

**The 4<sup>th</sup> International Conference on Economics and Social Sciences**  
**Resilience and economic intelligence through digitalization**  
**and big data analytics**  
**June 10-11, 2021**  
**Bucharest University of Economic Studies, Romania**

**Research on Policies and Mechanisms that can Streamline  
the Process of Transition to Green Energy and Achieve  
Climate Change-Related Targets**

Elena Andreea NICULESCU<sup>1</sup>

DOI: 10.2478/9788366675704-008

**Abstract**

*Global warming or climate change is a dangerous phenomenon that humanity is currently facing and it is a direct result of increasing greenhouse gas emissions. The European Union, as a global leader in combating climate change, has an important role to play in international efforts to reduce CO<sub>2</sub> emissions as well as to reduce the impact of climate change, by creating and implementing mechanisms aimed to deliver climate change direction by establishing a path towards climate neutrality and supporting this transition to green energy.*

*The objective of this paper is to identify and analyse the main tools that can streamline the process of transition to green energy and achieve climate targets associated with climate change.*

*In this sense, the comparative analysis is used, which aims to understand the need to implement these international mechanisms, being based on the presentation of strategies that can be used to stimulate the global transition to a neutral economy in terms of climate impact.*

**Keywords:** green energy, climate change, climate neutrality.

**JEL Classification:** Q49.

**1. Introduction**

Global warming or changing climatic conditions is a dangerous phenomenon that humanity is currently facing and is a direct result of increasing greenhouse gas emissions. (Cerovic Smolovic et al., 2020). Without making clear concrete measures to reduce these emissions, it is estimated that average temperatures worldwide will increase by 1.8 degrees to 4 degrees Celsius by 2100, bringing with it substantial changes in climate and extreme weather events, heat waves, frequent rainfall in a significantly increased volume (Esperanza Mata Perez et al., 2019).

---

<sup>1</sup> Bucharest University of Economic Studies, Bucharest, Romania, elenaandreea.niculescu@yahoo.com.

The European Union, as a global leader in combating climate change, has taken various actions aimed at reducing and even stopping greenhouse gas emissions. These actions derive mainly from the obligations assumed by the 1992 United Nation Convention, the 1997 Kyoto Protocol, as well as by the Paris Agreement adopted at the Paris Climate Conference in December 2015 and ratified on 5 October 2015. These approaches are joined by the environmental protection policy established by the 1997 Amsterdam Treaty and reconfirmed by the 2007 Lisbon Treaty, as well as other international mechanisms, including: the Modernization Fund, Innovation Fund and Just Transition Fund and the European Green Deal. The European Union declared that it will become the first economic neutral zone in terms of climate by 2050.

The Paris Agreement established ambitious global targets for climate change mitigation and set a long term goal in line with the goal of keeping global average temperatures rise well below 2 degrees Celsius above preindustrial levels and to maximize efforts to limit temperature rise to 1.5 degrees Celsius above pre-industrial levels.

Therefore, "the European Union can only succeed if its efforts stimulate the global transition to a fair, climate-neutral, resource-efficient and circular economy", which is one of the most important policy objectives of the Union.

## **2. Analysis of the Literature on Policies and Mechanisms for Promoting Green Energy**

The analysis of this paper presents several international mechanisms whose main purpose is to combat climate change by reducing and even stopping greenhouse gas emissions. In the present study we aimed to analyse these mechanisms by presenting legislation and relevant EU policies, which must relate to the objective of neutrality climate and under conditions of fair competition, so as to meet the objective set out by the Union and maintain an equal importance on emissions as well as on removals of greenhouse gases to reach zero net emissions by 2050. The principal mechanisms promoted by the EU in order to reduce CO<sub>2</sub> emissions and to reduce the impact of climate change, which are analysed in this material are: the Modernization Fund, the Innovation Fund, Just Transition Fund and the European Green Deal.

