

COMPATIBILITY ANALYSIS OF ROMANIA'S RELEVANT STRATEGIES WITH THE EUROPEAN GREEN DEAL

FELEA I., FELEA A.I.

University of Oradea, Universităţii no.1, Oradea,
ifelea@uoradea.ro

Abstract - The paper contains a synthesis of the EU and Romania objectives and targets from the perspective of the principles of sustainable development. After evoking the overwhelming importance of achieving the vital goal Net Zero Emission - Greenhouse gas emissions, the second part of the paper presents the synthesis of EU legislation to achieve this objective. In chapter 3 of the paper, the National Strategies relevant to the enrollment in the objectives of the European Green Deal are evoked, and in the last part, the conclusions of the analysis are presented.

Keywords: strategy, sustainable development, compatibility

1. INTRODUCTION

The full integration of Romania in the EU implies much more prompt reactions in terms of the compatibility of national policies and strategies with those of the Community. The most important direction of compatibility concerns the way of development of society, in general, and, respectively, of the economy in particular. Sustainable development is a well-known concept, enacted and implemented at EU level since the 1990s [1÷5].

In the last 30 years, the development strategies of the EU have had, in the foreground, Sustainable Development (SD), with the 3 pillars (social, economic, and ecological) that inter-condition and reinforce each other, constantly adapting to the stage of development and to the objective restrictions identified at community and international level [6÷10].

A major restriction considered imperative for about 10 years - at least at the EU level - is the one regarding climate change. The effects of climate change are well known [11, 12]: extreme weather conditions (drought, heat waves, hurricanes, heavy rains, floods), melting of glaciers, rising sea levels, acidification of oceans, depletion of biodiversity. In order to limit global warming to 1.5°C – an acceptable threshold from the point of view of the Intergovernmental Panel on Climate Change (IPCC) – it is essential that humanity reaches carbon dioxide (CO₂) neutrality by 2050. This vital objective is addressed in the Paris Agreement [13], signed by 195 countries as well as the EU. The target is CO₂, as it is the largest greenhouse gas emission (81% of total GHG). The other significant greenhouse gases (GHG) emitted as a result of

activities on Earth are: methane (11%), nitrous oxide (5%) and hydrocarbons (2%) [14].

The present paper is in line with the authors' concerns regarding the analysis of Romania's strategies, compared to the Sustainable Development Strategies of the EU, with the aim of identifying solutions that lead to the compatibility of national strategies with those of the community and to increase the compatibility of the national economy [15÷20]. In order to meet the current requirements - including the objectives of the Paris Agreement - at the EU level, the European Green Deal (EGD) was adopted, through which the EU aims to make the community climate neutral by 2050. Through the comparative analysis of the Significant National Strategies in terms of climate impact (SNSC) in relation to the EGD, the present work aims to signal the need to update the SNSC. After justifying the usefulness of the concern made in the introductory part, in the second part of the paper a synthesis of EGD is presented, in correlation with concerns at the international level regarding the objective of climate neutrality, and in the third part the analysis of the compatibility of SNSC with EGD is presented, synthetically. The last part contains the conclusions of the analysis.

2. SUMMARY OF THE EUROPEAN GREEN DEAL AND SPECIFIC ACTIONS

EGD is the current development strategy of the EU. The goal that the EU has undertaken regarding the climate neutrality in 2050 is a vital objective (VO) and involves an economy with net zero greenhouse gas emissions, which means fundamental transformations at the level of all activities in society. By implementing the EGD, in addition to achieving the vital objective, the European institutions aim to transform the EU into a fair and prosperous society, with a modern, competitive, and efficient economy in which economic growth is increasingly decoupled from the use of resources [21]. To achieve net zero emissions, it is necessary that all greenhouse gas emissions be counterbalanced by sequestering CO₂. Natural CO₂ absorbers (soil, forests, and oceans) remove between [9.5 - 11] GtCO₂ per year, or global CO₂ emissions are much higher (38 Gt in 2019). To counterbalance the huge difference there are two ways: reducing the amount emitted and, respectively, sequestration.

Energy conversion processes are responsible for around 80% of the EU's greenhouse gas emissions, which

means focusing attention on GHG reduction primarily on these processes. The levers are, mainly, the substantial increase in the share of renewable energy resources (RER) and the significant improvement of energy efficiency (En.Ef). The EU is the third largest emitter of GHGs after China and the US, which increases responsibility at the international level.

