

Aspects of European funding for the energy transition - Just transition

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Abstract

The present study follows the financial allocations in energy transition, focusing on fair transition related to the carboniferous and mono-industrial areas, in Europe and especially in Romania, whose populations go through significant challenges of the quality of life, generated by changing the activity profile. The research revealed that, at this moment, the impact of the amounts allocated for a fair transition cannot be assessed, neither in the European Union nor in Romania, because the official implementation programs are still being finalized and approved on national and community flows. We also obtained a very interesting conclusion regarding the stage of reducing the share of coal in the national mix, the statistics showing an important advance compared to the targets set for Romania in the perspective of 2030 and 2050, respectively. During the research, we used statistical data on the Cohesion Policy published by the European Commission and the International Energy Agency.

Key words: energy transition, just transition, European funding, energy security, sustainable development

J.E.L. classification: A13, B16, B26, B55, C10, C46, F36, F52, G28

1. Introduction

This project aims to research the financial allocations in the field of energy transition, being chosen as a case study the financing in fair transition for coal and mono-industrial areas, with a population strongly affected by the change of activity profile and quality of life.

The research wants to answer the question related to the method of allocation and the size of the amounts, to the way of their dispersion for the targeted areas in Europe and what are the steps to implement the financing for a fair transition in Romania. We also want to know if it is possible to evaluate, at this stage of the research, the impact of the amounts allocated for this objective, both in the European Union and in Romania.

During the research, statistical data published by the European Commission on the implementation of Cohesion Policy, as well as those of the International Energy Agency, were used.

2. Literature review

Evolution of the energy sector in the EU in conditions of instability and risk requires the implementation of an innovative energy doctrine, built on the correct use of new principles on the internal market, competitiveness and safety in power supply (Gribincea *et al*, 2020, p.86). Some authors (Schröder, 2020, p.13) support the promotion of a fair transition to a circular economy in which one realizes that natural resources are finite and therefore seeks to keep materials in circulation for as long as possible. The economic development model of the fair transition is based

on bottom-up public policies, with the aim of creating the conditions for a fair income and a decent quality of life for the workforce and communities suffering from declining industrial activity, but also for pollution abatement measures (Bankwatch Romania, 2022). At the same time, (Muscă *et al*, 2022, p.19) argue that efforts for a fair transition must work together with those for gender equality, because changes, for example, in the Romanian coal-fired areas affect women the most, which has to deal with the pressure of wage labor and, at the same time, that of domestic debt and childcare and care for children and the elderly.

The COVID-19 pandemic has called for a massive response from European countries to a wide range of economic areas. International institutions and governments are now under pressure to turn these short-term initiatives into policy changes in the longer term, so as to ensure a fair transition in tackling climate change and inequities (Mărgineanu *et al*, 2021, p.326). Thus, the paradigm of a "fair transition" calls for the need to interconnect efforts to achieve climate neutrality with a focus on equity issues for people affected by energy poverty and lack of livelihoods, categories that depend on a fuel-based economy. fossils. At the same time, this transition must pursue "climate justice" to ensure the quality of life of current and future generations (Newell *et al*, 2013, p.137). Therefore, global equity requires a profound fair transition (Stavis *et al*, 2020, p.4), which should be an innovative framework for analysis that aggregates knowledge on climate, energy and environmental justice (McCauley *et al*, 2018, p.3).

Some experiences have shown that policies in some parts of the world to accelerate the shutdown of coal-fired power plants have not sufficiently communicated the processes involved in a "fair" transition in affected communities, which has led to misdirection, marginalization of local interests. and gave way to inefficient redirection of funding that was intended for communities in transition areas (Weller, 2019, p.16). (Ciplet *et al*, 2019, p.13) were of the opinion that the "just transition" paradigm neglected the conflicts that arise between sustainability goals and those related to equity for communities.

