TRANSITION TO A LOW CARBON ECONOMY IN ROMANIA

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Abstract
The EU Roadmap for moving to a competitive low carbon economy in 2050 states a potential of 85% emission reductions in industry by 2050. The industry is unlikely to meet this target without a major change in the policy frame. The purpose of this article is to assess the potential of the transition to a low carbon economy in Romania including a macroeconomic outlook and to offer some recommendations.
Climate challenges rarely appear in the mass-media in Romania. There is no fundamental environmental education, and the media is uninterested in these issues because they do not sell. The environment receives only occasional attention; the primary concerns are about the energy supply and prices. Romania needs to increase knowledge transfer in this context. This change may be done by establishing tactics that combine techniques for reducing environmental impact and communicating the benefits of this process. At this time when innovation and sustainability are two of the most important key elements of the energy transition, it is more important than ever to maintain transparency and better consultation among all decision-makers by focusing on integrated efficiency issues that include economic, social, environmental, and climate change mitigation.

Keywords: *sustainable development, competitiveness, environmental performance, economic growth, low carbon economy.*
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Introduction

In the last two decades, an important number of governments, international organizations and private companies started to give more and more importance to the risks and opportunities related to the climate transition, to the low-carbon economies, without excluding the global financial system.
To obtain the low-carbon transition through financial system, policy makers and market participants need to require the efficient allocation of capital, efficient production processes and to support and to encourage the investments in renewable energy and green technologies. The clean energy transition has been too slow and progress too unbalanced to prevent the most serious consequence of climate change. But the COVID-19 pandemic forces decision-makers policymakers to change their actions and prioritize green recoveries and to give up on unsustainable strategies.
Governments, market participants, the civil society and innovators are increasingly rallying around carbon neutrality because with the Covid-19 pandemic, questions of sustainable development are at the heart of their concerns. The next ten years will determine whether or not the plan is implemented successfully.

1. Literature review

The effect of the rapid growth of industrial economy has been accompanied by a large amount of energy consumption. The results of the accumulations of CO_2 emissions generate a series of environmental problems: sea-level rise, global warming and outbreaks of the bad weather (Caldeira et al., 2018). Carbon emissions reduction and low-carbon sustainable development are important issues on the public agenda because CO_2 emissions are predominantly caused by human activities, as 96.5% of CO_2 emissions come from the utilization of fossil energy, and natural phenomena (Pao et al., 2015).

The aim of this section is to illustrate the evolution of the relevant literature by highlighting the relationship between the transition to a low carbon economy, environmental development, and the economic growth. For instance, this paper relates to a debate regarding the relationship between competitiveness and environmental performance (Porter, 1991).

After almost two years into the COVID pandemic, its economic shockwaves still let the societies vulnerable and created a deep economic recession, which hit the poorest countries hard affecting their ability to respond to the climate emergency (Gopinath, 2021).

Environmental performance results are not only obtain from specific programs in the industry, but also from efforts to improve productivity: total quality, operations management, innovations to the extent that they optimize resources by minimizing inputs as well as refusals (Roy et al., 2001).

The phenomena of depollution actions diminishing marginal efficiency tends to limit prospects for productivity growth over time, especially if significant efforts have already been done (Viardot, 1993). As a result, prospects for economic benefit will be simpler for Romanian enterprises starting on environmental program execution than for those well established in the sector. Whatever the nature of these projects, the implementation of even stronger environmental standards or more extreme environmental aims would necessitate more costly and cost-effective remediation technologies in the long term.

Pollution prevention actions and the promotion of a logic of continuous improvement involve a much wider mobilization of employees than in the case of technical measures, which usually depend on environmental services (Boiral, 2002). However, leadership is required to increase employee awareness from both public and private sector in Romania and engagement in environmental issues. Furthermore, the commitment of top management is the key criterion of the ISO 14 001 environmental management system.

2. Overview. Understanding of Romania`s political economy

Many aspects of Romania's political economy stand in opposition to a low-carbon transition. In this section of the article, we will analyze the national conditions from the Figure 1.

