THE EFFECTS OF THE EUROPEAN GREEN DEAL AGREEMENT ON THE ENERGY TRANSITION IN ROMANIA

IONESCU Mihaela
University of Oradea, Doctoral School of Economic Sciences, Oradea, Romania
ss_mihaela@yahoo.com

Abstract: *In this article, the author present some aspects regarding the energy transition in Romania that are currently facing barriers in the reform of his energy market. While the European Union aims, by the European Green Deal, to decarbonise the economy by 2050, the countries of the European Union are struggling with dysfunctional energy markets and a high dependence on fossil fuels and nuclear energy. European Union states have made national commitments to achieve long-term greenhouse gas neutrality and are now adopting national laws to achieve this objective. EU countries have approved the goal of achieving climate neutrality by 2050, in accordance with the Paris Agreement. Energy production and use account for more than 75% of the EU's greenhouse gas emissions. At EU level, the target for reducing GHG emissions was set at 40% by 2030 compared to 1990 levels, in addition to a target of 32% for renewable energy and a target of 32.5% for improving energy efficiency. The increase in the price of carbon dioxide emissions has led to the collapse of coal production, so that 15 states of the European Union have adopted national plans for the total elimination of coal by 2050. Only four states including Romania are beginning to adopt the plans their national coal disposal. Coal replacement plans provide for the use of clean energy from renewable sources and natural gas. But the European Union states are dependent on the imports of natural gas which leads to the focus on increasing energy obtained from renewable sources.*

Keywords: *climate neutrality; energy transition; greenhouse gases; primary energy; The European Green Pact.*

JEL Classification: *Q43.*

1. Context

The Kyoto Protocol was the first international agreement for reducing greenhouse gases. It was negotiated in 1992, completed in 1997 and entered into force in 2005. During the Paris Environmental Conference, the UN decided that the Kyoto Protocol was not enough to stop global warming, which led to the creation and adoption of the Paris Agreement.
The Paris Agreement adopted on December 12, 2015 is the first of a universal nature in the field of climate change, which imposes legal obligations on all parties to achieve the objective of limiting the increase of the global average temperature below 2˚C compared to the level of the pre-industrial period, having further efforts are envisaged to make this limit 1.5C.

The contribution of the European Union and its Member States to achieving the objective of the Paris Agreement is represented by the target of reducing greenhouse gas emissions by at least 40% compared to 1990.

1.1. Global primary energy consumption

During the period 2007-2017, primary energy consumption experienced a strong growth in Asia Pacific and a much slower growth in the US and the European Union (Figure 1).

