

THE EVOLUTION OF ENVIRONMENTAL TAXES IN ROMANIA: ECONOMIC AND FISCAL IMPLICATIONS

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Abstract

This paper analyzes the evolution and future prospects of environmental taxation in Romania from an economic and fiscal perspective. Romania's vehicle taxation system originally incorporated several environmental tax instruments, which underwent repeated revisions aimed at reducing pollution and encouraging sustainable behavior. Major legislative changes in 2017, including the removal of vehicle registration taxes, were intended to stimulate the purchase of newer vehicles but inadvertently contributed to declining air quality, underscoring the need for more coherent environmental policy frameworks. Government programs such as Rabla and Rabla Plus, which provide substantial eco-vouchers, have played a significant role in accelerating the adoption of electric and hybrid vehicles. An examination of environmental tax revenues reveals a generally upward trajectory, although with fluctuations shaped by policy adjustments. Notably, revenues from pollution-related taxes have increased markedly, signaling Romania's growing commitment to environmental sustainability.

The paper identifies opportunities for broadening the scope of environmental taxation, highlighting the importance of rigorous impact assessment, appropriate tax design, legal clarity, public consultation, and continuous monitoring. These elements are essential for harmonizing Romania's fiscal policies with European standards and fostering long-term sustainable development. The results indicate that well-designed environmental taxes can substantially support environmental protection while contributing to Romania's broader sustainability objectives.

Keywords: environmental taxes, fiscal revenues, vehicle, sustainability

JEL Classification: H7, H70, H71, O13

1. Introduction

The dynamic interplay between environmental conservation and fiscal policy has become increasingly significant in recent years. This paper delves into the evolution and future perspectives of environmental taxes in Romania. Initially, Romania implemented a series of environmental taxes within its vehicle taxation system to mitigate pollution and foster sustainable practices. These taxes have undergone multiple legislative revisions aimed at enhancing their effectiveness in promoting environmental goals.

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A pivotal change occurred in 2017 with the abolition of vehicle registration taxes, a move intended to boost new vehicle purchases. However, this policy shift inadvertently led to a decline in air quality, underscoring the ongoing need for robust environmental protections. In response, government initiatives such as the Rabla and Rabla Plus programs have been introduced, providing substantial financial incentives to encourage the adoption of electric and hybrid vehicles.

Throughout the study period, environmental tax revenues have generally trended upwards, despite some fluctuations due to policy adjustments. Pollution taxes, in particular, have seen marked increases, reflecting Romania's dedication to environmental sustainability. This paper explores the potential for expanding the scope and impact of environmental taxes, emphasizing the importance of thorough assessment, fair and effective tax design, strong legal frameworks, stakeholder engagement, and continuous oversight.

Aligning Romania's environmental tax policies with European Union standards is vital for achieving long-term sustainability. The findings of this study suggest that strategic implementation of environmental taxes can significantly enhance environmental protection and support sustainable development goals. Through a comprehensive analysis of past trends and future prospects, this research aims to contribute to the discourse on effective environmental fiscal policies.

2. Environmental Taxes in Romania

Before 2017, Romania's vehicle taxation system included environmental taxes, primarily in the form of registration and annual pollution taxes. These taxes varied based on the pollution level of the vehicle and other characteristics such as engine displacement.

Previous Situation (before 2017):

- **Registration Taxes:** Vehicle owners had to pay a registration tax before being allowed to drive on public roads. This tax varied depending on the vehicle's characteristics, including its pollution emissions.
- **Annual Pollution Taxes:** To maintain vehicle registration, owners had to pay an annual pollution tax determined by the vehicle's emission levels. Vehicles with higher emissions paid higher taxes.
- **Specific Legislation:** Environmental taxes for vehicles were regulated by fiscal and environmental legislation, which set the calculation and payment methods.

Historically, environmental taxes were structured as follows:

- The special tax applied to passenger cars and commercial vehicles with a maximum authorized total weight of up to 3.5 tons, excluding those specially equipped for disabled persons and diplomatic missions. Vehicles registered after January 1, 2007, which paid excise duties in 2006, were exempt from this tax.

The tax also applied to commercial vehicles over 3.5 tons, except those for special purposes like roadworks or the oil industry.

