

Pillar I. Green transition

Component I.1 Energy

Objective:Ensuring the green transition and digitalisation of the energy sector by promoting renewable electricity generation, energy efficiency and future technologies

Reforming:

Reform 1:Electricity market reform, replacing coal in the energy mix and supporting an incentive legislative and regulatory framework for private investment in renewable electricity production

Reform 2:Developing a favourable legislative and regulatory framework for future technologies, in particular hydrogen and storage solutions

Reform 3:Improving corporate governance of state-owned companies in the sector

Reform 4:Reducing the energy intensity of the economy by developing a sustainable mechanism to boost energy efficiency in industry

Reform 5:Increasing competitiveness and decarbonisation of the heating — cooling sector

Reform 6:Decarbonising the transport sector through investments in electric transport infrastructure and creating incentives for green transport

Investments:

Investment 1:Digitalisation and the transition to renewable energy sources of both grid operators' and other critical operators' own consumption and investments in new capacity for the production of electricity from renewable sources

Investment 2:Natural gas distribution infrastructure in combination with hydrogen

Investment 3:Integrated green hydrogen demonstration projects, related R & D and IPCEI facilitation

Investment 4:Industrial chain of production and/or recycling of batteries, photovoltaic cells and panels (including ancillary equipment) and R & D in the field.

Investment 5:Incentive scheme for energy efficiency in industry

Investment 6:Charging infrastructure for electric vehicles

Budget:EUR 1 623 500 000

1. Challenges and objectives

a) Challenges

In the context of political efforts to support investments in renewable energy production and due to structural transformations from savings towards lower-energy intensive manufacturing and services sectors, Romania is on track to meet its 2020 climate and energy targets. However, the European Commission warns that, in the context of current policies, renewable energy, emission reduction and energy efficiency targets for 2030 are challenging, even in the context of policy ambitions and programmes, in line with the unrevised version of the National Climate Energy Plan, which requires EUR 22 billion of investments in the energy sector over the period 2021-2030.

Since 1990, energy intensity in Romania has continued to be on a declining slope, but continues to be higher than the European average by almost 40 %, despite an annual rate of reduction in energy intensity between 2005 and 2017, among the highest in the European Union. While there are indications of decoupling between economic growth and energy consumption, energy demand is expected to increase, which will be the determining factor for channelling more than 80 % of the necessary investment in the sector.

Another challenge faced by Romania is the bottleneck in the renewable electricity market. From 2016 to 2019 the share of renewable energy in gross final energy consumption has stagnated and has even had a downward trajectory throughout 2019, contrary to the European trend, which has been on a strong upward trend in recent years. Even so, the share of renewable sources in gross final consumption was 24.3 % in 2019, around 30 % above the European average. Most of the investments in renewable energy production were made at significant costs due to the technology still under development at the moment, supported by a support scheme with a significant impact on the final cost of energy borne by final consumers. One of the main challenges facing the renewable energy industry, and one of the reasons why investments in this sector are lagging behind, is not so much the lack of a support scheme that was appreciated by the European Commission in its 2020 European Semester Report as “supporting the promotion of renewable energy in a sustainable manner”, especially the high degree of physical and moral wear of transmission network equipment. This challenge has negative consequences for the security of energy supply for the population, transmission costs, energy efficiency in this market segment and the environment. Moreover, the precariousness of electricity transmission infrastructure is also mentioned in the Country Reports of 2019 and 2020. The lack of adequate investment in electricity transmission infrastructure is also notable for the lack of electricity interconnectors. As noted in the 2020 European Semester report, Romania’s degree of connection remains below the EU average and Romania has made no progress in developing new electricity interconnectors. In 2017, the electricity interconnection level was 7 %, below the 2020 target of 10 %.

At the same time, according to an analysis of the adequacy of the national energy system, there has been a significant shortfall in installed capacity to meet the adequacy indicators imposed by ENTSO-E.

This leads, among other things, to high electricity costs at national level. In the second half of 2020, Romania recorded higher electricity prices for industrial consumers than Slovenia, France, Hungary, Luxembourg, Estonia, Bulgaria, Czechia, Finland, Denmark and Sweden, while for household consumers the price of electricity was EUR 0,1149/kWh, well above the electricity prices paid by household consumers in neighbouring countries (EUR 0,1009/kWh

in Hungary and EUR 0,0982/kWh in Bulgaria).

One of the major challenges of the National Energy System, in the case of the National Climate Energy Plan (PNIESC) scenario of increasing the share of renewable energy to 30.7 % in 2030 (even difficult to ambitious compared to what would be economically feasible, proposing to increase the level of renewable energy to 34 % in 2030), would be the lack of the current possibility of ensuring sufficient reserves and balancing for additional renewable capacity.

The energy sector remains the largest source of greenhouse gas (GHG) emissions with 66 % of emissions in this sector and under the current energy mix, even with the NICESCP targets, Romania will be driving towards its 2030 emission reduction targets. According to Regulation (EU) 2018/842, Romania has to reduce its non-ETS emissions by 2 % compared to 2005, while the European Commission's 2019 assessments predict that they will increase by up to 6 % despite the additional measures announced in the context of the review of the NECCP.

The energy sector is also the main sector causing air pollution, the restructuring of energy systems (through the switch from coal to natural gas and the integration of renewable energy sources) and heating (through the rehabilitation of SACETs, their transition from coal to gas and even renewable energy sources, combined with supporting the consumer transition to district heating) can lead to a significant reduction in air pollution. Air pollution has significant consequences for human health, with 25,000 premature deaths occurring each year due to particulate matter, Romania being referred to the European Court of Justice for exceedance of PM10 particle levels. The Commission's assessment of the NECCP recommends measures to address the energy efficiency of district heating systems, in particular their networks, for the energy sector. The share of renewable energy in the heating and cooling sector, projected at 33 % per 2030, is not ambitious enough according to the assessment of the NICRP, all the more so since inefficient heating on woody biomass in rural areas is currently the source of this high share. Insufficient support for alternative heating and cooling systems such as heat pumps, despite the fact that their prices are expected to fall by up to 25 % in 2030, leads to stagnation in the energy — cooling sector.