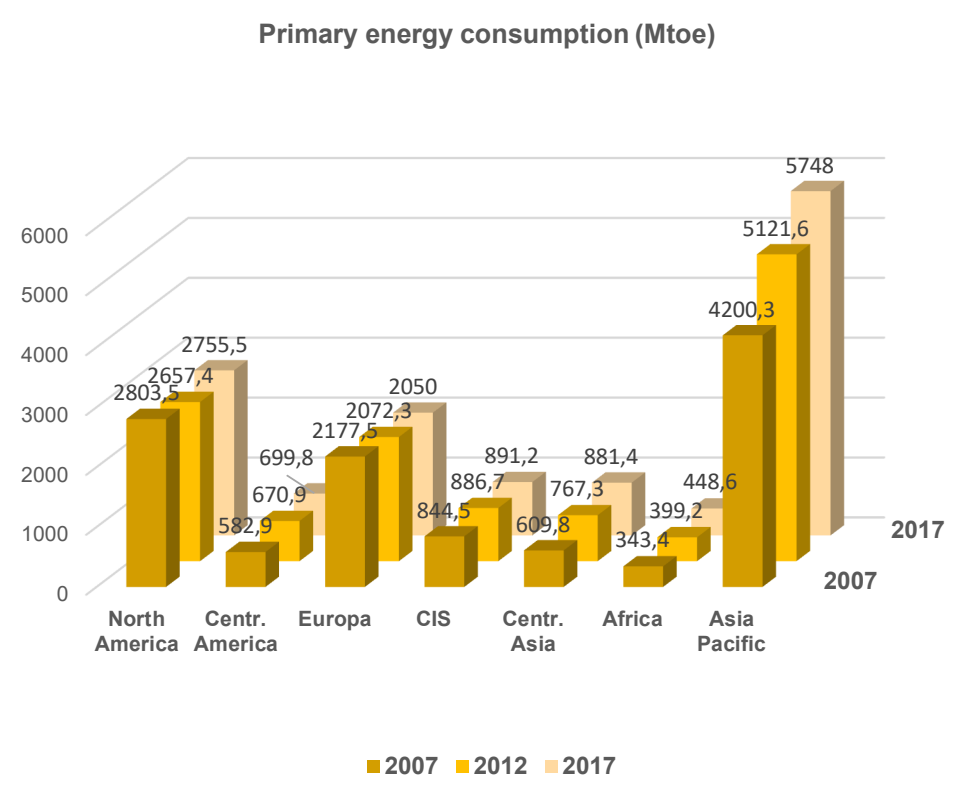

Figure 1: Primary energy consumption between 2007 and 2017
Source: BP Statistical Review of World Energy 2019

1.2. Global carbon dioxide emissions

Against the background of increasing energy consumption, greenhouse gas emissions also increased greenhouse gas emissions. Climate change is the biggest threat to the environment that humanity is facing.

Electricity and thermal energy production and the transport sector represent 80% of the greenhouse gases in the European Union. Quantitatively, Europe is only surpassed by Asia Pacific and North America in terms of emissions (Figure 2).