### ***A. Modernisation Fund***

Modernization Fund is a program that aims at helping the transition to climate neutrality of 10 low income EU countries, thus contributing to the modernisation of their energy systems and improving energy efficiency.

Its main role is to help the European Union in the process of transition to climate neutrality, so that the beneficiary states succeed in meeting their targets in this regard. At the same time, the Modernisation Fund will involve both the modernisation of energy networks and the promotion of exchange of good practices between the beneficiary Member States. Last but not least, it will help

finance renewable energy sources and help improve Member States' national energy systems by turning them into greener and more economical ones.

This mechanism supports substantial investments to help achieve the Union's climate and energy change objectives, both set by the Paris Agreement and by other legislative measures. Most of the resources of the Modernization Fund (at least 70%) must be invested in priority areas such as the creation and use of electricity from renewable sources, but also in areas aimed at improving energy efficiency (including areas such as transport, buildings, agriculture, waste and excluding energy efficiency related to the generation of energy using solid fossil fuels). Consideration is also given to how to store energy, modernise energy networks and also support a fair transition in the carbon-dependent regions of the beneficiary Member States.

However, the modernisation fund cannot finance investments involving solid fossil fuels, unless such investments relate to efficient and sustainable heating in less developed countries such as Bulgaria or Romania.

In order to fulfil its role, the Modernisation Fund will work with the responsibility of the beneficiaries Member States and will collaborate with the European Investment Bank (EIB), Investment Committee of and the European Commission.

An important role in achieving European Union's goals on climate and improving energy efficiency is played by the European Investment Bank, which has several functions, such as auctioning of allowances ensuring the resources of the Modernisation Fund. In this respect, such certificates shall be auctioned in annual volumes equal split between 2021 and 2030, and the auction shall be conducted in accordance with the Auction Regulation. Other tasks assigned to the European Investment Bank are also the confirmation of whether an investment is a priority or not, the achievement of financial and technical diligence of non-priority investments, including an assessment of expected emission reductions.

To this end, the Joint Procurement Agreement for procuring common auction platforms was signed by the European Commission and 24 Member States in 2011 and 2012 (including Romania), except Germany, Poland and United Kingdom, with the aim of establishing the practical arrangements governing the joint procurement procedure, as governed by Article 125 letter c of the Implementing Rules.

At the same time, according to the Article 4 para. (2) letter a of the aforementioned normative act, the Commission is authorized by the participating states to act on their behalf and to carry out the common public procurement procedure, including the award and signing of the resulting contract. The escrow agreement and the custody agreement are an integral part of this contract, according to Article 46 of Regulation (EU) 1031/2010.

The settlement of these auctions is according to the Directive 2003/87/EC of the European Parliament and of the Council. According to the Final Report on the Analysis of the use of auctioning revenues by Member States, the auction means the method of allocating allowances under phase 3 of the European Union's

emissions trading scheme, and is considered the simplest and most efficient way to do so in the absence of other factors.

Compared to the quotas auctioned in 2013 (over 40%), their proportion is expected to increase by the end of 2020, making the auctioning revenues of these certificates a continuous source of revenue for Member States (as noted on the European Commission website).

**Table 1. Modernisation Fund Financing**

| Modernisation Fund | Member States | Share   | Allowances  | Transfers   | Total       |
|--------------------|---------------|---------|-------------|-------------|-------------|
| 2% of cap          | Bulgaria      | 5.84%   | 16,095,825  | 0           | 16,095,825  |
|                    | Czechia       | 15.59%  | 42,968,135  | 150,184,557 | 193,152,692 |
|                    | Estonia       | 2.78%   | 7,662,054   | 0           | 7,662,054   |
|                    | Croatia       | 3.14%   | 8,654,262   | 5,978,852   | 14,633,114  |
|                    | Latvia        | 1.44%   | 3,968,834   | 0           | 3,968,834   |
|                    | Lithuania     | 2.57%   | 7,083,265   | 8,696,818   | 15,780,083  |
|                    | Hungary       | 7.12%   | 19,623,677  | 0           | 19,623,677  |
|                    | Poland        | 43.41%  | 119,643,793 | 0           | 119,643,793 |
|                    | Romania       | 11.98%  | 33,018,490  | 167,747,579 | 200,766,069 |
|                    | Slovakia      | 6.13%   | 16,895,104  | 35,011,645  | 51,906,749  |
|                    | Total         | 100.00% | 275,613,439 | 367,619,451 | 643,232,890 |