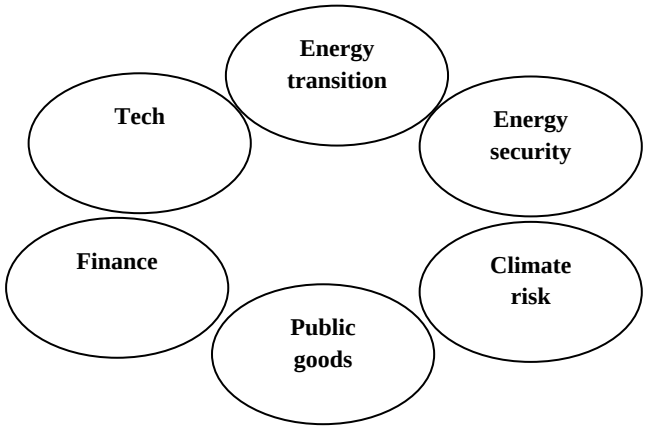

Figure 1. Natural Conditions in Romania
Source: Pemm Country Report, 2019

Romania is one of Europe's most energy-independent countries, with large gas and oil reserves. Fossil fuels play a major role in Romania's energy mix together with its nuclear capacity. The traditional economic model of nuclear power is challenged by liberalised electricity markets in which Cernavodă nuclear power plant operate, by the diversification of power mixes as the evolving policy, regulatory and technological landscape.

Nuclear power in Romania provides predictable and reliable electricity, providing a secured supply of electricity. The need for flexibility in the medium to longer term in electricity generation and system management – a trend accelerated by the pandemic crisis – will progressively characterize future systems.

The key issues for Romania on the way to a low carbon economy transition are the general inefficient energy production infrastructure, energy poverty and the challenge to maintain the energy independence from Russia. Romania can play an important role in the gas and oil market in Europe because of the potential in the Black Sea and because its low energy dependency rate (Heilmann et al., 2019).

Technology, innovation, finance, and the perception and role of public goods, all potential low-carbon transition drivers, have yet to play a substantial role in Romania's shift. The country is a favorite outsourcing destination for information and communication technology development, and the country's technical higher education is of high quality.

Brain drain, emigration, and a skilled labor shortage, as well as corruption in many sectors, all constitute significant obstacles to continued technological innovation.

Romania might profit from active participation in low-carbon supply chains, as seen by the renewables development, but this would need focused governmental investment. Although Romania has maintained strong growth, it has been almost entirely driven by private consumption, which is backed up by significant social spending, and government expenditures in a low-carbon transition are heavily reliant on EU funds.

Romania is also one of the EU's most vulnerable nations to natural catastrophes (Table 1), and it suffers significant economic losses as a result of extreme weather events such as floods and droughts, which are not linked to climate phenomena's.

Table 1. The World Risk Index for EU27, in 2020

	World Risk Index (WRI)	Rank among EU-27*)	Romanian WRI compared with other EU countries
Malta	0.66	1	5.20
Finland	1.96	2	3.90
Estonia	2.03	3	3.83
Sweden	2.20	4	3.66
Lithuania	2.26	5	3.60
France	2.47	6	3.39
Luxembourg	2.50	7	3.36
Germany	2.63	8	3.23
Belgium	2.66	9	3.20
Denmark	2.74	10	3.12
Cyprus	2.99	11	2.87
Latvia	2.99	12	2.87
Czech Republic	3.00	13	2.86
Poland	3.04	14	2.82
Austria	3.06	15	2.80
Slovak Republic	3.37	16	2.49
Slovenia	3.41	17	2.45
Spain	3.61	18	2.25
Portugal	3.66	19	2.20
Croatia	4.13	20	1.73
Bulgaria	4.17	21	1.69
Ireland	4.50	22	1.36
Italy	4.75	23	1.11
Hungary	5.07	24	0.79
Romania	**5.86**	**25**	**0**
Greece	7.25	26	-1.39
Netherlands	7.89	27	-2.03

Source: Bündnis Entwicklung Hilft (2020), World Risk Report 2020

***)** *Note: The ranks are in ascending order - from the highest level of the WRI to the lowest one.*

Due to a median of 3.51 for 27 countries, Europe faces a low risk overall, but the intra continental differences are significant, such as the Netherlands, Greece and Romania bear a medium to a high risk, they are on the higher end of the risk spectrum, while Estonia, Finland, Iceland and Malta are characterized by a rather low exposure.