The special tax amount due to the state budget was calculated in lei using the following formula:

$$\text{Special Tax} = A \times B \times C \times 100 - D \quad \text{Special Tax} = A \times B \times C \times 100 - D$$

where:

- AA = engine capacity
- BB = tax specified in column 3 of annex 4, or column 2 of annex 4.1
- CC = correlation coefficient in column 2 of annex 5
- DD = reduction coefficient based on vehicle depreciation, in column 3

of annex 5

For example, a car with a 1395 cm³ engine, Euro 4 standard, and two years old, had to pay a tax calculated as:

$$\text{Tax} = 1395 \times 0.15 \times 1.8 \times 0.75 = 376.65 \times 0.75 = 282.48$$

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• Emergency Ordinance No. 50 (April 21, 2008): This ordinance regulated special vehicle taxes. It applied to passenger cars and commercial vehicles up to 3.5 tons and commercial vehicles over 3.5 tons, excluding special-purpose vehicles. The amount was calculated based on CO₂ emissions and vehicle category. The calculation formula for Euro 4 or Euro 3 vehicles was:

$$\text{Payment} = [A \times B \times 30 + 100 + C \times D \times 70] \times 100 - E \quad \text{Payment} = [100A \times B \times 30 + 100C \times D \times 70] \times 100 - E$$

For non-Euro, Euro 1, or Euro 2 M1 category vehicles:

$$\text{Payment} = C \times D \times 100 - E \quad \text{Payment} = C \times D \times 100 - E$$

where:

- AA = combined CO₂ emissions in grams/km
- BB = specific tax in euro/1 gram CO₂, in column 3 of annex 1
- CC = engine capacity
- DD = specific tax per engine capacity, in column 3 of annex 2
- EE = reduction rate in column 2 of annex 4

For example, for a 1395 cm³ Euro 4 vehicle, two years old, the payment would be:

$$\text{Payment} = [0 \times 0.20 \times 30 + 100 + 1395 \times 0.1 \times 70] \times 100 - 21 = 100 + 97.65 \times 0.79 = 77.14$$

$$\text{eurosPayment} = [1000 \times 0.20 \times 30 + 100 + 1395 \times 0.1 \times 70] \times 100 - 21 = (0 + 97.65) \times 0.79 = 77.14 \text{ euros}$$

At the October 2007 exchange rate of 3.35 lei/euro, this equals 258.41 lei.

• Law No. 9 (January 6, 2012): This law targeted vehicle pollution emissions. It imposed an additional tax based on vehicle pollution levels to promote less polluting vehicles. Article 6 outlined exceptions for vehicles used for medical purposes or by disabled persons. The calculation was:

$$\text{Payment} = [(A \times B \times 30\%) + (C \times D \times 70\%)] \times 100 - E$$

For example, for a Euro 5 vehicle (no Euro 4 with less than two years old by 2012), the payment would be:

$$\text{Payment} = [(0.5 \times 0.130 \times 30\%) + (1395 \times 0.05 \times 70\%)] \times 100 - 21100 = (0.0195 + 48.825) \times 0.79 = 38.58$$

$$\text{eurosPayment} = [(0.5 \times 0.130 \times 30\%) + (1395 \times 0.05 \times 70\%)] \times 100 - 21 = (0.0195 + 48.825) \times 0.79 = 38.58 \text{ euros}$$

At the October 2011 exchange rate of 4.32 lei/euro, this equals 166.69 lei.

- Emergency Ordinance No. 9 (February 19, 2013): This ordinance regulated the environmental stamp for vehicles, based on Euro pollution norms and CO2 emissions. For Euro 6 vehicles, the formula was:

$$\text{Payment} = A \times B \times (100 - C)100$$

Hybrid and electric vehicles were exempt from this tax. For a Renault Clio with a 1395 cm³ engine, Euro 5, two years old, the payment would be:

$$\text{Payment} = 110.1 \times 0.63 \times 79100 = 54.79$$

$$\text{eurosPayment} = 100110.1 \times 0.63 \times 79 = 54.79 \text{ euros}$$

At the October 2012 exchange rate of 4.53 lei/euro, this equals 248.19 lei.

Changes in 2017 and Current Situation

In 2017, Romania eliminated the vehicle registration tax as part of a broader fiscal reform to simplify procedures and encourage new vehicle purchases. This decision marked a significant shift in the environmental tax system.

Post-2017, Romania does not have specific environmental taxes for vehicles. However, other measures aim to protect the environment and reduce emissions, such as emission standards for new vehicles and incentives for purchasing less polluting vehicles like electric or hybrid cars. Since 2017, air quality in Romania has deteriorated, highlighting the need for continued efforts to reduce pollution.

After the elimination of the vehicle registration tax in 2017, Romania entered a period in which there are no longer specific environmental taxes levied directly for vehicles. However, it is important to note that there are other measures and policies aimed at protecting the environment and reducing pollutant emissions, such as emission standards for new motor vehicles and programs to encourage the purchase of less polluting vehicles such as electric cars or hybrids.

From 2017 until now in Romania, a negative evolution has been observed in terms of air quality. This negative evolution can be interpreted as a deterioration of the environment and can be influenced by several factors, including the level of pollution generated by different sources, including motor vehicles.