Improving energy efficiency by 32.5 % by 2030 will also be a challenge. Currently in the residential sector less than 5 % of the building stock has been thermally rehabilitated and energy efficient, despite the fact that such work would lead, on average, to energy economics of more than 50 %.

Another significant challenge is the lack of digitalisation of the energy sector and the digital revolution in this sector will change the way we produce and consume energy. The lack of such investments makes it difficult to integrate prosumers and renewable energy in general into the energy system, with demand response measures insufficiently widespread in Romania and insufficiently widespread smart meters and grids.

b) Objectives

- Supporting investments in energy infrastructure to ensure better integration in regional energy markets and better integration into the energy mix of low-emission energy (hydrogen, renewable energy) — CSR 2019, 2020.

- Increase the share of renewable energy in the total energy mix through investments in RES, onshore or off-shore electricity capacity linked to the removal of coal from the energy mix by 2032 — RST 2019, 2020.
- Developing a realistic and data-driven pathway to reach climate neutrality in 2050 — in line with the European Green Deal
- Boosting energy efficiency investments in industry for both SMEs and large companies — in line with NECCP recommendations
- Increasing competitiveness, energy efficiency and the use of renewable sources in the heating sector — Recommendation European Semester
- Developing a strategic and regulatory framework for the integrated production and use of hydrogen, while supporting ambitious pilot projects in this sector
- Increasing the penetration of consumer centred digital technologies in the energy sector
- Review the electricity market model by introducing bilateral PPA and CfD contracts in order to incentivise investments in new renewable electricity generation projects
- Support an enabling regulatory framework for R & D and technology transfer in the energy sector.

2. Description of reforms and investments

In the context of the European Green Deal and the growing climate neutrality ambitions, Romania will need to accelerate investments and reforms to decarbonise all sectors: energy, transport, buildings and industry.

The installation of a minimum of 6,9 GW of additional renewable energy capacity by 2030 will require the implementation of a phase-in timetable for coal in the energy mix, combined with the development of an incentive regulatory and investment framework that encourages the penetration of renewable technologies, the development of the transport network and the digitalisation of the sector. This can be achieved by lowering the cost of RES technologies, but also by measures to increase the flexibility and resilience of the SEN.

Sustainable energy transition needs to be achieved through the development of pilot projects using future technologies in integrated gas/hydrogen/PV models, but also green hydrogen and innovative storage solutions. The digitalisation of the energy sector will have a major impact on energy consumption and contribute to increasing renewable energy generation through the development of smart grids and related storage, as well as the use of demand response measures and the penetration of digital and decarbonised technologies in the transport and heating and cooling sectors. All this can contribute to a modern, low-carbon energy market.

Demonstrating the feasibility and performance of energy storage solutions will create solutions to treat variability in generation from intermittent renewable energies and/or demand over

approximately 24 hours. Demonstrating the economic and technical feasibility of producing hydrogen in systems with high variability of production will contribute to an efficient use of the surplus electricity generated by the main carbon-free energy alternatives.

The strengthening of the legislative framework to support investment in the industrial sector aims at achieving a national energy efficiency (EE) target of 32.5 %, in line with the objectives of the PNIESC. Sustained investment aims at increasing the metering of final energy consumption through digital platforms of the legacy, delivering energy services by increasing the share of energy audits carried out at the level of industrial operators in the economy, optimising industrial technology processes through investments in green technologies and sustainable solutions, ensuring fair financing.

Reforms

R1: Electricity market reform, replacing coal in the energy mix and supporting an incentive legislative and regulatory framework for private investment in renewable electricity production

Challenges

1. The stagnation of new investments in renewable energy production despite the existence of a favourable technological and economic context (falling technology costs) is a reality that has several causes: lack of a regulatory framework for certain technologies, lack of investment in strengthening the transport network, delayed adoption of investment incentive schemes (ASF, Contracts for Difference, etc.), lack of clarity and cumbersome functioning of the authorisation system, lack of clarity on the removal of coal from the energy mix, etc.
2. In this context, the achievement of the current 2030 NICESCP target for renewable energies, and hence the emission reduction target, is likely to be missed, all the more so as they are assumed to be revised to become more ambitious, proposing a new target of 34 %.

Objectives of the reform:

- Revise and update the Energy Law to promote renewable electricity generation, integrate national energy markets at EU and regional level, remove barriers to complete the internal electricity market, adapt the SEN to viable and distributed generation of renewable energy, stimulate competition and facilitate cross-border access for electricity suppliers, generators, energy storage service providers and dispatchable consumers.
- Revision of the Romanian electricity market model
 - A. Amendment of Government Emergency Order No nr.74/2020 amending Law No 123/2012 on electricity and natural gas in order to allow the conclusion of bilateral PPA (*power purchase agreements*) contracts by all producers of renewable energy outside the centralised market, freely and directly negotiated with suppliers or final consumers of electricity and with the possibility of being concluded before the start of construction