3. Research methodology

In obtaining results, the historical method was used to make it possible to understand the process of shaping the current policies of a fair transition in terms of the imperatives of sustainability of both the environment and the social perspective. The logical method has helped to better understand the cause-effect relationship and the objective connections between economic processes of an energetic nature. With the help of the graphical method, the statistical data and their evolution in details of interest for the present study were highlighted. The analysis and synthesis of the information provided a systematic and integrated approach to the complex of factors considered in the study.

4. Findings

We obtained answers based on statistical data related to the allocation of amounts for the targeted areas in Europe and the steps to implement the funding, through official documents addressing the fair transition in Romania. The research also revealed that, at this moment, the impact of the amounts allocated for a fair transition cannot be assessed, neither in the European Union nor in Romania, because the official implementation programs are still being finalized and approved on national and community flows.

We also obtained a very interesting conclusion regarding the stage of the process of reducing the share of coal in the national mix, the statistics showing an important advance compared to the targets set for Romania in the perspective of 2030 and 2050, respectively.

For a proper understanding of the process dedicated to just transition, we took an overview of the place of coal in energy security, with a special attention for Romania.

4.1. The Fair Transition Fund, in support of EU Cohesion Policy

The Fair Transition Mechanism is designed as a tool to ensure a fair transition to a climate-neutral economy, in line with the "no one is left behind" principle (European Commission, MTJ, 2022). The territories in question are mainly coal-fired regions, which will be most affected by the

actions needed to implement the European Green Pact, but also other heavily industrialized areas that need to be transformed into highly polluting industrial processes.

The Fair Transition Mechanism (JTF) is designed in addition to the EU financial allocations directly relevant to the energy transition, in particular the European Regional Development Fund (ERDF) and the European Social Fund Plus ("ESF +").

Cohesion policy (CP) supports the aggregation of socio-economic and territorial cohesion in the European Union, with a view to adjusting disparities between Member States and regions. It sets out the Union's political priorities, in particular the green and digital transition. PC is the main European investment policy, mobilizing, in both the 2014-2020 and 2021-2027 programming periods, a financing volume of about one third of the total EU budget. For the 2021-2027 programming period, the total resources of cohesion policy amount to EUR 392 billion (including indexation for annual amounts over that period).

PC allocations fall into the following objectives:

1) The "Investment for jobs and growth (IJG)" objective is funded by: European Regional Development Fund (ERDF); European Social Fund + (ESF +); Cohesion Fund (CF); Fair Transition Fund (JTF).

2) “Interreg” Objective: European Territorial Cooperation (ETC);

3) Supporting PCs through EU Managed Instruments (EU Instruments) and Technical Assistance (TA)

4.2. A comparative analysis between the allocations at the level of the European Union and that of Romania

Following the open data of the European Commission (European Commission, Cohesion Data, 2022) and the way they are organized in statistical series, we extracted the amounts allocated for the IJG objective: Investment for jobs and growth (including ERDF, ESF + and FC), ETC objective (Interreg), TA (Technical Assistance) and EU Instruments. Data for JTF (Just Transition Fund) are also mentioned separately.

Regarding the Fair Transition Fund, it is observed that the allocation at the level of the European Union is 19,236.9 thousand euros, of which Romania has 2,139.5 thousand euros, ie 11.12% of the total amounts. Compared to the percentages of the IJG (ERDF, ESF + and FC) and Interreg, the allocation rate for the Fair Transition Fund is the highest. There are no allocations for our country for EU Technical Assistance and Tools.