Source: [https://ec.europa.eu/clima/policies/budget/modernisation-fund\\_en](https://ec.europa.eu/clima/policies/budget/modernisation-fund_en).

## ***B. The Innovation Fund***

The Innovation Fund is one of the largest funding programs in the world, which aims at creating technologies to reduce carbon emissions and will provide around € 10 billion over the period 2020-2030 with the aim of both decarbonising Europe and fostering its transition to climate neutrality.

The Innovation Fund helps create jobs, stimulate both growth and investment in clean energy and it will be funded from the auction of 450 million certificates (allowances) from 2020 to 2030, as well as any unused funds from the NER300 program provided by the EU Emissions Trading Scheme (EU ETS), which is set up by art. 10a para. (8) of the ETS Directive to support innovative low carbon technologies in the period 2021-2030. Detailed rules are established in the Commission Delegated Regulation (EU) 2019/8566.

It should be mentioned that for both the Modernisation Fund and the Innovation Fund the quotas are to be auctioned on the common auction platform, in accordance with Article 10 d paragraph 3 of Directive 2003/87 / EC (ETS) and article 20 paragraph (1) of the Rules from Delegated Regulation (EU) 2019/8566. In order for the rules on security and custody to be applicable to the common auction platform and for the bidding of certificates for the Modernization Fund and the Innovation Fund, the Escrow Agreement and the Custody Agreement should enter into force in respect of the shares to be auctioned for these two mechanisms.

## ***C. The Just Transition Fund***

The Just Transition Mechanism (JTM) ensures that the transition to a climate-neutral economy takes place in a fair way, leaving no one behind, with the most

disadvantaged regions receiving financial support of 150 billion in the period 2021-2027. It is intended to mitigate the socio-climatic impact of the transition by gradually eliminating their dependence on fossil fuels, including coal, peat and oil shale or high-emission industrial processes.

At the same time, the most relevant instruments of this mechanism, in particular the European Regional Development Fund ("ERDF") and the European Social Fund Plus ("ESF +"), will complement the European Union's contribution from the allocated budget perspective.

The Just Transition Fund ("FTJ") is one of the most important part of the Just Transition Mechanism and aims to reduce the negative impact of the climate transition by directly contributing to financing and modernizing the local economy and improving employment.

In this context, a specific scheme for a just transition within InvestEU will join the support provided by this Fund, mainly with a view to broadening the scope of investments, such as investments in renewable energy and green energy programs. Following this plan, it will also be possible to provide financial benefits for energy and transport infrastructure, but also for projects on the decarbonisation process, economic diversification of regions and social infrastructure.

Finally, a Platform for a Just Transition should be established, so as to allow for bilateral and multilateral exchanges of experience on lessons learned and good practice in all affected sectors.

The Just Transition Mechanism will include a sound governance framework focused on territorial transition plans, which sets out the territories in which the Fund will be used and which will be identified through a dialogue with the Commission. These plans will set out the challenges in each territory, as well as the development needs, but also the objectives to be met by 2030.

Member States can gain access by preparing equitable territorial transition plans covering the period up to 2030, which should also set out the most effective ways to best address social, economic and environmental challenges (Soeiro, Ferreira Dias, 2020).

#### ***D. European Green Plan - European Green Deal***

Given the need to rethink energy supply policies in all political and industrial sectors, the European Commission has created the European Green Deal. The aim of this Pact is to create a fair and fast growing society, with a modern, competitive and resource-efficient economy, where by 2050 there will be no net greenhouse gas emissions.

