CLIMATE ACTION: AN ANALYSIS OF NATIONAL AND INTERNATIONAL COMMITMENT

Raluca Florentina CREȚU[1], Daniela ȚUȚUI[2], Petrică ȘTEFAN[3]
[1] PhD Associate Professor, Bucharest University of Economic Studies, Romania
Email: raluca.cretu@cig.ase.ro
[2] PhD Lecturer, Bucharest University of Economic Studies, Romania
Email: daniela.tutui@cig.ase.ro
[3] PhD Lecturer, University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania
Email: stefanmarian2004@yahoo.com

Abstract
Increasingly visible climate change in recent years has led companies, governments, environmental organizations, non-governmental organizations and people to join forces to reduce greenhouse gas production. In the last 5 years, many agreements have been established, commitments between different decision makers on these global issues of humanity - climate change. The question we ask ourselves today is how effective have all these commitments been on the European continent? In this paper we aim to answer this question by analyzing a number of variables with an impact on climate action in the last 5 years, 2015-2019. We use as a research method the comparison of data collected from the Eurostat database, based on the fixed base index. The data are processed with SPSS software and the Pearson correlation test is used. Depending on the values of this coefficient, we determine what types of correlations exist between the chosen variables.

Keywords: *climate action, commitment, correlations, environmental taxes, greenhouse gas emissions, variables.*
DOI: 10.24818/CAFEE/2021/10/03

Introduction

In recent years, although nations have promised not to live up to their commitments in a joint effort to reduce carbon emissions. As a result, carbon emissions have not dropped enough and global warming has made Planet Earth an insecure place, which is increasingly shaken by political unrest and catastrophic natural phenomena. This horrible scenario can still be avoided if we think of our world as a complex ecosystem (Figueres Ch. and Rivett-Carnac, 2020) of which we are part. The founder of the largest American online retail company - Amazon.com together with Global Optimism Company co-founded in 2019 a platform called „The Climate Pledge". The role of this platform is to unite all entities that want to work together through ambitious actions that will lead to a drastic reduction in carbon emissions by 2040 globally. This joint initiative between Amazon and Global Optimism to launch a joint platform called „The Climate Pledge" was built on the belief that „global businesses are responsible" to act and at the same time reduce the pressure of human activity on the climate. Entities adhering to this „climate promise" are engaged in „transformation actions to protect the global economy from the disruptive risks associated with climate change", according to the sixth report on AR6 Climate Change 2021: The Physical Science Basis. The

