

INSIGHTS AND ISSUES OF THE ENVIRONMENTAL FISCAL REFORM

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Abstract: *The paper addresses the importance and impacts of an Environmental Fiscal Reform, as a solution to foster environmental protection and to mitigate economic and social issues, promoting a sustainable development. First there are stated some public economics conceptual grounds, followed by objectives and trends of environmental taxes in the European Union and in Romania. Next sections deal with the importance and necessity of the Environmental Fiscal Reform, emphasizing main challenges and perspectives of the EFR in Romania and the EU, in spite of delicate socio-economic issues and other goals.*

Keywords: *environmental; tax; reform; double dividend*

JEL Classification: *H23; H30; Q58*

Introduction

Environmental taxation, and especially tax reform programs known as environmental fiscal reform (EFR), are required in the political programs such as the 2020 European Sustainable Development strategy, the Green Deal and many subsequent EU policy documents.

The main objective of environmental taxes is to reduce pollution and natural resources usage. There are also several side benefits: these taxes contribute to a society with a healthier population and, therefore, reduce the health costs involved; they can lead to eco-innovations that involve added value and jobs; widespread dissemination of the green technologies supports the production and consumption systems.

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A significant feature of environmental taxes is the fiscal function as well. Properly designed tax systems are effective, contributing to the strengthening of economic growth and achieving important social goals, such as better public health. The environmental taxes can reinforce environmental and non-environmental objectives and thus constitute a holistic approach.

Fiscal policy perspectives in Europe have shown increased interest in the potential for revenue neutral environmental reform of fiscal policy, whereby income from environmental taxes will be used to decrease labour taxes. The reforms through environmental taxes have been and may be effective in the future, as some EU member countries have experienced.

In the current context of green recovery, excise duties and carbon taxes can be useful tools to decarbonize the economies. Environmental taxes offer the right price signals and incentives to producers and consumers, so stimulating less polluting consumption and sustainable economic growth, enabling most environmental goals of the European Green Deal.

In this paper we analyse and highlight the main characteristics and trends regarding environmental taxes and fees that are applied in the European Union and in Romania, with arguments for extending their use for obtaining double dividends, both ecological and economic-social, within the framework of an Environmental Fiscal Reform and a Green Deal that are well-coordinated and dedicated to the simultaneous achievement of sustainable development objectives.

1. Theoretical and conceptual grounds regarding environmental taxes and fees

In order to highlight the primary conceptual foundations of environmental taxes, in this section, the environmental protection will be analysed as a public good, with presence of externalities.

In the case of the natural environment, the public good feature of non-rivalry of consumption is represented more in the aspect of quantity; a public good does not decrease in amount when consumed by more people. However, that public good, namely the environment, may lose its quality, so that the individual utility obtained from that good can be reduced when others use the good (for instance, in the atmosphere the available air is practically unlimited and not affected by the number of "consumers", but air quality may be severely affected by pollution).

Externalities represent the collateral effects of production and consumption, with positive (external benefits) or negative (external costs) consequences. In light of these

consequences, the state encourages activities that create external benefits, while limiting the actions that generate external costs.

Although these concepts have already been realized and analysed for several decades, it is important to review some of the most important grounds that characterize the essence and efficiency of economic and especially environmental protection fiscal instruments. A number of the essential aspects are highlighted and analysed both theoretically and practically in the study „Financing of environmental protection activities. Between theory and practice” (Platon V., 2004).

The internalization of negative externalities is one of the key issues in the market economy theory. In essence, internalization involves the incorporation of external costs into the market price, through the creation of appropriate institutions and the adoption of rules that determine polluters (producers of externalities) to consider the social costs and benefits besides the private ones.

On the other hand, since the effects of negative externalities are difficult to measure accurately, challenges and problems arise in applying methods of internalizing external costs.

The most important mechanisms that can be applied to internalize negative environmental externalities are represented by:

[1] The Pigou approach, which is based on government intervention for:

- Applying taxes / fees on polluting activities;
- Granting subsidies to those who bear the negative external effects.

Thus, the mechanism consists of the following steps (Popescu C. et al., 2011):

1. Application of fines for the manufacturer of negative externalities;
2. Granting subsidies to those who produce positive externalities;
3. The introduction of taxes and fees that bring the private costs to the level of social costs.

Moreover, for pollution the polluter pays principle is applied, according to which a tax is levied in order to internalize the pollution. The approach of the environmental policy based on the pollution tax and the polluter pays principle allow for an efficient allocation of resources (Suciu M.C., 2004) due to the following effects:

- i.* The environmental tax (on pollution) will lead to increased production costs and thus practically the supply in these polluting sectors or industries will decrease.

- ii. Second, the pollution tax will stimulate companies for economic initiatives to use production methods or technologies that could lead to lower pollution.
- iii. Third, as long as companies are able to reduce taxes by controlling pollution, they will have the initiative to reduce the level of pollution.

The main problem that arises in the case of Pigouvian taxes is given by the too high administrative costs of establishing the precise level of the taxes and collecting them in a tax-levy system based on economic or physical indicators.

Also, there are other indirect taxes or fees (such as VAT or excise duties) levied on certain goods and services related to environmental damage, which can influence more or less directly the decisions of the polluters. The carbon taxes applied in the case of fossil fuel consumption rise the price of energy from non-renewable sources and, as a result, the following effects are obtained:

- the demand for energy is reduced;
- the structure of the energy demand is changed, decreasing the demand for fossil fuels;
- carbon dioxide emissions per unit of energy used are thereby, indirectly reduced.

The main advantage of these indirect environmental taxes are the lower administrative costs, because they are correlated with the quantities consumed and can be found in the commonly used invoices and accounting notes. However, because of too little connection with the source of pollution, these taxes are generally less efficient for controlling and combating pollution than the taxes levied on direct emissions.

An important conceptual conclusion, highlighted in the study (Platon V., 2004) is that it can be stated that there is a trade-off between the main characteristics of these environmental taxes:

- the lower administrative costs associated with indirect taxes and respectively
- the higher incentive effects associated with Pigouvian taxes (determined in relation to the pollution produced), but with higher administrative costs.

[2] Ronald Coase's approach to reducing pollution or protecting the environment, has theoretical value but cannot be effectively applied in practice, under the current complex economic conditions, because in this case the solution of internalizing the negative externalities consists in assigning property rights.

The Nobel Laureate (1991) has shown that if property rights are clearly defined, all stakeholders will take measures to internalize externalities, without the need for government intervention.

2. Objectives and trends regarding environmental taxes in the EU and in Romania

2.1. Objectives and principles

Apart from the reasons related to the economy of the environment as a public good and, therefore, the need to internalize the environmental externalities, another important reason for reaffirming the importance of environmental taxes and fees is the need to realize tax revenues and alternative sources of financing for greater resilience (as lessons learnt from the economic and financial crisis 2009-2010 and/or the 2020 Covid-19 health, social and economic crisis).

Thus, the collected tax revenues can be used for:

- Directly addressing and tackling specific ecological problems;
- Subsidizing producers or consumers in their "green" transition to activities and behaviours less harmful to the environment;
- Reduction or elimination of other taxes and duties, for example on labour, and such a shift in the fiscal burden leads to an increase in economic efficiency and social welfare.

The environmental tax is based on physical reference units, such as a litre of gasoline, or a proxy which has a proven negative specific effect on the environment. It is identified as environmental tax in the national accounts (EC, 2015).

The definition is directed to tax bases with special relevance for the environment and considers that all taxes levied on these tax bases are environmental taxes. This choice is generated by the need to ensure international comparisons.

For the practical applicability issue of environmental taxes, there are also problems related to the need to redesign the existing taxation in view of:

- The introduction of direct environmental (Pigouvian) taxes intended to correct negative externalities;
- The reflecting of environmental policies, within indirect taxes and duties.

Nevertheless, from a fiscal point of view, there are also some differences between environmental taxes and duties:

- a) Environmental taxes are considered the payments received for the use of environmental goods and services, introduced with the purpose of incentive, but which are actually used as the source of income to the state budget;
- b) Taxes and tariffs for the use of the environment refer to the payments made to access certain specific services (waste disposal, use of environmental infrastructure networks, etc.) and which usually accumulate in an (extra budgetary) fund with a special purpose

In conclusion, it can be stated that by using environmental taxes and duties, two possible objectives are pursued: first, to provide polluters with an incentive as significant as possible to reduce pollution; second, to obtain budgetary or special extra-budgetary revenues.

However, environmental taxes have both this dual and a pronounced dichotomous character so that the two objectives may be incompatible, in the long term, given that:

- If the main purpose is as an incentive to reduce emissions, revenues will decrease as the pollutant emissions decrease;
- If the purpose of the tax is to obtain income, the effect is perverse because to collect a sustained flow of receipts it is necessary to have the pollution done by the respective charged emissions.