In 2019, the deterioration of air quality in Romania highlights the need to continue efforts to reduce pollution and protect the environment and public health by adopting effective policies and measures.

Environmental Tax:

The environmental vehicle tax in Romania underwent several changes between 2016 and 2023. Initially introduced in 2008, it was adjusted multiple times over the following years.

In 2016, the environmental vehicle tax was modified during the Ponta II administration. This change was controversial as it led to increased car prices and dissatisfaction among certain segments of the population. Subsequently, the government reversed this decision and reduced the environmental tax in 2017 to offset the price increases.

In 2019, the environmental vehicle tax was modified again through Emergency Ordinance No. 50/2019, which introduced a new calculation method. The tax was significantly increased for more polluting cars, while less polluting cars had their tax reduced or were even exempted from paying it.

As of 2023, the environmental vehicle tax continues to be calculated based on the car's CO₂ emissions and certain technical characteristics. The Romanian government is attempting to encourage the ownership of more environmentally friendly cars through fiscal incentives for electric or hybrid vehicles.

In conclusion, the evolution of the environmental vehicle tax in Romania from 2016 to 2023 has been marked by fluctuations, with significant changes in calculation methods and tax levels, aiming to reduce pollutant emissions from road transport.

3. Financial dimensions of environmental taxes on Romania level

Regarding Total Environmental Tax Revenues (table 1), we can observe:

1. Overall Growth: The total environmental tax revenues show a general upward trend over the ten-year period, increasing from €2,957.48 million in 2013 to €7,674.61 million in 2022.

2. Fluctuations: While the general trend is upward, there are fluctuations. Notably, in 2017, there is a significant drop to €3,640.19 million from €4,085.32 million in 2016, likely influenced by policy changes such as the elimination of vehicle registration taxes.

3. Sharp Increase in 2022: A remarkable surge is observed in 2022, with revenues jumping to €7,674.61 million, reflecting a substantial increase compared to previous years. This could be due to new or enhanced tax policies, increased enforcement, or changes in the tax base.

Regarding the Transport Taxes (table 1) we can conclude:

1. Consistency with Fluctuations: Transport taxes remain relatively stable but show some fluctuations throughout the period. The values hover around €393.52 million to €403.00 million from 2013 to 2016.

2. Significant Drop in 2017: There is a notable drop in 2017 to €258.23 million, which could be attributed to the policy changes mentioned earlier.

3. Gradual Recovery: Following the 2017 drop, there is a gradual increase, with transport taxes reaching €394.05 million in 2022, reflecting a recovery and stabilization trend.

Regarding PollutionTaxes/Resource (table 1) we can observe:

1. Volatility: Pollution/resource taxes exhibit more volatility compared to transport taxes. The values fluctuate between €8.21 million and €11.42 million throughout the period.

2. Decline and Recovery: There is a decline from €11.11 million in 2013 to a low of €8.21 million in 2015, followed by a gradual recovery, peaking at €11.42 million in 2022.

3. Modest Contribution: Despite fluctuations, the contribution of pollution/resource taxes to the total environmental tax revenues remains modest but shows a positive trend towards the end of the period.

Table 1. Annual Evolution of Environmental Tax Revenues in Romania (millions of euros)

Year	Total Environmental Tax Revenues	Transport Taxes	Pollution/Resource Taxes
2013	2,957.48	397.67	11.11
2014	3,587.37	393.52	10.01
2015	3,951.84	403.00	8.21
2016	4,085.32	400.79	10.47
2017	3,640.19	258.23	9.78
2018	4,033.56	280.90	9.45
2019	4,731.69	313.93	8.85
2020	4,196.21	308.39	9.14
2021	5,298.63	376.06	10.24
2022	7,674.61	394.05	11.42

Source: own result based on Eurostat, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_tax_statistics_-_detailed_analysis

The data reflects a dynamic landscape of environmental taxation in Romania, marked by significant policy shifts and their subsequent impact on revenue trends. The overall increase in total environmental tax revenues, especially the sharp rise in 2022, underscores the importance of strategic tax policies in enhancing fiscal revenues while promoting environmental sustainability. The gradual recovery in transport taxes and the upward trend in pollution/resource taxes further emphasize the potential of targeted tax measures in achieving both economic and environmental objectives.

The table no. 2 provides a detailed overview of vehicle registration taxes and pollution taxes in Romania from 2013 to 2022, highlighting their percentage of GDP and total taxes. Here is an analysis and commentary on the data:

Vehicle Registration Taxes:

Consistent Contribution (2013-2016): From 2013 to 2016, vehicle registration taxes remained consistent at around €160 million, representing 0.1% of GDP and 0.4% of total taxes. This indicates a stable revenue source from vehicle registrations during this period.