Intergovernmental Panel on Climate Change (IPCC) has been set up at the United Nations with the aim of providing regular assessments of the scientific basis for climate change.
This group currently provides information on the short- and long-term impact and risks of these changes on the planet, as well as options for adapting and mitigating new scenarios. The IPCC's objective is to provide scientific information to all governments interested in developing and implementing appropriate climate policies. Specialists have analyzed over time the evolution of the disaster we were heading towards and found solutions in innovation (Gates B., 2021) and what needs to be done to introduce new ideas to the market. There are many areas where „technology is already helping to reduce emissions, where and how to make current technology work more efficiently, where are the cutting-edge technologies working on these key innovations". It is time for „concrete and practical plans to achieve the zero emissions target" corroborated on the one hand with the policies that each government should adopt and on the other hand we, as individuals, what can we do as „our government, our employers and we ourselves must be responsible in this crucial struggle". Reaching the zero emissions threshold will not be easy to achieve, but can be achieved through a number of actions related to environmental taxes or contributions to international commitments on climate-related spending.
Financial incentives, taxation and other instruments environmental taxes are "efficient and effective ways to achieve environmental policy objectives, and the circular economy action plan encourages their use". The energy tax is a tax that applies to fossil fuels. The tax is applied in the phase of production, (Sherlock M.S., 2013) transport or energy consumption. These taxes are major sources (Sahlian D.N., 2021) of revenue at the national and government levels. These revenues can be directed to categories of expenses that support and promote the green industry. Energy taxes are used to „manipulate the incentives faced by consumers and businesses to change their energy consumption and production decisions" (Crețu, 2018). In this way, the rational use of energy can be managed or the conservation of fuel and energy is promoted, favouring or discouraging certain types of fuel or energy consumption compared to others. The indicator „contribution to the international commitment of 100 billion US dollars for climate spending measures the total amount spent from the annual budgets of European countries and the European Commission but also of the European Investment Bank„ to mitigate emissions by investing in technology. EU member states contribute under the UN Convention to the international commitment to raise $ 100 billion to finance climate change. The effort of the Member States until 2020 has not been the desired one, therefore, sustained efforts are now being made at all levels to reach the desired target. Today, climate change and environmental degradation are the most important threats to Europe and the world. To eliminate these threats, the European Green Pact aims to transform the European Union into a new, modern, competitive and resource-efficient economy. EU Member States have set themselves the goal of achieving zero net greenhouse gas emissions by 2050 through this European Green Pact, economic growth will no longer depend on the use of natural resources, and the population will have decent living conditions life. The European Green Pact „is at the same time a lifeline for overcoming the COVID-19 pandemic". It will receive generous funding and „a third of the € 1.8 trillion investment will come from the Next Generation EU Recovery Plan, as well as funds from the EU's seven-year budget".
In the last 5 years, many commitments have been initiated at the level of the European continent that aimed to reduce gas emissions by 2020. In this paper we aim to analyze the efficiency and effectiveness of these commitments. Have these commitments led to a reduction in gas emissions in Europe between 2015 and 2019 or not? We will analyze whether there is a correlation between environmental taxes and gas emissions, between gas

emissions and energy taxes, the contribution of states to the commitment to reduce climate change and per capita gas emissions. We will use the Pearson correlation test to determine to what extent the increase or decrease of a variable will result in the modification of another variable with which it is correlated. We will process the data using SPSS software to determine the Pearson coefficient, for each variable but also the values of the significance threshold. If the Pearson coefficient will take values between -1 and +1, it results that there are relations between the analyzed variables. If the Pearson coefficient is closer to zero, then there is no connection between the variables, proving the inefficiency of the commitments of the last 5 years. To achieve this objective we will analyze the data provided by Eurostat in the period 2015 - 2019.

The content of the paper is structured as follows: the first part is devoted to the review of the literature on greenhouse gas reduction by sectors and per capita, energy taxes, environmental taxes and countries' contributions to various environmental commitments. The research methodology will be presented in the second part, which will be followed by results and discussions. The final section will be allocated to the final conclusions drawn from the research, the limits of this research and the directions of future action.

1. Literature review

Sarkodie and Strezov (2019) examined the correlation between vulnerability to climate change and adaptability for 192 states, showing that developed countries (Norway, Switzerland, Sweden, UK, Finland, Germany, etc.) are less vulnerable and that Africa is the region. with the greatest vulnerability and with a reduced capacity to adapt. The study emphasizes that food and water security, population health, ecosystem preservation, human habitat and infrastructure are vulnerable to climate change, highlighting the requirements for region-specific sustainable development measures. Therefore, reducing greenhouse gas emissions is a concern of all countries in the world (Bekun et al., 2019), being the main objective in the global debate on sustainable development. A report following the international commitment made by the Paris Agreement of 2015 to reduce greenhouse gas emissions, highlighted an increase in carbon dioxide emissions to 33,444.0 million tons in 2017, from a level of 29,714.2 million tons in 2009 (British Petroleum, 2018). Numerous studies have shown that in order to take sustainable measures to reduce global carbon dioxide (CO_2) emissions, it is important to identify the causes (Dong et al., 2019; Bekun et al., 2019; Baloch & Wang, 2019; Balsalobre-Lorente et al., 2018). Dong et al. (2019) point out that the pressure on the environment, mainly due to carbon dioxide (CO_2) emissions, is due to the sharp increase in energy consumption. From their analysis over long time segments, economic growth, followed by population growth, were the main factors of environmental pollution with greenhouse gas emissions, and changes in the structure of energy consumption and energy intensity were pollution mitigation factors. An important conclusion is that developing countries have a higher potential to mitigate emissions by 2030, up to 10,060.9 Mt in an optimistic scenario, if strict measures are implemented.