Moreover, as will be analysed in more detail below, in the environmental fiscal reform (EFR) carried out in a revenue-neutral manner, obtained by replacing existing taxes with direct or indirect environmental taxes, a so-called "double dividend" can be obtained.

This very relevant and useful concept in sustainable development theory can be a recommended political approach if two objectives are simultaneously achieved through the introduction of efficient environmental taxes:

- i. Reducing pollution or improving quality of the environment;
- ii. Reducing distortions and/or costs too high in the current tax system.

In fact, the statistical framework for environmental taxes is imposed by Regulation 691/2011 of the European Parliament and the Council on the European Environmental Economic Accounts and includes only the taxes that represent an income for a Central or Local public administration unit.

There are 4 main categories of environmental taxes in the Eurostat (2013) methodological guide:

- i. Energy taxes (including transport fuels);
- ii. Transportation taxes;

- iii. Pollution taxes;
- iv. Resource use taxes.

Energy taxes mean taxes on the energy goods and services used both for transportation and for stationary purposes (fuel or energy/ industrial processes). The main energy products used in transport are fuels (gasoline, diesel and others). In the category of energy goods and services for energy/ industrial processes are included: fuel, natural gas, coal and electricity. CO₂ and SO₂ taxes are also included in this category because they are difficult to identify separately in tax statistics.

Transport taxes mainly include the taxes related to the ownership and use of the vehicles. Taxes on aircraft and related transport services are also included as they comply with the general definition of environmental taxes. Transportation taxes may be taxes on trade of motor vehicles or recurring taxes such as the annual road tax. Taxes on consumption of gasoline, diesel and other fuels used for transport are not included in the transport taxes.

Pollution taxes are applied to emissions issued from mobile and immobile sources and properties, as well as from the manufacturing of some products (chemicals, tires, bags and cardboard packaging). Therefore, these taxes apply to air and water emissions, solid waste and noise. Here are not included CO₂ taxes, which were included in the energy taxes category.

Resource taxes are applied to the exploiting of natural resources not used as energy sources. There is no general consent that extraction of natural resources is harmful, but it is generally agreed that it may involve environmental negative impacts (soil erosion and pollution).

2.2. Trends on EU environmental taxes

The European Union also promotes these environmental taxes, especially as a cost-effective tool meant to apply the well-known principle „polluter pays” and also to reach the environmental policy goals. For instance, using economic instruments in order to obtain environmental benefits was stipulated in the 2020 EU Environment Action Program and in the EU's sustainable development objectives.

When analysing the potential for boosting sustainable development, it is important to emphasize that environmental taxes are not effective only for pollution control and resource saving efforts. At the same time, by their fiscal nature, environmental taxes have a characteristic closely linked to the economic dimension of sustainable development, capable of encouraging innovation (Sustainable Development Goal, SDG 9) and promoting sustainable production and consumption models (SDG 12).

Indeed, the environmental protection effect of an environmental tax occurs through the impact it has through the specific price elasticities, on:

- a. The relative price of products;
- b. The level of activities.

Some of the most important current trends on environmental taxation and financing of environmental investments in the European Union, according to the latest Report regarding EU environmental policy implementation (COM(2019) 149 final) are:

- Within the European Union, the environmental taxes/GDP ratio varies between approximately 1.7% and 4%. Several Member States use environmental taxes starting 2017, which include higher diesel cost or reducing subsidies that were harmful for the environment. However, in several Member States the use of personal motor vehicle is still favoured by low taxation, which hinders progress in addressing traffic congestion and air pollution (Poland, Belgium, France, Hungary and others).
- The ESI funds (European Structural and Investment Funds) allocated the largest sums for "environmental protection and resource efficiency" during 2014-2020 (Sweden, Austria, Denmark, Malta, Finland and others). In addition, EU funds for the environment were also much bigger than the environmental national budgets during 2014-2018 (Bulgaria, Romania, Hungary, Croatia, Poland, Portugal and others).
- In several European countries, including Romania (Greece, Austria, Hungary, Bulgaria, Italy, Germany, the Netherlands and others) the main challenge in financing the environment is to keep it at a functional level.
- Another problem that some of the EU countries are confronted to is the efficient use of EU funds (Croatia, Romania, Czech Republic, Poland, Slovakia, Lithuania, Latvia and Estonia), due sometimes to the insufficient capacity of administrations but also to the low availability and propensity to pay on average population (Frone Simona, 2012).

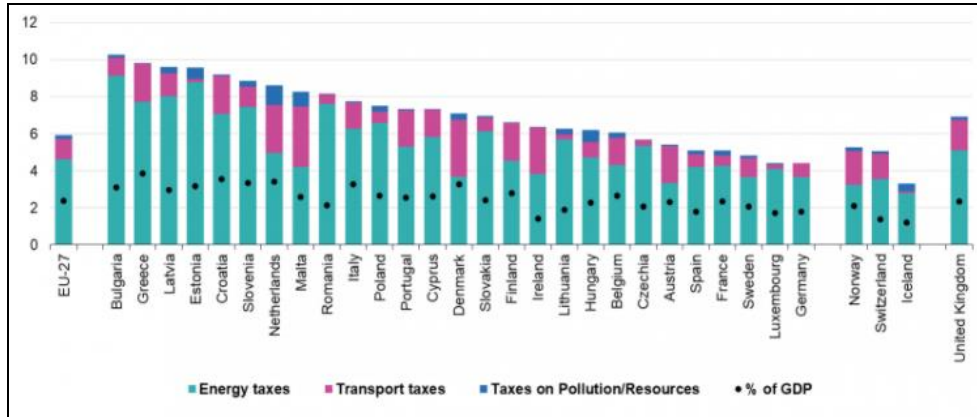
Table 1. Total environmental tax income by type, EU-27, 2019

Environmental taxes	Million Euro	% of Total	% of GDP	% of income from social contributions and taxes (TSC)
Total	330577	100	2.4	5.9
Energy taxes	257534	77.9	1.8	4.6
Transport taxes	62433	18.9	0.5	1.1
Pollution/ use of resource tax	10610	3.2	0.1	0.2

Source: Table 1 in Statistics Explained File:Total environmental tax revenue by type of tax and tax payer, EU-27 (Eurostat, Jun 2021.png)

According to the latest statistics report (Table 1), in 2019, the total income from environmental taxation in EU was 330.6 billion Euro, which amounts to 2.4% of total EU GDP and 5.9% of EU government income from social contributions and taxes (TSC).

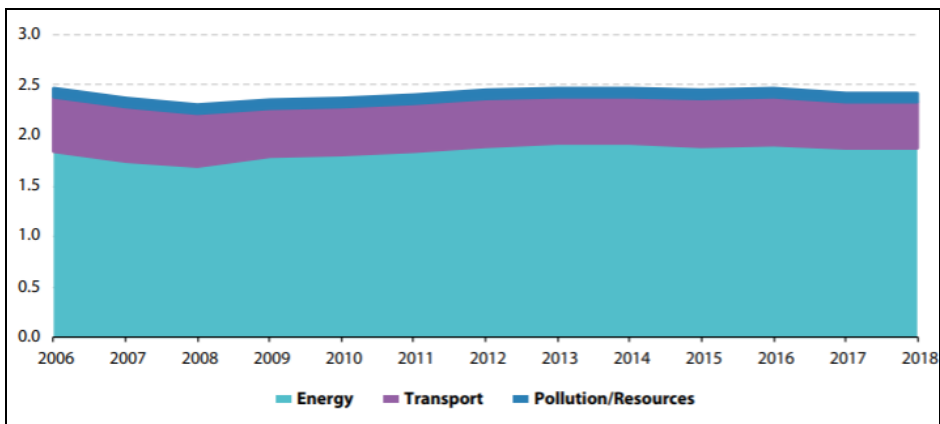
Figure 1. Environmental tax revenues as GDP share (%), EU-27 (2019)



Source: Eurostat (env_ac_tax)

It may be observed from Table 1 and Figure 1 that the energy taxes are the most important environmental taxes in the EU, representing 77.9% of the total environmental taxes and providing 4.6% of the total fiscal income (from social contributions and taxes).

Figure 2. Environmental tax revenues, 2006-2018 (% of GDP)



Source: Taxation Trends in Europe 2020, DG Taxation and Customs Union.

This trend is obviously due to the common EU and global efforts in fighting climate change by all means and policies, such as the carbon taxation. (Frone S., Constantinescu A., 2019). Moreover, it is expected to be continued and reinforced by the new green recovery policies.

In terms of their dynamics, after a small fall in 2008, the percentage of environmental taxes in EU GDP increased slightly until 2012, especially because of the increase in energy taxes (Figure 2). However, ever since the level of environmental tax revenues has been more or less stable and did not exceed 2.5% of the EU GDP.

