Romania's 2023

Technical report on greenhouse gas policies and measures under Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action

March 2023

Romania's Technical report on greenhouse gas policies and measures was prepared in collaboration with:

Beia Consult International

▪ Dr. Mihaela BĂLĂNESCU (coordinator); ▪ Drd. Andreea BĂDICU; ▪ Dr. George SUCIU; ▪ Cătălin SURU; ▪ Dr. Cristina BĂLĂCEANU; ▪ Adrian PASAT; ▪ Lucian NECULA.

Institute for Studies and Power Engineering

▪ Dr. Claudia TOMESCU; ▪ Dr. Anca POPESCU; ▪ Irene SAMOILĂ; ▪ Dr. Marian DOBRIN; ▪ Dr. Valentin RUSU; ▪ Camelia VASILE; ▪ Gloria POPESCU; ▪ Ileana CONSTATINESCU.

University of Agronomic Sciences and Veterinary Medicine of Bucharest

▪ Dr. Dana-Cătălina POPA; ▪ Dr. Vasilica STAN; ▪ Dr. Răzvan POPA**.**

National Research and Development Institute for Cryogenic and Isotopic Technologies

▪ Dr. chem. Mihaela Iordache; ▪ Felicia BUCURA; ▪ Dr. Marius CONSTANTINESCU.

National Institute for Research and Development in Forestry "Marin Drăcea"

▪ Dr. Raul-Gheorghe RADU; ▪ Mihai HAPA; ▪ Ștefan PETREA.

National Research and Development Institute for Soil Science, Agrochemistry and Environment

▪ Dr. eng. Olga Vizitiu (ICPA)

Ministry of Environment, Waters and Forests

▪ Gherghița NICODIM – Head of the Climate Strategies and Reporting Department; ▪ Tudor CULIC – Senior Counsellor; ▪ Maria FAINĂ - Senior Counsellor; ▪ Evelina-Floriana DASCĂLU - Senior Counsellor; ▪ Laurențiu RADU – Principal Counsellor; ▪ Maria-Claudia AARON-ANDRIEȘ - Counsellor for European Affairs; ▪ Ioana-Maria VASILIU - Counsellor for European Affairs.

MINISTRY OF ENVIRONMENT,
WATERS AND FORESTS

Romanian Ministry of Environment, Waters and Forests
Libertății Boulevard 12, District 5, Bucharest, Romania
E-mail: schimbari_climatice@mmediu.ro
Internet: www.mmediu.ro
Phone: +4021 408 9542

LIST OF FIGURES

LIST OF TABLES

CUPRINS

1. Updates relevant to the long-term strategies referred to in point (b) of Annex VI to Regulation (EU) 2018/1999

1.1 Objective and a short description of the update carried out

The National Climate Change and Low Carbon Green Growth Strategy (CC/LCGG) for period 2016 – 2030, with a long term vision, approved by the GD no. 739/2016, is still in force in Romania. It includes a roadmap for 2050 and establishes the country's operational objectives for GHG emissions mitigation and climate change adaptation.

For GHG emissions reduction, the National CC/LCGG Strategy adopted quantifiable targets in line with EU 2030 climate and energy framework targets (40% reduction of GHG emissions compared to 1990 levels, improving the energy efficiency with 27% and a renewable energy target of at least 27% of energy consumption).

To be in line with the European and international goals (Fit for 55 under the Green Deal objectives and in line with the Paris Agreement), the strategic documents and plans are in different stages of elaboration and adoption in Romania: the Long Term Strategy for greenhouse gas emissions reduction (LTS), Climate Change Adaptation Strategy and its Implementation Plan, or National Energy and Climate Plan (NECP) revision.

LTS is developed with financial support received from DG REFORM, by accessing the EU technical support instrument (TSI). The work is in progress, advancing to zero draft version and envisages a publicly consultation until the end of April 2023.

In conjunction with the LTS developing, the project mentioned above delivers elements that will support the updating of the NECP.

The revision of the Climate Change Adaptation Strategy is in final stage, to be sent in transparency procedure and made publicly available for institutional approval and opened for further comments, if still will be provided by different stakeholders.

1.2 Legal status of the low-carbon development strategy and of its update

The National CC/LCGG Strategy for period 2016 – 2030 is approved by the Government Decision no. 739/2016, and the Strategy is still in force in Romania. It will be replaced by the Long-Term Strategy for greenhouse gas emissions reduction.

The Governance of LTS is the Government responsibility, under the Ministry of Environment Waters and Forestry coordination at this moment. To prevent the delay in climate area decision-making, the institutional arrangements started to be improved. As such, through the Government Decision nr. 563/2022 it was decided the constitution of Inter-ministerial Committee for Climate Change (CISC) and its functioning rules. CISC is a political body, having consultative role, as follows:

- it analyzes and proposes solutions to ensure consistency of the national policies with the country commitments at the level of European Union, United Nations and other international organizations
- it monitors the progress made by the Romanian institutions in respect of the policies implementation.

Coordination of the CISC is ensured, as follows: the President of CISC is the Prime Minister of the Romanian Government; CISC has also three Vice-presidents: the Chancellor of the Prime Minister Chancellery, the Minister of the Ministry of Environment, Waters and Forests and the Head of Climate and Sustainability Department within the Presidential Administration.

The members of CISC are the representatives of public institutions that develop and implement policies with impact in the field of climate in Romania, related to both, adaptation to the climate change effects, as well as the GHG emissions reduction, as follows:

- ministers or designated state secretaries of the ministries, including representatives of the Presidential Administration and Government Departments
- leaders of other important national authorities, agencies, institutes (e.g., Meteorological Administration, National Statistics Institute, Commission for Strategies and Prognosis, etc.)
- working groups at expert level could be initiated.

To support the CISC's activity there are in progress arrangements for a new governance structure and a monitoring mechanism for LTS and NECP implementation. A coordination department at Government level will be installed (Department for Climate and Energy Transition), having the main responsibility of monitoring the LTS elaboration and NECP revision and their implementation. This department will ensure the relation with the implementing institutions, civil society and CISC. It will be established within the Government, directly subordinated to the Prime Minister and the key responsibilities will be to:

- Contributes to the definition and implementation of national policies in the field of climate and energy transition, with the responsible ministries
- Collaborate with relevant government stakeholders (including the Inter-Ministerial Committee on Climate Change - CISC, Ministry of Energy, Ministry of Environment, Water and Forests, etc.) on climate change and energy transition issues
- Monitors, reviews and updates the NECP and LTS, being also responsible for the scenarios modelling.

1.3 Changes and expected impacts of the update on the implementation of the low-carbon development strategy

The main effect of the LTS elaboration and establishing the 2050 goal and its achieving path, is the revision of the 2030 NECP targets consistently with the LTS path and 2050 goal.

For the LTS elaboration purpose, Romania developed three long term scenarios, the least ambitious being the one which ensures the Fit for 55 targets implementation at national level. Any other approached scenario for the LTS will involve higher targets for the Romanian NECP than those established through the EU Fit for 55 package.

The other two developed scenarios resulted in a 99% GHG emission reductions in 2050 in comparison with 1990 level, for the most ambitious one and a 94% GHG emission reductions for the middle developed scenario.

1.4 Timeline and a description of the progress for the implementation of the low-carbon development strategy and of its update, and where available, an assessment of the projected costs and benefits associated with the update

A first version of the Romanian LTS will be publicly available for consultation at the beginning of April 2023. The notification of the Romanian LTS is planned for the end of this month. This will be subject of review since it will be submitted for strategic environmental assessment procedure and public debate.

The progress made through implementation of Romania's current Strategy on Climate Change (HG 739/2016) can be quantified in achievement of the greenhouse gas emission reduction targets, in accordance with Decision no. 406/2009/CE for effort sharing among EU member states, as well as the Romanian contribution to the joint achievement of the EU targets under the United Nations Framework Convention on Climate Change and Kyoto Protocol.

According to Decision no. 406/2009/CE, for the period 2013 – 2020, Romania's target for 2020 was to limit its GHG emissions in the non-ETS sectors to +19% in comparison with 2005 GHG emissions level, following a mandatory trajectory given by the allocated annual emissions.

Romania's situation regarding its compliance with the annual allocations and the 2020 target provided by the Decision no. 406/2009/EC is presented below:

Year	Annual allocations (t CO_2 eq)	Realized emissions (t CO_2 eq)	Surplus (t CO_2 eq)
2013	75 630 005.00	72 718 616.00	2 911 389.00
2014	77 452 128.00	72 534 134.00	7 829 383.00
2015	79 274 251.00	74 555 379.00	12 548 255.00
2016	81 096 375.00	73 123 042.00	20 521 588.00
2017	84 055 283.00	75 363 245.00	29 213 626.00
2018	85 973 339.00	77 639 310.00	37 547 655.00
2019	87 891 395.00	75 211 340.00	50 227 710.00
2020	89 809 451.00	77 123 535.00	62 913 626.00

The above presented figures show that Romania has reached its commitments in the non-ETS sectors for 2020, accounting at the end of the compliance period a surplus of approx. 62 Mt CO_2 eq.

At the same time, Romania reached its target for renewable energy share in the total final energy consumption of 24%, accounting for this area in 2020 a share of 24.48%.
The share of biofuels in gasoline and diesel should have been 10%, the result obtained in these areas in 2020 being slightly below this commitment, around 9%.

The indicative energy efficiency target assumed by Romania regarding the reduction of primary energy consumption was 43 Mtoe by 2020, while the final energy consumption was not supposed to exceed 30.3 Mtoe. The result obtained by Romania for the primary energy consumption was 30.9 Mtoe, while for the final energy

consumption was 23.5 Mtoe, in accordance with the European Commission Report on the achievement of energy efficiency targets. These results indicate the achievement of the energy efficiency targets well over commitments.

1.5 Manner in which the information is made available to the public pursuant to Article 10 of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action

The National CC/LCGG Strategy is available at the following the link: http://www.mmediu.ro/categorie/strategia-cresc/117, http://www.mmediu.ro/categorie/planul-national-de-actiune-privind-schimbarile-climatice-2016-2020/122.

The public consultations are carried out in line with the United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters of 25 June 1998 (" Aarhus convention"), as well as with article 10 provisions of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action. The responsible Romanian institutions aim to ensure equal participation, public information and notification, making available for access all the relevant documents, facilitating the necessary arrangements for the public's participation. Local authorities, civil society organizations, the business community, investors and other relevant stakeholders had and will have the possibility to express their different options for energy and climate policies that will be included in the NECP and LTS.

The consultation and regional cooperation ensure the effective achievement of the objectives of the Energy Union in a cost/optimal manner. Other Member States' have the opportunity to comment on integrated national energy and climate plans before they are finalized to avoid inconsistencies and potential negative impacts on other Member States and ensure that common objectives are met collectively. Regional cooperation in elaborating, revision and finalizing integrated NECPs as well as in their subsequent implementation is essential to improving the effectiveness and efficiency of measures and fostering market integration and energy security.

The implementation of policies and measures in the areas of energy and climate has impact on the environment. In this respect, the public has early opportunities to participate and to be consulted on the preparation of the integrated national energy and climate plans. All procedural stages established by GD no. 1076/2004 on the assessment of the effects of certain plans and programmes on the environment (Strategic Environmental Assessment) are implemented for such strategic documents in Romania. This Government Decision transposed the provisions of Directive 2001/42/EC of the European Parliament and of the Council.

2. Planned additional policies and measures referred to in point (d) of Annex VI to Regulation (EU) 2018/1999

Information on planned additional national policies and measures, or groups of measures, envisaged with a view to limiting GHG emissions beyond the commitments under Regulation (EU) 2018/842 and Regulation (EU)

2018/841. The policies and measures that would reduce emissions beyond those that are covered in the Effort Sharing Regulation and the LULUCF regulation.

2.1 Transport

For this sector, a set of additional measures included in planned Operational Programmes 2021-2027 was considered in the With Additional Measures projection scenario, focused on the development of the transport infrastructure for assuring the connectivity at the national level and between EU countries, increasing the efficiency of Romanian railways, developing the green public transport and improving the efficiency of vehicles fleet. Also, the EU Package of proposals "Fit for 55" was considered, focusing on increasing the share of energy from renewable sources in final energy consumption of transport sector.

Details related to the planned programmes considered are presented in section *3.2 Information on WAM projection scenario*.

2.2 Energy consumption

For this sector, a set of additional measures was considered in the With Additional Measures projection scenario, focusing on modernization of the industrial sector and residential, services and agricultural sector. These additional measures are expected to improve the energy efficiency in industrial, residential and public buildings sectors by accessing the planned Operational Programmes 2021-2027 and support schemes for promoting the use of renewable energy sources. Also, the EU Package of proposals "Fit for 55" was considered, focusing on increasing the share of energy from renewable sources in final energy consumption of industrial sector and building sector and implementation of energy efficiency measures for reduction of final energy consumption, through renovation of buildings owned by public bodies.

Details related to the planned programme considered are presented in section 3.2 Information on WAM projection scenario.

2.3 Agriculture

The additional measures considered in the With Additional Measures projection scenario was focus on improving the feed quality for livestock, increase methane recovery from anaerobic fermentation of manure, modern methods of fertilizer application, in line with planned EU Methan Action Plan.

2.4 Land Use, Land-Use Change and Forestry (LULUCF)

Related to LULUCF sector was considered implementation through voluntary agreements and/or negotiated of a larger number of investment projects to reduce GHG emissions, such as investments to improve sustainable management of forest and forestry, expand forested areas, restore degraded lands, afforestation of degraded lands.

The following regulations and guidelines are considered: (i) Guidelines Reporting on greenhouse gas policies and measures under Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action; (ii) Commission Implementing Regulation (EU) 2020/1208. Policies and measures (PaMs) related to LULUCF sector have previously been reported in Romanian's National Communication (NC8) on Climate Change and Biennial

Report (BR5) to the UNFCCC and in the report submitted under to the EU 2022 in accordance to articles 13 and 14 under Regulation (EU) No 525/2013.

Starting with 2019, Romania developed and implemented a new QA/QC Plan specific to LULUCF sector, used for checking input data for compliance with the most important data quality requirements, IPCC Guidelines 2000 and 2006. The QA/AC strategy include several data consistency checks, through documentation of data inputs and changes to the calculation file. A standard data input form has been used for each subcategory.

Differences from the 2021 report. The manner of presentation, including aggregation, of policies and measures in the present report is different from that in the previous report. The modifications which have been made result from changes adopted in strategic documents and regulations and from the use of a verified, different approach to the analysis of policies and measures, as a result of which a substantial improvement has been achieved in terms of the scope, comprehensiveness and reliability of the information presented on policies and measures. A substantial group of policies and measures presented in the 2021 report has been replaced by different measures in relation to updates of plans, programmes and sectoral strategies which are often a continuation of the previous documents. Moreover, the changes also result from a more detailed approach to the presentation of policies and measures related to LULUCF sector. Certain policies and measures have also been regrouped and aggregated otherwise in order to improve the transparency of the reported information.

2.5 Waste

For the Waste sector, a set of additional measures included in planned Operational Programmes 2021-2027 was considered in the With Additional Measures projection scenario, focused on improving solid waste management, through efficient waste management in order to accelerate the transition to the circular economy. Details related to the planned measures are presented in section *3.2 Information on WAM projection scenario*.

3. Links between different policies and measures and the contribution of those policies and measures to different projection scenarios, as referred to in point (e) of Annex VI to Regulation (EU) 2018/1999

Romania, as an EU Member State has implemented mitigation policies and measures for many years which has already contributed successfully to the reduction of greenhouse gas emissions (GHG) in recent years. These include the European Union Emissions Trading System (EU ETS), Effort Sharing Decision and a wide range of policies and measures addressing all sectors of the economy.

At EU level, the climate policies are already extended through ***Regulation (EU) 2021/1119 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')***, setting out a a binding objective of climate neutrality in the EU by 2050, including a binding intermediate EU climate target (reduction of net GHG emissions, after deduction of removals, by at least 55% compared to 1990 levels by 2030). The the relevant EU institutions and the Member States (MS) shall take the necessary measures at EU and national level to enable the collective achievement of the climate-neutrality objective.

Romania's commitments for 2030 is established through:

- ***GD no. 780/2006 establishing the greenhouse gas emission allowance trading scheme*** (ETS), with further amendments and supplements; for *2021-2030* period, the national emissions reduction commitment is part of the EU's commitment to reduce GHG emissions related to ETS sector (62% lower than in 2005)
- ***Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement,*** establishing the Member States obligations related to their minimum contribution for the 2021-2030 period to fulfill the Union's target of reducing its GHG emissions by 40% below 2005 levels in 2030 in the sectors covered by article 2 of Regulation.

  For non-ETS sectors, Romania will contribute to the overall EU target of reducing the GHG emissions in 2030 with 40% in comparison with 2005 its share being established to -12,7%.

- ***Regulation (EU) 2018/841, as modified under the Fit for 55 negotiations, established for Romania a target of -25 665 kt of CO_2 equivalent greenhouse gas net removals.***

The assumption for GHG emission projections (activity data and considered policies and measures) in different projection scenarios are corelated with those considered in the Romania's National Air Pollution Control Programme, developed in line with *Directive 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC*. The Directive was transposed in national legislation by *Law no. 293/2018.on the reduction of national emissions of certain atmospheric pollutants* and the National Air Pollution Control Programme was approved by GD no. 119/2023.

The links between policies and measures (**PaMs**) and their contribution to the projection scenarios are presented in section 3.1 for With Existing Measures (**WEM**) scenario and in section 3.2 for With Additional Measures (**WAM**) scenario.

The key sectoral PaMs considered to have significant effects in WEM Scenario, in term of GHG emissions reduction potential, are as follows:

***Energy sector*:**

- GD no. 1076/2021 for approval of the 2021-2030 Integrated National Energy and Climate Plan (PNIESC)
- Romania's National Recovery and Resilience Plan (PNRR)
- GD no. 203/2019 approving the Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)
- GD no. 1034/2020 for approval of National Long-term Renovation Strategy to support the renovation of the national residential and non-residential building stock, public and private, into a highly efficient and decarbonized building stock by 2030.

***Transport sector*:**

- GD no. 1076/2021 for approval of the 2021-2030 Integrated National Energy and Climate Plan (PNIESC)
- Romania's National Recovery and Resilience Plan (PNRR)
- GD no. 666/2016 for approving the General Transport Master Plan, updated by GD no. 1312/2021 for the approval of the Investment Program for the Development of Transport Infrastructure for the period 2021-2030
- GD no. 985/2020 for the approval of the Railway Infrastructure Development Strategy 2021-2025 and GD no. 1302/2021 for the approval of the Action Program for the development of railway infrastructure and the modal transfer to the railway of passenger and freight transport flows
- GD no. 203/2019 approving the Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020).