A study conducted in 16 EU countries showed that economic growth of 1% increases long-term CO_2 emissions by 1.15% (Bekun et al., 2019). Regarding to renewable energy consumption, it was found that a 1% increase in consumption from renewable energy sources would lead to a 0.18% long-term decrease and a 0.13% short-term decrease of carbon dioxide emissions. Balsalobre-Lorente et al. (2018) confirmed the relationship between economic growth and CO_2 emissions for 5 EU countries (Germany, France, Italy, Spain and the UK) for the period 1985–2016, introducing additional variables such as energy consumption in the econometric function renewable energy, commercial transactions, the abundance of natural resources and energy innovation, validating the need for renewable resources and the

promotion of energy innovation to the detriment of polluting energy resources. Other researchers (Baloch & Wang, 2019) have shown that governance has a negative and significant impact on CO_2 emissions for the BRIC countries (Brazil, Russia, India, China and South Africa), which have experienced structural changes and rapid industrialization. Governance implies a fair legal framework that allows for sustainable development, through appropriate regulations that counteract any market failure that could lead to increased pollution, ensuring the minimization of CO_2 emissions. Actions to combat climate change are addressed through regulations (eg, emission standards, ban on toxic substances and spatial planning tools), advertising (eg, energy efficiency labels and communication campaigns), market-based tools, such as environmental taxes and greenhouse gas emissions being the most efficient measures, as long as financing is key. In the context of the commitment of EU states to achieve carbon neutrality by 2050, the issue of financing actions to reduce pollution is of increasing relevance (Pisani-Ferry, 2021). The specialized literature reveals the numerous aspects related to the anti-pollution mechanisms. Monitoring the impact of human actions on the environment has a more prominent role in Europe than on other continents (Sterner & Köhlin, 2017), and this is reflected in environmental protection tax revenues as a share of GDP, higher or lower in each EU member state. Miceikiene et al. (2018) identified that environmental taxes improve the quality of the environment. Others confirmed the results of research on the link between environmental taxes and greenhouse gas emissions (Bashir et al., 2020) and the importance of environmental protection measures through the application of taxes or subsidies in industries that use green technologies.

The application of environmental taxes encourages the implementation of new technologies that mitigate pollution and, at the same time, lead to the creation of new jobs. The role of environmental taxes is considered to be more important in economies that use non-renewable energy resources. Bachus et al. (2019) reveals that taxation on environmental protection is still underused, although it would be a powerful tool to combat environmental problems, and this is also due to public acceptance of environmental taxes. He pointed out that a major factor in this regard is education and awareness that environmental issues can be improved by using tax revenues, with almost half of the respondents who participated in the study stating the importance of environmental taxes. Other authors (Chishti et al., 2021) concluded that fiscal policy has a significant role to play in reducing CO_2 emissions and that governments should apply "green tax" and subsidies to producers and investors differently, depending on the use of resources and more or less environmentally friendly technologies. Claeys et al. (2019) states that it is essential to tax all greenhouse gas emissions, as this action stimulates all parties involved and reduces greenhouse gas footprints.

At the same time, without the application of environmental protection taxes, other measures adopted by climate change policy, such as subsidies or standards, cannot effectively reduce emissions. However, the environmental taxes applied disproportionately affect the inhabitants (Pisani-Ferry, 2021), those with lower incomes being more vulnerable to rising carbon prices. This has led governments to reconsider fiscal and legislative policies. The post-Covid recovery and resilience plan allocates at least 37% to climate-related actions, while the US regulates infrastructure investment and subsidies without changing the price of carbon. Investments in environmental protection should increase as long as greenhouse gas emissions increase, until a time when the amount of pollutants begins to decrease (Miceikiene et al., 2018). The EU budget is Europe's main funding tool for direct investment. Spending on combating climate change has increased, according to Claeys et al. (2019), with the EU performing lower than other areas in technological, electronic and digital development, sectors that support carbon footprint neutrality targets. The European Green Pact is a mechanism for reallocating existing funds, supporting investment in vulnerable sectors and

redistributing labor. The $ 100 billion a year commitment is the mechanism of international financing for climate action in developing countries by developed countries (Averchenkova et al., 2020).