On the other hand, a deeper dynamic analysis of revenues from environmental taxes is more delicate or difficult, as these trends highlighting the evolution of environmental taxes as a source of income, should be discussed with caution. They may be the outcome of modifications in the tax rate but also in the tax base. Sometimes, if the corresponding tax rates have increased, even if the related tax base has decreased, there will be no increase in tax revenues. Thus the 'green' dynamics cannot be fully described from the figures related to environmental tax income.

In addition, it should not be neglected that, in fact, the main objective of environmental taxes and charges is to discourage the polluting consumption or production behaviour, by applying the polluter pays principle, which probably ensures the best economic and ecological efficiency of these instruments.

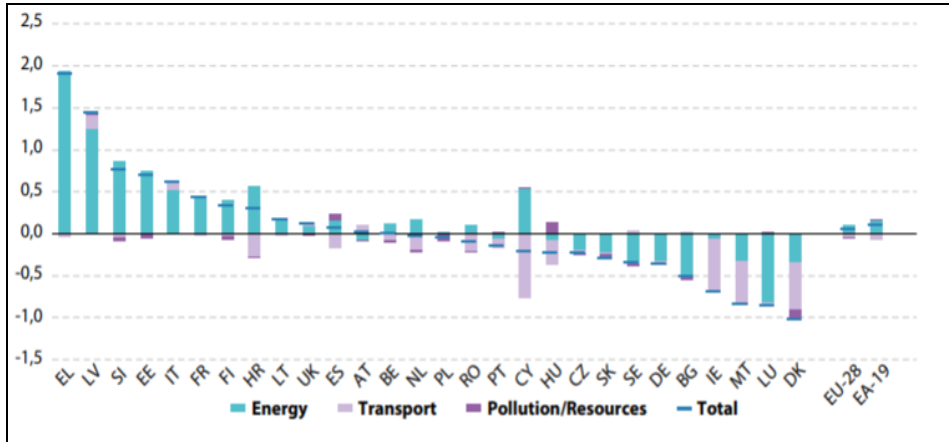
Energy tax income have the highest contribution to environmental tax revenues for almost every country (accounting for approximately 78% of EU environmental tax income in EU28). Out of this total, taxes on transport fuels represent approximately 67% of revenues, followed by transport taxes (19%) and pollution / resource taxes (3%).

It can be seen from Figure 1, based on recent data (Eurostat, 2020) that energy taxes hold the highest share in the structure of environmental taxes in all EU countries. This means, first of all, that the tax base given by energy consumption is the largest and most stable, being fuelled especially by the consumption of fuels for transportation.

The energy taxes represented more than half of the environmental tax income at EU level in 2019, representing the biggest source (more than 90%) of environmental taxes in Romania, Czech Republic, Estonia, Lithuania and even Luxembourg.

In this respect more interesting to observe and analyse are the variations that have taken place in the evolution of the structure of (revenues from) the environmental taxes, at European level as well as in every EU MS. (Figure 3)

**Figure 3. Structure evolution of environmental tax income, 2007-2017
(% GDP difference)**



Source: Taxation Trends in Europe 2019, DG Taxation and Customs Union.

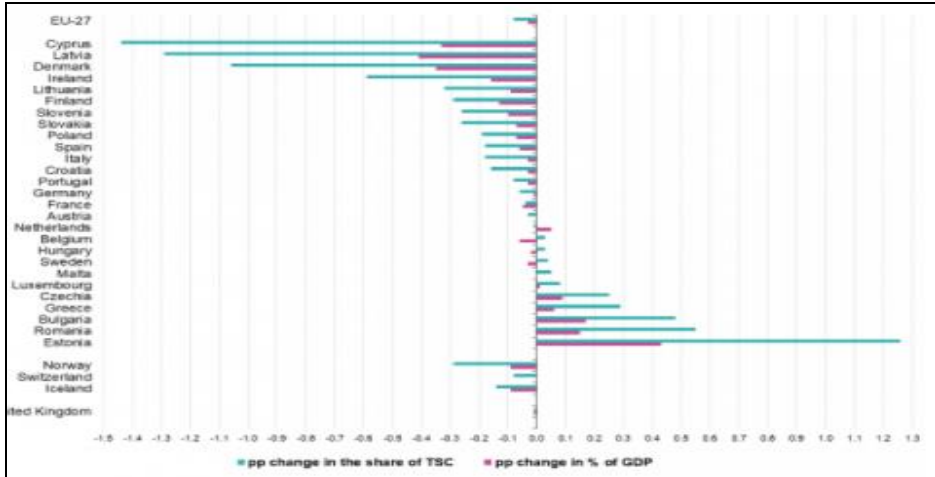
The structural changes of the environmental tax income that were registered during 2007-2017 can be noticed in Figure 3. There were quite many states where the total variation in the share of the revenues from the environmental taxes is negative, the first one, with a very small decrease being Romania, followed, in ascending order, by Portugal, Cyprus, Hungary, Czechoslovakia, Slovakia, Sweden, Germany, Bulgaria, Ireland, Malta, Luxembourg and Denmark.

We can say that, in principle, a reduction in the share of tax revenues from environmental taxes could be considered a positive evolution from an environmental point of view, resulting either from the decrease of the polluting tax base or from the greener economic growth, i.e., a GDP growth that is not commensurate with the increase in pollution and energy consumption in that country (with an increase in resource productivity).

In the decade 2007-2017 we could observe a very small positive overall evolution of approx. 0.1% for the entire EU-28, due to an increase in the percentage of revenues from energy taxes. However, during 2018-2019, environmental tax income decreased, as share of GDP and of TSC, in almost every EU country and the latest trends are represented in Figure 4.

Even if the changes in the ratios of environmental tax revenue-to-GDP during 2018-2019 are not significant, there were some differences between EU countries.

Figure 4. Environmental tax revenues, change between 2018-2019 (percentage points of GDP)



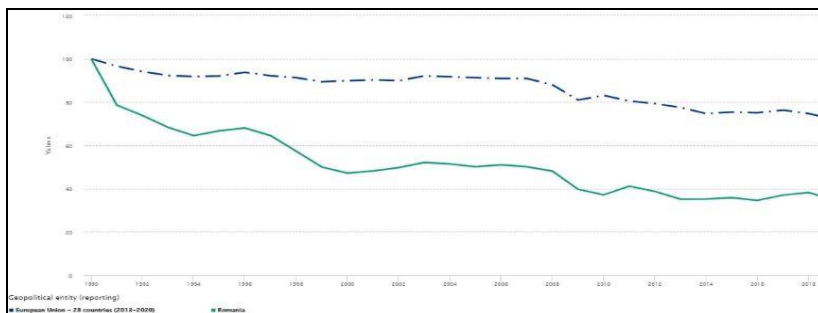
Source: Eurostat (env_ac_tax)

This share of income slightly increased only in ten EU Member States and Estonia and Romania were the only two countries with relatively large increases (1.26% and 0.55%).

2.3. Trends regarding environmental taxes in Romania

As will be shown below, it is precisely the energy taxes that have played a decisive role in reducing CO₂ emissions, both in Romania and in the EU (Figure 5).

Figure 5. Variation in total greenhouse gas emissions, Romania and EU, 1990-2019 (1990 = 100 %)



Source: own computation from Eurostat database, 2021.

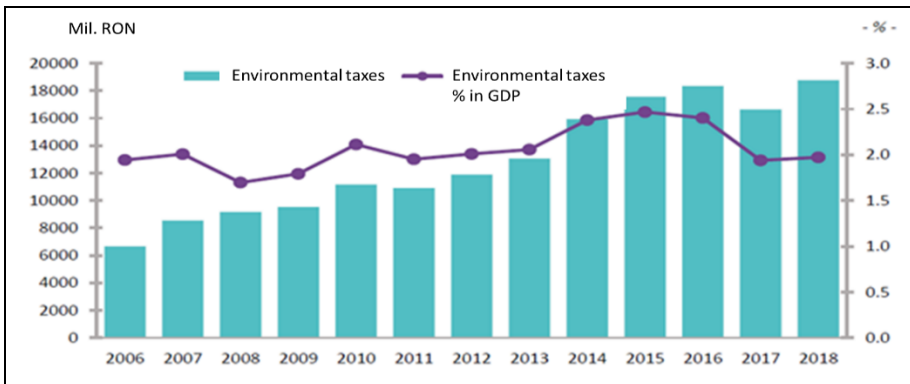
Romania had, every year during 2013-2019, lower emissions than the annual targets. Romania's national target for 2020, established under the EU Decision on the distribution of efforts is to avoid an emission increase of more than 19% compared to 2005. For 2030, the national target of Romania established under the Regulation on the distribution of efforts is to reduce emissions by 2% as compared to 2005.