- B. Launch an auction support scheme for new renewable energy capacity, encouraging both small generators and/or large investors, stimulating investments in particular in under-exploited regions in terms of current installed capacity, the beneficiaries of which will also be selected on the basis of a competitive bidding process
- C. Complete the legislative framework needed to implement the Low Carbon Electricity Difference Contracts, whereby the project revenue for each MWh produced is secured for a sufficient period of time
- D. Creating conditions and limitations for the participation of industrial consumers in the energy market, in particular balancing
- Revision of the Electricity Transport Network (RET) Development Plan, through close dialogue with representatives of relevant associations and the banking sector, with a view to meeting Romania's obligations to achieve the renewable energy targets in 2030 laid down in the National Integrated Energy and Climate Change Plan (PNIESC) and Romania's Energy Strategy
- Carry out a legislative review and implementation of related legislation and practices in the field of authorisation of new renewable capacities, leading to a number of regulatory changes at local level and simplification and uniformity of permit practices, thus aiming to remove barriers to the authorisation, construction and grid connection of new capacities
- Implementation of Demand Response (Demand Response) measures will contribute **to** the integration of RES into SEN by reducing/shifting consumption from peak hours (to empty load) as well as the possibility of final customer participation (as prosumer) in the electricity generation market
- The development of a timetable for the replacement of coal in the energy mix by 2032, by implementing the following steps:
 - A. Completion of County Local Development Strategies in affected counties to determine the consequences and opportunities of mitigating the negative effects of removing coal from the energy mix by 2032 at the latest
 - B. Finalisation of the County Regional Transitional Transitional Plans.Gorj, Hunedoara and Dolj
 - C. Adoption of consensus at Community and national level on milestones, consequences and strategies for each step of the roadmap towards the transition from carbon to other RES generation sources by 2032 at the latest
 - D. Review of the National Energy Strategy to shape different energy mix scenarios, but also to study the potential of less developed technologies (biomass, biogas, geothermal, etc.)
- Development of a strategy/law on offshore wind sources
- Review the legislative and implementation framework for energy produced from biomass so that sustainability and traceability of the source can be ensured.

Nature of the reform:

- Support schemes
- Review of the market model
- Review/development of the strategy

7. Timetable for the replacement of coal													
8. Offshore wind legislative framework													
9. Legislative framework for biomass													

State aid

Themeasures concerning the reform/modification of the legislative and regulatory framework do not constitute State aid.State aid is only involved in the tender support scheme for RES producers.

The reform involves State aid in the case of the support scheme for RES producers.

Nature of State aid:

Under the scheme for projects for which State aid is requested amounting to a maximum of EUR 15 million, the exemption rules under Article 41 of Regulation (GBER) shall apply and projects with requested State aid in excess of EUR 15 million shall be notified in accordance with the guidelines on state aid rules for energy and environmental protection.

Estimated State aid amount (scheme):EUR 200 million.

R2:Developing a favourable legislative and regulatory framework for future technologies, in particular hydrogen and storage solutions

Challenges

Romania does not currently have a regulatory framework for hydrogen electricity production and a clear vision of the use of hydrogen on the domestic market or for export will be defined.Romania is considering the development of hydrogen technologies mainly in the transport, **gas and**electricity sectors.Romania has a favourable environment to address the deployment of renewable hydrogen, given its national organisations active in this field (e.g.:Romanian Hydrogen Energy Association), its Natural Gas Transmission System Operator

Development of strategy													
Amend the legislative framework and, if necessary, create a supportive fiscal framework													

State aid

Measures concerning the revision/modification of the legislative and regulatory framework do not constitute State aid.

Activation of Article 7 (2) of Recovery and Resilience Regulation (RRR) **No 241/2021**.

The Ministry of Energy requests technical assistance under Article 7 (2) of Regulation No 241/2021.

In line with Article 7 (2) of the Recovery and Resilience Regulation, Romania intends to request technical support through the instrument on technical assistance for the development of the National Hydrogen Strategy, including the definition of a set of policies to guide, coordinate and mobilise public and private investment in the areas of production, storage, transport and consumption/use of hydrogen (renewable gases), including the revision of the legislative framework necessary to stimulate this area.

The technical support shall include:

1. Development of a hydrogen strategy in Romania;
2. Strategic Environmental Assessment for Hydrogen;
3. Developing a plan of measures to implement the strategy throughout the hydrogen value chain;
4. Assessment of onshore and off-shore technical and economic potential for hydrogen production;
5. Assistance in the process of public consultation of the hydrogen strategy;
6. Governance of the implementation of the strategy — developing the necessary legislation/legislative instrument to establish the rules in the functioning of the governance system structures.

We call for additional technical assistance to start in Q3-4 of 2021 and to cease in the 1 semester of 2026.

In support of the development of the national hydrogen strategy, Romania undertakes to request technical support, which, in line with Article 7.2 of the Recovery and Resilience Regulation (RRR), forms part of the costs of implementing the reform measure. Romania undertakes to request this technical support and to sign a contribution agreement for this amount with the European Commission, in line with Article 7.2 of the RRR Regulation. The total estimated cost of the technical support requested to support the reform is EUR 1mil.

This total cost has been estimated on the basis of technical assistance costs provided so far by the European Commission in the context of the Structural Reform Assistance Programme for activities similar to those described above.

In the cost estimation we considered the following key phases:

- i) A complex map appear: EUR 100.000
- ii) Examples of good practice: EUR 30.000
- iii) Strategy development — proposals for measures and plans and consultation: EUR 300.000
- iv) Strategic Environmental Assessment for Hydrogen: EUR 200.000
- v) Plan for preparing and implementing the measures in the strategy and proposing the legislative framework for implementation: EUR 200.000
- vi) Assist in the implementation of at least 4 Community structures: EUR 70.000

R3: Improving corporate governance of state-owned companies in the sector

Challenges

According to the European Semester report (2020), no progress has been made on the 2019 country-specific recommendations on the governance of state-owned companies (CSR 5). Despite the existence of one of the best-performing legislative frameworks on the governance of state-owned companies and a Guide on the integrated management of state and economic stakeholders (developed through technical assistance by the Ministry of Public Finance), designed to guide all entities in the system, from the public supervisory authorities, the Ministry of Finance, the governing and supervisory bodies of public enterprises, neither the legislation nor the principles of this guidance guide apply. The State, as a shareholder, will not interfere with the management of public undertakings and a complete and fair cycle of professionalisation and monitoring of their performance is being implemented. The development, negotiation, adoption and evaluation of performance indicators must follow best practices in this field and representatives of the governing bodies shall be selected in accordance with the existing legislative framework and best practices. Guardianship public authorities with holdings in energy companies (Ministry of Energy, General Secretariat of the Government) are still developing the capacity and culture of transparency so that companies' governing bodies are supervised "at army's length", transparent and professional, and that the public is regularly, transparently, informed about their performance. Thus, also in 2020, in the Special Country Recommendations, the Commission assessed the implementation of corporate governance of state-owned companies as still an ongoing process in Romania.