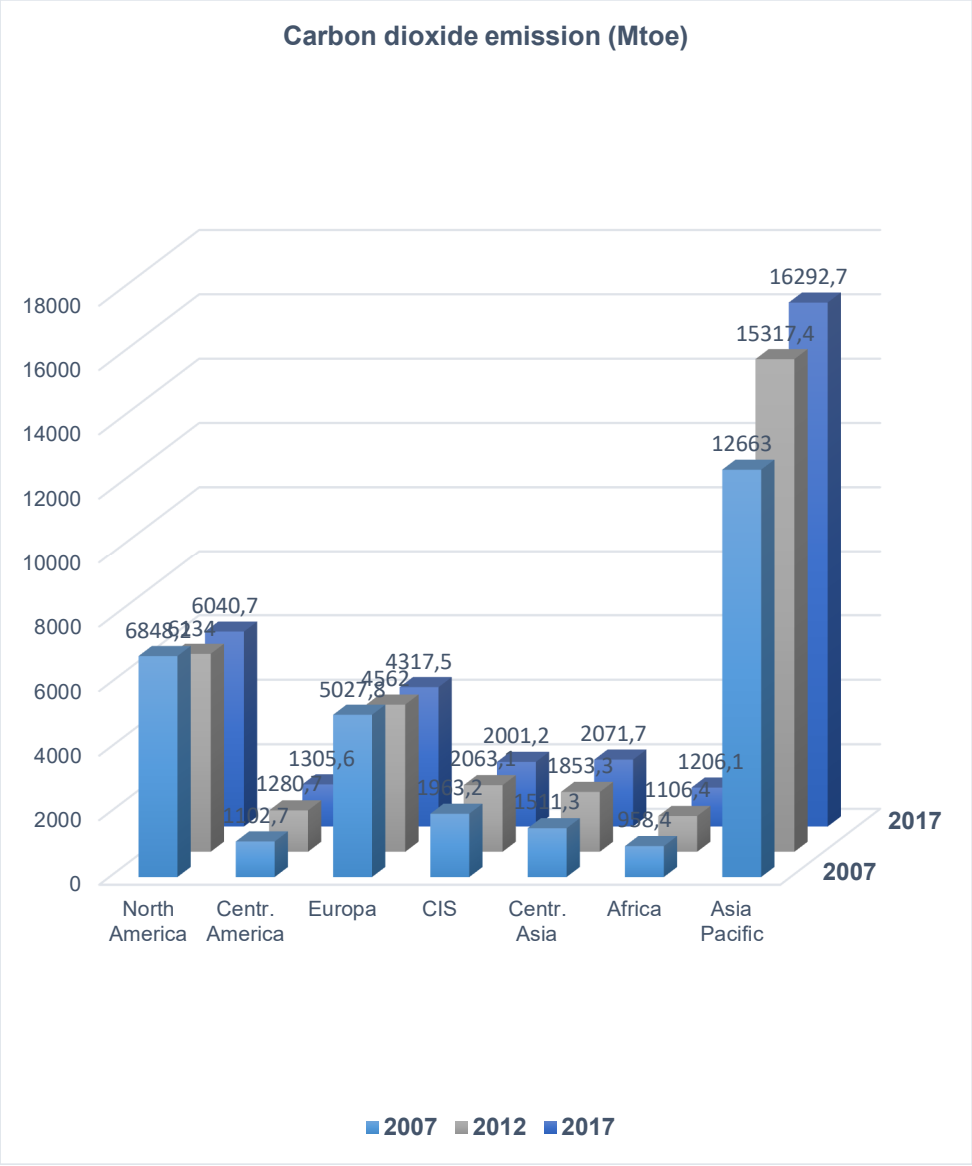

Figure 2: Global CO2 emissions (Mtoe) between 2007 and 2017
Source: BP Statistical Review of World Energy 2019

1.3. Renewable global energy

Renewables have grown worldwide in all countries of the world.
The growth of wind and solar production has been more significant in Europe, Asia Pacific and North America (Figure 3). The economic opportunities of low-cost

renewables have become increasingly visible. Since 2017 prices have been declining at auctions for offshore and solar wind.

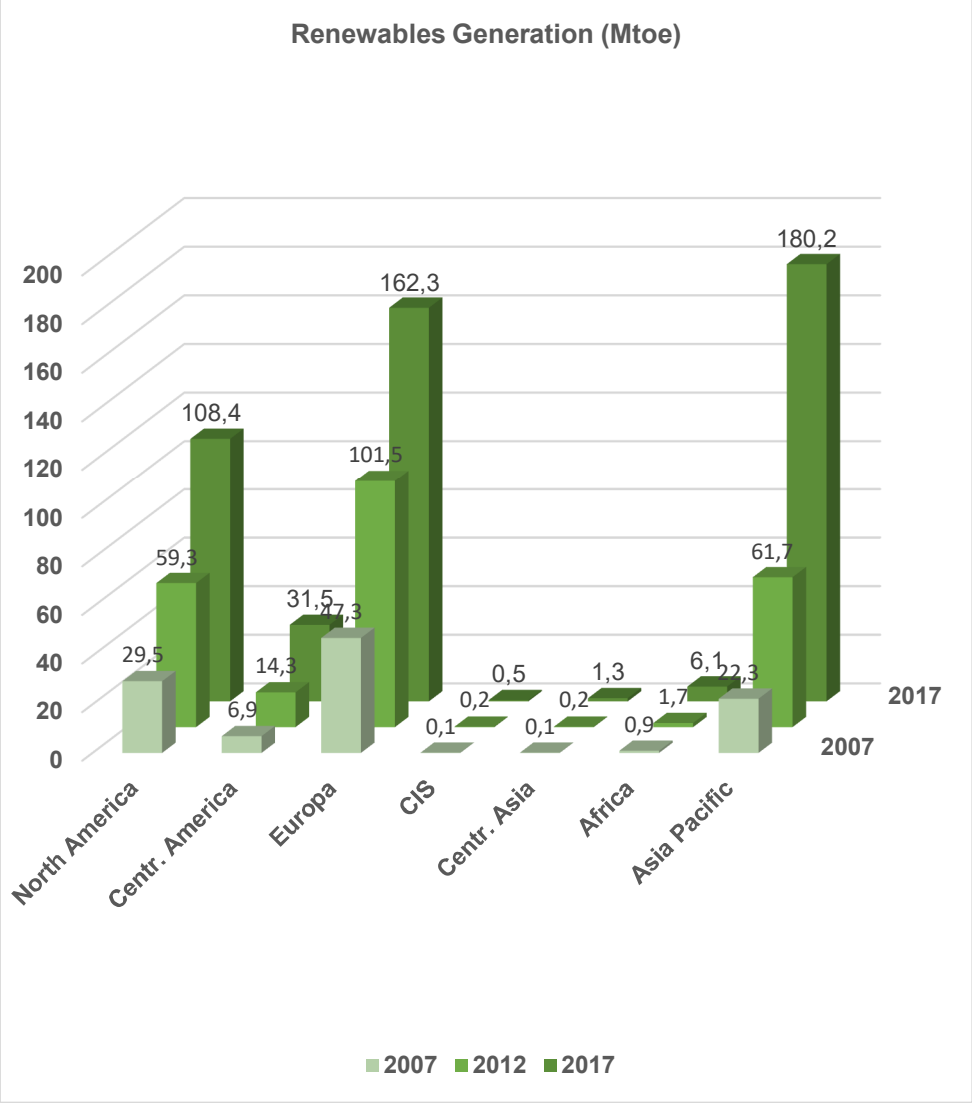

Figure 3: Global growth of RES (Mtoe) between 2007 and 2017
Source: BP Statistical Review of World Energy 2019

1.4. Coal consumption

Coal extraction and consumption decreased in North America and Europe in 2017 compared to 2007. In the CIS and Central America countries growth has been maintained, a slight decrease is observed in Asia Pacific (Figure 4).

