OFFICIAL GAZETTE

OF

ROMANIA

Year 186 (XXX)-No 225 bis | PART 1 LAWS, DECREES, DECISIONS AND OTHER ACTS | Tuesday, 13 March 2018

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DECISIONS OF THE GOVERNMENT OF ROMANIA

GOVERNMENT OF ROMANIA

DECISION

approving the Strategy on the national policy framework for alternative fuels market development in the sector of transportation and the deployment of the relevant infrastructure in Romania and establishing the Inter-ministerial Coordination Council for the Development of the Alternative Fuels Market*)

Under Article 108 of the Romanian Constitution, as republished, and having regard to Article 11(f) and Article 12(2) and (3) of Law No 90/2001 on the organisation and functioning of the Government and ministries, as subsequently amended and supplemented, and to Article 12(3) of Law No 34/2017 on the deployment of alternative fuels infrastructure,

The Government of Romania adopts this decision:

Article 1 - Approves the Strategy on the national policy framework for market development regarding alternative fuels in the sector of transportation and the deployment of the relevant infrastructure in Romania, as set out in the annex forming an integral part of this decision.

Article 2 - (1) Establishes the Inter-ministerial Coordination Council for the Development of the Alternative Fuels Market, hereafter referred to as CC DPCA, with representatives of the following central public entities as members thereof: the General Secretariat of the Government, the Ministry of Energy (*Ministerul Energiei*), the Ministry of Transport (*Ministerul Transporturilor*), the Ministry of Regional Development and Public Administration (*Ministerul Dezvoltării Regionale și Administrației Publice*), the Ministry of the Economy (*Ministerul Economiei*), the Ministry of the Environment (*Ministerul Mediului*), the Ministry of Internal Affairs (*Ministerul Afacerilor Interne*).

(2) CC DPCA shall comprise, as permanent guests, representatives of the following institutions: the Administration Authority for the Environmental Fund (*Administrația Fondului pentru Mediu*), the National Energy Regulatory Authority *Autoritatea Națională de Reglementare în Domeniul Energiei*), the National Statistics Institute (*Institutul Național de Statistică*), and other relevant institutions and/or organisations, as established by CC DPCA, which can provide relevant expertise in order to facilitate the implementation of the Strategy on the national policy framework for market development regarding alternative fuels in the sector of transportation and the deployment of the relevant infrastructure in Romania.

(3) The central public entities shall be represented in CC DPCA by the State Secretary and heads of the other public administration institutions.

(4) The President of CC DPCA shall be the State Secretary designated under an order of the Minister for Energy within ten days from the entry into force of this decision, and the Vice-President of CC DPCA shall be the State Secretary designated under an order of the Minister for Transport within ten days from the entry into force of this decision.

(5) CC DPCA shall be supported by a secretariat comprising experts who are representatives of the Ministry of Energy and of the Ministry of Transport and who are designated from the specialised directorates within the relevant ministries

Article 3 - CC DPCA shall aim at providing expertise services for the implementation and monitoring of the Strategy on the national policy framework for alternative fuels market development in the sector of transportation and the deployment of the relevant infrastructure in Romania. CC DPCA shall issue proposals, within three calendar years, in regard to the updating of the strategy on the national policy framework in accordance with the latest technological and economic developments in the field of alternative fuels.

Article 4 - CC DPCA shall meet, within 15 days from the entry into force of this decision, and shall prepare its rules of organisation and functioning, which shall be approved under a joint order of the Minister for the Economy and the Minister for Transport.

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This decision shall transpose Article 7(7) of Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure, as published in Official Journal of the European Union, series L, No 307 of 28 October 2014.

PRIME MINISTER

VASILICA-VIORICA DĂNCILĂ

Countersigned by:

Minister for Energy,

Anton Anton

Deputy Prime Minister,

Minister for Regional Development and Public Administration

Paul Stănescu

Deputy Prime Minister, Minister for the Environment,

Grațiela Leocadia Gavrilescu

General Secretary of the Government,

Ioana-Andreea Lambru

Minister for Transport,

Lucian Şova

Minister for Internal Affairs,

Carmen Daniela Dan

Minister for the Economy,

Dănuț Andrușcă

Minister for Foreign Affairs,

Teodor-Viorel Meleșcanu

Minister delegated for European affairs,

Victor Negrescu

Bucharest, 7 March 2018 No 87.

*) Government Decision No 87/2016 was published in Official Gazette of Romania, Part I, No 225 of 13 March 2018 and is also replicated in this *bis* number.

ANNEX

to Government Decision approving the Strategy on the national policy framework for alternative fuels market development in the sector of transportation and the deployment of the relevant infrastructure in Romania

Government of Romania

The Strategy on the national policy framework for alternative fuels market development in the sector of transportation and the deployment of the relevant infrastructure in Romania

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INTRODUCTION

This *Strategy on the national policy framework for alternative fuels market development in the sector of transportation and the deployment of the relevant infrastructure in Romania* (hereafter referred to as *the National Framework Strategy*) has been developed by the Ministry of Energy, in collaboration with the Ministry of Transport, the Ministry of the Environment, the Ministry of Regional Development, Public Administration and European Funds, and the Ministry of the Economy, and a series of other relevant authorised central public institutions, under direct coordination by the General Secretary of the Government of Romania.

The National Framework Strategy has been prepared in accordance with Chapter II of Law No 34 of 27 March 2017 *on the deployment of the infrastructure for alternative fuels* transposing Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 *on the deployment of the deployment of alternative fuels infrastructure*.

The purpose of this document is to support the deployment of the alternative fuels infrastructure in Romania so that all the relevant modes of transport, methods and technologies may be used non-discriminatorily according to their efficiency, applicability and return in order to ensure a transport system with a high degree of continuity and a minimum impact on the environment and the population health, in both conurbations and throughout the interurban infrastructure and European road, water and air transport networks.

In accordance with Annex I of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 *on the promotion of the use of energy from renewable sources*, and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, the national target on the share of energy from renewable energy sources in the gross final consumption of energy, which is to be recorded by 2020, is 24 %. This target was already achieved in 2015. At the end of 2014, the share of renewable energy sources in the gross final consumption of energy in the field of transport in Romania was approximately 4.5 %[1], which is by almost three percentage points below the NREAP[2] estimation for that period. Thus, in the proposed measures, this National Framework Strategy ensures consistency with the overall target set for 2020, concomitantly planning to contribute to reaching the target for a share of renewable energy sources, in all modes of transport, representing at least 10 % in the final energy consumption in transport in 2020.

1. ASSESSMENT OF THE STATUS-QUO

To deploy an adequate alternative fuels infrastructure in Romania is an objective included in the *European Strategy for Sustainable Transport*, which states that a sustainable transport policy should handle traffic intensity and the increasing levels of congestion, noise and pollution and foster the use of transport types with a low impact on the environment and of intermodal transport solutions, as well as providing an adequate level of accessibility to the persons holding alternative fuel powered vehicles.

At the beginning of 2017, Romania was slightly above half of the European average in regard to power engines, with approximately 300 passenger cars per 1 000 inhabitants registered, but with a tendency towards a rapid increase in the fleet, in particular by the import of second-hand motor vehicles.

In terms of the use of alternative fuels in aviation and waterborne transport, Romania is currently undergoing alignment to the relevant European standards. Thus, at the 2017 edition of the assembly of the International Civil Aviation Organisation (ICAO), the European Union aimed at reaching an agreement with regard to a global market-based mechanism in order to approach emissions generated by the international aviation and to achieve a neutral growth, in terms of the

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[1] The progress report of Romania on the promotion of the use of energy from renewable sources, ISPE 2015

[2] National Renewable Energy Action Plans (NREAPs)

carbon dioxide emissions, as from 2020.

This global market-based measure, as well as other measures, such as the standard recently agreed upon at international level with regard to carbon dioxide emissions for new aircrafts, are meant to ensure the neutral growth in terms of the carbon dioxide emissions by international aviation as from 2020. The EU shall revise its internal measure (the EU scheme for greenhouse gas emission allowance trading for aviation) taking into account the ICAO Assembly results.

The European Union is also strongly determined to secure, within the International Maritime Organisation, a sound mandatory global agreement with regard to the collection and reporting of emissions of greenhouse gas originating from international maritime transport, later on this year. It shall be supplemented by a strategy, at IMO level, for reducing emissions in the sector of international maritime transport, the adoption of which is proposed in the following period. The EU has already established rules[3] requiring ships using the EU ports to monitor, to report and to verify emissions.

Thus, the development of the alternative fuels infrastructure is a starting point, including for the upgrading and modernisation of the national fleet and for properly aligning the supply services in the maritime and air field to the European standards, with the overall objectives of the environmental policies and with the transport objectives.

The emission reduction path

The European Union and Member States signed *the Paris Agreement*, which entered into force on 4 November 2016[4], with the purpose of keeping the global temperature increase below 2° C, compared to the level in the preindustrial age, and of furthering the efforts to limit temperature increase to 1.5° C, i.e. above the level in the preindustrial period. For this objective to be achieved, the transport sector must bring its own contribution. Thus, the White Paper on transport in 2011 and the European Parliament reports indicate clearly the transport sector objective to reduce by at least 60 % the greenhouse gas emissions originating in transport, by the mid-century, compared to 1990, and to strongly commit to a path towards zero emissions.

In this respect, on 31 May 2017, the European Commission launched a set of initiatives entitled *"Keep Europe moving"*, which aim at achieving safer road traffic, encouraging the fair imposition of tolls, as much as possible, and last but not least, the reduction of CO_2 and NOx in the air resulting from road traffic.

In Romania, the contribution of road transport to the total air pollutant emissions for 2015, as per *the Information Report of the National Air Pollutant Emissions Inventory (IIR)* published in 2017, which includes the total air pollutant emissions for the period 2005-2015, is 40 % in the national total NO*x* emissions (of which: 12 % from passenger cars, 23 % from heavy vehicles and buses, and 5 % from light vehicles), 12 % in the national total CO emissions (from passenger cars) and 5 % in the national total NMVOC emissions (of which: 3 % from passenger cars and 2 % from gasoline evaporation).

The table below presents the series of data on the evolution of air pollutant emissions for the road transport sector in the period 2005-2015:

Year	NO*x* emission (kt)	NMVOC(kt) emission	CO emission (kt)	Total emissions of suspended particles (kt)

[3] Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC (the MRV Regulation)

[4] Romania ratified the Paris Agreement by Law No 57 of 10 April 2017, which was signed by Romania at New York on 22 April 2016.

2005	96.268	51.382	330.698	3.636
2006	96.054	46.397	288.368	3.768
2007	89.561	41.632	235.881	3.197
2008	93.443	37.849	212.559	3.508
2009	91.733	35.241	194.570	3.335
2010	83.842	29,060	162.861	3.073
2011	84.210	27,793	150.804	3.060
2012	86.993	28.018	148.177	3.310
2013	84.961	24.807	134.871	3.031
2014	86.223	24.084	133.278	2.851
2015	84.470	22.625	124.429	2.932
Evolution 2005-2015	-12.26 %	-55.97 %	-62.37 %	-19.36 %

Figure 1. Change in emissions in the period 2005-2015

In the period 2005-2015, decreases were recorded by 12.26 % for NO*x* emissions, by 55.97 % for NMVO emissions, by 62.37 % for CO emissions and by 19.36 % for total emissions of suspended particles.

Decrease in emissions in the period 2005-2015

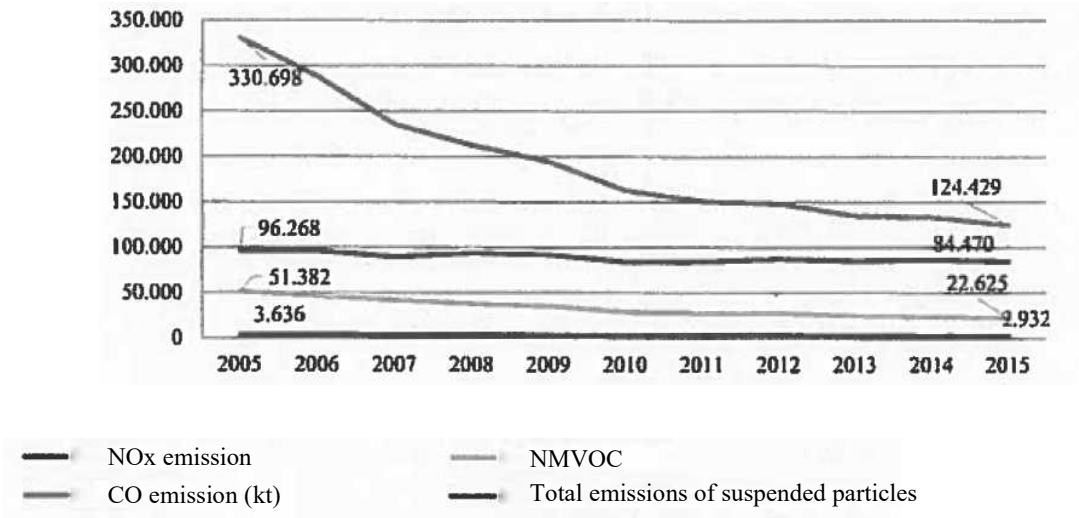


Figure 2. Change in emissions in the period 2005-2015

It is noteworthy that these decreases were largely caused by a downturn in the industrial activity, which is located at the outskirts of the large cities. In the analysed period, these emission decreases had a moderate impact on the level of pollution in urban centres.

The below table lists the data on the evolution of the *greenhouse gas emissions (GHG) in the transport sector*, by modes of transport for the period 2005-2015:

Year	Civil aviation	Road transport	Rail transport	Maritime transport	Other types of transport	Transport sector	Total emissions without LULUCF	% in total emissions without

								LULUCF
2005	189.77	11 893.84	253.10	129.73	114.20	12 580.64	146 454.48	8.59
2006	192.77	12 346.65	251.56	126.62	141.78	13 059.38	147 841.16	8.83
2007	304.78	12 349.80	629.66	267.32	171.90	13 723.46	150 878.01	9.10
2008	384.34	13 903.81	589.04	238.92	282.37	15 398.48	145 828.88	10.56
2009	254.82	14 173.99	439.50	172.89	140.84	15 182.05	126 571.89	11.99
2010	335.86	13 181.77	496.08	184.57	38.19	14 236.47	120 899.59	11.78
2011	245.36	13 258.23	671.13	159.68	35.65	14 370.05	126 992.67	11.32
2012	121.99	14 327.97	639.84	135.07	24.24	15 249.12	124 418.24	12.26
2013	137.72	14 219.07	547.81	150.83	9.53	15 064.96	115 389.18	13.06
2014	73.26	15 039.58	364.52	111.49	1 048	15 599.33	115 413.20	13.52
2015	127.09	15 093.54	374.21	129.53	6.03	15 730.41	116 426.73	13.51
Evolution in 2005-2015	**-33.03 %**	**26.90 %**	**47.85 %**	**-0.15 %**	**-94.72 %**	**25.04 %**	**-20.50 %**	**57.28 %**

* All the values in the table are expressed in kt CO_2 equivalent

Figure 3. Table with data related to GHG emissions in the *transport* sector in the period 2005-2015[5]

In accordance with the INEGES related reporting rules, the last year characterised to date is 2015. Currently, the data and information describing the level of the GHG emissions in Romania is available on the website of the UNFCCC Secretariat[6].

The trends recorded in the transport sector in the period 2005-2015 are: a decrease by 33.03 % for emissions in the civil aviation sector, an increase by 26.9 % for emissions generated by road transport, an increase by 47.85 % for emissions in the rail transport sector, a decrease by 0.15 % for emissions in the maritime transport sector and a decrease by 94.2 % for emissions generated by other types of transport. Overall, a 25.04 % increase in the greenhouse gas emissions in the transport sector was recorded in the period 2005-2015.

Civil aviation

In 2015, emissions from the civil aviation account for 0.81 % in the total emissions in the transport sector (15 730.41 kt CO_2 equivalent).

[5] The table with data related to GHG emissions in the sector transport for the period 1989-2015 is included in Annex 2.

[6] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php. The data for 2016 will be available until 15 January 2018.

In the period 1989-2003, emissions generally remain constant and fuel consumption is constant. As from 2004, in the civil aviation subsector, due to the economic development of the country, there have been several flights and, therefore, fuel consumption and, implicitly, emissions have increased. In the period 2005-2015, there have been increases and decreases in the emissions due to the fluctuations in the number of operated flights.

Road transport

Greenhouse gas emissions generated by the road transport increased by 67.73 % compared to the levels in the base year, amounting to 8 998.90 kt of CO_2 equivalent in 1989, and reached levels of 15 093.54 kt of CO_2 equivalent in 2015. These represent approximately 96 % in the total greenhouse gas emissions in the transport sector.

The trend of emissions in the road transport subsector reflects the changes in the period 1989-1999, which are characterized by a transition towards the market economy. Although the level of modernisation of the roads in Romania was low compared to other European states, the development of the economic activity led to a considerable increase in the freight and passenger road transport services after 1989. This economic activity led to an increase in the GHG emissions, particularly from 2000, and this trend had been constantly maintained until 2015.

Rail transport represents 2.38 % in the total emissions in the transport subsector (15 730.41 kt of CO_2 equivalent). In the rail transport subsector, the emissions trend reflects the changes in this period.

Maritime transport represents 0.82 % in the total emissions in the transport subsector (15 730.41 kt in CO_2 equivalent). In the maritime transport subsector, the downturn in the economic and industrial activities and the drop in the number of sea travels led to a decrease in the fuel consumption and GHG emissions.