Due to high poverty (Table 2) and increasing income inequality, these economic difficulties are viewed by the people as a major challenge for the country, whereas challenges such as climate change and environmental issues are not given the attention they require.

Table 2. At poverty risk (%) EU27

Country	At poverty risk %		Year to year change, pp*)					The range**)				
	2015	2019	2016/ 2015	2017/ 2016	2018/ 2017	2019/ 2018	2019/ 2015	2015	2016	2017	2018	2019
Austria	18.3	16.9	-0.016	0.005	-0.03	-0.03	-1.4	22	23	19	20	21
Belgium	21.1	19.5	-0.009	-0.014	-0.03	-0.03	-1.6	16	15	14	14	15
Bulgaria	41.3	32.8	-0.021	-0.037	-0.16	0	-8.5	1	1	1	1	1
Croatia	29.1	23.3	-0.041	-0.053	-0.06	-0.06	-5.8	6	7	8	8	9
Cyprus	28.9	22.3	-0.041	-0.09	-0.05	-0.07	-6.6	7	9	10	10	10
Czech Republic	14	12.5	-0.049	-0.082	0	0.024	-1.5	27	27	27	27	27
Denmark	17.7	16.3	-0.05	0.023	-0.01	-0.04	-1.4	23	24	21	22	24
Estonia	24.2	24.3	0.008	-0.04	0.042	-0	0.1	13	12	11	9	8
Finland	16.8	15.6	-0.011	-0.054	0.05	-0.05	-1.2	25	26	26	24	25
France	17.7	17.9	0.028	-0.065	0.023	0.028	0.2	24	21	23	21	19
Germany	20	17.4	-0.015	-0.035	-0.02	-0.07	-2.6	17	17	18	18	20
Greece	35.7	30	-0.002	-0.022	-0.09	-0.06	-5.7	3	3	3	3	3
Hungary	28.2	18.9	-0.067	-0.026	-0.23	-0.04	-9.3	10	10	9	15	16
Ireland	26.2	20.6	-0.068	-0.069	-0.07	-0.02	-5.6	12	13	13	12	12
Italy	28.7	25.6	0.045	-0.036	-0.06	-0.06	-3.1	8	5	5	6	6
Latvia	30.9	27.3	-0.077	-0.01	0.007	-0.04	-3.6	4	6	6	4	4
Lithuania	29.3	26.3	0.027	-0.016	-0.04	-0.07	-3	5	4	4	5	5
Luxembourg	18.5	20.6	0.032	0.015	0.067	-0	2.1	20	18	16	13	13
Malta	23	20.1	-0.117	-0.049	-0.02	0.057	-2.9	15	16	17	16	14
Netherlands	16.4	16.5	0.018	0.017	-0.02	-0.01	0.1	26	25	24	23	22
Poland	23.4	18.2	-0.064	-0.109	-0.03	-0.04	-5.2	14	14	15	17	18
Portugal	26.6	21.6	-0.056	-0.071	-0.07	0	-5	11	11	12	11	11
Romania	37.4	31.2	0.037	-0.079	-0.09	-0.04	-6.2	2	2	2	2	2
Slovak Republic	18.4	16.4	-0.016	-0.099	0	0.006	-2	21	22	25	25	23
Slovenia	19.2	14.4	-0.041	-0.07	-0.05	-0.11	-4.8	18	19	22	26	26
Spain	28.6	25.3	-0.024	-0.046	-0.02	-0.03	-3.3	9	8	7	7	7
Sweden	18.6	18.8	-0.016	-0.032	0.016	0.044	0.2	19	20	20	19	17

Source: Own calculation based on Eurostat database

**) Percent points. **) Note: The ranks are in descending order - from the highest level of the poverty rate to the lowest one.*

As shown be seen in Table 2, at the level of the European Union, in the period 2015-2019, the poverty rate was, on average, 22.78%, the highest values have being recorded in countries such as Bulgaria, Romania or Greece, and lowest values of the poverty rate can be found in countries such as Finland, Denmark or the Czech Republic.

