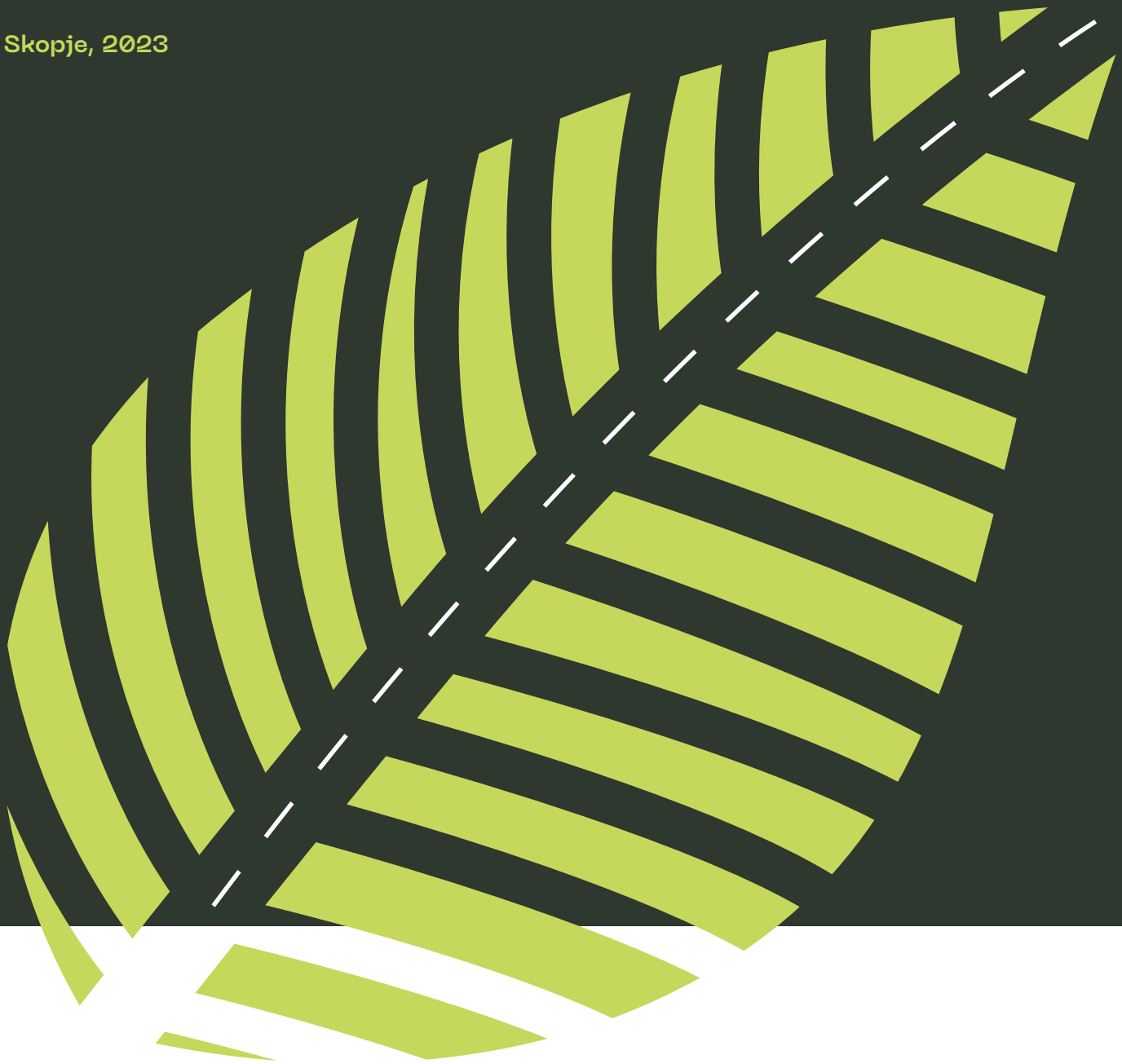
TOGETHER IN CLIMATE ACTION

Analysis of transport development and sustainable planning in RNM regarding impact on climate change

Skopje, 2023



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LIST OF ABBREVIATIONS

GDP — Gross Domestic Product

ECHR — European Convention on Human Rights

ECJ — European Court of Justice

ECtHR — European Court of Human Rights

EU — European Union

LCA — Law on Climate Action

CNG — Compressed Natural Gas

MIA — Ministry of Internal Affairs

MoE — Ministry of Economy

MoEPP — Ministry of Environment and Physical Planning

MoTC — Ministry of Transport and Communications

NECP — National Energy and Climate Plan

NPAA — National Programme for Adoption of the EU Acquis

NTS — National Transport Strategy

ESIA — Environmental and Social Impact Assessment

RNM — Republic of North Macedonia

BUR1, BUR2, BUR3 — First, Second, Third Biennial Update Report

EBOR — European Bank for Reconstruction and Development

EEA — European Environmental Agency

EIB — European Investment Bank

GEF – Global Environmental Facility

GCF — Green Climate Fund

IPCC – Intergovernmental Panel on Climate Change

NC1, NC2, NC3, NC4 — First, Second, Third, Fourth National Communication

TEN-T — Trans-European Transport Network

UNFCCC – United Nations Framework Convention on Climate Change

UNDP – United Nations Development Programme

WEM — With Existing Measures

WAM — With Additional Measures

CONTENTS

EXECUTIVE SUMMARY

Reducing greenhouse gas emissions has been one of the main global challenges for a long period of time. Consequently, a time frame with clearly established percentages according to which greenhouse gases should be reduced is constantly being established at the global level. Reducing greenhouse gases presupposes a reduction in carbon emissions by sources, including transport.

According to the analyses and projections, in RNM transport's share is 28% and it takes the second place in the largest national source of greenhouse gas emissions, that is, the energy sector. Projections for 2050 show that greenhouse gas emissions from transport will decrease by a small percentage, i.e. they will amount to 22%. Therefore, reducing the impact of transport on climate change is high on the EU agenda, as well as on our national agenda.

The conceptual structure of the analysis in this document is in function of fulfilling two basic goals:

1. The role of a guidance on the national legislation for the civil society sector, which will improve the capacities of civil society organizations for advocacy and monitoring of legal processes related to this area.

2. Increasing the awareness of civil society organizations and the general public about the possibilities for the development of green sectors with low levels of emissions, but also to increase public pressure on institutions in order to develop policies, programs and implement measures aimed at reducing emissions of greenhouse gases and decarbonization.

The fulfillment of the first goal has been achieved by analyzing the domestic and international legal framework in the area of transport and the impact on climate change.

In the Republic of North Macedonia, despite the fact that it is a member of all international organizations, there is still no integrated approach in the transport sector through which a policy for reduction in carbon quantities produced by means of transportation would be conducted, but there is only a partial regulation of this sector. In terms of the legal framework, North Macedonia has a fragmented approach, because in the positive law there is no supporting legal act on the basis of which the clearly set strategic goals of the National Transport Strategy 2018-2030 will be implemented. The fragmented approach is evident from the fact that only a few laws regulate the issue of preventing carbon emissions from vehicles in different types of traffic. First of all, there is regulation only of road traffic, but not of other types of traffic, i.e. water, air and railway. However, the strategic determination of North Macedonia is embodied in the draft law on climate action, which is an attempt for a comprehensive approach to finding solutions to the challenges arising from climate change.

Similar to the legal framework, the competences of public authorities are limited, even when it comes to the Ministry of the Environment, where climate change is organized at the unit level, not at the department level, which would be a more appropriate level and priority.

That climate change is a novelty for the international order is evident by the fact that before the European courts, the European Court of Human Rights and the European Court of Justice, there are only a few cases pending resolution, while only in the case T-330/18 - In Armando Ferrão Carvalho and Others v. European Parliament and Council, the courts determined that the applicants were not individually affected by climate policy of the European Union.

The second goal has been achieved first through the analysis of the goals and recommendations in the national strategies related to transport, in the direction of sustainable planning of transport and reducing greenhouse gas emissions. Taking into account that transport is simultaneously a source of greenhouse gas emissions, but also a sector that suffers negative impacts from climate change, the document also provides recommendations for improving the climate resilience of the transport infrastructure. At the end, the analysis is finalized with a presentation of measures and actions in transport, as well as actions for cross-sectoral cooperation, strengthening of institutional capacities and the need for supervision of their implementation. Civil society organizations, as well as the general public, have the opportunity to monitor, but also react to the implementation of the measures and actions defined in the national strategies in terms of the envisaged time periods and the institutions responsible for their implementation and monitoring. In this way, civil society organizations and the public will contribute to the development of sustainability in transport and to the reduction of its negative impact on climate change.

1. INTRODUCTION

This analysis was made within the *"CSOs Action for Climate"* project, supported by the Swedish International Development Cooperation Agency- SIDA, and implemented by the Environmental Research and Information Center "Eco-Svest" Skopje, the Macedonian Young Lawyers Association and the Connecting Natural Values and People Foundation - CNVP.

The general objective of the project is to strengthen the role of civil society in the process of decarbonization, transformation and renewal of society, to create a clean environment, encourage the green economy and improve the health of citizens in the country.

The analysis carried out data collection, mapping, legal assessment of national and international legislation and regulation, to ensure a clear systematization of the relevant regulation and to identify the obligations of state institutions related to the transport sector.

1.1 Analysis structure

The analysis consists of ten chapters and one annex. The chapters can be grouped into three integral parts.

The first integral part (chapters 2 and 3) covers the relevant domestic legal framework, competent institutions and international mechanisms for environmental protection. Namely, chapter 2, provides an overview of the legal acts, starting from the Constitution of the Republic of North Macedonia as the highest legal act and the laws, including also the by-laws that regulate the issues of transport and the greenhouse gas emissions. In addition to the relevant legal framework, chapter 2, provides a review of the competent state institutions in the area of transport and climate change, with a review of their competences. Chapter 3 covers international mechanisms for environmental protection and their role in the area of climate change mitigation. In this section the focus is placed on the European Court of Human Rights and the European Court of Justice through the climate change-related cases they handle.

The second integral part of the analysis covers chapters 4, 5 and 6, and it focuses on several topics: the institutional set-up and functioning of the transport sector and the national climate change structure; the situation in transport as a source of greenhouse gas emissions and the contribution of transport to the national greenhouse gas emission inventory. This second part first presents the main institutions, their duties, powers and interconnection in their functioning. Then, an overview of the basic parameters in transport (total number of vehicles, categorization of vehicles by fuel and age, etc.) is given as reasons for the occurrence of greenhouse gas emissions by this sector. The contribution of transport to the total greenhouse gas emissions is analyzed for the period of 1990-2019, and then the projections for the contribution of the transport sector until 2050 are shown.

The third integral part (chapters 7, 8, 9 and 10) provides detailed guidelines for sustainable development and taking measures in transport, as well as actions for cross-sectoral cooperation, strengthening of institutional capacities and the need for supervision in their implementation. This has been carried out according to the objectives and recommendations in the national strategies, and in the direction of sustainable transport planning and reduction of the impact on greenhouse gas emissions. Since the climate change also has a feedback effect on the transport situation, an analysis, providing recommendations for improving the climate resilience of the transport infrastructure, has been made.

At the end of this part, the "Compliance Traffic Light" is presented as a tool that visually shows the situation in the transport sector in terms of strategic compliance, organizational capacities and the performance of tasks in order to achieve results in this sector. The creation of this traffic light is the result of integrating the knowledge gained during the research and interviews.

Finally, Annex 1 to this document presents the PESTLE analysis, which identifies and analyzes the critical drivers of change outside the sector and it represents an evaluation to consider the objective, characteristics or plans towards improvement of the situation in the transport sector.

1.2. Analysis goals

The analysis has two goals:

1.The analysis of the situation and development of transport as a source of greenhouse gas emissions should be a guidance on the national legislation to the civil society sector, which will improve the capacities of civil society organizations for advocacy and monitoring of legal processes related to this area. This goal is closely correlated with one of the specific objectives of the project to empower the civil society organizations to take part climate-related decision-making decisions, and take local action through improving capacities, knowledge and skills, and providing support to civil society organizations.

2. The second goal of the analysis is to increase the awareness of civil society organizations and the general public about the possibilities for the development of green sectors with a low level of emissions, but also to increase public pressure on the institutions in order to develop policies, programs and implement measures aimed at reducing greenhouse gas emissions and decarbonization.

1.3. Analysis methodology

The research and preparation of this document was carried out in the period of February-April 2023, by the teamwork of the technical and legal expert.

The data presented are documented by using the method of analysis and synthesis with a detailed description and pictorial presentation of the research results. The analysis of the situation in the transport was carried out by a method of classification of the parameters and by a statistical method of data processing, supported by a graphic presentation of the results.

The comparative method was used when comparing the objectives and recommendations of the national strategies and the current situation with their practical application. The measures and actions defined in the transport sector, as well as the actions for horizontal coordination and capacity building, are defined in detail by applying the descriptive method. Certain knowledge about the implementation of measures and actions was obtained through the interview method.

Taking into account that in addition to the available data, additional knowledge about the practice in the implementation of strategic documents and legal acts was needed, interviews were also conducted with officials from the competent institutions.

The data and findings presented in the analysis were obtained through the following sources:

I. Relevant domestic and international documents

A large number of documents were used in the preparation of this analysis, including: the Constitution of the RNM, relevant laws and by-laws as well as draft laws in the area of transport and climate change, national strategies, plans, annual reports, project reports, studies, as well as international sources with a special focus on the jurisprudence of the European Court of Human Rights and the European Court of Justice.

II. Interview with the representatives of the transport sector

The direct interviews that were conducted have several objectives:

- A direct picture of the situation in transport is obtained through direct contact with representatives and employees in this sector;
- They represent a tool for synthesizing data and filling gaps that appear through other methods.

For the purposes of preparing this analysis, four people, actively involved in various areas related to the transport sector, were interviewed: one with a master degree in traffic sciences, one employee of the Ministry of Transport and Communications and two doctors of science, professors of the Department of Traffic and Transport at the Technical Faculty of Bitola, in the areas of traffic planning and integral transport. Certain aspects necessary to complete the analysis were obtained through conversations with traffic engineers, employed in public transport enterprises and in private traffic design enterprises.

At the end of the research, when defining the compliance traffic light and the PESTLE analysis, the deduction method was applied, in order to derive specific individual conclusions and claims based on the general knowledge about the transport sector, specifically about strategic compliance, the performance of tasks and the fulfillment of obligations for sustainable development and guidelines for improving the transport sector.

2. RELEVANT DOMESTIC LEGAL FRAMEWORK

Transport and traffic in the positive law in North Macedonia represent a special segment both in the area of legislation and in the area of competences. Within this segment, the legislation fully regulates traffic and transport on the territory of North Macedonia according to the type of traffic and transport that can be land, air and water. On the other hand, the issue of greenhouse gases is regulated by few legal acts, which are part of the regulation related to the environment. Hence, this issue is primarily regulated in the widest scope by the Constitution of the Republic of North Macedonia.

2.1. The Constitution of the Republic of North Macedonia

The Constitution of the Republic of North Macedonia [1] under the section on constitutional fundamental values in Article 8, line 10, stipulates that *"The fundamental values of the constitutional order of the Republic of Macedonia are – Spatial planning and humanization and the protection and promotion of environment and nature,"* placing the protection and promotion of life in the foundation of the constitutional arrangement according to which the society is built.

The guarantee for the promotion and protection of the environment is regulated in Article 43 of the Constitution, which provides for the individual right but also the obligation of every person to a healthy environment without being limited to the territory of the Republic of North Macedonia. In addition to determining the individual right and obligation, the Constitution strengthens the right to a healthy environment with the state's obligation to provide conditions for the exercise of this specific human right.

In addition to the fundamental value and the right to a healthy environment, the Constitution of the RNM also in Article 55 imposes an exceptional restriction on the freedom of the market and entrepreneurship, inter alia, on the basis of the preservation of nature and the environment.

Obviously, based on the constitutional framework laid out in this manner, it can be concluded that the Constitution of the RNM envisages wide-ranging guarantees in the area of environmental protection and promotion, both at the general and at the individual level. However, the Constitution itself, which was adopted in 1991, does not stipulate special provisions that regulate the issue of climate change and, within its framework, possibly also of greenhouse gases.

Transport and traffic on the one hand and the issue of greenhouse gases in the Republic of North Macedonia on the other hand represent mutually connected segments. The legal regulation of transport and traffic is arranged through special legal acts that regulate all three types of traffic, i.e. transport - land, air and water.

2.2. Laws and by-laws

Namely, land traffic is primarily regulated through the **LAW ON ROAD TRANSPORT** [2]. This law **regulates** the conditions and the method of transportation of passengers and goods in internal and international road transport. Namely, this law regulates both the transportation of passengers and the transportation of goods, as well as transportation for personal needs, which is performed through the issuance of transportation licenses.

Supervision over the implementation of this law and the regulations adopted based on it is carried out by the Ministry of Transport and Communications. The inspection over the application of the provisions of this law and the regulations adopted on the basis of this law that refer to the inter-municipal, special line transportation of passengers between two or more municipalities and the international transportation of passengers and transportation of goods in internal and international road traffic is carried out by the State Transport Inspectorate, through state road traffic inspectors.

THE LAW ON VEHICLES [3] regulates the conditions for vehicle placement on the market and start of use, the vehicle registration and technical correctness, the conditions for the performance of work by the technical services, the legal entities for technical inspection and the legal entities for registration and the vehicle data register. Unlike the Law on Road Transport, this law primarily regulates the issue of vehicle technical correctness for road traffic and thus the control of gas emissions emitted by vehicles. This law envisages a **special Environmental category of vehicles according** to the emission level of exhaust gases from the vehicles' engines, as well as an **Eco-sticker indicating** the environmental category of the vehicle. The environmental categorization of vehicles is performed in three environmental categories - the first environmental category with an emission level of exhaust gases EURO 5 and higher, the second environmental category, which includes vehicles with an emission level of exhaust gases EURO 4 and EURO 3, and the third (lowest) environmental category, which includes vehicles with emission level of exhaust gases EURO 2 and lower, as well as vehicles for which the manufacturer has not defined the emission of exhaust gases.

Eco-stickers are assigned by technical services certified by the Ministry of Economy to perform environmental categorization of vehicles. The work of the technical services is performed by legal entities that are certified by a decision of the Ministry of Economy, upon a proposal for authorization for technical service by the approval authority, and based on an issued Certificate of Accreditation by the authority for competence assessment.

The law also envisages a special obligation for determination, that is, a submission of a record of measured values from the vehicle's exhaust gas emissions in the vehicle registration procedure.

Competent institutions that monitor the application of this law are the Ministry of Internal Affairs and the Ministry of Economy in the domain of their competences. Namely, the Ministry of Economy is competent in the area of issuing authorization for performing identification and identification and assessment of the technical condition, whereas the Ministry of Internal Affairs is competent to supervise the technical correctness of vehicles in road traffic, which refers, inter alia, to also the emission of exhaust gases.