2. Research methodology

The aim of our research is to determine the correlations between greenhouse gas emissions by source and sector, per capita, energy taxes, environmental taxes and their share of GDP, but also the contribution of EU Member States and other states to the expenditure commitment climate. In this regard, we collected and analyzed data provided by Eurostat on gas emissions by source and sector of activity in 32 countries on the European continent. We calculated on the basis of the collected data the fixed base index reporting the year 2019 to 2015. Both increases in emissions and decreases in the period analyzed in European countries were found, as shown in the table below. The variables included in this research are:

Table 1. Research variables

The variables used in SPSS	Variables description
Greenhouse gas emissions by source sectors	It measures the amount of gas emitted by all activities in all sectors of activity at the level of a country.
Greenhouse gas emissions per capita	It measures the amount of greenhouse gases per capita in a country.
Energy taxes	They are taxes that apply to fossil fuels in the phase of production, transport or consumption of energy and are major sources of revenue in national budgets.
Environmental taxes	Stimulus to pollution reductions.
Environmental taxes and their share in GDP	The share of environmental taxes in GDP
The contribution of countries to the commitment to climate change	It measures each country's commitment to technological innovation to mitigate climate change

As a research method we will use the comparison of the variables in figure no 1, collected from the Eurostat database, in the period 2015-2019 based on the fixed base index:

$$I_{BF} = \frac{Year_{2019}}{Year_{2015}}$$

Where:

I_{BF} - is the index with a fixed base;

$Year_{2019}$ – indicators from figure no. 1 in 2019

$Year_{2015}$ - the indicators from figure no 1 in 2015

Based on these indices calculated below, we will analyze whether there is an increase or a decrease of the variables in table 1 both at EU level and at the level of each country in Europe.

Table 2. Greenhouse gas emissions by source sector (Thousand tones/annual)

TIME	2015	2016	2017	2018	2019	Index
GEO (Labels)						2019/2015
European Union - 27 countries (from 2020)	3929918.98	3938836.24	3973506.22	3891792.15	3742640.85	0.95
European Union - 28 countries (2013-2020)	4468615.31	4452949.92	4479338.35	4391258.68	4228794.83	0.95
Belgium	123390.47	122102.66	122263.34	123082.33	121869.97	0.99
Bulgaria	61871.67	59442.75	61866.90	58054.82	56689.36	0.92
Czechia	129666.17	131303.84	132264.67	130499.50	124573.91	0.96
Denmark	51265.28	53467.45	51244.60	51205.83	47369.90	0.92
Germany	929049.87	934676.73	921374.90	886050.19	839715.39	0.90
Estonia	18290.88	19948.00	21247.31	20416.74	14911.25	0.82
Ireland	62970.07	65078.16	65177.58	65833.02	63124.97	1.00
Greece	98357.51	94928.31	99064.75	96199.29	89653.50	0.91
Spain	351649.41	341782.88	356293.86	351744.63	333669.54	0.95
France	474971.02	477049.99	480779.98	462514.73	454842.39	0.96
Croatia	24268.97	24378.82	25190.38	24100.63	24215.97	1.00
Italy	450083.77	448072.98	443961.55	440605.60	430778.46	0.96
Cyprus	9100.63	9675.33	9984.01	9865.15	9885.41	1.09
Latvia	11072.76	11110.86	11207.42	11744.92	11631.59	1.05
Lithuania	20530.18	20601.15	20839.21	20531.30	20740.95	1.01
Luxembourg	11706.74	11616.73	12001.18	12419.58	12556.80	1.07
Hungary	62073.02	62849.28	65402.46	65583.38	65290.82	1.05
Malta	2572.09	2279.56	2492.00	2516.70	2693.21	1.05
Netherlands	204641.45	205326.80	203136.99	199020.69	192731.17	0.94
Austria	80611.35	81815.28	84127.25	81178.77	82773.29	1.03
Poland	392709.82	402443.44	417340.21	414858.87	393966.33	1.00
Portugal	70923.23	69295.27	74852.51	71424.50	68032.51	0.96
Romania	117074.58	114413.13	117982.83	118580.65	114331.93	0.98
Slovenia	16835.73	17677.57	17770.91	17624.03	17143.35	1.02
Slovakia	40914.41	41319.90	42440.58	42398.27	40180.79	0.98
Finland	57120.63	60045.11	57397.14	58742.29	55667.90	0.97
Sweden	56197.26	56134.26	55801.66	54995.74	53600.20	0.95
Iceland	5443.72	5641.30	5951.89	6118.17	5686.86	1.04
Norway	55774.99	54707.70	53785.69	53988.77	52043.16	0.93
Switzerland	53484.27	54013.14	53336.07	52159.23	51969.65	0.97
United Kingdom	538696.34	514113.68	505832.14	499466.54	486153.98	0.90
Turkey	484515.32	509606.98	536089.46	534584.41	520116.28	1.07