3. Macroeconomic outlook for Romania

Low-carbon transition needs to take into account the link between economy, the production and consumption of energy, society and environment and it should not ignore the economic growth, industrial structure, energy consumption and energy structure.

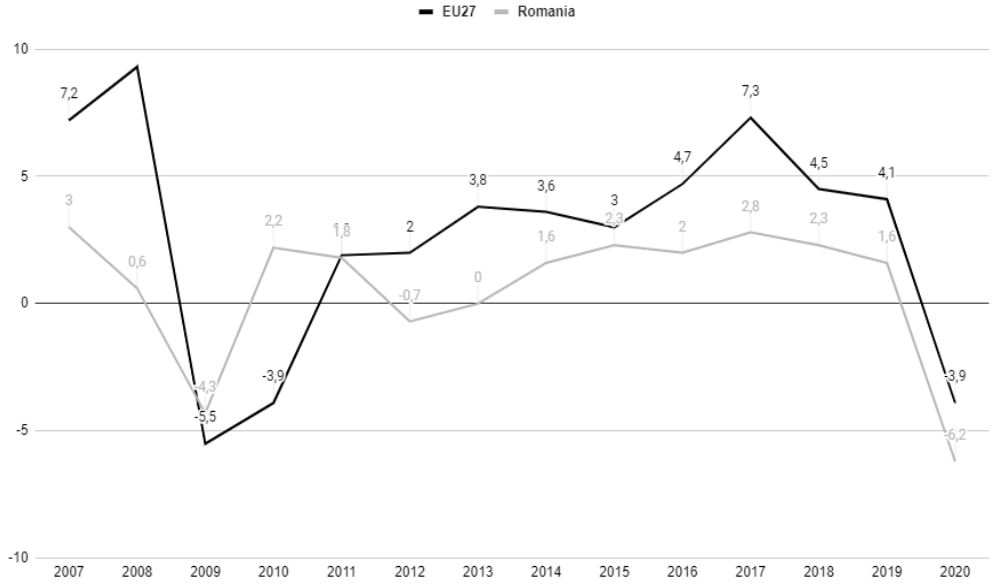

Figure 2. Romania vs. EU27 - Real GDP growth rate
Source: Own calculation based on Eurostat database

Romania is a relatively large European market with an economy measured at EUR 218.2 billion in GDP terms in 2020 and a population of 19.3 million people. A varied and competitive industrial environment, strong agricultural potential, and minimal energy reliance may all contribute to a long-term growth and development path that is steady and predictable.

In the spring of 2020, the economic context changed due to the COVID-19 pandemic, which led to lockdown and reduced economic activity. An important number of companies closed or suspended their business and the employee layoffs/ technical unemployment reduced private consumption with the restrictive measures on mobility and goods transportation.

In the pandemic year 2020, Romania had an economic slowdown with a 3.9% fall in GDP. This downturn was mostly due to weak foreign demand, which slowed manufacturing and exports, as well as weaker consumer spending.

Reduced energy consumption can contribute to the decrease of carbon emissions. On the other hand, some energy usage is required for human well-being and growing living standards. Energy intensity might be a useful indication to track based on this concept. The quantity of energy utilized per unit of Gross Domestic Product is measured by energy intensity (GDP). It effectively assesses a country's ability to use energy to generate a certain quantity of economic production. A lower energy intensity indicates that less energy is required per unit of GDP.