Regarding the main trends of environmental taxes in Romania, we will refer to the evolution of some important economic indicators.

Environmental taxes registered the highest share of GDP in 2015, over 2.4% and the lowest share in 2008 (1.8%). In Figure 6 the dynamics of the cumulative environmental taxes in Romania is represented graphically, both effectively (million lei) and relatively, as % of GDP, during 2006-2018.

It is noted that in terms of the absolute value of revenues from environmental taxes, they have increased by about 3 times, since about 6,000 million lei in 2006, to almost 18,000 million lei in 2016.

Figure 6. The amount of environmental taxes in Romania and their share in GDP, 2006-2018

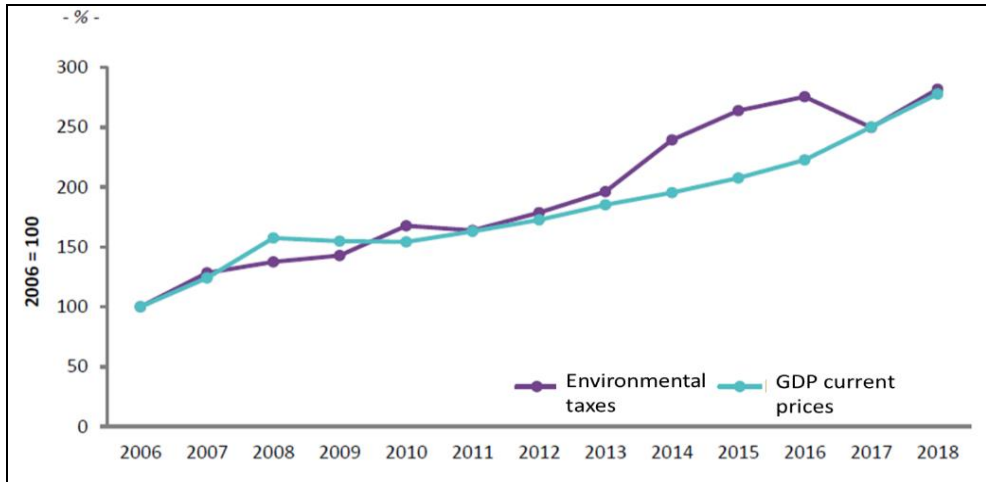


Source: C.E.M. - INS, 2020.

In the period 2006 - 2018, the trend of the environmental taxes is increasing having in 2006 the value of 6644.2 million lei current prices, and in 2018 being about 181.9% higher (18771.5 million lei current prices). On the other hand, in terms of their relative value, respectively their share in GDP, this is more stable, of about 2% and not exceeding 2.5% of GDP (Figure 7).

In order to determine the important role of environmental policies, it is useful to compare the dynamics of environmental taxes, in relation to the dynamics of GDP in Romania, respectively with the economic growth during the analysed period, 2006-2018.

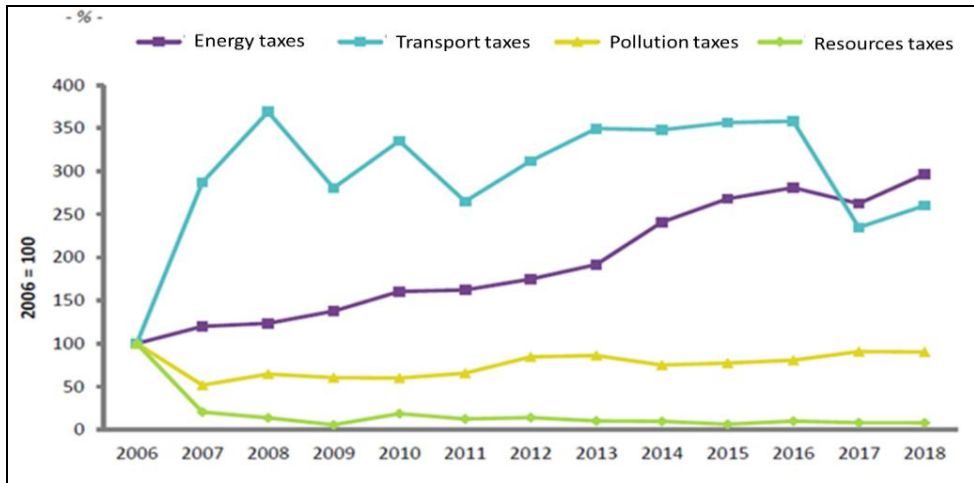
Figure 7. Dynamics of environmental taxes and GDP in Romania, 2006-2018



Source: C.E.M. - INS, 2020.

It may be observed (Figure 7) that, during the period of "overheating" of the Romanian economy, 2006-2008, the GDP growth was higher than that of environmental taxes, which does not necessarily indicate the green, ecological character of the production, but rather the incipient, underdeveloped stage of environmental taxation in Romania.

This trend has reversed, of course, with the economic crisis 2009-2010, when the GDP collapsed but the value of the environmental taxes continued to increase, which shows the polluting nature of the Romanian economy. The situation continues, after 2012, with a higher increase in revenues from environmental taxes than of the GDP, which suggests a less environmentally sustainable economic growth, in which transport and fuel consumption hold a high share.

Figure 8. Dynamics of environmental taxes by categories, in Romania, 2006-2018

Source: C.E.M. - INS, 2020.

It is noticeable that in the latest years (2017-2018) the dynamics of the environmental taxes is the same with that of the GDP which should be considered as being a trend of greening economic growth in Romania. Moreover, it is important to analyse the structure of environmental taxes, in order to be able to appreciate the more or less ecological character of the economic growth in Romania during this period and some structural changes that have taken place. The environmental taxes in current prices evolved differently during the analysed period. Thus, if taxes on transport, energy had a positive evolution compared to the first year of the series, the (low anyway) taxes on resources and pollution decreased (Figure 8).

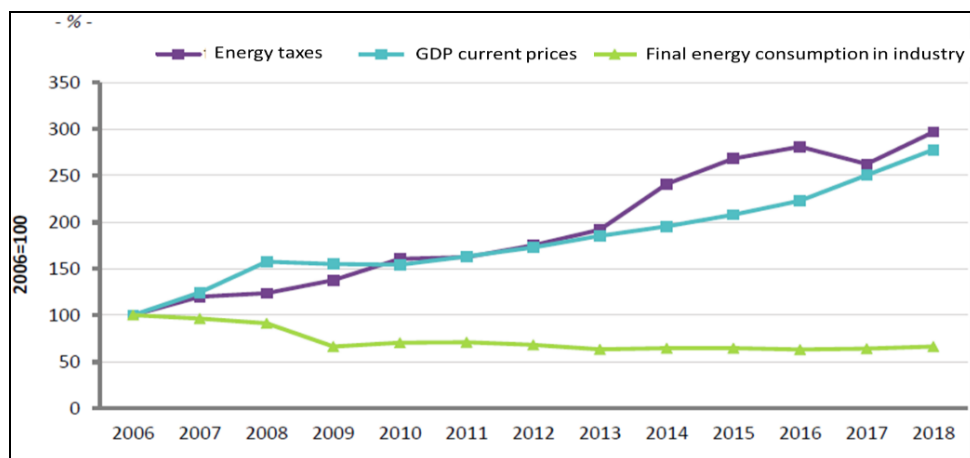
After a short drop in 2017 of the energy and transport taxes (due to populist policies), they resumed their growing trend in 2018, which is supposed to continue in view of implementing a more ambitious climate and environmental targets of the European Green Deal.

The most significant weight in the environmental taxes have the energy taxes for the entire period analysed, of 87.1% so that they give the general evolution of the environmental taxes. In 2018 energy taxes accounted for 92.8% of the total environmental taxes followed by transport taxes (7%) and pollution taxes and resource taxes with only approximately 0.1%.

Regarding the environmental efficiency of these environmental taxes, energy taxes are probably the most significant, although apparently their ability to reduce consumption

has reached a maximum threshold (a limit). Thus, as can be seen in Figure 9, in 2018 the final energy consumption in the industry (including constructions) in Romania, decreased by almost 33.8% compared to the first year of the analysed series, while the taxes on energy increased by about 196.6% compared to 2006.

Figure 9. Dynamics of final energy consumption, energy taxes and GDP during 2006- 2018, in Romania (%)



Source: C.E.M. - INS, 2020.