Other types of transport include transport by pipes and transport outside public roads. Emissions from combustion in all the remaining transport activities are featured, including transport by pipes (operation of pumping stations and maintenance of pipes), ground-handling activities in airports (activities outside the railway).

1.1 Legal and strategic framework

- **The Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy [COM/2015/080 final] and the policy framework for climate and energy in the period from 2020 to 2030 [COM(2014) 15 final/2]**

The **COM/2015/080 final** Communication lays down the strategy underlying the package proposed by the EU on Energy Union. It defines the five main dimensions underlying the strategy of the Energy Union to enhance its security, sustainability and competitiveness: the security of supply, the reduction of emissions, a fully integrated internal market, energy efficiency, research and innovation.

The **COM(2014) 15 final/2** Communication proposes a framework for the EU policies on climate and energy in the period 2020-2030, starting from the progress achieved with a view to reaching the 2020 objectives in regard to greenhouse gas emissions, the energy from renewable sources and energy savings.

A. In the field of energy

- **The Energy Strategy of Romania for the period 2007-2020**

In a more and more globalized context, the energy policy of Romania is developed in the framework of the changes and developments on the national and European level. The energy policy of Romania must be correlated with the similar documents at European level in order to ensure the convergence of our national policy and of the relevant EU policy.

The energy strategy aims at fulfilling the main objectives of the new EU energy-environment policy, which were also assumed by Romania in its strengthening of the following concepts:

Energy security

Energy security is defined by provision for the demand for energy resources and the limitation of dependency on the import energy resources, by a diversification of import sources, energy resources and their transport routes, by an increase in the level of adequacy of the national electricity, gas and oil transport networks, and by the projection of the critical infrastructure.

Sustainable development

This concept is transposed by an increase in energy efficiency, by promoting the production of energy from renewable sources, by promoting the production of electricity and heat in cogeneration plants, in particular in high-efficiency cogeneration units, by supporting activities involving research-development and dissemination of the applicable research results, by reducing the negative impact of the energy sector on the environment and by the rational and efficient use of primary energy resources.

- **The Energy Strategy of Romania for 2016-2030, with outlook to 2050 (pending completion)**

The Energy Strategy of Romania is mainly concerned with the final consumer. It responds to the final consumer's need to benefit from quality products and services in the future, and from less and less polluting energy production, at the same time ensuring the optimal parameters for ongoing energy supply. Romania proposes a mixture of generation sources to guarantee energy security; security resting on balance between energy independence given by the efficient exploitation of the national resources and the interconnectivity with the neighbouring states and with the energy markets in the region, as an alternative, also in crisis situations. Thus, we have planned for Romania to represent, also in terms of energy, a factor of stability and security, first and foremost for its own citizens, as well as in the Central and Eastern Europe region.

After almost a decade from the last revision of the National Energy Strategy, Romania needed to update its medium- and long-term development projections for this sector in order to cope with new challenges, such as the ageing of the fleet of energy production aggregates or the potential exhaustion of the currently known conventional resources. Such an undertaking is also required in order to be able to make better use of new opportunities arising in the context of the technological development, in particular as regards renewable energy sources, the introduction of smart grids or of electric vehicles.

- **Law No 123/2012** on electricity and natural gas;

The law provides for the regulatory framework for the development of activities in the electricity and natural gas sector for the optimum use of energy primary resources under conditions of accessibility, availability and sustainability and in compliance with the safety, quality and environmental protection rules.

- **Law No 220/2008 establishing the system for promoting energy production from energy renewable sources**

In order to reach the national target for 2020, i.e. 24 %, the Parliament of Romania adopted Law No 220/2008 establishing the system for promoting the production of energy from renewable sources. The law provides for a system promoting the production of electricity from renewable sources based on the imposition of mandatory electricity quotas, combined with trading of green certificates. For 2015, the weight of energy from renewable sources in the total consumption was 24.8 %. (according to the Eurostat data).

Romania has put in efforts in order to achieve the renewable energy objectives and reached its 24 % target for 2020 as early as 2013. The total RES consumption rates in the gross energy consumption in 2013 and 2014 are 25.13 % and 26.27 %, exceeding by far the rates set for the

indicative path of 19.66 % for the period 2013-2014, as calculated in accordance with the provisions of Directive 2009/28/EC on

the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

This law establishes the legal framework required for the extension of the use of renewable energy sources, including by attracting to the national energy balance the renewable energy sources required in order to increase the security of supply with energy and to reduce imports of primary energy resources by fostering sustainable development locally and regionally and by creating new jobs for the processing involving the use of renewable energy sources, by reducing environmental pollution, by reducing the production of pollutants and greenhouse gases, and by setting sustainability criteria for biofuels and bioliquids.

B. The regulatory framework in the specific field of alternative fuels

- **Order No 12/2015 of ANRE** approving the *Regulation for granting licenses and authorisations* ***in the energy sector***:

Operators of energy loading stations are free to purchase energy from any EU energy supplier if the latter is interested in concluding energy supply contracts with operators of energy loading stations within the territory of our country and either holds a license for the supply business, which is granted by ANRE (National Energy Regulatory Authority), or has proceeded/is proceeding to obtain a confirmation from ANRE for its entitlement to supply energy in Romania under the license or an equivalent right granted by the EU state where it has its registered office.

The relationship between the electricity distribution/transport operators and the economic operators installing and/or operating the public loading stations is classified as relationship covered by the rules on access to public interest electricity networks and the provision of the electricity distribution service. The principles referred to in Articles 25 and 44(2) of Law No 123/2012 on electricity and natural gas, as subsequently amended and supplemented, were set out in regulations, among which, first of all:

a. *Regulation on connecting users to public interest electricity networks*, approved by Order No 59/2013 of the President of ANRE, as subsequently amended and supplemented.
b. *The general conditions related to the license granted for the provision of the electricity distribution service by economic operators acting as concessionaires of the electricity distribution service and the general conditions related to the license for the provision of the electricity distribution service by economic operators not acting as concessionaires of the electricity distribution service,* **both regulations being approved by Order No 73 of ANRE in 2014**.

- **Order No 64/2014 of the President of ANRE**, as subsequently amended and supplemented, approves *the Regulation for electricity supply to final customers* and is also applicable to operators of loading stations. *The procedure on the change of the electricity supplier by the final customer and amending the annex to Order No 35/2010 of the President of the National Energy Regulatory Authority establishing rules on the electricity balancing market* was approved by Order No 105/2014 of the President of ANRE, also applicable to operators of loading stations.
- **Order No 34/2013 of ANRE** approving the *Regulation for granting start-up authorisations and licenses* ***in the natural gas sector***:

Any economic operator may purchase natural gas from a holder of a license for the natural gas supply business as a Romanian or foreign legal person.

Thus, ANRE issues licenses for the supply of natural gas, biogas/biomethane, liquefied petroleum gas (LPG), liquefied natural gas (LNG), compressed natural gas for vehicles (CNGV), and for the operation of LNG terminals. At the same time, start-up authorisations are required for LNG and CNGV units.

- As regards the **general regulatory framework for LPG**, it is established by the *Technical Code for Liquefied Petroleum Gas (LPG),* as approved by **Decision No 968/2006 of ANRE**
- As regards the **general regulatory framework for LNG and CNGV**, it is established in the *Technical Code of Liquefied Natural Gas*, approved by **Order No 109/2013 of ANRE**, and the *Technical Code for Compressed Natural Gas for Vehicles*, approved by **Decision No 277/2006 of ANRE** and the *Technical Regulation on the design, execution, operation, maintenance and repairing of stations for storage and distribution of compressed natural gas used as fuel for vehicles (GNCV)*, approved by **Order No 7/2012 of the President of ANRE**.

C. In the field of transport

The EU transport legislation:

- **A European Strategy for Low-Emission Mobility (COM/2016/501 final)**

The Strategy provides that, by mid-century, greenhouse gas emissions from transport will need to be at least 60% lower than in 1990 and provides relevant data for the status quo in the EU in 2016. Thus, urban transport is responsible for 23 % of the greenhouse gas emissions in the EU. Road transport accounts for the largest source of nitrogen oxide (39 %) and an important source of particles (13 %). The transport sector in the EU still depends on oil in order to cover approximately 94 % of the energy demand. The emissions from trucks, buses, and coaches currently represent one quarter in the carbon dioxide emissions produced by road transport and they are foreseen to increase to approximately 10 % in the period 2010-2030. Thus, the 10 % target for the renewable energy source used in transport and the national mandatory targets for 2020 are an integral part of the EU energy policy.

- **COM/2011/0144 final - Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system**

The White Paper lays down a series of ambitious objectives regarding the reduction of Europe's dependence on oil imports, the environmental improvement, the decrease in the number of accidents and the significant reduction of greenhouse gas emissions. These objectives should be framed in the context of a continuous growth of the transport demand, of the differences in regard to the trends in the modes of transport, of the demographic changes and of a weakened capacity of investment on the part of public authorities.

The White Paper objectives include removing the conventional fuel propelled motor vehicles from cities, reaching a level of 40 % in regard to the use of sustainable low-carbon fuels in aviation by 2050, and reducing by 40 % the emissions from waterborne transport.

The future development should also be based on the improvement of the performance of vehicles in terms of energy efficiency for all the modes; development and implementation of fuels and sustainable propulsion systems.

Freight transport on short and medium distances (up to approximately 300 km)[7] will continue to be performed largely by means of trucks. Therefore, in addition to encouraging alternative (rail, waterborne) transport solutions, it is important to improve the efficiency of trucks by developing and adopting new engines and cleaner fuels, by using smart transport systems and by adopting additional measures in order to improve the market mechanisms.

- **Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU.**

[7] More than half (in weight) of all the freights in the road transport sector are transported on distances below 50 km and more than three quarters on distances below 150 km as per the calculations made on the basis of Eurostat data

In accordance with the TEN-T regulation, two different levels of network organisation were established: the comprehensive network and the core network. The comprehensive network represents the basic level of TEN-T, and its objective is to ensure the interconnection of all the EU regions and the access of citizens and economic operators to the Single Market. The core network is made up of all the most important sections in terms of strategy and traffic flows of the comprehensive network. This network is the spine of the multimodal mobility network and is focused on the sections with the highest added value at European level.

The regulation sets clear time limits for completion of the core network and of the comprehensive network and proposes technical specifications to be mandatory. Thus, Member States have the obligation to develop by 2030 the national infrastructure, which is part of the core network, and by 2050 the entire comprehensive network.

- **Proposal for a Directive of the European Parliament and of the Council amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructure.**

With reference to environmental sustainability, the European Commission proposes that the charging policy take into account the emissions generated by the road transport sector so as to contribute to reaching the targets stated in the Paris Agreement.

Directive 1999/62/EC does not include currently any elements contributing specifically to a reduction of CO_2 emissions in transport. The highest rate of such emissions originates from passenger cars (over 60 %), whereas the rate of emissions from HGVs is increasing. Under current trends, the reduction of emissions will not be sufficient in order to reach the EU targets set for 2030 and 2050.

The national transport legislation:

- **Law No 34/2017** on the deployment of the alternative fuels infrastructure. At the level of waterborne transport infrastructure and inland waterways transport, those LNG loading stations need to be provided in the Romanian ports from the TEN-T network by 2025 for maritime ports (Constanta) and by 2030 for ports located on the inland waterways (Galați, Drobeta Turnu Severin, Cernavodă, Giurgiu, Calafat).
- **Government Order No 43/1997 on the regime of roads, as subsequently amended and supplemented.** Article 1 of GO No 43/1997 provides that "the administration of public and private roads concerns the design, construction, modernisation, rehabilitation, repairing, maintenance and use of roads".
- **Emergency Order No 55/2016** on the reorganisation of the National Motorway and National Roads Company (*Compania Națională de Autostrăzi și Drumuri Naționale*) in Romania and the establishment of the National Road Investment Company (*Compania Națională de Investiții Rutiere SA*), and amending and supplementing certain legislative acts.
- **Order No 622/2003 of the Minister for Transport, Constructions and Tourism** approving the technical regulation "Regulation on the design of extra-urban motorways" (revision PD 162-1983), indication PD 162-2002. *Article 140(1) Section 2 Chapter XI of the Regulation* only provides for the obligation to equip services areas with fuel charging stations, without indicating their nature.
- **Order No 2264/2004 of the Minister for Transport, Constructions and Tourism** approving the Technical Regulation on the design and equipment of parking places and stops on public roads, which are located outside the locality boundaries. Articles 3 and 4 of the Regulation only provides for the obligation to equip services areas with fuel charging stations, without indicating their nature.
- **Government Decision No 666/2016 approving the strategic document General Transport Master Plan of Romania** includes the Strategy for Implementation of the General Transport Master Plan of Romania for the period 2014-2030, as set out in the annex to this decision, which constitutes the general framework for the prioritisation and

implementation of transport infrastructure projects, established on the basis of the estimative values required for the execution of works.

D. In the field of environmental and climate change policies

The current situation of greenhouse gas emissions is regulated by the following legislative acts:

International law:

- **The Paris Agreement**

The Paris Agreement was adopted in December 2015, at the 21st Conference of the parties to the United Nations Framework Convention on Climate Change (UNFCCC), and its long-term objective is to maintain the global temperature increase below 2 °C, compared to the level in the preindustrial period, and to further the efforts to keep this increase below 1.5 °C. The Paris Agreement entered into force within less than a year from its adoption (October 2016). It sends out a clear signal to investors, the business environment and decision-makers regarding the fact that global transition towards a low-carbon economy is the way to the future.

European legislation:

- **The Europe 2020 Strategy**

This is the EU strategy launched in 2010 with the purpose of creating the conditions for smart, sustainable and inclusive growth.

Five main objectives were convened for the EU to achieve by the end of 2020, more specifically: employment; research and development; climate/energy; education; social inclusion and reduction of poverty.

The 2020 package sets out three key objectives in order to ensure that the EU fulfils its objectives on climate and energy for 2020: (i) to reduce greenhouse gas emissions by 20 % (from the levels in 1990), (ii) to obtain 20 % of the EU energy from renewable sources and (iii) to achieve a 20 % energy efficiency improvement. The objectives for 2030 have not been agreed upon yet.

National legislation:

- **Law No 104/ 2011** on the quality of ambient air, as subsequently amended and supplemented

The legislative act includes broad rules on:

- the evaluation of the ambient air quality for sulphur dioxide, nitrogen dioxide, nitrogen oxides, particulate matter PM 10 and PM 2.5, lead, benzene, carbon monoxide, arsenic, cadmium, nickel, benzo[a]pyrene;
- the management of the ambient air quality by preparing air quality plans in order to reach appropriate limit values or air quality maintenance plans, where applicable.

Annex II also identifies the conurbations where road traffic has a significant impact on air quality.

- **Government Emergency Order No 40/2011** *on the promotion of non-polluting and energy-efficient road transport vehicles,* as subsequently amended and supplemented;

The legislative act aims at promoting the placing on the market of non-polluting and energy-efficient transport vehicles through green public procurement.

Thus, a general obligation has been imposed on contracting authorities and certain operators to take into account the energy and environmental impact over their lifetime, including energy consumption, CO_2 emissions and certain pollutants when purchasing road transport vehicles.

- **Emergency Order No 196/2005** *on the Environmental Fund*, as subsequently amended and supplemented;

The establishment of the Environmental Fund entailed the establishment of a system of taxes and contributions on the polluting activities performed by the natural and legal persons. The amounts thus collected are used to fund, in the form of reimbursable or non-reimbursable aid, environmental protection projects.

The programmes funded from the Environmental Fund also include, in 2017, the *Programme for the reduction of greenhouse gas emissions in transport by promoting non-polluting and energy-efficient road transport vehicles and the Programme for the reduction of greenhouse gas emissions in transport by promoting the infrastructure for non-polluting energy-efficient road transport vehicles: loading stations for electrical and plug-in hybrid electrical vehicles*.

- **Emergency Order No 115/ 2011** establishing the institutional framework and authorising the Government, through the Ministry of Public Finance, to auction the emission allowances awarded to Romania within the EU, as subsequently amended and supplemented;

The implementation of the scheme for trading the emission allowances valid after 2012 is a complex process requiring the attention of all the public institutions involved. The Ministry of Public Finance is authorised to auction, on the joint platform, emission allowances awarded to Romania and to manage the account where the amounts collected as a result of auctioning such allowances are received. Those amounts are used by the central public administration authorities for measures intended to reduce CO_2 emissions and to increase energy efficiency.

- **Government Decision No 935/2011** *promoting the use of biofuels and bioliquids*, as subsequently amended and supplemented.

The aim of the Decision is to promote the use of biofuels and other renewable fuels to replace the gasoline and diesel oil used in transport in order to contribute thus to achieving certain targets, such as fulfilling the commitments on climate change, ensuring the supply of fuels under conditions of environmental safety and protection, and promoting renewable energy resources.

- **Government Decision No 739/2016** *approving the National Strategy on climate change and low-carbon based economic growth for the period 2016-2020 and the National Action Plan for the implementation of the National Strategy on climate change and low-carbon based economic growth for the period 2016-2020*

The Strategy envisages the two key components of the endeavour in the field of climate change: preventing and combating the effects of climate change (by action intended to reduce greenhouse gas emissions - GHG emissions) and adapting adequately and with minimum damage in the context created by the climate change which has already taken place.