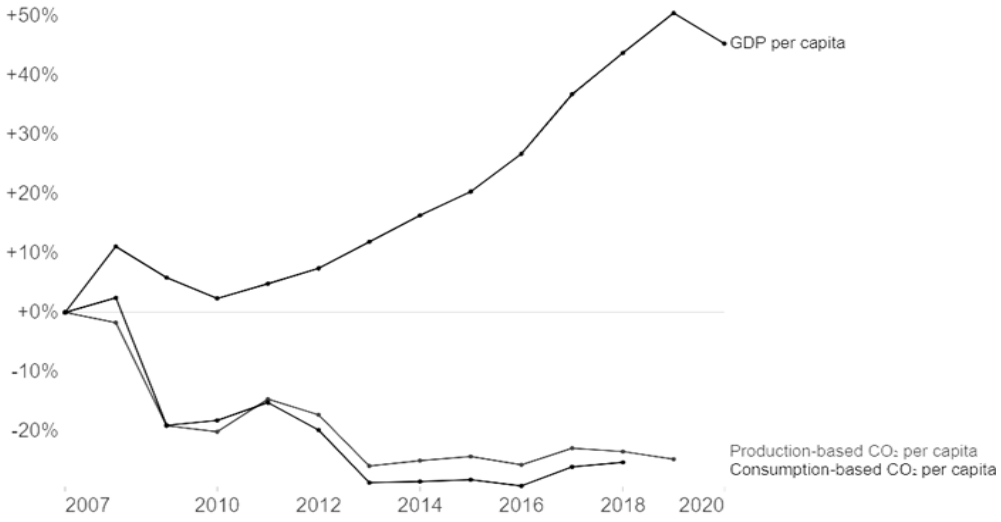

Figure 3. Change in per capita CO_2 emissions and GDP, Romania
Source: World Bank based on the Global Carbon Project 2020

We must separate economic growth from CO2 emissions in order to cut emissions and increase prosperity at the same time. The graph above illustrates the change in GDP per capita and annual per capita CO2 emissions from 2007 to 2020 to see if Romania has accomplished this.
The Figure 3 illustrates both production and consumption-based data. This allows us to assess if the import of goods from other countries – or the export of goods to other nations – has had an impact on the change in emissions.
In time, green electricity will eventually overtake fossil fuels production as the central determinant of economic and environmental progress. Joining to the Schengen area is the most important EU policy goal for Romania in the way to suspend border controls, but this goal failed so far due to the lack of credible judiciary reforms and its results in the fight against corruption. The implementation of EU legislation is slow even there is a willingness to comply with EU legislation, Romania largely lacks the resources for this and is regularly subject to criticism from the European Commission, like for not being able to transpose into national Romanian law system the Industrial Emissions Directive.

Recommendations

- To obtain significant emission cuts, Romanian decision-makers should demand significant adjustments in the steel, cement, and chemical sectors;
- A greater importance must be given to the biomass resource potentials, because their sustainability are limited by the competition with other sectors.
- The improvement of material efficiency and a greater importance to be allocated to the potential of circular economy, by enacting more policies to improve material efficiency;
- The government could utilize public procurement to help low-carbon goods enter the market by creating specialized markets;
- The establishment of the Innovation Fund, which will provide public research and development funding to help accelerate the commercialization of innovative and efficient low-carbon processes.

Conclusions

Romania faces a major potential in the commercialization of low-carbon solutions, including clean energy technology, as well as a substantial difficulty in transitioning to a low-carbon economy. This transitional opportunity has the potential to stimulate a significant emerging market and contribute in the change of the energy sector.

Undoubtedly, the Romanian and foreign investors and financial market participants alike reflect their increased interest raised by issues related to the carbon emissions, along with carbon reporting and the proliferation of climate conscious investment products worldwide—an interest that culminated within the 2015 Paris Agreement.

Among other premises, issues of transparency and the availability of climate-relevant information are both gaining importance in support of the global agreement (Ceccarelli et al., 2019).

Energy efficiency, innovative production technologies, material efficiency, substitution and circular economy elements are some recommendations for the successful transition. Whatever options are chosen, environmental actions must not be entirely subordinated to economic considerations that are considered more or less favorable but must be based first and foremost on the concern to respect the integrity of ecosystems and the sustainable health of populations. With regards to these core values in the Romanian society imposes expenses that should not be judged only on economic criteria and in the evaluation of the investment efficiency the evaluators must take into account the following issues: economic, social; environment and climate change mitigation.

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