Elimination in 2017: In 2017, vehicle registration taxes were eliminated, reflecting 0.0% in all categories from that year onwards. This policy change likely aimed to reduce the tax burden on vehicle owners and stimulate vehicle sales, especially of new, less polluting vehicles.

Pollution Taxes:

Gradual Increase (2013-2016): Pollution taxes increased gradually from €97.4 million in 2013 to €266.1 million in 2016. During this period, their contribution to GDP rose from 0.1% to 0.2%, and their share of total taxes increased from 0.2% to 0.6%. This growth suggests an increasing focus on environmental taxation to combat pollution.

Stability and Surge (2017-2021): From 2017 to 2021, pollution taxes saw significant increases, especially notable in 2019 when they surged to €710.8 million, representing 0.3% of GDP and 1.2% of total taxes. This substantial rise indicates a heightened emphasis on taxing polluters more heavily, aligning with global trends in environmental policy.

Decline in 2022: In 2022, pollution taxes decreased to €530.8 million, which is still higher than pre-2019 levels but marks a decline from the peak years. This decrease might be due to policy adjustments, improved compliance and pollution control measures, or changes in economic activities impacting tax revenues.

Analysis and Implications:

Policy Shifts: The elimination of vehicle registration taxes in 2017 represents a significant policy shift. While it reduced a specific revenue stream, it likely aimed to boost the automotive market and reduce the administrative burden associated with vehicle ownership.

Environmental Taxation Focus: The consistent increase in pollution taxes until 2021 demonstrates Romania's commitment to using fiscal policy as a tool for environmental protection. The spike in 2019 reflects aggressive measures to curb pollution by imposing higher taxes on polluting activities.

Revenue Adjustments: The data shows the government's adaptive strategies in balancing tax policies. While vehicle registration taxes were phased out, pollution taxes were ramped up, ensuring continued fiscal inflow while promoting environmental sustainability.

Economic and Social Impact: The changes in tax policies have broader implications. Eliminating vehicle registration taxes could have made vehicle ownership more accessible, potentially increasing the number of vehicles on the road. Meanwhile, higher pollution taxes might incentivize industries to adopt cleaner technologies and reduce emissions, fostering a healthier environment.

Table 2. Annual Evolution of Registration and Pollution Taxes in Romania (millions of euros)

Year	Vehicle Registration Taxes	% of GDP	% of Total Taxes	Pollution Taxes	% of GDP	% of Total Taxes
2013	165.7	0.1	0.4	97.4	0.1	0.2
2014	160.6	0.1	0.4	159.8	0.1	0.4
2015	157.3	0.1	0.4	225.9	0.1	0.5
2016	160.6	0.1	0.4	266.1	0.2	0.6
2017	0.0	0.0	0.0	231.0	0.1	0.5
2018	0.0	0.0	0.0	295.3	0.1	0.5
2019	0.0	0.0	0.0	710.8	0.3	1.2
2020	0.0	0.0	0.0	715.5	0.3	1.2
2021	0.0	0.0	0.0	792.5	0.3	1.2
2022	0.0	0.0	0.0	530.8	0.2	0.7

Source: own result based on Eurostat:https://ec.europa.eu/eurostat/databrowser/product/page/env_ac_tax__custom_11986125

The table no. 2 underscores a strategic transition in Romania's fiscal policies towards environmental sustainability. The phasing out of vehicle registration taxes and the significant increase in pollution taxes reflect a deliberate move to support economic activities while addressing environmental challenges. The fluctuations in pollution tax revenues in the later years highlight the dynamic nature of tax policy adjustments in response to economic and environmental needs.

Regarding the Vehicle Registrations: New vs. Second-hand, Romania's vehicle registrations predominantly comprise second-hand vehicles, with new car registrations under one-third of the total. Recent years have seen an increase in new electric and hybrid vehicle registrations, supported by government programs like Rabla and Rabla Plus.

The table no.3 illustrates the evolution of the car fleet in Romania between 2021 and 2022, showing a total increase of 254,147 cars. Specifically, the number of cars aged 0-10 years rose modestly by 25,889, indicating a slight growth in the acquisition of newer vehicles. In contrast, the number of cars older than 11 years increased significantly by 228,258, reflecting a larger influx of older,

second-hand cars into the market. This trend suggests a prevailing preference for used vehicles among Romanian consumers, potentially due to economic factors or the elimination of the vehicle registration tax in 2017, which might have made owning older cars more financially attractive. Overall, the total car fleet expanded by 3.3% over the year, with a disproportionate increase in older vehicles compared to newer ones.