The strategic objectives included in this Strategy, in regard to the transport sector, are: “To introduce strong economic incentives for environment-friendly transport, through pricing instruments”, “To enhance the efficiency of urban transport” and “To reverse the long-term downturn in rail passenger and freight transport and to include projects for the development of intermodal terminals”

E. In the field of regional development

- **The Territorial Agenda of the European Union - We Support the Strengthening and Extension of Trans-European Networks**

Mobility and accessibility are key prerequisites for economic development in all regions of the EU. To meet the requirements for mobility in a polycentric European territory, including our neighbouring countries, and to contribute to enhancing the urban environment, it is important to secure integrated and sustainable development of multi-modal transport systems. We need capable

networks both for passengers and goods, of rail, road and air (including networks of viable regional airports), efficient maritime, coastal and inland waterways, and secondary networks linking with respective hinterland areas as well as cross-border transport management. We support the removal of barriers to cross-border rail and road transport and particularly support the use of telematic measures to assist the operation of overloaded parts of road networks.

Rising energy demand in the face of limited reserves of non-renewable energy sources, and a growing dependence of the EU on imported energy as well the challenge of climate change, means that we should further explore and develop opportunities for decentralized, efficient, safe and environmentally friendly production of renewable energy, which is as yet underutilised. In order to make better use of regional potentials in this field, which might generate opportunities particularly in rural areas, we recommend further strengthening networks and harmonising conditions for the energy sector.

- **Law No 350/2001** on land management and urban planning, as subsequently amended and supplemented.

The spatial management of the country land is a mandatory, ongoing and forward-looking action carried out in the interest of the communities that use it, in accordance with the societal values and aspirations and with the requirements of integration in the European space.

Spatial land management confer on the individuals and communities the right of fair use of and the responsibility for efficient land use. (3) The management is achieved through land management and urban planning, which consists of a whole set of general interest complex activities contributing to balanced spatial development, the protection of the natural heritage and built assets, and the improvement of living conditions in urban and rural localities, and to ensuring territorial cohesion at regional, national and European level.

Starting from 2013, Law No 350/2001 on land management and urban planning introduced the obligation to prepare the Urban Mobility Plan (UMP) for first and second level localities (the peri-urban/metropolitan land development strategy and the peri-urban/metropolitan urban mobility plans are designed by the county council or the polarising core locality).

In accordance with Law No 350/2001, the Urban Mobility Plan is a documentation which complements the peri-urban/metropolitan land development strategy and the General Urban Plan (GUP) and constitutes the strategic land planning tool which correlates the spatial development of localities and of their peri-urban/metropolitan area with the mobility and transport demands of people and freight.

The content framework, the institutional functions and the procedure for endorsing the documentation were regulated by Order No 233/2016 approving the detailed rules implementing Law No 350/2001 on land management and urban planning, and preparing and updating urban planning documentations.

- **Law No 351/2001** approving Section IV in the National Land Management Plan - Localities Network, as subsequently amended and supplemented.

Law No 351/2001 aims at establishing a functional hierarchy of urban and rural localities - the ranking of localities by importance in the network and their territorial role - ensuring an efficient public service system from the economic and social viewpoint and a balanced territorial development of localities.

The national network of localities comprises urban and rural localities which are ranked as follows:

a) class 0 - the Capital of Romania, a municipality of a European importance;
b) class I - municipalities of a national importance, with a potential European influence;
c) class II - municipalities of an inter-county importance or with a balanced role in the network of localities;
d) class III - towns;

e) class IV - capital village at commune level;
f) class V - villages pertaining to communes and villages pertaining to municipalities and towns.

- **Law No 215/2001** on local public administration, as subsequently amended and supplemented

Law No 215/2001 of local public administration, as subsequently amended and supplemented, defines conurbations in Article 1(2)(b) as intercommunity development associations established under partnerships between municipalities, other than those referred to in point (j), and towns, together with the urban and rural localities in the area of influence

1.2 The status quo pertaining to the type of alternative fuel

To this date, the measures fostering the alternative fuel based transport sector have not been integrated in a formal strategic framework, but such a framework has developed organically. The fostering measures adopted occasionally represented punctual initiatives of the relevant competent authorities, such as the Environmental Fund Administration Office (*Administrația Fondului de Mediu*) and certain private investors.

In regard to road transport[8], the current tendency is towards a fast increase in the vehicle fleet, in particular through the import of used motor vehicles, although Romania is slightly above half of the European average in regard to power engines. Thus, approximately 5.15 million passenger cars were registered in Romania at the beginning of 2016, of which approximately 3.2 million were equipped with gasoline engines and 1.9 million with Diesel oil engines. Moreover, the analysis of the draft *Energy Strategy of Romania for 2016-2030, with an outlook to 2050* has revealed that, at the beginning of 2016, 21 000 buses, of 14 years of age on average, 25 000 minibuses, of 9 years of age on average, and 775 000 freight vehicles, of which 330 000 heavy vehicles, of an unspecified average age, were registered in Romania.

The average age of the passenger car fleet in Romania is over 12 years, which is among the oldest in Europe. Approximately 75 % of the passenger cars registered for the first time in Romania in 2015 in the first nine months of 2016 circulate in the Western European states. The average age of circulated passenger cars imported to Romania is 13 years for gasoline vehicles and 10 years for Diesel oil vehicles.

It is also noteworthy that the interest of the Romanian consumer of passenger cars using fossil fuel remains high and 55 % of the 330 000 passenger cars registered for the first time in Romania in 2015 are equipped with a Diesel-oil engine. Considering that some European states have established objectives for removing the fossil fuel vehicles from their national vehicle fleet, in the absence of preventive measures, purchases of used fossil fuel vehicles are expected to be further encouraged.

The status quo of the market in the field of **alternative fuel transport** is largely influenced by the availability of the alternative fuels vehicles with reference to the purchasing power of potential users, and by the level of development of this type of vehicle loading/charging infrastructure.

In Romania, according to official data, approximately 10 000 alternative fuels vehicles are currently in circulation, including hybrid vehicles. With reference to the size of the vehicle fleet, it has been noted that the number of alternative fuels vehicles in Romania is low, i.e. far below 1 %.

According to the draft *Energy Strategy of Romania for 2016-2030, with outlook to 2050*, the electric vehicle is estimated to become more cost-efficient for drivers towards the end of 2020, compared to the current level, even in the absence of the subsidies granted by the Romanian state, by the mere increase of the availability of that technology.

Below is a presentation of the status quo of the alternative fuels market by type of used

[8] For waterborne transport, please see Section 1.4.2., and for air transport, see Section 1.4.3.

fuel, with reference to the availability of vehicles in 2017, and to the development of the specific infrastructure.

1.2.1 Electric and hybrid electric vehicles

In regard to the **availability of vehicles**, the price for electric vehicles is currently significantly higher than for vehicles equipped with internal combustion engines, and for the small number of models, where autonomy exceeds 500 km, the price is very high (approximately EUR 100 000). The battery is the major component in the total costs pertaining to an electric vehicle (EV), and its price, availability on the market and technical performance have a determining influence on the decision to purchase such a vehicle. At the same time, the price for electric buses is high and, for this reason, their purchase for public transport by local authorities is a complex process. Moreover, in 2017, the GDP/capita in Romania, except for the capital city, was below 75 % of the EU average, which is likely to contribute significantly to the low EV and plug-in hybrid electric vehicles (HEV) rate, with reference to both *the total fleet of motor vehicles, and the total number of registered vehicles*.

Most of the plug-in hybrid vehicles currently have an autonomy of approximately 30-50 km if they use the electric engine alone, whereas 100 % electric vehicles have an autonomy of approximately 200 km. Likewise, plug-in hybrid vehicles have a more competitive price than 100 % electric vehicles. However, by 2020, the interest for exclusively electric vehicles is expected to rise due to the technological developments, which will entail an increase in their autonomy (450-600 km) and competitive prices.

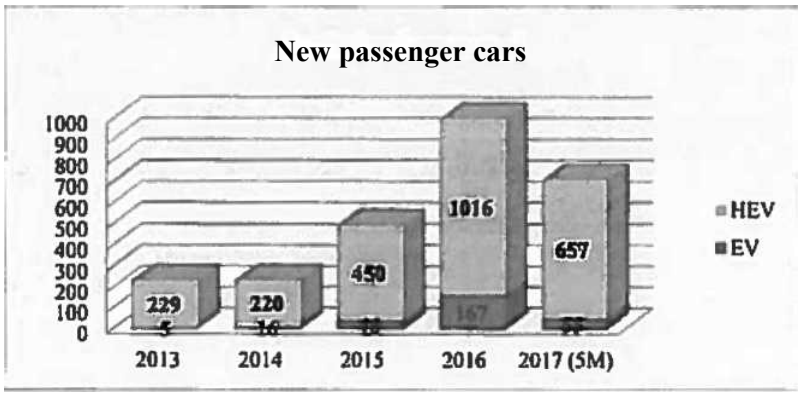
In Romania, approximately 230 electric vehicles had been registered by 2016, with a tendency of steady increase from one year to the other. The number of purchased vehicles exceeds the number of registered vehicles.

Newly purchased passenger cars	2013	2014	2015	2016	2017 (5 months)
EV	5	16	46	167	55
HEV	229	220	450	1 016	657
TOTAL	234	236	496	1 183	712

From: APIA (Paying and Interventions Agency for Agriculture)

Figure 3. New passenger cars purchased in the period 2013-2017 (5 months)

If, in the period 2013-2014, only a 1 % increase is noted in the number of newly purchased electric and hybrid electric vehicles, in the following period this number increases successively by 110 % (2014-2015), by 139 % (2015-2016) and by 185 % (in the first five months of 2017). This speedy rate of increase could be explained by the fact that the vehicles have become more accessible in terms of price, and as the effect of certain punctual measures whereby the Romanian state encourages purchase, such as the "Rabla Plus" Programme (the period 2016-2020).



Source: APIA

Figure 4. Chart of newly purchased vehicles in the period 2013-2017 (5 months)

The purchase of new electric and hybrid electric vehicles accounts, on average, for approximately 48 % of the total EV and HEV registered in Romania. The approximately remaining rate of 52 % accounts for already circulated (second-hand) electric and hybrid electric vehicles purchased in particular in other European states. Unlike internal combustion engine vehicles, the age of these vehicles is not directly proportional with the level of pollution generated, and therefore they could be included as passenger cars benefitting, in operation, from the same fostering measures as newly purchased motor vehicles.

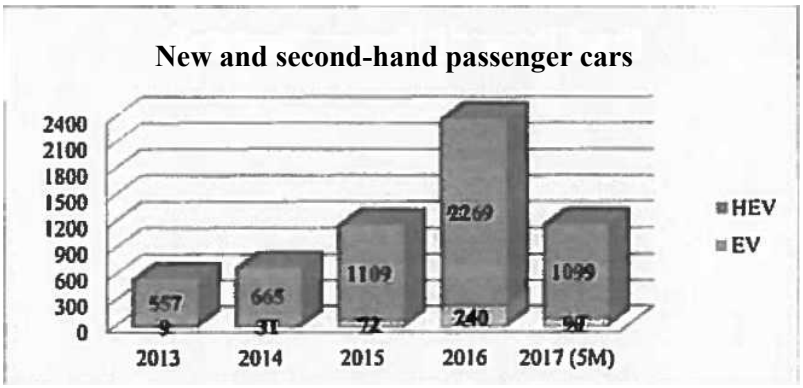
However, account should be taken of the fact that the lifetime and efficiency of batteries of these vehicles is low, and any potential replacement and recycling should be such as to generate a minimum impact on the environment and to produce adequate efficiency.

New and circulated passenger cars purchased	2013	2014	2015	2016	2017 (5 months)
EV	9	31	72	240	90
HEV	557	665	1 109	2 269	1 099
TOTAL	566	696	1 181	2 509	1 189

Source: APIA (Paying and Interventions Agency for Agriculture)

Figure 5. New and circulated passenger cars purchased in the period 2013-2017 (5 months)

A rapid increase in the number of electric vehicles purchased in the last two years has been noted, as well as a higher interest in purchasing new passenger cars - the percentage increase being higher when already circulated passenger cars are also taken into account (*second-hand*).



Source: APIA (Paying and Interventions Agency for Agriculture)

Figure 6. Chart of new and circulated passenger cars purchased in the period 2013-2017 (5 months)

Thus, in the last three years, the increase in the number of electric vehicles exceeded 100 % for new vehicles. However, with reference to the vehicle fleet, the number of electric vehicles, including hybrid ones, is insignificant, i.e. around the value of 0.1 %.

Vehicle category	**Electric**	**HYBRID 01 (gasoline + electric)**	**HYBRID 02 (Diesel oil + electric)**	**HYBRID 03 (LPG + electric)**
Passenger cars	217	6 187	688	6

Passenger transport	3	0	1	0
Freight transport	31	3	2	0
Total	251	6 190	691	6

Source: DRPCIV (Directorate for Driving Licenses and Registration of Vehicles)

Figure 7. Number of electric and hybrid vehicles registered at the end of June 2017

As regards the **infrastructure, approximately 150 EV charging/recharging stations are available to the public at national level in June 2017**, both fast charging - with a charging time of approximately 30-60 minutes, and conventional (slow) charging - with a charging time of approximately 2-3 hours, located exclusively in the urban environment. This number represents a significant evolution considering that, at the beginning of 2016, there were approximately 50 recharging points.

The rapid increase in the number of recharging points is largely due to the private initiatives of some economic operators, such as those managing retail stores, restaurants or hotels. The recharging points are available to the public and are mainly addressed to their customers.

1.2.2 Liquefied Petroleum Gas (LPG)

The infrastructure in Romania includes over 1 800 operational LPG refuelling stations. The data available in public sources indicates a uniform distribution throughout the country, with concentration points around significant urban centres and covering, implicitly, the road transport network (Fig. 8).

According to the official data, in regard to the number of vehicles supplied with LPG, approximately 4 300 such vehicles were registered in June 2017 in Romania, including hybrid LPG vehicles, also fuelled with gasoline.

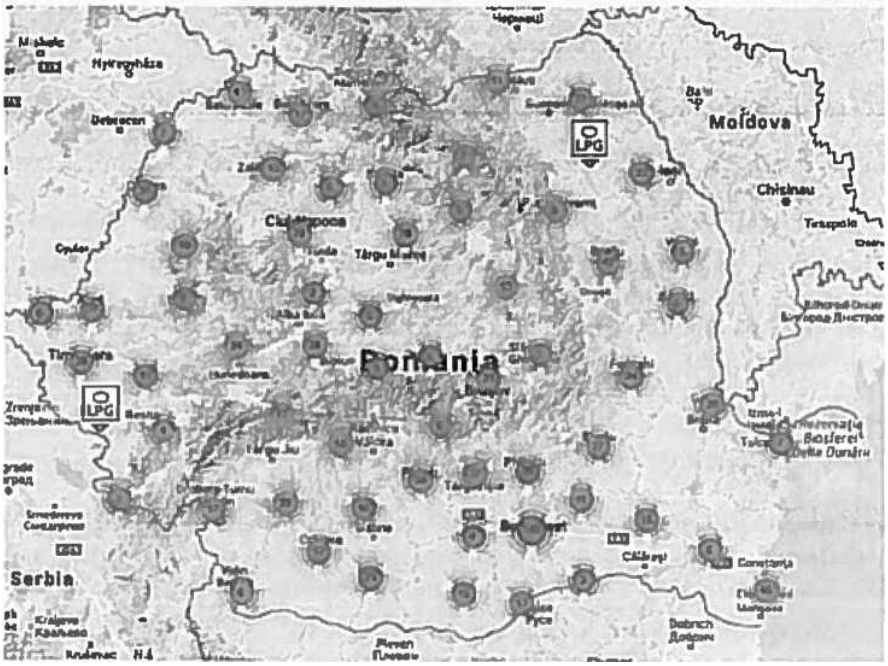
Vehicle category	LPG	GASOLINE + LPG
Passenger cars	17	4 198
Passenger transport	82	0
Freight transport	3	49
Total	102	4 247

Source: DRPCIV (Directorate for Driving Licenses and Registration of Vehicles)

Figure 8. Total LPG fuelled passenger cars registered at the end of June 2017

In Romania, the installation of a LPG station is declared to the Romanian Vehicle Register (Registrul Auto Român - RAR) and registered in the Vehicle Identity Card, the owner having the obligation to inform the authorities and to update the Registration Certificate[9].

[9] In accordance with Order No 229/2003 of the Minister for Transport, Constructions and Tourism (MTCT) approving the Rules for amending the motor vehicle engine fuelling system, which were homologated for circulation on the public roads in Romania with a certain fuel provided by the contractor, also for operation with liquefied petrol gas (LPG) and the authorisation of economic operators carrying out services involving mounting, technical revisions and repairing of engine LPG fuelling installations - RNTR-6.



Source: https:/www.mylpg.eu/stations/romaniat#map

Figure 8. Distribution of LPG stations throughout the territory of Romania

The RAR records on the road vehicle fleet concern vehicles for which RAR issued the vehicle identity card (VIC) for registration purposes and vehicles which were submitted to regular technical inspections (ITP).

For this reason, in practice, the RAR data does not reflect the entire status quo of the road vehicle fleet because it is not correlated with the actual situation of registrations or deletions of vehicles by DRPCIV and does not include vehicles which, for certain reasons, have not been submitted to the regular technical inspection. Thus, the actual number of vehicles with LPG installations is estimated to be significantly higher than that presented in Figure 8.