***IPPU sector*:**

- GD no. 780/2006 establishing the scheme for greenhouse gas emission allowance trading, with subsequent amendments (including GD no. 393/2020)
- Regulation (EU) no. 517/2014 related fluorinated greenhouse gases
- Directive 40/2006/EC (MAC Directive) on emissions from air conditioning systems of the motor vehicles.

Agriculture sector:

- The new Common Agricultural Policy (2023-2027)
- GD no. 1571/2022 establishing the general framework for the implementation of interventions related to the plant and animal husbandry sectors within the Strategic CAP Plan 2023-2027, financing from the European Agricultural Guarantee Fund and the state budget
- The National Strategy for Sustainable Development of Romania - Horizon 2013 - 2020 – 2030, aproved by GD no. 529/2013
- The National Rural Development Program 2014-2020
- Directive 91/676/EEC on the protection of waters against nitrite pollution from agricultural sources was transposed into Romanian legislation by GD no. 964/2004
- Order no 269/2020 Guideline regarding on facilities (Best Technique Available) for the intensive breeding of farm animals, including meat birds, egg-laying birds, pigs and sows.

LULUCF Sector:

Romania's policy to mitigate climate change aims at both GHG removal and resilience to the effects of climate change. In order to achieve the overall objective of GHG removal, a set of PaMs has been developed at national level. These PaMs are in line with operational objectives as well as strategies and documents considered crucial in the field of climate change.

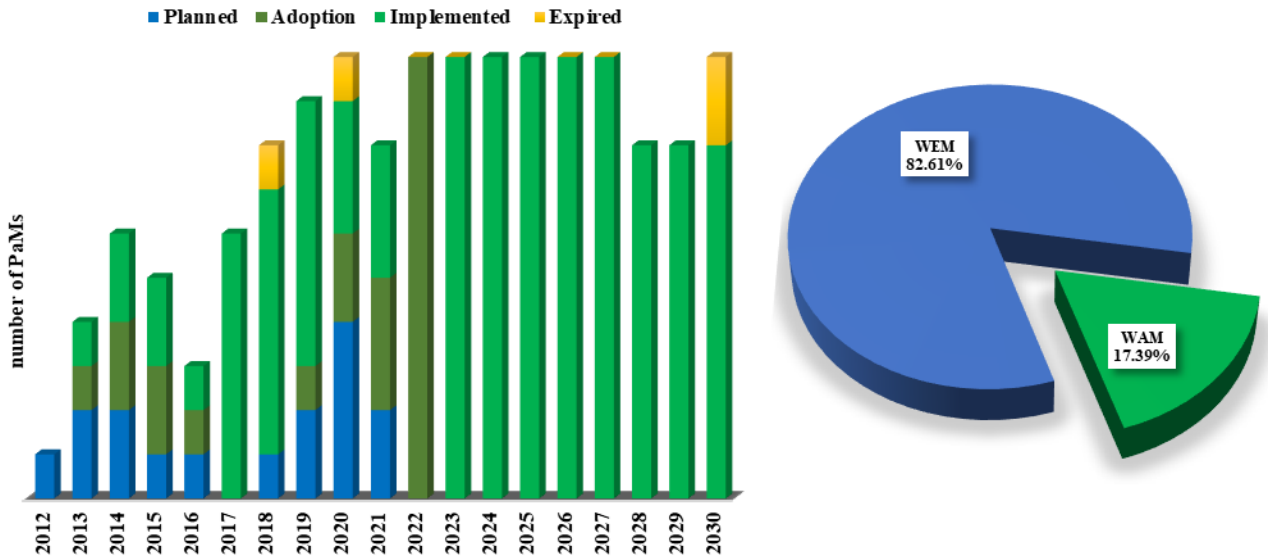

Figure 3-1 PaMs analysis. LULUCF sector

At EU level, there is an annual GHG monitoring mechanism for Member States, as well as the actions taken by the EU member states to reduce emissions/increase removals. Out of a volume of over 2000 PaMs at EU level regarding climate change and their mitigation in Europe, Romania counts approximately 76 for all sectors[1]. Romania's LULUCF sector analysis indicates the ongoing concern regarding the development and implementation of PaMs to monitor climate actions at national level. It aims to assess the climate situation and help make future decisions on climate change mitigation measures, Figure 3-1. PaMs are divided in two scenarios, WEM - assumed to be those adopted before 2020 and WAM - assumed to be those adopted after 2020. The assumptions of including PaMs in the two scenarios were according to the following definitions: (i) WEM - with existing measures, shall encompass currently implemented and adopted PaMs; (ii) WAM - with additional measures, also encompass planned PaMs. In that case the status must be planned, and the implementation period must be in the future[2].

Romania's policy to combat climate change aims at both GHG reduction and increase resilience to the effects of climate change.

Cross-Cutting Measures. Measures in this section include those aimed at reducing emissions across the economy or across multiple sectors, including LULUCF. To achieve the overall objective of GHG reductions, a set of multi-sectoral policies and measures included in the WEM scenario has been developed at national level. These policies and measures are in line with the operational objectives of (i) Romania's Energy Strategy 2019-2030, with a view to 2050[3], and (ii) the National strategy for climate change and economic growth, based on low carbon emissions

[1] https://www.eea.europa.eu
[2] 2021_Reporting guidelines-GHG PaMs_GovRegArt18_v3.pdf
[3] http://www.mmediu.ro

for the period 2016- 2030, (iii) National Action Plan[4], as well as other strategies and documents that are considered crucial in the field of energy, change climate or ETS related and non-ETS industries.

National Integrated Energy and Climate Change Plan 2021-2030, it was built on a series of constitutive elements, essential for defining Romania's role and contribution to the consolidation of the Energy Union. In this regard, the main elements taken into account in the strategic approach of the Plan were the following: (i) economic growth and household income growth by 2030; (ii) the holistic approach to energy, the economy, the environment and climate change should be closely linked to the economic reality of the Member States, so that the macroeconomic and internal social balance is not affected; (iii) the dimension of energy security: implementation of projects included in the Energy Strategy of Romania 2019-2030, with perspectives for 2050; (iv) reducing energy poverty and accelerating the electrification of transport; (v) restructuring the market environment in the context of transition-induced costs and the ability of Member States to support these costs in terms of accessibility and competitiveness.

Romania's National Strategy for Sustainable Development on the horizon 2013-2020-2030 was achieved in 2008 and it was revised by GD no. 877/9 adopted in November 2018. The aim of the strategy is to stimulate the country's development to meet EU standards by ensuring that the principles and practices of sustainable development are incorporated into public programs and policies. Among other issues relevant to climate change mitigation and adaptation, the strategy recommends the initiation of a national sustainable forest management program including an increase in forest area of 200 kha through afforestation of degraded and abandoned land, establishment of the national forest curtain system, especially in areas affected by drought and desertification. The strategy highlights recent progress and the needs for energy efficient development, with substantial potential in rural areas of the country and by increasing the share of biomass-based energy in the national energy mix. The vision for Romania in its efforts to combat climate change is to become a low-carbon, climate-resilient economy that has integrated its climate change policies and actions into smart, green and smart economic growth, inclusive until 2030.

The main objective in the field of agriculture and rural development is to maintain a low level of GHG emissions from the Agricultural and LULUCF sector. Agriculture generates almost 15% of GHG emissions in the country in 2012, if we do not consider the change of land use and forestry. Although this percentage is higher compared to the EU-27 average of 10%, the intensity of GHG emissions per unit of agricultural production in Romanian agriculture is among the lowest in the region. Several of the measures attributed to other sectors influence GHG emissions-removals in the LULUCF sector as well. For this report, measures and policies listed as affecting carbon stocks in the LULUCF sector may be common to the Agriculture and Energy sectors.

Waste Sector:

- GEO no. 92/2021 regarding waste management, approved by Law no.17/2023
- GD no. 942/2017 approving the National Waste Management Plan
- GEO no. 2/2021 on landfill of waste.

[4] http://www.anpm.ro

3.1 Information on WEM projection scenario

This section provides information on adopted/implemented PaMs, which contribute to achieve the GHG emissions mitigation goals at national and EU level under the Convention provisions, taking into consideration the Kyoto Protocol and Paris Agreement goals. Also, this section presents information related to the expired PaMs, comparing with the previous submissions; the PAMs no longer in force were excluded from the PAMs table presented in Annex.

The PaMs considered the GHG emissions of each sector, the reduction potential and the national priorities for economic development.

The estimated total effect of implemented/adopted PaMs was calculated for groups of PaMs, in line with Regulation (UE) no. 1208/2020, as the difference between the GHG emissions in the WOM and WEM projection scenarios.

This approach was considered, mainly due to the lack of information related to the effects of individual PaM, the interaction among several PaMs and also the difficulty of estimation the effect of multi-sectoral policy.

The multi-sectoral PaMs included in the WEM projection scenario were:

- ***GD no. 877/2018 aproving Romania's Sustainable Development Strategy 2030,*** defining the national framework for implementing 2030 Agenda for Sustainable Development and promotes the development of Romania by focusing on three dimensions – economic, social and environmental; the specific dimensions where additional efforts and resources are needed to achieve the convergence objectives with the EU on the main indicators of sustainable development are presented in the following sections, at sectoral level;
- ***Law no. 278/2013 on industrial emissions***, including *Decisions establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU*;
- ***GD no. 780/2006 establishing the greenhouse gas emission allowance trading scheme*** (ETS), with further amendments and supplements;
- ***Regulation (EU) 2018/842*** *on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement****;***
- ***Law no. 220/2008 on establishing the promotion system for the production of the energy from renewable energy***, with further amendments and supplements; Romania contribution for achieving the EU target (32% renewable energy consumption in 2030) is established through the 2021-2030 Integrated National Energy and Climate Plan;
- ***Law no.121/2014 on energy efficiency***, with further amendments, ensuring necessary conditions for implementing measures to increase energy efficiency in all economic and social sectors; the national indicative contribution regarding energy efficiency for 2030 is established through the 2021-2030 Integrated National Energy and Climate Plan;
- ***The 2021-2030 Integrated National Energy and Climate Plan,*** adopted by GD no. 1076/2021, establishing the national targets and shares in the achievement of the 2030 EU climate change targets, as presented below:
    - *ETS emissions:* the national emissions reduction commitment is part of the EU's commitment to reduce GHG emissions related to ETS sector (43.9% lower than in 2005);

- Non-ETS emissions: according with *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement,* Romania GHG emissions reduction in 2030, in relation with 2005 level, is -2%;
- *Renewable energy*: Romania contribution for achiving the EU target (32% renewable energy consumption in 2030) consists in reaching a overal share of renewable energy in gross final energy consumption of 30.7% in 2030 (of which: RES-E share: 49.4%; RES-T share: 14.2%; RES-H&C share: 33.09%);
- *Improvement in energy efficiency:* Romania contribution for achiving the EU target (32.5% for improvements in energy efficiency in 2030), consists in reduction of primary energy consumption (45.1% compared to the PRIMES 2007 projection for 2030, meaning 32.3 Mtoe in 2030) and reduction of final energy consumption (40.4% compared to the PRIMES 2007 projection for 2030, meaning 25.7 Mtoe in 2030);

- ***GD no. 203/2019 on the approval of the National Action Plan for Energy Efficiency IV*** *(NAPEE IV),* establishing significant measures to increase energy efficiency, evaluating the energy savings achieved and establishing the energy savings expected to be achieved by 2020;
- ***National Recovery and Resilience Plan*** *(PNRR),* ensuring an optimal balance between EU priorities and Romania's development needs, in the context of recovery after the COVID-19 crisis, and containing interventions designed to support the implementation of the PNIESC 2021-2030; PNRR includes several components that shall directly contribute to the reduction of GHG pollutant emissions: *C1 Water Management, C3 Waste Management, C4 Sustainable Transport, C5 Renovation Wave, C6 Energy*;
- ***National programs for local and regional development****,* e.g.:
  - the programs managed by the Ministry for Development, Public Works and Administration aiming to improve the transport infrastructure and the wastewater management systems and to extend the connectivity to the natural gas transport system (e.g., *Anghel Saligny National Investment Program*);
  - the programs managed by the Ministry of Environment, Water and Forests. through the Environmental Fund Administration (AFM): *"Rabla Clasic", "Rabla Plus", "Realization of cycle tracks", "Recharging stations with normal power", "Photovoltaic Green House",* etc.

An overview of adopted/implemented multi-sectoral PaMs considered in the WEM projecton scenario, including the affected sectors are presented in the Table 3-2.

Table 3-1 Multi-sectoral policies and measures, WEM projection scenario

Policies and Measures	Affected sectors					
	Energy Supply	Energy Consumption	Industrial processes	Transport	Agriculture	Waste
GD no. 877/2018 aproving Romania's Sustainable Development Strategy 2030	YES		YES	YES	YES	YES
Law no. 278/2013 on industrial emissions, including BAT Conclusion	YES		YES		YES	YES
GD no. 780/2006 establishing the greenhouse gas emission allowance trading scheme	YES		YES			
Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030	YES	YES	YES	YES	YES	YES

contributing to climate action to meet commitments under the Paris Agreement				
Law no. 220/2008 on establishing the promotion system for the production of energy from renewable energy sources, with further amendments	YES	YES		
Law no. 121/2014 on energy efficiency	YES	YES	YES	
GD 1076/2021 for approval of the 2021-2030 Integrated National Energy and Climate Plan (PNIESC)	YES	YES	YES	
GD no. 203/2019 on the approval of the National Action Plan for energy efficiency IV (NEEAP IV)	YES	YES	YES	
Romania's National Recovery and Resilience Plan (PNRR)	YES	YES	YES	YES
National programs for local and regional development		YES	YES	YES

The links between multi-sectoral PaMs and their contribution to WEM projection scenario, including changes compared to previous submission are presented in the following table.

Table 3-2 Contribution of multi-sectoral PaMs, including changes compared to previous submission

PaM ID	PaM name	Changes compared to previous submission
1	GD no. 739/2016 approving the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2030 and the National Action Plan for implementation of the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2020	No change, not included in the projection scenario (previous ID 1)
2	GD no. 877/2018 approving Romania's Sustainable Development Strategy 2030	No change (previous ID2)
3	Law no. 278/2013 on industrial emissions, including BAT Conclusion	No change (previous ID3)
4	GD no. 780/2006 establishing the scheme for greenhouse gas emission allowance trading, with with subsequent amendments (including GD no. 393/2020)	No change (previous ID4)
-	Commitments up to 2020 for non-ETS sectors (ESD), establishing the Romania's GHG emission limit for 2020, compared to 2005 level, and the annual emission allocations at national level till 2020.	Not included in the projection scenario and PaMs tabel - implementing action is finalised (previous ID 5)
5	Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	No change, New name (previous ID6)
6	Law no. 220/2008 on establishing the promotion system for the production of energy from renewable energy sources, amended and completed by Law no. 139/2010	No change (previous ID7)
7	Law no. 121/2014 on energy efficiency	No change (previous ID8)
8	GD no. 1076/2021 for approval of the 2021-2030 Integrated National Energy and Climate Plan (PNIESC)	No change, New name (previous ID 9)
9	GD no. 203/2019 approving the Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)	No change (previous ID 13)
10	Romania's National Recovery and Resilience Plan (PNRR)	Moved from WAM to WEM

11	National programs for local and regional development	New PaM

Comparing with previous submission, the WEM projection scenario considered the latest historical inventory data, as a baseline data for projection, and one key PaM, previously included in WAM projection scenario - Romania's National Recovery and Resilience Plan, that shall directly contribute to the reduction of GHG emissions in several sectors (Energy industry, Transport, Other sectors, Waste).

Energy Sector

The evolution of the Energy sector is dependent on socio-economic and demographic development for meeting the energy demand on medium and long term, at the lowest possible price, adequate to a modern market economy and a civilized living standard, under quality and safety in supply conditions, in compliance with the sustainable development principles and in correlation with the EU energy - environment policy.

The promotion with priority of the energy efficiency policies and measures is required to ensure the energy need afferent to the development requirements, under sustainability conditions, as an alternative solution to the increase of energy sources.

Moreover, the use of renewable energy sources for the electricity and heating production should be encouraged.

Energy industry

The national energy regulation framework includes norms specific to the electricity and/or heating generation sector, as well as norms regarding the improvement of consumer energy efficiency.

The main PaMs considered in WEM projection scenario are presented below; the full list of PaMs considered for this sector are presented in excel format (Annex).

Romania's Sustainable Development Strategy 2030, approved by GD no. 877/2018, within the *Objective 7 Affordable and clean energy* establishes the following 2030 national targets that directly influence the GHG emissions related to the Energy sector:

- Expand electricity and gas distribution networks for ensuring household consumer, industrial and commercial access to safe sources of energy at acceptable prices
- Decouple the economic growth from the process of resource depletion and environmental degradation by substantially boosting of the energy efficiency (by a minimum of 27% compared with the status quo) and the extensive use of the ETS in stable and predictable market conditions
- Increase the share of renewable energy and low-carbon fuel used in the transport sector (electric vehicles), including the use of alternative fuels
- Ensure a stable and transparent regulatory framework in the field of energy efficiency in order to attract investments
- Strategically support the share of electricity in total household, industrial and transport consumption by establishing performance standards for facilities and equipment.

Romania's Energy Strategy for 2019 - 2030 period, with the perspective of 2050, updating the previous strategy, considering the demand and international obligations of Romania, but also the achievement of the optimal scenario for the development of the national energy system. The national strategic investments presented by the Romania's Energy Strategy for 2019 - 2030, with the perspective of 2050, are the following:

- Completion of groups 3 and 4 from NPP Cernavoda, with an installed capacity of 720 MW each (one group to be put into operation by 2030); by investment implementation, an additional energy input in the energy system of about 11 TWh, as well as an increase in installed capacity by 1,440 MW, shall be ensured
- New 600 MW group on lignite, with supercritical parameters, to enter in production after 2020; the group will be provided starting with 2035 with technology of capture, transport and geological storage of CO_2 (CSC)
- Construction of the Tarnița-Lăpuștești Pumped Hydropower Plant, with a capacity of 1,000 MW that could balance the electric power system for durations between 4-6 hours
- Construction of the Turnu Măgurele-Nicopole Hydrotechnical Complex of approx. 2,200 GWh/year, by the Danube river arrangemet on the sector downstream of the Portile de Fier I and II, until immediately downstream of the confluence with the Olt River, within the cooperation between the governments of Romania, Bulgaria and Serbia.