This Law further regulates the CO2 emission by also the **Rulebook on the information available to the consumer on fuel consumption and CO2 emissions relating to the new passenger vehicle sales** [4], which provides for the information on fuel consumption and CO2 emissions of new passenger vehicles that are sold on the market in the Republic of North Macedonia. The Rulebook itself provides for an official specific CO2 emissions and fuel consumption label as well as an information manual on fuel consumption and CO2 emissions of a specific passenger vehicle. This manual explains, inter alia, the effects of greenhouse gas emissions, possible climate change, as a reference to consumers on the possibility of choosing to use other types of motor fuels, with a description of their impact on the environment based on the latest scientific knowledge and requirements according to CO_2 emission regulations.

LAW ON ROAD TRAFFIC SAFETY [5] regulates the area of safety of the roads along which land, that is, road traffic is carried out. Namely, this law envisages regulation and arrangement of the conditions for the safety and protection of the roads and the mutual relations of the participants and other entities in the road traffic, as well as the road traffic rules, the system of traffic signs, the equipment and signaling on the roads, the duties in case of a traffic accident and special safety measures, the organization and tasks of road traffic safety councils and other segments of importance for traffic safety. In terms of the emissions from motor vehicles, this Law envisages a special competence of the local self-government, i.e. municipalities to establish special zones in which there will be low emissions of harmful gases from motor vehicles that participate in road traffic. Article 7 of the law stipulates that "Municipalities and the city of Skopje regulate traffic on local roads and streets in their area, in accordance with the provisions of this law." Hence, the Law, among other elements regarding regulation of local road traffic, envisages the competence of the local self-government in the part of determining zones with low emissions of harmful gases from vehicles and the conditions for vehicle traffic thereto, for which the local self-government issues approval.

The Government of the Republic of North Macedonia in January 2019, following the proposal of the Minister of Transport and Communications, adopted the **NATIONAL TRANSPORT STRATEGY 2018-2030** [6]. This long-term strategy is based, above all, on four general objectives, among which is the general objective "To introduce green mobility and logistic focused on environmental performance of the Transport sector", which is expected to result in "reducing greenhouse gas emissions from transport by 15.1 % in 2025 and by 18.6% in 2030 compared to levels in the respective years under the Do Nothing Scenario. Within this general objective, the Strategy envisages three specific objectives: 1) To develop and improve environmentally friendly and low carbon transport systems; 2) To stimulate modal shift and 3) To increase the importance of intermodal and multimodal transport in the national transport policy. The first specific measure envisages shifting to low-carbon modes of transport and improving vehicle efficiency, which should result in a reducing traffic and the costs related to it, thereby contributing to the improvement of public health and reduction of pollution from vehicles. The second specific measure envisages encouraging the use of rail versus road traffic, primarily due to the fact that CO2 emissions from rail transport are ten times lower compared to road transport, according to figures from the European Environment Agency. Within the third specific measure, the Strategy envisages that by it the Government should launch intermodal systems that facilitate and optimize the transfer between different modes of transportation.

LAW ON RAILWAY SYSTEM [7] is a law that comprehensively regulates railway traffic and railway infrastructure, organization of the railway system, manner and conditions for performing railway transport and the types of transport, management, organization, protection of the railway infrastructure and access to the railway infrastructure, charging for access to the use of railway infrastructure, allocation of infrastructure facilities, announcement of a network, establishment of an independent and autonomous regulatory body granting and types of concessions, financing of railway infrastructure and services of public interest in railway passenger transport. Despite the fact that railway traffic represents a significant part of land traffic, this law does not regulate the matters adopted on gas emissions emitted by railway transport, by following the example of the Law on Vehicles.

In the section of the railway system as a part of land traffic, the issues regarding environmental protection are the subject of the **National Program for Railway Infrastructure for the period of 2014-2016** [8], providing a special section 1.3. Environmental protection. In this section, the Program envisages the basic principles and measures for the realization of environmentally sustainable transport, stating the level of the country's economic development reached against the demand for transport in terms of environmental impact; meeting the demand for the transportation of goods and passengers using different means of transport, different models of railway rolling stock and infrastructure, as well as the use of information technology and investment in railway transport and infrastructure, which will encourage the development of railway technology, industry, logistics etc. Thus, the Program envisages that based on the analyses that preceded the Program itself, the railway vehicles are evaluated as means of transportation that have the most favorable impact, i.e. least pollute the environment. Then analyses have also indicated that this type of transport is a favorable substitution of voluminous and large transportations of goods carried out in the road traffic.

After the expiry **of the National Program for Railway Infrastructure for the period 2014-2016, a new National Program for Railway Infrastructure for the period 2019-2021**[9] **was adopted, in which, unlike the previous Program, the issue of the environment was not elaborated at all, nor for the amount of greenhouse gases that are generated by railway transport as part of land traffic in the Republic of North Macedonia.**

AVIATION LAW [10] regulates the air traffic in a way that envisages the technical conditions for aircraft and other means of air traffic in the Republic of North Macedonia. Yet, despite the fact that this law regulates the technical conditions in detail, the law itself does not regulate the technical conditions regarding the exhaust gases within the air traffic, that is, of the aircraft.

LAW ON INLAND WATERWAYS [11] is the only law that regulates water traffic in the Republic of North Macedonia. The law itself regulates inland waterways navigation and safety of navigation on inland waterways on the territory of the Republic of North Macedonia; conditions and manner of use, maintenance and protection of waterways, ports, winter quarters, anchorages and bathing places; state ownership, identification, registration and cancellation of vessels; vessel crew; treatment in the case of navigation accident; removal of sunken vessels; jurisdiction of the Port Authority; supervision and other issues regarding the inland waterways. The provisions of this law that refer to ships also apply to vessels, boats and warships, only if it is explicitly envisaged by this law.

Unlike the above-mentioned law, the subject of which is regulation in the area of transport and means of transportation, the **LAW ON AMBIENT AIR QUALITY** [12] is a legal act, the focus of which is ensuring ambient air quality through prevention, reduction, remediation and information regarding the ambient air situation. Namely, this Law regulates the measures for avoidance, prevention or reduction of the harmful effects of ambient air pollution on human health, as well as on environment as a whole, by establishing limit and target values for ambient air quality and alert thresholds and information threshold, limit and target values for emissions, establishment of a single system for ambient air quality monitoring and control and monitoring of sources of emissions, comprehensive system of ambient air quality and sources of emissions management, information system, as well as other measures aimed at protection against certain activities by legal entities and individuals having direct or indirect impact on ambient air quality.

In terms of the impact of transport on ambient air, the law itself provides a definition of sources of ambient air pollution by the means of transportation referring to the mobile sources of pollution, including internal combustion engines installed in vehicles and internal combustion engines installed in non-road mobile machinery, locomotives, ships and aircraft. In terms of emission limit values of mobile sources pollution, the Law envisages reference norm regarding the emission limit value of polluting substances in the gases emitted by the means of transportation as mobile sources of pollution referring to the regulations that more closely regulate the limit values for vehicles and additionally envisages a general obligation that these prescribed limit values are mandatory for all mobile sources of pollution. This provision in essence is incomprehensible in terms of the above-stated fact that only the Law on Vehicles regulates the limit values only in the area of passenger vehicles, but not aircraft or vessels, for which there is a need to envisage different limit values due to their specifics.

In addition to definition of the means of transportation, in the section on sanction, the Law also envisages special sanctions in case when in the Republic of North Macedonia there is production, import and sale of means of transportation which do not comply with the prescribed emission limit values for mobile sources in accordance with the regulation that more closely regulate the limit values for vehicles. The fine is in the amount ranging from 18,000.00 to 200,000.00 euros, depending on the size of the legal entity that is found to have committed the offence.

The only legal act that directly regulates the issue regarding greenhouse gases in the Republic of North Macedonia is the Law on the Environment. Namely, the **LAW ON ENVIRONMENT** [13] is a sectoral law that regulates the conditions and methods of environmental protection and promotion, in order for the citizens to exercise their right to a healthy environment.

In the section on greenhouse gases, the Law envisages the adoption of a National Plan on Climate Change which is in the service of stabilizing the concentrations of greenhouse gases, at a level that would prevent the dangerous anthropogenic influence in the climate system in a time frame sufficient to enable the ecosystems to naturally adapt to climate change, in accordance with the principle of international cooperation, as well as in accordance with the national social and economic development goals.

The National Plan on Climate Change is adopted by the Government of RNM at the proposal of the Ministry of Environment and Physical Planning for a period of 6 years.

To date, 4 National Plans on Climate Change have been adopted in the Republic of North Macedonia. the Law stipulates that the Ministry of Environment and Physical Planning, the Ministry of Agriculture, Forestry and Water Economy, the Ministry of Economy, the Ministry of Transport and Communications and the Ministry of Health, as well as the National Hydrometeorological Service take part in the preparation of the draft National Plan, and it is prepared on the basis of the adopted documents of the United Nations Framework Convention on Climate Change.

For the implementation of the National Plan, the Law envisages the adoption of a Climate Change Action Plan, which is an integral part of the National Plan. The Action Plan is actually a document that foresees how the causes will be prevented and the negative effects of climate change will be mitigated. Hence, the Action Plan must necessarily contain institutional and legal measures, preventive measures and actions to reduce greenhouse gas emissions, measures and actions to mitigate the negative effects of climate change, education and raising public awareness measures, measures for professional training of the scientific, technical and managerial staff, as well as a time frame and financial plan for the implementation of the foreseen measures and actions. Starting from the fact that the Action Plan is an operational document, the Law envisages that it be updated every three years.

The same authorities that participated in its preparation take part in the implementation of the National Plan by establishing cooperation with all competent authorities during the implementation of the envisages measures and actions. All authorities participating in the implementation of the national plan are obliged to inform the Ministry of Environment and Physical Planning at least once a year about the level of implementation, which then submits a report every three years to the Government of RNM about the level of implementation of the National Plan.

Within the framework of the National Plan, the Law envisages the obligation of the Government of RNM to adopt a National Inventory of anthropogenic greenhouse gas emissions by sources and sinks for a period of three years. In addition to the National Inventory, the Government of RNM, at the proposal of the Minister of the Environment, determines the actions and activities that create greenhouse gas emissions in order to manage data on anthropogenic greenhouse gas emissions by sources and sinks in the atmosphere on the territory of the Republic of North Macedonia. Within the framework of the system itself, the following activities are carried out: collection, processing, systematization, assessment, verification and quality assurance and data uncertainty management, as well as storage, use, distribution and presentation of data and information received by entities that possess data on anthropogenic greenhouse gas emissions by sources and sinks in the atmosphere. The system for inventorying greenhouse gas emissions in the Republic of North Macedonia is established through the inventory itself.

All entities that perform the actions and activities that create greenhouse gas emissions are obliged, through an appointed authorized person, to submit data on greenhouse gas emissions. They should be submitted or made available in a format, content, form and within a deadline according to the manner prescribed by the Government of RNM at the proposal of the Minister of Environment and Physical Planning.

In December 2022, the Government of the Republic of North Macedonia published the **Draft Law on Joint Climate Action** [14] on the Single National Electronic Register. By this law, it is planned to establish a framework for climate action for the reduction of greenhouse gas emissions in the atmosphere and their removal through natural and other absorbents, as well as adaptation to climate change. In fact, the law envisages the so-called Framework for Climate Action, which includes planning for climate action and harmonizing strategic and planning documents from other sectors with the basic planning documents for climate action, establishing a mechanism for monitoring and reporting greenhouse gas emissions and removal by absorbents, including the National Inventory and the reporting system for policies, measures and projections established by the provisions of this law, conditions for issuing permits for greenhouse gas emissions for operators of stationary installations, monitoring and reporting of greenhouse gas emissions from aviation activities and measures to reduce emissions of greenhouse gases in certain sectors and adaptation of sectors to climate change. Hence, it is obvious that by this legal act, the Republic of North Macedonia intends to establish a strategic approach for undertaking climate action in order to mitigate climate change and adapt to the undesirable effects of climate change, following the obligations and recommendations arising from international documents and agreements for greenhouse gas reduction.

In the section on strategic documents, the Law envisages the adoption of a Long-term Strategy on Climate Action and Action Plan, as well as a National Energy and Climate Plan. The competent authority for the adoption of the Strategy and the Action Plan is the Parliament of the Republic of North Macedonia, whereas the adoption of the National Energy and Climate Plan is the responsibility of the Government of the Republic of North Macedonia.

In the section on providing directions, opinions and recommendations for the overall climate actions as part of the climate action for integrating climate actions into sectoral policies, the Law also envisages the establishment of a National Coordination Mechanism for Climate Action, which is composed of the National Coordination Council for Climate Action, The National Council for Sustainable Development and the Scientific Advisory Body. The framework of the National Coordination Mechanism for Climate Action includes all relevant stakeholders from the administration bodies, science, chambers of commerce and citizens' associations, in order to ensure full coordination of capacities for climate action.

In the section on greenhouse gas emissions from transport, this draft law envisages a separate section that refers to greenhouse gas emissions from mobile sources. Namely, this section provides for an obligation referring to the fact that only new vehicles that meet the requirements for CO2 emission prescribed by the Ministry of Economy are placed on the market in North Macedonia. The Law also envisages a separate section on monitoring greenhouse gas emissions from aviation activities. According to the Law, the aircraft operator is obliged to monitor greenhouse gas emissions from aviation activity based on the approved Plan for monitoring greenhouse gas emissions from aviation activity.

The Draft Law on Climate Action is harmonized with the European Union Directives and Regulations that regulate climate action of the member states, that is, Regulation (EU) 2018/1999 of December 11, 2018 for Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, incorporated and adapted by the Decision of the Ministerial Council of the Energy Community 2021/14/ MC-EnC of November 30, 2021 incorporating Regulation (EU) 2018/1999 in the Energy Community acquis communautaire and amending Annex I to the Treaty Establishing the Energy Community, Commission Implementing Regulation (EU) 2020/1208 of 7 August 2020 on structure, format, submission processes and review of information reported by Member States pursuant to Regulation (EU) 2018/1999, Directive 2003/87/ECof the European Parliament and the Council of 13 October 2013 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, Commission Implementing Regulation (EU) 2018/2067 of 19 December 2018 on the verification of data and on the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council, and Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 601/2012.

2.3. Obligation to pay fees for carbon emissions

In North Macedonia, compensation for carbon emissions resulting from the use of different sources has not been yet fully regulated.

The positive legal framework envisages compensation for carbon, that is, greenhouse gases in the Law on Environment and the Law on Excise.

LAW ON ENVIRONMENT envisages the Polluter pay principle, according to which the polluter has an obligation to compensate for the costs of removing the danger of environmental pollution, for remediation and fair compensation for the environmental damage caused. This law envisages a fee for production of energy from fossil fuels (Article 185-a) in the amount of 0.007 denars for one kilowatt-hour (kWh) of energy produced, and it is an obligation for legal entities and natural persons managing installations that produce energy by burning fossil fuels. The law itself stipulates that the funds collected from this fee shall be paid into the Budget of the Republic of North Macedonia. The use of funds from this fee is regulated by the Decree on the methodology for distribution of funds realized as income from the fee for production of energy from fossil fuels (OGRM no. 12/2008).

THE LAW ON EXCISE DUTY [15] ("Official Gazette of the Republic of North Macedonia" no. 108/19, 143/19, 225/19, 275/19, 77/21 and 57/22) envisages excise duty on energy and electricity, according for which compensation is determined when they are used as propellant fuel, heating fuel as well as for lubricating oils. Article 92 and 93 of the Law on Excise Duty determine the excise duties for motor gasoline, gas oil, liquid petroleum gas, kerosene, heating oil, natural gas, biofuels etc. According to the Law on the mentioned energy products, the excise duty ranges from 0 to 25.00 denars per liter/kilogram or cubic meter. In terms of the excise duty, there is no separate item that refers to the amount of carbon obtained from the use of the above-mentioned energy products.

LAW ON MOTOR VEHICLE TAX [16] ("Official Gazette of the Republic of North Macedonia" no. 261/19) in Chapter 3, Calculation of motor vehicle tax, envisages that motor vehicle tax is calculated based on the sum of two components. The first component is the value component, which consists of the value of the motor vehicle and the percentage of the value of the vehicle for the respective value category. The second component is the so-called the specific component, which is the product of the amount of the average emission of carbon dioxide - CO2 and the value for 1 gram of carbon dioxide - CO2 for the respective category depending on the type of fuel used for vehicle propulsion. The law also envisages how the amount of the average emission of carbon dioxide - CO2 and the level of emission of exhaust gases of motor vehicles shall be calculated.

The amount of the average emission of carbon dioxide - CO2 expressed in grams per kilometer depending on the fuel type and the sales value of the vehicle, including the value of additional installed equipment, which does not include the value added tax, is taken as the basis for calculating the motor vehicle tax.

Regarding the use of the funds collected from the motor vehicle tax, the Law does not envisage their use in the area of reducing the damages from the carbon emissions produced by motor vehicles during their use, as for example is the case with the Law on Environment.

However, the idea of regulating this compensation is embodied in the DRAFT LAW ON CLIMATE ACTION, which envisages the financing of the mechanism for monitoring and reporting greenhouse gas emissions by source. Namely, in Chapter 5, Financing of climate action, which also envisages Carbon Compensation (Article 40). Pursuant to these provisions, the draft law stipulates an obligation for legal entities that emit greenhouse gases during the performance of their activities to pay an appropriate fee for each ton of verified emitted carbon dioxide or carbon dioxide equivalent. The draft law also envisages the manner in which the fee will be calculated, which should be calculated on a scaled basis, as a percentage according to the market price of the permitted emissions on the European regulated market. At the same time, for the minimum percentage of compensation, a threshold of at least 2.5% of the amount of the market price of the permitted emissions on the European regulated market at the time of the entry into force of the law is envisaged.

The Draft Law also envisages strict guarantees for how the funds that will be collected from the carbon fee shall be used. Primarily, it is planned that these funds will be part of the budget of the Ministry of Environment, as the competent authority for the implementation of the (draft) Law. Second, the allocation of funds will be done only through the Annual Program for Financing Climate Action Actions, which is proposed by the Minister based on the actions provided in the planning documents. And, thirdly, the draft law envisages a limited list of actions that can be supported by the funds collected on the basis of carbon compensation, such as decarbonization of economic operators and reduction of emissions per unit of production, energy efficiency; the transition to green and sustainable energy production and transformation, strengthening social cohesion and supporting coal regions to transition, supporting vulnerable and energy-poor consumers, producing greenhouse gas inventories, as well as producing reports on the policy system, measures and projections, realization of activities for climate-friendly investments, for education in the area of climate change, information and public awareness and gender aspects, youth and vulnerable groups.

3. INTERNATIONAL ENVIRONMENTAL PROTECTION MECHANISMS

3.1 The role of the European Court of Human Rights in the area of climate change mitigation

The European Court of Human Rights is part of the Council of Europe and it was established by the European Convention on Human Rights. Within its jurisdiction and work, the European Court of Human Rights (hereinafter referred to as the ECtHR) ensures the protection of the rights and freedoms guaranteed by the European Convention, but it does not ensure the protection of the right to healthy environment. Regardless of this, the ECtHR still has case law that has ruled on issues that are in the domain of the environment. This is primarily due to the existence of a need to protect convention rights from violations that may result from damage to the environment and exposure to environmental risks.