We note some very interesting aspects, from the analysis of the graphical representation of the evolution of energy taxes in Romania, in relation to the evolution of GDP and the final energy consumption:

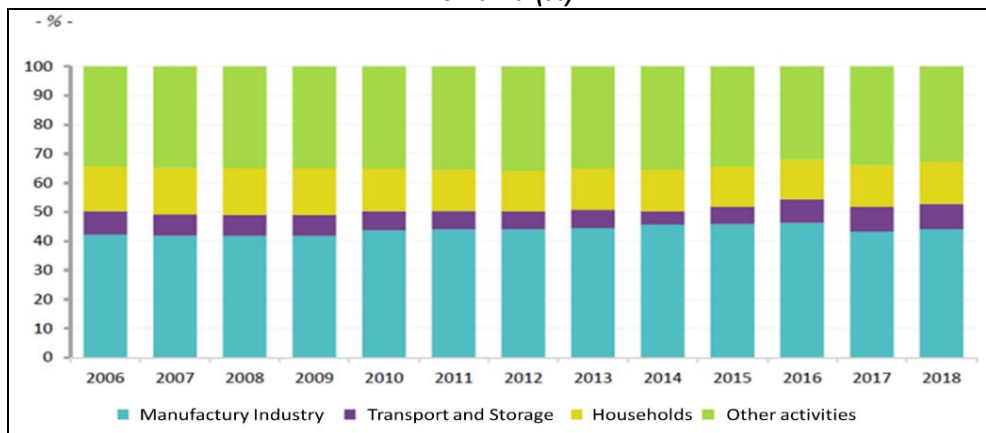
- First, the initial growth rate of GDP overtook that of environmental taxes in the period of economic boom (2007-2008);
- Then, along with the economic crisis (2009-2010), the GDP decreased more sharply than the accumulated environmental taxes;
- During the economic recovery period (2011-2013) the increase of the environmental taxes was natural, at the same rate as the GDP;
- Lately (2017-2018) the trend shows a slightly higher dynamic of the energy taxes compared to that of GDP.

These aspects can also be explained by the fact that although the economy (GDP) has always grown more or less pronounced after 2011, the final energy consumption in the industry has been somewhat capped, failing to decrease significantly compared to 2013,

the economic agents paying higher energy taxes but not willing or being able to restructure in order to reduce final energy consumption.

However, it is noteworthy that this final energy consumption in the industry currently has a relatively steady level of only 63% compared to the initial level in 2006. For the whole period analysed the distribution of environmental taxes by activity areas and their level has changed due to the fact that there have been substantial annual changes in the legislation.

Figure 10. Distribution of energy taxes by main activity areas during 2006-2018, in Romania (%)



Source: C.E.M. - INS, 2020.

As can be seen from Figure 10, during 2006 - 2018 the revenues to the state budget from energy taxes come from the processing or manufacturing industry with an average of 43.8%, followed by other economic sectors with 34.5% and households with an average of 14.7%. The transport sector has a decreasing share of only 7% in 2018. This means that the structure of the Romanian economy is currently relatively balanced but also that the transport sector has a decreasing share in the economy and/or a lower pollution potential, since the greening of transportation has started.

3. Importance and Necessity of the Environmental Fiscal Reform

3.1. Conceptual aspects of EFR

Conceptually the Environmental Tax (or Fiscal) Reform (EFR) can be defined, approached and understood in several ways.

- I. In a first definition, the RFE refers to “a range of taxation or pricing instruments that can raise revenue, while simultaneously furthering environmental goals, by providing economic incentives to correct market failure in the management of natural resources control of pollution.” (IBRD – World Bank, 2005). From this point of view, the EFR is linked only to the application of environmental taxes.
- II. Another definition considers the EFR as “the tax shift from labour towards environmental use and the removal of environmentally adverse subsidies” (EEB, 2017).
- III. The third definition of EFR highlights that it is more of a ‘shift of tax’ in which “a gradual increase in the revenues obtained through environmentally related taxes offers a reason for reducing taxes generated from sources, such as income, profits and employment, which should be taxed” (OECD, 2017).

For the purpose of this research paper, an EFR is seen more like in the last definition. The EFR involves two components: first, an increasing public income and its investment in a social action; (b). an environmental policy which uses economic instruments to include the environmental damage cost in the prices that polluters should pay.

We must underline that, until recently, the two components of fiscal theory – the fiscal policy to collect income and the fiscal policy to correct externalities - were analysed independently. The “double dividend” literature recently issued the idea that environmental taxes have a revenue-raising role and it is a substantial reason to implement these taxes and promote them for the EFR.

In the double dividend approach of David Pearce (Pearce D., 1991), a first benefit of an environment tax reform was considered the imminent environmental quality improvement as for the second benefit, reducing the old taxes, this was a reduction of economic costs.

In the view of Robertson the double dividend principle is that: „if revenue from an environmental tax can be used to finance a cut in the tax rate for a distortionary tax (such as the income tax), that cut produces an efficiency gain in addition to the other effects of the environmental tax”. (Robertson C., 2016)

The “double dividend” concept implies that environmental taxes increase economic efficiency in two separate ways: by internalising an externality and by generating income used for cutting other taxes. This additional “dividend” is also known as the effect of “revenue-recycling.”

Even if on the subject of the double dividend there are many papers which discuss the topic, it is still important to approach more on the usefulness of the EFR in emerging-market and new EU countries, with limited institutional capacity or experience on this

matter. To tackle efficiency, environmental taxes should benefit from incentives (Frone S., Constantinescu A., 2019).

The need for EFR is justified by the following features of environmental taxation:

- a) an environmental policy using economic instruments to include the environmental damage cost into the price paid by polluters;
- b) a fiscal policy intended for raising public income and using it for social actions.

Often the income from environmental taxes is wasted because of the lack of productive or useful revenue use.

The environmental tax schemes are suitable for the economic and financial crisis context, due to the low tax-evasion possibility and to the very low administrative costs. It is a good option for countries which intend to develop economic growth while also collecting income to raise their budget (EEA, 2016).

3.2. Necessity and social issues of the EFR

The Seventh Environment Action Program (WFP 7) calls for a change in the basis of taxation replacing labour basis with pollution and consumption of resources, in order to foster the achievement of environmental goals, increased employment and green economic development.

As shown above, environmental taxes have as tax base a physical unit (or proxy) of some act with proven negative environmental impact. Thus, revenues of environmental taxes currently come from energy, transport, pollution and resource taxes. Labour taxes encompass all the taxes on personal income, on wages and social contributions levied for work income.

Analysis suggested that for success in the environmental taxation reform (EFR) it is necessary to have a wise plan to escape negative socio-economic effects with a large-scale consultation that reflects the principles of good governance.

On the other hand, the EFR is also necessary to reduce the harmful economic and social impact of environmental taxes. The environmental taxes on electricity and fuels of household use are usually regressive, while transportation taxes are progressive in the majority of states.

The impact of taxes depends essentially on the resource that is taxed. For instance, in water consumption, the social impact is more significant. In an endeavour to increase water use efficiency and to finance water supply and sanitation (WSS) investments, in Ireland a water supply tax was issued in 2014. Costs for water and wastewater can be up to EUR 260 per household/year (Irish Water, s. a.).

The water tax has led to large-scale protests demanding partial exemption from tariffs (McDonald, 2014) and even today, they are still politically contentious. The willingness to pay for WSS services is very low at the Irish people (Edwards, 2016), though punishments for non-payment go up to prison sentence.

Since the possibility for saving or replacing water is little, the burden on low-income households is very high compared to higher-income ones. In the less developed countries, since it is necessary for water tariffs to cover the costs of services in the medium term, taxes for WSS can often have a high social equity impact. If they are issued, they should be wisely conceived for the widest access to water services and avoiding adverse impact (Frone S., Frone D.F., 2012).

Regardless of their impact as such, the environmental taxes may or may not be regressive according to the political context. In developed countries there are cases of progressive EFR actions, since many such countries have applied them in a larger block of tax reforms or in a package covering policies to reduce labour taxes, induce behaviour change, finance investments, and allow for compensation to protect prone social categories.

As a basic rule, it has been stated that up to 10% of the additional revenue from new energy tax measures is needed to cover compensation for the poorest 20% of the population (Vivid Economics, 2012), so substantial environmental tax income is left for other purposes, depending on exemption or compensation involved.

The administrative costs of the social schemes differ according to the context of the country. Especially in developing states, experience has shown that specific measures are more effective while those addressing poorly designed social effects carry high feasibility costs. In the UK, for example, the VAT rate applied to household energy consumption is lower. This reduces indeed the burden for the households, but state incurred costs are about 0.25% of GDP loss of fiscal revenue (OECD, 2010b).

Where possible, better targeted systems, focusing on compensation of low-income households should be preferred. In developed countries, the studies suggest that the clearing mechanisms must not jeopardize the incentive effect of a certain tax, and should compensate in other means (OECD, 2006). Nevertheless, administratively it is challenging to target all negatively affected by a certain measure since rather difficult to determine whom and to what extent to compensate by the state government. (Jacqueline Cottrell et al., 2016)

Therefore, the regressive impact of environmental taxes may be neutralized, for instance, by reducing income tax or wage costs. Thus, the price signal of environmental taxes is maintained for the purpose of protecting the environment, still the poorer households are somehow exempted or compensated.