1.2.3 Compressed natural gas (CNG) and Liquefied natural gas (LNG)

Compressed natural gas (CNG) is an alternative fuel based on the compression of methane to approximately 1 % of its volume, existing under conditions of standard air pressure. The volumetric density of energy contained in a CNG unit equals approximately 42 % of that of the liquefied petrol gas and approximately 25 % of that of conventional fossil fuels (diesel oil and gasoline). Transport, storage and use of compressed natural gas are achieved at pressure values between 200 and 280 bar, which requires developing and implementing adequate standards to ensure safety in the use of such an alternative fuel.

In terms of the number of vehicles and of the refuelling infrastructure, the CNG usage rate in the transport sector has been so far extremely low.

Vehicle category	CNG	CNG/LNG
Passenger cars	80	0
Passenger transport	29	0
Freight transport	46	1
Total	155	1

Source: DRPCIV (Directorate for Driving Licenses and Registration of Vehicles)

Figure 9. Status in June 2017 in regard to the availability of the vehicles fuelled with CNG

In regard to the recharging infrastructure, in June 2017, the CNG station network in Romania included two stations, i.e. one in Ramnicu Valcea municipality and one in Bucharest municipality. The station in Ramnicu Valcea has a maximum capacity of 600 cm/h and one fuelling end, ensuring a fuelling speed of minimum 5 kg/minute. In June 2017, a new station was under construction and it was planned to be commissioned by the investor during the fourth quarter.

In the period 2017-2019, 9 stations[10] will be built on own initiative under various European co-funding and/or private capital programmes, which will be located nearby the following urban centres: Arad, Timișoara, Deva, Drobeta, Craiova, Sibiu, Pitești, București, Constanța. These locations can service both the respective conurbations and the vehicles transiting within approximately 5 km from the main European transport network TEN-T.

Under these private initiatives, stations will maintain a fuelling speed of minimum 5 kg/minute and at least two fuelling ends. It is estimated that, by the end of 2019, there will be at least 10 such stations.

The operating hours for these recharging points are for the station operators to set and, at a first stage, they are foreseen to be operated for at least eight hours per day, being adapted afterwards to the estimated vehicle flow rate serviced by them.

Liquefied natural gas (LNG) is mainly methane subjected to liquefaction, whereby its volume is reduced by approximately 600 times, thus becoming suitable for storage and transport in tanks. Unlike CNG, the pressure of the liquefied natural gas is approximately 4 bar, and the volumetric density of the energy contained in a LNG unit is approximately 2.4 times higher than that of CNG. In order to maintain it in a liquid state, it must be brought and stored at temperatures below -150°C (International Gas Union, 2012, p. 22).

Thus, although a LNG volume unit contains more energy than an identical unit of CNG and is stored at much lower pressures, its handling at such low temperatures make it commercially non-feasible for its direct use by the final user without regasification. Therefore, in July 2017 there was no infrastructure deployed in Romania to fuel road vehicles or ships with LNG.

A potential deployment of a LNG fuelling infrastructure for ships is provided for in **Government Decision No 666/2016 approving the strategic document entitled General Transport Master Plan of Romania, in Table 6.15** - *Proposals for investment projects with a view to attracting new freight flows to Constanta Port*, which lists two projects: "Construction of LNG Terminal on the Southern Dam of Constanta Port" and "Construction of LNG Fuelling Station at Berth D99 (ml) and Parking Platforms".

1.2.4 Biofuels

Biofuels, which are defined as alternative fuels in Article 2(i) of Directive 2009/28/EC, as transposed by Government Decision No 935/2011 *promoting the use of biofuels and bioliquids*, as subsequently amended and supplemented, are biodiesel, bioethanol and ETBE[11]. The relevant analysis period selected from the viewpoint of the biofuel volumes placed on the market in Romania is 2011-2016.

Thus, approximately 285 thousand tonnes of biofuels were placed on the market in 2011, approximately 320 thousand tonnes in 2012 and approximately 250 thousand tonnes in 2013.

Approximately 257 thousand tonnes of biofuels were placed on the market in Romania in 2014 out of a volume of biofuels of approximately 286 thousand tonnes, as reported by Romanian

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[10] Initial Market Deployment of a Refuelling Station Network along the Core Network Corridors - 2015-RO-TM-0373-M, total budget of EUR 5 212 338, with 80.00 % EU contribution;

[11] Ethyl tertiary butyl ether (ETBE) is produced from ethanol and isobutylene in a catalytic reaction.

companies. The total volume of fuels placed on the market in 2014 was approximately 5.9 million tonnes and the weight of biofuels was approximately 4.4 % in this volume.

Volume of biofuels supplied on the market in the period 2011-2015

(tonnes)

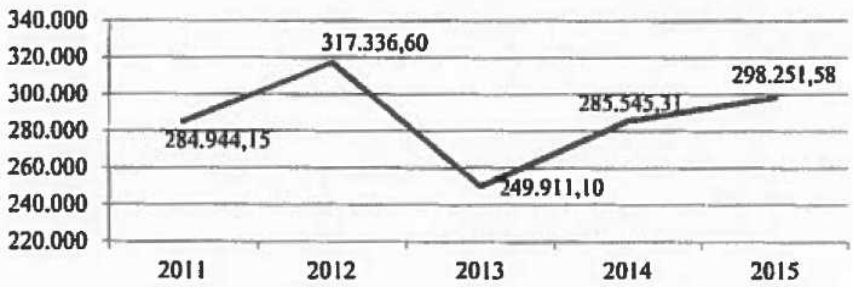


Figure 9. Trends in the volume of biofuels in the period 2011-2015

For 2015, an approximate volume of 244 thousand tonnes was placed on the market in Romania from internal production and import, out of a volume of biofuels of approximately 300 thousand tonnes, as reported by Romanian companies. Considering that the annual total volume of gasoline and diesel oil placed on the market in Romania in 2015 was approximately 6.7 million tonnes, we assess that biofuels weigh approximately 3.65 % in the total fuels placed annually on the market. In 2016, the volume of biofuels supplied to the internal market was maintained around 300 thousand tonnes.

However, in promoting the use of biofuels at the level of future public policies, account shall also be taken of aspects related to single agricultural crops, of the level of greenhouse gases released upon harvesting, storage and transport pertaining to the production of these alternative fuels, and of the effect of the biofuel fraction introduced in the conventional fuels on the lifetime of internal combustion engines.

1.2.5 Hydrogen

Romania is included in the group of countries (less than thirty) which traditionally produce hydrogen. The presence in this group is due to the increased pace of development of the chemical industry, which was recorded in the previous decades, and to the fact that Romania, for the first time globally, started to produce ammonia by thermo-catalytic conversion of methane, with parallel production of hydrogen by water hydrolysis and cracking (conversion) of methane.

At a first stage, hydrogen production is practically determined by the development of the industry producing chemical fertilizers. In addition to this category of producers, there are also other hydrogen producers in Romania, such as refineries, the petro-chemical industry and, as a by-product from the chlorine-sodium substance production units.

The first situations include hydrogen production intended exclusively for internal consumption, refineries shifting from the status of producers to that of industrial consumers of hydrogen. Hydrogen, as a by-product resulting from the operation of plants in the petro-chemical industry and of chlorine-sodium plants, may be marketed for various applications, including those pertaining to hydrogen-based mobility. The first uses of hydrogen in the energy field in Romania were in 2009 and 2015, when cogeneration plants fuelled by natural gas and hydrogen were constructed.

Thus, it has been found that Romania has the premises for using hydrogen as an alternative fuel, including by a re-profiling of the current industrial potential. The required charging and propelling systems may be developed within the relevant companies through the support granted to research activities, including by facilitating access to certain European funding mechanisms.

Research and development in this field in Romania is to be fostered by empowering the

expertise held by relevant institutions, by facilitating access to relevant European funding and by setting a development agenda contingent upon and in accordance with the economic viability of the solutions using such fuel.

1.3 Status quo with reference to conurbations

Main conurbations in Romania, which concentrate the largest number of population and economic activities, comprise municipalities as county capital cities. They are: Oradea, Arad, Timișoara, Reșița, Drobeta Turnu-Severin, Deva, Cluj-Napoca, Zalău, Satu- Mare, Baia-Mare, Bistrița, Suceava, Botoșani, Piatra Neamț, Iași, Târgu Mureș, Vaslui, Miercurea Ciuc, Brașov, Bacău, Alba Iulia, Sfântu Gheorghe, Sibiu, Focșani,Galați, Râmnicu Vâlcea, Târgoviște, Buzău, Brăila, Tulcea, Târgu Jiu, Craiova, Slatina, Pitești, Alexandria, Ploiești, Slobozia, Călărași, Giurgiu, Constanța, and the capital city, Bucharest.

Law No 351/2001 approving Section IV of the National Land Management Plan - Locality Network, ranks the localities in Romania into 6 classes (from 0 to V), depending on their territorial role and the endowments they have.

For the objectives of this National Framework Strategy, account is taken of the conurbations included in the first two categories, which are added up with those in the third category, fulfilling the function of municipalities as capital cities:

- **class 0** - Bucharest (the Capital of Romania, municipality of a European importance);
- **class I** - Bacău, Brașov, Brăila, Galați, Cluj-Napoca, Constanta, Craiova, Iași, Oradea, Ploiești, and Timișoara (municipalities of a national importance, with a potential influence at European level;
- **class II** - Arad, Reșița, Drobeta Turnu-Severin, Deva, Zalău, Satu-Mare, Boia-Marc, Bistrița, Suceava, Botoșani, Piatra Neamț, Târgu Mureș, Vaslui, Miercurea Ciuc, Alba Iulia, Sfântu Gheorghe, Sibiu, Focșani, Râmnicu Vâlcea, Târgoviște, Buzău, Tulcea, Târgu Jiu, Slatina, Pitești, Alexandria, Slobozia, Călărași, Giurgiu.

For the objectives of this framework document, account is also taken of the relevant conurbations under the environmental law. Thus, Law No 215/2001 of local public administration, as subsequently amended and supplemented, defines conurbations in Article 1(2)(b) as intercommunity development associations established under partnerships between municipalities, other than those referred to in point (j), and towns, together with the urban and rural localities in the (metropolitan) area of influence.

Considering the less significant territorial role, the measures set out in this National Framework Strategy are indicative for the other localities ranked second (municipalities of an inter-county or county importance, or with a balancing role in the network of localities which do not fulfil the role of county capital city), third (towns), fourth (villages as commune capitals) and V (villages as components of communes and villages pertaining to municipalities and towns).

Also, **Law No 104/2011 on the quality of the ambient air** identifies, in Annex 2 to this law, 13 conurbations on which road traffic has a significant impact: Bacău; Baia Mare; Brașov; Brăila; București; Cluj-Napoca; Constanța; Craiova; Galați; Iași; Pitești; Ploiești; Timișoara. Order No 1206/2015 of the Minister for the Environment presents the lists with the territorial administrative units prepared after the classification in area management regimes in the areas and conurbations referred to in Annex 2 to Law No 104/2011. As per Annex 1 to Law No 104/2011, the first management regime includes seven conurbations: București, Bacău, Brăila, Brașov, Iași, Galați, and Cluj, as well as Măgurele town, which is located in the vicinity of Bucharest municipality, in Ilfov County.

Thus, having regard to the above, the objectives and measures in this National Framework Strategy concern at least the following conurbations classified, for the purposes of this National Framework Strategy, as follows:

Category	Name of locality
A category conurbation	Bucharest
B category conurbation (as per Law No 104/2011)	Bacău, Brașov, Brăila, Galați, Cluj-Napoca, Constanța, Craiova, Iași, Oradea, Ploiești, Timișoara, Baia Mare, Pitești
C category conurbation	Arad, Reșița, Drobeta Turnu-Severin, Deva, Zalău, Satu-Mare, Bistrița, Suceava, Botoșani, Piatra Neamț, Târgu Mureș, Vaslui, Miercurea Ciuc, Bacău, Alba Iulia, Sfântu Gheorghe, Sibiu, Focșani, Râmnicu Vâlcea, Târgoviște, Buzău, Tulcea, Târgu Jiu, Slatina, Alexandria, Slobozia, Călărași, Giurgiu.

Source: Law No 104/2011

Figure 10. Conurbations with relevance for the objective of this National Framework Strategy.

The localities included in the above categories represent the main urban centres in Romania, concentrating the highest number of population and economic activities. At the same time, by their territorial layout, inter-urban and cross-border connectivity with reference to TEN-T is ensured. Distances between these localities or among these localities and border areas are not longer than 150 km (except for the distance between Oradea and Cluj-Napoca, i.e. 164 km).

1.3.1 Public transport services[12]

In Romania, 17 cities have electric public transport (tramways or trolleybuses).

Development regions	Length of single line (km)		
	Tramways	**Trolleybuses**	**Underground**
Romania	858	458.1	162.4
North-East	98.8	34.5	-
South-East	75	25.4	-
South	24	23	-
South-West	34.4	27.2	-
West	190.5	75	-
North-West	62.7	79.2	-
Centre	11.0	60.1	-
Bucharest-Ilfov	361.6	143.7	162.4

Source: INS (National Statistics Institute)

Figure 11. Length of the single line in local public transport at the end of 2016, by types of vehicles

Development regions	Inventoried vehicles (No)		
	Tramways	**Trolleybuses**	**Buses and micro-buses**

[12] The source of data in this section: *Report 1 - Justification and EU Funding Strategic Objectives - Preparation of Public Service Contract (PSC) for the cities in Romania in accordance with the EU law*

Romania	1 260	597	4 832
North-East	182	28	484
South-East	92	13	740
South	33	42	428
South-West	29	15	334
West	285	50	361
North-West	148	109	624
Centre		43	714
Bucharest-Ilfov	491	297	1 147

Source: INS (National Statistics Institute)

Figure 12. Local public passenger transport at territorial level (2016)

Development regions	Transported passengers (thousands)			
	Tramways	Buses and micro-buses	Trolleybuses	Underground
Romania	459 057.4	1 071 890.0	170 003.8	179 119.0
North-East	66 050.2	118 843.3	3099.1	-
South-East	22 048.0	126 985.2	3 024.0	-
South	24 911.0	132 289.0	29 299.0	-
South-West	9 349.8	60 825.5	1 988.0	-
West	95 156.0	55 365.0	35 100.0	-
North-West	12 252.4	210 358.5	46 023.0	-
Centre	-	164 878.5	8 271.7	-
Bucharest-Ilfov	194 403.0	202 345.0	43 199.0	179 119.0

Source: INS (National Statistics Institute)

Figure 13. Public local passenger transport (2016)

At the end of the 2007-2013 funding period, when the focus was on infrastructure rehabilitation, with a significant number of projects being developed, both by EU funding and by long-term loans from credit institutions and budget allocations, a discrepancy is noticed between the state of the transport infrastructure (largely modernised) and the rolling stock which, in general, has exceeded the useful lifetime, is inefficient and particularly pollutant (especially motor means of transport).

Electric systems have been eliminated from certain cities due to the increased demands for financial resources for their maintenance. Moreover, modest progress has been recorded in the area of traffic management and automated taxation. The situation of public transport at the growth poles is presented in Annex 7.

Urban mobility plans

"The Urban Mobility Plan" is the strategic land planning tool which correlates the land development of localities in the peri-urban/metropolitan area with the mobility and transport demands of people, goods and freight.

At the same time, in order to fund urban transport projects under the 2014-2020 Regional Operational Programme, through the European Regional Development Fund (ERDF), the urban areas must prepare Sustainable Urban Mobility Plans (SUMP).

In the context of the Memorandum of Understanding signed between the Romanian Government and each IFI, in order to improve the absorption capacity and to prepare strategic projects for the 2014-2020 EU programme, EBRD provided support to the Ministry of Regional Development, Public Administration and European Funds for the preparation of sustainable urban mobility plans for the seven growth poles (the seven cities and their neighbouring areas) and the Bucharest-Ilfov conurbation. In the same context, EBRD completed a project in order to prepare a model public services contract for public transport in accordance with the EU rules.

1.3.2 The public fuelling/charging infrastructure

The public alternative fuels refuelling/charging infrastructure is naturally developed in the most important urban centres in Romania.

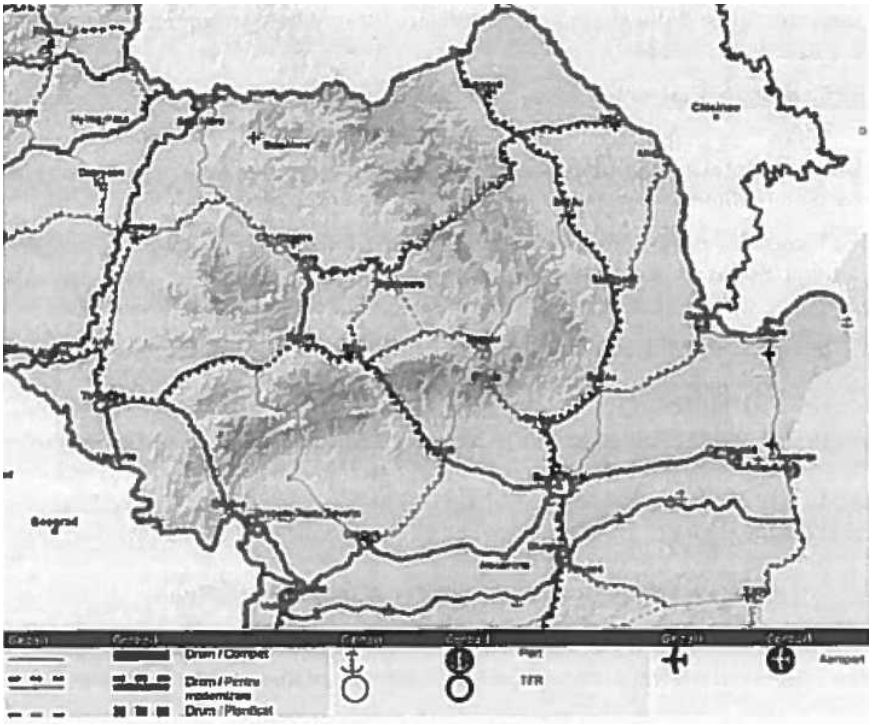
In some of the municipalities, local authorities (mayor's offices, local councils etc.) recharging points have been deployed, however the most initiatives are due to the private environment.