However, the ECtHR provides for the violation of the right to the environment through Article 2 - Right to life, Article 3 - Prohibition of torture and inhumane treatment, Article 6 - Right to a fair trial, Article 8 - Right to respect for private and family life, Article 10 - Right to receive and to impart information on matters of general public interest.

To date, in its jurisdiction, the ECtHR has decided and delivered judgments in more than 300 cases related to the environment [17], by ensuring the protection of the right to life, freedom of speech and family life on a wide range of issues, including pollution, man-made or natural disasters and access to environmental information.

However, despite the extensive jurisprudence, the ECtHR in the area of climate change still does not have a specific jurisprudence, because requests for the protection of convention rights from violations resulting from climate change have not been treated at all so far. However, three cases are pending before the Grand Chamber of the ECtHR regarding climate change before, which is the largest forum of judges who decide on cases of particular importance in relation to the application of the European Convention on Human Rights.

3.1.1 Cases before the ECtHR with a focus on climate change

Verein Klima Seniorinnen Schweiz and Others v. Switzerland, application no. 53600/20

This case, which has been brought by a Swiss association and its members, a group of older people concerned with the consequences of global warming on their living conditions and health, relates to a complaint of various failings of the Swiss authorities in the area of climate protection. The applicants submit in particular that the respondent State has failed to fulfil its positive obligations to protect life effectively (Article 2 of the Convention) and to ensure respect for their private and family life, including their home (Article 8 of the Convention). They further complain that they have not had access to a court within the meaning of Article 6 (right to a fair trial) of the Convention and of a violation of Article 13 (right to an effective remedy) of the Convention, arguing that no effective domestic remedy is available to them for the purpose of submitting their complaints under Articles 2 and 8.

Carême v. France (no. 7189/21)

This case concerns a complaint by a resident and former mayor of the municipality of Grande-Sinte, who submits that France has taken insufficient steps to prevent climate change and that this failure entails a violation of the right to life (Article 2 of the Convention) and the right for respect of private and family life (Article 8 of the Convention).

Duarte Augustinho and Others v. Portugal and 32 Other States (no. 39371/20)

This case concerns the polluting greenhouse gas emissions from 33 member States, which in view of the applicants - Portuguese nationals aged between of 10 and 23 - contribute to the phenomenon of global warming, resulting, among other things, in heatwaves affecting the applicants' living conditions and health. The applicants complain in particular that the 33 States concerned are failing to comply with their positive obligations under Articles 2 (right to life) and 8 (right to respect for private and family life) of the Convention, read in the light of their undertakings under the 2015 Paris Agreement on Climate Change (COP21). They also allege a violation of Article 14 (prohibition of discrimination) taken in conjunction with Article 2 and/or Article 8 of the Convention, arguing that global warming affects their generation particularly and that, given their age, the interference with their rights is greater than in the case of older generations.

In addition to these pending cases, the ECtHR, in the proceedings led by a Single Judge, declared both applications inadmissible on the grounds that there was no alleged breach of the Convention or its Protocols to claim to be victims. In addition, the applications that were declared inadmissible are presented.

Humane Being and Others v. United Kingdom (no. 36959/22)

In the case of Humane Being and Others v. United Kingdom (No. 36959/22), the Court passed a Decision on inadmissibility on December 1, 2022. In the specific case, the applicant is a non-governmental and non-profit organization running the factory farming campaign and cited as the grounds for the application a violation of the right to life, the prohibition of inhuman or degrading treatment and the right to respect for private and family life. As a violation of these rights, the applicants alleged that the United Kingdom had failed to safeguard against the risks of factory farming.

Plan B. Earth and Others v. United Kingdom (application no. 35057/22)

In the case of Plan B. Earth and Others v. United Kingdom, one non-governmental organization and four individuals appear as applicants. The complaint was filed relaying on Articles 2 (right to life), 3 (prohibition of inhuman or degrading treatment), 8 (right to respect for private and family life) and 14 (prohibition of discrimination) of the Convention. The reason for the application at the ECtHR was that the applicants felt that the United Kingdom had failed to take practical and effective measures to tackle the extreme threat from man-made climate change. The court passed a Decision on inadmissibility on December 1, 2022.

Between 2022 and 2023, the Court held a series of procedural meetings in respect of climate change applications for cases other than those pending before the Grand Chamber, after which it decided to adjourn its examination of six cases until such time as the Grand Chamber has ruled in the climate change cases before it. [18][19][20][21][22][23]

3.2 The role of the European Court of Justice in the area of climate change mitigation

The European Court of Justice has a special status within the European Union. Namely, this court is responsible for interpreting the law of the European Union, which aims to ensure its harmonized application in all the member states of the European Union and resolves all legal disputes between national governments and the institutions of the European Union. The European Union law regulates the area of the environment in terms of its protection in the Charter of Fundamental Human Rights of the European Union, as a basic legal act for the protection of human rights in the member states of the European Union. Namely, in Article 37, the Charter stipulates that: *"A high level of environmental protection and the improvement of the quality of the environment must be integrated into the policies of the Union and ensured in accordance with the principle of sustainable development".*

This provision represents a direct protection of the environment in terms of establishing a policy framework as a guarantee of this right. However, the weight of implementing this right, in addition to the policy area under the competence of the institutions of the European Union, the Parliament and the Council, mostly falls on the European Court of Justice. The court will face the challenge to interpret this provision, which has above all the form and substance of a principle, that is, a principle to interprete in terms of individual or collective right of citizens and other persons in the European Union. However, as is the case with the European Court of Human Rights, the rights and freedoms guaranteed by the basic documents first revive and develop only through the actions and creation of the case law of the courts, in the specific case of the European Court of Justice. This challenge will first of all be very complex in the area of climate change because the Court will have to determine the immediate and sufficient concern of the parties from climate change.

3.2.1 ECJ jurisprudence with a focus on climate change

To date, the European Court of Justice has ruled in dozens of cases in which it ruled on appeals involving greenhouse gases, but only one case in which it specifically ruled on the harmful consequences of climate change on people's lives. The decisions of the European Court of Justice have had a great impact on the environmental policy development in the European Union. Below we will provide a special overview to several of them in order to see the possibility of protection from the climate change impact as well as the method and doctrine according to which the European Court of Justice acts.

Case T-330/18 -Armando Ferrão Carvalho and Others v. European Parliament and Council [24]

This case is the first and only case that was conducted before the European Court, the purpose of which was to prove the negative effects of the insufficiently effective policy of the institutions of the European Union. Therefore, this case is also called "The People's Climate Case". In the specific case, ten families, from Portugal, Germany, France, Italy, Romania, Kenya, Fiji and the Swedish youth association Sami Saminuora, filed an application before the General Court of the EU in order for the court to oblige the European Union to take stricter measures to fulfill the expected reduction of greenhouse gas emissions. As a basis, the applicants pointed out that the measure of the European Union for the reduction of greenhouse gases by 2030 by 40% was not enough, because despite this reduction, the negative and risky climate change that directly affect people's lives would not be avoided. The applicants' application had two claims, the first of which sought the Court to annul the three basic legal acts, Directive 2003/87/EC regulating emissions from large electricity generation plants (ETS); Regulation 2018/EU on emissions from industry, transport, buildings, agriculture and the like (ESR); and Regulation 2018/EU on emissions from land use, land use change and forestry (LULUCF) because they have not fulfilled their purpose and reason for enactment. The second claim refers to non-contractual liability in accordance with Article 340

of the Treaty on the Functioning of the European Union for the reason that they considered that the three conditions were met: 1) the existence of unlawful conduct by the EU institutions, 2) the unlawful conduct is a serious violation of the law that protects individual rights and 3) there is a sufficient causal link between the injury and damages.

The European Court of Justice made a decision dismissing the application of the applicants on procedural grounds for the reason that the applicants could not file an application because they were not directly and sufficiently affected by the insufficiently effective policies of the institutions of the European Union, that is, they did not have a direct and individual concern. The court held that the applicants had no right to bring a case because climate change affects every person in one way or another, while case law requires that the challenged conduct directly affect the applicants in a way that is specific to them or because of the circumstances in which they would distinguish from all other people and on the basis of these factors it distinguish them individually.

The applicants filed the application to the European Court of Justice, which on March 25, 2021 dismissed the applicants' application and confirmed the decision of the General Court because it concluded that the applicants' allegations were unfounded because the first-instance court determined as a rule that the applicants were not individually affected by climate policy of the European Union.

Case C-366/10- Air Transport Association of America v. Secretary of State for Energy and Climate Change [25]

The American Air Transport Association filed a claim at the European Court of Justice seeking to avoid inclusion in the EU's Emissions Trading System on the grounds they believed that the system was invalid as applied to them and not justified by international law or specific arguments between the EU and the USA.

The European Court of Justice, acting on the claim, rejected it, thereby confirming the earlier decision of the advocate general. The court rejected the claim, holding that the European Union has the right to permit a commercial activity, such as air transport, to be carried out on its territory only on the condition that the operators comply with the criteria that have been established by the European Union.

In the Decision, the Court stated in the specific case that the only principles and provisions of international law, that can be relied upon, in circumstances such as those of the main proceedings and for the purposes of assessing the validity of Directive 2008/101/EC of the European Parliament and of the Council of November 19, 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emissions allowance trading within the Community, are the following:

– first, within the limits of review as to manifest error of assessment attributable to the European Union regarding its competence, in the light of those principles, to adopt that directive:

- the principle that each State has complete and exclusive sovereignty over its airspace,

- the principle that no State may validly purport to subject any part of the high seas to its sovereignty and

– the principle that guarantees freedom to fly over the high seas,

– and second: – Articles 7 and 11(1) and (2)(c) of the Air Transport Agreement concluded on 25 and 30 April 2007 between the United States of America and the European Community and its Member States, as amended by The Protocol, and – Article 15(3) of that agreement, read in conjunction with Articles 2 and 3(4) thereof.

Case C 203/12 - Billerud Karlsborg ABBillerud Skärblacka AB v. Naturvårdsverket [26]

On April 30, 2007, the Billerud companies from Sweden, which had quantities of allowances for carbon dioxide emissions, did not surrender the quantities of their emissions for 2006, i.e. quantities of 10828 and 42433 tons. Therefore, the Naturvårdsverketim issued a sanction provided for by Law no. 2004:1109 for the implementation of Directive 2003/87, in the amount of SEK 3,959,366 for one company and SEK 15,516,051 for the other, that is, equivalent to EUR 437,320 and EUR 433,201.

In favor of their defense, the companies stated that on 30 April 2007 they already had sufficient emission allowances on their accounts to cover their total emissions for 2006. They also stated that they did not intend to default and that the alleged failure to surrender their quantities of allowances on time was due to an internal administrative problem that was not accepted by the first-instance authority.

The Billerud companies appealed against that judgment to the Supreme Court, which decided to stop the proceedings and refer questions to the Court of Justice for a preliminary ruling. The Supreme Court submitted the following questions

1. Does Article 16(3) and (4) of Directive 2003/87 ... mean that an operator who has not surrender a sufficient number of allowances of emissions by 30 April must pay a penalty regardless of the reason for the failure, for example, where, although the operator had a sufficient number of allowances of emissions on April 30, as a result of an oversight, administrative error or technical problem, can be considered not to have surrendered?

2. If Question 1 is answered in the affirmative, does Article 16(3) and (4) of Directive 2003/87 mean that the penalty will or may be abolished or reduced, for example in the circumstances described in Question 1?

The court, acting on the request of the Supreme Court, decided that Article 16(3) and (4) of Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and the amendment of Council Directive 96/61/EC must be interpreted as an exception for operators who failed to surrender, by April 30 of the current year, carbon dioxide equivalent emissions equal to their emissions for the previous year, from avoiding the imposition of a penalty for the excess emissions for which they are foreseen, even when they had enough emission allowances on that date. Thus, the Court stated that Article 16(3) and (4) of Directive 2003/87 must be interpreted in such a way that the amount of the lump-sum penalty provided for in the Directive cannot be changed by the national court based on the principle of proportionality.

3.3 The role, approach and differences between ECtHR and ECJ in environmental protection

The Republic of North Macedonia as a member state of the Council of Europe and a signatory to the European Convention on Human Rights is obliged, according to the principle of subsidiarity, to directly apply the Convention in the area of freedoms and rights and to follow and respect the case law of the European Court of Human Freedoms and Rights especially by national courts and other competent authorities that decide on people's rights and freedoms. This means that North Macedonia should

constantly monitor the case law development in the application of the Convention by the Court and consequently try and strive for those legal positions to be primarily applied at the national level. However, in the area of protection of the right to healthy environment, North Macedonia should first of all ensure it through one or more of the already defined rights and freedoms in the Convention in the absence of a clear and precisely regulated and protected individual right to healthy environment. This obligation represents a serious challenge for every country, including North Macedonia, because it is a firm guarantee for citizens that the state and the courts are obliged to ensure the protection of their rights and freedoms through the doctrine of the so-called Strasbourg law and the jurisprudence of the European Court of Human Rights.

In relation to the application of the European Union law and the case law of the European Court of Justice, North Macedonia has an obligation at a lower level of application, unlike the Convention and the case of the ECtHR. But starting from the fact that in the process of accession with the ultimate goal of joining the European Union, the Government of RNM has a strong obligation to harmonize all legal acts with the legal acts (directives, regulations, etc.) of the European Union. If the basic role and competence of the European Court of Justice is taken into account, the court is competent for the interpretation of the European Union law, which aims to ensure its harmonized application in all member states of the European Union, North Macedonia is obliged to follow its case law due to the fact that the domestic legislation is mostly harmonized with the European Union law. This means that the institutions, especially the Government of the RNM and the national courts, in addition to the jurisprudence of the European Court of Human Rights as part of the national legislation, are obliged to constantly follow the jurisprudence of the European Court of Justice in the area of interpretation of the application of directives and regulations that are already incorporated into national legislation.

Below, there is an illustration of the strengths, opportunities, but also the challenges in the application of the case law of the European Court of Human Rights versus the European Court of Justice [27]

ECtHR compared to ECJ

4. INSTITUTIONAL STRUCTURE AND ORGANIZATION

4.1. Institutional framework in the transport sector

The Ministry of Transport and Communications is in charge of creating and implementing transport policy, including national strategies and action plans, inspection and enforcement. The Ministry of Transport and Communications bears the responsibilities and duties in accordance with the Law on the Organization of State Administration Bodies ("Official Gazette of the Republic of Macedonia" No. 58/00, 44/02, 82/08, 167/10, 51/11 and "Official Gazette of the Republic of North Macedonia" No. 96/19 and 110/19) within the framework of its basic competences, performs works that are enacted in road traffic and road infrastructure, railway traffic and railway infrastructure, air traffic and aviation infrastructure, as well as inland waterways, i.e. all types of traffic and transport, carried out on and over the territory of the Republic of North Macedonia.

Within the framework of the Internal Organization Act [28], the Ministry of Transport and Communications has separate sectors organized by type of traffic, namely, the Road Traffic and Infrastructure Sector, the Railways Sector and the Aviation Sector, whereas waterway transport is under the jurisdiction of the Port Authority. The competence of these Sectors is based exclusively on the provision of conditions for the traffic organization and development, traffic infrastructure safety and development, but they do not cover issues related to climate change mitigation in which the means of transportation take part.

The national road network is managed by the **Public Enterprise for State Roads** and the **Public Enterprise for Maintenance and Protection of Trunk and Regional Roads.** The latter, in accordance with the Law on Public Roads, is responsible for the protection and maintenance of the national and regional road network in the country.

Railway infrastructure and transportation are managed by two state-owned enterprises: **Public Enterprise for Railway Infrastructure "Macedonian Railways" Skopje** and **Joint-Stock Company for Transport "Macedonian Railway Transport".**

The Agency for Railway Sector Regulation ensures transparent and impartial performance of the activities of the infrastructure manager, railway transportation and other railway service providers.

The Railway Safety Directorate is a body within the Ministry of Transport and Communications. It operates as a competent body for the implementation and supervision of the relevant laws regarding safety in railway traffic.

The Civil Aviation Agency is responsible for air transport functions, whereas the **Public Enterprise for Airport Services** is responsible for the management of airports in the Republic of Macedonia. The two airports in Ohrid and Skopje are under concession by the Turkish company TAV Airports for 20 years. The Air Navigation Service Provider (M-NAV) manages and controls civilian air traffic in the Republic of Macedonia.

The Captaincy of Ports - Ohrid, a body within the Ministry of Transport and Communications, is the responsible body for the implementation and supervision of the relevant laws regarding inland waterway transport (lake transport).

The State Transport Inspectorate and the **Railway Safety Directorate** are responsible for supervising the implementation of the relevant laws and rules in the area of inland surface transport, i.e. road and rail transport. The State Transport Inspectorate is the competent body for performing inspection of activities concerning transport of passengers and goods in domestic and international road transport. It operates as an independent body, separate from the Ministry of Transport and Communications.

4.2. Institutional structure for climate change at national level

Different aspects of climate change are integrated to varying degrees in the following institutions, bodies and sectors at the national level.

Ministry of Environment and Physical Planning

The issue related to climate change is perhaps the most complex issue internationally due to the numerous factors that impact climate change. The MoEPP is an institution in charge of climate change policy making, national focal point to the United Nations Framework Convention on Climate Change (UNFCCC) and national designated entity for the implementation of the Kyoto Protocol. The Internal Organization Act of the MoEPP envisages a Unit for Climate Change Policies [29] in the Department for Sustainable Development and Investments, that has an exclusive competence in relation to policy making in the area of climate change and sustainable development. In the policy making process, the Unit prepares and implements planning documents, operational programs and projects, establishes cross-sectoral and interdepartmental cooperation with other authorities and bodies in the country and abroad, makes proposals for legal solutions in the area of climate, implementation of measures and actions for climate change reduction and mitigation in other sectoral policies, research and analysis of policies, documents and programs at the local, national and international level in the area of climate change. In the area of monitoring of greenhouse gas situation, the Unit for Climate Change Policies analyzes data on greenhouse gas emissions, analyzes greenhouse gas projections and makes proposals for their reduction. The Unit carries out these competences in cooperation with stakeholders for initiating and implementing climate change mitigation actions.

In addition to the Unit for Climate Change Policies, the Internal Organization Act also envisages a State Adviser on Climate Change, who is in the service of the Minister of Environment and Physical Planning and the State Secretary in the Ministry in the implementation of climate change policies.

Other ministries that bear responsibilities for climate-related issues are:

- Ministry of Economy
- Ministry of Agriculture, Forestry and Water Economy
- Ministry of Transport and Communications
- Ministry of Health
- Ministry of Internal Affairs
- Ministry of Finance.

The Ministry of Economy is in charge of the following climate-related policies:

- energy policy, including investments in the energy sector, fossil fuels, energy efficiency and renewable energy sources;
- internal market policies governing standards and policies for road transport vehicles and technical conformity;
- mining policies and geological aspects;
- industrial and investment policies.