The ***Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)***, approved by GD 203/2019, establishing significant measures to increase energy efficiency, evaluating the energy savings achieved and establishing the energy savings expected to be achieved by 2020, considering NEEAP III as reference; for energy supply system, according with the National Action Plan for Energy Efficiency 2017-2020 for the energy supply system, the achievement of energy savings will be achieved through:

- Implementation of investment programs approved by ANRE for the period 2017-2020 for the transmission and distribution of electricity and heat;
- Promoting high efficiency cogeneration;
- Continuation of the program "District Heating 2006-2016 Heat and Comfort".

The ***2021-2030 Integrated National Energy and Climate Plan (PNIESC),*** approved by GD no. 1076/2021, involving the implementation of the following measures in order to achieve the targets established at national level, with direct implication for the energy sector:

Decarbonisation dimension:

- Decarbonisation of energy sector through promotion of investments in new low-carbon power generation capacities (replacement of existing conventional power generation capacities with new low carbon capacities on natural gases, nuclear energy and RES) and promotion of RES and energy efficiency projects;
- Decarbonisation of industrial sector, through implementation the best available technologies (BAT), in order to reduce GHG emissions and to increase energy efficiency in the industrial sector;
- Promotion of circular economy (recycling) for achieving the energy efficiency target by reducing consumption of energy used in the industry, in the processing of raw materials;

Energy efficiency dimension:

- Increasing energy efficiency in the industrial sectors regulated by ETS;

Energy security dimension:

- Assuring the flexibility of the energy system, through encouraging the development of energy storage capacities and high-efficiency cogeneration;

- Implementation of the Decarbonisation Plan of CE Oltenia, involving the development of new solar energy and micro-hydro- power capacities which will contribuite to the achievement of RES-E target and will ensure the diversification of energy sources.

GEO no. 53/2019 on the approval of the multi-annual investment financing program for the modernisation, rehabilitation, expansion or establishment of centralised thermal energy supply systems - the *Heating Program 2019-2027*, financing new investment and ongoing projects. Currently, funding for 7 UATs (Arad – 3 investment objectives, Giurgiu, Gheorgheni, Iași, Brad, Vatra Dornei, Suceava) has been requested.

PNRR - Component 6 Energy, addressing the main challenges of the energy sector in Romania in terms of decarbonisation and air pollution, ensuring the green transition and digitalisation of the energy sector by promoting the production of electricity from renewable sources, energy efficiency and future technologies. By PNRR, is envisaged:

- Replacement of coal in the energy mix, by: decommissioning the installed coal-based electricity production capacities (in 2025: 3,780 MW compared to the 2021 reference value of 1,695 MW); partial replacement with a gas-based electricity production or a combined electricity and gas thermal energy production, allowing the use of renewable and low-carbon gases of 1,300 MW; additional energy capacity from renewable sources (wind and solar) of at least 3,000 MW, commissioned and connected to the grid
- New capacities for electricity production from renewable sources (in 2024, additional 950 MW capacity of energy from renewable sources - wind and solar energy)
- Gas distribution infrastructure from renewable sources (natural gas in combination with green hydrogen, as a transitional measure), as well as green hydrogen production capacities and/or its use for electricity storage
- Flexible and highly efficient gas cogeneration capacities for the district heating sector (in 2025, 300 MW)
- Ensuring energy efficiency in the industrial sector.

The links between specific PaMs for this sector and their contribution to WEM projection scenario, including changes compared to previous submission are presented in the following table.

Table 3-3 Energy industry - Contribution of PAMs, including changes compared to previous submission

PaM ID	PaM name	Changes compared to previous submission
1	GD no. 739/2016 approving the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2030 and the National Action Plan for implementation of the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2020	No, change, not included in the projection scenario (previous ID 1)
2	GD no. 877/2018 approving Romania's Sustainable Development Strategy 2030	No change (previous ID2)
3	Law no. 278/2013 on industrial emissions, including BAT Conclusion	No change (previous ID3)
4	GD no. 780/2006 establishing the scheme for greenhouse gas emission allowance trading, with with subsequent amendments (including GD no. 393/2020)	No change (previous ID4)
-	Commitments up to 2020 for non-ETS sectors (ESD), establishing the Romania's GHG emission limit for 2020, compared to 2005 level, and the annual emission allocations at national level till 2020.	Not included in the projection scenario and PaMs tabel - implementing action is finalised (previous ID 5)

5	Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	No change, new name (previous ID6)
6	Law no. 220/2008 on establishing the promotion system for the production of energy from renewable energy sources, amended and completed by Law no. 139/2010	No change (previous ID7)
7	Law no. 121/2014 on energy efficiency	No change (previous ID8)
8	GD no. 1076/2021 for approval of the 2021-2030 Integrated National Energy and Climate Plan (PNIESC)	No change, New name (previous ID 9)
9	GD no. 203/2019 approving the Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)	No change (previous ID 13)
10	Romania's National Recovery and Resilience Plan (PNRR)	Moved from WAM scenario to WEM scenario
-	GD no. 1069/2007 approving the National Energy Strategy for 2007-2020	Not included in the projection scenario and PaMs tabel - implementing action is finalised (previous ID 10)*
12	National Energy Strategy for 2019 - 2030 period, with the perspective of 2050	No change (previous ID 11)
-	GD no. 122/2015 aproving the National Action Plan for Energy Efficiency (NAPEE III)	Expired, replaced by GD no. 203/2019, not included in the projection scenario and PaMs table, (previous ID 12)
-	National Action Plan for Energy from Renewable Energy Sources	Expired, not included in the projection scenario and PaMs table (previous ID 14)
13	GEO no. 64/2011 on the geological storage of carbon dioxide, approved by Law no. 114/2013	No change (previous ID 15)
14	GD no. 1090/2013 for establishing measures to apply Commission Regulations (EU) no. 327/2011, no. 206/2012 and no. 547/2012, implementing Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products	No change (previous ID 16)
15	GD no. 219/2007 on the promotion of cogeneration based on useful heat demand, amended by GD no. 846/2015	No change (previous ID 17)
-	GD no. 462/2006 for the approval of the “Heating 2006-2020 heat and comfort” National Program	Expired, replaced by GEO no. 53/2019, not included in the projection scenario and PaMs table (previous ID 18)
16	GEO no. 53/2019 for the approval of the multiannual program for financing investments for the modernization, rehabilitation, refurbishment and extension of the district heating system	No change (previous ID 19)
17	Law no. 123/2012 on electricity and natural gas	No change (previous ID 20)

Comparing with previous submission, the WEM projection scenario considered the latest historical inventory data, as a baseline data for projection, and one cross-sectoral key PaM, previously included in WAM projection scenario - Romania's National Recovery and Resilience Plan, aiming to ensure the green transition by decarbonisation of the energy sector and by promoting the production of electricity from renewable sources, energy efficiency and future technologies.

Transport

The transport activity holds an important role in the support of the economic and social development of Romania, in close correlation with the energy/fuel consumption and the GHG emissions.

The evolution of this economic activity sector indicates a significant increase of the number of vehicles registered in Romania. Therefore, is necessary to adopt the adequate measures leading to the decoupling of GHG emissions in the transport sector in relation to the economic growth, aiming to ensure sustainable development.

The objective in the Transport area is the development of a sustainable system improving social cohesion, access in peripheral areas, the reduction of environmental impact, including the reduction of GHG emissions, promoting economic competitiveness through the improvement of the infrastructure, ensuring an optimal fuel mix, as well as the use of biofuels from renewable plants and the use of information and communication technology to increase the efficiency of the sector.

The reduction of the CO_2 emissions generated by transport shall be carried out through an integrated, cost-efficient approach, combining innovation in the automobile propulsion technology area and the use of biofuels with the efforts made by the decisional factors and consumers on taking a new attitude in terms of the development of the economic sector.

The technical and financial options, competitiveness and, not lastly, social impact shall be considered in establishing the balance between the demand for mobility and the environmental protection requirements.

Romania's Sustainable Development Strategy 2030*,* approved by GD no. 877/2018, within the *Objective 9 Industry, innovation and infrastructure* establishes the following 2030 national targets that directly influence the GHG emissions related to the Transport sector:

- Modernize and develop quality, viable, sustainable and powerful regional and cross-border infrastructure, in order to support economic development and human well-being, with a focus on fair and equitable access by all
- Improve road safety.

In order to meet the target of 10% renewable energy share in the national energy final consumption in transports by 2020, considering the provisions of Directive 2003/30/EC and of Directive 2009/28/EC, transposed at national level by ***GEO no. 80/2018*** *for laying down the conditions for placing on the market gasoline and diesel fuel, introducing a mechanism for monitoring and reducing greenhouse gas emissions and laying down calculation and reporting methods for reducing greenhouse gas emissions and for amending and supplementing the Law no. 220/2008 on establishing the system for promoting the production of energy from renewable energy sources*, the suppliers have the following obligations concerning the fuels placed on the market:

- Diesel:
  - Biofuel content of at least 6.5% of the total volume traded in a calendar year
- Gasoline:
  - Till 31 December 2018, minimum 4.5 % volume-based biofuel content
  - From 1 January 2019, gasoline with a biofuel content of at least 8% of the total volume marketed to final consumers in a calendar year.

In accordance with the provisions of the same decision, the GHG emissions savings due to the use of biofuels and bioliquids, in comparison with GHG emissions from fossil fuels, shall be at least:

- 60% for biofuels and bioliquids produced in installations starting operation after 5 October 2015
- 50% for biofuels and bioliquids produced in installations in operation on or before 5 October 2015.

The ***General Transport Master Plan (GTMP),*** approved by GD no. 666/2016 (in force starting with 4.10.2016), as a planning strategic instrument for major investments in the transport sector that has the environmental strategic objective to develop a modern transport infrastructure considering the environmental effects, defines the following specific environmental objectives:

- Promotion transport investment projects contributing to the sustainable transport system performance, with measures to avoid and reduce negative effects, such as: air pollution emissions; noise pollution in urban areas and, on heavy traffic routes; water and soil pollution due to diffuse sources; impact on landscape and cultural heritage
- Reduction GHG emissions from the transport sector
- Protection the population's health by improving environmental and transport safety conditions
- Decrease the impact on biodiversity by ensuring measures for protection and preservation of biodiversity and ensuring the coherence of the national network of natural protected areas.

The Investment Program for the Development of Transport Infrastructure for the period 2021-2030, approved by GD no. 1312/2021, updating the GTMP implementation strategy and specifying the needs for the development of the transport infrastructure in Romania (6,624.1 km of road network -highways, expressways, transregions, bypasses, of which 2,900.5 km primary network and 3,723.6 km secondary network). For the railway network, the program envisages the construction of 3,274.8 km primary network and 1,228 km secondary railway network. The Program develops the strategy to ensure the necessary financing for the 10 years of implementation, starting from the correlation of the main sources of financing available to Romania: PNRR, POT 2021-2027, Connecting Europe Facility (CEF 2.0) and national budget.

Strategy for the development of railway infrastructure 2021-2025, approved by GD no. 985/2020, detailing the general strategy presented through the GTMP for the railway field. The Strategy identifies a series of strategic actions and priority measures for the modal balancing of the national transport system and for the reduction of the total costs supported by the national economy for ensuring mobility of people and goods.

The Action Program for the development of railway infrastructure and the modal transfer to the railway of passenger and freight transport flows, approved by GD no. 1302/2021, including for the reference period 2021-2026:

- Measures to increase the railway freight traffic, by at least 25% until 2026 compared to 2020
- Specific measures in order to achieve the objective of increasing the number of passengers in railway transport, by an average of 25% compared to the reference level of 2021
- Measures to increase the use of newly purchased rolling stock
- Passenger transfer measures from bus/minibus transport to railway transport.

The ***Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)***, approved by GD no. 203/2019, proposes significant measures to improve energy efficiency in the Transport sector, comparing with NAPEE III, by increasing the energy savings (by 6.2%). The potential energy savings in this sector in 2020, of 0.4127 Mtoe, are mainly based on the renewal of the cars fleet - cars and goods vehicles (0.200 Mtoe) and alternative mobility (0.165 Mtoe).

The 2021-2030 Integrated National Energy and Climate Plan, approved by GD no. 1076/2021, involves implementation of the following measures in order to achieve the targets established at national level, with direct implications for the transport sector:

Decarbonisation dimension:

- Decarbonisation of the transport sector, through Priority development and fostering the use of rail transport for transportation of passengers (to the detriment of road transport) and its intermodal integration with other modes of transport
- Promotion of use of renewable energy in transport (RES-T)

Energy Efficiency dimension:

- Developing and promoting alternative mobility and renewing the vehicle stock.

For the ***2021-2030*** period, according with ***the 2021-2030 Integrated National Energy and Climate Plan***, the Transport sector could contribute together with Industry and the Residential sectors to the achievement of the energy efficiency target (cumulative value of energy savings in the period of 10.12 Mtoe), in approximately equal shares (each with a percentage of 29%), by renewing the fleet, modernisation of urban and rail public transport, encouraging alternative mobility and promoting the use of electric vehicles.

PNRR, *Component 4 Transport*, aiming to develop the transport infrastructure to optimise travel speed, avoid traffic jams, improve the quality of services, reduce the impact on the environment and human health, as well as drastically reduce the number of road accidents. The implementation of the measures aims to discourage the use of polluting vehicles and to transfer the road traffic (passengers and goods) to railway transport untill 2026, compared to 2020.

PNRR, *Component 10 Local Fund*, aiming to increase access to sustainable and safe mobility solutions in urban and rural areas, through new zero-emission public transport vehicles, construction of 13,200 additional charging stations for electric vehicles and 1,091 km of cycle tracks at local/metropolitan level. The implementation of the measures aims to discourage the use of polluting vehicles and the transfer of road traffic (passengers and goods) to rail transport untill 2026, compared to 2020.

The ***Regulation (EU) 2019/631 setting CO_2 emission performance standards for new passenger cars and for new light commercial vehicles,*** repealing Regulations (EC) No. 443/2009 and (EU) No. 510/2011, in force from 1 January 2020, establishing the following provisions:

- Starting with 1 January 2020, the EU fleet-wide average emissions targets are: 95 g CO_2/km for new passenger cars and 147 g CO_2/km for new light commercial vehicles; until 2024, additional measures will be provided corresponding to a reduction of 10 g CO_2/km
- Starting with 1 January 2025, the EU fleet-wide average emissions targets for the new passenger car fleet and the new light commercial vehicles fleet shall be reduced with 15% comparing with 2021 target
- Starting with 1 January 2030, the EU fleet-wide average emissions targets shall be reduced comparing with 2021 target with 37.5% for the new passenger car fleet and with 31% for the new light commercial vehicles fleet
- Starting with 1 January 2025, a zero and low-emission vehicles' benchmark equal to a 15% share of the respective fleets of new passenger cars and new light commercial vehicles shall apply
- Starting with 1 January 2030, the following zero and low-emission vehicles' benchmarks shall apply: 35% share of the new passenger cars and 30% share of new light commercial vehicles.

Regulation (EU) 2019/1242 *setting CO_2 emission performance standards for new heavy-duty vehicles and amending Regulations (EC) no. 595/2009 and (EU) 2018/956,* aiming to reduce the specific CO_2 emissions of the UE fleet of new heavy-duty vehicles by 15% in 2025 and by 30% in 2030, compared with the reference CO_2 emissions for the period from 1 July 2019 to 30 June 2020.

Regulation (EC) no. 715/2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6).

The links between specific PaMs for this sector and their contribution to WEM projection scenario, including changes compared to previous submission are presented in the following table.

Table 3-4 Transport sector- Contribution of PaMs, including changes compared to previous submission

PaM ID	PaM name	Changes compared to previous submission
1	GD no. 739/2016 approving the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2030 and the National Action Plan for implementation of the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2020	Not included in the projection scenario (previous ID 1)
2	GD no. 877/2018 approving Romania's Sustainable Development Strategy 2030	No change (previous ID2)
-	Commitments up to 2020 for non-ETS sectors (ESD), establishing the Romania's GHG emission limit for 2020, compared to 2005 level, and the annual emission allocations at national level till 2020.	Not included in the projection scenario and PaMs tabel - the date the policy ended (previous ID 5)
5	Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	No change (previous ID6)
7	Law no. 121/2014 on energy efficiency	No change (previous ID8)
8	GD no. 1076/2021 for approval of the 2021-2030 Integrated National Energy and Climate Plan (PNIESC)	No change, New name (previous ID 9)
-	GD no. 122/2015 approving the National Action Plan for Energy Efficiency (NAPEE III)	Expired PaM, replaced by GD no. 203/2019, not included in the projection scenario and PaMs table (previous ID 12)
9	GD no. 203/2019 approving the Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)	No change (previous ID 13)
10	Romania's National Recovery and Resilience Plan (PNRR)	Moved from WAM scenario to WEM scenario
11	National programs for local and regional development	New PaM
21	GD no. 666/2016 for approving the General Transport Master Plan (GTMP)	No change (previous ID 24)
22	GD no. 1312/2021 for the approval of the Investment Program for the Development of Transport Infrastructure for the period 2021-2030	New PaM
23	GD no. 985/2020 for the approval of the Railway Infrastructure Development Strategy 2021-2025	New PaM
24	GD no. 1302/2021 for the approval of the Action Program for the development of railway infrastructure and the modal transfer to the railway of passenger and freight transport flows	New PaM
-	Order no. 457/2011 of the Ministry of Transport and Infrastructure approving the Strategy for intermodal transport units in Romania, amended by Order no. 1358/2012	Not included in the projection scenario and PaMs table -

		implementing action is finalized (previous ID 25)
25	GEO no. 40/2011 on the promotion of non-polluting and energy-efficient road transport vehicles, amended by GEO no. 9/2013	No change, applicable till 2021 (previous ID 26)
26	GEO no. 71/2021 regarding the promotion of non-polluting road transport vehicles, supporting the low-emission mobility, repealing the GEO no. 40/2011 and Law no. 37/2018 regarding the promotion of ecological transport	New PaM
27	GEO no. 80/2018 relating to the quality of petrol and diesel fuels and introducing a mechanism to monitor and reduce greenhouse gas emissions, with subsequent amendment (Law no. 311/2018)	No change (previous ID 29)
28	Regulation (EU) 2019/1242 setting CO_2 emission performance standards for new heavy-duty vehicles	New PaM
29	GD no. 116/2020 for establishing measures to apply Regulation (EU) 2018/956 on the monitoring and reporting of CO_2 emissions from and fuel consumption of new heavy-duty vehicles and Regulation (EU) 2019/631setting CO_2 emission performance standards for new passenger cars and for new light commercial vehicles	No change (previous ID 32)
-	GD no. 928/2012 concerning the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions, amended by GD no. 1308/2012 and GD no. 1121/2013	Expired, replaced by GEO no. 80/2018, not included in the projection scenario and PaMs table (previous ID 27)
-	GD no. 935/2011 promoting the use of biofuels and bio liquids, amended and supplemented by GD no. 1121/2013	Expired, replaced by GEO no. 80/2018, not included in the projection scenario and PaMs table (previous ID 28)
-	GD no. 90/2011 establishing measure for implementing Regulation (EC) no. 443/2009 setting emission performance standards for new passenger cars	Expired, replaced by GD no. 116/2020, not included in the projection scenario and PaMs table (previous ID 28)
-	GD no. 238/2012 for establishing measures to apply Regulation (EU) no. 510/2011 setting emission performance standards for new light commercial vehicles	Expired, replaced by GD no. 116/2018, not included in the projection scenario and PaMs table (previous ID 31)
30	GD no. 53/2012 for establishing measures to apply Regulation (EC) no. 1222/2009 on the labelling of tyres with respect to fuel efficiency and other essential parameters	No change till 2022, (previous ID 33)
31	GD no. 1417/2022 for establishing measures to apply Regulation (EU) no. 2020/740 on the labelling of tyres with respect to fuel efficiency and other essential parameters	New PaM starting with 2022, replacing GD no.53/2012
32	GO no. 15/2002 concerning the application of use and passage toll for national road network in Romania, with subsequent amendments	No change (previous ID 34)
33	Regulation (EC) no. 715/2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6), with subsequent amendments	No change (previous ID 35)
-	GD no. 817/2005 approving the Plan for long term strategy of the railway sector in order to restore the financial equilibrium of the infrastructure manager and the modernization of infrastructure	Not included in the projection scenario and PaMs table - implementing action is finalised (previous ID 36)
34	Law no. 155/2005 amending GEO no. 12/1998 regarding Romanian railway transport and the reorganization of the Romanian National Railway Company	No change (previous ID 37)

35	Law no. 34/2017 on deployment of alternative fuels infrastructure	No change (previous ID 38)

Comparing with previous submission, the WEM projection scenario considered the latest historical inventory data, as a baseline data for projection, one cross-sectoral key PaM, previously included in WAM projection scenario - Romania's National Recovery and Resilience Plan and several new PaMs establishing the development of the sector, as is presented in the previous table.