Objectives of the reform:

Evaluation of the Board													
APT capacity building													
Continue the procedure for listing Hidroelectrica													
Removing legislative obstacles to listings													

State aid

It does not include State aid measures, but only aims at revising/amending the legislative and regulatory framework to improve corporate governance.

The reform is complementary to the business environment monitoring the reforms of state-owned companies.

R4: Reducing the energy intensity of the economy by developing a sustainable mechanism to boost energy efficiency in industry

Challenges

Energy intensity by 40 % above the European Union average is an obstacle to the competitiveness of the national economy, both small and medium-sized enterprises and large companies. The effectiveness of resource use is also well below the European average, so it is necessary to reform the framework for promoting energy efficiency in the industrial sector, small and medium-sized enterprises and/or large enterprises by increasing the energy efficiency indicator, including digital systems for monitoring and centralising data. The current legislative and regulatory framework, combined with constraints in the carbon market, has, in the period 2010-2018, led to the best improvement in energy efficiency in industry compared to other sectors. Total energy efficiency, measured by ODEX, has improved by more than 41 % since 2000 in 2018. Sectoral, the biggest progress was made in industry (almost 45 %), followed by residential (44 %), transport (43 %) and services (28 %). According to the -Law No 121/2014

on energy efficiency, the target for energy savings from the application of alternative measures is 1.5 %/year from 2018 to 2020. According to the European Semester Report, “investments in energy efficiency remain low despite good incentives.” To reach the European Union’s target of increasing energy efficiency by 32.5 % by 2030, private financing should be attracted to boost energy efficiency investments and revised measures and policies to boost energy efficiency.

Objectives of the reform:

Support large enterprises and SMEs in implementing proposed energy efficiency measures following energy audits. This will be pursued through Investment 6 of the National Recovery and Resilience Plan and other operational programmes.

— Clarify the legislative framework on energy performance contracting and remove any obstacles to its implementation

Establishing market mechanisms for monitoring the energy efficiency of products, installations and services made available to consumers in Romania

Improving institutional capacity to inform SMEs about energy efficiency (measures, programmes, benefits) and to inform the public about the results of energy efficiency programmes implemented by economic operators, including through better monitoring of their energy audit and management programmes

— Facilitating access for industrial consumers to loans and financial instruments for energy efficiency, including green bonds and loans

— Developing standards for banking products and green financial instruments

The incentive bond as a percentage of the number of audits/management programmes carried out, weighted by the results of the energy efficiency measures.

Nature of the reform:

- Clarification of the legislative framework
- Improving institutional capacity
- Product development and standards

Target group: Banking, large companies and productive SMEs

Responsible: Ministry of Energy, Ministry of Economy, Entrepreneurship and Tourism, Consumer Protection Authority (ANPC)

Activities	2021	2022	2023	2024	2025	2026	
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Implement incentive bonus																			
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State aid

The financing provided under the energy efficiency scheme constitutes State aid.

State aid will be granted through de minimis schemes and/or on the basis of Article 38 of the Exemption Regulation GBER nr.651/2014.

The rest of the activities concern the revision/modification of the legislative framework and do not involve State aid.

R5:Increasing competitiveness and decarbonisation of the heating — cooling sector

Challenges

The main challenge for improving the competitiveness of the sector, modernising and reducing their emissions is the sharing of responsibility between the Ministry of Energy, the Ministry of Development, Public Works and Administration and local public authorities. There is a need to clarify the framework of responsibilities for the management of the sector in order to ensure the reduction of losses in the sector, improve the comfort of the population, stop the disconnection of homes from the centralised heating system, implement the existing legislation on heating — cooling for new homes and promote modern renewable sources in heating and cooling. Electricity and district heating systems are currently disconnected, with cases of municipalities that are particularly exposed to the risk of disconnection of the population as thermal generation capacities, on carbon, are in a poor economic state (high emitters) — e.g.: Deva, Craiova, Motru, etc. High efficiency cogeneration at municipal level is insufficiently supported and decentralised heating systems from renewable sources still less (solar panels, heat pumps, etc.). Romania appears to be better than the European average for the use of renewable sources for heating, but this is due to the use of wood heating in rural, inefficient and energy-poor environments. Around a quarter of Romania's population is in energy poverty, largely due to the heating systems used.

Objectives of the reform:

- Clarification and simplification of the institutional framework for managing this public policy area
- Increase the absorption of European funds (including the component of the National Recovery and Resilience Plan for ATUs) and sources from the Modernisation Fund for network rehabilitation and replacement of coal-fired production sources with high-efficiency cogeneration in urban agglomerations and potential for biomass production in small urban areas

Directing European funds to refurbishment of buildings, high-efficiency cogeneration, refurbishment of networks														
National and local programmes incentivising individual RES solutions														
Improving the prosumer legislative framework														
National support programme for heat pumps, including fiscal incentives														

State aid

Activities aimed at legislative changes do not involve State aid, from the point of view of the Ministry of Energy.

In order to stimulate high-efficiency cogeneration, the Ministry of Energy is considering developing a support scheme for electricity produced in high-efficiency cogeneration through a competitive procedure, but which will not be funded by the National Recovery and Resilience Plan (PNRR).