This change of taxation from labour to environmental factors can contribute to neutralize the distributional impact of taxes on energy and CO₂, as in The Netherlands and Sweden (Peter et al., 2007). This way, the EFR does not undermine the incentive effect of the environmental tax since no tax exemptions.

Exemption or social protection in some form is more required in developing countries, especially in those with large proportion of population living in poverty so hit by any small price changes, on energy for example. Meanwhile, in developing countries the compensation systems are challenging to design and provide coverage, given that the most vulnerable population categories are active in the informal or non-fiscal economic sector.

4. Main challenges and perspectives of the EFR in Romania and the EU

4.1. Challenges and prospects of the EFR in Romania

As member of the EU, Romania has the obligation to implement European environmental regulations in Romanian legislation. The national objective, part of the 2020 strategy and Romanian National Sustainable Development Strategy 2013 - 2020 - 2030 is to improve the environmental and living standards with increased resource efficiency.

On the other hand, as noted in many of our previous publications, Romania is lagging behind and had poor performance regarding some EU environmental directives (Water Framework Directive and others). Insufficient wastewater treatment, the landfilled solid waste and high air pollution are the main challenges for the national environmental program, while technologies for environmental protection should be improved and developed.

The environmental legislation (introduced in 1991) has been extended and developed to standards mandated by the European Union. Some environmental norms in Romania are higher than EU norms (for example, the quality of waste water discharged into surface water sources), in order to save the already affected environment. Nevertheless, the Romanian government has got EU approved transition periods (from 3-12 years after Romania joined the EU in 2007) to certain environmental *acquis* directives.

Immediately after the economic and financial crisis (2009-2010), Romania had a position at the bottom of the list of EU states, as share of environmental taxes and charges in GDP (position 23 in 2011). After the economic recovery, the revenues collected for the Environmental Fund have steadily increased.

However, these amounts obtained for the Environmental Fund are a very little share of GDP. Revenues from pollution taxation were very small, so these real incomes dedicated for environmental programs have left Romania among the last in European rankings.

The situation shows the necessity of a major reform in fiscality for the environmental taxes in our country. The gradual increase of the total environmental taxes, and the introduction of some instruments used in other EU countries, represent the needed measures in Romania.

The emergence and perpetuation of the budget crisis in recent years, the EU recommendations to change the taxation system (Romania has a high tax burden), with focus on raising consumption and pollution taxes, together with better collection of environmental taxes, should become a priority.

Environmental taxes have played an important role in the previous economic crisis (2009-2010). Their growth created the possibility of reducing labour taxation, thus simultaneously stimulating employment and environmental quality improvements.

Table 2. Evolution of income from environmental taxes (million lei), 2007-2018

Taxes/year	2007	2008	2009	2010	2011	2012
Energy taxes	7037.77	7251.61	8078.51	9416.51	9528.2	10268.82
Transport taxes	1441.9	1854.3	1409.7	1685	1331.9	1567.7
Pollution taxes	13.7	17.1	16	15.9	17.4	22.4
Resource taxes	52.5	35.7	14.4	48.3	32	35.9
Environmental taxes total	8545.87	9158.71	9518.61	11165.71	10909.5	11894.82
Taxes/year	2013	2014	2015	2016	2017	2018
Energy taxes	11262.34	14148.47	15740.05	16498.33	15407.1	17420.2
Transport taxes	1757.3	1748.7	1791.5	1799.7	1179.8	1307.3
Pollution taxes	22.8	19.9	20.5	21.4	24	23.9
Resource taxes	26.2	24.6	16	25.6	20.7	20.1
Environmental taxes total	13068.64	15941.67	17568.05	18345.03	16631.6	18771.5

Source: own processed data from National Institute of Statistics TEMPO–online, in June 2021.

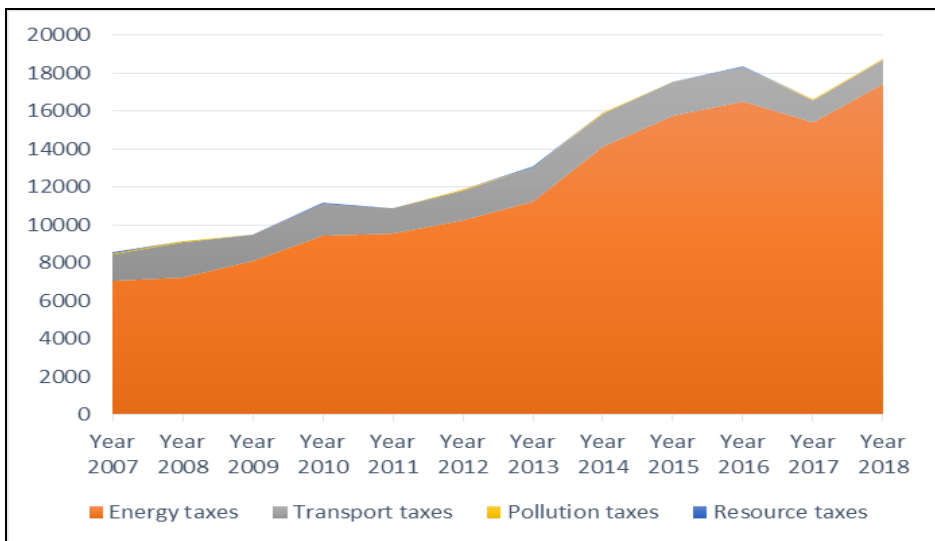
Between 2000 and 2013 there were changes in the structure of environmental taxes at EU level. There is no perfect tax, since environmental charges have both pros and cons. Major difficulties arise in obtaining approval from all EU member states (Chitiga G., 2017).

Romania has improved its environmental legislation and some performance over the period of more than 10 years after joining the EU in 2007. For example, environmental taxes and charges revenues have increased almost continually since 2011 (Table 2).

The default energy tax rate stayed lower than the EU average, suggesting an energy-saving economy and a still wide scope for improvement in energy efficiency.

Table 2 and Figure 11 below describe the evolution of environmental taxes in Romania, after 2008, on each of the main categories of taxes.

Figure 11. Evolution of income from environmental taxes (Million lei), 2007-2018



Source: own processing of data from Table 2.

In addition, considering that Romania has issues of achieving environmental goals for water, waste and air, additional measures of environmental taxation are welcome also based on a considerable potential to increase revenue from environmental taxes.

Romania must take the efforts to meet EU air quality standards, especially in large cities. With the most robust economic growth in the EU area, Romania should focus more on sustainable development, namely improving quality of life and environment, ensuring an increased efficiency of resources (EC, 2017).

It may be noted from the Figure 11 that the value of environmental taxes has increased after 2007, and the increasing trend is mainly imprinted by the energy taxes, which have

the largest share in Romania. Some environmental taxes, such as the pollution and resource taxes, are quite insignificant, while the transport taxes are rather low.

Table 3. Evolution of the unemployment rate (%) in Romania, 2007-2019

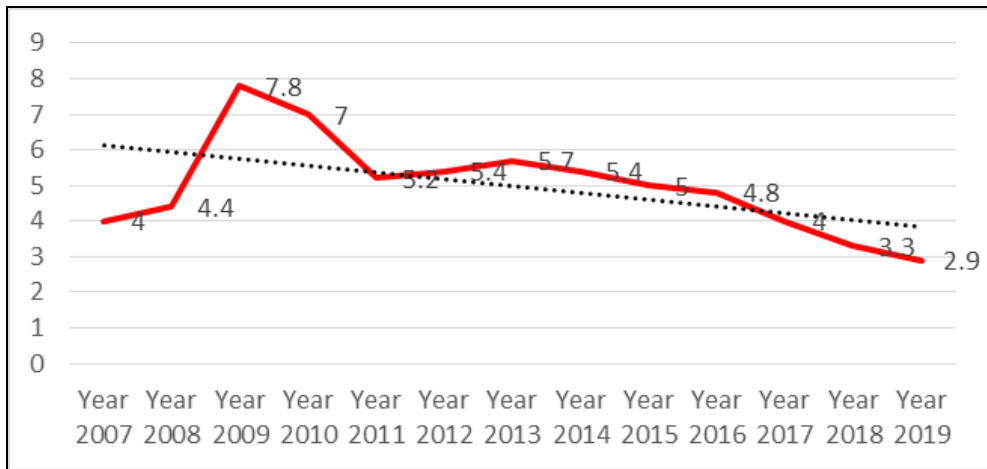
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Un. rate (%)	4	4.4	7.8	7	5.2	5.4	5.7	5.4	5	4.8	4	3.3	2.9

Source: own data processing from TEMPO SOM103A

During the same period, the Romanian unemployment rate (Un rate) recorded a fluctuant evolution, shown in Table 3:

It is obvious that, in the same period 2008-2018, after a sharp increase in the period of the economic crisis 2009-2010, unemployment decreased in Romania, reaching a relatively constant rate of 4%, and the trend was downward before the Covid-19 crisis in 2020 (Figure 12).