An intermediate step towards climate neutrality set at EU level is the commitment to reduce GHG emissions by at least 55% by 2030 [21]. The operationalization of the EGD also requires holistic conduct so that all EU policies and actions contribute to the fulfillment of the objectives listed in the EGD. A first step that the EU has taken in this direction consists in the elaboration of the legislation implementing EGD, summarized in table 1.

Table 1. EGD application legislation.

No.	Name of the law / regulation	Fundamental Objectives (FO)
1.	Climate law	FO 1. All sectors of the economy and society contribute to the achievement of the vital objective. FO 2. Net reduction by 2030 of GHG emissions by 55% compared to 1990s.
2.	Biodiversity strategy	FO 3. Restoring Europe's biodiversity by 2030.
3.	"From the farm to the consumer" strategy	FO 4. Food safety and security, reducing food waste. FO 5. Sustainable food production through the development of ecological agriculture. FO 6. Improving animal welfare.
4.	Industrial strategy	FO 7. Industry is the engine of the circular economy. FO 8. Industry becomes the key accelerator of innovation and growth.
5.	Energy strategy	FO 9. Clean, affordable, and secure energy. FO 10. Decarbonisation of the energy sector FO 11. The EU is the world leader in the use of renewable energy resources and energy efficiency.
6.	Strategy for promoting sustainability in chemicals	FO 12. Better protection of human health. FO 13. Sustaining a toxic-free environment.
7.	Sustainable and smart mobility strategy	FO 14. 90% reduction in greenhouse gas emissions in transport by 2050.
8.	The renovation wave strategy	FO 15. Decarbonization of the buildings sector. FO 16. Combating energy poverty.
9.	Mechanism for a just transition	FO 17. Financial and technical support to regions affected by decarbonisation. FO 18. Investments in research and innovation to increase the attractiveness of investments in technologies with low GHG emissions. FO 19. Retraining workers for the circular economy on the path to climate neutrality.

Considering the very high share of energy conversion processes in GHG emissions and therefore, the decisive dependence of the desired climate neutrality on these processes, it is important to point out the trends and targets, at the community and international level, in relation to these processes. It is well known that energy conversion processes are present, in comparable proportions, in three essential sectors: industry, transport, residential (buildings), so that the strategies that refer to the three sectors primarily look at increasing efficiency energy and expanding the use of RER. In addition to institutional and company actions [22], the implementation of EGD is related to the mobilization of citizens for investments in En.Ef., through the fact that the improvement of En.Ef. it has a double effect: reducing GHG and improving citizens' well-being.

The Group of Seven (G7) which includes four of the most developed European states and which has a significant weight in the global economy [23] together with the EU have clearly stated their position on Vital Objective - "NET ZERO EMISSIONS" (NZE), position substantiated by the International Energy Agency (IEA), summarized in fig. 1.

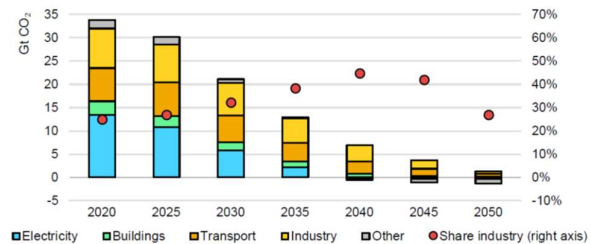


Fig. 1 – Global CO2 emission by sector in the Net Zero Emission by 2050 Scenario. [23]

Achieving the VO -NZE, by 2050, requires action on a large scale, at an unprecedented speed, under conditions of political connivance and in an atmosphere of peace. In the view of the G7 and the EU, the expansion of low-carbon technologies is the central pillar for achieving VO. In this sense, it is important to meet the targets for 2030:

- T1: The power installed in wind and photovoltaic electricity sources (EE) should be close to 10 TW;
- T2: The production of hydrogen with low carbon emissions reaches 150 million tons;
- T3: All buildings will be "nearly zero" energy;
- T4: Electric cars will exceed 60% of classic car sales;
- T5: The electric motors will have the most efficient energy class.

According to the roadmap (RM) developed by the IEA for the G7 [23] the expansion of EE obtained from RER is required, which leads to the gradual elimination of coal. Rapid end-users of energy electrification are important to VO-NZE. Over 400 specific benchmarks are identified in the RM of the IEA developed for the Global Energy Sector [23]. Another interesting report is the "Global Energy Perspective 2022" [24] in which scenarios of global energy evolution are presented, including the scenario leading to the realization of VO-NZE which essentially implies rapid investments in decarbonization and fuel switching. According to this report, the essential targets are expected:

- T6: By 2050, EE, H2 and synthetic fuels will represent 50% of the energy mix;
- T7: By 2050, EE produced from RER will represent (80-90)% of total EE.