R6:Decarbonisation of the transport sector through investments in electric transport infrastructure and creation of incentives for green transport

Challenges

Electric mobility is growing and well received by the public, but the pace of development of public and private charging infrastructure needs to be accelerated. The NECCP projections point to accelerated electrification in the transport sector, based on the set of priorities identified, as well as the assumption of convergence of the costs of light duty vehicles with those of internal combustion cars in 2024, according to independent studies. Thus, in 2030, around 700.000 private electric cars (including hybrid) and around 650.000 charging points (of which about 40.000 under fast and semi-fast charging) are planned to be in circulation. A significant share of Romania's GHG emissions (excluding LULUCF) (over 14 %) comes from the transport sector (more than 20 % of CO₂ emissions). In the absence of adequate charging infrastructure it is difficult to expect that the targets of the PNIESC will be met. Electrification of the transport sector and decreasing GHG emissions from transport is a key country recommendation and part of the conclusions of the European Semester document.

Objectives of the reform:

Promoting electromobility (light vehicles and urban public transport, but also electrification of ports, which would significantly contribute to reducing GHG from maritime transport) by:

- Develop a plan for the deployment of public charging networks and encourage private investment for infrastructure development through an incentive mechanism (e.g.:equipping all transport corridors with the necessary infrastructure to install stations, subsidies from local budgets or the Environment Fund Administration for public entities or companies wishing to provide commercial electric charging services for large vehicles, subsidies to companies — shops, etc. — that want to install commercial charging stations within their perimeter with access to the public;reduction of property charges for buildings/legal entities providing parking spaces with charging stations in their own building). These bonuses and incentives should be subject to annual monitoring of effectiveness and cost-effectiveness.
- Installation of at least one recharging point as well as built-in infrastructure (ducting for electric cables) for at least one in ten parking space for all non-residential and residential buildings with more than twenty parking spaces (to ensure the subsequent installation of additional points) by 1 January 2025
- Stimulate investment in the development of manufacturing, RES equipment, energy efficiency and electro-mobility by establishing support measures including research and setting common standards

Nature of the reform:Monitoring, regulation

Target group:companies and public institutions with car fleets, residential and non-residential building owners

Responsible entity: Ministry of Transport and Infrastructure, Ministry of Environment, Water Resources and Forestry, Ministry of Public Works Development and Administration

Activities	2021		2022		2023		2024		2025		2026		
	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	
Electrical charging infrastructure plan													
Incentive mechanisms to develop charging infrastructure													
Standards and mandatory points uploading new buildings													

Investments

Investment 1: Digitalisation and the transition to renewable energy sources of both grid operators' and other critical operators' own consumption and investments in new capacity for the production of electricity from renewable sources

Challenges

As I mentioned in the description of the 1 reform, an incentive for investment in renewable electricity production is needed to overcome the current system lock-in and stagnation of the percentage of renewable electricity installed. At the same time, transmission system operators and other critical operators in the SEN currently have high technological own consumption due to the degraded state of equipment and could, through targeted investments to secure part of their renewable electricity consumption. Last but not least, until the entry into force of the bonus scheme through contracts for difference and in order to encourage penetration of the renewable electricity generation market, given the currently low bankability of such projects, a dedicated competitive funding scheme is needed for competitive diversification of market players.

Objectives of the investment:

- Stimulating competitive renewable energy production at the lowest cost through an open competitive scheme to install new capacity. This scheme would, according to our estimates, lead to an installed capacity of 235 MW, generating about 420 GWh/y, representing about 0.8 % of annual consumption (~ 55 TWh). A large part of this scheme will be allocated to SMEs. However, based on electricity market reforms (PPA, CfD), etc., we target a total of 1.500 MW installed in renewable energy by 2026 only through the CfD and a total of 3.000 MW by the same year based on all other funds (including the tender scheme supported by the National Recovery and Resilience Plan, the Modernisation Fund, etc.) and improved legislative conditions. The selection will be made according to the following criteria:
 - degree of maturity of the project (e.g., level of authorisation, etc.)
 - project location, dispersion vs. network capabilities — projects that are installed in unmanaged network sites to be scored higher
 - amount of State aid claimed from eligible expenditure/MW installed — aiming to ensure that the applicant, taking into account the decrease in technology costs, covers a large source of the investment from its own funds, so that the public subsidy provided per MW installed is the lowest and to avoid overcompensation
 - proof of co-financing and eligibility of the applicant in accordance with the HS rules.
- Strategic projects for large companies combining renewable electricity production with storage
- Digitalisation and more efficient operations of the generation and system operator in order to increase the ability to take over high flows of energy from renewable sources from the grid
- One-off solutions for transiting transmission system operators' technological consumption towards renewable electricity

Investment	Beneficiary	Value	Timeline of implementation
Support scheme for the installation of electricity generation plants from RES sources	Open call for projects	EUR 200.000.000	2021-2023

The modernisation, reinforcement of transmission and distribution networks, thus increasing the adequacy of the SEN and the capacity to connect new renewable electricity generation units, will be achieved through a dedicated scheme from the Modernisation Fund (10 d).

State aid

In view of the above, projects will be financed following their selection on the basis of a competitive procedure, in two possible variants, depending on the maturity of the projects, the implementation capacity of the beneficiaries, etc.:

Scheme drawn up on the basis of Article 41 of the GBER — aid amounting to a maximum of EUR 15 million per undertaking per investment project may be granted; the aid intensity may reach 100 % of the eligible costs — exempted from notification.

Scheme drawn up on the basis of the guidelines on state aid for environmental protection and energy, to be notified to the European Commission — aid exceeding EUR 15 million per undertaking per investment project.

Estimated time horizon for notification: S1 2022.