Other sectors (commercial/ institutional/ residential/ agriculture, forestry, fishery)

Land use is an important instrument for the evolution of society, as it is practically the spatial expression of its economic, social and ecological policies.

The National Long-term Renovation Strategy to support the renovation of the national residential and non-residential building stock, public and private, into a highly efficient and decarbonised building stock by 2030, approved by GD no. 1034/2020, forecasting an increase rate of renovations of the national building stock in order to improve energy efficiency, reduce GHG emissions and increase the share of renewable energy in total energy consumption.

According to the scenario recommended by the Strategy (scenario 2), the annual renovation rate shall register in the period 2021-2030 a gradual increase from 0.69% to 3.39%; the annual renovation rate in 2031-2040 period shall be 3.79% and in the 2041-2050 period shall be 4.33%.

NAPEE forecasts the co-financing of projects to increase energy efficiency for urban heating, the thermal rehabilitation of public buildings, for public lighting.

The enforcement of the EU regulations established under the “Eco-design” Directive shall lead to the electricity consumption reduction in the service and residential service due to the use of efficient lighting technologies, as well as of efficient equipment.

The ***Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)***, approved by GD no. 203/2019, proposes significant measures to improve energy efficiency for final energy consumer, comparing with NAPEE III, through:

- Introduction of new economic sectors: Construction (with energy savings of 31,800 toe) and Agriculture (with energy savings of 49,000 toe)
- Increase of projected savings in the following sectors: Residential (by approx. 19.65%), Services (by approx. 15.8%).

The 2021-2030 Integrated National Energy and Climate Plan, approved by GD no. 1076/2021, involves implementation of the following measures in order to achieve the targets established at national level, with direct implication for this sector:

Energy efficiency dimension:

- Increasing the energy efficiency in Residential sector through implementation of Long-Term Renovation Strategy, which will contribute to the achievement of the RES-E and RES-H&C targets for 2030.

For ***2021-2030 period***, according to the 2021-2030 Integrated National Energy and Climate Plan and in accordance with the National Long-term Renovation Strategy, the Residential sector shall contribute together with industry and transport to the achievement of the energy efficiency target (cumulative value of energy savings of 10.12

Mtoe in the covered period), in approximately equal shares (each with a percentage of 29%), through renovating buildings in order to increase energy efficiency and use of energy from renewable sources (solar thermal panels, photovoltaic panels, heat pumps).

PNRR, *Component 5 Renovation Wave*, aiming to accelerate the rate of renovation by financing moderate or deep energy renovation investments of multi-family residential buildings and public buildings, respectively the integrated renovation of multi-family residential buildings and public buildings (energy efficiency and seismic strengthening).

The PNRR 2021-2027 will finance the renovation of at least 4.3 million m² of residential buildings and 2.3 million m² of public buildings. By implementing the energy renovation measures, the following total primary energy savings are expected to be achieved: residential buildings of at least 0.15 Mtoe; public buildings of at least 0.0215 Mtoe.

PNRR, *Component 10 Local fund,* aiming to improve the provision of local public services through the moderate renovation of public buildings (area of 1,306,818 m^2) belonging to cities and communes.

GD no. 55/2011 on the establishment of ecodesign requirements for energy related products, including the EU Regulation related to ecodesign requirements for space heaters, domestic local space heaters, solid fuel boilers, solid fuel local space heaters, namely:

- *Commission Regulation (EU) No 813/2013 with regard to ecodesign requirements for space heaters and combination heaters,* establishing ecodesign requirements for the placing on the market and/or putting into service of space heaters and combination heaters with a rated heat output ≤ 400 kW;
- *Commission Regulation (EU) 2015/1188 with regard to ecodesign requirements for local space heaters,* establishing ecodesign requirements for the placing on the market and putting into service of domestic local space heaters with a nominal heat output of 50 kW or less and commercial local space heaters with a nominal heat output of the product or of a single segment of 120 kW or less;
- *Commission Regulation (EU) 2015/1189 with regard to ecodesign requirements for solid fuel boilers,* establishing ecodesign requirements for placing on the market and putting into service solid fuel boilers with a rated heat output of 500 kilowatt, applicable starting with 1 January 2020;
- *Commission Regulation (EU) 2015/1185 with regard to ecodesign requirements for solid fuel local space,* establishing ecodesign requirements for the placing on the market and putting into service of solid fuel local space heaters with a nominal heat output of 50 kW or less, applicable starting with 1 January 2022.

The links between specific PaMs for this sector and their contribution to WEM projection scenario, including changes compared to previous submission are presented in the following table.

Table 3-5 Other sectors - Contribution of PaMs, including changes compared to previous submission

PaM ID	PaM name	Changes compared to previous submission
1	GD no. 739/2016 approving the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2030 and the National Action Plan for implementation of the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2020	Not included in the projection scenario (previous ID 1)
-	Commitments up to 2020 for non-ETS sectors (ESD), establishing the Romania's GHG emission limit for 2020, compared to 2005 level, and the annual emission allocations at national level till 2020.	Not included in the projection scenario and PaMs tabel -

		implementing action is finalised (previous ID 5)
5	Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	No change (previous ID6)
6	Law no. 220/2008 on establishing the promotion system for the production of energy from renewable energy sources, with further amendments	No change (previous ID7)
7	Law no. 121/2014 on energy efficiency	No change (previous ID8)
8	GD no. 1076/2021 for approval of the 2021-2030 Integrated National Energy and Climate Plan (PNIESC)	No change, new name (previous ID 9)
-	GD no. 122/2015 approving the National Action Plan for Energy Efficiency (NAPEE III)	Expired, replaced by GD no. 203/2019, not included in the projection scenario and PaMs table (previous ID 12)
9	GD no. 203/2019 approving the Fourth National Action Plan for Energy Efficiency (NAPEE 2017 - 2020)	No change (previous ID 13)
10	Romania's National Recovery and Resilience Plan (PNRR)	Moved from WAM scenario to WEM scenario
11	National programs for local and regional development	New PaM
37	Law no. 372/2005 regarding the energy performance of buildings, with subsequent amendments	No change (previous ID 40)
38	GD no. 55/2011 establishing ecodesign requirements for energy-related products, including EU Regulation related to ecodesign requirements for space heaters, domestic local space heaters, solid fuel boilers, solid fuel local space heaters	New name (previous ID 41)
39	GD no. 217/2012 establishing the requirements for the identication by labelling and standard product information of the consumption of energy and other resources by energy-related products, amending GD no. 1039/2003	No change (previous ID 42)
40	GD no. 917/2012 establishing measures to apply Regulations (EU) no. 1059/2010, no. 1060/2010, no. 1061/2010, no. 1062/2010 and no. 626/2011, supplementing Directive 2010/30/EU	No change (previous ID 43)
41	GD no. 1490/2009 establishing measures for the implementation of the Regulations (EU) no. 1275/2008, no. 107/2009, no. 244/2009, no. 245/2009 and no. 278/2009, implementing Directive 2005/32/EC.	No change (previous ID 44)
42	GD no. 580/2011 establishing measures for the implementation of the Regulations (EC) no. 640/2009, no. 641/2009, no. 642/2009 and no. 643/2009, implementing Directive 2009/125/EC with regard to ecodesign requirements for energy-related products, amending GD no. 1039/2003 regarding labelling and energy efficiency requirements for household refrigerating appliances	No change (previous ID 45)
43	Strategy to stimulate investments in renovating residential and commercial buildings, both public and private, existing at national level (April 2014, updated in 2017)	No change (previous ID 46)
44	GD no. 1034/2020 for approval of National Long-term Renovation Strategy to support the renovation of the national residential and non residential building stock, public and private, into a highly efficient and decarbonized buiding stock by 2030	No change (previous ID 47)

Comparing with previous submission, the WEM projection scenario considered the latest historical inventory data, as a baseline data for projection, one cross-sectoral key PaM, previously included in WAM projection scenario - Romania's National Recovery and Resilience Plan and new PaM - National programs for local and regional development (e.g., extending the connectivity to the natural gas transport system, "Photovoltaic Green House").

IPPU Sector

It is essential for the drawing up of strategic documents on the development of the Romanian industry to also consider the need for a GHG emission analysis.

The reduction of emissions from Industrial Processes shall mainly be carried out through the enforcement of measures on increasing energy efficiency stipulated in the **NAPEE**, by optimizing technological flows and promoting green technologies.

Measures on the reduction of energy intensity identified by **NAPEE** for the industry sector include:

- Energy audits and efficient energy management
- Improving energy efficiency by supporting financing from European union funds
- Information campaigns
- Long term volunteer agreements in various sectors of the processing industry.

Romania's Sustainable Development Strategy 2030, approved by GD no. 877/2018, within the Objective 9 Industry, innovation and infrastructure establishes the following 2030 national targets that directly influence the GHG emissions:

- Rehabilitate the industrial sector to make it sustainable through a more efficient use of resources and increased adoption of clean and ecological industrial technologies and processes
- Boost the scientific research and modernize the technological capacity of the industrial sectors
- Promote inclusive and sustainable industrialization and increase the rate of employment.

By implementing adequate economic policy instruments between 2008 and 2030, the productivity of the used material and energy resources shall increase by a 3÷4% annual average rate, by reducing the shares of the energy-intensive sub-sectors, through the upgrade of technologies and management development.

Considering that Europe requires a strong, competitive, and innovative industry to be internationally competitive, based on excellence, clusters and cluster networks were promoted, as key factors of innovation and economic growth, through the development of a collaborative and multi-sectoral approach and through the stimulation of interactions between innovative participants.

Through public funds, the Romanian Government shall support the increase of competitiveness in industrial enterprises, the production of high added value products, the production of exported products, and respecting the environmental operating permits.

The industrial policy aims to implement the best technologies to increase energy efficiency and provide quality products for competitive prices, in accordance with environmental permits. The result is that the **industrial processes** require re-engineering operations and the use of new technologies for the efficient processing of raw material and energy resources, leading to the reduction of GHG emissions.

Regulation no. 517/2014 on fluorinated greenhouse gases (F-gases) which repeal Regulation No. 842/2006 are applying since 1 January 2015 and aim to reduce these emissions by two thirds in 2030 compared to 2015 levels.

Regulation lays down rules on the containment, use, recovery and destruction of F gases and prohibits the sale of certain products containing F-gases. Also, sets an annual limit on the overall climate impact of HFC which will be phased out between 2015 and 2030.

The Regulation establishes the following obligations:

- Prohibits the deliberate release of F gases if it is not technically necessary for the intended use of a product; manufacturers must strive to limit emissions during production, transport and storage of F gases
- Operators of equipment containing F gases must take every precaution possible to prevent any leakage and must ensure that equipment are regularly checked for leakage; requirements vary depending on the potential impact on the climate or how hermetically sealed they are
- National authorities are responsible for establishing training and certification programs for businesses and individuals involved in the installation, providing the service, maintenance, repair or decommissioning of equipment containing F gases, and recovery
- From 2015 until 2025, are phased ban on the sale of new items, such as certain types of refrigerators and freezers, air conditioning systems, foams and aerosols containing F gases, where safer and less polluting alternatives exist
- Annual limit for HCF quantities placed on the market in 2030 represent 21% of 2009-2012 levels; to ensure the compliance with the limits the Commission allocates producers and importers annual quotas which must not be exceeded
- Manufacturers, importers, exporters, users and businesses that destroy F gases must report annually to the Commission; importers of equipment containing F gases must do the same and, from 2017 must present evidence on accounting of the quantities of HFCs contained in imported equipment.

Directive 40/2006/EC (MAC Directive) on emissions from air conditioning systems of the motor vehicles provides the gradual replacement of air-conditioning systems using HFC-134a. It also limit the possibility of retrofitting motor vehicles with air conditioning systems designed to contain fluorinated greenhouse gases with a global warming potential higher than 150 and prohibit the charging of the air conditioning systems with such gases.

Automotive manufacturers must provide the competent authority all relevant technical information regarding the installed air conditioning systems and the gases used in the respective systems. If air conditioning systems designed to contain fluorinated greenhouse gases with a global warming potential higher than 150, the manufacturer must make available the leakage rate of these systems. The measures provided for in this Directive are expected to take effect from 2011.

Romania has adopted the ***Montreal Protocol Amendment*** on substances that deplete the ozone layer (Kigali Amendment, 2016) by Law no. 30/2020 published in the Official Gazette. no. 275/2 Apr. 2020. The Kigali Amendment sets emission limits for substances in category F (HFCs and HCFCs) by 2045.

The links between specific PaMs for this sector and their contribution to WEM projection scenario, including changes compared to previous submission are presented in the following table.

Table 3-6 IPPU sector - Contribution of PaMs, including changes compared to previous submission

PaM ID	PaM name	Changes compared to previous submission
1	GD no. 739/2016 approving the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2030 and the National	Not included in the projection scenario (previous ID 1)

	Action Plan for implementation of the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2020	
2	GD no. 877/2018 approving Romania's Sustainable Development Strategy 2030	No change (previous ID2)
3	Law no. 278/2013 on industrial emissions, including BAT Conclusion	No change (previous ID3)
4	GD no. 780/2006 establishing the greenhouse gas emission allowance trading scheme	No change (previous ID4)
-	Commitments up to 2020 for non-ETS sectors (ESD), establishing the Romania's GHG emission limit for 2020, compared to 2005 level, and the annual emission allocations at national level till 2020.	Not included in the projection scenario and PaMs table - implementing action is finalised (previous ID 5)
5	Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	No change (previous ID6)
48	Directive 40/2006/EC (MAC Directive) on emissions from air conditioning systems of the motor vehicles	No change (previous ID51)
49	Regulation (EU) no. 517/2014 related fluorinated greenhouse gases	No change (previous ID52)
50	The Amendament of the Montreal Protocol on substances that deplete the ozone layer, adopted in Kigali, on the XXVIII at Conference of Parties	No change (previous ID53)

Comparing with previous submission, the WEM projection scenario considered the latest historical inventory data, as a baseline data for projection.

Agriculture Sector

The National Strategy for Sustainable Development of Romania - Horizon 2013 - 2020 - 2030 (GD no. 1460/2008) focuses on the field of agriculture and food production on ensuring food security and food safety. Agriculture continues to play an important role in ensuring the income of a significant part of the active population. It will have to promote a sustainable production model with the protection of ecosystems and ensure the sustainability of food production, the reduction and elimination of imbalances on the agricultural market generated by the way natural resources are used, ensuring better capitalization of the advantages available to Romanian agriculture.

Within the National Strategy for Sustainable Development of Romania for agriculture and forestry, the following national objectives are considered:

- Horizon 2030. Full adoption of Community policies and practices in agriculture, forestry, and fisheries; completing the restructuring and modernization of these sectors and the rural area.

The National Rural Development Program 2014-2020 was approved according to the European Commission's Implementation Decision no C (2015)3508 of 26 May 2015, as amended. This program continues the efforts necessary for the development of the rural area made through the previous program (2007-2013) through the strategic approach of the following objectives:

- restructuring and increasing the viability of agricultural holdings
- sustainable management of natural resources and combating climate change
- diversifying economic activities, creating jobs, improving infrastructure and services to improve the quality of life in rural areas.

These objectives comply with the provisions of the Partnership Agreement and agree with the Common Agricultural Policy and the Europe 2020 Strategy.

The fulfillment of these objectives is achieved in the period 2014-2020 through the six EU priorities established in the framework of the Rural Development Regulation (1305/2013):

- encouraging knowledge transfer and innovation in agriculture, forestry, and rural areas (P1)
- increasing the viability of holdings and the competitiveness of all types of agriculture in all regions and the promotion of innovative agricultural technologies and sustainable forest management (P2)
- promoting the organization of the food chain, including the processing and marketing of agricultural products, animal welfare and risk management in agriculture (P3)
- restoring, conserving, and strengthening ecosystems that are linked to agriculture and forestry (P4)
- promoting the efficient use of resources and supporting the transition to an economy with low carbon emissions and resilience to climate change in the agricultural, food and forestry sectors (P5)
- promoting social inclusion, poverty reduction and economic development in rural areas (P6).

All these priorities have been transposed through areas of intervention and facilitate the achievement of objectives related to innovation, environmental protection and mitigating the effects of climate change and adapting to them.