In addition, the Ministry of Economy has competence in the area of environmental categorization of vehicles. Pursuant to the Law on Vehicles, the Ministry of Economy is competent to enact a by-law - Rulebook for environmental categorization of vehicles.

The Ministry of Agriculture, Forestry and Water Economy is in charge of designing and implementing agricultural and forestry policies, as well as of the economic use of water resources.

The Ministry of Transport and Communications is in charge of transport licenses for freight and passenger transport, aviation activities and railways. In addition, this Ministry is in charge of spatial planning and construction land management.

The Ministry of Health is in charge of public health policy. Its relevant areas of responsibility include drinking water quality, chemical management and medical waste management. In its Institute of Public Health, there is an Environmental Health Protection Unit, which collects data from the 10 regional public health centers, monitors and assesses environmental and climate health risks, identifies priority issues and potential health risks at the national level and informs the Ministry of Health.

The Ministry of Internal Affairs is the competent institution that performs technical control of motor vehicles in accordance with the vehicle legislation. Within the Ministry of Internal Affairs, according to the Rulebook on Internal Organization, the responsibility for motor vehicles is within the Unit for Vehicles. The Ministry of Internal Affairs is responsible for the technical inspections of vehicles in the same way as it is competent for issuing approvals for performing the activity of technical inspections of vehicles by legal entities.

The Ministry of Finance, which manages the single account of the Ministry of Finance, receives all revenues of which all payments are made on behalf of budget users at the central and local government level.

Other relevant institutions and bodies with responsibilities regarding climate change:

• The Office of the Deputy Prime Minister for Economic Affairs is in charge of achieving the Sustainable Development Goals and it is also the national designated entity for the Green Climate Fund (GCF).

• The National Climate Change Committee was established by the Government, and it is a comprehensive political platform that provides a high level of support for the development and implementation of climate change activities. It consists of representatives nominated by the key stakeholders, i.e. by the national institutions, academic institutions, the private sector and civil society and climate change coordinators appointed by ministries.

• The Technical Group at the Council for Sustainable Development, as well as other key government and civil society stakeholders, are also participating in the policy-making process related to climate change.

• Regulatory Commission for Energy and Water Services, which sets energy and water supply tariffs and tariffs for sewage and waste water treatment services.

• Local Self-Government Units that organize municipal utility services (such as waste collection and disposal, water supply and sewage).

National focal points to the UN Framework Convention have been appointed:

• National focal point to the UN Framework Convention on Climate Change

• national focal point for gender and climate change.

International institutions and donors providing financial and technical support for the reporting process:

• The Global Environment Facility (GEF)
• The United Nations Development Program (UNDP).

5. OVERVIEW OF BASIC PARAMETERS ABOUT THE SITUATION IN TRANSPORT

The necessity of transport is in providing daily mobility and enabling access to goods and services. Furthermore, the transport sector helps maintain and develop social and economic systems. But at the same time, transport is one of the main sources in the environment in terms of negative impacts on climate change. In the largest national source of greenhouse gas emissions, i.e., the energy sector, transport is in second place in terms of share in these emissions, reaching up to 28%. Thus, transport is a sector that has a large share in the contribution of the total greenhouse gas emissions at the national level.

Reducing the impact of transport on climate change is high on the EU agenda and also on our national agenda [30].

The negative impact of the transport sector on climate change is due to several aspects, such as the old fleet of registered passenger vehicles, as well as the large consumption of fossil fuels (oil and gasoline). According to the latest statistics, about 85% of the total number of registered passenger vehicles at the national level are older than 10 years; that is, the average age of passenger vehicles in 2021 reached almost 20 years of age.

Therefore, in addition, there is an analysis of the basic parameters in transport, which are significant as reasons causing greenhouse gas emissions of this sector, and thus the negative impacts on climate change.

5.1. Total number of vehicles by category

According to the official statistics of the State Statistics Office, in the Republic of Macedonia in 2021 there were a total of 559,418 vehicles, of which the largest part, i.e. 477,820 or 85.4%, were passenger vehicles [31]. Freight vehicles, together with truck tractors and trailers make up 59,291, i.e. 10.6%. The rest is made up of motorcycles (2.8%), buses (0.5%), tractors and work vehicles (0.65%).

The total number of vehicles by category has a constant growing trend – if in 2012 there were 350,762 vehicles, in ten years this number increased to 559,418, that is, there was an increase of 59.5% [2]. Throughout all the years in the period under review (2012-2021), the number of passenger vehicles continuously prevailed (average share of 84-86% in the total number of vehicles).

Hence, due to the number, passenger vehicles are the ones that continuously contribute to the largest amounts of greenhouse gas emissions, and thus cause the biggest problems with climate change. Therefore, in this section of the analysis, the attention is paid on this category of vehicles in transport, especially in relation to the fuel type and the age of the vehicle fleet, as basic parameters that impact greenhouse gas emissions.

5.2. Passenger motor vehicles by fuel type

This parameter defines the number of passenger motor vehicles at the national level broken down by fuel type (gasoline, oil, mixture, gasoline-gas, electricity).

A key question in the climate change policy making is the following: what is the share of passenger motor vehicles by fuel type, in the total number of passenger motor vehicles? The answer to this question is given in fig. 1, for the time period from 2012-2021.

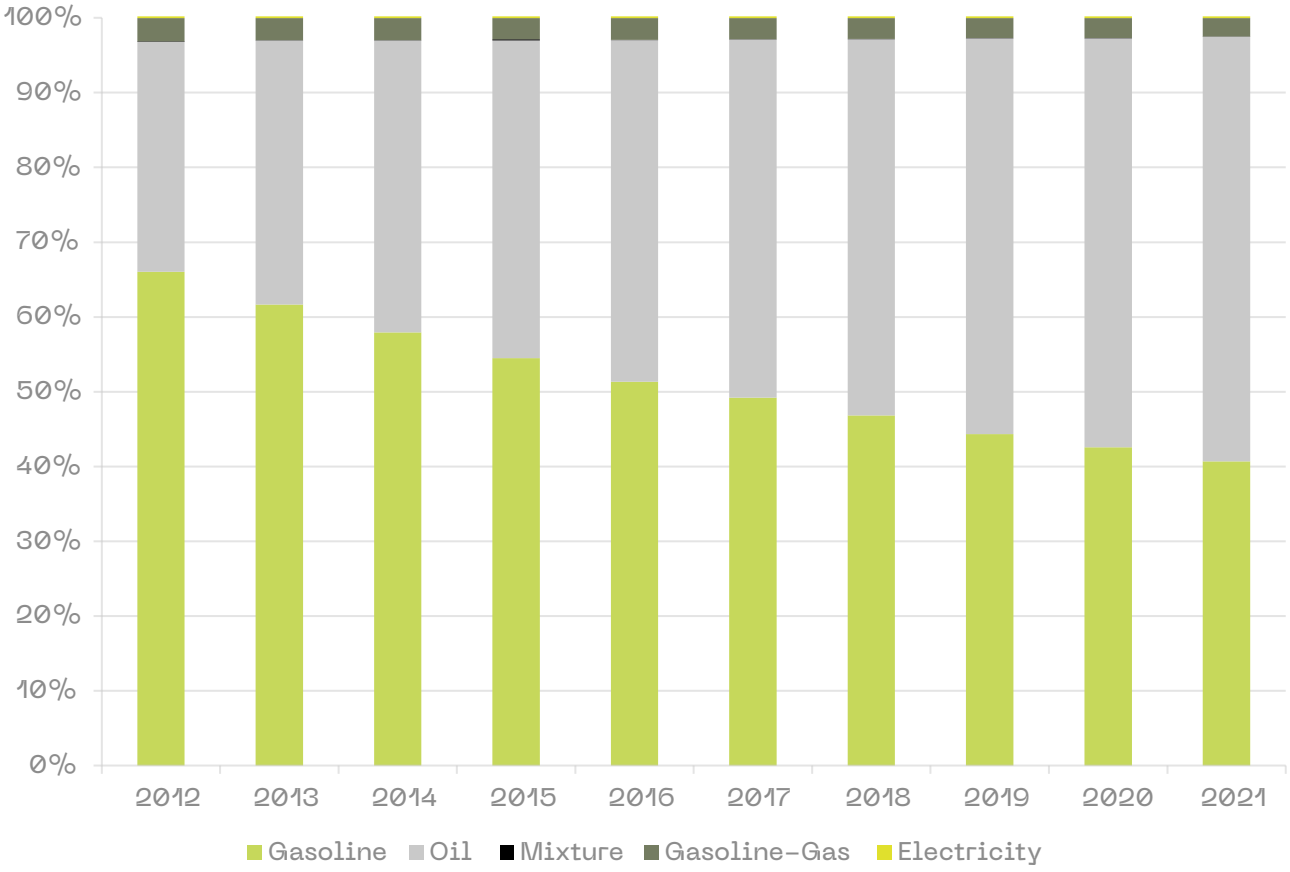

Fig. 1: *Share of passenger vehicles by fuel type in the total number of passenger vehicles*
Source: *MakStat database of the State Statistics Office of RNM, authors' analysis*

As for passenger motor vehicles, the most used fuels are fossil fuels, that is, oil and gasoline. The use of oil in passenger motor vehicles is the largest, with a growing trend of 26% in the period under review. In 2012, 30.72% of passenger motor vehicles used oil, and in 2021 this percentage increases to 56.8% (Fig. 1).

Due to the growth in the use of oil, the use of gasoline decreased from 66.06% in 2012 to 40.68% in 2021. This has a positive impact on the amount of greenhouse gas emissions, because gasoline vehicles emit more greenhouse gas emissions than diesel vehicles. The other fuel types have a very small share, with an almost equal share in the period under review (from 0.03% to 2.46% in 2021).

As for other types of vehicles - buses, trucks, truck tractors, work vehicles and tractors, the dominant fuel type is oil with an increasing trend (it reaches 90%), followed by gasoline, except for motorcycles, where the dominant fuel type is gasoline [31]. The other fuel types have a very small share with an increasing tendency.

5.3. Passenger motor vehicles by age

This parameter classifies passenger motor vehicles by average age at national level.

A key question for policy making is the following: does fleet replacement result in a reduction in the average age of vehicles and a positive impact on climate change?

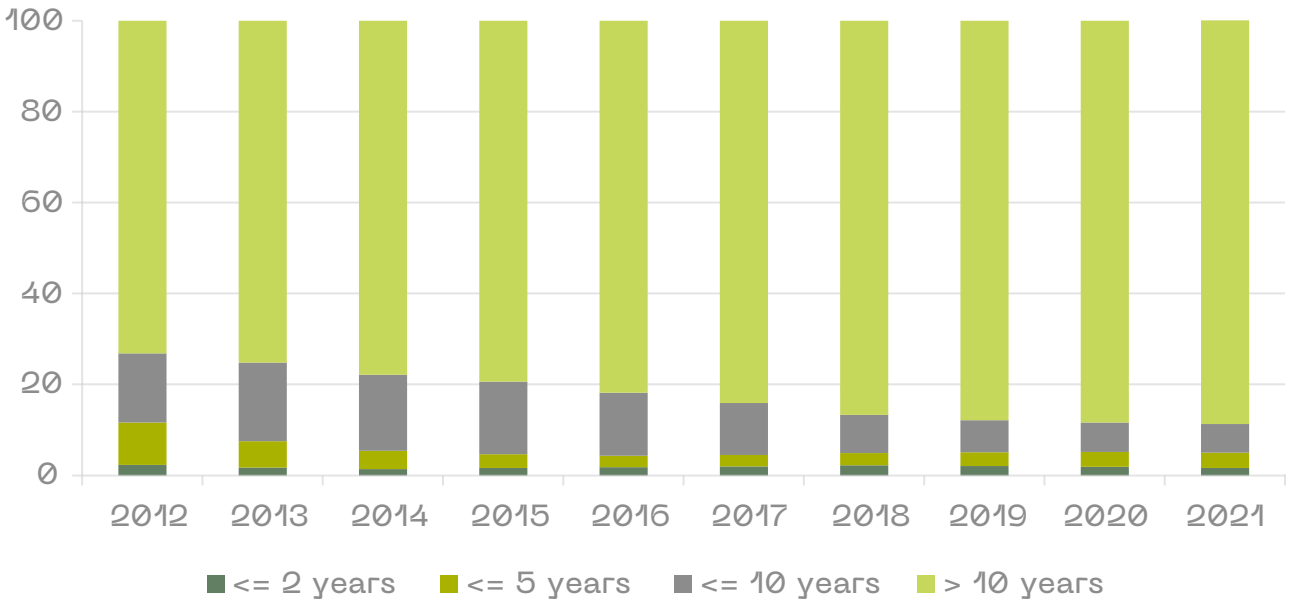

Fig. 2: *Share of passenger vehicles by average age of vehicles in the total number of passenger vehicles (in percent)*
Source: *MakStat database of the State Statistics Office of RNM, authors' analysis*

According to fig. 2, in 2021 compared to 2012, the share of passenger vehicles in the total number of vehicles older than 10 years had an increasing trend of 15.6%, with an age between 5 and 10 years had a decreasing trend of 8.9%, with ages between 2 and 5 years there was a decreasing trend of 5.9% and with age up to 2 years there was a decreasing trend of 0.7%. Thus, the number of vehicles older than 10 years was increasing, and the number of newer vehicles was decreasing.

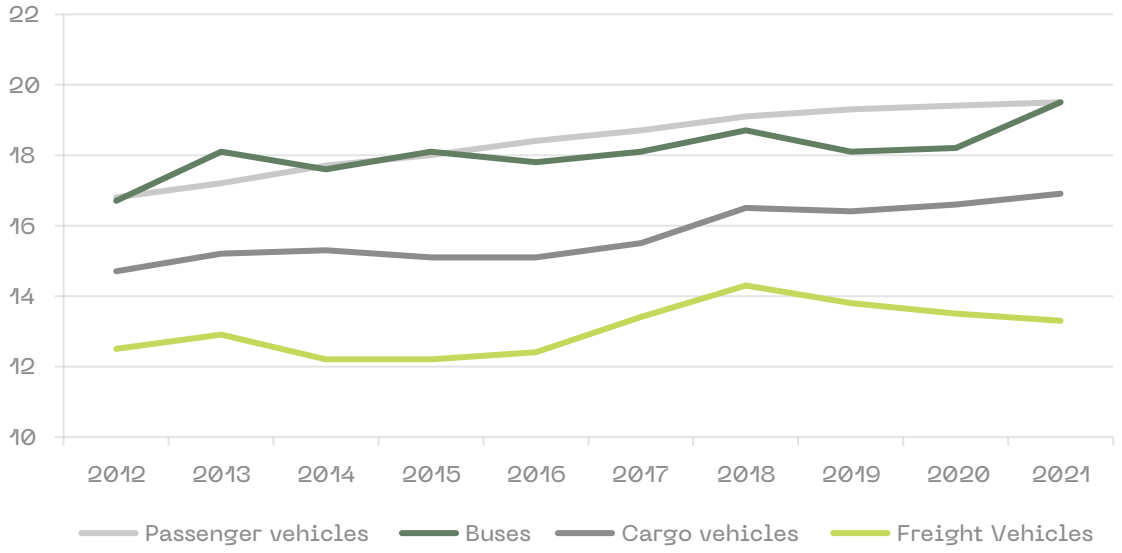

Fig. 3: *Average age of vehicles*
Source: *MakStat database of State Statistics Office of RNM, authors' analysis*

According to fig. 3, the average age in the categories of passenger vehicles, buses and trucks had an increasing trend, whereas in truck tractors since the middle of 2018 there had been a decreasing trend. In the period under review (2012-2021), the average age of passenger vehicles had an increasing trend and ranged between 16.8 and 19.5 years, for buses the increasing trend ranged between 16.7 and 19.5 years, and for trucks ranged between 14.7 and 16.9 years. In the case of truck tractors, as of 2018, the trend is decreasing from 14.3 to 13.3 years.

Based on the data in the period under review, for all categories of vehicles, it can be noted that vehicles older than 10 years have the largest share in the total number of vehicles, which indicates an old vehicle fleet. This is particularly pronounced in the case of passenger vehicles, where vehicles over 10 years old make up about 85% of the total fleet of passenger vehicles. Thus, the average age of these vehicles in 2021 was 19.5 years. These data confirm that this situation of passenger vehicles has a negative impact on the level of greenhouse gases. As a result, it is particularly important to renew the vehicle fleet through measures implemented at the national level. These measures are analyzed in detail in chapter 9.

6. TRANSPORT IN THE NATIONAL GREENHOUSE GAS EMISSION INVENTORY

6.1. Contribution of transport to greenhouse gas emissions

The National Greenhouse Gas Emission Inventory in the last Fourth National Plan on Climate Change [32] is made for five sectors, and each sector consists of several individual categories. Transport as a category is included in the Energy sector. The assessment of the level of key categories is made for 1990 as the starting year and 2019 as the last year. Although the inventory covers all greenhouse gases, the analysis of the Energy sector and the Transport category, takes into account only the most common greenhouse gas emissions: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O).

6.1.1. Greenhouse gas emission trend – Energy sector

The sectoral approach of the inventory for the Energy sector accounts for the greenhouse gas emissions released as a result of fuel combustion activities, as well as the fugitive emissions from extraction of solid fuels and transmission and distribution of liquid and gaseous fuels. The emissions from fuel combustion activities derived from several categories:

- Energy Industries
- Manufacturing Industries and Construction
- **Transport**
- Other Sectors (Commercial/Institutional Sector, Residental and Agriculture/Forestry/Fishing/Fish Farms)
- Non-specified.

Total greenhouse gas emissions in the Energy sector are given in fig. 4. One can notice a decreasing trend due to reduced electricity production by the energy industries, replaced mainly with electricity import. Although the emissions in 2018 had almost the same values as in 2016 (as the lowest level), in 2019, the emissions increased by 14% compared to the 2016 level due to increased domestic production and reduced imports. Compared to the 1990 level, in 2019, emissions were lower by 11.5%.

Total greenhouse gas emissions in the Energy sector amounted to 7,429 Gg CO_2CO_2-eq in 2018 and 8,501 GgCO2-eq in 2019. The largest share of greenhouse gas emissions in 2019 (Fig. 4) came from the Energy Industries category (54%), followed by **Transport (27.7%)** and Manufacturing Industries and Construction (12.6%). The other two categories together accounted for 4% of the total emissions in 2019, and the remaining 2% were Fugitive Emissions.