According to this report, it is estimated that the demand for natural gas will increase by 10% in the next decade and the demand for oil could reach a maximum in the next (2-5) years, following the decline due to the expansion of the use of the electric car. Prestigious international organizations from the energy perspective, such as: WEC (World Energy Council), IEA and IREMA (International Renewable Energy Agency) make extensive analyses on the energy vectors of the future from the NZE perspective. In addition to RER such as wind, solar and biofuels, H₂ is considered a promising energy agent. For example, in the recent reports of WEC [25] and IREMA [26] there are details of development and trade with H₂ considering that in the geopolitics of the energy transition the target is also imposed:

- T8: by 2050, H₂ with low-carbon emission (clean) will account for 12% of final energy consumption

We also note that the target registered in the IRENE registry [26] which, although it has differences from T6, is interesting:

- T9: by 2050, EE consumption will double, accounting for 50% of final energy consumption with an increase of 1%/year.

The following targets can also be extracted from official EU documents [27]:

- T10: 13% reduction of GHG intensity by 2030;
- T11: RER will represent 40% of the EU's energy mix in 2030;
- T12: 49% of the energy consumed in buildings comes from renewable energy resources by 2030;
- T13: 1.1%/year increase in the share of renewable energy resources in industry;
- T14: 2.1%/year increase in the share of renewable energy resources, use of waste heat and cold for district heating and cooling;
- T15: Electrolyzers for the production of H₂ from RER: minimum 6 GW – until 2024 and minimum 40 GW – until 2030;
- T16: Energy from offshore wind installations: 60 GW – in 2030 and 300 GW – in 2050;
- T17: Reduction of primary and final energy consumption by 39% and 36% respectively by 2030;
- T18: EU member states to reduce final energy consumption by 1.5%/year in the period 2024-2030;
- T19: Reducing the energy consumption of buildings by 1.7%/year.

3. SYNTHESIS ABOUT SNSC

Romania has signed all international and community documents regarding the environment and climate, including the Paris Agreement. There are many areas included in the EGD related legislation in which Romania has substantial negative gaps compared to the EU average [20]. The present paper cannot include all the specific aspects listed in table 1, so we will refer to the aspects of

first relevance from the VO perspective of EGD. In summary, at the level of 2020:

- In terms of GHG emissions, Romania is well below the EU average, with an emission intensity of 537.6 g equiv. CO₂ / €1, compared to 266.5 g equiv. CO₂ / €1 - EU average;
- Under the En.Ef. aspect, the energy productivity had the value of 5.2 €/kg in Romania and respectively 8.57 €/kg – EU average;
- Under the aspect of the exploitation of renewable energy resources, the gross final consumption index of RER had the values of 24.48% - in Romania and 22.09% - in the EU;
- The municipal waste recycling rate was: 13.7% - Romania and 47.20% - EU average.

If we search on the websites of the government and relevant ministries [29], we will be able to access the Significant National Strategies in terms of climate impact (SNSC) listed in table 2.

Table 2. Accessible SNSCs.

No.	The name	The objective (ON) / Targets (TN) compatible with EGD
1.	The National Strategy for the Sustainable Development of Romania 2030 (NSSD)	<p>ON1. Increasing the share of organic agriculture.</p> <p>ON2. Decoupling economic growth from the process of resource depletion and environmental degradation.</p> <p>TN1. Increasing energy efficiency by at least 27% compared to the status-quo scenario, until 2030;</p> <p>ON3. Increasing the share of RER and biofuels in transport</p> <p>ON4. Increasing the share of EE in energy consumption, by establishing performance standards for installations and equipment.</p> <p>ON5. Rehabilitation of industries to become sustainable, efficient, ecological.</p> <p>ON6. Improving air quality.</p> <p>TN2. 55% recycling of municipal waste by 2025 and 50% by 2030.</p> <p>TN3. 65% recycling of packaging waste by 2025 and 70% by 2030.</p> <p>ON7. Intensification of efforts for the transition to the "green" economy.</p> <p>ON8. The transition to a circular economy.</p>
2.	Romania's Development Strategy for the next 20 years (RDS)	<p>ON9. Ensuring the conditions for satisfying the energy requirement in compliance with the principles of sustainable development.</p> <p>TN4. Recycling of 40% of municipal waste by 2027 and 55% - by 2037.</p> <p>TN5. Reduction of GHG emissions (compared to 1990) by 40% by 2030.</p> <p>TN6. RER will have a share of 27% of gross energy consumption in 2030.</p>
3.	The National Integrated Plan	Target for 2030:

No.	The name	The objective (ON) / Targets (TN) compatible with EGD
	with the field of Energy and Climate Change 2021 – 2030 (NIPECC)	TN7. Total GHG emissions reduction (compared to 2005) by 43.9%. TN8. The share of energy from RER in the final gross energy consumption will be 30.7%. TN9. Reduction of primary energy consumption by 45.1% and final consumption by 40.4% (compared to the 2007 PRIMES projection)
4.	Romania's Energy Strategy 2019 – 2030 with the perspective of 2050 (RES)	ON10. Clean energy and energy efficiency. ON11. Ensuring access to EE for all consumers and protecting vulnerable consumers. TN10. 80% GHG reduction in 2050 compared to 1990. TN11. The share of RER in total primary energy will be 37.9% in 2030. TN12. The production of EE from RER will be: 37.5% - in 2030 and 37.8% - in 2050 [37.2% in 2017]. TN13. EE will account for 19.5% of gross energy consumption in 2030 and 23.6% - in 2050 [fossil fuels 47% - in 2050]. TN14. The share of EE in the final energy consumption will be 19% - in 2030 and 25% - in 2050. [strategic investment: realization of the 600 MW in Rovinari] TN15. Reduction of GHG emissions by 40% - 2030 and 60% - 2050 (compared to 1990).
5.	Strategy for the Development of the Agri-Food Sector 2020 – 2030 (SDAFS)	ON12. Extension of organic agriculture (ON1). ON13. Protection and development of biodiversity. TN16. The contribution of agriculture to RER energy production increases to 5% (2020), to 11% (2030). TN17. The level of GHG emissions from agriculture increases by 12.9% between 2020 and 2030.

CONCLUSIONS

The Significant National Strategies in terms of the impact on the Climate (SNSC) are comprehensive in terms of the areas addressed by the legislation implementing the European Green Deal (EGD). SNSC have objectives (ON) consistent with EGD objectives (OF) but cause confusion by having targets that do not synchronize (TN2 with TN4, TN3 with TN7, TN8 with TN11) or have different references (Ex.: TN1 with TN9). It is clear that SNSC drafting groups did not coordinate with each other. It is also incomprehensible that, after the development of the RDS, the NSSD was also developed, they work simultaneously, although they have many non-synchronizations. The SNSC (TN) targets, those that materialize the ON, quantifying performance growth indicators, are significantly more modest than the

corresponding ones in the EGD application legislation, on all levels: environmental impact through GHG and recyclable waste, energy efficiency, RER share in the energy mix and by the share of EE in the set of energy agents. In this sense, a first-order role is played by RES, which we consider far exceeded, both through part of the objectives (e.g. the realization of a 600 MW thermal energy group in Rovinari) and through all the important targets for EGD (Tn10 -TN15). The RES development group is out of step with reality, being stuck in projects for over 30 years, abandoned for many years in the EU. It is necessary to redraft the RES and adapt the other SNSC, in accordance with the VO - NZE of the EGD. We believe that the RES should be repealed, chapters from it being included in the NSSD.