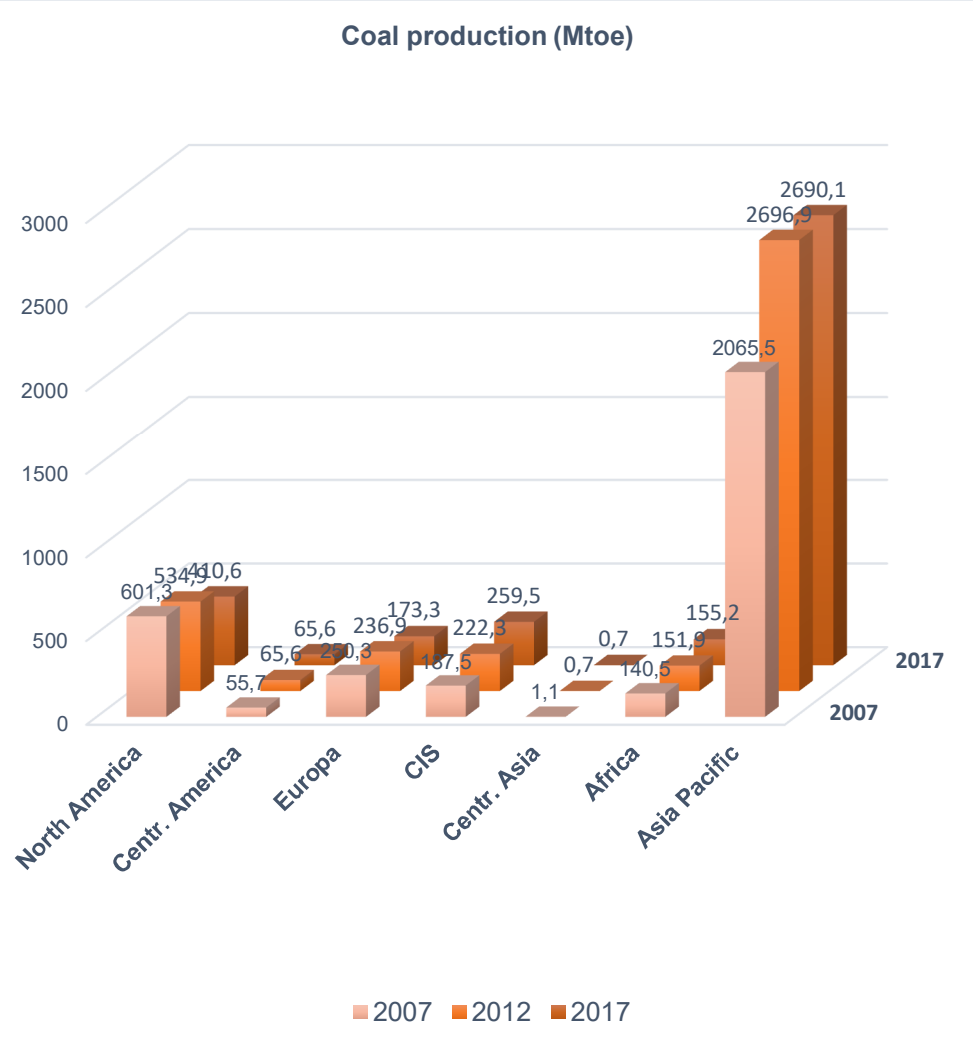

Figure 4: Global coal production between 2007 and 2017
Source: BP Statistical Review of World Energy 2019