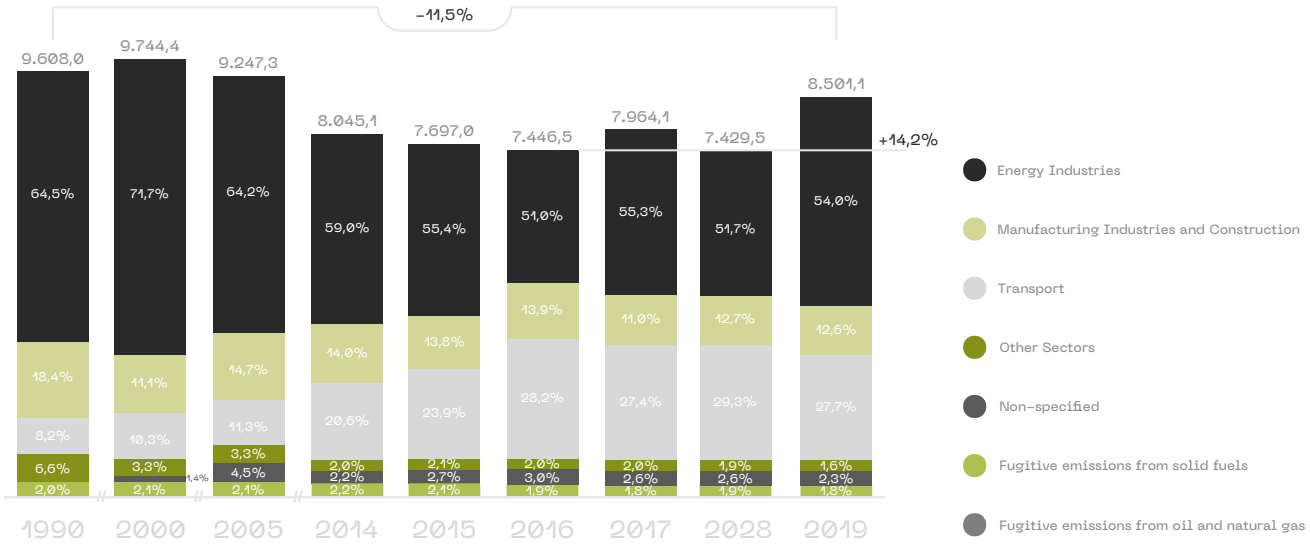

Fig. 4: *: GHG emissions in Energy sector, by category (Gg CO_2-eq)*
Source: *[32]*

Total greenhouse gas emissions in Energy sector by gas (in Gg CO2-eq) for the reporting years are given together in fig. 5.

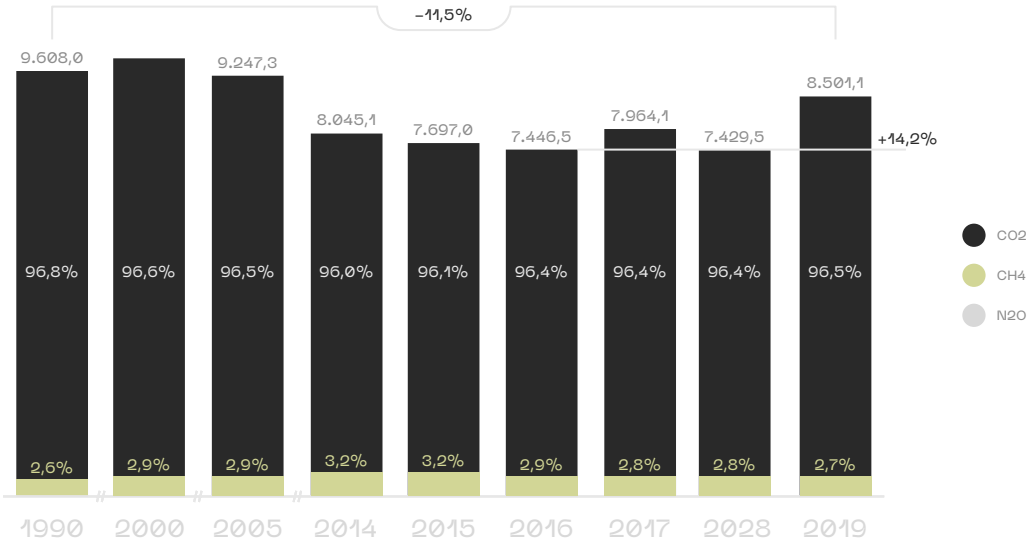

Fig. 5: *GHG emissions in Energy sector, by gas (Gg CO_2-eq)*
Source: *[32]*

Almost all of the greenhouse gas emissions in Energy sector in 2019 are actually CO_2 emissions (96.5%). CH_4 and N_2O emissions amount to only 2.8% and 0.7%, respectively.

6.1.2. Greenhouse gas emission trend — Transport category

Participating with 27.7% in 2019, the transport category was the second biggest category that contributed to the overall Energy sector emissions [32]. Regarding the fuels, this category uses diesel, motor gasoline, liquid petroleum gas, aviation gasoline and natural gas. Emissions are estimated based on fuel consumption by vehicle type.

There are three subcategories that actively contribute to emissions, as follows: road transportation, railways and domestic aviation. Road transportation released almost all of emissions from the category, i.e. 99.6% in 2019, whereas emissions from railways were 0.4% in 2016, and emissions from domestic aviation were close to zero (Fig. 6).

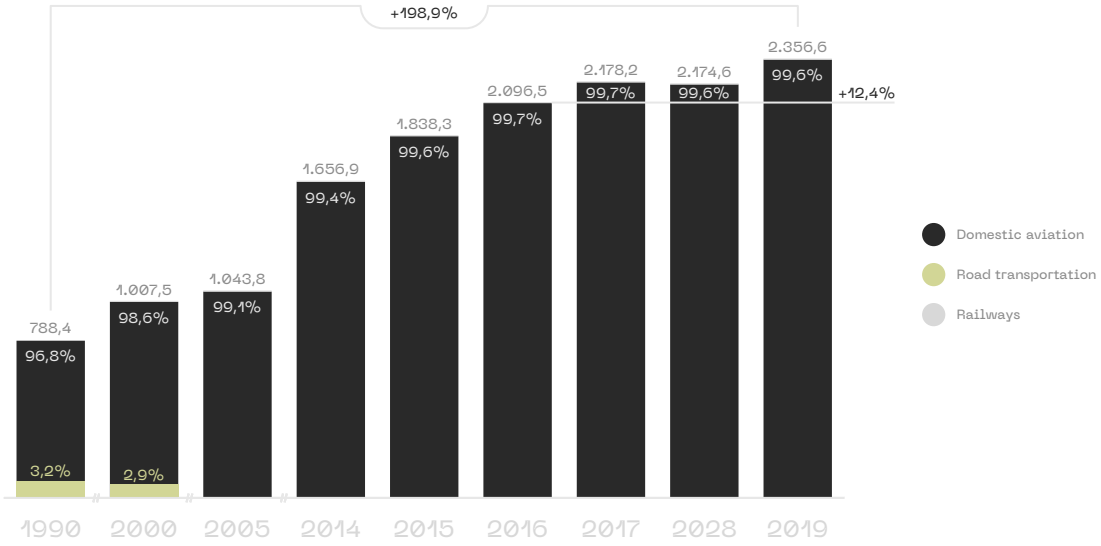

Fig. 6: *GHG emissions in Transport (in Gg CO_2-eq)*
Source: *[32]*

Unlike other categories and the Energy sector as a whole, emissions from Transport show an increasing trend, or 26.5% more emissions in 2019 compared to 2014, and 12.4% more in 2019 compared to 2016. In the period 1990 - 2016, emissions increased by almost 200% (Fig. 6).

6.2. Greenhouse gas emission projections in transport

6.2.1 Energy system in transition

In the Long-term Strategy on Climate Action and Action Plan [33], two scenarios for climate change mitigation were developed. One is a scenario that assumes a transition using existing policies and measures (WEM), and the other considers a more radical transition using additional policies and measures (WAM). Having in mind that in the period 2019-2020 few documents in the field of energy and climate change were prepared and adopted, these two scenarios are in accordance with the scenarios developed as part of the Energy Development Strategy up to 2040, Third Biennial Update Report on Climate Change (TBUR) - Mitigation Report - 2020 and the final draft version of the National Energy and Climate Plan - 2020. In addition, the measures proposed in these documents are also applied in the Long-term Strategy on Climate Action. The scenarios developed in this Strategy, unlike the scenarios in all previously mentioned documents, additionally consider the period 2040-2050.

A brief description of the transport mitigation policies and measures considered in each of the scenarios is shown in Table 1.

Table 1: Mitigation policies and measures assumed in WEM and WAM scenarios [33]

	WEM	WAM
General vision	Transition based on current policies	Transition based on enhanced policies
Transport	Electrification of the transport sector Higher penetration of biodiesel and CNG Advanced mobility	Further electrification of the transport Deployment of hydrogen for heavy-duty vehicles Higher penetration of biodiesel and CNG Advanced mobility

6.2.2. Energy consumption and development of greenhouse gas emissions by transport

For transport, the main drivers according to which the energy demand is projected are passenger and freight kilometers. These parameters are calculated according to GDP growth, number of vehicles, number of kilometers per vehicle and number of passengers per vehicle (Fig. 7). Additionally, the projections for the number of light vehicles are calculated using the relation between the number of cars/capita and GDP/capita (i.e. ownership growth elasticity relative to income growth is calculated). It is projected that up to 2050, the freight kilometers will be almost tripled and passenger kilometers will be almost doubled, following an S curve. Most of the passenger kilometers (around 79% in 2050) are from light-duty vehicles. It should be noted that the number of passenger kilometers presented in fig. 7 assumes no measures, thus the number and distribution of passenger kilometers in the WEM and WAM scenarios (after the measures are applied) is different [33].

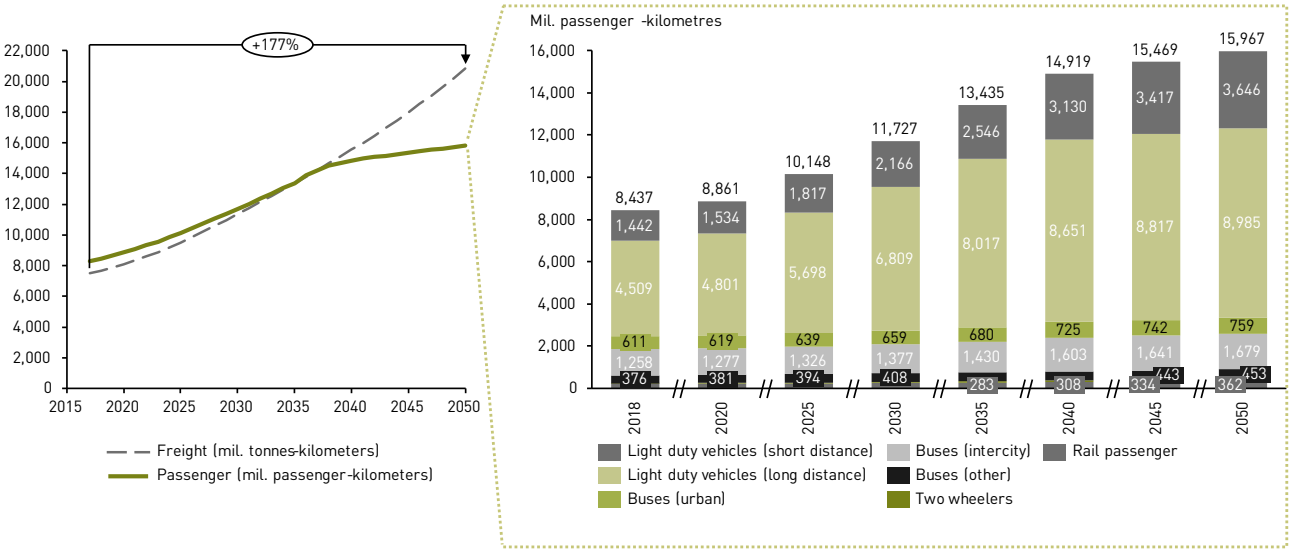

Fig. 7: *Passenger and freight kilometers Projections*
Source: *[33]*

After industry, transport is predicted to be the second fastest growing sector in terms of final energy consumption [33]. In the WEM scenario, the consumption increases by about 60% in 2050 compared to 2017. The gradual introduction of biofuels in the period from 2020 to 2030 (when they reach a maximum of 10%) is the main reason for the reduction of greenhouse gas emissions in this period, although there is an increase in energy consumption. In the period after 2030, greenhouse gas emissions increase, but at a slower rate than the increase in final energy consumption, as a result of: biofuels and the introduction of vehicles that use fuels with lower emission factors, such as CNG and electricity.

In the WAM scenario, the growth of final energy consumption is almost twice as low compared to the WEM scenario [33]. Unlike the WEM scenario, the WAM in the period up to 2030 has a reduction in greenhouse gas emissions and energy consumption primarily due to the penetration of hybrid vehicles and electric vehicles. In the period from 2030-2040, the trend of vehicle electrification continues, but as a result of freight transport there is a slight increase in emissions. Additionally, at the beginning of this period, another minor trend of import of used diesel and gasoline vehicles is expected to occur, having in mind that the efficiency of the imported used vehicles is close to the efficiency of a new vehicle sold on the market in that specific period.

This growth of greenhouse gas emissions will stop after 2040, primarily due to the introduction of hydrogen, greater penetration of CNG, as well as greater penetration of hybrid vehicles in light and heavy freight transport. At the same time, the trend of electrification and purchase of hybrid vehicles continues with light-duty vehicles. All this leads to a gradual reduction in the share of diesel fuel in transport, which allows a decreasing trend of emissions (Fig. 8).

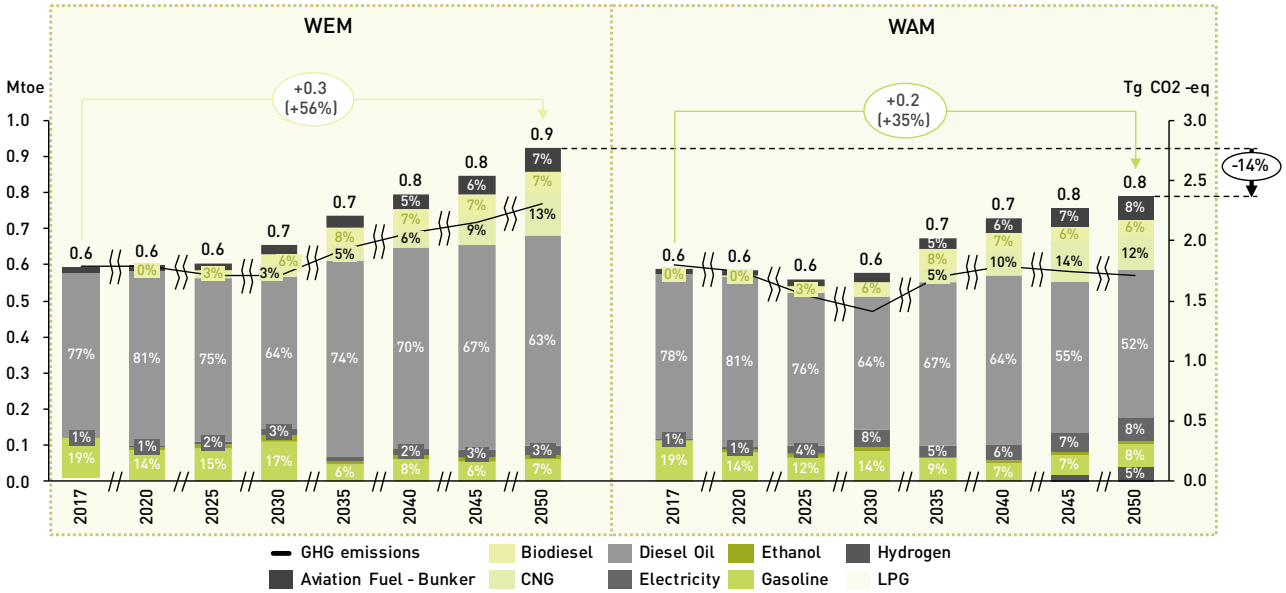

Fig. 8: *Final energy consumption by fuels in the transport sector*
Source: *[33]*

Analyzing greenhouse gas emissions by sector, including the emissions for the international aviation and the electricity imports, in the WEM scenario, the total emissions are rising from 9 Mt in 2017 to 10.6 Mt in 2050 (or 18%), mainly as a result of the increase in the emissions from the industry and transport (Fig. 9). Regarding the sectoral contribution to the total greenhouse gas emissions in 2050, electricity and heat production account for 35%, followed by industry with 27%, transport with 22%, electricity import with 9%, and the other sectors contribute the remaining 7% [33].

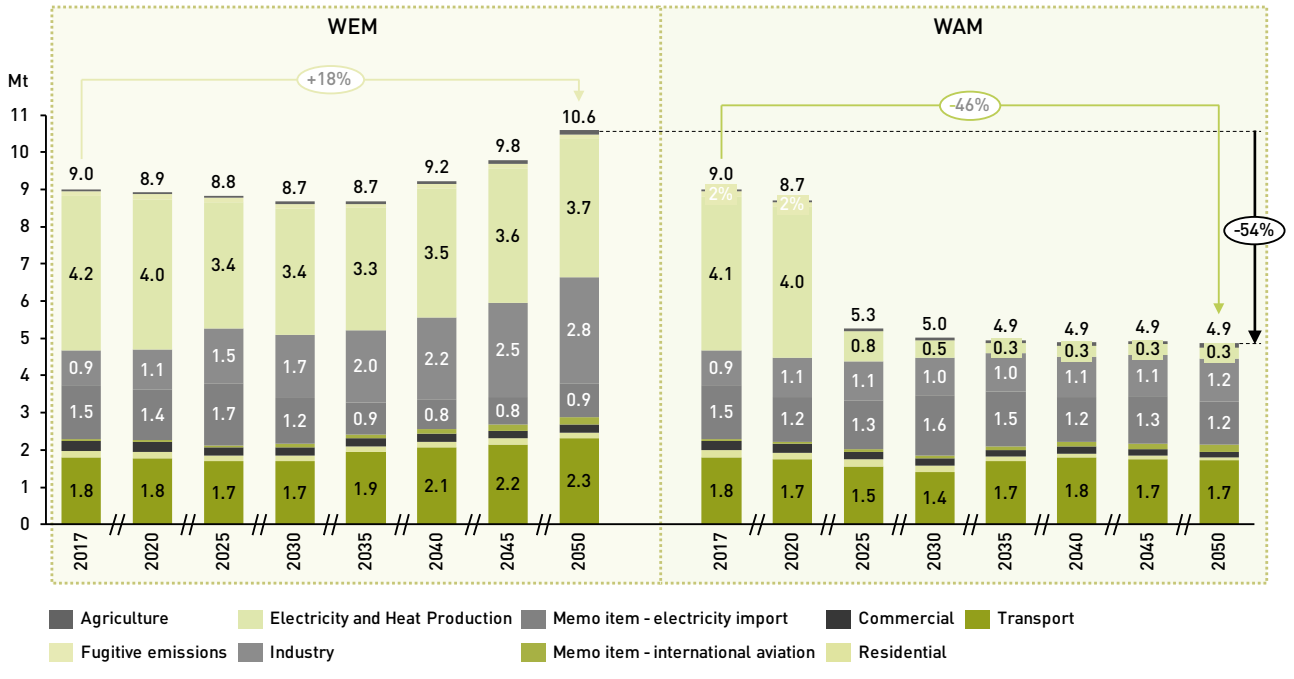

Fig. 9: *GHG emissions development by sector, including MEMO items (imports + aviation)*
Source: *[33]*

In the WAM scenario, the total emissions are estimated to drop by 46% in 2050 compared to 2017 or by 54% compared to the WEM scenario (Fig. 9). On the other hand, the emissions from the transport sector are estimated to slightly reduce (6%) as a result of the introduction of more advanced technologies that using less carbon-intensive fuels.