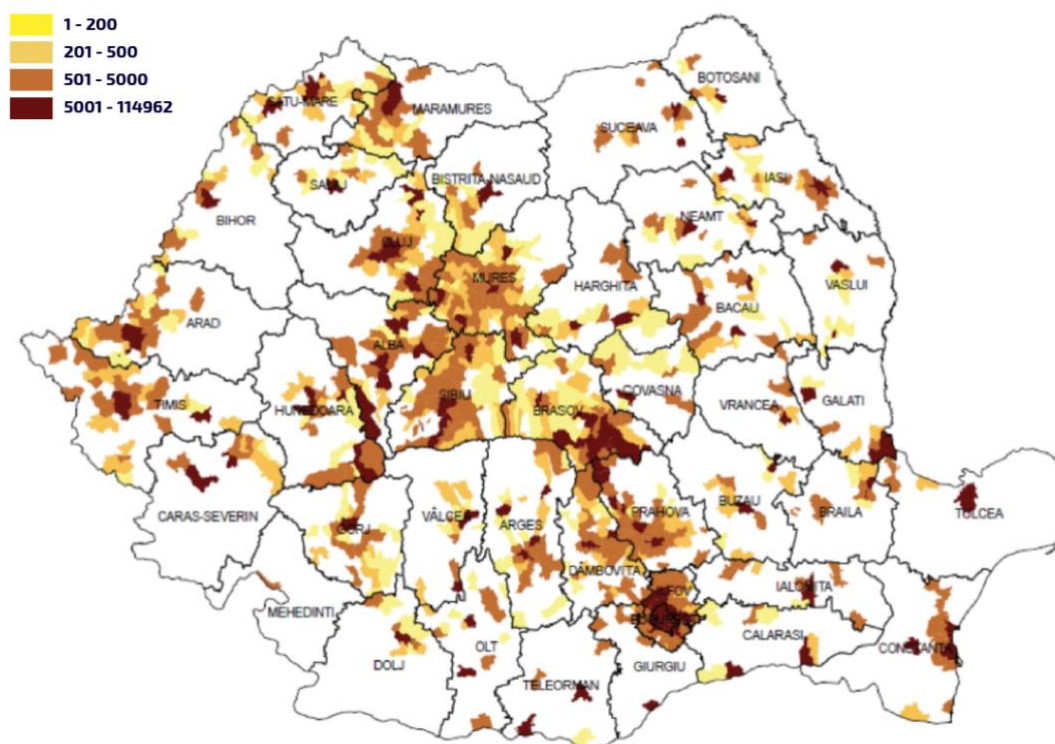
Investment 2: Natural gas distribution infrastructure in combination with hydrogen

Hydrogen is a clean fuel with a very high efficiency/calorific value, capable of addressing the energy needs of both the population and the business community. In Romania, more than half of the population is not served by natural gas, using polluting, high-emission, costly and health-damaging energy sources. The National Recovery and Resilience Plan offers Romania the chance to take a step in the future by building from the outset natural gas transmission and distribution networks fully capable of integrating the gas of the future, such as hydrogen. The density of the natural gas network is uneven in Romania, therefore regions with poor access should be prioritised with this investment, especially as it would be an investment outside the current transmission and distribution network.

Objectives of the investment: The development of a regional natural gas infrastructure (transmission, distribution, compression stations) in a region that is poorly connected to natural gas, capable of receiving hydrogen and other decarbonised gases (e.g. bio-methane, etc.) up to 10 % of the capacity. The total value of the investment is estimated at EUR 400 million. From our preliminary estimates, taking into account the fact that Oltenia is the weakest region connected to the natural gas distribution infrastructure, with counties such as Mehedinți and Dolj where the connection is almost non-existent, we propose that Oltenia be the pilot region for the deployment of this low-carbon smart grid of the future. Map 1 below shows the map of natural gas consumption for household consumers as well as the degree of grid connection of ATUs.

Harta 1: UAT-uri conectate la rețeaua de gaz și consumul anual

Consumul de gaze pentru uz casnic, 2016 (mii mc)



1

- Our estimates of the allocated budget are around 4.000 km of smart pipelines with 160.000 connections with a smart measurement system, based on the following data:
 - The average cost of producing smart distribution pipelines is around.EUR 110/ml.
 - The average cost of making a connection, with a smart measurement system, is approximately.EUR 1,000/piece.
 - The average cost of achieving a km of smart distribution line with 40 connections is around.EUR 150,000.
- Given the average annual consumption per unit of 20 MWh (1.800 N m.c.), it follows that we will have an estimated total annual consumption of ca.3.200 GWh.
- To cover the demand for injection of up to 10 % H2 into the smart gas grid, an amount of ca.9.500 to H2 green, using electrical appliances that will be powered by approximately.580 GWh electricity produced from renewable sources (photovoltaic, hydro and wind).For example, this amount of renewable energy (580 GWh) can be produced over a calendar year by photovoltaic parks with an installed capacity of ca.450 MW or microhydropower plants with installed capacity of ca.150 MW.
- The insertion of hydrogen into the smart network will be carried out after the National Natural Gas Transmission System (SNTGN) Measuring and Control Station (SMR),

¹Source:Centre for the Study of Democracy, Natural Gas Opportunity in the Resistance Sector in Romania, 2018, <https://www.democracycenter.ro/romana/presa/comunicate/oportunitatea-gazelor-naturale-sectorul-rezidential-din-romania>

thus avoiding the absorption of hydrogen in the national transport network, and the completion of the blending will be carried out with maximum security.

- The digitalisation and efficiency of the distribution and system operator’s operations in order to increase the ability to take hydrogen streams from the grid is one of the features of the new smart grids to be achieved.

Through this investment Romania will actively participate in the implementation of the European Union Strategy for Hydrogen and will install on its territory by 2024.30 GW in electrical appliances for the production of 1.500 tonnes of H2.

Nature of the investment:Investment natural gas transmission and distribution network “hydrogen ready”

Target group:naturalgas transmission operator, natural gas distribution operator

Responsible entity:Ministry of Energy, public authorities.