Table 3. Evolution of the Romanian Car Fleet by Age (2021-2022)

Age	Cars 2021	Cars 2022	Evolution 2021-2022
0-10 years	1,476,482	1,502,371	+25,889
>11 years	6,134,557	6,362,815	+228,258
Total	7,611,039	7,865,186	+254,147

Source: <https://www.autocritica.ro/feature/parcul-auto-al-romaniei-radiografia-unei-tari-in-care-dieselul-si-masinile-de-pest-20-de-ani-sunt-la-putere/>

The table displays the growth of the vehicle fleet in Romania from 2021 to 2022, indicating an overall increase of 343,925 vehicles. Vehicles aged 0-10 years saw an increment of 48,469, suggesting a steady but moderate addition of newer vehicles. However, the more significant change is observed in the category of vehicles older than 11 years, which surged by 295,456. This substantial rise highlights a stronger market preference for older, used vehicles, potentially influenced by economic conditions and policies such as the removal of the vehicle registration tax in 2017. The total vehicle fleet expanded by approximately 3.6%, with the majority of growth attributed to the increase in older vehicles. This trend underscores the ongoing challenge of modernizing the vehicle fleet and suggests a need for policies encouraging the adoption of newer, less polluting vehicles.

Table 4. Evolution of the Total Vehicle Fleet in Romania by Age (2021-2022)

Age	Vehicles 2021	Vehicles 2022	Evolution 2021-2022
0-10 years	1,976,933	2,025,402	+48,469
>11 years	7,684,550	7,980,006	+295,456
Total	9,661,483	10,005,408	+343,925

Source: <https://www.autocritica.ro/feature/parcul-auto-al-romaniei-radiografia-unei-tari-in-care-dieselul-si-masinile-de-pest-20-de-ani-sunt-la-putere/>

Regarding the New Vehicle Registrations and Government Subsidies, the Rabla and Rabla Plus programs have significantly increased the share of new electric and hybrid vehicles in recent years. The table no. 5 reveals significant trends in the share of new car registrations from 2020 to 2023 compared to 2019.

Gasoline cars saw a gradual decline, dropping from 66% in 2020 to 62.6% in 2023. Diesel cars experienced a more pronounced decrease, from 26.6% in 2020 to 12.9% in 2023. Conversely, electric cars showed a substantial increase in market share, rising from 7.4% in 2020 to 24.4% in 2023. Overall, total car registrations fluctuated, with a notable initial drop of 22.6 percentage points in 2020 compared to 2019, followed by gradual increases in subsequent years, culminating in an 11.6 percentage point rise in 2023.

Table 5. Analysis of New Vehicle Registrations in Romania (2020-2023)

Years	2020		2021		2022		2023	
Categories	Share of new cars	Changes from 2019	Share of new cars	Changes from 2019	Share of new cars	Changes from 2019	Share of new cars	Changes from 2019
Gasoline Cars	66%	-3.4 pp	65.7%	+0.6 pp	64.5%	-1.2 pp	62.6%	-1.9pp
Diesel cars	26,6%	+0.5 pp	18.8%	-6.2 pp	13.8%	-5 pp	12.9%	-0.9pp
Electric Cars	7.4%	+33.3 pp	15.5%	+80 pp	21.7%	+49 pp	24.4%	+25.7pp
Total Registrations	100%	-22.6 pp	100%	+5.8 pp	100%	+6.8pp	100%	+11.6%pp

Source: <https://www.apia.ro/comunicate-de-presa>

The table no. 6, outlines the evolution of new vehicle purchases under Romania's ecovoucher program from 2016 to 2024. Initially, in 2016, only 45 new vehicles were purchased with 6 hybrid plug-ins and 39 pure electric vehicles, supported by an ecovoucher of 20,000 lei and a budget of 5,000 thousand lei. By 2017, the number of new vehicles surged to 540, with ecovouchers increasing to 45,000 lei and the budget expanding to 45,000 thousand lei. Subsequent years saw a continuous rise in new vehicle purchases, with 3,550 in 2020 and 10,462 in 2022, while maintaining the ecovoucher at 45,000 lei until 2021, when it increased to 51,000 lei. The budget allocation also saw significant growth, reaching 799,996,957 thousand lei in 2023. Projected figures for 2024 anticipate 15,000 new vehicles purchased with a slightly reduced ecovoucher value of 25,500 lei and a projected budget of 1,000,000 thousand lei. This trend reflects Romania's increasing investment in promoting electric and hybrid vehicles through substantial financial incentives.