REFERENCES

- [1]. Artis M., Nixon F. (2007). The Economics of the European Union. Policy and analysis. Fourth Edition. Oxford University Press.
- [2]. Brundtland, G. H. (1987). UN Documents: Gathering a Body of Global Agreements. Available from <http://www.un-documents.net/ocf-cf.htm>
- [3]. European Commission (1995). EC Documents: Competitiveness Advisory Group. Climate action. Enhancing European Competitiveness. Available from http://ec.europa.eu/clima/politics/brief/eu/index_en.htm
- [4]. UNDP (1999). Human Development Report. Available from http://hdr.undp.org/sites/default/files/reports/260/hdr_1999_en_nostats.pdf
- [5]. European Commission (2003). EC Documents: A final report for The European Commission Directorate-General Regional Policy - A Study on the Factors of Regional Competitiveness, Cambridge Econometrics, University of Cambridge;
- [6]. The Single European Act (1987). Available from http://ec.europa.eu/clima/politics/brief/eu/index_en.htm
- [7]. The Maastricht Treaty (1993). Available from http://ec.europa.eu/clima/politics/brief/eu/index_en.htm
- [8]. The Gothenburg Summit (2001). Available from http://ec.europa.eu/clima/politics/brief/eu/index_en.htm
- [9]. European Commission (2006). EC Documents: Sustainable Development Strategy, Available from http://ec.europa.eu/clima/politics/brief/eu/index_en.htm
- [10]. http://ec.europa.eu/clima/politics/brief/eu/index_en.htm
- [11]. European Commission (2010). EC Documents: Europe Strategy 2020. Available from <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:RO:PDF>
- [12]. <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:RO:PDF>
- [13]. European Union. EU Documents: Climate change. Available from https://climate-pact.europa.eu/about/climate-change_ro
- [14]. European Commission. EC Documents: Consequences of climate change. Available from https://climate.ec.europa.eu/climate-change/consequences-climate-change_ro
- [15]. https://climate.ec.europa.eu/climate-change/consequences-climate-change_ro
- [16]. European Council. Paris Agreement on climate change. Available from <https://www.consilium.europa.eu/ro/policies/climate-change/paris-agreement/>
- [17]. <https://www.consilium.europa.eu/ro/policies/climate-change/paris-agreement/>
- [18]. Intergovernmental Panel on Climate Change -IPCC (2021). Climate change widespread, rapid, and intensifying. Sixth Assessment Report. Available from <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>
- [19]. <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>

- [20]. Felea, Adrian Ioan (2011). Considerations regarding the convergence of national and European strategies for competitiveness and sustainable development, communicated within the Scientific Communication Session of doctoral students in economics, "Romania and the challenges of the economic crisis. The response of young economists", Second Edition, Oradea, ISBN 978 - 606-100659-5. Available from
- [21]. <http://steconomiceuoradea.ro/wp/wp-content/uploads/2012/01/program-doctoranzi-2011.pdf>
- [22]. Felea I., Crenci E., Szabo E. (2019). Analysis of Energy Performance of a Cogeneration Source, *Journal of Sustainable Energy*, vol. X, No. 1, 2019, ISSN 2067-5534
- [23]. Felea I., Barla E.M., Felea A. (2012). Proposes to define the competitiveness indicators in power engineering, *Bulletin AGIR*, 2012, pag. 439 – 447
- [24]. Felea, Adrian Ioan (2015). Competitiveness and sustainable development. An integrated strategic approach at the level of Romania and the EU, Oradea, Publishing House of the University of Oradea, ISBN 978-606-10-1529-0
- [25]. Felea, Adrian Ioan (2012). Considerations regarding the competitiveness indexes compatibility with the sustainable development indexes and strategies in the EU, *Universitatea din Oradea*, Available from
- [26]. <http://anale.steconomiceuoradea.ro/volume/2012/volum-abstracts-2012.pdf>
- [27]. Felea Ioan, Felea Adrian Ioan (2014). The Multidimensional Characterization of Romania's Energetic Competitiveness, 12th Edition - FOREN 2014 „Tomorrow's Energy: From Vision to Reality”, ISSN-L 2284-9491
- [28]. European Commission. EC Documents: European Green Deal. Available from
- [29]. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
- [30]. International Energy Agency - IEA. Global Energy and Climate Model, Available from
- [31]. <https://iea.blob.core.windows.net/assets/3a51c827-2b4a-4251-87da-7f28d9c9549b/GlobalEnergyandClimateModel2022Documentation.pdf>
- [32]. International Energy Agency - IEA. Global Energy Perspective 2022, Available from
- [33]. <https://iea.blob.core.windows.net/assets/c4d96342-f626-4aea-8dac-df1d1e567135/AchievingNetZeroHeavyIndustrySectorsinG7Members.pdf>
- [34]. World Energy Council (2022). Regional insights into low-Carbon Hydrogen scale up. Available from <https://www.worldenergy.org/news-views/entry/regional-insights-low-carbon-hydrogen-news-world-energy-council-epri-pwc>
- [35]. International Renewable Energy Agency – IRENA (2022). Geopolitics of the Energy Transformation: The Hydrogen Factor, ISBN: 978-92-9260-370-0, Available from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jan/IRENA_Geopolitics_Hydrogen_2022.pdf?rev=1cfe49eee979409686f101ce24ffd71a
- [36]. European Economic and Social Committee – EESC. <https://www.eesc.europa.eu/en>
- [37]. The Romanian Government.
- [38]. <https://www.gov.ro/>