There are currently no rules in Romania to foster the deployment of public alternative fuels charging points/stations by the developers of residential projects, offices or public parking spaces. At European level, COM(2016) 501 final Communication from the Commission - A European Strategy for Low-Emission Mobility, proposes future objectives in this field, as follows:

In order to support the implementation of the EU Strategy for Low-Emission Mobility and to increase the use of electricity in transport. The directive on the energy performance of buildings will require to deploy power recharging points. For existing buildings, this provision will be applicable only for commercial buildings with more than 10 parking spaces from 2025 onward. For new or significantly renovated buildings, the provision will be applicable for residential buildings with more than 10 parking spaces, in the form of an obligation to include pre-cabling, and for commercial buildings with more than 10 parking spaces, in the form of the obligation to deploy recharging points. SMEs and public authorities may be excluded from the scope, considering the fact that they are already covered by the Directive on alternative fuels insofar as their recharging points are available to the public. In order to increase the efficiency of transport and to promote digital mobility solutions, this package also contains an EU strategy for the implementation of cooperative smart transport systems.

1.4 Status quo with reference to TEN-T

Romania is currently putting in considerable efforts to modernise and develop the TEN-T priority axes, with the application of the measures required for environmental protection in the modernisation and development of the national transport networks in accordance with the sustainable development principles and in the promotion of rail, waterborne and intermodal transport.



Source: Regulation (EU) No 1315/2013

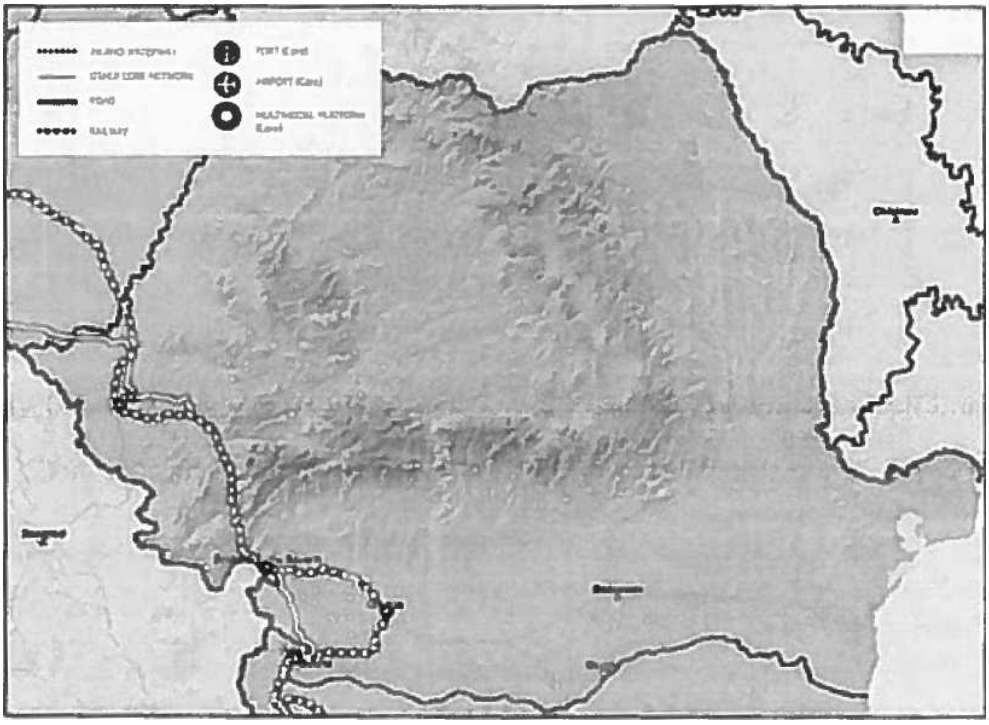
Figure 14. TEN-T in Romania - road, waterborne, air transport.

Particular attention is given to the development of sustainable transport, which is supported by measures meant to minimise the negative effects of transport on the environment, to improve traffic safety and human health.

1.4.1 The public fuelling/charging road infrastructure

Romania is crossed by two corridors of the primary network:

the Eastern/Eastern Mediterranean Corridor connects the German ports of Bremen, Hamburg and Rostock, through the Czech Republic and Slovakia, with ramification through Austria, farther through Hungary, through the Romanian port of Constanta, the Bulgarian port of Burgas, with connection to Turkey, up to the Greek ports of Thessaloniki and Piraeus, with a connection through the Sea Motorway ("Autostrada Mării") towards Cyprus. It includes railways, roads, airports, ports, rail-road terminals and the Elba inland waterways. The main sector with heavy traffic is Timisoara-Sofia railway.



Source: cc.europa.eu

Figure 15. The Eastern/Eastern Mediterranean Corridor

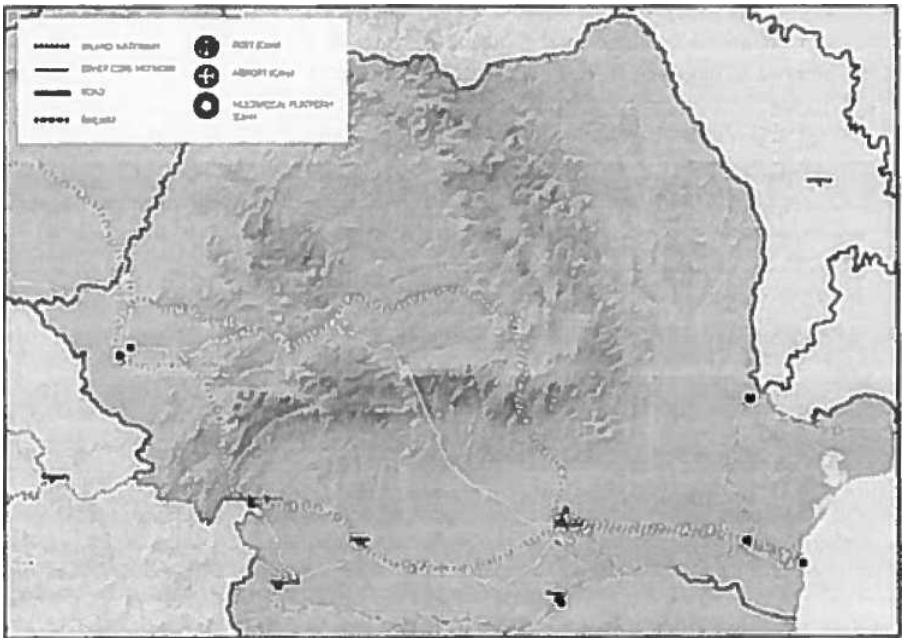
In Romania, the Eastern/Eastern Mediterranean road corridor includes:

- A1 motorway: Nădlac Arad-Timișoara-Lugoj
- A6 motorway: connection between A1 and Lugoj belt road
- E70 European road: Lugoj-Drobeta-Turnu Severin
- 56A national road: Drobeta-Turnu Severin-Calafat

In July 2017, on the route of the Eastern/Eastern Mediterranean road corridor there were:

- Approximately 13 power recharging points (in Arad, Timișoara and Drobeta-Turnu Severin)
- Approximately 55 LPG refuelling stations (including in urban centres)
- There were no CNG/LNG refuelling stations

The Rhine-Danube Corridor connects Strasbourg and Mannheim through two axes from Southern Germany, i.e. one alongside the Main and Danube Rivers, and the other through Stuttgart and Munich, with a ramification towards Prague and Zilina, up to the Slovak-Ukrainian border, through Austria, Slovakia and Hungary, up to the Romanian ports of Constanta and Galati. It includes railways, roads, airports, ports, rail-road terminals and the system of inland waterways of the Main River, the Main-Danube Channel, the entire Danube downstream Kelheim and the Sava River. The main projects remove heavy traffic sectors alongside inland waterways and the railway sector of Stuttgart Ulm and Munich-Freilassing.



Source: cc.europa.eu

Figure 16. The Rhine-Danube Corridor

In Romania, the Rhine-Danube road corridor includes:

- The northern side:
  - A1 motorway-Nădlac-Arad-Lugoj-Margina;
  - DN68A national road-Margina-Deva;
  - A1 motorway-Deva-Sibiu;
  - DN7 national road-Sibiu-Pitești;
  - A1 motorway-Pitești-Bucharest;
  - A2 motorway-Bucharest-Constanța.
- The southern side:
  - A1 motorway-Nădlac-Arad-Lugoj;
  - DN6 national road-Lugoj-Caransebeș-Drobeta Turnu Severin;
  - DN56A national road-Drobeta Turnu Severin-Calafat;
  - DN56 national road-Calafat-Craiova;
  - DN6 national road-Craiova-Roșiorii de Vede-Alexandria-Bucharest;
  - A2 motorway-Bucharest-Constanța.

In July 2017, on the route of the **Rhine-Danube** road corridor there were:

- Approximately 90 power recharging points, most of them being located in Bucharest; 13 of these stations are fast-charge type (in urban centres)
- Approximately 400 LPG refuelling stations (most of them being located in urban centres, over 130 of such stations being located in Bucharest municipality)
- Two CNG stations in Rm. Vâlcea and Bucharest.

1.4.2 The infrastructure in maritime and inland ports

The core TEN-T port network of Romania includes a maritime port, i.e. Constanța, and five inland ports: Galați, Drobeta-Turnu Severin, Cernavodă, Giurgiu, and Calafat

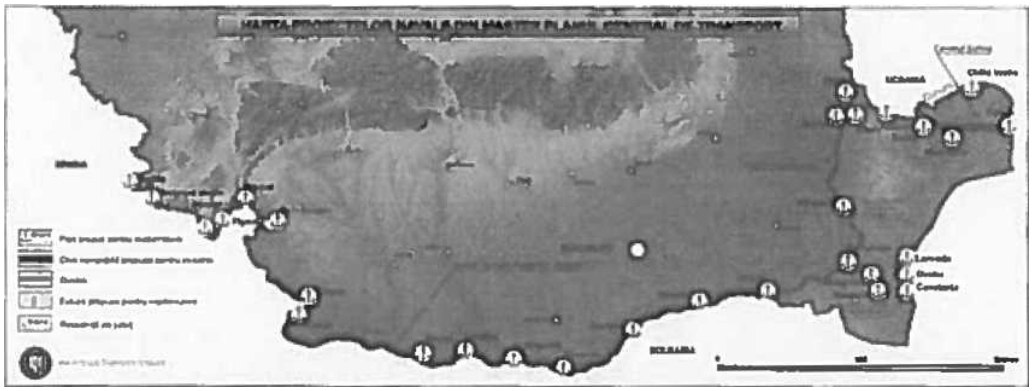


Figure 17. The map of ports proposed for modernisation through the General Transport Master Plan of Romania, which are located in the core and comprehensive TEN-T network or in other networks.

In June 2017, there were no LNG refuelling points intended for inland or sea ships in Romanian ports.

Plans have been designed to develop two LNG terminals in the sea area of the Danube, in Constanța and Galați.

The LNG Masterplan Project for Rhine-Main-Danube, coordinated by Pro Danube Management GMBH, was initiated and approved by the EC (2012-EU-18067-S), with the purpose of creating a platform for the cooperation of responsible authorities, the port authorities involved and the economic operators interested in promoting the introduction of LNG as fuel and freight for inland navigation, and of assessing the opportunity and traffic conditions with a view to designing the infrastructure for LNG terminals in the sea port of Constanta and in the port of Galati in the Danube sea area.

In the Romanian ports in the core TEN-T network, power sockets will be installed by 2025 for sea ports (Constanta) and, by 2030, for the inland ports (Galați, Drobeta Turnu Severin, Cernavodă, Giurgiu, Calafat).

1.4.3 The airport infrastructure

In Romania, the airport network includes 17 certified airports and one airport under construction.

Two airports pertaining to the urban centres Bucharest and Timisoara, are included in the **core network**:

- **LROP - "Henri Coandă" International Airport in Bucharest (core network)**
- **LRTR - "Traian Vuia" International Airport in Timisoara (core network)**

Airports within the remit of the Ministry of Transport	
ICAO Code	Name of airport
LROP	"Henri Coandă" International Airport in Bucharest
LRBS	"Aurel VIaicu" International Airport in Băneasa
LRTR	"Traian Vuia" International Airport in Timișoara
LRCK	"Mihail Kogălniceanu" International Airport in Constanța

Airports within the remit of county councils

ICAO Code	Name of airport
LRAR	Arad International Airport
LRBC	“George Enescu” International Airport in Bacău
LRBM	Baia Mare International Airport
LRCL	Cluj-Napoca International Airport
LRCV	Craiova International Airport
LRIA	Iasi International Airport
LROD	Oradea International Airport
LRSB	Sibiu International Airport
LRSM	Satu-Mare International Airport
LRSV	“Ștefan cel Mare” International Airport in Suceava
LRTM	“Transilvania” International Airport in Târgu Mureș
LRTC	“Delta Dunării” International Airport in Tulcea

Private airports	
ICAO Code	**Name of airport**
LRTZ	Tuzla Airport

Airports under construction	
ICAO Code	Name of airport
LRBV	Brașov Airport

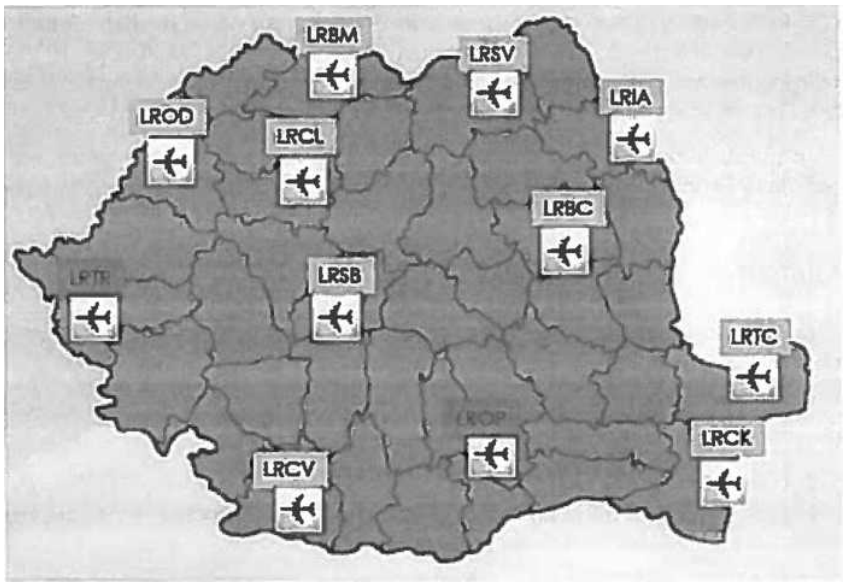


Figure 18. (Core and comprehensive) TEN-T airport network

In the total 17 airports, with a total number of 200 aircraft parking positions, 17 parking positions are currently provided with a power supply infrastructure for aircrafts without using fossil fuels. There are **14 Air Bridges at “Henri Coandă” International Airport in Bucharest**,

and three helicopter parking positions at Tuzla Airport.

2. NATIONAL POLICY OBJECTIVES

The analysis of the status quo of the use of alternative fuels and of their infrastructure outlined the potential of Romania in this sector. Three main objectives, which are aligned to the national priorities and strategies, and the main objective of Directive 2014/94/EU contributed to the achievement of the targets in this National Framework Strategy:

I. Reducing the impact of the transport sector on the environment
   a. Lowering the level of pollution, including sound pollution, in urban centres
   b. Establishing a route for crossing Romania, which has minimum impact on the environment
   c. Raising awareness of the benefits of environment-friendly transport

II. Enhancing transport efficiency
   a. Developing the alternative fuels infrastructure
   b. Allocating energy resources in the transport field more efficiently by optimising the relation between fossil fuels and alternative fuels

III. Fostering economic growth in the sector of alternative fuels
   a. Fostering the public and private market of vehicles using alternative fuels
   b. Fostering research, development and innovation
   c. Supplementing and streamlining the legal framework for the sector of alternative fuels
   d. Creating new jobs, professional qualifications and opportunities for SMEs

This National Framework Strategy contributes to the fulfilment of the following **overall objectives**:

1. Providing for the required framework in order to reach the level of 10 % for the energy market share of renewable energy sources in the fuels used in transport by the end of 2020.
2. The public authorities adopting measures to provide for the development of approximately 6 500 public recharging and/or refuelling points. Each of these recharging/refuelling points will have, on average, three units, more specifically there will be 19 500 units in total. Of these points, 500 recharging and/or refuelling stations for conurbations and 250 stations for TEN-Ts and other routes will be funded from the means of the Environmental Fund Administration (*Administrația Fondului de Mediu*)/funds resulting from the reduction of greenhouse gases. Funds will be considered from local budget the construction of approximately 1 260 recharging/refuelling points through the urban mobility plans of administrative territorial units (UTAs). Measures will be considered to encourage the construction of approximately 3 000 recharging/refuelling points in public parking areas (supermarkets, office buildings, residential blocks). Moreover, measures will be considered to encourage the construction of approximately 1 500 recharging/refuelling points on the premises of classical fuelling stations (for fossil fuels) under the own funding of holders of such stations.