In 2015, it was issued to the ***Order of the Minister of Agriculture and Rural Development, the Minister of Environment, Water and Forests and the president of the National Veterinary Sanitary and Food Safety Authority no. 352/636/54/2015*** for the approval of the rules regarding eco-conditionality within the schemes and support measures for farmers in Romania, with subsequent amendments. The rules in the annex to the Order are drawn up pursuant to art. 93 and 94, respectively annex II of Regulation (EU) no. 1306/2013 of the European Parliament and of the Council of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Regulations (EEC) no 352/78, (EC) no 165/94, (EC) no 2.799/98, (EC) no 814/2000, (EC) no 1,290/2005 and (EC) no 485/2008 of the Council.

Directive 91/676/EEC on the protection of waters against nitrite pollution from agricultural sources was transposed into Romanian legislation by GD no. 964/2004 approving the Action Plan for the protection of waters against nitrite pollution from agricultural sources. GD no 964/2000 provides that Romania re-examines, revises or completes at least once every 4 years, the list of designated nitrite vulnerable areas to take into account changes and factors that have occurred since the previous designation. Thus, in the joint Order 1552/2008 of the Ministry of the Environment and Sustainable Development and the Ministry of Agriculture and Rural Development, the list of localities by county where there are sources of nitrites from agricultural activities is approved. As a result of this approved list, the Interministerial Commission for the application of the Action Plan for the protection of waters against nitrite pollution from agricultural sources approved the Action Program for nitrite-vulnerable areas by Decision 21130/DC/14.10.2010. In accordance with this program, the provisions of the Code of Good Agricultural Practices for the protection of waters against nitrate pollution from agricultural sources approved by joint Order 1182/1270/2005 of the MMDD and MADR are mandatory in areas declared vulnerable to nitrate pollution. The nutrient management plan is carried out under the guidance of the Pedological, and Agrochemical Studies Offices based on the nutrient management framework plan drawn up and made available by MADR.

In Romania, there is a national system for integrated soil monitoring, supervision, control and decisions to reduce the input of pollutants from agricultural sources and for the management of organic residues from animal husbandry in vulnerable and potentially vulnerable areas to nitrite pollution, within the structures of the National

Integrated Monitoring System of Water Resources and Protected Areas, managed by the National Research - Development Institute for Pedology, Agrochemistry and Environmental Protection.

On February 20, 2020, a guide was published on facilities for the intensive breeding of farm animals, including meat birds, egg-laying birds, pigs and sows, approved by ***Order no 269/2020***.

The conclusions on the best available techniques (BAT) concern the following activities provided for in section 6.6 of Annex I to Directive 2010/75/EU, *"6.6. Intensive breeding of poultry and pigs"*, with capacities of over:

a. 40 000 places for poultry;
b. 2 000 places for production pigs (over 30 kg);
c. 750 places for sows.

These BAT conclusions cover the following on-farm processes and activities:

- nutritional management of poultry and pig feed administration;
- feed preparation (grinding, mixing and storage);
- raising (housing) poultry and pigs;
- collection and storage of animal manure;
- animal manure processing;
- the spreading of animal droppings on the ground (https://eur-lex.europa.eu).

The new Common Agricultural Policy (CAP), 2023-2027[5]. The new CAP will be key to securing the future of agriculture and forestry, as well as achieving the objectives of the ***European Green Deal***. The new CAP is a modernised policy, with a strong emphasis on results and performance and focuses on ten specific objectives, linked to common EU goals for social, environmental, and economic sustainability in agriculture and rural areas. The ten objectives of the new CAP are: 1. to ensure a fair income for farmers; 2. to increase competitiveness; 3. to improve the position of farmers in the food chain; **4. climate change action**; 5. environmental care; 6. to preserve landscapes and biodiversity; 7. to support generational renewal; 8. vibrant rural areas; 9. to protect food and health quality; 10. fostering knowledge and innovation.

One of the specific objectives of the new PAC is to **contribute to climate change mitigation and adaptation, as well as sustainable energy**. To achieve this objective, CAP aims to **enhance carbon sequestration** by increasing organic carbon and to **increasing sustainable energy in agriculture** by the production of renewable energy from agriculture and forestry.

Regarding the enhancement of carbon sequestration, this indicator estimates the *total organic carbon content in arable soils*. Soil organic carbon is the major component of soil organic matter and is extremely important in all soil processes. It is also important for the earth's ability to bind water and thus cope with large fluctuations in precipitation, which is important in terms of climate adaptation. The annual rate of loss of organic matter can vary greatly, depending on cultivation practices, the type of plant/crop cover, drainage status of the soil and weather conditions.

GD no. 1571/2022 establishing the general framework for the implementation of interventions related to the plant and animal husbandry sectors within the Strategic CAP Plan 2023-2027, financing from the European Agricultural Guarantee Fund and the state budget. CAP Strategic Plans support the transition towards a smart,

[5] https://agriculture.ec.europa.eu/common-agricultural-policy_en

sustainable, competitive, resilient and diversified agricultural sector, while ensuring long-term food security. They also contribute to climate action, the protection of natural resources and the preservation/enhancement of biodiversity, as well as strengthen the socio-economic fabric of rural areas.

Romania submitted its first proposal for a CAP Strategic Plan on 28 February 2022, after consultation of stakeholders. On 21 November 2022, Romania submitted a revised proposal, addressing the Commission's observations on the first draft. **The Commission approved this proposal on 7 December 2022**.

The strategic objectives of Romania's Plan are to develop a resilient and sustainable agricultural sector by increasing the economic viability of farms, reducing income disparities between farms, and increasing the market orientation and competitiveness of the agricultural sector as a whole. The plan will also support farmers who contribute to protecting the environment, increasing the welfare of farm animals, and ensuring a coherent socio-economic development of rural areas.

Romania's Plan is aligned with the EU's environmental and climate ambitions and aims at mitigating and adapting to climate change, sustainable development, efficient management of natural resources (water, soil, air) and conservation of biodiversity and landscapes. The enhanced standards for good agricultural and environmental conditions (GAECs) **further increase the environmental and climate ambitions** and represent minimal requirements for farmers. The way Romania is going to contribute to reducing climate change refers to the storage of carbon in soil and biomass. This means the share of used agricultural area (UAA) that is covered by commitments that benefit from support for reducing emissions or maintaining or improving carbon storage (including permanent grassland, permanent cover crops, wetland agricultural land and peatlands).

The links between specific PAMs for this sector and their contribution to WEM projection scenario, including changes compared to previous submission are presented in the following table.

Table 3-7 Agriculture sector - Contribution of PAMs, including changes compared to previous submission

PaM ID	PaM name	Changes compared to previous submission
1	GD no. 739/2016 approving the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2030 and the National Action Plan for implementation of the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2020	No change, not included in the projection scenario (previous ID 1)
2	GD no. 877/2018 approving Romania's Sustainable Development Strategy 2030	No change (previous ID2)
3	Law no. 278/2013 on industrial emissions, including BAT Conclusion	No change (previous ID3)
-	Commitments up to 2020 for non-ETS sectors (ESD), establishing the Romania's GHG emission limit for 2020, compared to 2005 level, and the annual emission allocations at national level till 2020.	Not included in the projection scenario and PaMs tabel - implementing action is finalised (previous ID 5)
5	Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	No change, New name (previous ID6)
53	Water Law no. 107/1996, amended by Law no. 112/2006	No change (previous ID 54)
54	National Rural Development Programme 2014-2020 (PNDR 2014-2020)	No change (previous ID 55)
55	Order no. 226/2003 for the approval of the Strategy on the organization of the activity for improvement and exploitation of the grazing land at national level on medium and long term	No change (previous ID 56)

56	GD no. 964/2000 on the approval of the Action Plan for water protection against pollution with nitrates of agricultural origin	No change (previous ID 57)
57	Order no. 344/708/2004 approving the technical rules on environment protection, particularly soil protection, when using sludge in agriculture	No change (previous ID 58)
58	GD no. 1261/2007 establishing measure for implementation of the Regulation (EC) no. 2003/2003 relating to fertilisers	No change (previous ID 59)
59	GEO no. 3/2015 approving payment schemes applicable in agriculture within the period 2015-2020, with subsequent amendments	No change (previous ID 60)
60	The new Common Agricultural Policy (2023-2027)	New PAM
61	GD no. 1571/2022 establishing the general framework for the implementation of interventions related to the plant and animal husbandry sectors within the Strategic CAP Plan 2023-2027, financing from the European Agricultural Guarantee Fund and the state budget. In force from December 30, 2022.	New PAM
62	Order 352/636/54/2015 for the approval of the rules regarding eco-conditionality within the schemes and support measures for farmers in Romania, with subsequent amendments	New PAM
63	Order 269/2020 Guideline regarding on facilities (Best Technique Available) for the intensive breeding of farm animals, including meat birds, egg-laying birds, pigs and sows	New PAM

Comparing with previous submission, the WEM projection scenario considered the latest historical inventory data, as a baseline data for projection, and one key PAM – Common Agricultural Policy and the GD no. 1571/2022 refering to Strategic CAP Plan 2023-2027 of Romania, previously included in WAM scenario.

LULUCF Sector

Government of Romania has committed to reducing emissions and increasing removals through actions in three key areas: (i) increasing stored carbon and advancing innovative practices; (ii) increasing the use of wood for construction; and (iii) generating bioenergy and advanced bioproducts.

- ***Government Decision no. 739/2016[6] for the approval of the Romania's national strategy regarding climate change and economic growth based on low carbon emissions (NSCCE)***[7]

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Implementing entity: MARD; MEWF
Interlinkages with projection-scenario: WEM
Covering: national
Quantified mitigation impact: (i) carbon conservation in existing forests, increase production in existing forests, increase the pool of harvested timber products, improve forest management, prevent deforestation, strengthen protection against natural disturbances, replace raw materials and GHG-intensive materials with harvested timber products; (ii) reduction of GHG emission levels

(A) promoting the transfer of knowledge and advisory services on climate change issues between farmers: *(A1)* providing services for farmers to acquire knowledge on methods to reduce GHG concentrations in the air

[6] https://legeaz.net/monitorul-oficial-831-2016/hg-739-2016-strategii-nationale-schimbari-climatice
[7] http://www.mmediu.ro/categorie/strategia-cresc

generated by activities key, animal husbandry and fertilizer use; *(A2)* promoting carbon sequestration technologies and practices, insulation of buildings, use of energy from renewable sources.

(B) investment support for farm modernization; this objective can be achieved by: *(B1)* encouraging investment in the creation of facilities and the purchase of high-performance equipment for the storage and use of manure; *(B2)* encouraging investment for increased energy efficiency of buildings / farms; *(B3)* encouraging the generation and use of energy from renewable sources on a small scale.

(C) promoting good agricultural practice: *(C1)* avoiding the use of mechanized machinery; *(C2)* prohibition/limitation of the use of chemical and organic fertilizers; *(C3)* reduction of the number of animals on pastures; *(C4)* use of crops with a high capacity to fix nitrogen in the soil; *(C5)* encouraging organic farming.

(D) promoting carbon sequestration in agriculture: *(D1)* incorporating plant matter into soil on agricultural land where green crops are grown.

- ***National Rural Development Program (NRDP)***[8]

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Implementing entity: MARD
Interlinkages with projection-scenario: WEM
Covering: national
Quantified mitigation impact: (i) carbon conservation in existing forests, increase production in existing forests, increase the pool of harvested timber products, improve forest management, prevent deforestation, strengthen protection against natural disturbances, replace raw materials and GHG-intensive materials with harvested timber products; (ii) reduction of GHG emission levels

It is a non-reimbursable EU financial instrument to support rural development and to unlock the rural economy and life. It contributes to the implementation of rural development priorities to meet national strategic objectives and EU CAP objectives. Many measures and sub-measures contained in the NRDP have an implicit potential to support LULUCF GHG reduction and adaptation actions. The scale of application of the measures differs depending on the specific, from the small farm to the large farms. Specific support measures range from better management of soil and land resources to promoting renewable energy production and use, from avoiding land abandonment and addressing emissions from the application of nitrogen fertilizers to green measures. The environmental and climate measures of NRDP 2014-2022, both in the case of permanent natural and semi-natural meadows, and in the case of traditional orchards used extensively or arable land, promote the practice of agriculture which involves avoiding or limiting the use of heavy machinery and avoiding chemicalization application of traditional agricultural techniques used, which are basically reduced to non-intensive grazing and the establishment of data and methods of mowing. They will promote the maintenance of priority habitats and important species, the traditional cultural background, as well as the rational use of natural resources. Efforts to date to achieve ambitious environmental protection targets are further supported by the NRDP 2014-2022, the allocation of environmental and climate measures in the current programming period, exceeding 30% of total EAFRD allocations. For the 2014-2022 programming period, special emphasis was placed on promoting the efficient use of resources, as well as on smart, sustainable and inclusive growth in agriculture and rural areas, in line with the objectives set by the Europe 2020 Strategy made available to Member States to achieve these objectives is the new package of environmental and climate measures of the NRDP 2020, addressed to agri-environment and climate practices - Measure 10, organic

[8] https://www.pndr.ro

farming - Measure 11 of areas facing natural constraints - Measure 13, they being implemented in Romania since 2015. The allocations of these Measures are consistent, with farmers being able to access the commitments in which amounts of approximately 2.623 billion euros are available, as follows:

(i) Measure 10 - 1.069 billion euros, agri - environment and climate. Measure to encourage the application of sustainable agricultural practices in relevant areas, in particular in areas of high natural value and in areas important for wild bird and butterfly species, Natura 2000 areas, with the aim of conserving biodiversity on agricultural land, protecting water and soil and reducing GHG emissions. It is also envisaged to increase the number of adult breeding animals from traditional local breeds in danger of abandonment.

(ii) Measure 11- 235.72 million euros, organic farming. The measure promotes the application of organic farming practices by providing financial support both for the conversion to organic farming methods and in maintaining organic farming practices.

(iii) Measure 13- 1.318 billion euros, payments for areas facing natural or other specific constraints. Aims to encourage the continuation of agricultural activities in areas facing natural or specific constraints.

- ***Joint Order no. 352/636/54/2015 on cross-compliance in support schemes and measures for farmers in Romania[9]***

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Implementing entity: MARD; NVSFSA; MEWF
Interlinkages with projection-scenario: WEM
Covering: national
Quantified mitigation impact: (i) increasing the cropland and grassland quality throug is SOC increases in mineral soils; (ii) reduction of GHG emission levels

Romania has established a set of rules that all beneficiaries are obliged to observe on all agricultural plots within the holding, including those for which they do not request support and those that are not used for production purposes. The cross-compliance norms refer to a series of standards constituted by the Good Agricultural and Environmental Conditions (GAEC) and the Legal Requirements in Management Matters (SMR), grouped by domains:

Soil and carbon stock: (i) minimum soil cover; (ii) minimum land management that reflects specific local conditions to limit erosion, (iii) maintaining soil organic matter levels, including a ban on burning arable stubble.

Landscape, minimum level of maintenance: (i) the preservation of landscape elements, including isolated trees and existing terraces on agricultural land, (ii) taking appropriate measures to prevent the installation of unwanted vegetation and to ensure a minimum level of maintenance of agricultural land.

- ***National Support Program in the Wine sector (NSPWS)[10]***

In the context of the continuous development of the Agricultural sector, it was decided to continue the national support programs in the wine sector for the next programming period, respectively for the period 2019-2023.

GHG affected: CO_2

[9] https://legeaz.net/monitorul-oficial-363-2015/ordinul-madr-mmap-ansvsa-352-2015/anexa-norme
[10] https://www.madr.ro/comunicare/4724-sprijin-european-acordat-sectorului-vitivinicol-in-perioada-2019-2023

Type of policy: regulatory
Implementing entity: MARD
Interlinkages with projection-scenario: WEM
Covering: national
Quantified mitigation impact: (i) prevention of soil erosion; (ii) maintain organic matter and soil structure; (iii) protecting biodiversity; (iv) reduction of GHG emission levels

Is based on the evaluation of the results obtained as a result of the implementation of previous national programs, namely the National Support Program 2009-2013 and the National Support Program of Romania in the wine sector 2014-2018 and on conducting an analysis of the needs of the Romanian wine sector. Through the National Support Program in the Wine Sector 2019-2023, Romania aims to restructure, annually, an area of vines of approx. 1000-1800 ha, which would represent an annual percentage of 0.5-1% of the total vineyard area. The important activities provided for in the "National Support Program for Vineyards and Wine Producers for 2019-2023", in the context of climate change, refer to the conversion of varieties, including grafting, relocation of vineyards, replanting due to compulsory deforestation, sanitary or phytosanitary products, as well as the modernization of vineyards by: (i) designing, (ii) installing/replacing a management and palisade support system, (iii) modernizing vine management through the transition from low to semi-high cultivation, and (iv) modernization of the support system by replacing the wires and installing 3 rows of wires, of which at least two doubles, to the management and fencing system to support the hubs, (v) installation of drip irrigation systems eligible for funding, including for winegrowers who have accessed restructuring programs - previous conversion of vineyards.

- ***GD on the organization, management and use of permanent pasture land in support of the implementation of GEO 34/2013***[11], in accordance with ***Regulation 1234/2007 EC***[12]

GHG affected: CO_2
Type of policy: regulatory
Implementing entity: MARD; MEWF
Interlinkages with projection-scenario: WEM
Covering: national
Quantified mitigation impact: (i) increasing the grassland quality throug is SOC increases in mineral soils; (ii) reduction of GHG emission levels

It focuses on improving the management of grazing land and conserving its total area as of 1 January 2007, although without land conversion restrictions. It also established the obligation of the owners to develop a pastoral management plan and establishes a register of grazing lands, organized by the local municipality. The decision is meant to fill a historical institutional gap regarding the management of grazing lands by allocating specific tasks to different local and county institutions.

- ***Law no. 220 of October 27***, 2008 for the establishment of the system for the promotion of energy production from renewable energy sources[13]

GHG affected: CO_2; CH_4; N_2O
Type of policy: Regulatory, Support
Implementing entity: Ministry of Energy
Interlinkages with projection-scenario: WEM

[11] https://legislatie.just.ro/Public/DetaliiDocument/147761
[12] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32007R1234
[13] https://www.engie.ro/wp-content/uploads/2021/07/Legea-nr-220-din-2008-actualizata.pdf

Covering: national
Quantified mitigation impact: reducing GHG emissions produced from instant oxidation of wood used for energy uses and reducing the pressure on the annual harvest

The mentioned law foresees to promote of the use of renewable resources for energy production and seeks to extend the renewable grid across Romania. Producers of energy from renewable sources benefit from several green certificates for the electricity produced and delivered according to the provisions; one or more green certificates are given for every 1 MWh based on specific guidelines.