Achieving this goal will need the implementation of measures in all areas of the economy, as well as the involvement of all consumers by offering them certain benefits. An important role will be played by renewable energy sources, which involves increasing offshore wind energy production. A good way of integrating the renewable energy sources and energy efficiency will contribute to succeed in a low emission of CO<sub>2</sub>. The rapid decline of renewable energy sources coupled with improved policy development that favours this goal, has already reduced the

impact of the use of renewable energy sources on household energy bills (Montanarella, Panagos, 2021).

Investment will thus be made in the development of technologies that are to generate low-carbon sustainable, product and service , and to reduce waste significantly.

With more than a quarter of its carbon emissions growing, the transport sector plays an important role in the objectives of the European Green Pact, ensuring climate neutrality, by reducing emissions from transport by 90% by 2050 (Christodoulou et al., 2019).

The design of green buildings, as well as the modernisation of the existing ones so that they become more energy efficient, the effective afforestation, conservation and restoration of forests in Europe, as well as an environment free of toxic substances are other main objectives of the new EU strategy.

The InvestEU Fund will help combat climate change, with at least 30% of its revenues allocated in this direction. A major collaboration will be made with the European Investment Bank Group (EIB), the national banks and other international financial institutions. In this sense, European Investment Bank aims at doubling its climate objective from 25% to 50% by 2025, thus becoming the first European climate bank.

The private sector will play an important role in financing the transition to a green economy, with the aim of directing financial sources to green investment and creating opportunities to help identify sustainable and credible investments.

By mobilising national public and private investment, Horizon Europe plays an important role in achieving these goals by funding at least 35% of the budget for new solutions to climate change.

With a budget set at 95.5 billion Euro (including EUR 5.4 billion of the next generation of the EU - Recovery Fund), all the available tools in this mechanism will support the necessary research and innovation efforts. In this sense, four "Green Pact missions" will take part to major upgrades in areas such as climate change adaptation, oceans, cities and soil.

However, in order to achieve the mandatory goal of obtaining climate neutrality by 2050, the Proposal of the Regulation of the European Parliament and of the Council creates a framework for achieving climate neutrality goal and amending Regulation (EU) 2018/1999, also known as the European Law of climate change, which sets the conditions for the irreversible and progressive reduction of greenhouse gas emissions and for increasing uptake by natural or other absorbents in the Union.

### ***E. Similarities and Differences between These Mechanisms***

Even if the purpose of all of these Mechanisms is to combat the climate change by reducing and even stopping greenhouse gas emissions, there are some differences in how they manage to implement their strategies and reach this purpose, as presented in the following table:

**Table 2. Differences between these mechanisms**

|                            | <b>Modernisation Fund</b>  | <b>Innovation Fund</b>  | <b>Just Transition Fund</b>   | <b>European Green Deal</b>  |
|----------------------------|--|---|---|---|
| <b>Objective</b>           | transition to climate neutrality of 10 low income EU countries, thus contributing to the modernisation of their energy systems and improving energy efficiency.  | both decarbonising Europe and fostering its transition to climate neutrality  | reduce the negative impact of the climate transition by directly contributing to financing and modernizing the local economy and improving employment. for work                         | create a fair and fast growing society, with a modern, competitive and resource-efficient economy, where there will be no net greenhouse gas emissions. by 2050   |
| <b>Implementation Term</b> | 2021 - 2030  | 2020 - 2030   | 2021 - 2027   | Until 2050  |
| <b>Who is responsible</b>  | Beneficiary State  | European Commission, Brussels   | Beneficiary State   | European Commission, Brussels   |
| <b>Financing</b>           | Up to €14 billion  | Around € 10 billion   | Up to € 150 billion   | € 95.5 billion  |
| <b>Funding procedure</b>   | <ul style="list-style-type: none"> <li>- Selection of investments by states;</li> <li>- Their submission to the EIB;</li> <li>- Confirmation;</li> <li>- Either Disbursement decision (priority investment) or recommendation for financing (non-priority).</li> </ul> | Two methods: Large scale and small scale as described in the diagram below<br>Beneficiaries are selected by: <ul style="list-style-type: none"> <li>- effectiveness of greenhouse gas emissions avoidance;</li> <li>- degree of innovation;</li> <li>- project maturity;</li> <li>- scalability;</li> <li>- cost efficiency.</li> </ul> | territorial Plans of just transition (territories in which the transition fund will be used) determine challenges of each area, the need of development and the goals to be met in 2030 | <ul style="list-style-type: none"> <li>- clean, safe and affordable energy;</li> <li>- mobilising industry for a clean and circular economy;</li> <li>- construction and renovation of energy efficient buildings;</li> <li>- conservation and restoration of ecosystems and biodiversity;</li> <li>- accelerating the transition to sustainable and smart mobility.</li> </ul> |