   They will be distributed so as to ensure the autonomy of the alternative fuels-based means of transport within a radius of at least 10 km in selected conurbations by the end of 2020, of at least 150 km in the extra-urban environment for national roads, and of at least 70 km for the TEN-T network by the end of 2025. For the bypass routes pertaining to cities with more than 100 000 inhabitants, sufficient charging points will be provided and they will be positioned at reasonable distances, preferably within not more than 50 km.
3. Encouraging the increase of vehicles using alternative fuels, compared to 2016, by more than 100 % by the end of 2020, by more than 200 % by the end of 2025 and by more than 400 % by the end of 2030.
4. Providing the required conditions to construct at least one LNG refuelling point in the sea port from the core TEN-T network (Constanta) by the end of 2025, and at least one LNG refuelling point in at least one of the inland ports from the core TEN-T network by the end of 2030. Port administrations under the remit of the Ministry of Transport will make available to the economic operators port lands for the construction of LNG terminals in accordance with the critical infrastructure technical standards when the commercial terms

have been met.

5. By maintaining and upgrading the existing systems, where applicable, providing the shore power supply infrastructure for sea-going ships and inland navigation according to the identified demand and the costs involved, as a priority in sea or inland waterways ports from the core TEN-T network by the end of 2023, as well as in other ports, where applicable, by the end of 2025, by the port administrations under the remit of the Ministry of Transport, which own and/or administer such ports.
6. Analysing the need for deploying power supply sources in airports in order to be used by parked aircrafts, by the end of 2020, by the authorities and/or local and central public institutions with relevant duties which own and/or administer these airports.
7. Encouraging the deployment of charging points at home/the registered office in correlation with the production of electricity at that location, in order to ensure a predominantly renewable production-use chain.
8. When establishing the locations for the alternative fuels recharging/refuelling points, the avoidance of Natura 2000 sites will be considered.

In this respect, the national objectives were organised in the following categories: objectives pertaining to conurbations (public transport, catering infrastructure) and objectives pertaining to the TEN-T network (road, sea, air infrastructure).

2.1 Objectives with reference to conurbations

The objectives regarding the investments to be achieved in the most important conurbations in Romania are set out in the local strategic documentations, more specifically the General Urban Plan and the Urban Mobility Plan. They envisage the development of the infrastructure required for public or private transport by alternative fuels-based means of transport and the increase in the rate of renewable sources in the fuel used to supply public transport services. These objectives include:

- furthering the rehabilitation programmes for the public transport infrastructure;
- renewing the rolling stock;
- implementing modern systems for traffic management and automated charging systems;
- introducing new electrical transport systems in order to reduce the use of conventional buses;
- providing a minimum number of alternative fuels recharging or refuelling points in locations which enable the adequate autonomy of the means of transport using this type of fuel;
- encouraging investments and facilitating the deployment of an appropriate number of public recharging points in passenger transport terminals in train stations and airports, and in public parking spaces under public ownership/administration.

In accordance with the principle of subsidiarity and local autonomy, each local public authority will adopt specific measures to reach the specific objectives identified in Subchapters 2.2.1 and 2.2.2.

2.1.1 Urban public transport services

The modernisation of the urban public transport sector may be implemented through a series of investments made in order to improve the quality of the urban public transport and to reduce pollutants in urban areas (see Annex 4).

The mobility plans of the main conurbations in Romania provide for a series of short- and medium-term operational objectives. Below are presented objectives and measures contributing directly to the specific objectives of this National Framework Strategy.

For all the conurbations in the A and B categories:

- initiating projects for the deployment of means of transport using other energy sources
- renewing the vehicle fleet, including by using motor vehicles partially or fully powered by

alternative fuels:

- purchasing at least 100 public transport vehicles using alternative fuels by 2020 for the A category conurbation (Bucharest);
- purchasing at least a total number of 246 public transport vehicles using alternative fuels by 2020 for the B category urban area.

- For the A category conurbation (Bucharest) and for the B category conurbation the following objectives will be pursued to be achieved by 2020:
  - introducing utility vehicles using alternative fuels;
  - improving and extending the tramway and trolleybus infrastructure, and ensuring their operational improvement.
- For the A category conurbation (Bucharest), the construction and commissioning of the M6 (underground) line by 2020 will be envisaged.

Moreover, considering that, in 2016, the entire urban public transport in Romania was using 6 689 vehicles (see Figure 12), of which 1 857 (25.5 %) are electric vehicles, the objective for 2020 is to increase this share to at least 30 % at national level.

2.1.2 The fuelling and/or recharging infrastructure available in the urban area

The relevant conurbations for this National Framework Strategy were listed in Chapter 1.3. for the purpose of being provided with alternative fuels recharging/refuelling points in accordance with Articles 4 and 10(6) of Law No 34/2017. Local public administration authorities will enforce the required measures in order to ensure the conditions for the development of the alternative fuels refuelling infrastructure in the designated conurbations. Thus, out of the approximately 6 500 recharging/refuelling points planned to be deployed within the Romanian territory by the end of 2020, at least 166 will be built in the identified conurbation areas, as follows:

Category of designated conurbation	**Minimum objective by 31 December 2020**
A category conurbation Bucharest	- 50 power recharging points - 10 CNG refuelling stations
B category conurbation Bacău, Brașov, Brăila, Galați, Cluj-Napoca, Constanța, Craiova, Iași, Oradea, Ploiești, Timișoara, Baia Mare, Pitești	- 5 power recharging points in each location (total: 65 points) - 1 CNG refuelling station in each location (total: 13 stations)
C category conurbation Arad, Reșița, Drobeta Turnu-Severin, Deva, Zalău, Satu-Mare, Bistrița, Suceava, Botoșani, Piatra Neamț, Târgu Mureș, Vaslui, Miercurea Ciuc, Alba Iulia, Sfântu Gheorghe, Sibiu, Focșani, Râmnicu Vâlcea, Târgoviște, Buzău, Tulcea, Târgu Jiu, Slatina, Alexandria, Slobozia, Călărași, Giurgiu.	- 1 power recharging point (total: 27 points)
Total: **42 conurbations**	**Total:** - 142 power recharging points - 23 CNG refuelling stations

By deploying a minimum number of refuelling and recharging points in the above conurbations, wide access to the alternative fuels infrastructure is guaranteed in the most populated and economically relevant urban areas in Romania. At the same time, the territorial arrangement of these urban areas ensures inter-urban and trans-border connectivity with reference to TEN-T, the distances between the identified localities or between these and the border areas not exceeding 150 km (except for the 164 km distance between Oradea and Cluj-Napoca).

2.2 Objectives with reference to TEN-T

The trans-European transport network strengthens the social, economic and territorial cohesion of the EU and contributes to a single European area for transport, which is efficient and sustainable, which increases the benefits of its users and which supports inclusive growth. It proves a European added value by its contribution to the achievement of the objectives presented in the following four categories: cohesion, efficiency, sustainability and increase of benefits for all its users.

Sustainability is achieved by:

- developing all the transport modes so as to ensure sustainable and economically efficient transport in the long run;
- contributing to the achievement of the objectives targeting non-polluting transport with low greenhouse gas emissions and low carbon dioxide emissions, to the security of supply with fuel, to the reduction of external costs and to environmental protection;
- promoting low-carbon transport with the purpose of reducing CO_2 emissions significantly by 2050, in accordance with the EU relevant objectives for the reduction of CO_2.

2.2.1 The public fuelling and/or charging road infrastructure

According to the General Transport Master Plan for the core TEN-T network, the road infrastructure projects have implementation periods by 2032.

The map (see Figure 19) illustrates the indicative layout proposals for the alternative fuels stations for the core TEN-T network in Romania. The analysis took into account the distance criterion, so that the average distance between two alternative fuels stations is 70 km to ensure sufficient autonomy for these vehicles, as required. Alternative fuels (electricity, LPG and CNG) stations will be built in specially arranged areas in accordance with the legislation in force.

For the core TEN-T road network in operation (motorways), the proposals for alternative fuels stations were to locate them in rest areas or in already existing fossil fuel areas. For the core TEN-T road network under construction, they were located in the areas provided in the feasibility studies and, for the core TEN-T network at the project stage, they were located at adequate distances, in areas which have not been confirmed yet by the future feasibility studies (with the exception of Euro Trans road projects, because they overlap with the existing national roads).

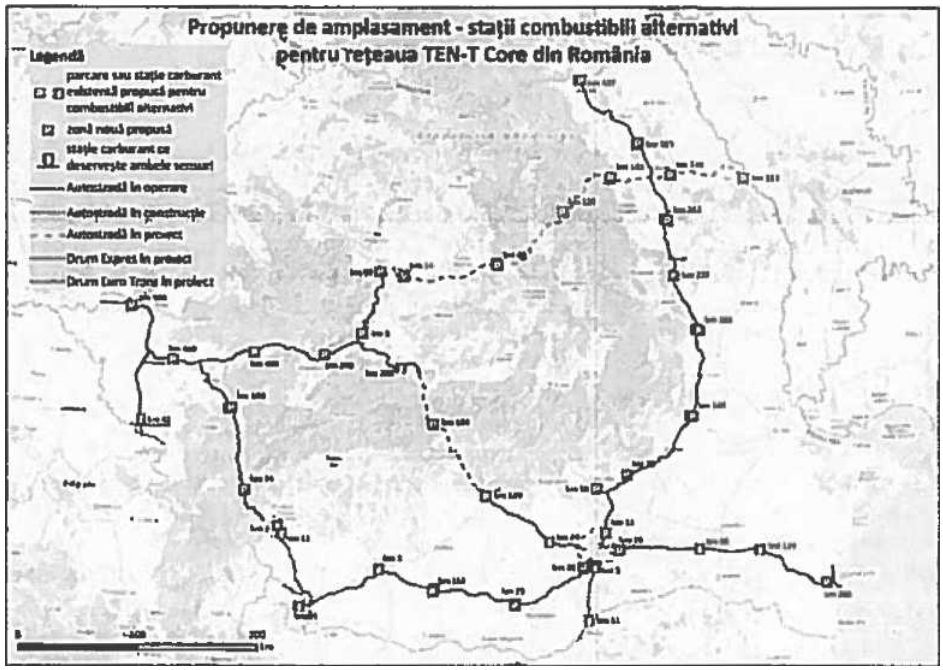


Figure 19. Simulation of location of alternative fuels stations for the core TEN-T network

Having reviewed the entire core TEN-T network in Romania, which comprises the road infrastructure in operation (motorways: Bucharest-Constanța, Bucharest-Pitești, Bucharest-Ploiești, Sibiu-Deva, Nădlac-Dumbrava), under construction (motorways: Sebeș-Turda, Lugoj-Deva) or at the project stage (motorways: Câmpia Turzii-Tg. Mureș, Tg. Mureș-Iași-Ungheni; express roads: Bucharest-Craiova, Drobeta Tr. Severin-Craiova, Ploiești-Buzău-Bacău-Suceava-Șiret; Euro Trans roads: Bucharest-Giurgiu, Craiova-Calafat, Drobeta Tr. Severin-Calafat, Timișoara-Moravița), at least 70 alternative fuels recharging points and 30 alternative fuels refuelling stations are proposed and they are to be located at an average distance of 70 km, not exceeding 100 km on both driving directions.

The proposal is to group the 70 alternative fuels recharging points and the 30 alternative fuels refuelling stations in approximately two (one on each driving direction) according to the availability of the respective areas. Where the infrastructure permits so (e.g. on Euro Trans roads), one station is provided on each of the two driving directions. Thus, 40 spaces are planned for the deployment of alternative fuels recharging/refuelling points.

Recharging points for electric vehicles	**CNG refuelling stations**	**LNG refuelling points**
In order to ensure the autonomy of this type of vehicle, the recharging points need to be arranged at a distance of approximately 70 km along the core TEN-T network. The charging points need to be the fast-charge type in order to provide users with fast charging. The legislation in force does not prohibit the location of recharging points in the already existing fossil fuels supply areas.	The legislation in force does not prohibit the location of recharging points in the already existing fossil fuels supply areas. In order to ensure the autonomy of this type of vehicle, the recharging points need to be arranged at a distance of approximately 150 km along the core TEN-T network.	**Minimum objective by 31 December 2025**: the assessment of the feasibility of deploying the LNG fuelling infrastructure on the TEN-T main route and its potential implementation

Minimum objective by 31 December 2030: 70 recharging points along the core TEN-T route.	**Minimum objective by 31 December 2020**: 30 refuelling stations along the core TEN-T route.	

Figure 20. Centralisation of charging points and fuelling stations on the TEN-T road network

2.2.2 The infrastructure in sea and inland waterways ports

By the end of 2025, the sea port of Constanta must have the LNG fuelling infrastructure deployed for sea-going ships, and the fuelling installation must be developed by port administrations under the coordination of the Ministry of Transport and of the relevant supervisory authorities and institutions.

By the end of 2030, the Galati river port must have the LNG fuelling infrastructure deployed for inland waterways ships, and the fuelling installation must be developed by port administrations under the coordination of the Ministry of Transport and of the relevant supervisory authorities and institutions.

On-shore operational power supply units for sea-going and inland waterways ships are currently deployed in all the ports included in the TEN-T network. In accordance with the feasibility studies, an assessment shall be made as to the possibility to build or renew units already deployed in the core and comprehensive TEN-T ports as per the technical specifications in Section 1.7 of Annex II of Directive No 2014/94/EU by the end of 2025.

2.2.3 The airport infrastructure

The administrations of airports in Romania, which perform more than 50 000 aircraft movements/year (in July 2017 only “Henri Coanda” International Airport in Bucharest), have set as objective of assessing, by 31 December 2018, the opportunity and the need to deploy power supply sources for use in the case of parked aircrafts without using fossil fuel-based supply sources.

3. MEASURES REQUIRED FOR ACHIEVING THE NATIONAL OBJECTIVES

In order to reach the objectives in Section 2, the competent central and local public authorities will implement the measures provided in this chapter.

The measures provided in this National Framework Strategy, which are intended for implementation by the public authorities, will be correlated with the measures already adopted by public institutions and the private environment, so that the results reflect the development potential of the market in Romania and the global trends in the area of alternative fuels.

In order to implement the measures provided in this chapter, the Coordination Council for the Development of the Alternative Fuels Market (CC DPCA) will be established.

The purpose of CC DPCA will be to provide the required expertise for the implementation and follow-up on this National Framework Strategy and to ensure cooperation between the authorities with responsibilities in the relevant fields. It will be organised at the State Secretary level and will be supported by a group of experts. The Council will comprise permanent representatives of the relevant ministries in the field of energy, transport, economy, environment, regional development, internal affairs, public finances, and guests from any relevant institutions.

3.1 Measures achieved or under implementation

By mid-2017, a series of measures had been adopted in order to promote electric vehicles at the level of central and local public authorities. Some relevant examples are provided below:

- ***Emergency Order No 196 of 22 December 2005 on the Environmental Fund (AFM)***, as subsequently amended and supplemented, ensures, within the limits of the available funds, the general legal framework for the development of support lines for the alternative fuels infrastructure.

Among the categories of projects eligible for funding, which concern the improvement of the environmental performance, may be included:

- pollution prevention;
- reduction of noise levels;
- use of clean technologies;
- public education and awareness raising on environmental protection;
- increase of production of energy from renewable sources;
- greenhouse gas emission reductions.

- ***The programme for greenhouse gas reduction in transport by promoting non-polluting and energy-efficient road transport vehicles.***

  The programme is designed for supporting **the purchase of EV and plug-in HEV and for funding the development of the recharging infrastructure**. In this respect, the Ministry of the Environment, through the Environmental Fund Administration, launched an assistance programme in 2016 for the construction of recharging stations, being to cover 80 % of the investment costs within the limits of the applications submitted in the 2016 session and amounting to RON 15 million.

- Romania has been involved in environment-friendly projects involving also the use of alternative fuels, such as: Innovative Danube Vessel, PROMINENT and LNG Master Plan for Rhine-Main-Danube, which reviews the implications of the use of liquefied natural gas (LNG) as fuel in ships, with the purpose of enhancing the competitiveness of transport on inland waterways and of assessing the technologies which can be implemented in the existing ships and in the new constructions in order to reduce consumption of fuel and greenhouse gas emissions, and to increase efficiency in terms of operating costs.

- LNG Master Plan for Rhine-Main-Danube[13] is a study conducted by Pro Danube in the period January 2013-December 2015 and co-funded by the EU under the TEN-T Programme. Its objective was to assess the need to create LNG terminals on the three waterways (Rhine, Main, Danube) and then to implement a pilot stage testing the logistic chain for the LNG transportation, the LNG port infrastructure, the construction of LNG fuelled ships and the involvement of specialised means of transport for road and/or rail transport of LNG to ensure the delivery of this fuel from the port to other hinterland users. The partners in Romania were CN APDM SA Galați, CERONAV, TTS, NAVROM SA Galați and Craiova University. The project created the conditions for promoting the development of LNG terminals in the area of Constanta and Galati ports.

Thus, in order to support transport by LNG fuelled ships, two LNG terminals are planned to be developed in the Galati river port so as to enable a wide range of distribution: LNG bunkering for inland waterways and sea-going ships, the LNG supply for road transport and industries, and in the Constanta sea port, which includes a storage facility, charging units for sea-going ships and fuel supply to inland waterways ships.