Waste Sector

Waste management

Based on the continuous decrease and degradation of natural resources, as well as on the need to conserve them (mainly biological resources), the re-assessment of the anthropogenic origin waste management options is required, concerning the increase of the recovery level thereof and the drastic reduction of the quantities requiring disposal.

Judicious waste management is a mean to identify, totalize and assess eco -systemic services, to adopt the best decisions on environmental preservation, conservation and management, and, therefore, a means of GHG emission reduction.

Romania's Sustainable Development Strategy 2030*,* approved by GD no. 877/2018, within the *Objective 12 Responsible consumption and production* establishes the following 2030 national targets that directly influence the GHG emissions for this sector:

- Halving per capita the food waste at the level of retail and consumption and reduce food waste throughout the production and supply chain, including post-harvest losses
- Recycle 55% of municipal waste by 2025 and 60% by 2030
- Recycle 65% of packaging waste by 2025 (plastic materials 50%, wood 25%, ferrous metals 70%, aluminum 50%, glass 70%, paper and cardboard 75%) and 70% by 2030 (plastic materials 55%, wood 30%, ferrous metals 80%, aluminum 60%, glass 75%, paper and cardboard 85%)
- Implement the separate collection of household hazardous waste by 2022, of biological waste by 2023 and of textile waste by 2025
- Establish extended producer responsibility schemes for all types of packaging by 2024.

The ***National Waste Management Plan,*** approved by GD no. 942/2017, including clear and coherent measures to achieve the objectives of preparation for reuse and recycling of waste, in accordance with Article 11 (2) of Directive 2008/98/EC; the measures considered are mainly based on the existence and use of key economic instruments such as:

- Adequate storage rates (and/or prohibitions on the storage of recyclable waste)
- Incineration pricing policy able to favor recycling/reuse
- Other economic instruments identified during the elaboration of the plan, in accordance with the specific national situation
- Additional capacities for collection, treatment, recycling, if applicable
- In 2020 - gradual increase of the readiness degree for reuse and recycling of municipal waste - target of 50% of the total amount of recyclable waste generated, calculated by Method 2 of Annex I of Decision 2011/753 / EU, ensuring compliance current legal provisions

- In 2025 - gradual increase of the readiness degree for reuse and recycling of municipal waste - target in 2025 - 50% calculated by Method 4 of Annex I of Decision 2011/753/EU, correlated with the provisions of the proposed amendment to the Directive framework of the Circular Economy Package, published in December 2015.

The ***Circular Economy package***, adopted by the European Commission in December 2015, aiming to stimulate the transition to a circular economy at European level. The package includes legislative proposals on waste, as well as a related action plan. Waste proposals set long-term goals to reduce waste disposal and increase recycling and reuse.

The adoption of the circular economy package entails the revision of the following Directives:

- Directive 2008/98/EC on waste and repealing certain Directives
- Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157 / EEC
- Directive 2011/65/EC on restrictions on the use of certain hazardous substances in electrical and electronic equipment
- Directive 2012/19/EU on waste electrical and electronic equipment
- Directive 2000/53/EC on end-of-life vehicles
- Directive 94/62/EC on packaging and packaging waste.

Adopted in May 2018, following the inter-institutional negotiations between Parliament and the Council, the four Directives (Directive 2018/849 amending Directive 2000/53/EC on end-of life vehicles, Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators and Directive 2012/19/EU on waste electrical and electronic equipment, Directive 2018/850 amending Directive 1999/31/EC on the landfill of waste, Directive 2018/851 amending Directive 2008/98/EC on waste and Directive 2018/852 amending Directive 94/62/EC on packaging and packaging waste), include the following main elements:

- Reuse and recycling of 65% of the mass of municipal waste by 2035 (with an intermediate target of 55% by 2025 and 60% by 2030). To achieve this goal, Romania can benefit from an additional period of five years, provided that by 2025 and 2030, respectively, the preparation rate for reuse and recycling of municipal waste reaches a minimum of 50% and 60% by weight
- Reuse and recycling of 65% of the weight of all packaging waste by 2025 and at least 70% by 2030. Minimum targets are also set for the preparation for reuse and recycling of specific materials contained in packaging waste for both 2025 and for the year 2030
- Storage of a maximum of 10% of municipal waste by 2035. Romania may benefit from an additional period of five years provided that by 2030 the amount of municipal waste stored is reduced to 20% of the total amount of waste generated
- Prohibition of the storage of separately collected waste, which requires the separate collection of biological waste until 2023 and textiles and hazardous waste from households until 2025
- Promoting economic instruments to discourage storage
- Simplified and improved definitions and harmonised methods for calculating recycling rates at EU level
- Promoting reuse and stimulating industrial symbiosis - transforming a by-product of one industry into a raw material for another industry
- Economic incentives for manufacturers to market greener products and support recycling and recovery schemes (eg for packaging, batteries, electrical and electronic equipment, vehicles)

- Reducing the generation of food waste in primary production, processing and processing, in wholesale and retail trade, in restaurants and food services, as well as in households.

The action plan provides for measures aimed at closing the loop of the circular economy, following all stages of the life cycle of a product: from production and consumption, to waste management and the secondary raw materials market.

PNRR, Component C3 Waste Management, aiming to accelerate the process of expansion and modernization of waste management systems in Romania based on separate collection, prevention measures, reduction, reuse and recycle in order to comply with the applicable directives and the transition to the circular economy. This component includes the adoption of the National Strategy for Circular Economy and the Action Plan (Q3 2022).

Wastewater treatment

The legislation in force shall be observed to prevent the pollution of surface water sources with waste waters resulting from anthropogenic sources. The legislation mainly refers to the quality indicators of the waste waters discharged in tributary streams.

The basis of the European Union legislation on waste waters is Directive 91/271/EEC of May 21st, 1991 on the treatment of urban waste waters, amended and supplemented by Commission Directive 98/15/EC of February 27th, 1998. Directive 91/271/EEC was fully transposed in the Romanian legislation by Romanian Government Decision no. 188/2002 approving certain norms on the conditions for the aquatic discharge conditions of wastewater, amended and supplemented by Romanian Government Decision no. 352/2005. GD no. 188/2002 contains the following capital importance annexes in the collection, transport, treatment and discharge of waste waters:

- Annex 1. Technical norms on the collection, treatment and discharge of municipal waste waters, NTPA – 011
- Annex 2. Norm on the conditions on the discharge of waste waters in the sewage systems of localities and directly in treatment stations, NTPA – 002
- Annex 3. Norm on establishing the pollutant loading limits of industrial and municipal waste waters, on discharge in natural receptors, NTPA – 001.

The main objective of Directive 91/271/EEC is to protect the environment from the negative impacts of the discharges of urban waste waters and of waste waters from certain industrial sectors (mainly food industry product processing and manufacturing).

In Romania, the European legislation on the treatment of wastewater and discharge in the aquatic environment was transposed between 2002 and 2005, however, implementation stages for full conformity with the Directive requirements are still required.

Considering both Romania's positioning in the hydrographic basin of the Danube River and in the Black Sea basin, as well as the need for environmental protection in such areas, Romania declared its entire territory as a sensitive area. The decision materializes through the fact that agglomerations with over 10,000 equivalent inhabitants shall ensure an infrastructure for the treatment of urban waste waters enabling advanced treatment, particularly in terms of the nitrogen and phosphor nutrients. Secondary treatment (the biological step) is a general rule for agglomerations under 10,000 equivalent inhabitants.

The Directive implementation terms vary and depend on the size of the agglomeration and the impact thereof on the receptor waters. The final transition term for the implementation of the Directive was set for December 31st, 2018, with interim terms for the collection and treatment of urban waste waters.

Measures for the limitation and/or reduction of GHG emissions resulting from the treatment of household waste waters are as follows:

- Increasing the connection level to wastewater sewage and treatment services
- Construction and commissioning new wastewater treatment stations
- The rehabilitation and upgrade of the existing wastewater treatment stations
- Using modern, low power technologies
- The automation of the wastewater treatment facility operation, with positive implications on the optimum operation thereof, respectively the avoidance of methane gas emissions
- Collecting household sludges per geographic areas, the processing thereof through anaerobic fermentation in modern and safe biogas production facilities.

Romania's Sustainable Development Strategy 2030, approved by GD no. 877/2018, within the *Objective 6 Clean water and sanitation* establishes the following 2030 national targets that directly influence the GHG emissions for this sector:

- Substantially increase the efficiency of water use in industrial, commercial, and agricultural activities; expand the rational reuse of treated and recycled water in order to meet the requirements of a circular economy
- Connect at least 90% of households in towns, communes and compact villages to the drinking water and sewerage network
- Improve water quality by reducing pollution, eliminating waste disposal and reducing to a minimum the amount of chemical products and dangerous substances, thereby reducing the proportion of untreated waste water and significantly increasing recycling and safe reuse.

PNRR, Component 1 Water management, aiming to increase the degree of access of the population, especially in rural areas, to a public water and sewerage service in accordance with the requirements of European directives, accessible to all social categories.

The links between specific PaMs for this sector and their contribution to WEM projection scenario, including changes compared to previous submission are presented in the following table.

Table 3-8 Waste sector - Contribution of PaMs, including changes compared to previous submission

PaM ID	PaM name	Changes compared to previous submission
1	GD no. 739/2016 approving the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2030 and the National Action Plan for implementation of the National Climate Change and Low Carbon Green Growth Strategy for period 2016 – 2020	Not included in the projection scenario (previous ID 1)
2	GD no. 877/2018 approving Romania's Sustainable Development Strategy 2030	No change (previous ID2)
3	Law no. 278/2013 on industrial emissions, including BAT Conclusion	No change (previous ID3)

-	Commitments up to 2020 for non-ETS sectors (ESD), establishing the Romania's GHG emission limit for 2020, compared to 2005 level, and the annual emission allocations at national level till 2020.	Not included in the projection scenario and PaMs tabel - implementing action is finalised (previous ID 5)
5	Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	No change (previous ID6)
10	Romania's National Recovery and Resilience Plan (PNRR)	Moved from WAM scenario to WEM scenario
11	National programs for local and regional development	New PaM
80	Law no. 211/2011 regarding waste management, with subsequent amendments	No change (previous ID 69)
81	GEO no. 92/2021 regarding waste management, approved by Law no. 17/2023	New PAM, replacing starting with 2021 the Law no.211/2011
-	GD no. 870/2013 approving the National Strategy on Waste Management 2014-2020	Not included in the projection scenario and PaMs tabel - implementing action is finalised (previous ID 70)
82	GD no. 942/2017 approving the National Waste Management Plan	No change (previous ID 71)
-	GD no. 621/2005 on the management of packaging and packaging waste, amended and supplemented by GD no. 1872/2006 and GD no. 247/2011	Expired, replaced starting with 2015 by Law no. 249/2015, not included in the projection scenario and PaMs table (previous ID 72)
83	Law no. 249/2015 regarding the method of managing packaging and packaging waste, with subsequent amendments	New PAM
-	GD no. 1037/2010 regarding waste from electric and electronic equipment	Expired, replaced starting with 2015 by GEO 5/2015, not included in the projection scenario and PaMs table (previous ID 74)
84	GEO no. 5/2015 regarding waste from electric and electronic equipment	No change (previous ID 75)
85	GD no. 349/2005 on landfill of waste, amended and supplemented by GD no. 201/2007 and GD no. 1292/2010	No change (previous ID 76)
86	GEO no. 2/2021 on landfill of waste	New PaM
87	Law no. 181/2020 regarding the management of compostable non-hazardous waste	New PaM
88	GD no. 188/2002 for the approval of certain norms concerning the conditions of discharging the waste water into aquatic environment, with subsequent amendments	No change (previous ID 77)

Comparing with previous submission, the WEM projection scenario considered the latest historical inventory data, as a baseline data for projection, one cross-sectoral key PaM, previously included in WAM projection scenario - Romania's National Recovery and Resilience Plan, aiming to promote action to increase the degree of access to a public water and sewerage service and to accelerate the modernisation of waste management systems and the National programs for local and regional development aiming to improve wastewater management systems.

3.2 Information on WAM projection scenario

This section provides information on planned PaMs, which contribute to achieve the GHG emissions mitigation goals at EU level and of the Convention taking into consideration the Kyoto Protocol.

The planned PaMs took into considerations the GHG emissions of each sector, the reduction potential and the national priorities for economic development.

The estimated overall effect of planned PaMs was calculated for groups of policies and measures, as the difference between the GHG emissions in the WEM and WAM projection scenarios.

The PaMs included in the WAM projection scenario includes a set of additional measures that are likely to be implemented by accessing the available funding sources at national level.

The planned PaMs at the national level applying on several sectors are the following:

The Sustainable Development Operational Program (PODD) 2021 -2027[14]***,*** with the following policy objectives relevant to climate change, the GHG emission reduction component:

- Promoting energy efficiency measures, developing smart energy systems and GHG emissions reduction, by financing the thermal energy supply systems in centralized system, respectively the heating networks, including thermal points
- Promoting the use of renewable energy sources, by financing investments in new capacities or in the modernisation of existing capacities for the production of electricity/thermal energy from biomass/biogas and in new capacities or in the modernisation of capacities for the production of thermal energy from geothermal water
- Input of gases from renewable sources and gases with low carbon emissions into the system
- Improving energy efficiency at the industrial consumer's level
- Increasing the degree of collection and purification of urban wastewater
- Efficient waste management in order to accelerate the transition to the circular economy

The ***Regional Operational Programs (POR) 2021-2027***[15]***,*** developed for the sustainable and balanced development of the 8 development regions of Romania, having the following policy objectives relevant to the climate change, the GHG emissions reduction component:

- Improving energy performance in the buildings sector for achieving the PNIESC 2021÷2030 objectives
- Increasing regional connectivity and ensuring access to mobility for all areas, including the rural areas
- The construction/expansion/modernisation of urban public transport and urban/suburban electric public transport routes, the infrastructure intended for the bicycles use and investments intended for the purchase of rolling stock (trams) in order to reduce the degree of use of personal vehicles

[14] The Sustainable Development Operational Program 2021 -2027, version submitted to EC on 8 July 2022, https://mfe.gov.ro/minister/perioade-de-programare/perioada-2021-2027/

[15] The Regional Operational Programs 2021-2027, submitted version to EC: PO București- Ilfov, 23 July 2022; POR Vest, 18 May 2022; POR Sud Muntenia, 25 May 2022; POR Sud-Vest Oltenia, 25 May 2022; POR Nord-Vest, 26 May 2022; POR Nord-Est, 30 May 2022; POR Sud-Est, 30 May 2022; PO Centru, 30 May 2022, https://mfe.gov.ro/minister/perioade-de-programare/perioada-2021-2027/

The ***Just Transition Operational Program (POTJ) 2021-2027***[16]***,*** responding to the investment needs defined at the territorial plans level developed for 6 counties (Gorj, Hunedoara, Dolj, Galați, Prahova and Mureș);

PaMs planned to be implemented at EU level, respectively the EU package of proposals "***Fit for 55***", revising and updating the EU legislation in the field of climate, energy and transport and including the following EC proposals, currently in the negotiation process with the European Parliament:

- ***The proposal on the revision of the EU Emissions trading system (ETS)***, which should lead to a global reduction of GHG emissions in the targeted sectors by 62% by 2030, compared to 2005, by:
    - Expanding the EU ETS scope, by: including maritime transport within the scope of the EU ETS; phasing out the free allocation for the aviation sector and for sectors to be subject to the carbon border adjustment mechanism; implementation of the global carbon offsetting and reduction scheme for international aviation; increasing funding available from the modernisation fund and the innovation fund;
    - A new, self-standing emissions trading system for the buildings and road transport, which would lead to a reduction of emissions associated with these sectors of 43% by 2030, compared to 2005;
- ***The Proposal on the revision of the Effort Sharing Regulation (ESR),*** which increases the objective of reducing GHG emissions at the EU level from 29% to 40%, compared to 2005, and updates the objectives at the MS level; *for Romania, the reduction commitment proposed for the non-ETS sector in 2030 is -12.7% compared to 2005;*
- ***The Proposal for a Directive amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and of the Directive 98/70/EC as regards the promotion of energy from renewable sources,*** which sets as a mandatory objective at EU level, a share of energy from renewable sources in the global energy mix of 40% by 2030, compared to the current level of at least 32%; MS will need to increase their national contributions set out in their integrated national energy and climate plans, due to be updated in 2023 and 2024, to collectively reach the new target;

  The Directive proposal establishes the following objectives at the sectoral level:

  Transport sector:
    - Reduction of GHG intensity in the transport sector of at least 13% by 2030 **or** a binding target of at least 29% renewable energy within the final energy consumption in the transport sector by 2030;
    - Establishing a cap for MS related to the amount of final energy consumption in the maritime sector, depending on the share of maritime in the gross final consumption of energy;

  Heating and cooling sector:
    - The mandatory increase of the share of energy from renewable sources in this sector applicable for all MS, of 0.8% per year at the national level between 2021-2026 and 1.1% in the period 2026-2030; the minimum average annual rate applicable to all MS should be complemented with additional indicative increases calculated specifically for each MS - *for Romania, the additional indicative increases are at least 0.6% for the period 2021-2025 and at least 0.3% for the period 2026 -2030. The weight resulting from the additions, without residual heat and cooling, is 1.4%;*

  Industrial sector:

[16] The Just Transition Operational Program, https://mfe.gov.ro/minister/perioade-de-programare/perioada-2021-2027/

- MS shall increase the share of energy from renewable sources in the amount of energy used for final energy and non-energy purposes – of least 1.1 percentage points as average annual calculated for the period 2021-2025 and 2026-2030;
- MS ensures that by 2030, 35% of the hydrogen used in industry should come from renewable fuels of non-biological origin; the percentage should increase to 50% by 2035;

Buildings sector:

- MS shall define an indicative national share of renewable energy in final energy consumption in their building sector in 2030, included in their integrated national energy and climate plan, consistent with EU indicative target of at least a 49% renewable energy share in buildings in 2030;

- ***The Proposal for a recast of Energy Efficiency Directive***, which establishes the reduction of energy consumption at EU level by 36% for final energy consumption and by 39% for primary energy consumption until 2030; the MS contribution to the EU target will be set out in the integrated national energy and climate plans to be updated in 2023 and 2024;

  In order to meet *the energy savings target* for final energy consumption, the MS would ensure savings of 1.1% of annual final energy consumption from 1 January 2024; 1.3% from 1 January 2026 and 1.5% from 1 January 1 2028 to 31 December 2030, with the possibility to carry over a maximum of 10% of excess savings in the following period.