1.5. Nuclear power

The European Green Agreement has put the fight against the climate crisis at the center of all EU policy activities over the next five years: The European Union aims to become the first greenhouse gas neutral continent by 2050, and the EU commission is putting forward proposals to lift it. the European target for reducing greenhouse gases by 2030 to -50% or -55% below 1990 levels. This implies that

emissions from the energy sector will continue to decline, even as electricity increases as the transport and heating industry continue. to be electrified.
Nuclear power is a low carbon alternative to fossil fuels.
Regarding the production of electricity from nuclear energy between 2007 and 2017, it has seen an increase in CIS countries, Africa, Central Asia, while in North America and Asia Pacific it decreased from 2007 to 2012 when production becomes ascendant again. In Europe, nuclear power production slightly decreases from 2007 to 2017 as a result of new technologies that are expensive due to nuclear accidents in Chernobyl and Fukushima.
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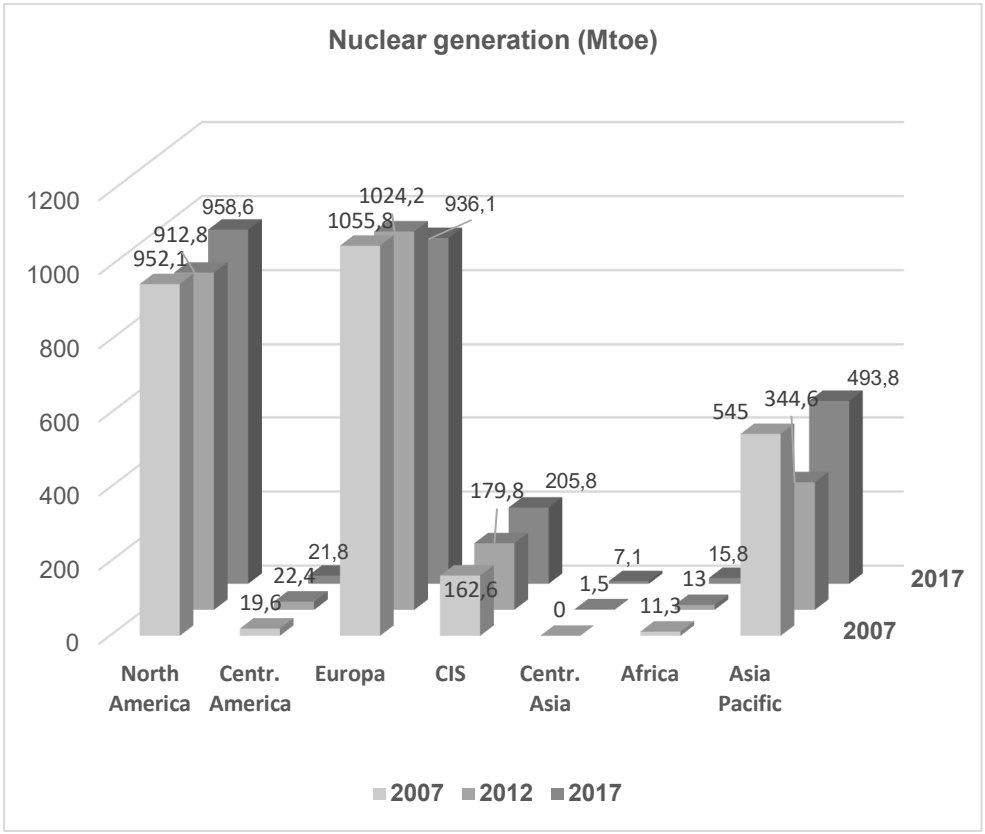

Figure 5: World nuclear energy produced between 2007 and 2017
Source: BP Statistical Review of World Energy 2019

2. Effects of the energy transition in the European Union

2.1. European regulations on energy transition

Articles 191 to 193 of the Treaty on the Functioning of the European Union (TFEU) confirm and specify the EU's powers in the field of climate change. The legal basis for this proposal is Article 192 (1) TFEU. In accordance with Articles 191 and 192 (1) TFEU, the European Union contributes to, inter alia, the following objectives: preserving, protecting and improving the quality of the environment, promoting measures at international level to address regional or global environmental problems, especially climate change.

In 2010, the European Union adopted the Europe 2020 Strategy, a 10-year program, through which it set out to create conditions for smart, sustainable and inclusive growth. The strategy was developed and adopted within the European Council, amid a deep economic crisis and the intensification of long-term challenges, such as globalization, pressure on resource use and population aging. Europe 2020 takes into account the particularities of each Member State, while pursuing a coherent reform program, with the general aim of increasing Europe's competitiveness. The 2020 Strategy envisages a 20% increase in energy efficiency, a 20% increase in the share of energy from renewable sources in final consumption and a 20% reduction in greenhouse gas (GHG) emissions by 2020.