3.2 Legal measures

The legislative, regulatory or administrative measures are collected in this section. By their correlation, support is granted to the creation and development of the alternative fuels infrastructure in Romania.

Type of alternative fuel	Measure	Deadline for completion
Electricity	1. Development of the legislative framework to ensure the enforcement of Article 8 of Law No 34/2017.	Mid 2019
	2. Assessment of the opportunity to establish provisions ensuring the availability of recharging points in classical fuel stations.	End of 2018
LPG	3. Revision, supplementation and streamlining of the legislative framework intended for the authorisation of LPG refuelling stations. The measure will envisage to provide for adequate safety and environmental protection standards, and efficient reporting of the amounts supplied in conurbations by the competent regulatory authority.	End of 2019
	4. Assessment of the opportunity to amend the legislative framework intended for the record-keeping of vehicles equipped with LPG systems.	Mid 2019
CNG and LNG	5. Revision, supplementation and streamlining of the legislative framework intended for the authorisation and operation of CNG refuelling stations. The measure will envisage to provide for adequate safety and environmental protection	Mid 2020

[13] http://lngmasterplan.eu

	standards, and the streamlining of the rules governing the procedure for refuelling road vehicles.	
	6. Revision, supplementation and streamlining of the legislative framework intended for refuelling vehicles and ships using LNG under conditions of safety and environmental protection.	Mid 2020
	7. Performance of an assessment as to the development of the LNG infrastructure, which will envisage the economic feasibility and the proportionality of the costs with reference to benefits, including environmental ones.	Mid 2020
Biofuels	8. Assessment of the mandatory biofuel shares in fossil fuels and of the reporting and control methodologies in accordance with the national legislation in force, and with the legislative acts which are to transpose Directives 2015/652/EU and 2015/1315/EU.	Mid 2019
Hydrogen	9. Revision of the legislative framework for hydrogen use by the final user under conditions of safety and environmental protection.	Mid 2020
Applicable to all fuels	10. The assessment of the opportunity to establish financial instruments (such as guarantee funds, bonds, public-private partnerships) available to legal persons which intend to develop charging/fuelling points/stations, and for the purchase of vehicle fleets using alternative fuels.	Mid 2019
	11. Revision of the legislative framework on the concession of spaces designated for the deployment of refuelling/recharging stations/points. Identification of the critical points in the transport system, which require the deployment of such stations/points and assessment of the possibility to allocate budget for the development of stations in these locations.	Beginning of 2019

3.3 Policy measures for the application of the National Framework Strategy

These measures include elements such as direct incentives for purchasing means of transport using alternative fuels or for constructing the related infrastructure, and the availability of fiscal incentives in order to promote means of transport using alternative fuels and the relevant infrastructure. Also, the following measures considered the possibility to improve the public procurement procedures (e.g. joint public procurement actions) in order to support alternative fuels and non-financial incentives to act at demand level. Moreover, the aim was to review the need to deploy alternative fuel refuelling points for aviation in the ports from the core TEN-T network.

Type of	**Measure**	**Deadline for**

alternative fuel		completion
Electricity	12. Identification of funding solutions for power supply infrastructure deployment programmes for parked aircrafts. The administrations of airports in Romania, which perform more than 50 000 aircraft movements/year, will assess the opportunity and the need to deploy power supply sources for use in the case of parked aircrafts without using fossil fuel-based supply sources.	**Mid 2019**
LPG	13. Establishment of a more efficient monitoring system for vehicles equipped with LPG units after type approval. The plan is to establish also a more efficient control and sanctioning regime in order to reduce risks to public safety.	**Mid 2019**
CNG and LNG	14. Assessment of the opportunity to include vehicles using CNG and LNG in the *Programme for greenhouse gas reduction in transport by promoting non-polluting and energy-efficient road transport vehicles*.	**Beginning of 2019**
Biofuels	15. Assessment of the possibility to encourage the purchase of vehicles, which can operate at optimal parameters with E10 fuels, by freight and passenger transport operators.	**Mid 2019**
Hydrogen	16. Establishment of technical characteristics for defining and possibly facilitating the authorisation of hydrogen fuelling stations, and in regard to the authorisation of supply with this type of alternative fuel.	**Mid 2020**
Applicable to all fuels	17. Preparation of a regulation to establish the obligations regarding the vehicle parks of public institutions. The regulation will seek: - to establish a minimum number/rate of vehicles using alternative fuels - to establish rules for joint procurement	**Mid 2020**
	18. A continuation of funding under the Programme for greenhouse gas emission reduction in transport, by promoting non-polluting and energy-efficient road transport vehicles as per the annual budget allocations and the accessibility of technologies in the field of alternative fuels.	**Mid 2021**
	19. Assessment of the opportunity to establish a favourable fiscal regime for alternative fuels vehicles. It may include: - reduction of or exemption from the registration tax - tax charging depending on the pollution rule and the vehicle pollutants	**Mid 2020**
	20. Preparation of a public policy framework on a favourable regime, in A, B and C category	**Mid 2019**

	conurbations, for the parking of vehicles using alternative fuels. The public policy framework will envisage indicators such as: - the minimum number of parking spaces equipped with recharging infrastructure as a rate in the total number of parking spaces; - the minimum number of parking spaces dedicated exclusively to vehicles using alternative fuels; establishment of visual identification means for vehicles using alternative fuels, which also serve as means of authorising the use of the parking spaces reserved for them; - the favourable tax charging regime for parking spaces for vehicles using alternative fuels. At the level of the implementing methodology for the legislative framework, account shall be taken of the proportionality of the measures for each identified conurbation, including with reference to its level of pollution.	

3.4 Support for deployment and production

This section includes measures to assess any potential allocation of an annual public budget for the deployment of the alternative fuels infrastructure, depending on the alternative fuel and the transport mode used (road, rail, waterborne, and air transport). Moreover, the assessment of the allocation of an annual public budget for supporting units which develop alternative fuels technologies, broken down by alternative fuel and mode of transport used, and review of any special needs at the initial stage of deployment of the alternative fuels infrastructure will also be considered.

Type of alternative fuel	Measure	Deadline for completion
Electricity	21. Improvement of the methodology for replacing and recycling EV and HEV batteries so as to mitigate any potential negative impact on the environment and public health.	**Mid 2019**
Applicable to all fuels	22. Assessment of the possibility to allocate an annual budget for supporting the units developing alternative fuels technologies, broken down by alternative fuel and mode of transport used, and the prompt review of any special needs concerning the use of such technologies by the state institutions, accessing of European funds and communication of any potential benefits for the environment and the economic efficiency of these technologies for the final user.	**Mid 2019**

3.5 Information, research, technological development and demonstration

Support for the information, research, technological development and demonstrative activities in

the field of alternative fuels, broken down by type of fuel and mode of transport, by facilitating access to European funds and by the distribution of expertise and good practices by public institutions.

Type of alternative fuel	Measures	Deadline for completion
Electricity **LPG** **CNG and LNG** **Biofuels**	23. Setup of information points which make available information materials to the interested public with regard to mobility based on alternative fuels, such as: - types of vehicles based on the alternative fuels available on the market in Romania, - current technologies, - location of charging stations. Preparation of information materials regarding the recharging/refuelling standards, intended for the final user. Information will be considered in regard to the compatibility of the various standards with those pertaining to vehicles newly placed on the market. These materials will be available on the websites of the relevant public authorities.	**Mid-2019**
	24. Assessment of the possibility to use hydrogen as an alternative fuel, including by a re-profiling of the current industrial potential.	**Mid-2019**
Hydrogen	25. Assessment of the possibility to support the research activity, including by facilitating access to European funding mechanisms, for developing the required charging and propelling systems.	**Mid 2020**
	26. Organisation of a calendar of events to enable the testing of buses using alternative fuels for the purpose of procurement for public transport.	**Mid-2019 – Mid-2021**
	27. Organisation of events intended to promote, among the general public, mobility based on alternative fuels.	**As from the end of 2018**
Applicable to all fuels	28. Establishment, under the competent authority, of a system for monitoring the development of the alternative fuels infrastructure (an online software tool). The system will guarantee that, when available, the date indicating the geographical location of the alternative fuels refuelling and recharging points available to the public is available to all the users in an open and non-discriminatory manner. The aim will be for the system to provide information on real-time accessibility, and historical and real-time information on charging.	**Mid-2019**
	29. Preparation of a guide designed for local authorities, which contains measures for encouraging public transport based on alternative fuels, by adapting and integrating good practices tested in other European cities.	**Mid-2019**
	30. Promotion of funding lines at the level of local authorities, which are available under the 2014-2020 ROP (Regional Operational Programme) (see Annex 6),	**Mid-2019**

	and which are intended for the development of local projects, with a focus on the provision of electricity in the urban environment for the development of the alternative fuels supply infrastructure.	

Annex 1 - List of abbreviations

Acronyms	Definition
AFM	Environmental Fund Administration (*Administrația Fondului pentru Mediu*)
ANRE	Autoritatea Națională de Reglementare în Domeniul Energiei (*National Energy Regulatory Authority*)
APIA	Association of Producers and Importers of Vehicles (*Asociația Producătorilor și Importatorilor de Automobile*)
EIB	European Investment Bank
EBRD	European Bank for Reconstruction & Development
DRPCIV	Directorate for Driving Licenses and Registration of Vehicles (*Direcția Regim de Permise de Conducere și înmatriculare a Vehiculelor*)
ETBE	Ethyl tert-butyl ether
EV	Electric vehicles
FBT	Flat bottom tanks
GHG	Greenhouse gases
CNG	Compressed natural gas
GNCV	Compressed natural gas for vehicles
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
HEV	Hybrid electric vehicles
IIR	National Inventory of Air Pollutants (*Inventarul Național de Emisii de Poluanți Atmosferici*)
SME	Small and medium-sized enterprises
INEGES	National Inventory of Greenhouse Gas Emissions (*Inventarul național al emisiilor de gaze cu efect de seră*)
LULUCF	Land Use, Land Use Change and Forestry
MDRAPFE	Ministry of Regional Development, Public Administration and European Funds (*Ministerul Dezvoltării Regionale, Administrației Publice și Fondurilor Europene*)
NMVOCs	Non-methane volatile organic compounds
GDP	Gross domestic product
UMB	Urban mobility plan
ROP	Regional operational programme
RAR	Romanian Vehicle Register
RES	Renewable energy sources
SPT	Semi-pressured tanks
ATU	Administrative-territorial unit
UNFCCC	United Nations Framework Convention on Climate Change

Annex 2 - Table with data on GES emissions in the transport sector 1989-2015

Year	Civil aviation	Road transport	Rail transport	Maritime transport	Other types of transport	Transport sector	Total emissions without LULUCF	% in total emissions without LULUCF
1989	26.17	8 998.90	435.44	160 337	68.86	11 132.73	301 359.00	3.69
1990	25.08	10 682.84	500.87	1 162.79	67.01	12 438.59	246 271.86	5.05
1991	24.05	8 721.94	424.29	1 373.90	88.12	10 632.29	203 183.45	5.23
1992	23.02	8 583.05	1 132.01	1 120.57	44.97	10 903.61	187 102.76	5.83
1993	31.42	7 184.89	1 084.69	424.34	19.40	8 744.74	I7 779 931	4.92
1994	4 538	7 851.46	974.76	41 139	16.07	9 299.06	17 450 531	5.33
1995	31.72	7 195.32	983.82	329.05	1 330	8 553.11	181 112.91	4.72
1996	21.87	10 427.03	1 010.34	477.75	34.63	11 971.62	183 883.61	6.51
1997	27.40	10 058.67	101 334	1 094.06	4 930	12 242.86	171 745.73	7.13
1998	35.63	9 852.37	864.84	703.73	90.81	1 154 737	15 220 339	7.59
1999	35.48	8 064.54	703.52	70 037	67.82	9 571.73	13 436 134	7.12
2000	26.69	8 451.78	1 007.10	361.60	65.40	9 912.57	140 163.06	7.07
2001	17.84	11 030.67	502.41	330.77	58.55	1 194 033	147 244.17	8.11
2002	14.80	11 197.24	670.60	333.91	81.71	1 229 835	145 935.95	8.43
2003	20.69	12 054.49	595.29	223.34	58.33	12 952.14	150 525.60	8.60
2004	139.62	12 521.14	683.78	133.85	79.11	1 355 730	149 161.45	9.09
2005	189.77	11 893.84	253.10	129.73	11 430	12 580.64	146 454.48	8.59
2006	192.77	12 346.65	251.56	126.62	141.78	13 059.38	147 841.16	8.83
2007	304.78	12 349.80	629.66	267.32	171.90	13 723.46	150 878.01	9.10
2008	38 434	13 903.81	589.04	238.92	282.37	15 398.48	145 828.88	10.56
2009	254.82	14 173.99	439.50	172.89	140.84	15 182.05	126 571.89	11.99
2010	335.86	13 181.77	496.08	184.57	38.19	14 236.47	120 899.59	11.78
2011	24 536	1 325 833	671.13	159.68	35.65	14 370.05	126 992.67	11.32
2012	121.99	14 327.97	639.84	135.07	2434	15 249.12	124 418.24	12.26
2013	137.72	14 219.07	547.81	150.83	9.53	15 064.96	115 389.18	13.06
2014	73.26	15 039.58	364.52	111.49	10.48	15 599.33	11 541 330	13.52
2015	127.09	15 093.54	37 431	129.53	6.03	15 730.41	116 426.73	13.51

* All the values in the table are expressed in kt CO_2 equivalent

Annex 3 - Any possible locations for the power recharging stations on TEN-T

The Core TEN-T network within the Romanian territory				
Proposals for power charging stations				
A2 Bucharest-Constanța motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 19	69	one station on each driving direction
2	Fuel station	km 88	51	one station on each driving direction
3	Fuel station	km 139	66	one station on each driving direction
4	parking	km 205	-	one station on each driving direction
A1 Bucharest-Pitesti motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	Fuel station	km 42	67	a station for both driving directions
2	parking	km 109	80	one station on each driving direction
A1 Pitești-Sibiu motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	/	Km 189	71	proposed stop area, one station on each driving direction
Sibiu-Deva A1 motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	Fuel station	km 260	80	one station on each driving direction
2	parking	km 340	69	one station on each driving direction
A1 Deva-Margina motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 409	71	one station on each driving direction
A3 Margina-Nădlac motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 480	79	one station on each driving direction
2	parking	km 559	-	one station on each driving direction

A3 Bucharest-Ploiesti motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 11	47	one station on each driving direction
2	parking	km 58	-	one station on each driving direction
A10 Sebeș-Turda motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 8	60	proposed area; one station on each driving direction
2	parking	km 68	-	proposed area; one station on each driving direction
A5 Cp. Turzii-Tg Mureș motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 14	-	proposed area; one station on each driving direction
A8 Tg. Mureș-Iași-Ungheni motorway				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
l	parking	km 45	80	proposed area; one station on each driving direction
2	parking	km 125	58	proposed area; one station on each driving direction
3	parking	km 183	57	proposed area; one station on each driving direction
4	parking	km 240	73	proposed area; one station on each driving direction
5	parking	km 313	-	proposed area; one station on each driving direction
Ploiești-Bacău-Suceava-Siret express road				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
	parking	km 25	79	proposed area; one station on each driving direction
2	parking	km 104	78	proposed area; one station on each driving direction
3	parking	km 182	100	proposed area; one station on each driving direction

4	parking	km 282	73	proposed area; one station on each driving direction
5	parking	km 355	72	proposed area; one station on each driving direction
6	parking	km 427	-	proposed area; one station on each driving direction
Bucharest-Craiova express road				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 10	69	proposed area; one station on each driving direction
2	parking	km 79	75	proposed area; one station on each driving direction
3	parking	km 154	-	proposed area; one station on each driving direction
Bucharest-Drobeta Turnu Severin express road				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	parking	km 34	75	proposed area; one station on each driving direction
2	parking	km 109	-	proposed area; one station on each driving direction
Timișoara-Moravița Euro Trans road (SRB)				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	Fuel station	km 42	-	a station for both driving directions
Bucharest-Giurgiu Euro Trans road (BG)				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	fuel station	km 5	46	one station on each driving direction (2 km distance between them)
2	fuel station	km 51	-	one station on each driving direction
Craiova-Calafat Euro Trans road (BG)				
No	**type**	**position**	**distance from the following power charging station (km)**	**observations**
1	fuel station	km 8	77	one station on each driving direction
2	fuel station	km 85	-	one station on each driving direction
Drobeta Turnu Severin-Calafat Euro Trans road (BG)				

No	type	position	distance from the following power charging station (km)	observations
1	fuel station	km 4	-	a station on the direction Drobeta Turnu- Severin-Calafat
2	fuel station	km 11	-	a station on the direction Calafat-Drobeta Turnu- Severin

Annex 4 - Assessment of the need for investment in the urban public transport infrastructure