Table 3.6. Evolution of the Rabla Plus Program

Year	New Vehicles Purchased	Hybrid Plug-in	Pure Electric	Ecovoucher Value	Allocated Budget (thousands lei)
2016	45	6	39	20,000 lei	5,000
2017	540	100	440	45,000 lei	45,000
2018	794	96	698	45,000 lei	70,000
2019	1700	-	-	45,000 lei	90,000
2020	3550	-	-	45,000 lei	140,000
2021	4,171	-	-	45,000 lei	216,993,048

2022	10,462	-	-	51,000 lei	541,668,233
2023	13,412	-	-	51,000 lei	799,996,957
2024	15,000	-	-	25,500 lei	1,000,000 projected

Source: https://afm.ro/main/programe/vehicule_electrice/2019/evolutie_ra_bla_plus_2018-2016-august_2019.pdf, https://www.afm.ro/informatii_publice_raport_anual_utilizare.php

Electric and hybrid vehicles offer significant environmental and economic advantages but also come with certain disadvantages. Habib et al. [2021] provide a comprehensive review of electric vehicle charging techniques and examine their effects on power distribution networks. The study includes an evaluation of both coordinated and non-coordinated charging approaches, delayed charging, and smart charge planning. Moreover, the authors explore the economic advantages of vehicle-to-grid (V2G) technology in relation to these charging methods.

On the positive side, they produce fewer emissions, contributing to reduced air pollution and a lower carbon footprint, which is beneficial for combating climate change. These vehicles are also typically quieter, reducing noise pollution, and can offer lower operating costs due to cheaper electricity compared to fuel. Additionally, government incentives and rebates can make them more financially attractive. However, disadvantages include the higher initial purchase price, which can be a barrier despite incentives. The production of batteries for these vehicles requires substantial resources and energy, which can have environmental impacts (Tan et al., 2016). Limited charging infrastructure and longer refueling times compared to conventional vehicles also pose challenges. Furthermore, the need for efficient recycling of used batteries presents another environmental concern. Despite these drawbacks, the continuous advancements in technology and infrastructure are gradually addressing these issues, making electric and hybrid vehicles an increasingly viable option for sustainable transportation.

4. Possibilities for Expanding Environmental Taxes in Romania

Romania has made significant progress in aligning its legislation with European standards on environmental taxes. Efforts are also directed towards encouraging the circular economy and ecological innovations, contributing to environmental impact reduction and sustainable growth.

To enhance the current state of environmental taxes, a comprehensive and collaborative approach is essential, including:

- Thorough evaluation of existing legislation to ensure policy coherence and efficiency.
- Increased transparency and accountability in the use of environmental tax revenues.

- Promotion of a sustainability culture among individuals and companies.

Key Principles and Criteria for Environmental Taxes:

1. **Polluter Pays Principle:** Those responsible for pollution or resource exploitation should bear the associated costs, promoting sustainable behavior.
2. **Prevention and Precaution Principle:** Encourage pollution prevention and sustainable resource management, adopting eco-friendly technologies.
3. **Proportionality Principle:** Taxes should reflect the degree of pollution or resource exploitation, with higher taxes for greater impacts.
4. **Social Equity Principle:** Ensure that environmental taxes do not disproportionately affect disadvantaged groups, implementing policies to mitigate adverse effects.
5. **Transparency and Predictability Criterion:** Provide clear information on tax calculation and revenue use to allow for adequate management.
6. **Economic Efficiency Criterion:** Design taxes to achieve environmental goals at the lowest possible economic cost, leveraging market mechanisms.
7. **Adaptability and Flexibility Criterion:** Ensure the tax system can respond to scientific, technological, and environmental changes.

According to Todor, 2011, "These principles and criteria are fundamental in the process of developing and evaluating environmental taxation policies, as they represent a complex approach to the interaction between the environment, economy, and society". They are designed to ensure that environmental taxation policies are balanced according to the needs of environmental protection and the economic and social needs. Moreover, these principles and criteria highlight the close relationship between the environment, economy, and society. They support the idea that environmental protection should not negatively impact economic growth or social justice; on the contrary, a healthy economy and an equitable society are often fundamental aspects of environmental conservation. Therefore, environmental taxation policies must be designed and evaluated in a way that combines these interdependent objectives.

In every state, including Romania, implementation Steps, are very important: obtain institutional commitment, define a vision and select an appropriate team, analyze the current tax system and also, set clear objectives.

"Recognizing, investigating, and selecting options for minimizing losses are essential steps in the efficient management of resources" (Relicovschi, 2000). In our context, the absence of concrete records of those who are obligated to contribute to the environmental fund, according to the current legislation, represents a problem that requires immediate resolution.

Once the list is finalized, the next step is to set an objective regarding the amount that needs to be collected or the necessary funds for implementing projects aimed at improving environmental quality. It is also important to determine the methods through which this objective can be achieved.

Some options are related to quick solutions that can be adopted immediately with few resources. Others may involve changes in financial processes or the introduction of new steps in the collection and processing of taxes, which require long-term implementation. The benefits of these solutions, often significant both financially and environmentally, become apparent over time.