  For the *public sector*, annual energy consumption reduction of 1.7% (or alternatively at least 1.9% each year if public transport or the armed forces are excluded) and annual renovation of at least 3% of the total floor area of buildings owned by public bodies.
- ***The Proposal for a Regulation on the deployment of alternative fuels infrastructure,* for** ensuring a sufficient infrastructure network for **recharging of light electric vehicles, electric heavy-duty vehicles and hydrogen refueling and for the power supply of ships** at the quayside in ports**; for each type of vehicle, specific requirements are established for MS in order to ensure refueling with alternative fuels and electricity supply, respectively:**
  - Light electric vehicles: power requirements to be provided based on the size of the registered vehicle fleet and TEN-T network coverage requirements in 2025 and 2030;
  - Heavy duty vehicles and hydrogen refueling: requirements for TEN-T network coverage by 2030, starting in 2025 for electric heavy-duty vehicles;
  - Electricity supply to ships at the quayside in ports: requirements applicable from 2030;
- ***The Proposal on CO_2 emission performance standards for cars and vans,*** establishing CO_2 emission reduction targets of 55% for cars and 50% for vans by 2030; by 2035, for new cars and vans, the CO_2 emission reduction target is 100%, by banning the introduction of internal combustion cars and vans on the EU market;
- ***The proposal for the revision of the Directive on the taxation of energy products and electricity,*** aiming to move from a taxation based on volume to a taxation based on energy content, establishing a ranking of rates according to environmental performance, as well as by limiting the incentives for the fossil fuels use;
- ***The Proposal for a Regulation on the carbon border adjustment mechanism***, aiming to prevent the relocation of carbon emissions through imports from non-EU countries (excepting Iceland, Liechtenstein, Norway and Switzerland) of products with high CO_2 emissions from the cement, aluminum, fertilizer, electricity, cast iron, iron and steel sectors and encouraging carbon pricing policies to combat climate change;

- ***The Proposal for a Regulation on ensuring a level playing field for sustainable air transport*** (*ReFuelEU* in the aviation field), aiming to reduce the environmental footprint of the aviation sector, through fuel suppliers obligation to ensure that all fuels made available to operators of aircrafts at EU airports contain a minimum share of sustainable aviation fuels (SAF) from 2025 and, from 2030, a minimum share of synthetic fuels, with a progressive increase of these shares until 2050; the general approach also foresees an increase in the minimum share for 2030 from 5 to 6%;
- ***The Proposal for a Regulation on the use of fuels from renewable sources and with low carbon dioxide emissions in maritime transport*** (*FuelEU* in the maritime field), aiming to reduce the intensity of GHG emissions generated by the energy used on board ships by up to 75% by in 2050, by promoting the use of greener fuels by ships and the obligation to use shore power sources or zero-emission technologies in ports under the jurisdiction of an MS; according to the proposed Regulation, starting from 1 January 2030, post-container ships and passenger ships at the quayside in ports under the jurisdiction of an MS, connect to a source of electricity supply from the shore and use it to ensure the necessary their electricity;
- ***The Proposal for a Regulation on methane emissions reduction in the energy sector and amending Regulation (EU) 2019/942,*** aiming to reduce the methane leals from oil and gas sector and coal sector (underground mines and surface mines); In the coal sector, flaring shall be prohibited from 1 January 2025 and venting shall be prohibited in coal mines (from 1 January 2027 for coal mines emitting more than 5 tonnes of methane/kilotonne of coal mined; from 1 January 2031 for coal mines emitting more than 3 tonnes of methane/kilotonne of coal mined); v**enting and flaring** from closed and abandoned mines will be banned from 1 January 2030;
- ***The Proposal for a Regulation establishing the Fund to mitigate the social impact of climate actions***, aiming to support vulnerable consumers (households, micro-enterprises and transport users) through temporary direct income support and through measures and investments aimed at increasing energy efficiency of buildings, the decarbonisation of heating and cooling of buildings, including the integration of energy from renewable sources and the provision of improved access to zero and low emission mobility and transport;

  Each MS will submit to the EC a Plan for mitigating the social impact of climate actions, together with the update of the Integrated National Energy and Climate Plan which will include national projects for:
  - Financing measures and investments aimed at increasing the energy efficiency of buildings, implementing measures to improve energy efficiency, renovating buildings and decarbonising the heating and cooling of buildings, including the integration of energy production from renewable energy sources;
  - The financing of measures and investments aimed at increasing the use of mobility and transport with zero and low emissions.

EU Methane Action Plan – EEAS, outlining the existing EU policies as well as the ongoing review of these policies and additional new policies to achieve even higher CH_4 emission reductions in several sectors – energy, agriculture and waste.

The EU package of proposals "Fit for 55", under negotiation with the European Parliament, involves significant changes of EU climate, energy and transport legislation, focusing on the EU's climate objectives, generally not mention the national contributions; specific national contribution will be established through the integrated national energy and climate plans (to be updated in 2023 and 2024). Therefore, part of the expected effects of the implementation of the EU package of proposals "Fit for 55", were considered for the GHG emission projection, WAM scenario, presented below at sectoral level.

An overview of planned PaMs considered in the WAM projecton scenario per sectors are presented in the following table. These planned PaMs replace the previous submitted PaMs.

Table 3-9 Contribution of PAMs to WAM scenario, including changes compared to previous submission

PaM ID	PaM name	Sector	Changes compared to previous submission
19	Modernization of the industrial sector	Enegy consumption	Same name, new PaM replacing the previous one (old ID 22)
20	Modernization of the energy sector to cover the demand for electrical and thermal power	Energy supply	Same name, new PaM replacing the previous one (old ID 23)
36	Modernization of the transport system	Transport	Same name, new PaM replacing the previous one (old ID 39)
45	Modernization of the residential sector	Energy consumption	Same name, new PaM replacing the previous one (old ID 48)
46	Modernization of the services sector	Energy consumption	Same name, new PaM replacing the previous one (old ID 49)
47	Modernization of the agricultural sector	Energy consumption	Same name, new PaM replacing the previous one (old ID 50)
51	National Competitiveness Strategy 2021-2027	Industrial processes	New PaM
52	Strategy for Circular Economy 2030	Industrial processes	New PaM
64	WD 13341/2022 EU Methane Action Plan – EEAS	Agriculture	New PAM
70	GD no. 877/2018 aproving Romania's Sustainable Development Strategy 2030	LULUCF	New PAM
71	EU Farm to Consumer Strategy	LULUCF	New PAM
72	EU Biodiversity Strategy for 2030	LULUCF	New PAM
73	GD no. 1076 for the approval of the National Integrated Plan in the field of energy and climate change 2021-2030	LULUCF	New PAM
74	Decision No. 933/2022. National Strategy for research, innovation and smart specialization 2022-2027	LULUCF	New PAM
75	Decision no. 195/2022 for the approval of the State Aid Scheme regarding the support of investments intended to promote the production of energy from less exploited renewable sources, namely biomass, biogas, geothermal energy, and the State Aid Scheme regarding the support of investments in high-efficiency cogeneration	LULUCF	New PAM
76	Law no. 254/2022 for the amendment and completion of the Land Fund Law no. 18/1991 and other normative acts	LULUCF	New PAM
77	Law no. 248/2022 regarding the approval of the GEO no. 143/2021 for the amendment and completion of the Electricity and Natural Gas Law no. 123/2012, as well as for the modification of some normative acts	LULUCF	New PAM
78	Decision No. 1172/2022 for the approval of the National Strategy for Forests 2030	LULUCF	New PAM
79	National Recovery and Resilience Plan 2021-2026	LULUCF	New PAM

89	Improving solid waste management	Waste management/waste	Same name, new PaM replacing the previous one (old ID 78)

Energy Sector

Energy supply

For this sector, a set of additional measures was considered in the WAM projection scenario, focusing on modernization of the energy sector to cover the demand for electrical and thermal power. These PaMs are expected to improve the energy efficiency and to increase the share of renewable energy by accessing by accessing the funding that will be available through planned programs. Details about each planned program, including specific priorities/actions and expected results are presented below.

PODD 2021÷2027, *Priority 4 Promoting energy efficiency, intelligent energy systems and networks and reducing GHG emissions*, *Action 4.2 Reducing GHG emissions and increasing energy efficiency in thermal energy production systems*, aiming to replace the thermal energy production plant based on coal and fuel oil with a high efficiency cogeneration plant based on natural gas in the Motru municipality;

Expected results in the target year 2029: annual primary energy consumption 31,447,974 MWh/year, compared to the 2018 reference value of 32,989,123 MWh/year; total budget ***11,764,706 Euro*** *(ERDF and national contribution).*

PODD 2021÷2027, *Priority 4 Promoting energy efficiency, intelligent energy systems and networks and reducing GHG emissions*, *Action 4.3 Reducing GHG emissions and increasing energy efficiency in thermal energy distribution and transport systems*, aiming to finance centralised thermal energy supply systems, respectively heating networks, including thermal points, with priority for the completion of projects started in programming period 2014÷2020;

Expected results in the target year 2029: new or modernised heating networks: 135 km; energy losses on the heat transport and distribution networks: 22.70%, compared to the reference value of 2018 (29.8%); total budget ***355,647,059 Euro*** *(CF and national contribution).*

PODD 2021÷2027, *Priority 4 Promoting energy efficiency, intelligent energy systems and networks and reducing GHG emissions*, *Action 4.4 Promoting the use of renewable energy sources,* aiming to finance investments for new capacities or for modernisation of existing electricity/thermal capacities on biomass/biogas and for new or modernised geothermal capacities;

Expected results in target year 2029: new capacity on renewable sources of 14 MW; increasing the energy produced from RES from the 2022 reference value of 22 MWh/year to the 2029 target value of 256,832 MWh/year; total budget ***58,823,530 Euro*** *(ERDF and national contribution).*

PODD 2021÷2027, *Priority 4 Promoting energy efficiency, intelligent energy systems and networks and reducing GHG emissions*, *Action 4.5,* financing intelligent energy systems and networks, total budget ***176,470,588 Euro*** (ERDF and national contribution).

POTJ 2021-2027*,* aiming to ensure the investment needs defined at the level of territorial plans developed for 6 counties (Gorj, Hunedoara, Dolj, Galați, Prahova and Mureș), by supporting the installation of photovoltaic/photothermal panels at household level and through investments in the development of small capacities for production, transport and storage of renewable energy (photovoltaic, wind or geothermal, including

heat pumps) necessary for public buildings (schools, hospitals, homes for the elderly, nurseries, social services, vocational training centers).

*The budget from EU funds (FTJ) is **397,023,048 Euro** (without national contribution of 15%).*

In addition to the mentioned PAMs, the EU Package of proposals "Fit for 55" was considered in the WAM scenario, focusing on increasing the share of energy from renewable sources and implementation of energy efficiency measures for reduction of primary and final energy consumption.

Energy consumption

For this sector, a set of additional measures was considered in the WAM projection scenario, focusing on modernization of the industrial, residential, services and agricultural sectors.

These PaMs are expected to improve the energy efficiency in industrial, residential and public buildings sectors by accessing the funding that will be available through planned programs and support schemes for promoting the use of renewable energy sources. Details about each planned program, including their specific priorities/actions and expected results are presented below.

***PODD 2021÷2027,** Priority 4 Promoting energy efficiency, intelligent energy systems and networks and reducing GHG emissions*, *Action 4.1 Improving energy efficiency,* aiming to increase the energy efficiency in SMEs and large enterprises and the share of energy from renewable sources, through the development of electricity production facilities by industrial consumers (with a consumption greater than 1,000 toe/year);

*Expected results in the target year 2029: reduction of annual primary energy consumption from the 2018 reference value of 32,989,123 MWh/year to the 2029 target value of 31,447,974 MWh/year; reduction of GHG emissions based on converting the boilers and heating system from solid fossil fuels to natural gas: from the 2020 reference value of 29,215 t $CO_{2\ eq}$./year to the 2029 target value of 18,522 t $CO_{2\ eq}$./year; total budget **135,294,118 Euro** (ERDF and national contribution).*

***POR 2021÷2027,** Priority An environmentally friendly region*, specific objective *Promoting energy efficiency and reducing GHG emissions*, aiming to finance investments in residential and public buildings. *The total budget is **1,420,013,100 Euro** (ERDF and national contribution).*

***PODD 2021÷2027,** Priority 4, Action 4.6 Conversion, modernisation and expansion of gas transmission and distribution networks to add gas from renewable sources and low-carbon gases to the system*, aiming to adapt the existing natural gas transmission and distribution system for green gases (e.g., hydrogen).

*Expected results in the target year 2029: new or modernised gas transmission and distribution networks: 1,437 km; users connected to smart grids: 137,612 end users/year, compared to the reference value of the year 2020 ("0"); total budget **380,545,520 Euro** (CF and national contribution).*

For this sector, in addition with the planned policies and measures mentioned above, the following measures are envisaged:

- Support schemes to increase the connection rate to centralized thermal energy supply systems;
- Support schemes to promote the use of renewable energy sources (solar panels, heat pumps);
- Support schemes to equip residential buildings with high energy performance equipment (household appliances, lighting systems, etc.).

In addition to the mentioned PAMs, the EU Package of proposals "Fit for 55" was considered in the WAM scenario, focusing on increasing the share of energy from renewable sources in final energy consumption of industrial and building sectors and implementation of energy efficiency measures for reduction of final energy consumption, through renovation of buildings owned by public bodies.

Transport

For this sector, a set of additional measures was considered in the WAM projection scenario, in order to develop the transport infrastructure for assuring the connectivity at the national level and between EU countries, to increase the efficiency of Romanian railways, to develop the green public transport and to improve the efficiency of vehicles. This PaM is expected to modernize the transport system by accessing the funding that will be available through planned programs. Details about each planned program, including specific priorities/actions and expected results are presented below.

POT 2021÷2027, aiming to improve primary and secondary road connectivity, increase the efficiency of Romanian railways, increase the attractiveness of rail passenger transport, develop sustainable mobility in urban nodes and develop naval and multimodal transport. *The requested budget to finance the investments included in the POT 2021-2027 is **7,312,358,178 Euro** (European funds and national contribution).*

POR 2021÷2027, priority *An accessible region*, aiming to promote the increase of connectivity at the regional level and to ensure the access to mobility, including the rural areas, by modernisation of road infrastructure of regional importance for ensuring connectivity to the TEN-T network and solutions for decongestion and streamlining of traffic at the level of county seat municipalities*. The requested budget to finance the investments included in this priority is **1,465,119,467 Euro** (ERDF and national contribution).*

POR 2021÷2027, priority *A region with sustainable multimodal urban mobility,* aiming to promote the construction/expansion/modernisation of urban public transport and urban/suburban electric public transport routes, the infrastructure for the bicycles uses and investments for the purchase of rolling stock (tram) in order to reduce the degree of using personal vehicles. *The requested budget to finance the investments included in this priority is **1,377,048,518 Euro** (ERDF and national contribution).*

POTJ 2021-2027, aiming to ensure the investment needs defined at the level of territorial plans developed for 6 counties (Gorj, Hunedoara, Dolj, Galați, Prahova and Mureș), by supporting the development of green public transport (the purchase of non-polluting vehicles and charging stations necessary for public transport services) which facilitate access to vocational training and employment opportunities. *The requested budget to finance the investments is **63,502,310 Euro**, to which is added the national co-financing of 15%.*

National program for scrapping the used vehicle[17]*,* managed by the Ministry of Environment, Water and Forests through AFM, to be launched in 2023. By this program, the individuals receive an incentive of 3,000 lei for scrapping a vehicle older than 15 years. The budget allocated for the financing session is 50,000,000 lei.

In addition to the mentioned PAMs, the EU Package of proposals "Fit for 55" was considered in the WAM scenario, focusing on increasing the share of energy from renewable sources in final energy consumption of transport sector.

[17] National program for scrapping the used vehicle, https://www.afm.ro/casare_auto_uzate.php

Industrial Processes and Product Use Sector

For this sector, a set of additional measures was considered in the WAM projection scenario, focusing on modernization of the IPPU sector, based on the following planned strategy.

National Competitiveness Strategy 2021-2027. Enables the development of a coherent action plan regarding the implementation and evaluation of public policies that it coordinates at the level of the institution, with the aim of increasing Romania's economic competitiveness, mainly targeting economic fields, research and development, education, labor market, public institutions, and regulation. Thus, the strategic target of the SNC 2021-2027 consists in encouraging an economy based on a competitive economic environment, the adoption of digitization in enterprises and a stable institutional framework.

The objectives of the strategy aim at the industrial modernization of enterprises, including by supporting the mechanisms of the circular economy and the collaborative economy and supporting the digital transformation process (Industry 4.0) to increase the degree of competitiveness of enterprises. At the same time, it also aims to increase the institutional capacity for the implementation of national public policies with an impact on competitiveness.

Strategy for Circular Economy 2030. The general objective of the National Strategy on Circular Economy in Romania is to provide the framework to guide the country in its efforts to transition to Circular economy through the implementation of the Action Plan. The success indicator of this transition is the decoupling of economic development from the use of natural resources and environmental degradation. The overall objective of the strategy is closely linked to the Sustainable Development Goals (SDGs) of the UN 2030 Agenda and the global climate goals, as well as the new EU goals of the Circular Economy Action Plan (PAEC), in line with the principles and actions promoted within the EU Green Deal. The transition to circular economy must take place in such a way that it does not affect quality, productivity, competitiveness, and performance. This is important since the business environment in Romania is characterized by small and medium-sized enterprises, with a significant presence of micro-enterprises, which have a relatively important contribution in terms of added value and jobs.

Agriculture Sector

The PaM considered in WAM projection scenario was focus on improving the feed quality for livestock, increase methane recovery from anaerobic fermentation of manure, modern methods of fertilizer application, in line with planned EU Methan Action Plan.

LULUCF Sector

- ***Romania's National Strategy for Sustainable Development 2030***[18] (GD 754/2022[19]; GD 877/2018[20])

GHG affected: CO_2
Type of policy: regulatory
Implementing entity: MARD; MEWF
Interlinkages with projection-scenario: WAM

[18] https://gov.ro/fisiere/NF_HG_754-2022
[19] https://legislatie.just.ro
[20] https://legislatie.just.ro

Covering: national
Quantified mitigation impact: reduction of GHG emission levels until climate neutrality

Through this strategy, Romania establishes its national framework for supporting the *2030 Agenda and implementing the 17 SDG set*[21]. The strategy supports the development of Romania on three main pillars, namely economic, social and environmental. The strategy aims to strengthen Romania's capacity to adapt and resilience to combat the dangers of climate change and natural disasters by integrating measures to mitigate and adapt to climate change and natural disasters in both national strategies and policies and in planning and increasing the level of climate change education and awareness.