On December 11, 2019, the Commission published a Communication on the European Green Pact and the roadmap with key actions to achieve its objectives. The main objective of the document is to achieve zero net greenhouse gas emissions in Europe by 2050.

Actions have divided the entire economic spectrum, announcing specific actions to accelerate EU emission reductions in the 2020-2030 decade. In addition to an industrial strategy, the roadmap also sets out measures for greening the EU's industrial policy, protecting nature and adapting to climate change.

The most notable feature of the European Green Agreement is that it puts the fight against the future climate crisis at the center of the elaboration of economic policies.

On June 6, 2012, the European Commission presented a communication entitled "Renewable energy: a major player in the European energy market" (COM (2012) 271 final), which contains options for a post-2020 renewable energy policy. The Communication also called for a more coordinated European approach in establishing and reforming support schemes and increased use of trade. renewable energy between EU Member States. In January 2014, the European Commission presented a set of energy and climate targets for 2030, with the aim of encouraging private investment in infrastructure and low carbon technologies. One of the key goals proposed is that the share of renewable energy reach at least 27% by 2030. These goals are seen as a step towards meeting the targets for greenhouse gas emissions for 2050, presented in the Roadmap for moving to a low level competitive carbon economy in 2050 (COM (2011) 112 final).

On December 11, 2018, the EU adopted Directive 2018/2001 / EU on promoting the use of energy from renewable sources. The new regulatory framework includes a mandatory 2030 EU renewable energy target of 32%, with an upward revision clause

by 2023. This will largely contribute to the Commission's political priority, as expressed by President Juncker. in 2014 for the European Union to become the world number one in renewable sources. This will enable Europe to maintain its leading role in the fight against climate change, in the clean energy transition and in meeting the objectives set by the Paris Agreement.
Gas replaced about half of coal, solar and wind power the other half. Coal decline will continue: Greece and Hungary have pledged to phase out coal. Another 13 Member States have proposed to phase out coal. Only Poland, Romania, Bulgaria and Slovenia are still at the beginning.
In terms of nuclear energy, 13 of the 28 member states of the European Union account for about 26% of the electricity produced. Following the Chernobyl disaster in 1986 and the Fukushima disaster in 2011, nuclear power became highly controversial.
The climate and energy framework for 2030 adopted by the European Council in October 2014 includes EU-wide goals and policies for 2021-2030, respectively reducing by at least 40% of greenhouse gas emissions (compared to 1990 levels), the share of at least 32% of renewable energy and at least 32.5% improvement of energy efficiency.
Under the European Green Agreement, the Commission aims to raise the EU target to at least 50% and 55% in a responsible manner.
A mandatory renewable energy target for the EU by 2030, of at least 32% of final energy consumption, including a review clause by 2023, is an upward revision of the EU-wide target.
Defining energy transition models places renewable energy sources in the energy mix having one of the most important roles.
Some European countries have already adopted national strategies for greenhouse gas neutrality. These are aimed at 2035 in Finland, 2040 in Austria, 2045 in Sweden and 2050 in Denmark, Germany, France and Spain.

2.2. Effects of the energy transition in Romania

The use of renewable energy sources is considered a key element in European energy policy on reducing dependency on imported fuel from non-EU countries, reducing emissions from fossil fuel sources and decoupling energy costs from oil prices. Directive 2009/28/EC on the promotion of the use of energy from renewable sources has set accounting criteria for the 2020 objectives regarding renewable energy sources.
In November 2018, the European Commission launched the "Long-term Strategy" for decarbonisation the European economy. There is only one path modeled until 2030.
For Europe 2030 targets are 32% renewable energy and 32.5% for energy efficiency. Renewable energy proposed as a target of 24% by 2020 has been reached and exceeded. The objective of energy efficiency, however, was lacking in firmness and was based on the argument that the country went through an industrial restructuring which led to energy savings.