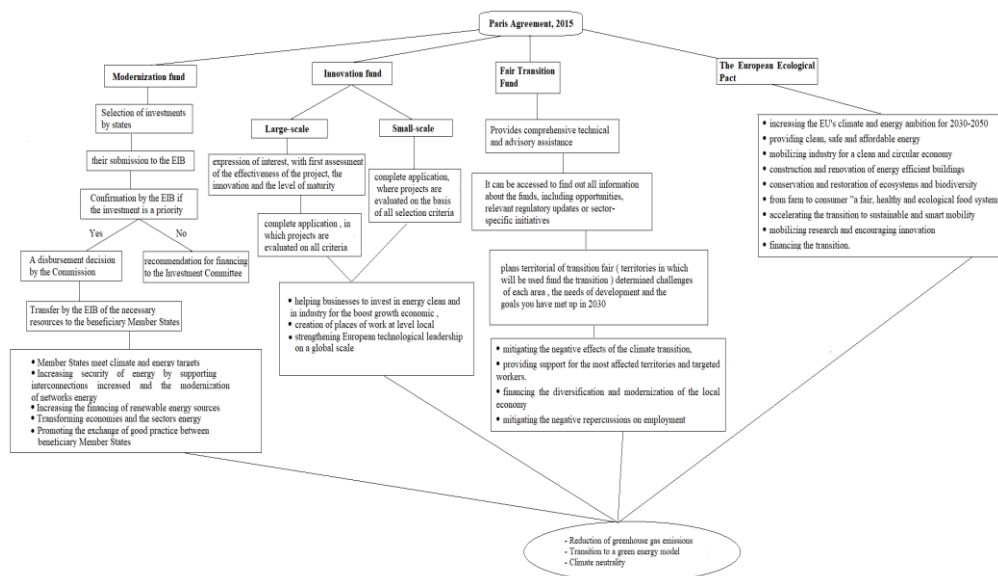
Source: Created by authors.

### 3. Methodology

The aim of this paper is focused on the comparative analysis of several international mechanisms whose main purpose is to combat climate change by reducing and even stopping greenhouse gas emissions. The research method is the comparative analysis aimed at understanding the need to implement these mechanisms, being based on the presentation of strategies that can be used to stimulate the global transition to a fair, climate-neutral and efficient world.

In carrying out the work, a documentation activity was carried out in the field of instruments and mechanisms of the EU, which have as objective the reduction of CO<sub>2</sub> emissions and implicitly of the effects of climate change. I studied the specialized literature related to the possibility of facilitating the transition to green pattern energy, by taking into account the practical tools for analysing them, but also all legislative measures taken at the Community level. In this regard, the paper aims to present, in the most efficient way possible, the steps to be followed and the mechanisms that can be used to develop innovative solutions on decarbonising Europe and supporting its transition to climate neutrality.