Sursa: Statistics | Eurostat (europa.eu), accessed on October 2, 2021 and author processing

Analyzing the data in the table, we can see a decrease in the amount of gas emissions in the period 2015-2019 at EU level. An in-depth analysis of the data provided by Eurostat at the level of European countries shows that out of 32 countries, 20 reduced the amount of gas emissions by about 10% in the analyzed period, while 12 states had an increase in the amount of gas emissions by up to 1% (Ireland, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Austria, Poland, Slovenia, Iceland and Turkey).

Table 3. Greenhouse gas emissions per capita (Thousand tones/annual)

TIME	2015	2016	2017	2018	2019	Index
GEO (Labels)						2019/2015
European Union - 27 countries (from 2020)	8.8	8.8	8.9	8.7	8.4	95.45
European Union - 28 countries (2013-2020)	8.8	8.7	87	8.6	8.2	93.18
Belgium	10.9	10.8	107	10.8	10.6	97.25
Bulgaria	8.6	8.3	8.7	8.3	8.1	94.19
Czechia	12.3	12.4	125	12.3	11.7	95.12
Denmark	9	9.3	8.9	8.8	8.1	90.00
Germany (until 1990 former territory of the FRG)	11.4	11.4	11.1	10.7	10.1	88.60
Estonia	13.9	15.2	16.1	15.4	11.2	80.58
Ireland	13.4	13.7	13.6	13.5	12.8	95.52
Greece	9.1	8.8	9.2	9	8.4	92.31
Spain	7.6	7.4	7.6	7.5	7.1	93.42
France	7.1	7.1	72	6.9	6.8	95.77
Croatia	5.8	5.8	61	5.9	6	103.45
Italy	7.4	7.4	7.3	7.3	7.2	97.30
Cyprus	107	11.4	11.6	11.3	11.2	104.67
Latvia	5.6	5.7	5.8	6.1	6.1	108.93
Lithuania	7.1	7.2	7.4	7.3	7.4	104.23
Luxembourg	20.6	2.0	20.1	20.4	20.3	98.54
Hungary	6.3	64	6.7	6.7	6.7	106.35
Malta	5.8	5	5.3	5.2	5.3	91.38
Netherlands	12.1	12.1	11.9	11.5	11.1	91.74
Austria	9.3	9.4	9.6	9.2	9.3	100.00
Poland	10.3	10.6	11	10.9	10.4	100.97
Portugal	6.8	6.7	7.3	6.9	6.6	97.06
Romania	5.9	5.8	6	6.1	5.9	100.00
Slovenia	8.2	8.6	8.6	8.5	8.2	100.00
Slovakia	7.5	7.6	7.8	78	7.4	98.67