6.3. Reporting procedures

As a Party to the UN Framework Convention on Climate Change (UNFCCC), the Republic of North Macedonia has committed to developing an Inventory of the anthropogenic emissions (by sources) and removals (by sinks) of greenhouse gases, which are emitted into or removed from the atmosphere, as part of the National Plans on Climate Change (National Communications) and Biennial Reports (Biennial Update Reports). To date, three National Plans (NC1, NC2, NC3) and three Biennial Reports (BUR1, BUR2, BUR3), have been submitted to the UNFCCC as presented in Figure 10.

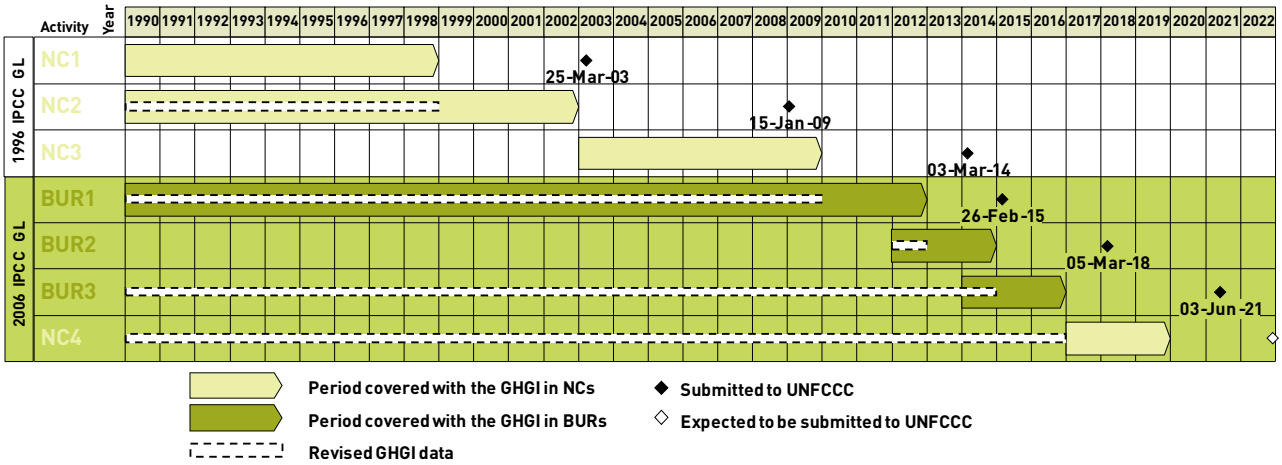

Fig. 10: *Development of the GHG inventories as part of reporting documents to UNFCCC*
Source: *[32]*

The inventory development activities under the Fourth National Plan on Climate Change (NC4) build on the work done under the previous Biennial Reports and the emission trend with a greenhouse gas inventory for 2017, 2018 and 2019 has continued. The preparation of a national greenhouse gas inventory is project-based, supported by the Global Environment Facility (GEF) and the United Nations Development Program (UNDP) [32].

MoEPP is an institution in charge of reporting national greenhouse gas emissions. In accordance with its international (including European) and national obligations, the MoEPP should prescribe a reporting format to be followed by working groups for the development of a national inventory [32]. The MoEPP has a reporting obligation, in addition to the UNFCCC, also to the European Environment Agency (EEA), all in accordance with the EU Monitoring Mechanism Regulation (EU MMR).

The estimated emissions in the inventory are transparent and publicly available on the national climate change platform www.api.klimatskipromeni.mk, open data portal (data.gov.mk) and the UNFCCC website. This also improves the transparency of presenting climate information according to Article 13 of the Paris Agreement.

In addition to the reporting obligation, it can be added that the Long-term Strategy on Climate Action and Action Plan defines an activity (table 2) for establishing a system for monitoring and reporting greenhouse gas emissions. This activity supports the implementation of the legal framework for climate action and is in accordance with the relevant European regulation, whereas the main institutions for its implementation are the MoEPP and the Government of the RNM.

Table 2: Action A-L-3 [33]

A–L–3: Establishment of a system of monitoring and reporting of greenhouse gas emissions	
Main objective: Establishment of the national system of monitoring and reporting as provided for in the LCA.	
Implementation period:	- 2021-2022 for adopting decrees, rulebooks and administrative decisions on creating staff units, systematization, creating capacity - 2022 onwards and according to schedule foreseen in the LCA for preparation of reports on National Greenhouse Gas Inventory and Policy and Measures - Submission of reports and communications to Convention as required under the international reporting obligations
Link to EU policies (where relevant):	Regulation (EU) 525/2013; Regulation (EU) 749/2014; Regulation (EU) 666/2014
Relevant national planning documents, legal and regulatory instruments:	LCA
Implementing entity:	- MoEPP with main responsibility for the system of data collection, establishment and operation of databases for the greenhouse gas inventory, the information on policies and measures - All institutions contributing data as foreseen in LCA and by-laws - Government for adopting decrees and decisions on single national entity and coordination committee - MoEPP for adopting rulebooks
Monitoring entity	- MoEPP - Government
GNG(s) affected (if applicable)	As defined in the LAC
Reference to assessments and underpinning reports	Roadmap for the Implementation of the Law
Assumptions / General comments	- Secondary legislation (decrees and rulebooks) adopted and in force. - Coordination Committee with MoEPP and all relevant institutions established - Human and financial resources available in MoEPP and other relevant institutions

The reporting obligation of the MoEPP after 2022 about the prepared plans and reports for the national greenhouse gas inventory, as well as for the implementation of the planned policies and measures, will be carried out according to the schedule provided for in the Law on Climate Action (which at the time of preparation of this document is not yet adopted).

7. TRANSPORT SUSTAINABILITY PLANNING AND IMPACT ON CLIMATE CHANGE – OBJECTIVES AND RECOMMENDATIONS IN THE NATIONAL STRATEGIES

7.1. National Transport Strategy 2018–2030

7.1.1. Overall objective

The National Transport Strategy (NTS) demonstrates the ambition for integration into the European Union through the development of a sustainable transport sector that is harmonized with other strategic developments of the country; that disposes of an intermodal infrastructure fully integrated into the Trans-European Transport Network (TEN-T); that is governed according to the principles of good governance respecting the universal right of "mobility" for all; and that is properly regulated in accordance with EU rules and regulations while incorporating international best practices for its further development [34].

Guided by the fundamental principle that transport is a service and not an economic good, the NTS takes into account overall objectives for the economic and social development of the country, for ensuring the needs of future generations and for preserving the environment. It will be realized through the construction of a "green" transport system that reduces emissions and limits the consumption of resources and energy. Hence, it will have a positive impact on climate change. NTS therefore proposes medium- and long-term activities and measures to efficiently and effectively address the key challenge of improving the quality of transport infrastructure and services.

7.1.2. General and specific objectives

The general objectives (four) of the NTS are prepared according to the policies and guidelines of the strategic documents of the EU and the Republic of North Macedonia. The specific objectives consist of an analysis of the specific needs of the transport system in the country, and are given in detail according to the type of transport.

In addition, from the list of general and special goals, those measures that have an impact on the reduction of greenhouse gas emissions from transport are highlighted and shown. Thus, these measures are structured in two key functions that reflect the responsibilities of modern governments to guarantee mobility for all [34]:

1. The ***infrastructure function:*** developing an integrated and multimodal infrastructure, which is efficiently maintained and corresponds to the sector's present and future capacity needs.

2. The ***management and services function:*** ensure the provision of services and management that correspond to the principles of sustainable mobility for all.

7.1.3. Proposed measures for management and services in the transport sector and proposed infrastructure measures

In addition, the measures of the NTS with the function of management and services in the transport sector are shown. The general objective 3, together with the three specific objectives, also have an impact in terms of mitigating climate change, because their implementation envisages reductions in greenhouse gas emissions by transport by 18.6% by 2030:

- general objective 3 with specific objective 3.1
- general objective 3 with specific objective 3.2
- general objective 3 with specific objective 3.3.

These same objectives, that is, the general objective 3 with the three specific objectives also have an infrastructure function, thus in this chapter they will be analyzed from the aspect of development of multimodal and integrated transport infrastructure, which contributes to climate change mitigation.

Objective	Objective description	Target
General objective 3	To introduce green mobility and logistic focused to environmental performance of the Transport sector	Reduce the greenhouse gas emissions from transport by 15,1% in 2025 and 18,6% in 2030 compared to the levels in the respective years under the Do nothing scenario.
Specific objective 3.1	To develop and improve environmentally friendly and low carbon transport systems	

Management and services in the transport sector

Environmentally friendly and low-carbon transport measures, such as avoiding trips, reducing demand, shifting to low-carbon transport modes and improving vehicle efficiency can help reducing traffic and parking congestion, service cost savings, improved mobility options for non-drivers and improved public health, in addition to their key purpose of reducing pollution and greenhouse gas emissions.

Air quality and the reduction of greenhouse gas emissions are the major issues to which low-carbon transport can make a positive contribution. A number of measures are available to reduce transport emissions (public transport attractiveness, park/ride opportunity, avoid traffic congestion, increase access and mobility), which also reduce costs by improving alternative travel modes, including walking, cycling, ride sharing and public transport, and by creating more compact communities with shorter travel distances.

In addition, specific cross-sectoral measures will facilitate the stimulation, introduction and use of eco-friendly vehicles, equipment, techniques and technologies, such as biofuel and other forms of clean energy, electric and hybrid vehicles, etc., which will not damage the environment.

All these given measures, together with the development of sustainable modes of transport, simultaneously affect the reduction of both polluting emissions and greenhouse gases. The responsibility for their implementation lies with the local self-government units and the competent line ministries, especially the Ministry of Transport and Communications and the Ministry of Economy. In the NTS, the priority of these measures is defined as medium-term, with a realization period of up to 6 years.

According to the actual situation with the implementation of such measures in the municipalities, where modest steps are being taken in the development of sustainable transport, it is obvious that this period will be exceeded, even for more years.

Infrastructure function

Reducing the negative impact of transport systems on the environment and climate change is high on the EU agenda and also on the national agenda [35]. The negative impact can be mitigated by improved infrastructure for non-motorized modes of transport in urban areas, as well as the implementation of new standards for the protection, construction and maintenance of infrastructure in the direction of climate resilience. This aspect of transport infrastructure adaptation to climate change is analyzed in detail in chapter 9.

Objective	Objective description
General objective 3	To introduce green mobility and logistic focused to environmental performance of the Transport sector
Specific objective 3.2	To stimulate modal shift

Management and services in the transport sector

A key precondition for encouraging a shift from one mode of transport to another, road to rail freight transport, is the existence of a reliable and safe infrastructure and encouraging the use of railways. The modal shift is also related to climate change, because it is important to reduce CO_2 emissions. One way of doing this is by opting for the railway transport for freight and passengers, because CO_2 emission of mode of transport is ten times lower compared to road transport, according to the figures of the European Environment Agency [34].

According to an interview conducted with a professor from the field of integral transport, the first key steps for shift are: introduction of electrification of the railway infrastructure, electronic records of freight traffic and reconstruction of industrial tracks. Only in this way, heavy freight vehicles will no longer be used for complete transport, but only for delivered transport to the railway, and on the other hand, the modernized railway will attract more passengers. Such changes will positively affect the reduction of greenhouse gas emissions of the road transport.

In urban areas, the modal shift will be stimulated after the development and implementation of sustainable urban mobility plans for larger cities (for cities > 25,000 inhabitants). Modal shift should be strengthened, that is, the encouragement of public transport, railway transport, walking and cycling, instead of using private vehicles [35]. If properly implemented, these measures are expected to lead to a reduction in the need for private vehicles in urban areas, thus directly contributing to the reduction of greenhouse gas emissions.

Infrastructure function

The implementation of the foreseen measures within this specific objective, aimed at shifting from one type of transport to another, from road to rail passenger and freight transport, will mitigate the harmful effects of road traffic. By improving the attractiveness of public transport and connectivity through the adaptation of infrastructural facilities, shifting from one mode of transport to another will contribute to reducing emissions.

In parallel, the development and improvement of the infrastructure for non-motorized transport in larger cities (pedestrian and cycling lanes) should take place. This is confirmed by a professor from the field of Traffic Planning, who points out that for the development of these networks, the initiative to start the project activities, should be given by the planning regions in RNM. Then the obligation is assumed by the local self-governments, which for the basic designs development can and preferably use the foreign funds for this purpose. Some of the planning regions are ahead of the rest in the development and realization of the network for non-motorized traffic, such as the South-West and South-East planning regions in RNM. Their good practices and experiences can be used in other planning regions for the development of pedestrian and cycling networks.

In addition, the implementation of measures to shift from one mode of transport to another will improve access for all users, including persons with disabilities and reduced mobility (access to air transport, railway and bus stations in urban areas). This especially requires technical improvement and modernization of the existing railway infrastructure network.

Objective	Objective description
General objective 3	To introduce green mobility and logistic focused to environmental performance of the Transport sector
Specific objective 3.3	To increase the importance of intermodal and multimodal transport in national transport policy

Management and services in the transport sector

The analysis shows that intermodal transport in RNM is underdeveloped compared to EU countries [34]. The level of participation of intermodal transport in the total freight transport, the development of infrastructure capacities, legislation, regulations and standards lags behind. The RNM government has ambitions to encourage intermodal systems that facilitate and optimize transfers between different modes of transport.

Along with the infrastructure development of, especially if it is climate resilient, the improvement of transport intermodality could be done by establishing a legal and regulatory framework, strengthening professional training and education about the benefits of modal interconnections, as well as launching public campaigns to changes of individual behavior. In parallel, work should be done on institutional strengthening and capacity building at the central level, that is, the Ministry of Transport and Communications should be the central institution for transport policy making.

Infrastructure function

Improving the connectivity of different modes of transport is an important task for establishing a well-developed and functional intermodal and multimodal transport infrastructure [34]. In particular, the connection of freight transport between freight terminals, the railway network and airports should be improved. The improvement of inter- and multimodal transport is expected to improve the attractiveness and competitiveness of the entire region and mitigate the impact of heavy goods vehicles on the environment and climate change.

In fact, this is also pointed out by the professor in the field of integral transport: it is necessary to focus on the establishment of goods transport logistics hubs, with carefully selected locations near the corridors of the TEN-T network and in close cooperation with regional industrial zones. Therefore, modern transport technologies should be used in these hubs to enable intermodality between road and rail freight transport, which will reduce the road traffic pressure on the environment and climate change. RNM lags behind in this regard, because there are only individual solutions, without plans for the development of a national network of such hubs.

The monitoring of the implementation of all these previously shown and analyzed measures of the NTS with a positive impact on greenhouse gas emissions, but also the monitoring of the complete NTS as a key document for the national transport policy, is under the competence of the Department for the European Union at the Ministry of Transport and Communications - the Unit for Negotiations and Integration. This will ensure effective management of reform processes and resources in a single framework.

7.2. National Strategy for Sustainable Development 2009–2030

The development and policy making in the Republic of North Macedonia based on the principles of sustainable development is one of the conditions for RNM to become a member of the EU as soon as possible.

Based on this strategy, follows an overview of the consolidated conclusions of several working groups, which have an indirect impact on the situation and development of a sustainable transport sector, and are therefore also related to the impact on climate change. Bearing in mind that this strategy was developed in 2009, since when several legislative and strategic aspects in sustainable development have been amended and harmonized, the presented conclusions have been selected according to the actuality and non-implementation at the time of the preparation of this analysis.

7.2.1. Conclusions of the working group: Policy and legal framework

Defining the legal and policy framework is the backbone of any strategy development. The consolidated conclusions arising from this working group can be summarized as follows [36]:

• There is a need to develop an **integrated approach in the sustainable development policy making;** therefore, considerable effort needs to be made in this field to ensure policy implementation. A positive step has been taken, as the professor from the field of Traffic Planning points out, because specifically in the spatial planning process, attention is paid to the environment. However, sustainability planning is a process with a different degree of performance at the regional and urban level, which is why there is a need for better coordination in the preparation of plans. Therefore, there is a need to continue working on strengthening interdisciplinarity in this process, especially from the point of view of the integration of the methodology for climate change in the methodology for spatial planning.

• **The lack of an integrated approach** in the sustainable development policy making is caused by inadequate budget planning, low capacity for policy making and insufficient investments for capacity building. However, today there are signs of a gradual overcoming of this problem, and an example is the good basis in the sectoral cooperation of ministries, agencies and other authorities in the implementation of actions and measures to mitigate climate change and sustainable development of transport.

• **Insufficiently developed awareness of sustainable development,** insufficient cooperation among policy makers from different sectors, as well as the top-down approach to policy making, make it difficult to include the sustainable development dimension in sectoral policies. In this regard, capacity building is of essential importance, which will be focused on both policy and legislation at the same time. This is specifically linked to specific objectives 7 and 9 of the Long-term Strategy on Climate Action and Action Plan, which are described in chapter 9.

• **Basic institutional set-up and legislation exist in a large number of sectors,** but the operational potential of the institutions is quite limited, especially in terms of human resources and finances. The major problem with the legislation is its implementation, even in cases where harmonization with the EU legislation has been carried out and where technical assistance has been provided for building the institutions' capacities.

Even today, these conclusions have not been fully implemented, which has been confirmed through the interviews conducted. Therefore, to overcome these shortcomings, activities 7, 8 and 9 with complete data on the implementation period, as well as the bodies responsible for implementation and monitoring are shown in chapter 9.

7.2.2. Conclusions of the working group: Environment – need for administrative capacity and law implementation capacity

Regarding this group's conclusions that are particularly relevant even today, it can be said that the same actions (7, 8 and 9) proposed in chapter 9 apply. The consolidated conclusions in the environment are reduced to the following [36]:

• The environment should be identified as cross-cutting **priority** by the Government.

• **The capacity** of the Ministry of Environment and Physical Planning should **be strengthened.** A more detailed analysis of this is made in subchapter 9.3, in terms of assessing the administrative capacities of the MoEPP for dealing with climate change.

• **Preparation of sustainable development monitoring indicators** and establishment of a comprehensive spatial-based monitoring and information system for the environment. Today, this conclusion has been implemented, i.e., specifically for the transport sector, sustainability indicators are defined and regularly included in the annual environmental reports with an indicator approach.

• To ssignificantly increase the **enforcement of the adopted laws**, support the central and local authorities to enforce the laws and increase the efficiency of the administration.

• **To increase public awareness of the environment** in terms of sustainable development and to point out the economic and social benefits brought by responsible behavior towards the environment in everyday life. This is specifically related to specific objective 9 of the Long-term Strategy on Climate Action and Action Plan; this objective is described in chapter 9.

• **To intensify the focus** on alternative sources of energy, which are not harmful to the environment and to use the special opportunities of the environment in the Republic of Macedonia in encouraging cooperation and management in the wider region. Meeting this conclusion is especially important for transport, where despite being one of the largest national sources of greenhouse gas emissions, fossil fuels are still largely used.