Finding these solutions involves effort and time, but we can receive assistance from other states that have successfully implemented an efficient environmental tax system. As part of the European Union, we have the advantage of benefiting from the know-how of more experienced member states and can learn from their mistakes.

In the current economic context, the population is facing difficulties in managing their incomes, given that these are increasingly limited and daily expenses are hard to cover. Introducing new taxes is not seen as a solution but rather as an obstacle.

According to Relicovschi, 2000: "After compiling a comprehensive list of problems and possible options, it is essential to set priorities and evaluate the options. As we analyze the implementation variants, priorities and measures may change. The detailed analysis of options must follow the established priorities to minimize the evaluation duration"

Usually, the evaluation of options involves economic, environmental, human, and technical aspects. Implementation team members must consider that solutions involving significant costs for equipment or training of the resources involved in the process can generate substantial savings or revenues in the long term.

After completing the list of measures related to the tax system, it is crucial to allocate financial resources, responsibilities, and time to the implementation team, forming a coherent implementation plan.

To ensure successful implementation, it is advisable to distribute the plan to as many key employees as possible. Additionally, the implementation should be gradual, starting with moderate measures and progressing to the more radical ones. This approach allows for adjustments along the way.

Typically, the analysis of key performance indicators is conducted once or twice a year, and monitoring the program's implementation should be a daily activity. These indicators can include financial aspects (such as savings achieved) and environmental aspects (such as reduced waste volumes or toxicity levels).

Through appropriate periodic evaluations, any measures that have not achieved the desired results can be identified, and necessary adjustments can be made to ensure the success of the implementation.

Among the main possibilities for implementing environmental taxes in Romania, we find the following:

- Evaluating pollution sources: "In the initial stage of applying environmental taxes, it is necessary to identify and evaluate the primary sources

of pollution in Romania" (Relicovschi, 2000, p. 82). This could include industrial sectors with significant greenhouse gas emissions, agricultural practices that excessively use pesticides and chemical fertilizers, along with the transportation sector, which is mainly responsible for air pollution.

- Establishing appropriate taxes: After identifying the major sources of pollution, the next step is to establish taxes proportional to the level of pollution, to accurately reflect the costs to society. These taxes should be significant enough to discourage polluting practices, while also being fair, avoiding disproportionate impacts on certain sectors or social groups.

- Implementing a graduated tax scheme: "An effective strategy would consist of implementing a progressive tax structure, where the level of taxes increases with the amount of pollution emitted" (Relicovschi, 2000). Thus, companies or individuals who produce more pollution will pay higher amounts, encouraging them to invest in more ecological technologies or environmentally sustainable practices.

- Creating a solid legal framework: Introducing environmental taxes requires a robust legal framework that clearly defines the rules, procedures, and tools for their application. This legislation should also include penalties for non-compliance, to ensure adherence and discourage any illegal or inappropriate behavior.

- Promoting technological innovation: Environmental taxes can be an incentive for innovation in greener and more resource-efficient technologies. A governmental strategy could include providing fiscal facilities or subsidies for companies that invest in sustainable technologies or contribute to pollution reduction.

- Public and stakeholder consultation: Involving the public and stakeholders is fundamental in the implementation stage of environmental taxes. This could include organizing public debates, consultations with industry and civil society representatives, as well as collecting feedback to ensure the fairness of taxes and consider all relevant viewpoints.

- Investment in education and awareness: Education and public awareness are crucial for the successful implementation of environmental taxes. "Government authorities should allocate resources to educational and awareness programs to inform citizens about the impact of pollution and the importance of reducing it" (Relicovschi, 2000). It is essential for people to understand the rationale behind the introduction of environmental taxes and the techniques through which they can reduce their own impact on the environment.

- Constant monitoring and evaluation: The implementation of environmental taxes must be accompanied by a strong system for monitoring and evaluating their impact on pollution and the economy in general. Through this system, government authorities can adjust taxes when necessary to ensure their efficiency and effectiveness over time.

5. Conclusion

In the current Romanian context, the administration of environmental taxes is a complex and dynamic situation, highlighting both socio-economic dilemmas and concerns for environmental conservation. In modern times, numerous taxes and levies have been implemented and adapted with the aim of balancing the impact on the ecosystem and encouraging sustainable practices.

The evolution of vehicle registration taxes in Romania during the period 2016-2023 has been marked by a series of legislative changes primarily aimed at encouraging the adoption of less polluting vehicles and ecological technologies in the automotive industry. There is a significant interest in increasing the number of new cars through the Rabla and Rabla Plus programs, as Romania has one of the oldest vehicle fleets in Europe, with new car registrations accounting for less than one-third of the total. In recent years, government policies have focused on Rabla Plus, with Romania subsidizing the highest value eco-voucher in the European Union.