Figure 12. Evolution of the unemployment rate (%) in Romania, 2008-2019



Source: own data processing, from Table 3.

From Figures 11 and 12 there appears to have been quite a reversed correlation between the environmental taxes and the unemployment rate in Romania, in 2008-2018, indicating the actual working of a **double dividend effect**.

In order to strengthen these analyses, we present in the following the results and conclusions of a recent study for the case of Romania and EU as a whole, regarding the estimated impact of environmental taxes on certain economic, social and environmental variables, from the Romanian point of view, but also in comparison.

The authors (Radulescu M. et al, 2017) used the annual data series from the Eurostat database (1996 - 2015) for the following variables:

- real GDP growth (growth rate compared to the previous year, %);
- the unemployment rate (%);
- the share of environmental taxes and taxes/GDP;
- the greenhouse gas emissions (in CO₂ equivalent), compared to the base year 1990 (%).

The findings are that in Romania and in the EU area, the impact of unemployment on the CO₂ emissions is negative, but much more significant in Romania. Both in the EU and Romania, a rise in environmental taxes leads to a lowering in CO₂ emissions, validating the theoretical background of environmental taxation.

The correlation of environmental taxes with the unemployment rate is negative in Romania (confirming the hypothesis of double dividends also observed from our analysis and figures with reverse trends) while the EU area has a positive correlation (this hypothesis of double dividends is not validated with EU data).

However, according to (Radulescu M. et al, 2017) an increase in environmental taxes has the following effects in Romania:

- The decrease of CO₂ emissions with greenhouse effect (environmental dividend);
- The unemployment decline, improved employment (positive social impact);
- The economic growth is not achieved (zero or negative economic effect).

In the European Union, the increase in environmental taxes entails economic growth and reduced total CO₂ emissions, but not the decrease in the unemployment rate. This may be explained by the lower level of labour taxation in EU than in Romania.

The main conclusions of the (Radulescu M. et. all, 2017) economic-mathematical modelling of environmental tax reform are the following:

1. There is sufficient space for further EFR in Romania.
2. Resulting from forecasts (IEEP, 2014), it is also shown that a further rise in environmental taxation could mean benefits of 0.07% of GDP in EU area, while in

Romania they would be much higher than the EU average (estimated at about 0.24% of GDP).

Besides, the results of the analysis for Romania may be explained by the research outcomes of other authors [Kohlhaas, M. et al., 2004; Ekins P., 2009] which claim a strong correlation of the environmental tax with unemployment, but negative correlation with the output. An explanation is that Romanian economy depends on exports so the increased environmental taxes decrease competitiveness of Romanian exports, eventually affecting the GDP growth.

4.2. Trends and issues of Environmental Fiscal Reform in the EU

The latest challenges in the global economic development such as the economic, environmental and social crisis determined by the Sars-Cov-2 pandemic in 2020 urge governments and institutions to take more serious, active and correlated measures to mitigate climate change and avoid further losses and disasters.

The European Green Deal, adopted by the EU in 2019, is supposed to actually deal more effectively with all the challenges, being: "a new growth strategy that aims to turn the European Union into a fair and prosperous society, with a greener, resource-efficient and competitive economy where greenhouse gases are no longer emitted in 2050 and economic growth is decoupled from resource use" (EC COM (2019) 640 final).

The fiscal policy will become a solid pillar of the European Green Deal since it considers that appropriate tax reforms: "can boost economic growth and resilience to climate shocks and help contribute to a fairer society and to a just transition. At national level, the European Green Deal will create the context for broad-based tax reforms, removing subsidies for fossil fuels, shifting the tax burden from labour to pollution, and taking into account social considerations". (EC COM (2019) 640 final)

In this framework, following the sustainable development documents and in accordance with the EU recommendations, adjustments of the fiscal system are envisaged by transferring part of the taxation on labour force to the taxation on the use of resources. This action should have an important beneficial impact in sustainable development through:

- Stimulating of investments directed to the sub-sectors where the productivity of resources is higher and inhibition of growth in energy- and material-intensive sectors;
- Promotion of products and services based on medium and high complexity technologies, with an advanced processing degree and high added value, as well as increasing their share in export.

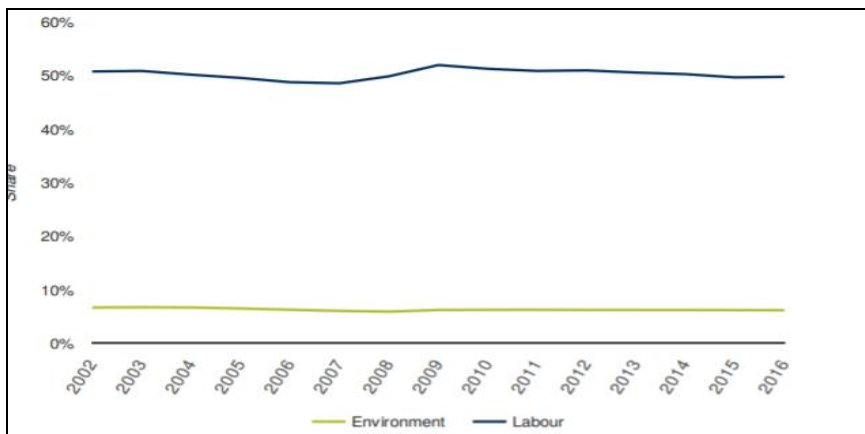
A relevant research work done for the 27 EU countries (at that time) by (Groothuis, 2016) investigated the economic growth and employment effects of changing the tax base of labour to fossil fuels and CO₂ emissions, also increasing the VAT rates and electricity and water use taxes. By applying these measures of EFR, a total EUR 554bn (13% of labour tax revenue) may be shifted from labour towards taxes on natural resources consumption.

The outcomes of the econometric model suggest that this tax shift implemented over 2016 – 2020, could increase employment by 3% in 2020 and GDP by 2%, while water and energy consumption and carbon emissions would decrease by at least 5%. This indicates a significant double dividend of the Environmental Fiscal Reform.

In reality, as can be seen from the figure 13, it was striking that before 2016, the revenue from labour taxation was about 8 times higher than income from environmental taxes in the European Union.

The Seventh Environment Action Programme (7th EAP) requested the tax move from labour to pollution and resource consumption to enable reaching of environmental goals, higher employment and green development. The Roadmap to a Resource Efficient Europe (EC COM, 2011) even mentions a milestone: by 2020, an important reform towards environmental taxation would substantially increase the share of environmental taxes in the public budget revenue.

Figure 13. Share of environmental (green line, below 10%) and labour taxes in total income from TSC, European Union

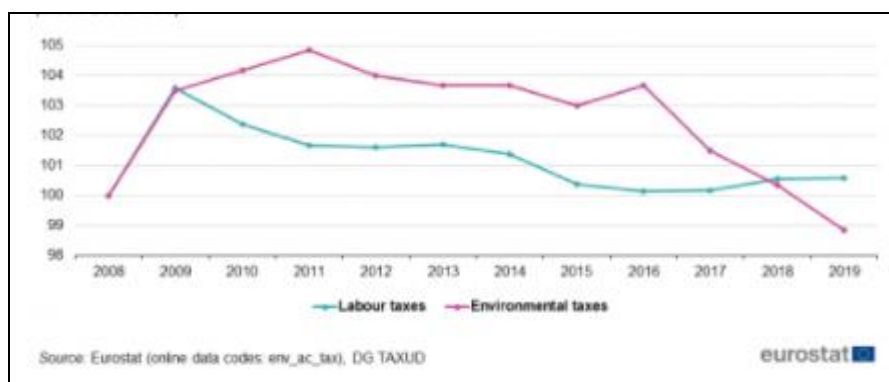


Source: EEA, <https://www.eea.europa.eu/airs/2018/resource-efficiency-and-low-carbon-economy/environmental-and-labour-taxation>

Nevertheless, the share of EU environmental tax revenue in total taxes and social contributions (TSC) has decreased between 2002 and 2017 by 0.7 percentage points, from 6.8% to 6.1%. Thus, up to the recent period (before the Sars-Cov-2 pandemic of 2020), no progress was observed in implementation of this resource efficiency policy.

Besides, the downward trend of the environmental taxes share in the total tax revenue was continued. The equivalent ratio for labour taxes has fallen during the financial crisis (2009-2010). The labour taxation has remained quite stable in recent years, and environmental taxes decreased dramatically since 2016, so that both shares reached in 2018 a similar level as recorded in 2008 (see Figure 14).