Table 1. EU / Romania comparative financial allocations under Cohesion Policy

	IJG	JTF	ETC	TA	EU Instruments
UE (thousand Euros)	361.056,80	19.236,90	9.041,60	1.332,10	1.211,60
Romania (thousand Euro)	29.937,40	2.139,50	372,60	0,00	0,00
% Ro/UE	8,29	11,12	4,12	0,00	0,00

Source: Comparative analysis based on European Commission statistics available at <https://cohesiondata.ec.europa.eu/stories/s/2021-2027-EU-allocations-available-for-programming/2w8s-ci3y#2021-2027-cohesion-policy-eu-budget-allocations> (accessed 14.06.2022)

The Fair Transition Fund is designed as a key tool to support territories severely affected by the transition to climate neutrality and to avoid widening regional imbalances. The fund will be used in shared management, in an equation that includes national, regional and local authorities, as well as stakeholders. Romania has a total allocation on FTJ of approx. 1.947 billion euros, to which is added the national co-financing of 0.292 billion euros (15%, with the possibility of reaching, in some cases, up to 50%), the total amount being approx. 2.240 billion euros (Romanian Government, Ministry of Finance, 2021).

From the open data of the European Commission (European Commission, Cohesion Data, 2022) and their organization by statistical series, we made a comparative analysis of the amounts allocated at Member State level, including the calculation of the allocation ratio between the amount to the Member State. respectively and total FTJ.

Table 2. Comparative financial allocations from the Fair Transition Fund for EU Member States, 2021-2027

Nr.	Member State	Allocation JTF (thousand Euros)	% allocation JTF/EU
	EU	19.236,90	100
1	Romania	2.139,50	11,12
2	Portugal	223,80	1,16
3	Spain	868,70	4,52
4	France	1.030,10	5,35
5	Czech Rep.	1.641,50	8,53
6	Poland	3.847,40	20,00
7	Hungary	261,10	1,36
8	Lithuania	273,20	1,42
9	Greece	830,20	4,32
10	Bulgary	1.295,10	6,73
11	Slovakia	458,90	2,39
12	Malta	23,30	0,12
13	Cyprus	101,10	0,53
14	Latvia	191,60	1,00
15	Belgium	182,60	0,95
16	Sweden	155,70	0,81
17	Estonia	353,90	1,84
18	Italy	1.029,70	5,35
19	Finland	465,70	2,42
20	Croatia	185,90	0,97
21	Netherlands	622,90	3,24
22	Ireland	84,60	0,44
23	Germany	2.477,60	12,88
24	Denmark	89,00	0,46
25	Austria	135,80	0,71
26	Luxemburg	9,30	0,05
27	Slovenia	258,70	1,34

Source: Comparative analysis based on European Commission statistics available at <https://cohesiondata.ec.europa.eu/stories/s/2021-2027-EU-allocations-available-for-programming/2w8s-ci3y#2021-2027-cohesion-policy-eu-budget-allocations> (accessed 10.06.2022)

Romania, from the point of view of the total amounts allocated for the implementation of the FTJ, occupies the third position among the member states. So, on the first place is Poland, with an allocation of 20% of the FTJ, followed by Germany, which has 12.88% of the FTJ, on the third place being Romania, with a percentage of 11.12% of the FTJ. Along with Luxembourg, Cyprus and Malta, countries with very small territories, the lowest EU allocations for FTJ are in countries such as Ireland, Sweden, Belgium, Croatia.

Continuing the analysis based on open data from the European Commission (European Commission, Cohesion Data, 2022), we have made an annual profile of allocations for the Fair Transition Fund, taking into account EU-wide amounts and amounts for Romania, shown in the table below.

Table 3. Annual allocation profile for the Fair Transition Fund - EU / Romania comparative analysis, 2021-2027

Year	EU	Romania	% UE
2021	3.244.705.617,00	360.910.931,00	11,12
2022	5.463.509.838,00	607.710.115,00	11,12
2023	5.572.780.031,00	619.864.317,00	11,12
2024	1.202.379.481,00	133.741.532,00	11,12
2025	1.226.427.073,00	136.416.363,00	11,12
2026	1.250.955.612,00	139.144.690,00	11,12
2027	1.275.974.726,00	141.927.584,00	11,12
total	19.236.732.378,00	2.139.715.532,00	11,12

Source: Comparative analysis based on European Commission statistics available at <https://cohesiondata.ec.europa.eu/stories/s/2021-2027-EU-allocations-available-for-programming/2w8s-ci3y#2021-2027-cohesion-policy-eu-budget-allocations> (accessed 12.06.2022)

Thus, we found that the allocation percentage of the total FTJ at EU level for Romania is constant every year, this being 11.12%. It is noted that the allocation strategy was for the maximum funding to be planned for the first three years of implementation, respectively 2021-2023, after which, in the next four years, the amounts decrease substantially.