- ***National Recovery and Resilience Plan (NRRP), 2021-2026***[22]

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Implementing entity: MEIP; MARD; MEWF
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: afforestation and reforestation, including urban forests

Developed under the Recovery and Resilience Mechanism under Article 16 of the Regulation of the European Commission and the European Parliament, it presents a multiannual budget for 12 priority areas. Romania benefits of a budget in the EU's multiannual financial framework, from the total budget in the EU. NRRP Romania is structured on 3 pillars of interest: (i) transport and climate change; (ii) public services, urban development, capitalization; (iii) economic competitiveness, digitization, resilience. Of the three major pillars set for the NRPP, the Transport and Climate Change pillar presents 5 areas of intervention: (i) sustainable transport; (ii) climate change; (iii) environmental; (iv) energy and green transition; (v) energy and thermal efficiency. Area of intervention - Climate change: reforms and investments in Romania, the challenges launched by climate change have led to multi-annual studies, developing maps of high risk areas, respectively: (i) desertification; (ii) swamping; (iii) soil erosion and (iv) occurrence of extreme weather events[23].

The concept pursued in NRRP was to strengthen Romania's resilience to combat the risk of climate change. Specific investments will focus on the following areas: (i) irrigation arrangements; (ii) drainage arrangements; (iii) arrangements for combating soil erosion; (iv) anti-hail systems; (v) forest fund management, torrent collection.

- ***EU Farm to Consumer Strategy***[24]

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Implementing entity: MARD; EC
Interlinkages with projection-scenario: WAM
Covering: EU level
Quantified mitigation impact: achieving climate neutrality by 2050

Is one of the key actions in the European Green Deal, helping to achieve the goal of achieving climate neutrality by 2050, a strategy that takes into account the evolution of the current EU food system towards a sustainable model. The strategy has the following main objectives: (i) to ensure a sufficient supply of affordable, nutritious

[21]The 2030 Agenda for Sustainable Development
[22]https://mfe.gov.ro/pnrr
[23]National Meteorological Administration
[24]https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

food within the planetary limits; (ii) halving the use of pesticides, fertilizers and the sale of antimicrobials; (iii) increasing the area of land intended for organic farming; (iv) promoting more sustainable food consumption and healthy diets; (v) reducing food loss and waste; (vi) combating food fraud along the food supply chain; (vii) improving animal welfare.

- ***EU Biodiversity Strategy for 2030***[25]

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Implementing entity: MARD; EC
Interlinkages with projection-scenario: WAM
Covering: EU level
Quantified mitigation impact: mitigate of climate change impact

It is the cornerstone of biodiversity protection in the EU. The main actions to be taken by 2030 include: (i) the creation of protected areas covering at least 30% of the EU's land and sea area, extending the coverage of existing Natura 2000 areas; (ii) restoring degraded ecosystems across the EU by 2030 through a number of specific commitments and measures, including a 50% reduction in pesticide use and associated risk by 2030 and the planting of 3 billion trees across the EU; (iii) allocating EUR 20 billion per year to protect and promote biodiversity through EU funds and by mobilizing national and private sources of funding; (iv) creating an ambitious global biodiversity framework. The EU aims to lead by example worldwide in this regard.

- ***Government Decision no. 1076 for the approval of the National Integrated Plan in the field of energy and climate change*** 2021-2030[26]

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Interlinkages with projection-scenario: WAM
Covering: national
Implementing entity: MARD; MAWF; Ministry of Energy
Quantified mitigation impact: reduction of GHG emission levels

Following the EU's accession to the Paris Agreement and with the publication of the Energy Union Strategy, the Union assumed an important role in combating climate change, through the 5 main dimensions: energy security, decarbonization, energy efficiency, the internal energy market and research, innovation and competitiveness. Thus, the European Union is committed to leading the energy transition at a global level, by fulfilling the objectives set out in the Paris Agreement on climate change, which aims to provide clean energy throughout the European Union. To fulfill this commitment, the European Union has set energy and climate objectives for 2030 as follows: (i) the objective of reducing domestic greenhouse gas emissions by at least 40% by 2030, compared to 1990; (ii) the objective regarding energy consumption from renewable sources of 32% in 2030; (iii) the objective of improving energy efficiency by 32.5% in 2030; (iv) the objective of interconnecting the electricity market at a level of 15% by 2030. In this sense, the main elements considered in the strategic approach of the Plan were the following: (i) the holistic approach to energy, economy, environment and climate change should take place in close correlation with the economic reality of the Member States, so that the internal macroeconomic and social balance is not affected; (ii) the restructuring of the market framework, in the context of the costs induced by the transition and the capacity

[25] https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_ro#obiective
[26] https://legislatie.just.ro

of the Member States to support these costs, in terms of accessibility and competitiveness; (iii) economic growth and income per household (on the horizon of 2030); (iv) reduction of energy poverty.

- ***Decision No. 933 of July 20, 2022. National Strategy of 20 July 2022 for research, innovation and smart specialization 2022-2027***[27]

GHG affected: CO_2; CH_4; N_2O
Type of policy: regulatory
Implementing entity: MCD
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: reducing GHG emission levels in all sectors through innovation programs

The strategy foresees the concept of bioeconomy through seeds and genotypes improvement as well as advanced technologies, which contributes to the development of the forest sector, agroforestry, hunting management, and cropland ecology.

- ***Decision no. 195 of February 10***, 2022 for the approval of the State Aid Scheme regarding the support of investments intended to promote the production of energy from less exploited renewable sources, namely biomass, biogas, geothermal energy, and the ***State Aid Scheme regarding the support of investments in high-efficiency cogeneration***[28]

GHG affected: CO_2
Type of policy: regulatory, support
Implementing entity: MMAP, MARD
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: reducing GHG emissions through more efficient use of resources

It is designed as an aid scheme regarding investments promoting energy production from less exploited renewable sources, such as biomass, biogas, and geothermal energy, and acquisitions in high-efficiency cogeneration energy-producing installations. In principle, the goal is targeted towards a more efficient economy regarding resources. Moreover, it stresses the achievement of EU objectives regarding the use of energy from renewable sources, the increase in production, the share of energy from renewable sources, and the reduction of carbon emissions in the atmosphere. There is an estimated increase of 60 MW in the installed capacity to produce electric and thermal energy from biomass, biogas, and thermal energy through Annex 1 and an increase of 50 Mwe in power installed in high-efficiency cogeneration.

- ***Law no. 254 of July 20, 2022*** for the amendment and completion of the Land Fund Law no. 18/1991 and other normative acts[29]

GHG affected: CO_2; CH_4; N_2O
Type of policy: Regulatory
Implementing entity: All ministries
Interlinkages with projection-scenario: WAM
Covering: national

[27] https://legislatie.just.ro/Public/DetaliiDocument/257796
[28] https://legislatie.just.ro/Public/DetaliiDocument/251619
[29] https://legislatie.just.ro/Public/DetaliiDocumentAfis/257727

Quantified mitigation impact: Efficient land and resources use, reducing GHG emissions

The land fund law is updated with the possibility of placing investment objects on quality class III, IV, and V agricultural lands. The specific investment has to be the production of electric energy from renewable sources: production capacity of solar energy, wind energy, energy from biomass, bioliquids, and biogas on agricultural land located outside the village with a maximum area of 50 ha.

- ***Law no. 248 of July 20, 2022 regarding the approval of the Government's Emergency Ordinance no. 143/2021*** for the amendment and completion of the Electricity and Natural Gas Law no. 123/2012, as well as for the modification of some normative acts[30]

GHG affected: CO_2; CH_4; N_2O
Type of policy: Regulatory
Implementing entity: All ministries
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: reducing GHG emissions from fossil fuels filled power plants; efficient use of resources; communities' economic growth and development

The amendment and completion of the Electricity and Natural Gas Law no. 123/2012 encourages the production of electrical energy from renewable sources. It guarantees that the produced energy is received into the national grid. Participation in energy sector activities of local energy communities is ensured. At the same time, prosumers are exempted from the obligation to purchase annual and quarterly green certificates provided in Law no. 220/2008 for electricity produced from renewable sources and used at the place of production for their own final consumption. At the same time, the same producers can conclude directly negotiated contracts only with the final consumer suppliers for the sale of green certificates issued for the electricity produced and delivered.

- ***Decision No. 1.172 of September 21, 2022 for the approval of the National Strategy regarding the circular economy***[31]

GHG affected: CO_2; CH_4; N_2O
Type of policy: Regulatory, Informational, Economic
Implementing entity: All ministries
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: reducing GHG emissions, sequestrating CO_2, maximizing reuse

The strategy will provide the necessary tools for implementing decisions regarding reducing generated waste, dependence on primary resources, and harmful emissions, simultaneously changing the economic model and creating the premises for increasing the number of new jobs. Moreover, it foresees the cascading use of biomass, increasing the use of bio-fertilizers, and compost, supporting initiatives on alternative protein sources, regulating water/wastewater reuse in agriculture, optimizing water extraction, and maximizing its reuse/recycling. It also adopts circular design principles, reducing synthetic materials, increasing the degree of separate collection, and investing in furniture return infrastructure and recycling technologies. In the agriculture and forest domain, the decision-makers state that the owners should be rewarded, either through the CAP or other public or private

[30] https://legislatie.just.ro/Public/DetaliiDocumentAfis/257741
[31] https://legislatie.just.ro/Public/DetaliiDocument/259668

initiatives, to ensure implementation. In the case of Romania, a regulatory framework will be developed for the certification of carbon emissions according to the EU Action Plan.

- ***Emergency Ordinance No. 35 of April 6, 2022*** for the approval of the necessary measures to carry out the national afforestation and reforestation campaign provided for in the National Recovery and Resilience Plan[32]

GHG affected: CO_2; CH_4; N_2O
Type of policy: Regulatory, Financial, Informational
Implementing entity: All ministries, MMAP
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: reducing GHG emissions, improving soil fertility, intersectoral coordination, and efficient land use

The follow-up intervention implemented financial aid schemes according to specific guidelines elaborated by The Environment, Water, and Forest Ministry. Taking into account the low rate of afforestation of lands outside the national forest fund, i.e., less than 200 ha in 2020, and the need to increase the areas covered with forest vegetation to achieve the objectives of the National Recovery and Resilience Plan, the decision-makers have found mandatory to carry out some interventions legislation to simplify the procedures for afforestation of lands outside the national forest fund. Thus, the approved funds are used for the financing of the following:

- developing projects, as well as carrying out afforestation and plantation maintenance works carried out on agricultural land in the use categories of arable land, permanent meadows, and permanent crops
- technical-economic documentation, as well as carrying out afforestation and plantation maintenance works on degraded land suitable for afforestation, established in improvement perimeters
- restoration of forest potential by afforestation of lands located in the national forest fund, which have been affected by forest fires, unfavorable meteorological phenomena that can be assimilated to a natural calamity, plant infestations with harmful organisms and catastrophic events, as well as the maintenance of plantations
- technical-economic documentation, as well as carrying out the installation works of forest protection curtains and maintenance of the plantations

- ***Decision No. 1.227 of October 5, 2022 regarding the approval of the National Strategy for Forests 2030***[33]

GHG affected: CO_2; CH_4; N_2O
Type of policy: Regulatory, Support, Informational
Implementing entity: MMAP
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: reducing GHG emissions through the diversity of measures in policy reforms

The National Strategy for Forests (SNP30) is sought to ensure a good governance approach based on the coherence of legislation in the forestry field, the assumption of responsibility and transparency, and capitalizing

[32] https://legislatie.just.ro/Public/DetaliiDocumentAfis/253712
[33] https://legislatie.just.ro/Public/DetaliiDocument/260277

more effectively on the principles of sustainable management of forests that must ensure productivity, the multifunctional role, stability, and the biodiversity of Romania's forests.

The strategy is built upon the principles of sustainable forest management, from which five thematic areas emerged following the strategic regions provided by the European Forest Strategy 2030.

The main thematic areas that affect LULUCF consist of supporting the forests' socio-economic functions *and stimulating the forest bioeconomy within the limits of sustainability* and *Protecting, Restoring, and Expanding forests in Romania*. The strategy is acknowledged as a novelty as a shift towards descriptive directions rather than prescriptive.

Even though the quantitative ambitions of the strategy are not high (15.000 hectares of new forests in the period of 2026-2030 and 350 hectares of urban forests until 2026), the plan focuses on easing out the bureaucracy and increasing transparency through the diversity of measures.

- ***Order No. 68 of March 22, 2022*** for the amendment of the annex to the Order of the Minister of Agriculture and Rural Development no. 857/2016 on the approval of the state aid scheme "Support for the first afforestation and the creation of forested areas"[34]

GHG affected: CO_2
Type of policy: Regulatory
Implementing entity: MARD, MEWF
Interlinkages with projection-scenario: WAM
Covering: national
Quantified mitigation impact: reducing GHG emissions

The budget of the state aid scheme at the end of the period (2020) was 21.786.653,33 Euros from a total of 46.786.653,35 Euros. Thus, no quantitative data regarding afforestation or the creation of forested areas are available, yet almost half of the budget was indirectly used to reduce GHG emissions. Through the mentioned Order No. 68, the remaining amount from the budget will be relocated to the state budget and probably transferred towards the Resilience and Recovery plan.

Waste Sector

For this sector, the PaM considered in the WAM projection scenario was focused on improving solid waste management, through efficient waste management in order to accelerate the transition to the circular economy, by accessing the funding that will be available through PODD 2021-2027.

Details about planned program, including specific priority/action and expected results are presented below.

PODD 2021÷2027, *Priority 1 Development of water and waste water infrastructure and the transition to a circular economy, Action 1.2 Efficient waste management for accelerate the transition to the circular economy, for meeting the requirements of environmental directives,* aiming to: expand the separate waste collection recyclables system; implementation/expansion of separate collection of bio-waste; implementation/expansion of separate collection of bulky, hazardous and textile waste by 2025; centers prepared for reuse; new transfer stations and modernisation/expansion of the existing ones; facilities/integrated facilities for the treatment of separately

[34] https://legislatie.just.ro/Public/DetaliiDocument/253202

collected waste, and of residual waste; modernisation of existing facilities (sorting, composting and mechanical-biological treatment); closing non-compliant landfills and ensuring the necessary storage capacities.

Expected results in the target year 2029: additional capacity for waste recycling: 370,000 t/year; investments in separate waste collection facilities: 73,312,500 Euro; investments for the closure of non-compliant landfills: 11,250,000 Euro; recycled waste: 290,000 t/year, compared to the reference value of 2021 ("0" value); separately collected waste: 330,000t/year, compared to the 2020 reference value ("0" value); recycled waste from residual waste: 30,000 t/year, compared to the reference value ("0" value); non-compliant landfills closed: 6 landfills, compared to the reference value of 2020 (value "0").

*The total budget required for this action is **480,000,000 Euro** (CF and national co-financing).*

3.3 Qualitative information regarding the links between policies and measures reported and their contribution to the achievement of low-carbon development strategy

The contribution of PAMs (reported in Annex A) to GHG emissions reduction is presented in the following tables.

Table 3-10 Total GHG emissions (including LULUCF) in the 3 scenarios, period 2020-2050

Total GHG emissions (kt CO_{2e}), including emissions from the LULUCF sector								
Scenario/Year	**2005**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
WOM	115405.87	127320.12	140289.05	150092.30	162355.17	176267.92	185272.50	193737.67
WEM	115405.87	77472.87	74996.46	69106.94	74051.92	78489.56	77544.18	79366.91
WAM	115405.87	77472.87	67368.80	59566.31	61141.30	60414.21	57492.65	58055.88
Difference WOM vs WEM	*0.00*	*49847.25*	*65292.59*	*80985.36*	*88303.25*	*97778.36*	*107728.32*	*114370.76*
Difference WEM vs WAM	*0.00*	*0.00*	*7627.66*	*9540.63*	*12910.61*	*18075.35*	*20051.54*	*21311.03*

Table 3-11 Total GHG emissions (without LULUCF) in the 3 scenarios, period 2020-2050

Total GHG emissions (kt CO_{2e}), excluding emissions from the LULUCF sector								
Scenario/Year	**2005**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
WOM	147216.28	158348.59	161891.06	168835.34	178128.48	189045.52	194880.25	200080.73
WEM	147216.28	110366.83	106312.78	100787.32	105215.86	110008.73	109041.78	110724.25
WAM	147216.28	110366.83	104411.06	98360.79	101538.02	102504.47	101283.97	103576.40
Difference WOM vs WEM	*0.00*	47981.75	55578.28	68048.02	72912.62	79036.79	85838.47	89356.48
Difference WEM vs WAM	*0.00*	0.00	1901.72	2426.54	3677.84	7504.25	7757.82	7147.85

For the period 2025-2030, GHG emissions for the ESR sector were compared with the proposed annual allocated emission levels, considering the following:

- The forecasted GHG emissions were calculated considering the data reported in the last submission of NGHGI (November 2022), calculated by applying the global warming potential defined in the Fourth Assessment Report of the IPCC
- The annual allocated emission levels proposed for the ESR sector are calculated by applying the global warming potential defined in the Fifth Assessment Report of the IPCC.

Table 3-12 Contribution of the implementation of policies and measures in WEM scenario

WEM	2020	2030	2040	2050
ETS (excluding domestic aviation)	32306.85	18017.99	19974.46	18246.22
ESR	77944.34	82526.31	89726.91	92113.51
Domestic aviation	115.64	243.03	307.35	364.52
LULUCF	-32893.96	-31680.39	-31519.17	-31357.34
Total net GHG emissions	**77472.87**	**69106.94**	**78489.56**	**79366.91**

Table 3-13 Contribution of the implementation of policies and measures in WAM scenario

WAM	2020	2030	2040	2050
ETS (excluding domestic aviation)	32306.85	17642.42	18054.53	17987.47
ESR	77944.34	80511.16	84142.94	85246.48
Domestic aviation	115.64	207.20	307.00	342.45
LULUCF	-32893.96	-38794.47	-42090.27	-45520.51
Total net GHG emissions	**77472.87**	**59566.31**	**60414.21**	**58055.88**

The GHG emissions forecasted in the WEM scenario show that in 2030, the allocated GHG emissions for the ESR sector are around 80.000 kt CO_{2eq}.