Table 1: Electricity consumption to the European Union - Romania between 2007 and 2017

Primary energy consumption (Mtoe)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
European Union	2177,5	2173,3	2048,4	2124,6	2077,7	2072,3	2054,7	1978,3	1996,8	2017,5	2050,0
Romania	38,5	38,6	33,8	34,0	34,9	33,6	31,4	32,7	32,8	32,8	33,4

Source: Eurostat, 2018

After a gradual decline between 2007 and 2014, energy consumption has started to increase in recent years and is currently slightly above the linear path for the targets set for 2020. This is due to climate change, especially in the colder 2015 and 2016, but also the growth of economic activity and low oil prices. The energy intensity in the industry has continued to improve, and the energy savings have indeed contributed to partially offset the impact of these increases (Table 1).

Table 2: Primary energy consumption by production sources in 2007:

Primary energy consumption (Mtoe)	Coal	Oil	Nuclear energy	Natural gas	Hydroenergy	Renewables	Total
European Union	315,5	746,2	218,8	431,9	132,3	162,3	2050,0
Romania	5,4	10,3	2,6	9,6	3,3	2,2	33,4

Source: Eurostat, 2018

The growth continued in the energy sector produced from renewable sources, but with an unequal implementation. Since 2014, the share of energy from renewable sources in the energy mix of the European Union has increased significantly, reaching 2.2 Mtoe in 2017 (Table 2).
In 2017, Romania has already exceeded the target for 2020 (Figure 6).

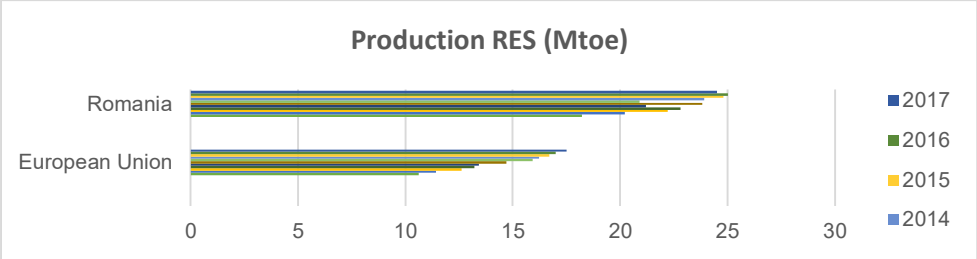

Figure 6: Renewable energy production Romania - European Union between 2007 and 2017
Source: Eurostat, 2018

While the price of greenhouse gases is rising, a supply system with a much higher level of renewable energy sources - 50% by 2030 - has proven to be realistic. This

will undoubtedly require major changes in the structure of the electric energy system regarding investments to increase the electricity transmission capacity.
Due to its proven renewable potential in previous years, Romania can increase its energy production from renewable sources by 2050 by up to 65% (Table 3).

Table 3: Primary energy consumption on production sources (Mtoe) in the context of the Green Deal Pact for 2050:

Primary energy consumption (MToe)	Coal	Oil	Nuclear energy	Natural gas	Hydroenergy	Renewables	Total
Romania	1,5	10,3	2,1	8,3	3,3	6,6	32,1

Source: Results obtained by the author

While the need for strategic planning is obvious, the energy transition will also be based on a rigorous policy design, availability and accessibility of various financial instruments for investments, as well as functional and transparent energy markets.

3. In conclusion

The European Commission has set several energy strategies for a safer, sustainable and low carbon economy.
The biggest challenge and opportunity of the European Union is to become the world's first climate-neutral continent by 2050. To accomplish this, on December 11, 2019, the European Commission presented the European Green Agreement (COM (2019) 640 final), the most ambitious package of measures that should enable European citizens and businesses to benefit from a sustainable ecological transition.
The European Green Agreement establishes a path for a fair and socially just transition. It is designed so that no person or region is left behind in the great transformation.
The Climate and Energy 2020 package adopted in December 2008 provided an additional incentive to increase the use of renewable energy sources to 20% of total energy consumption by 2020, while reducing energy consumption and gas emissions by 20% with greenhouse effect.
A mandatory target to reduce emissions in the EU by at least 40% below 1990 levels by 2030 will allow the EU to move towards a climate-neutral economy and to implement its commitments under the Paris Agreement.
In addition to combating climate change by reducing greenhouse gas emissions, the use of renewable energy sources can lead to more secure energy supply, greater diversity in energy supply, less air pollution.
Regarding Romania, the implementation of the European Green Agreement by encouraging investments in renewable energy and the gradual reduction of the use of coal, against the background of maintaining nuclear energy and the same level of use of natural gas, would be obtained up to about 65% clean energy from renewable sources.

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2. The Paris Agreement builds upon the Convention and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort.
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