At the time of completion of this paper, there are **no financial data on the implementation** of the Fair Transition Fund, as this process will start after the adoption by EU Member States of FTJ national programs, probably in 2022 (European Commission, Just Transition Mechanism - Performance, 2022).

4.3. About the place of coal in energy security

By 2020, unabated coal will supply 35.2% of global energy production (International Energy Agency, 2021) and, depending on the evolution of the availability of new technologies in the future, will have a key place in the industry. In coal-fired energy production, reducing pollution ("abated coal") means using carbon dioxide capture and storage (CCS) technology or carbon capture, use and storage (CCUS) technology. In antithesis, "unabated coal" has the meaning of a coal-fired power plant without technological equipment CC (U) S (E3G, 2022).

The climate neutrality scenario by 2050 assumes that the production of unabated coal will decrease annually by approx. 11% and cease completely in 2040.

Following the signing of the Paris Agreement, 21 countries that currently use polluting coal for electricity generation have agreed to phase out its use, but these commitments accounted for only 3.2% of global coal-fired energy production in 2020. and 1% of global greenhouse gas emissions from the energy sector. Basically, it is estimated that coal will continue to be an essential component in the energy mix of many countries around the world.

However, International Energy Agency statistics show that global coal-fired energy production has rebounded sharply in 2021 amid rising economic activity in China and gas prices in Europe and the United States. Compared to the first part of 2020, coal production in the first half of 2021 increased by approx. 15% (IEA, 2022). In addition, the map of global coal consumption indicates that economies on the Asian continent have a hard time saying where targets for the phasing out of coal have not yet been set. In the European Union, coal is mined in 41 areas in 12 Member States, making it the richest fossil fuel in the European Union and generating the largest volume of economic activity (Valea Jiului Social Institute Association, TRACER, 2022). The transition to a low-greenhouse gas economy brings substantial technological, social and economic challenges, especially for coal-fired regions, which need to be prepared to reduce, to phase out, coal use, following Sustainable Development.

From the open data of the International Energy Agency (IEA, 2022) and their organization by statistical series, we conducted a comparative analysis of the distribution of coal utilization capacity in the energy sector (GW) by age of plants still in operation in countries selected, 2021.

Table 4. Distribution of coal use capacity in the energy sector (GW) by age of plants still in operation in selected countries, 2021

EU Member State	GW				total
	<10 years	11-30 years	31-50 years	>50 years	
Germany	10	9,8	17,8	3,2	40,8
Netherlands	3,5	0,6	0	0	4,1
Finland	0	0,6	1,5	0	2,1
France	0	0	3,1	0,1	3,2
Greece	0	1	1,5	0,3	2,8
Hungary	0	0	0,4	0,7	1,1
Ireland	0	0	0,9	0	0,9
Italy	0	5	2,4	1,6	9
Portugal	0	0,6	0	0	0,6
Romania	0	0,2	3,4	0,9	4,5
Slovakia	0	0	0,4	0,6	1
Spain	0	0,5	1	0	1,5

Source: comparative analysis based on International Energy Agency statistics <https://www.iea.org/commentaries/key-lessons-for-phasing-out-co2-emitting-coal-plants-from-electricity-sectors> (accessed 14.06.2022)

From the available statistical data, it appears that the leader in the European area in terms of coal use capacity for energy generation is Germany, followed by Italy and Romania. On the other hand, the least coal-dependent EU countries are Portugal, Ireland, Slovakia and Hungary. On the other hand, Germany and the Netherlands are the only countries with coal-fired power plants older than 10 years, with the most significant age segment for the reported countries being 31-50 years, which is a third of the total, followed by the 11-30 years old.