Activities	2021		2022		2023		2024		2025		2026		
	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	
Choice of pilot area		■	■										
Finalisation of feasibility study		■	■	■									
Start of investment					■	■	■	■	■	■			
Commissioning							■	■	■	■	■	■	

State aid:

For investments in the transmission and distribution network of ‘hydrogen ready’ natural gas, the beneficiaries of which will be the natural gas transmission operator and/or natural gas distribution operators, no State aid rules apply as the natural gas transmission networks are natural monopoly (the conditions of the analytical Grila regarding the enegetic and hydrogen infrastructure are fulfilled — see paragraphs 41 to 46).

Investment 3: Integrated hydrogen demonstration projects, research and development and IPCEI facilitation, as well as projects vertically integrating multiple industries to achieve deep decarbonisation using hydrogen

Supporting the reform of R2 above requires demonstrating the technical and economic feasibility of hydrogen in integrated projects (natural gas — hydrogen — renewables) and green hydrogen. Until a number of publicly supported demonstration pilot projects do not demonstrate the technical and economic feasibility of this new technology, it is difficult to believe that investors will be able to raise capital in this direction. However, together with legislative reform and the adoption of a national hydrogen strategy, these pilot projects can trigger further investment. In order to be able to quickly replace coal-fired capacities, gas must play a key role, in blending with hydrogen, in order to support national decarbonisation objectives and in line with the country-specific recommendations. The new gas-to-power and power-to-X projects would put Romania at the forefront of European energy innovation, and could bring more stability and security to the European energy market. As green hydrogen produced locally becomes an alternative, it will take advantage of the early introduction of blue hydrogen into the mix and the development of related infrastructure. Local production of blue hydrogen is the least costly solution to reduce emissions from the combustion of natural gas and virtually the only solution to produce large amounts of hydrogen in the short term, with no negative impact on the balancing of SEN. The use of natural gas in combination with renewable and hydrogen, the capture of CO₂ and its use in agricultural greenhouses will make it possible for new gas-fired plants to reach a maximum of 250 g CO₂/KWh when they are put into operation, and may even fall below 100 CO₂/KWh, depending on the area of agricultural greenhouses cultivated. Moreover, other industries such as agriculture, health and urban mobility would also be included in integrated projects and would benefit the local community by pre-decontamination of the sites where the investment will be located. Investment will be doubled by local innovation centres — research with training facilities in what the industries of the future mean. Part of the electricity and heat produced in these integrated projects will be used to feed hydroponic agricultural greenhouses covering 100-150 ha in the vicinity of the production units. The oxygen produced in the production process can be used immediately in the health technology industry.

Objectives:

Implement green hydrogen demonstration projects using different technologies to determine their economic and technical feasibility.

Implementation of integrated demonstration projects Natural Gas — Photovoltaic — Hydrogen — Agricultural greenhouses/Future Time.

Investment	Beneficiary	Value	Timeline of implementation
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<p>Romgaz Partnership — GSP Power “Complex integrated energy (green city)”:gas plant with installed capacity of 159 MW, 100 MW photovoltaic park, green hydrogen production plant and CO2 capture installation in Halanga, Mehedinti County</p> <p>Split cost:EUR 135 million — gas plant;EUR 70 million — construction of the photovoltaic park;EUR 60 million — the CO2 capture installation (capture and backbone from capture to glasshouse entrance);55 mil euro- hydrogen production</p>	<p>Romgaz, GSP Power, Siemens, National Institute for Research on Criogenic and Isotopic Technologies.</p>	<p>EUR 320.000.000</p>	<p>2021-2024</p>
<p>Romgaz Partnership — GSP Power “Complex integrated energy (green city)”:gas plant with installed capacity of 159 MW, 20 MW photovoltaic park, green hydrogen production plant and CO2 capture installation in Constanta, Constanta County</p> <p>Split cost:EUR 135 million — gas plant;EUR 15 million — construction of the photovoltaic park;EUR 60 million — the CO2 capture installation (capture and backbone from capture to glasshouse entrance);55 mil euro- hydrogen production</p>	<p>Romgaz, GSP Power, Siemens, National Institute for Research on Criogenic and Isotopic Technologies.</p>	<p>EUR 265.000.000</p>	<p>2021-2024</p>
<p>Green hydrogen production unit</p>	<p>Hidroelectrica</p>	<p>EUR 100.000.000</p>	<p>2021-2026</p>
<p>Photovoltaic power plant for the production and storage of green hydrogen and its use using electricity storage (batteries and supercapacitors) on the Cernavoda SA NPP platform</p>	<p>Cernavoda SA NPP</p>	<p>EUR 28.000.000</p>	<p>2021-2023</p>

State aid:

As there are currently no specific provisions on State aid for hydrogen production, the integrated projects ROMGAZ and Cernavodă will be notified individually to the European Commission on the basis of the TFEU.

The Ministry of Energy is to take the necessary steps to pre-notify these projects, on the basis of which discussions with the European Commission will start.

We estimate a time horizon for the submission of pre-notifications: S2 2021.

The Hydroelectric project will be notified individually under the *Guidelines on State aid for environmental protection and energy*. Intensity — 45 % for large enterprises, to which a bonus of 15 % may be added if the investment is located in assisted areas according to Article 107(3)(a) TFEU, i.e. by 5 % if the investment is located in assisted areas fulfilling the conditions of Article 107(3)(c) TFEU.

Investment 4: Industrial chain of production and/or recycling of batteries, photovoltaic cells and panels (including ancillary equipment), research and development in the field and new electricity storage capacity.

There is only one battery producer in Romania and the only one in South East Europe. It produces batteries with a capacity of 200 MW each year. From a market point of view, a compound annual growth of 17 % by 2029 is expected, due to increases of 2 digits expected over the same period in the battery-related industries: automotive, industrial batteries. At SEN level, the integration of batteries will mean the flexibility of the grid and the possibility of integrating additional RES generation capacities — which is no longer possible at this stage given the state of the grid.