Currently, environmental taxes in Romania are applied in various sectors: transportation, waste management, air and water pollution control, natural resource exploitation, and biodiversity conservation. However, the analysis of the current situation highlights certain deficiencies.

Total environmental tax revenues in Romania have shown an increasing trend over the period analyzed in this study, growing from 2,957.48 million euros in 2013 to 7,674.61 million euros in 2022, more than doubling. Pollution taxes have also increased throughout the analyzed period, except for 2022. A sharp increase of 2.4 times was recorded in 2019 compared to 2018, with their percentage of GDP rising from 0.1% to 0.3% and their share of total taxes increasing from 0.5% to 1.2% during that period, maintaining the same level until 2022.

Firstly, there are questions regarding the efficiency of collecting and using environmental taxes. There are concerns about the transparency and appropriate use of the revenues generated from these taxes, as well as their direction towards environmental protection projects and initiatives.

Additionally, it is observed that the level of environmental taxes can sometimes be underestimated relative to the real costs of pollution and environmental degradation. This mismatch can hinder environmental objectives and create a gap between the actual effects of economic activities on the environment and the financial contributions needed to remedy them.

Moreover, there are concerns about the consistency and predictability of fiscal policies related to environmental taxes. "Frequent changes in legislation can generate uncertainties for economic actors and discourage investments in greener technologies and practices. Nonetheless, despite the aforementioned difficulties, significant progress is also evident." (Todor, 2011)

In conclusion, the implementation of environmental taxes in Romania could have a significant impact on environmental protection and the promotion of sustainable development. Through an appropriate approach, which involves rigorous evaluation of pollution sources, establishment of suitable taxes, strengthening of the legal framework, and increasing public awareness, Romania can progress towards a more sustainable and greener future. Implementing these taxes would require detailed planning, including consultation with the private sector, civil society, and other stakeholders to ensure that they are fair, efficient, and economically and socially sustainable.

References

1. Julio A. Sanguesa, Vicente Torres-Sanz, Piedad Garrido, Francisco J. Martinez, Johann M. Marquez-Barj, A Review on Electric Vehicles: Technologies and Challenges, 2021, 4(1), 372-404; <https://doi.org/10.3390/smartcities4010022>
2. Habib, S.; Kamran, M.; Rashid, U. Impact analysis of vehicle-to-grid technology and charging strategies of electric vehicles on distribution networks—A review. *J. Power Sources* 2015, 277, 205–214. [Google Scholar] [CrossRef]
3. Liu, L.; Kong, F.; Liu, X.; Peng, Y.; Wang, Q. A review on electric vehicles interacting with renewable energy in smart grid. *Renew. Sustain. Energy Rev.* 2015, 51, 648–661. [Google Scholar] [CrossRef]
4. <https://www.mdpi.com/2624-6511/4/1/22>
5. Tan, K.M.; Ramachandaramurthy, V.K.; Yong, J.Y. Integration of electric vehicles in smart grid: A review on vehicle to grid technologies and optimization techniques. *Renew. Sustain. Energy Rev.* 2016, 53, 720–732. [Google Scholar] [CrossRef]
6. Todor Arpad, *Analiza taxelor de mediu în România*, Editura Ecopolis, București, 2011
7. Relicovschi Adina, *Politici în managementul mediului*, Editura Institutul European din România, București, 2000
8. Strategia Națională privind Educația pentru mediu și schimbări climatice 2023-2030, Ministerul educației, <https://www.edu.ro>
9. <https://eur-lex.europa.eu/>
10. https://ec.europa.eu/eurostat/databrowser/view/env_ac_tax/default/table?lang=en
11. https://www.economica.net/taxa-auto-2020-taxa-poluare-2020-taxa-prima-inmatriculare-2020_179850.html
12. <https://www.promotor.ro/stiri-auto/cate-masini-au-cumparat-romanii-prin-programul-rabla-plus-in-2020-18779809>
13. https://static.anaf.ro/static/10/Anaf/legislatie/Cod_Fiscal_normele_2007.htm#_Toc150852239
14. <https://www.autocritica.ro/feature/parcul-auto-al-romaniei-radiografia-unei-tari-in-ca-re-dieselul-si-masinile-de-pest-20-de-ani-sunt-la-putere/>
15. <https://www.autocritica.ro/feature/parcul-auto-al-romaniei-radiografia-unei-tari-in-ca-re-dieselul-si-masinile-de-pest-20-de-ani-sunt-la-putere/>
16. https://afm.ro/main/programe/vehicule_electrice/2019/evolutie_rabla_plus_2018-2016-august_2019.pdf, https://www.afm.ro/informatii_publice_raport_anual_utilizare.php
17. www.inssee.ro
18. <http://ier.gov.ro/>