**Figure 1. Implementation of the mechanisms analysed in this article**



Source: Created by authors.

## 4. Discussions and Results

The need for a neutral society from the climate point of view and keeping the rate of global warming below 1.5 °C above pre-industrial levels have been embraced by all EU countries, who are aware of the risks to which citizens are exposed, but also of the impact that these climate changes have on both the health and food system, but also on the ecosystems and biodiversity of the planet. In this sense, in order to limit the rise in temperature, it is mandatory to achieve climate neutrality in all sectors of the economy, neutrality that can only be achieved by implementing relevant legislative and budgetary measures on climate and environment and reforming investment policies in agriculture, trade, transport, energy and infrastructure.

While the goal behind the achievement and implementation of these mechanisms is the same, namely achieving climate neutrality, each tool discussed in this article comes with its own element of novelty, to which is added a complete and accurate strategy to support the achievement of the initial goal. In this regard, unlike the Modernisation Fund, which has as main objective the support for the transition to climate neutrality of 10 low income states of the European Union, including Romania, the Innovation Fund and the Just Transition Fund contribute to the financing and modernisation of the local economy and to the job creation. the European Green Deal is a culmination of these mechanisms and aims to rethink all ideas on energy supply in the political and industrial sectors in order to obtain the ultimate goal, which is climate neutrality.



Therefore, the creation of these mechanisms and the allocation of financial resources reaffirm the Commission's goal to make Europe, by 2050, the first climate-neutral continent.

An example of this is the Modernisation Fund whose total revenues could be around 14 billion Euro in 2021-2030, depending on the price of carbon, 2% of which will be distributed in form of allowances to the beneficiary Member States.

Therefore, to achieve its objective, the European Union established a framework of comprehensive policies to limit CO<sub>2</sub> emissions, as the process of modernisation and transformation of the economy in order to achieve neutrality has already started. Results are encouraging as it is "on track to meet its 20% emissions reduction target for 2020", as noted on the European Commission website:

- EU greenhouse gas emissions were reduced by 24% between 1990 and 2019, while the economy grew by about 60% over the same period.
- Power plants experienced the most significant decline in emissions from stationary installations in all countries, decreasing by 9.1% between 2018 and 2019. A year earlier, these emissions had decreased slightly.
- In the field of aviation, there has been an increase of CO<sub>2</sub> emissions, by 2% more than in the previous year. Emissions constantly increasing, and aviation emissions are being taken into account by the directive only in terms of flights from the European Economic Area (EEA) (Christodoulou et al., 2019).

A new target has been set by the European Union, which wants to reduce carbon dioxide emissions by at least 40% by 2030 - as part of the EU's 2030 climate and energy framework and the current contribution to the Paris Agreement.

Effective implementation of the national energy and climate plans presented to the Commission in 2019-2020 could lead to reductions in the EU27 greenhouse gas reduction by 41% in 2030 compared to 1990, and this can be done by introducing and complying with national energy and climate plans. Their correct application can even lead to a reduction of about 45% in greenhouse gas emissions.

## **5. Conclusions**

The world is evolving and the emerging trend is towards green. The European Union implemented new mechanisms to help adapt to changes in climate and energy, which turned the European Union into a fair and prosperous society, with a modern, competitive and efficient from the point of view on resource use, in which there should be no net greenhouse gas emissions. These initiatives are important, as climate change will keep on having an essential impact in our continent, despite mitigation efforts. It is crucial to keep up efforts to fight against climate change, build resilience, prevent and prepare.

The transition to a green Europe can only be successful if it is carried out in a fair and favourable way for the implementation of these strategies. Managing these objectives will help changing the terms of living standards, people's perception towards the implementation and observance of these mechanisms. Depending on the circumstances, the level of development, but also the capacity to react, each state will start this path of transition from another point, the achievement and

implementation of these objectives being mandatory to be strongly analysed and thought of at the national level.