TIME	2015	2016	2017	2018	2019	Index
GEO (Labels)						2019/2015
Finland	10.4	10.9	10.4	10.7	10.1	97.12
Sweden	5.7	5.7	5.5	5.4	5.2	91.23
Iceland	16.5	16.8	17.3	17.3	15.8	95.76
Norway	10.7	10.5	10.2	10.2	9.7	90.65
Switzerland	6.5	6.5	6.3	6.1	6.1	93.85
United Kingdom	8.3	7.8	7.7	7.5	7.3	87.95
Turkey	6.2	6,4	6.7	6.6	6.3	101.61

Source: Statistics | Eurostat (europa.eu), accessed on October 1, 2021 and author processing

Table 3 shows that in many European countries emissions have decreased by up to 10%, but there are still countries where this limit has been exceeded by about 9% (Latvia) but also Cyprus, Lithuania, Hungary, Croatia, Turkey, Poland. In 2019 there are 3 countries with similar level of greenhouse gas emissions per capita, comparing values registered in 2015
Table 4 presents the evolution of energy taxes at the level of European countries, but also of EU member countries. It can be seen that these taxes increased in 2019 compared to 2015, in 24 countries, up to 66.37% (Estonia), 5 countries did not report energy taxes in 2019, and 5 countries recorded a decrease in of these taxes, even by 42%, the case of Turkey. At the level of EU member states, energy tax increases increased by 11.17% in 2019 compared to 2015. The European countries where energy taxes decreased are: Denmark, Ireland, Sweden, United Kingdom and Turkey.
Environmental taxes increased compared to 2015 by up to 33% (Lithuania) in 2019, but there are countries where this tax has decreased (Denmark, Norway, the United Kingdom and Turkey).

Table 4. Energy taxes (mil. euro)

TIME	2015	2016	2017	2018	2019	Index
GEO (Labels)						2019/2015
European Union - 27 countries (from 2020)	231444.73	240815.46	245761.80	252059.61	257297.99	111.7
European Union - 28 countries (2013-2020)	278300.79	283836.63	287219.82	294296.05	300643.06	108.03
Euro area - 19 countries (from 2015)	196901.49	204985.55	209356.47	214349.52	218137.76	110.79
Belgium	7262.80	8082.60	8532.40	8814.00	8945.00	123.16
Bulgaria	1277.68	1230.89	1323.09	1441.97	1691.61	132.40
Czechia	3217.57	3465.15	3621.55	3841.35	4301.44	133.69
Denmark	6023.80	6134.53	5879.36	5894.07	5300.84	88.00
Germany (until 1990 former territory of the FRG)	48230.00	48405.00	49184.00	49474.00	50565.00	104.84
Estonia	491.27	567.28	599.28	623.94	817.31	166.37