To this end, measures to support actors in the electricity storage market will be financed in order to develop their production facilities for raw materials and batteries through State aid. Given the growth rate of demand for batteries, but also the exponential increase in capital allocated to this industry, it can reasonably be assumed that the implementation of battery production projects will be achieved by August 2026.

Measures to support players in the PV cell and panel production market will also be financed with the aim of developing their production facilities for raw materials and finished products (e.g. photovoltaic cells and panels, inverters, etc.) through State aid. Given the growth rate of demand for PV panels and ancillary equipment, but also the significant increase in capital allocated to this industry, it can reasonably be assumed that the implementation of the production projects will be achieved by August 2026.

We will launch a State aid scheme of EUR 167.500.000 to support productive investments in the whole production chain — valorisation (installation) — disposal — of photovoltaic batteries, cells and panels (including ancillary equipment), to be allocated according to the

etc.)													
Call for projects													
Call for projects													
Implement winning projects													

Investment 5:Incentive scheme for energy efficiency in industry

The challenges of achieving the energy efficiency targets in industry were outlined in the reform section.Those reforms should be complemented by the financing of investment programmes targeted at economic operators in industry and SMEs in order to implement the proposed energy efficiency measures following mandatory energy audits, including the installation of electricity consumption and energy quality thelegacy systems, replacement and retrofitting of equipment and automation of existing systems, smart storage capacities with gradual energy release.

Investments aimed at increasing the energy efficiency of economic activity will focus on the reduction of energy consumption (fossil fuels, electricity and heat) by industrial economic operators as well as by small and medium-sized enterprises, the development of systems to digitise energy consumption metering and energy efficiency improvements by economic operators, financial support for energy services provided by specialised economic and financial operators, and investments by economic operators in small-scale and medium-scale electricity and heat production for self-consumption and independence.Investments to increase energy efficiency will therefore have an impact on reducing GHG emissions, increasing the share of renewable energy, but also combating energy poverty.This will also have positive effects at the macroeconomic level, ensuring the creation of new jobs, improving the quality of life and reducing social costs.

In addition to large-scale investments with a macroeconomic impact (e.g. transmission and distribution operators), energy efficiency in Romania could follow the European train by using small-scale, efficient units targeted on residential complexes, production/processing hubs, etc. This removes network losses, makes the management and manipulation of the system more efficient, increases the network connectivity of household consumers and the quality of supply services.

Preparation of documentation and Implementation of the investment													
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State aid

The project will be financed through the National Recovery and Resilience Plan — with individual notification on the TFEU.

Time horizon for notification S1 2022.

2. Strategic autonomy and security issues

In order to ensure energy consumption, installed capacity will increase by about 35 % in 2030 compared to 2020, thanks to the installation of new wind (2.302 MW by 2030) and solar (3.692 MW by 2030), which will lead to an increase in domestic energy production, thus ensuring a higher degree of energy independence. The positive impact can be seen in particular in reducing dependence on imports from third countries from a level of 20.8 % expected in 2020 to 17.8 % in 2030, representing one of the lowest levels of dependence of energy imports from the European Union. A number of coal groups are also expected to be replaced by combined cycle units fuelled with natural gas, the retrofitting of a nuclear unit, and the construction of at least one new nuclear unit by 2030.

As regards the supply of natural gas, Romania specifically envisages the development of the National Gas Transmission System on the Bulgaria-Romania — Hungary — Austria (BRUA) corridor and also the development on Romanian territory of the Southern Transmission Corridor for the takeover of natural gas from the Black Sea shore. Existing interconnections will continue to be used in the North West (Aurit Environment), South East (Isaccea) direction with Ukraine, West with Hungary, South with Bulgaria and East with the Republic of Moldova.

Ensuring the flexibility and adequacy of the national energy system is an important objective for Romania in the field of energy security. In connection with the objective of ensuring a diversified energy mix, Romania aims to replace the electricity generation capacities that will exit operation with new, efficient and low-emission capacity in 2030 (see the Decarbonation Plan proposed by Complexul Energetic Oltenia).

3. Green and digital dimension of the strand

See Annex 2

4. Compliance with the No Significant Damage Principle (DNSH)

See Annex 1

5. Milestones, targets and implementation period

See Annex 2

6. Budget

The need for funds to carry out the investments provided for in this component of the National Recovery and Resilience Plan has been calculated on the basis of historical costs highlighted in the market, on the basis of consultation with large companies in the sector, but also through assessments made by the National Energy Regulatory Authority.

As regards the estimated costs for the production of electricity from renewable sources, we estimate that the financial support dedicated to the regional electricity sub-component of Investment 1 amounts to approximately EUR 200 million, through which we estimate that 235 MW (total installed capacity) will be installed. Given the intermittent nature of this energy source, we refer to 1.300 PVP — 2.600 WPP of hours of installed capacity, which results in approximately 235 MW, costing around EUR 700,000/MW (PVP) and EUR 1.100.000/MW (WPP). Thus, it is only through the support of the National Recovery and Resilience Plan that we call for the addition of approximately renewable energy sources. 0.8 % of annual consumption of 55 TWh.

In order to calculate the costs necessary for Investment 2 (Natural gas distribution infrastructure in combination with green hydrogen), totalling EUR 400.000.000, we used the historical costs documented by the National Energy Regulatory Authority. Based on data currently held by the National Energy Regulatory Authority, the average costs of connecting applicants to the smart gas distribution system are:

- Average cost of delivering smart distribution lines approximately EUR 110/ml
- Average cost of making a connection (includes smart measurement system) EUR 1 000/buc.
- Average cost of one kilometre of pipeline, with around 40 connections EUR 150,000

This shows that about EUR 400 million can be achieved through a budget of around EUR million. 4.050 km of networked smart grid, or about 3 000 km of smart grid with connections.