Climate change adaptation work will continue to have a powerful impact on public and private investment, including nature-inspired solutions and will allow for the creation of schemes to carry out ongoing monitoring of greenhouse gas emissions of the progress made by the European Union and the Member States regarding the objectives set by these mechanisms.

It can be clearly seen that the evolution is a productive one, and that the norms implemented at European level, through concerns related to the environment and climate, are crucial in the decision-making by the member states regarding their implementation. From the data we have presented, it can also be seen that the European Union is more determined than ever to promote and help regulate and implement the mechanisms at national level. It is worth mentioning that Romania, especially through the Modernisation Fund, is on the list of states that can benefit from funds in reaching, in a fast and unequivocal manner, the established climate targets. Only in such a way can the transition to a climate-neutral economy be made without leaving anyone behind.

## References

---

- [1] Cerovic Smolovic, J., Muhadinovic, M., Radonjic, M., Duraškovic, J. (2020). How does renewable energy consumption affect economic growth in the traditional and new member states of the European Union?, *Science Direct, Energy Reports 6*, pp. 505-513.
- [2] Christodoulou, A., Gonzalez-Aregall, M., Linde, T., Vierth, I., Cullinane, K. (2019). Targeting the reduction of shipping emissions to air, *Emerald Insight*, pp. 16-30.
- [3] Esperanza Mata Perez, M., Scholten, D., Smith Stegen, K. (2019). The multi-speed energy transition in Europe: Opportunities and challenges for EU energy security, *Science Direct, Energy Strategy Reviews 26*, pp. 1-6.
- [4] European Commission (2010). Regulation (EC) No 1031/2010 of 12 November 2010 concerning the timing, administration and other aspects of the auctioning of greenhouse gas emission allowances under Directive 2003/87 / EC of the European Parliament and of the Council establishing a trading system for allowances greenhouse gas emissions within the Community, *The Official Journal of the European Union*.
- [5] European Commission (2011). Joint Procurement Agreement to procure common auction platforms, Preamble, p. 3.
- [6] European Commission (2020). Proposal for a Regulation of the Parliament and of the Council establishing the Fair Transition Fund, Brussels.
- [7] European Commission (2019). Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions - European Ecological Pact, Brussels, The European Green Deal, p. 6.
- [8] European Commission (2019). Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions - European Ecological Pact, Brussels, The European Green Deal, p. 17.

- [9] European Commission (2020). Proposal for a Regulation of the European Parliament and of the Council establishing a framework for achieving climate neutrality and amending Regulation (EU) 2018/1999, also known as the European Climate Law, Brussels, p. 2.
- [10] European Parliament and the Council of the European Union, Directive 2003/87 / EC of the European Parliament and of the Council of 13 October 2003 establishing a system for the trading of greenhouse gas emission allowances within the Union and amending Council Directive 96/61 / EC, *The Official Journal of the European Union*.
- [11] European Commission Just Transition Fund website: [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_20\\_2354](https://ec.europa.eu/commission/presscorner/detail/en/IP_20_2354).
- [12] European Commission Innovation Fund website: [https://ec.europa.eu/clima/policies/innovation-fund\\_en](https://ec.europa.eu/clima/policies/innovation-fund_en).
- [13] European Commission website on progress in reducing emissions: [https://ec.europa.eu/clima/policies/strategies/progress\\_en](https://ec.europa.eu/clima/policies/strategies/progress_en).
- [14] European Commission website on the Modernization Fund: [https://ec.europa.eu/clima/policies/budget/modernisation-fund\\_en](https://ec.europa.eu/clima/policies/budget/modernisation-fund_en).
- [15] Montanarella, L., Panagos, P. (2021). The relevance of sustainable soil management within the European Green Deal, *Science Direct*, Land Use Policy, pp. 1-6.
- [16] Soeiro, S., Ferreira Dias, M. (2020). Renewable energy community and the European energy market: main motivations, *Science Direct*, Heliyon 6, pp. 1-6.