Figure 14: Taxes on labour and environmental taxes as share of total taxation in the EU, 2008-2019 (index 2008=100)



Source: Eurostat data sheets (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_tax_statistics_detailed_analysis#General_overview), accessed June 2021.

The environmental taxes-to-total TSC ratio (represented by the purple line in Figure 14) continued its decreasing trend in 2019, still the ratio for labour taxes (the blue line) retained the previous level. Therefore, the share of labour taxes in total TSC (51.7 % in 2019) was in the European Union 8.7 times higher than the equivalent share for environmental taxes (5.9%).

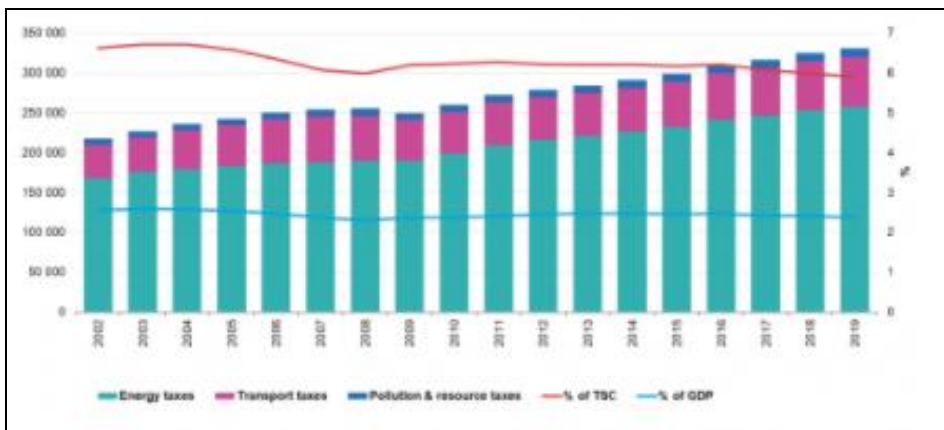
In 2019, the largest part (77.9 %) of environmental tax revenue was made from energy taxes. Here are included also the CO₂ taxes as they are mostly levied on energy products.

Besides the taxes on energy and carbon, the pollution and resource taxes represent means to further reduce environment pollution and increase resource efficiency, for a greener economy.

Unfortunately, as noticed also for the case of Romania, these environmental taxes are still little used in the European Union, cumulating only 3.2 % of total environmental taxes revenues in 2019, or about 0.08 % of gross domestic product (GDP) in the European Union (Figure 15).

The environmental taxes relative shares in the overall taxes did almost not change over the period and few countries have reduced their share of labour taxes while raising the share of environmental taxes. The 9 EU Member States having moved taxation towards the environment from 2003 to 2016 are Bulgaria, Estonia, Greece, Hungary, Italy, Latvia, Poland, Romania and Slovenia, still the modifications were not significant (EEA, 2018).

Figure 15: Environmental tax revenue total and by type, as percent of TSC and GDP, EU-27, 2002-2019 (EUR million and % TSC and GDP)



Source: Eurostat data sheets (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_tax_statistics_detailed_analysis#General_overview), accessed June 2021.

A possible cause for this little progress could be a combined influence of the political complication in reforming the tax system and of the delicate socio-economic issues of environmental taxes.

The lack of progress in EFR may be also due to obstacles in implementing environmental taxation. The review of tax reforms (EC, 2015) mentions 3 main obstacles:

- 1) the equity issues raised by the probable regressive character of environmental taxes;
- 2) the negative impact on the competitiveness;
- 3) the important administrative costs of enforcing the environmental taxes.

As for the perspectives of the Environmental Fiscal Reform in the EU, there are no strong signals from most Member States that they will move taxes from labour toward the environment, so the prospect for 2020 and beyond still seems rather neutral. However, the change in the labour taxation may not be the only double dividend to be achieved through the EFR, according to specific priorities of every country.

Conclusions and recommendations

Environmental taxes are new effective policies for promoting a sustainable development, because they involve environmental, economic and social benefits.

It can be stated that by using environmental taxes and duties, two possible goals are pursued: first, to provide polluters with an incentive as significant as possible to reduce pollution and second, to obtain special budgetary or extra-budgetary revenues.

However, environmental taxes have both a dual and dichotomous character so that the two objectives may be incompatible, in the long term, given that:

- If the main purpose is an incentive to reduce emissions, revenues will decrease as the pollutant emissions decrease;
- If the purpose is to obtain income, the effect is perverse because in order to get a continuous flow of receipts it is necessary to continue the pollution through the respective emissions charged by taxation.

Moreover, as analysed in the paper, with an environmental fiscal reform (EFR), carried out in a neutral manner from the viewpoint of the revenue that will be obtained by replacing existing taxes with direct or indirect environmental taxes, a so-called "double dividend" can be obtained.

This very relevant and useful concept in sustainable development theory can be a recommended political approach if two objectives are simultaneously achieved through the introduction of efficient environmental taxes: 1. reducing pollution or improving environmental quality; 2. reducing distortions and/or high costs of the current tax system.

In the conceptual analysis elaborated in the paper, the objective was to highlight that both economic and environmental effectiveness of the Environmental Fiscal Reform can

be achieved through the so-called double dividends. Since the mechanism is represented by combining income tax reduction with greater taxation on consumption of natural raw materials or products - for example, on water, energy and CO₂ - these price signals are very necessary for the transition to a greener economy.

Given the convincing economic and ecologic justification for using environmental taxes, one may wonder why they are not used more intensively, on a much larger scale. A number of reasons can be identified: on the one hand, there is a general perception of a high fiscal burden within the EU, which leads to resistance against the subsequent increase of taxes and charges, unless the crisis makes them inevitable. On the other hand, especially with regard to environmental taxes, there are concerns about their impact on distribution and competitiveness.

In terms of the distribution effect, poorer households may suffer more proportionally, especially in the case of water consumption taxes or in terms of heat (or electricity) consumption, which are basic needs and make up a higher share of the household income in the lower income category. In terms of the impact on competitiveness, some sectors - especially those consuming energy - will be most severely affected by an Environmental Fiscal Reform.

In such situations, the additional increase of environmental taxes is politically difficult. Therefore, there is always a need for a careful design and special communication efforts.

Different reform options have been used by the states (Rosenstock M., 2014):

- Recycling tax revenues from environmental taxes is an approach to increase acceptability;
- Derogations, namely tax reductions / exemptions from environmental taxes, designed to help companies / sectors most affected by environmental taxes, have often been used to help energy-consuming companies. This reduces the economic burden, but also reduces the environmental efficiency of environmental taxes, as it weakens financial incentives to reduce energy (or resource) consumption and pollution;
- As an alternative to an environmental tax reform, revenues from environmental taxes can be allocated, for example for environmental expenses or for energy saving;
- A final approach that can reconcile competitiveness concerns is to seek harmonization of these environmental taxes and duties at cross-border level, especially at EU level.

Although significant obstacles and barriers have prevented most EU countries from adopting stronger EFR measures, the European Commission proposed efficient implementation strategies, such as: transparency and good collaboration with the parties involved by environmental taxation; the gradual enforcement of environmental taxes in accordance with a pre-announced program and the requirement that these tax measures be included in a policy package, aimed at achieving a specific environmental objective.

Nevertheless, the absence, in recent years, of policies that promote this change in the tax base from labour to environmental resources and the absence of plans in most Member States to apply these reforms made it improbable to achieve the 2020 target (environmental taxes to reach 10% of total tax revenues and contributions) in the European Union. The most recent data available are of 2019, so there was no actual possibility in this research to analyse the actual success in reaching this 2020 target in the EU. Besides, the unexpected impact of the Covid-19 health, economic, social and environmental crisis on the European Union policy and budget is too important and complex to be considered here.

Our study presents also other limitations of the research, related in particular to the absence of a proper own economic-mathematical model to simulate the ecological fiscal reform in Romania but also to the abandonment of the analysis of potentially important new environmental taxes (Oxygen vignette), due to the confused political context (2019-2020).

Nevertheless, the conclusions analysed based on a recent economic-mathematical study on the same topic, were that, in Romania, environmental taxes have a positive environmental and social impact, as they mainly support CO₂ emissions reductions and therefore the environmental protection, although they do not have significant economic growth impact (while, in the EU area, environmental taxes support both environmental protection and economic growth).

Properly managed, implementing of the Green Deal and of the latest policies of green recovery in the European Member states should be able to boost both the environmental and economic benefits of the environmental taxes. An important but not yet researched enough aspect might be the impact of the environmental tax reform on the overall environmental and economic resilience of a state.

Therefore, a direction for further research could be to analyse the correlation between every type of environmental tax (energy, transport, pollution and resource taxes) in relation to GDP or between the share of environmental taxes in total taxes and variables such as the CO₂ emissions, energy consumption, GDP growth and unemployment rate.

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