Regarding Romania, studies show that 25.6% of the total GHG emissions in Romania in 2020 are related to the combustion of coal for electricity generation at the Hunedoara (CE Hunedoara) and Oltenia (CE Oltenia) Energy Complexes, which operate in Dolj, Gorj and Hunedoara counties. The positive side is that the volume of emissions related to coal combustion in CE Oltenia and CE Hunedoara was 66% lower compared to 2007 (PTTJ Hunedoara, 2020).

The declining trend in coal, gas, oil and nuclear production has resulted in the EU's increasing dependence on primary energy imports (Eurostat, 2016) to meet domestic demand from Member States. Moreover, the conflict in Ukraine, which began in February 2022, is leading the European Union to make certain short-term compromises on the European Ecological Pact. In March 2022, after the issue of dependence on gas imports from Russia was discussed, European officials agreed that, for the time being, it will be allowed to return to coal for electricity generation (Timmermans, in Politico, 2022). This solution was also taken over by Romania, by revaluing the coal production capacity through the Hunedoara Energy Complex (Agerpres, 2022).

In Romania, during 2022, almost 17% of the internal energy mix for electricity generation is occupied by coal, in a percentage of approx. half that of hydropower and almost equal to that of wind energy. The data we compared, at a distance of 4 months (before and during the evolution of the economic context determined by the conflict in Ukraine), show a slight increase (by 0.2%) in the share of coal, together with hydropower (which records the largest difference, 0.6%), wind energy, nuclear energy, mainly to the detriment of the share of hydrocarbons (-1.2%) (ANRE, 2022, February and June)

Analyzing the estimates on the share of energy sources in Romania's energy mix for the period 2020-2050 (Ministry of Energy, Environmental Report, 2019), we note that at the level of June 2022, there is an advance of 3.8 on the percentage of coal % of the proposed target for 2030 and 0.4% of the proposed target for 2050.

Another interesting indicator to note is the "degree of energy independence", ie the percentage between production and the amount of primary energy available in the analyzed period, the calculation being made by subtracting energy resources from exports and stocks at the end of the reference period (INS, 2021). The data sources used by the National Institute of Statistics of Romania to calculate the indicator were: "statistical research on electricity and heat production", "statistical research on energy balance and structure of energy equipment", "energy resources and their use". For Romania, among the values of the indicator "IND121A - Degree of energy independence" we extracted the percentages related to coal, resulting in a peak in 2009 (86,5%) compared to which, in the last year for which there are statistical data (2020), there was a decrease 12.6% (73,9%).

A sustainable transition in line with energy security needs for low-GHG energy production will be achieved, according to national strategy papers, through the phasing out of coal dependence. This complex process is to be through a normative act approving the calendar 2022 - 2032 for the closure of the total installed capacity based on coal and lignite (PTTJ GD, 2022). For the functioning of the national energy system in a framework of security and continuity, the Turceni and Rovinari groups will be kept in use, between 2026–2030, as a technical reserve. At the same time, the mines in Hunedoara and Gorj counties, which supply these energy complexes, will be closed until 2032, so that, in 2030, the amount of coal estimated to be extracted will decrease by 75% compared to 1993 , it is estimated that, starting in 2031, coal mining will cease altogether.

5. Conclusions

Benefiting from the access to open data published by the European Commission on the implementation of Cohesion Policy and the International Energy Agency, in the research project we proposed here we managed to follow the financial allocations in the field of energy transition, focusing on fair transition related to the carboniferous and mono-industrial areas, whose populations go through significant challenges of the quality of life, generated by the change of the activity profile.

A question arising during the research for this project is related to a comparative analysis of the costs and implications of the whole process of fair transition in coal areas from the perspective of coal mine closure and what would be an alternative to refurbish them by use of carbon capture and storage (CCS) technology or carbon capture, use and storage (CCUS) technology. We propose to answer this question in a future research.

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