7.2.3. Conclusions of the working group: Energy – need for structural changes in terms of energy sources and energy prices

The consolidated conclusions in the Energy sector are the following [36]:

• A study on utilization of the potential of renewable energy sources should be prepared. Today, in RNM, we have the Energy Development Strategy of until 2040 and a National Energy and Climate Plan already produced. The strategic policy in the National Energy and Climate Plan [8] for the **decarbonization** dimension envisages the implementation of all identified actions for climate change mitigation that will further reduce greenhouse gas emissions, while at the same time increasing the share of renewable energy sources in a sustainable manner in the gross final energy consumption. An increase in the consumption of biofuels is envisaged for the transport sector, with the goals for 2030 being a 10% share of renewable energy in the final energy consumption in transport.

• The Clean Development Mechanism under the Kyoto Protocol should be used as an additional tool to implement projects for reduced greenhouse gas emissions.

7.2.4. Summary of the conclusions of the given working groups

Thus, although there has been positive progress in several aspects in the sustainable development of RNM since the moment the strategy was developed [36] there are still some main conclusions remaining to be worked on in a committed manner even today. In addition, those conclusions of the then comprehensive evaluation for sustainable development are shown.

• Insufficiently developed awareness, understanding and commitment to the concept and principles of sustainable development.

• Incompletely developed legal and regulatory framework to support sustainable development policy.

• Need for strategic redirection in certain segments in the energy sector.

• **Need for significant improvement** of the railway network. In this document, chapter 9.2 presents actions 1 and 5, which are directly related to this conclusion, and are defined in the Long-term Strategy on Climate Action and Action Plan [33]. Thus, this conclusion, which directly refers to transport, has already been given a lot of attention for practical implementation.

• **Need for strategic focus in the area of road planning and construction.** In terms of this conclusion, today, it can be pointed out that the road infrastructure construction at the national level is in the direction of connection with the TEN-T network of the EU, and attention is also paid to ensuring climate resilience of the infrastructure (chapter 8).

• Weak capacity for strategic operations based on sustainable development - planning, administration and implementation.

• Need for comprehensive organizational development and institutional strengthening in all spheres of public life (cross-cutting and integrated approach), including policy making, preparation of legal and regulatory framework, strategic planning, administration, monitoring and implementation.

Thus, in the National Strategy for Sustainable Development, as early as 2009, some problems were pointed out in terms of the development and harmonization of the legal framework, the development of the cross-cutting approach in solving problems and strengthening capacities, which are still relevant today. These shortcomings are pointed out in the Long-term Strategy on Climate Action and Action Plan [33] and in the National Energy and Climate Plan [37]. Therefore, chapter 9 of this document singles out and presents in detail the actions that can contribute to their overcoming.

8. ANALYSIS OF THE LEGISLATIVE AND STRATEGIC FRAMEWORK FOR CLIMATE RESILIENT TRANSPORT INFRASTRUCTURE

8.1. Brief overview of infrastructure in the transport sector

Roads

According to the National Transport Strategy [34], the existing transport infrastructure in North Macedonia covers 14,410 kilometers of public roads, 699 kilometers of railways and 2 international airports. Air traffic is organized through two international airports, in Skopje and Ohrid. The only water transport is on Ohrid Lake. Apart from few lines between places in North Macedonia, an international lake line has been established between North Macedonia and Albania, but it is seasonal.

The road network consists of 899 kilometers of state highways, 3,778 kilometers of regional and 9,733 kilometers of local roads. Most of these roads have two lanes. The open railways were constructed as single-track, and only sections of Corridor X are electrified at about 34% of the total length. There is no railway connection with Albania and Bulgaria. It is planned to construct new railway connections with a length of 89 kilometers from Kumanovo to the Bulgarian border and 66 kilometers from Kichevo to the Albanian border.

The road infrastructure along Corridor X is 195 kilometers long and is located in the direction from Serbia to Greece, while 83 percent of this road is already constructed according to standards of modern highways. The Corridor VIII connects the Adriatic Sea with the Black Sea and has a length of 298 kilometers. Only 37% of the road infrastructure along Corridor VIII is at the highway level in line with standards. Corridor X-d is a sub-section of Corridor X, starting in Veles and ends at the border crossing with Greece. The length of this road is 117 kilometers and this section has 2 lanes. The entire length of Corridor X was completed in the first half of 2018. The connection of Corridor VIII highway has not been realized and projects are underway.

Railways

The railways network length in North Macedonia is slightly below 700 kilometers. Partial rehabilitation of about 54 km of railway on Corridor X track line is still underway [34]. However, the other railway track lines should be rehabilitated, as well as the signal and telecommunication systems should be modernized, and the conditions of the railway stations should be improved. Most railway stations were constructed to standards other than those prescribed in the European Agreement concerning international railways for combined transport.

Estimates of the Public Enterprise for State Roads say that slightly less than 80 percent of the national road network of RN Macedonia is in good or satisfactory condition. However, World Bank data show that only 40% of highways are in good or satisfactory condition [5]. About 70% of locomotives and motor vehicles were produced between 1965 and 1974. The railway on Corridor X is single-track, electrified, mostly in medium condition, with two recently renovated sections Tabanovce-Kumanovo 11.6 km and Miravci-Smokvica 12.5 km, which can be described as good condition. Corridor VIII railway track line is not yet fully constructed.

Airports

The concession period for the airports began in 2010, and the planned works under the concession agreement included the construction of a new airport terminal building in Skopje, expansion of space, a new administrative building and a new parking lot on the access road. Ohrid Airport has completed the modernization of the terminal building. The concession agreement also envisages the construction of a third airport for freight traffic near Stip. The country's two main airports are being modernized and reconstructed.

8.2. Practices related to climate proofing of transport infrastructure

The National Transport Strategy 2018-2030 sets up strong foundation for climate proofing of infrastructure. It contains concrete set of envisaged activities [34]:

- Regulatory measure (RM) 5, 1.3. Modify national transport infrastructure standards regarding the environmental sustainability and climate change included.
- Strategic action OSM 19 3.1. Preparing a comprehensive study for quantifying impacts of climate change, climate variability and extreme weather events on infrastructure and services (network resilience).

These activities present a clear pathway towards climate proofing of transport infrastructure and it is yet to be defined how this will be achieved.

The strategic framework, together with the analysis of the primary legislation laws, related to the climate resilience of transport infrastructure are presented in table 3.

Table 3: Analysis of the legal and strategic framework in transport sector [38]

Item	Description (including standards as relevant)	Relevance to the assignment	Level of climate resilience consideration inclusion – infrastructure wise	
Primary legislation			**Level**	**Description**
Law on Vehicles (2016) (Official Gazette of RM no. 140/08, 53/11, 123/12, 70/13, 164/13, 138/14, 154/15, 192/15, 39/16)	The purpose of this law is to ensure a high degree of safety of road traffic, protection of life and health, protection of the environment and nature and energy efficiency.	The Law that regulates aspects of sustainable transport and potentially smart mobility.	LOW	There are no climate resilience related aspects covered by this law.
Law on Motor Vehicle Tax (2019) (Official Gazette of RNM no. 261/2019)	The purpose of this law is to regulate the system of taxation on motor vehicles in North Macedonia and the competences of the customs authority in relation to this tax.	The purpose of this law is to regulate the system of taxation on motor vehicles in North Macedonia and the competences of the customs authority in relation to this tax.	LOW	The impact of this law on climate change mitigation is very significant, while the resilience potential is negligible.

Strategic documents			Level	Description
National Transport Strategy 2018-2030	NTS supports the ambition of RNM for EU integration, through the development of a sustainable transport sector that is harmonized with the strategic development of the country; that disposes of an intermodal infrastructure fully integrated into the European TEN-T network; that is governed according to the principles of good governance respecting the universal right of "mobility" for all; and that is properly regulated in accordance with EU rules and regulations while incorporating international best practices for its further development.	The National Transport Strategy covers climate change considerations in this sector.	HIGH	• Regulatory measure (RM) 5, 1.3. Amendment of national transport infrastructure standards regarding the inclusion of environmental sustainability and climate change. • Strategic action OSM 19 3.1. Preparation of a comprehensive study to quantify the impacts of climate change, climate variability and extreme weather conditions on infrastructure and services (network resilience).
National Program for Railway Infrastructure for the period of 2019-2021	The national program is a document that determines the needs for construction, reconstruction, overhaul, modernization and maintenance of the functionality of the railway infrastructure for a period of three years. The development of high-quality and efficient railway infrastructure in RNM must be in function of sustainable and balanced development of the country.	The National Program takes into account the contribution to climate change and the impact of climate change and potential natural and man-made disasters on infrastructure and accessibility for all transport users.	HIGH	During infrastructure planning, all development actors should pay attention to risk assessments and adaptation measures that appropriately improve resilience to climate change and environmental disasters.

Currently, national technical standards and regulations relating to railway infrastructure and traffic are almost the same as those applied by the former Yugoslav railway company. It is necessary to harmonize standards and rules with EU directives and technical standards.

In terms of importance for the design and development of climate resilient transport infrastructure, there are several relevant initiatives in the transport sector present in North Macedonia, shown in the table below.

Table 4: Overview of the most relevant initiatives/projects/programs [38]

Initiatives/projects/programs	Relevance to climate resilient infrastructure
The project "Enhancing Environmental Performance and Climate Proofing of Infrastructure Investments in the Western Balkans Region from an of EU integration perspective" (CLIMAPROOF) is financed by the Austrian Development Cooperation (ADC) and implemented by the UN Environment Programme. (2017-2021)	The ClimaProof project deals with a comprehensive assessment of the climate vulnerability of the road sector in North Macedonia. It will result in increased technical capacities of the relevant national authorities in the field of climate proofing of road infrastructure and green infrastructure. For big infrastructural projects, detailed and specific climate projections will be prepared in the planning phase and it will be found to incorporate adaptation measures both the planning phase and realization phase, thus maximizing their resilience to climate variability and extreme weather events.
World Bank - Technical assistance for preparation of climate resilience design guidelines for the Public Enterprise for State Roads in North Macedonia - Climate resilience design guidelines (2019).	The Guidelines provide detailed and practical instructions on how to conduct a climate change and natural hazard road network vulnerability and risk assessments. The methodology distinguishes between two main groups of actions: i) risk impact assessment and ii) identification and prioritization of engineering/non-engineering solutions for risk reduction/mitigation. The identification of road sections under the most critical need for intervention is performed through four steps incorporating 9 tasks spanning across three layers: hazard, risk, engineering screening. The Guidelines define engineering and non-engineering measures, as well as institutional and legal recommendations.
Detailed Design and Environmental and Social Impact Assessment for Motorway A4, Skopje - Blace. Section: Stenkovec interchange-Blace border crossing (12.5 km) – Climate resilience report (financed by EBOR and EIB).	The report envisages climate change adaptation measures during the road construction phase and during the operational phase.

Although addressing the effects of climate change in the Western Balkans in general takes precedence over preventive action, there are examples of good practice in including infrastructure resilience into capital projects in North Macedonia. For the construction of some sections of the highway between Skopje and Kosovo, the Environmental and Social Impact Assessment (ESIA) Study has made proposals on how the road should be resilient to climate change. The proposed measures should be incorporated into the detailed design, so the contractor will have to apply them during construction. This is another example of such a practice, in addition to the ESIA Study for the Bukojcani-Kicevo highway, the EIA study for the state road A3: section Bitola-border crossing Medzhitlia, then for the state road Strumica-Valandovo: junction with A1. As for the railway transport, we can mention the ESIA Study for the construction of a new railway on the section Kriva Palanka-Border with the Republic of Bulgaria, as part of Corridor 8. In all these studies, the designers of the basic design are recommended to use the developed guidelines and, if appropriate, to apply some of the recommendations and measures to reduce the negative climate change impacts on the environment. Hence, there is already positive practice in the application of the guidelines for designing climate resilient infrastructure, developed for the Public Enterprise for State Roads.

8.3. Key findings and recommendations for the transport sector

8.3.1. Key findings

Key finding 1. There is a strong national strategic objective for climate proofing of transport sector.

The National Transport Strategy 2018-2030 contains clear objectives for inclusion of standards and practices for climate proofing of the transport infrastructure by 2030.

Key finding 2. The road network is relatively well developed. However, roads are in average condition, and most of roads do not meet modern standards.

The existing national transport infrastructure consists of almost 15,000 kilometers of public roads. According to World Bank data, less than 50% of roads are in good or satisfactory condition.

Key finding 3. Climate resilience design guidelines for the Public Enterprise for State Roads have been developed.

These guidelines include climate adaptation measures that relate primarily to drainage and structure specifications, retaining walls and slope stabilization. The guidelines can also be useful for increasing the resilience of other types of infrastructure. It is recommended that Public Enterprise for State Roads continue with the implementation of these guidelines, by providing training and capacity building of construction companies and experts/engineers [38].

Key finding 4. Climate resilience requirements for transport infrastructure are not sufficiently included in the legislation system.

Mandatory use of standards that contribute to increasing resilience can be ensured by introducing obligations to apply those standards. This can be achieved by including standards in relevant sectoral laws and by-laws.

8.3.2. Recommendations

Recommendation 1: Consider promotion and update of transport design guidelines among public and private sectors (municipalities, engineers, designers and other transport experts)

Elaboration

As already noted, transport sector in RNM already has several relevant initiatives, as well as a strong foundation, in the latest National Transport Strategy, for increasing the resilience of its infrastructure. Initiatives include the ClimaProof project and World Bank's Technical assistance for preparation of climate resilience design guidelines for the Public Enterprise for State Roads. These initiatives clearly present recognition of importance of climate resilience of infrastructure within the sector.

Potential approach

Potential approach is quite straightforward as above-mentioned initiatives and strategic framework support the implementation of climate resilience aspects within the sector. The resulting capacity should be scaled up and taken into consideration in any future infrastructural projects in transport sector. However, stronger legal framework, adoption of most up to date standards, and overall coordination would be vital for that to happen [38].

It would also be very useful to develop guidelines for the railway transport in a similar way to the guidelines developed by the World Bank for the road transport.

It is very important to ensure that such guidelines are actually implemented in the processes of design, construction and maintenance of infrastructure.

Implementation and timeline

In [38] it is suggested that the Ministry of Transport and Communications organize training by the end of 2023 for engineers/designers and transport experts to promote the implementation and usage of World Bank's guidelines for road transport. In parallel, these guidelines could be amended based on results from ClimaProof project and additional guidelines for other types of transport could be considered.

Recommendation 2: Consider incentivizing climate resilient transport projects and innovative adaptation solutions - transfer of best international applicable technical solutions

Elaboration

There are many international examples of best practices. Significant experience has been developed in the transport sector, as many projects are adapting to the forecasted impacts of climate change. It may be worthwhile to consider technology and knowledge transfer in this regard.

Potential approach

Key stakeholders might consider opting for applying different applicable and available international methodologies and technical solutions related to climate adaptation. This can be done through pilot projects in cooperation with international organizations and academia.

The railway transport is characterized by a fairly old infrastructure and train compositions. Having this in mind, it may be advisable to launch initiatives that specifically address the support of improving railway infrastructure in all segments, with mandatory consideration of climate resilience in design, construction and public procurement processes [38].

Implementation and timeline

The Ministry of Transport and Communications, in cooperation with an international organization/s, might consider promotion of climate resilient innovative design solutions in transport sector, based on best international practices [9]. This might be done through various awareness raising events. Furthermore, if there are going to be initiatives for railway modernization, the line ministry might consider implementing best international practices.

Co-benefits

• Inclusion of innovation and academia sectors and support towards tailored technological solutions, most appropriate for our country.

• Quality transport infrastructure also provides socio-economic benefits through greater safety, higher traffic, additional income from tourism and new jobs.

9. TRANSPORT AND CLIMATE CHANGE IN THE LONG-TERM STRATEGY ON CLIMATE ACTION AND ACTION PLAN

As a candidate for European Union membership, the Republic of North Macedonia is obliged to transpose the EU legal framework into its national legal system, namely the 2030 Climate and Energy Framework and the Long-term Strategy up to 2050 and the European Green Deal.

This strategy defines the contribution of RNM to the global efforts, through a pathway towards green, low-carbon and climate-resilient development, based on the best available information and in the context of the country's accession to the EU. The vision for this strategy is as follows: ***Republic of North Macedonia by 2050 is a prosperous low-carbon economy, following sustainable and climate-resilient development pathways, enhancing competitiveness and promoting social cohesion through action to combat climate change and its impacts*** [33].

Addressing climate change requires policies and measures across a wide spectrum of policy sectors, each with a precise contribution to the overall achievement of national climate commitments. It is therefore fundamental that the vision and objectives of this strategy are mainstreamed in the agendas of the line ministries and that they permeate to the relevant sectoral policies, through enhanced horizontal policy coordination. This coordination imperative is also valid to both reduced vulnerabilities to impacts of climate change (adaptation) and is required at national level, but also at different levels of administration, namely at local self-government level.

9.1. Specific objectives related to the transport sector

Based on the current situation regarding climate change in the RNM, the results of the modeling of greenhouse gas emissions, including the strategic assessment of environmental impacts and taking into account the Paris Climate Agreement and the EU's 2030 Climate and Energy Framework, the European strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy, the following general objective is defined [33]: *Reduction of national net greenhouse gas emissions (including forestry and other land use and excluding MEMO items) of 72% by 2050 compared to the 1990 level and increased resilience of the society, economy and ecosystems of the Republic of North Macedonia to the impacts of climate change.* MEMO items include greenhouse gas emissions from aviation and electricity import.

In order to support compliance with the general objective and with the implementation of sectoral measures, the general objective is broken down into specific mitigation, adaptation and cross-cutting objectives. In addition, only those specific objectives that have a connection with the transport sector are presented.

Specific mitigation objectives

Specific mitigation objectives reflect the Intergovernmental Panel on Climate Change (IPCC) sectoral aggregation of greenhouse gas emissions and, therefore, to the extent possible, also correspond to the division of responsibilities for achievement of specific targets. Closely related to transport is the only specific mitigation objective 1.

Specific objective 1: To reduce greenhouse gas emissions by 64% in the energy sector (excluding MEMO emissions) by 2050 compared to 1990. The energy industry sector will deliver the greatest emissions reductions, namely through the implementation of the "polluter pays" principle (carbon taxation) and through the increased penetration of renewable energy sources.

The reduction of greenhouse gas emissions in the second most contributing sector to greenhouse gas emissions – transport, should be achieved mostly through an increase of energy efficiency and renewal of the vehicle fleet. In this context, the introduction of hybrid and electric vehicles will play an important role, but, in the short term, it is not as important as the reduction of fuel consumption in traditional combustion vehicles, which, until 2030, will remain as the typical vehicle in RN Macedonia [33].

Specific adaptation objective

The specific adaptation objective that has an impact on the adaptation of the transport sector in relation to climate change is given below. In the context of adaptation, the analysis presented in chapter 8 on achieving climate-resilient transport infrastructure can be mentioned.