INVESTMENT NEED[14]		JUSTIFICATION OF PROJECTS
I. At county level – excluding Bucharest-Ilfov (40 counties)		
Modernisation, rehabilitation and extension of the tramway and trolleybus infrastructure, including stations, power supply and contact line equipment, tree planting, service shops	Tramway systems	40 % of 573 km of single railway requires upgrading, which means 229 km of the tramway infrastructure to be upgraded * EUR 1.5 million /km of single railway (including rails, contact line equipment, stations etc.)
		with an average of 1 substation 2 km away from the double railway, 71 power substations are estimated to be needed for tramway systems (50 % of the existing ones) * EUR 0.6 million /power station
	Trolleybus systems	80 % of 370 km of one-way railway requires upgrading, which means 104 km for the contact line equipment to be upgraded * EUR 0.3 million /km)
		with an average of 1 station 2 km away from the double railway, 26 power substations are estimated to be needed for tramway systems (50 % of the existing ones) * EUR 0.6 million /power substation
Introduction of new transport power systems in cities (tramway and trolleybus)	Tramway systems	12 new systems (9 cities with over 100 000 inhabitants with 10 km of double railway and 3 cities with 150 000 inhabitants with 15 km of double railway), which means a total length of 270 km of single railway * EUR 1.7 million /km of single railway (including runway, contact line equipment, stations etc.)
		12 cities with one service shop, which means 12 service shops * EUR 3 million /service shop
		12 cities with 3 power substations/tramway system, which means 36 power substations * EUR 0.6 million /power substation
	Trolleybus systems	14 new systems (14 cities with population between 100 000 and 50 000 inhabitants with 15 km of single railway each), which means a total length of 210 km of single railway * EUR 0.4 million /km, contact line equipment for single railway
		14 cities with 3 power supply systems/trolleybus, which means 42 power substations * EUR 0.6 /power substation
Improvement of inter-modal stations-inter-modal	Inter-modal transfer/inter-modal stations	40 cities with 1 station/city, in various sizes (10 stations * EUR 20 million + 10 stations * EUR 15 million + 10 stations * EUR 5 million + 10 stations * EUR 2 million)
	park & ride type	40 cities with 2 arrangements/city (80 park & ride * EUR

[14] Estimative data obtained from the combination of several research techniques: interviews with representatives of transport operators, the analysis of websites of municipalities and transport operators, data sources of the National Statistics Institute and the panel of experts in urban public transport, 2014.

transfer, park & ride	arrangements	4 million)
Purchase of rolling stock (tramways, trolleybuses, electric buses)	Purchase of tramways	700 tramways will replace the existing fleet and 216 tramways will be introduced for the implementation of the new tramway systems (calculated with an average of 1.6 tramways per km of double railway)* EUR 1.8 million/tramway
	Purchase of trolleybuses	360 trolleybuses will replace the existing fleet and 252 trolleybuses will be introduced for the implementation of the new systems (calculated with an average of 14 trolleybuses per km of double railway)* EUR 0.25 million /trolleybus
	Purchase of electric buses	2 pilot projects with 10 buses per system * EUR 0.5 million
	Upgrading of existing tramways (with a high degree of modernisation)	500 tramways *EUR 0.5 million
	Purchase of Euro 6 buses	1 800 buses * 0.25
II Bucharest-Ilfov		
Modernisation, rehabilitation and extension of the tramway and trolleybus infrastructure, including stations, power supply and contact line equipment, tree planting, service shops		Tramway systems
		Trolleybus systems

Source: Report 1 - Justification and EU Funding Strategic Objectives - Public Service Contract (PSC) for the cities in Romania in accordance with the EU law

Annex 5 - Extract of the urban mobility plans

No	Urban area	Objectives	Implementation period
1.	CRAIOVA[15]	1) renewing the vehicle fleet, including by using motor vehicles partially or fully powered by alternative fuels: biogas, LPG 2) initiating projects for the deployment of means of transport using other (electric, hybrid) energy sources	*On the medium term*
		3) renewing the vehicle fleet intended for public transport - 105 vehicles for the operation of the entire urban network, more specifically 17 tramways, 18 BRT buses and 70 buses.	*On the short and medium term*
2.	TIMIŞOARA[16]	In the period 2016-2020, the aim is to purchase: • 15 multi-articulated long low-floor tramways • 10 articulated trolleybuses • 5 standard trolleybuses • 10 standard buses	*2020*
3.	IAŞI[17]	Extension of the tramway network - 2 projects of 1.6 km and 1 km	*On the medium term*
		Renewing the public transport fleet by purchasing 50 tramways	*On the short and medium term*
4.	CONSTANŢA[18]	Purchase of electric minibuses - 67 units	*On the short and medium term*
5.	CLUJ NAPOCA[19]	Extension of the trolleybus network in the "Intre Lacuri" neighbourhood	*2018*
		Renewing and extending the public transport fleet - Horizon 2020 • 12 multi-articulated low-floor tramways • 20 articulated trolleybuses • 20 standard trolleybuses	*2016-2020*
		Trolleybus power supply system - stage II	*2026-2028*
		Tramway contact network II	*2028*
		Tramway extension - 2 projects	*2019-2021*
6	PLOIEŞTI[20]	Renewing and extending the public transport	*2016-2030*

[15] http://www.primariacraiova.ro/pozearticole/userfiles/files/01/12136.pdf

[16] http://www.primariatm.ro/ik/index.php?meniuID=2&viewCat=4084&sectiune=primaria

[17] http://old-www.primaria-iasi.ro/content.aspx?item=1964&lang=RO

[18] http://www.primaria-constanta.ro/oras/planul-de-mobilitate-urbana

[19] http://primariaclujnapoca.ro/userfiles/files/Plan%20mobilitate%20Cluj%20Napoca.pdf

		fleet. Purchases: • 10 tramways • 12 trolleybuses	
		Establishing a connection, in the tramway infrastructure, between the Western Motorway (Soseaua Vestului) and Republicii Boulevard	*2019-2023*
		Strategy for the implementation of the tramway infrastructure on own railway	*2019-2023*
		Construction of trolleybus infrastructure on the route Western Train Station (Gara de Vest)-Strand Bucov	*2016-2018*
		Construction of trolleybus infrastructure on the route Western Train Station (Gara de Vest)-Fero	*2019-2023*
		Extension of the 202 trolleybus line from Pod Înalt to Ploiești Industrial Park	*2019-2023*
		Creation of inter-modal terminals (3)	*2019-2023*
7	BRAŞOV[21]	Preparing and implementing a plan for strengthening the trolleybus network under a network redesign, fleet replacement and infrastructure upgrading programme.	*2015-2020*
		Purchasing **30 electric buses**	*2015-2020*
		Project for strengthening local **electric transport**	*2015-2020*
		Deploying charging stations for electric vehicles in Brasov Municipality	*2020-2030*
8	BUCHAREST ILFOV[22]	Introducing supply and utility electric vehicles	*2019-2021*
		Improving the tramway infrastructure	*2016-2024*
		Bringing operational improvements to tramway routes	*2018-2020*
		Purchasing rolling stock - tramways. The long-term aim is to replace most of the tramway fleet.	*2019-2020* + *2025-2026*
		Purchasing fast tramway rolling stock	*2018-2020*
		Construction and commissioning of M6 line, including rolling stock	*2016-2020*
		Construction and commissioning of MS line	*2016-2027*

[20] http://www.ploiesti.ro/RO_2015-01-SUMP-Lot-2-Ploiesti-Final-rev%20ian2016_raport.pdf

[21] http://www.brasovcity.ro/file-zone/proiecte-hotarari/PMUD/BRASOV%20-%20PMUD.pdf

[22] http://www.pmb.ro/servicii/transporturi_drumuri/docs/planul_de_mobilitate_durabila_2016-2030.pdf

Annex 6 - Description of funding under the Regional Operational Programme (ROP) 2014-2020

ROP is one of the programmes pertaining to the 2014-2020 Partnership Agreement, whereby European structural and investment funds can be accessed, more specifically funds from the European Regional Development Fund (ERDF). The programme was approved by Commission Decision C (2015) 4272/23.6.2015.

The overall objective of ROP 2014-2020 is the increase of economic competitiveness and the improvement of the living conditions of local and regional communities by providing support for development of the business environment and of the infrastructural conditions and services, which ensure the sustainable development of regions, ensuring their possibility to manage their resources efficiently, and to make better use of their potential of innovation and assimilation of technological progress[23].

Priority axis	Investment priority (IP)	Specific objective (SO)	Type of project	Categories of beneficiaries	Territory	Thematic objectives
Priority axis 2 Enhancing the competitiveness of small and medium-sized enterprises	Promoting the entrepreneurial spirit, in particular by facilitating economic use of new ideas and through encouraging more start-ups, including through business incubators	Strengthening the position of SMEs on the market in the competitive areas identified in the National Competitiveness Strategy (NCS) and Regional Development Plans (RDPs)	Purchasing specific installations/equipment with the purpose of achieving energy savings, and systems using renewable/alternative energy sources to improve the efficiency of activities for which funding was requested etc.:	microenterprises with not less than 1 year history business incubators and accelerators	non-agricultural microenterprises, incubators, accelerators in the urban environment incubators and accelerators for the rural environment	TO 3 - Improving the competitiveness of small and medium enterprises, of the agricultural sector and of the fisheries and aquaculture sector
Priority axis 3 - Supporting the shift towards a low-carbon economy	Promoting strategies to reduce carbon dioxide emissions for all types of territory, in particular urban areas, including the promotion of sustainable urban mobility plans and of relevant measures for mitigating adaptations	Reducing carbon emissions in the urban areas based on the sustainable urban mobility plans	A. **Investments intended for improving urban public transport** [e.g. purchasing electric rolling stock/environmental-friendly vehicles (EEV), including for pilot projects for introduction of public transport in urban localities; upgrading the electric rolling stock (tramways), upgrading/rehabilitation/extension of electric public transport routes; upgrading/rehabilitating depots for public transport and the related technical infrastructure, including building new depots for electric transport; establishing separate routes, only for public transport vehicles; improving the existing public transport stations, including building new stations and inter-modal terminals for public means of transport; developing e-ticketing systems for passengers; building/upgrading/rehabilitating the road infrastructure (on the corridors used by public transport) to enhance safety and efficiency in traffic and the use of the transport network (also creating/upgrading pedestrian and bicycle routes, where possible) etc.];	Local public authorities in the urban localities (possibly in partnership with the public transport operator), except for the municipalities acting as county capital cities eligible under the Priority Axis 4 of ROP.	Urban area	TO 4 - supporting the shifting towards a low-carbon economy in all the sectors

[23] The 2014-2020 Regional Operational Programme - Guidelines for Applicants - General Conditions for Accessing Funds

			B. Investments intended for electric and non-motorised transport [e.g. building the infrastructures required for electric transport (including electric vehicle fuelling stations); building/upgrading/rehabilitating bicycle tracks/routes and the related technical infrastructure (rental points, parking systems for bicycles etc.); arranging pedestrian areas and walkways, including introducing measures to reduce vehicle traffic in certain areas etc.]: C. **Other investments designed to reduce CO_2 emissions in the urban area** (e.g. developing video monitoring systems based on the innovative and efficient traffic management tools; upgrading/rehabilitating the road infrastructure, with justification by the SUMP (Sustainable Urban Mobility Plan) to reduce CO_2 emissions, developing park and ride type systems; establishing forest barriers with tree alignments (with high CO_2 retention capacity). Through this investment priority, the expenditure incurred with the sustainable urban mobility plans generating projects implemented under the 2014-2020 ROP will be considered eligible.			
Priority axis 4 - Supporting sustainable urban development (municipalities acting as county capital cities)	Promoting strategies to reduce carbon dioxide emissions for all types of territory, in particular urban areas, including the promotion of sustainable urban mobility plans and of relevant measures for mitigating adaptations	Reducing carbon emissions in the municipalities acting as county capital cities based on the sustainable urban mobility plans	**Investments intended for improving urban public transport** [e.g. purchasing electric rolling stock/environmental-friendly vehicles (HEV); upgrading/rehabilitating/extending electric public transport routes; upgrading the existing electric rolling stock (tramways), upgrading/rehabilitating depots for public transport and the related technical infrastructure, including building new depots for electric transport; establishing separate routes, only for public transport vehicles; improving the existing public transport stations, including building new stations and inter-modal terminals for public means of transport; developing e-ticketing systems for passengers; building/upgrading (including by introducing bicycle routes)/rehabilitating the road infrastructure (on the corridors used by public transport) to enhance safety and efficiency in traffic and the use of the transport network etc.] **Investments intended for electric and non-motorised transport [e.g. building the infrastructures required for electric transport (including electric vehicle fuelling stations); building/upgrading/rehabilitating bicycle tracks/routes and the related technical infrastructure (rental points, parking systems for bicycles etc.); arranging pedestrian areas and walkways, including introducing measures**	Local public authorities (possibly in partnership with the public transport operator) in the municipalities acting as county capital cities (including localities in the urban functional area, where applicable), except for Tulcea municipality (which will receive funds, under the thematic priority axes, from the budget allocated in the framework of ITI Danube Delta).	Urban area, with the exception of the Bucharest-Ilfov development region and of Tulcea Municipality	TO 4 - supporting the shifting towards a low-carbon economy in all the sectors

			to reduce vehicle traffic in certain areas etc.] Other investments designed to reduce CO_2 emissions in the urban area (e.g. developing video monitoring systems based on the innovative and efficient traffic management tools; developing park and ride type systems; establishing forest barriers with tree alignments (with high CO_2 retention capacity); the expenditure incurred with the sustainable urban mobility plans having projects implemented under the 20142020 ROP will be considered eligible.			

Annex 7 - Situation of public transport at growth poles level:

Bucharest-RATB

The Autonomous Transport Company in Bucharest (RATB) is equipped with the following:

Inventory vehicle fleet

Means of transport	Number of vehicles
Tramways	516 units
Trolleybuses	297 units
Buses	1 148 units
TOTAL	1 961 units

Number of public transport lines

Means of transport	
Tramways	26 lines
Trolleybuses	18 lines
Buses	106 lines
TOTAL	150 lines

Length of routes

Means of transport	
Tramways	241 km
Trolleybuses	149 km
Buses	1 067 km
TOTAL	1 457 km

Number of stops

Means of transport	
TOTAL	2 175 stops

Wear condition

The wear condition of most vehicles is very bad, and some vehicles are more than 30-40 years old

Iaşi - RATP Iaşi

The Autonomous Public Transport Company in Iasi is equipped with the following:

Inventory vehicle fleet

Means of transport	Number of vehicles
Tramways	150 units
Buses	176 units
Minibuses	25 units
TOTAL	351 units

Number of public transport lines

Means of transport	
Tramways	8 lines

Buses	10 lines
Minibuses	3 lines
TOTAL	21 lines

Length of routes

Means of transport	
TOTAL	363.4 km

Number of stops 237 stops

The tramway is the most popular mean of transport in Iasi. Over 50 % of the passengers use the tramway, 36 % take the bus and 14 % take the minibus.

Cluj - CTP Cluj[24]

The Public Transport Company in Cluj is equipped with the following:

Inventory vehicle fleet

Means of transport	Number of vehicles
Tramways	36 units
Trolleybuses	93 units
Buses	213 units
TOTAL	342 units

Number of public transport lines

Means of transport	
Tramways	3 lines
Trolleybuses	6 lines
Buses	37 lines
TOTAL	46 lines

Length of routes

Means of transport	13.2 km
Trolleybuses	22 km
Buses	97.3 km
TOTAL	132.5 km

Constanta - RATC

The Autonomous Public Transport Company in Constanta is equipped with the following:

Number of public transport lines

Means of transport	
Bus	23 lines + 1 seasonal line

[24] http://www.ratuc.ro/dategenerale.php - Preparation of Public Service Contract (PSC) for the cities in Romania in accordance with the EU law

Minibus	9 lines
TOTAL	32+1 lines

Length of routes (km of double railway)

Means of transport	
Bus	136.7 km
Minibus	90 km
TOTAL	226.7 km

Ploiești:

"Transport Călători Expres" Public Company in Ploiești is equipped with the following:

Inventory vehicle fleet

Means of transport	Number of vehicles
Tramways	33 units
Trolleybuses	42 units
Buses	183 units
TOTAL	258 units

Length of routes

Means of transport	
Tramways	10.3 km
Trolleybuses	7.6 km
Buses	90.2 km
TOTAL	109.1 km

Wear condition

The wear condition of most vehicles is very bad, and some vehicles are more than 30 years old

Timişoara RATT

The Autonomous Transport Company in Timisoara is equipped with the following:

Inventory vehicle fleet

Means of transport	Number of vehicles
Tramways	42 units
Trolleybuses	50 units
Buses	86 units
TOTAL	178 units

Number of public transport lines

Means of transport	
Tramways	8 lines + 8 express line
Trolleybuses	6 lines

Buses	11 lines
TOTAL	25 + 8 express lines

Length of routes

Means of transport	
Tramways	180 km
Trolleybuses	120 km
TOTAL	300 km

Number of stops

Means of transport	
Tramways	178 stops
Trolleybuses	115 stops
Buses	164 stops
TOTAL	457 stops

Craiova - RATC

The Autonomous Transport Company in Craiova is equipped with the following:

Inventory vehicle fleet

Means of transport	Number of vehicles
Tramways	-
Buses	159 units
TOTAL	-

Number of public transport lines

Means of transport	
Tramways	3 lines
Buses	16 lines
TOTAL	19 lines

Length of routes

Means of transport	
Tramways	73 km
Buses	247.5 km
TOTAL	320.5 km

Brașov - RATBv

The Autonomous Transport Company in Brasov is equipped with the following:

Inventory vehicle fleet

Means of transport	Number of vehicles
Trolleybuses	30 units

Buses	211 units
TOTAL	341 units

Length of routes

Means of transport	
Trolleybuses	21 km
Buses	106.5 km
TOTAL	127.5 km