TIME	2015	2016	2017	2018	2019	Index
GEO (Labels)						2019/2015
Ireland	3042.88	3135.26	3258.00	3176.04	3016.31	99.13
Greece	5377.97	5265.97	5689.00	5350.05	5575.00	103.66
Spain	17389.00	17202.00	17693.00	18253.00	18117.00	104.19
France	38472.00	41237.00	43925.00	46693.00	46997.00	122.16
Croatia	1168.15	1272.70	1345.57	1494.46	1474.97	126.27
Italy	45512.00	48393.00	46868.00	47128.00	47453.00	104.26
Cyprus	423.78	433.33	480.07	496.87	n.a.	n.a.
Latvia	730.58	784.27	807.95	849.27	n.a	n.a
Lithuania	622.94	677.26	731.92	809.33	836.76	134.32
Luxembourg	868.53	848.92	871.28	940.82	1015.49	116.92
Hungary	2124.28	2282.50	2370.74	2370.02	2507.15	118.02
Malta	139.23	145.02	154.05	161.74	176.48	126.75
Netherlands	12788.00	13362.00	13691.00	14487.00	15793.00	123.50
Austria	5216.40	5284.47	5539.72	5457.08	5647.86	108.27
Poland	9764.82	9996.33	10889.13	11788.80	12312.45	126.09
Portugal	3185.49	3531.93	3640.18	3800.02	3918.80	123.02
Romania	3540.75	3674.13	3372.24	3743.06	4408.93	124.52
Slovenia	1271.13	1326.09	1359.08	1355.01	1344.11	105.74
Slovakia	1762.18	1773.70	1897.14	1941.51	209471	118.87
Finland	4115.31	4530.46	4435.39	4538.85	4612.00	112.07
Sweden	7426.20	7773.66	7603.66	7136.37	7162.84	96.45
Iceland	184.43	201.84	248.63	246.30	n.a	n.a.
Liechtenstein	21.79	20.96	20.96	18.37	n.a	n.a.
Norway	4572.94	4492.82	4711.91	4960.15	4656.84	101.83
Switzerland	5854.34	6068.28	6007.11	6123.82	6325.65	108.05
United Kingdom	46856.06	43021.18	41458.01	42236.44	43345.07	92.51
Serbia	1200.17	1314,16	1382.76	1542.13	n.a	n.a.
Turkey	17358.93	17323,64	15857.21	10112.77	10074.18	58.03

Source: Statistics | Eurostat (europa.eu), accessed on October 2, 2021 and author processing

The share of these taxes in GDP decreased in 2019 compared to 2015 in many European countries. However, the highest share is recorded in Estonia (116.60%), where there was an increase of 16.6%. Opposite the population is Turkey with a decrease in the share of this tax in GDP by 34.2% in 2019 compared to 2015. The contribution of countries to the commitment assumed on climate action is increasing in 2019 compared to 2015, the increase being 3 times, as is the case in Lithuania.

3. Results and discussion

Table 1 shows that at the level of EU member states, greenhouse gas emissions decreased in the period 2019-2016 by 5%. At the level of each country, it can be seen that the decrease of these emissions is very small, about 0.03-0.09%, which means that the countries have not effectively applied their own strategies to reduce greenhouse gas emissions or not applied the best. Moreover, there are countries where there were exceedances in 2019 compared to 2016 in small but safe proportions (Ireland, Cyprus, Latvia, Lithuania, Hungary, Luxembourg, Turkey, etc.). In the case of Romania, the amount of greenhouse gases decreased by 0.03% in 2019 compared to 2016, but there are still many actions to be taken in this area.

The per capita greenhouse gas emissions shown in Table 2 show a decrease of 6.82% in the EU. In many European countries, this amount of greenhouse gas emissions fell to 11.40% in Germany, 12.05% in the United Kingdom or 19.42% in Estonia. These countries have proven maturity and responsibility in implementing measures to reduce greenhouse gas emissions per capita. In 2019, Romania is in the same stage of assuming and implementing policies to reduce emissions per capita as in 2016. Inefficiency of actions taken by decision makers, but especially the commitments of large polluting companies to reduce gas with the greenhouse effect is reflected by the relatively calculated index with the fixed base whose value is constant (100%). Moreover, at the level of Europe there are states that exceeded the values in 2019 compared to 2016 by 3.45% (Croatia), 4.67% (Cyprus), 8.94% (Latvia), 4.24% (Lithuania), 6.35% (Hungary), 1.61% (Turkey). It is time to rethink short-term strategies to reduce greenhouse gases on the population.

Energy taxes increased by 8.03% in the EU, the highest increase being 66.37% (Estonia), 34.42% (Lithuania), Czech Republic (33.69%). Romania registered an increase of 24.52% in 2019 compared to 2016. It is time to rethink short-term investments in those renewable energy sources such as: wind, solar, thermal, plant waste, etc.

The share of these taxes in GDP decreased in 2019 compared to 2015 in many European countries. However, the highest share is recorded in Estonia (116.60%), where there was an increase of 16.6%. In the case of Romania, the share of environmental taxes decreased by 14.18% in 2019 compared to 2015. A careful x-ray of the current situation related to the illegal burning of plastic waste or plant debris, tires or other prohibited activities could have a contribution higher of these fines in the form of pollution taxes in GDP.

Opposite is Turkey, with a decrease in the share of this tax in GDP by 34.2% in 2019 compared to 2015.

The contribution of countries to the commitment on climate action is increasing in 2019 compared to 2015, the increase being 3 times, as is the case in Lithuania. Romania's contribution to this fund was 0.24 million euros (2019), 0.03 million euros (2018), 0.86 million euros (2017), 0.78 million euros (2016), and in 2015 he did not pay.

Following the analysis of the data with the SPSS software, it was found that the P values associated with the Pearson coefficients given in the table below:

Table 5. *P*-value associated with Pearson correlation value

		Energy taxes2015	Energy taxes2016	Greenhouse gas emissions by source sector2019	Contribution to the international 100bn 2015
Energy taxes2015	Pearson Correlation	1	1.000**	.995**	.956**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	33	33	33	33
Energy taxes2016	Pearson Correlation	1.000**	1	.996**	.956**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	33	33	33	33
Greenhouse gas emissions by source sector2019	Pearson Correlation	.995**	.996**	1	.962**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	33	33	33	33
Contribution to the international 100bn 2015	Pearson Correlation	.956**	.956**	.962**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	33	33	33	33

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The - P value is used by researchers to tell if a particular model they measured is statistically significant.

It can be seen that a statistically significant correlation is established between Greenhouse gas emissions by source sector and Contribution to the international 100bn which have a statistically significant linear relationship ($r = .962$, $p < .001$).

The direction of the relationship is positive in the sense that the two variables tend to increase together (ie, a higher greenhouse gas emission is associated with a higher contribution to climate action commitments).

The level of statistical significance is often expressed as a p-value between 0 and 1. The lower the p-value, the stronger the evidence that we should reject the null hypothesis (no correlations between Greenhouse gas emissions by source sector and Contribution to the international 100bn).

According to the literature, there is a positive correlation between environmental taxes and greenhouse gas emissions. To test the correlations between the variables analyzed above we considered the Pearson correlation test. The Pearson correlation test shows the significance of the variation between the variables. It can take values between -1 and +1. A very strong relationship is given by the proximity of the value 1, so a high correlation, while a value as close as possible to -1 will explain a very weak correlation, so a weak relationship. These relationships, if any, will have only positive or negative values and will show the significance of the increase or decrease of one variable in relation to the other. If the correlation coefficient has the value zero or almost zero, then it turns out that there is no connection between the variables, so it does not correlate.

The research will continue with the stage of identifying the causal links between the dependent variables, namely greenhouse gas emissions by sectors and per person and the independent variables, which are energy taxes, environmental taxes, the share of these taxes in GDP, contributions to climate action commitments.

Conclusions

After five years of agreements and strategies signed by European countries, we examined how effective the measures were and what effect they had on reducing the amount of greenhouse gases per sector or per capita. In order to answer this question, we analyzed by comparison, based on the fixed base index, six variables presented in Figure no. 1. For each variable we identified values based on the fixed base index 2019/2015 that established its increase or decrease. There are many countries where the fixed base index calculated for each variable indicates progress, although there are still many EU members, e.g. Romania had to work harder for a cleaner environment.

We analyzed the link between the chosen variables, using P-values associated with the Pearson correlation test. We identified a correlation between Greenhouse gas emissions by source sector and Contribution to the international 100bn which have a statistically significant positive and linear relationship ($r = .962$, $p < .001$)

The research will continue with the identification of causal links and the establishment of the regression equation in order to determine the link between greenhouse gas emissions and influencing factors (environmental taxes, energy taxes, etc.).

The limit of our research is that environmental protection tax is little used and applied in many countries, although it can be a powerful tool to reduce environmental problems.

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