Specific objective 5: To build solid systems for the regular and periodic data collection for the production and dissemination of scientific and technical knowledge. The data collection system proves to be crucial for the appropriate and timely response to the effects of climate change. This will have a contribution in terms of identifying the adaptation needs of the transport infrastructure, as well as for the implementation of policies, measures and activities to meet those needs.

Specific horizontal/cross-cutting objectives

These objectives relate to the development of cross-sectoral cooperation and building the capacities necessary for action in relation to climate change. Their implementation will also contribute to the complete fulfillment of the planned activities that need to be undertaken in transport to reduce the amount of greenhouse gas emissions.

Specific objective 7: To establish comprehensive policy planning, coordination and implementation instruments for climate action. This has to be enabled by a comprehensive legal basis and legally established coordination instruments for facilitation of the cross-sectoral policy design and implementation, as well as the mechanisms for monitoring the implementation of the foreseen policies and measures.

Specific objective 8: The mainstream climate change related aspects into the future national strategic planning documents related to education, research, development and innovation, social inclusion and equal gender opportunities. Four public universities and their faculties, as well as some private universities, have undergraduate and graduate programs related to climate change and sustainable development. However, the climate is still not properly included in the overall national education system.

Strategic integration of climate change at all levels of the education system should include providing additional funding for climate-related research activities, raising public awareness, and establishing centers of excellence and research institutes.

The most important national strategic documents that should integrate climate-related aspects are the future National Education Strategy and the National Innovation Strategy. This will ensure a systematic and harmonized integration of climate aspects into the national education system, research and development, as well as will increase educational and research capacities, and climate awareness of the general public.

Specific objective 9: To promote the green transition through capacity building, training for new skills and awareness raising. The transition to a low-carbon economy is based on technological innovation, on large-scale investment and policy decisions, but it is also based on the decisions and behavior of the individual citizen. Well-informed and aware citizens, of all ages, are more likely to actively engage in efforts to reduce greenhouse gas emissions. Climate awareness is extremely low among the general public, but it is sufficient at the institutional level [33]. The comparatively higher degree of awareness among institutions can be explained by the extensive efforts of national authorities, the donor community and non-governmental organizations, which have been working on climate-related issues in the country for more than 10 years.

The overall climate change framework needs to be managed and supervised by competent authorities, where significantly enhanced capacity is needed as a precondition for sustainable implementation, monitoring and reporting of mitigation policies and measures.

9.2. Proposed actions in the transport for implementation of the mitigation objective

In addition, the proposed actions to reduce climate impacts of the transport sector are presented. For each action, a tabular overview is given with all the necessary information: the relevant link to the EU policies, the relevant national planning documents, the implementation progress, as well as the entities responsible for implementation and monitoring. These actions are defined in the Action Plan for the first phase of the implementation of the Long-term Strategy and the law.

Action 1: Increased use of the railway [33]

A–M–27: Increased use of the railway	
Main objective: Improve the energy efficiency in the transport sector using cheap and efficient railway transport	
Implementation period:	2020-2040
Link to the EU policies (where relevant):	Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles 2009/33/EC, Regulation on CO_2 from cars and vans (2009/443/EC Regulation on CO_2 from cars and vans 2009/443/EC
Relevant national planning documents, legal and regulatory instruments:	- National Transport Strategy - Energy Development Strategy of RNM until 2040

Implementing entity:	- Government of the RN Macedonia - Ministry of Transport and Communications - Ministry of Economy, Energy Agency - JSC Macedonian Railway Transport - End-users - Private companies
Monitoring entity	Ministry of Economy, Energy Agency
GHG(s) affected (if applicable)	37.2
Reference to assessments and underpinning technical reports	Energy Strategy until 2040, NECP, Third Biennial Update Report
Assumptions/general comments	By 2040, 3% of the passenger kilometers of cars, 1% of passenger kilometers of buses and 6.6% of tonnes kilometers of heavy-duty vehicles will be realized by railway transport

Action 2: Renewing of the national car fleet [33]

A–M–28: Renewing of the national car fleet	
Main objective: Use of more advanced technologies in order to slow down the growing energy consumption in the transport sector, which is complex and with limited capabilities of energy use reduction.	
Implementation period:	2020-2040
Link to the EU policies (where relevant):	- Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles 2009/33/EC - Regulation on CO_2 from cars and vans (2009/443/EC Regulation on CO 2 from cars and vans 2009/443/EC
Relevant national planning documents, legal and regulatory instruments:	- National Transport Strategy - Energy Development Strategy of RNM until 2040 - Law on Vehicles - Law on Motor Vehicle Tax
Implementing entity:	- Government of the RN Macedonia - Ministry of Transport and Communications - Ministry of Economy, Energy Agency - End-users
Monitoring entity	Ministry of Economy, Energy Agency Ministry of Internal Affairs
GHG(s) affected (if applicable)	43.1

Actions to support the implementation of the objective	- Law on Vehicles (adopted August 2019) - Law on Motor Vehicle Tax by-laws to be adopted - Implementation of the program for subsidizing for purchasing vehicles stipulated in the Law on Vehicles - Review of the Law on Excise Duty to be prepared (excise duties of diesel fuel and gasoline need to be gradually equalled)
Reference to assessments and underpinning technical reports	Energy Strategy until 2040, NECP, Third Biennial Update Report
Assumptions/general comments	It is assumed that only new vehicles and vehicles not older than eight years, that is vehicles that meet EU standards will be sold. Advanced technologies such as diesel and gasoline Hybrid Electric Vehicles will be used with a share of 35% in the total passenger km from cars by 2040.

Action 3: Renewing of other national road fleet [33]

A–M–29: Renewing of other national road fleet	
Main objective: Reduction of the local pollution	
Implementation period:	2020-2040
Link to the EU policies (where relevant):	Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles 2009/33/EC
Relevant national planning documents, legal and regulatory instruments:	- National Transport Strategy - Energy Development Strategy of RNM until 2040 - Law on Vehicles - Law on Motor Vehicle Tax
Implementing entity:	- Government of the RN Macedonia - Ministry of Transport and Communications - Ministry of Economy, Energy Agency - Private companies
Monitoring entity	Ministry of Transport and Communications Ministry of Economy, Energy Agency
GHG(s) affected (if applicable)	66.4
Actions to support the implementation of the objective:	- Law on Vehicles (adopted August 2019) - Law on Motor Vehicle Tax by-laws to be adopted - Successive implementation of EURO standards (EU new standard is EURO 6, while in RNM it is EURO for import of new energy efficient vehicles)

Reference to assessments and underpinning technical reports	Energy Strategy until 2040, NECP, Third Biennial Update Report
Assumptions/general comments	It is assumed that only new advanced vehicles such as Hybrid Electric Vehicles that meet EU standards for exhaust fumes will be sold.

Action 4: Advanced mobility [33]

A–M–30: Advanced mobility	
Main objective: Reduction of local pollution.	
Implementation period:	2020-2040
Link to the EU policies (where relevant):	
Relevant national planning documents, legal and regulatory instruments:	- National Transport Strategy - Energy Development Strategy of RNM until 2040 - Decision made by municipalities to subsidize buying of new bicycles
Implementing entity:	- Ministry of Economy - Energy Agency - Local Self-Government - End-users
Monitoring entity	Ministry of Economy, Energy Agency Local Self-Government
GHG(s) affected (if applicable)	3.6
Reference to assessments and underpinning technical reports	Energy Strategy until 2040, NECP, Third Biennial Update Report
Assumptions/general comments	By 2040, 3% of short distance passenger kilometers will be replaced by walking, using bicycles or electric scooters.

Action 5: Construction of the railway to Republic of Bulgaria [33]

A–M–31: Construction of the railway to Republic of Bulgaria	
Main objective: Connecting RNM with the Republic of Bulgaria and extending the export to external markets, not just in the neighboring countries, but in the Southeast Europe and Turkey region, using the railway traffic.	
Implementation period:	2020-2040
Link to the EU policies (where relevant):	
Relevant national planning documents, legal and regulatory instruments:	- Work Program of the Government of RNM - National Transport Strategy

Implementing entity:	- Government of the RN Macedonia - Ministry of Transport and Communications - Ministry of Economy, Energy Agency
Monitoring entity	Ministry of Transport and Communications Ministry of Economy, Energy Agency
GHG(s) affected (if applicable)	24.6
Reference to assessments and underpinning technical reports	Energy Strategy until 2040, NECP, Third Biennial Update Report
Assumptions/general comments	By 2040, up to 5% of the tonne kilometers to the Republic of Bulgaria of the heavy-duty vehicles will be replaced by the railway traffic.

Action 6: Electrification of the transport [33]

A–M–32: Electrification of the transport	
Main objective: Transition from society based on fossil fuels to low carbon society, where the renewable energy and electrification of the transport will play the most important role.	
Implementation period:	2020-2040
Link to the EU policies (where relevant):	Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles 2009/33/EC
Relevant national planning documents, legal and regulatory instruments:	- National Transport Strategy - Energy Development Strategy of RNM until 2040 - Law on Vehicles - Law on Motor Vehicle Tax
Implementing entity:	- Government of the RN Macedonia - Ministry of Transport and Communications - Ministry of Economy, Energy Agency
Monitoring entity	Ministry of Economy, Energy Agency Ministry of Internal Affairs
GHG(s) affected (if applicable)	61.6
Reference to assessments and underpinning technical reports	Energy Strategy until 2040, NECP, Third Biennial Update Report
Assumptions/general comments	It is envisaged that by 2040 the share of electric vehicles and "plug-in" hybrid electric vehicles in the total passenger kilometers from cars will be 45%.

The presented actions in the transport sector, due to the larger scope of impact, have a longer implementation period of 20 years, with a deadline up to 2040. The main institutions in charge of their implementation and monitoring are, first of all, the line ministries: MoTC and ME with the Energy Agency. Regardless of the long period of implementation of all actions, their final realization will contribute to the development of sustainable transport that will no longer be among the main national sources of greenhouse gas emissions. The sustainable transport development will contribute to overcoming the current serious situation with the age of the vehicle fleet and the use of fossil fuels, as analyzed in chapter 5. In this way, it will lead to a reduction of greenhouse gas emissions from transport, and thus achieving also climate change mitigation.

9.3. Horizontal coordination for implementation of objectives

The implementation of the policies and measures envisaged in this strategy requires a comprehensive process of policy planning, coordination and implementation. This must be enabled by a comprehensive legal basis and legally established coordination instruments in order to facilitate the design and implementation of the cross-sectoral policy, as well as the mechanisms for monitoring the implementation of the envisaged policies and measures. The draft law on climate action provides for favorable preconditions for comprehensive policy coordination processes and defines the legal mechanism for monitoring progress towards achieving the national sustainable development goal.

Climate mainstreaming can be significantly improved with strengthened institutional capacities and the establishment of sound mechanisms for cross-sectoral cooperation. Currently, the climate capacities of the MoEPP are limited, especially in terms of technical expertise for reporting to international organizations, as well as for monitoring and reporting on policies, measures and projections [33].

The capacity needs assessment carried out in the Long-term Strategy showed that all relevant ministries need the capacity and knowledge to be fully capable of integrating climate aspects into their sectoral plans and programs. This means that climate aspects should be placed higher on the political agenda of the Government in order for the country to allocate resources to engage additional human capacities at all levels. In addition, it is essential to integrate climate aspects into future national strategic planning documents related to education, research and development, and innovation.

An assessment of the administrative capacities for dealing with climate change was made within the project "Strengthening the Institutional and Technical Macedonian Capacities to Enhance Transparency within the Framework of the Paris Agreement" (CBIT Project – Capacity Building for Increased Capacities), implemented by the Ministry of Environment and Physical Planning with financial and technical support by GEF and UNDP. In the project report [39], a specific proposal was made for 8-10 new jobs, half of which would be systematized in the Unit for Climate Change in the MoEPP, and the other half in the newly formed Unit for Greenhouse Gas Inventory within the Macedonian Environmental Information Center. The advantage of this approach is that all issues related to climate change will be covered within a single organizational unit under the supervision of the head of the Unit.

In the project report [39], the Ministry of Economy and the Energy Agency are identified as institutions that will play a key role in certain processes or in the climate change data processing. The former has a key role in the development of plans and reports on energy and climate change, whereas the latter is responsible for the management of energy efficiency information systems and platforms. Therefore, for these two institutions, there is a proposal in [39] of very detailed work tasks, which do not imply that the new jobs must be systematized, but that they can be incorporated into the existing jobs.

Implementing a national climate change administrative system requires adequate resources. Establishing and maintaining appropriate organizational relations, establishing and adapting data flows, recruiting and retaining expertise, developing and deploying systems and tools, and delivering new results all require careful resource planning and maintenance [33].

Hence, it is clear that there is a necessity to build the institutional capacities and human resources, especially in the MoEPP, for the implementation of plans and policies by integrating the climate aspects. The other institutions, sectoral bodies and authorities that have a connection with the impacts on greenhouse gas emissions, can make their contribution through a more efficient development of horizontal coordination for the purpose of implementing the activities envisaged in the Strategy on Climate Action. This was also confirmed by the employee of the Ministry of Transport and Communications, who emphasized the continuous cooperation with the MoEPP regarding the provision of data on the activities and changes in the transport sector development.

From the point of view that there is always room for improvement of the process, the obtained knowledge is shown in more detail in the traffic light in chapter 10.

In addition, the activities that have the effect of strengthening inter-institutional capacities and relations are presented.

9.4. Actions for strengthening institutional capacities

The following actions are based on the action plan for strengthening the administrative capacity for climate actions. The action plan distinguishes between actions for organizational and structural strengthening and actions for strengthening administrative capacities. The action plan recommends actions related to the *organization and structure* of relevant national institutions involved in climate actions.

The proposed actions include internal reorganizations and cross-institutional relations to ensure the necessary cooperation and coordination of authorities and government institutions. Cooperation and coordination in the government will be ensured through the National Climate Change Council provided for in the LCA and they will be established immediately after the adoption of the law.

Actions for institutional arrangements include [33]:

• To provide institutional responsibilities in climate action with the necessary, qualified personnel and, as far as possible, a separate structure for climate action, be it a department or a unit.

• To provide each of these climate action structures with a clear mandate and a comprehensive, consistent description of tasks and responsibilities, avoiding overlaps and conflicts of competencies with other structures within the same institution or with other institutions.

• To ensure that each of these climate action structures is staffed and equipped with the necessary human, financial and technical resources covering all relevant subjects falling within their competences and functions (policy, regulatory, monitoring, reporting, law and finance).

• To provide institutions with responsibilities in climate actions with legal and financial support, through resources or within their departments or units through cooperation mechanisms with central government structures.

• Where tasks in climate action are shared within a particular institution, to ensure that communication, coordination and cooperation mechanisms are in place.

• To ensure that competent authorities have access to scientific expertise, as needed.

In addition, the actions for strengthening the institutional capacities are presented.

Action 7: Establishment of organizational capacity in institutions relevant for climate action [33]

A–L–13: Establishment of organizational capacity in institutions relevant for climate action	
Main objective: Enabling competent governmental institutions to establish the organizational capacity necessary to implement climate action.	
Implementation period:	2021-2025 (with subsequent adjustments)
Link to the EU policies (where relevant):	All EU climate change acquis
Relevant national planning documents, legal and regulatory instruments:	- LCA and by-laws - Sectoral legislation relating to climate action (primary and secondary)
Implementing entity:	- Ministry of Environment and Physical Planning - Sectoral Ministries
Monitoring entity	- Ministry of Environment and Physical Planning - Relevant Sectoral Ministries - Other state bodies
GHG(s) affected (if applicable)	As defined in EU climate action acquis and LCA
Reference to assessments and underpinning technical reports	Action Plan for Administrative Capacity Strengthening for Climate Action

Assumptions/general comments	- Political will to implement climate actions - Human and financial resources - Cooperation and coordination in Ministries and state bodies between relevant units functioning - Cooperation and coordination among all relevant institutions in Government functioning

The actions proposed to strengthen administrative capacities through adequate staffing for climate action in the various institutions responsible in the area are also based on the Action Plan for Administrative Capacity Strengthening mentioned before. The Action Plan identified all the measures to reach the capacity needed to carry out the climate action tasks in the relevant institutions in the RN Macedonia. As a second step, the capacity strengthening measures needed in each institution were identified and proposed over time, with a projection period of up to 10 years, i.e. until 2030. This second part of the Action Plan is referred to here.

Action 8: Establishment of necessary staff capacity in institutions for climate action [33]

A–L–14: Establishment of necessary staff capacity in institutions for climate action	
Main objective: Establishment of necessary staff capacity in institutions for climate action	
Implementation period:	2021-2025 (following adoption and entry into force of the LCA)
Link to the EU policies (where relevant):	All EU climate action acquis
Relevant national planning documents, legal and regulatory instruments:	- LCA and by-laws - Sectoral legislation relating to climate action (primary and secondary)
Implementing entity:	- MoEPP - MoE - Ministry of Local Self-Government - Energy and Water Services Regulatory Commission - Deputy Prime Minister Cabinet - Ministry of Finance - Ministry of Health - National Hydrometeorogical Service - Ministry of Agriculture, Forestry and Water Economy - MoTC - Ministry of Internal Affairs - State Market Inspectorate - State Statistical Office - Macedonian Academy of Sciences and Arts
Monitoring entity	All institutions, as above
GHG(s) affected (if applicable)	As defined in EU climate action acquis and LCA

Reference to assessments and underpinning technical reports	Action Plan for Administrative Capacity Strengthening for Climate Action
Assumptions/general comments	- Political commitment and will to implement climate action - Relevant institutions and state bodies committed to strengthen their staff capacity

Action 9: Strengthening capacities for implementation of environmental and climate change legislation [33]

A–L–15: Strengthening capacities for implementation of environmental and climate change legislation	
Main objective: To strengthen capacities at all levels of the public administration to promote, monitor, and enforce environmental and climate change legislation in RNM.	
Implementation period:	2022-2025
Link to the EU policies (where relevant):	
Relevant national planning documents, legal and regulatory instruments:	- Law on Climate Action - By-laws on climate action - Law on Environment - Secondary legislation on environment
Implementing entity:	MoEPP
Monitoring entity	MoEPP
GHG(s) affected (if applicable)	CO_2, CH_4, N_2O
Reference to assessments and underpinning technical reports	- Assessment of the environmental and climate legal and policy framework - Assessment of the existing national legal and strategic frameworks vs. the most recent EU policies and measures for climate action - Further alignment of the national legislation with the EU climate legislation

A continuous commitment to the institutional potential improvement of all sectoral bodies that have a direct connection with climate actions is needed, regardless of whether they include a special unit for climate action (or generally for environment and sustainable development) in their organizational set-up. For example, the Ministry of Transport and Communications, as indicated by the interview with its employee, actively cooperates with the MoEPP and other institutions in providing data on the transport sector, which are necessary for the analysis of the impacts on climate change. Certainly, efficiently organized human resources for the collection of statistical data on transport, information gathering, analysis, information exchange, which are needed for management and planning in the transport sector, will contribute to the future increase in the quality of this process.

10. COMPLIANCE TRAFFIC LIGHT

Compliance Traffic Light is a tool that should visually show the conditions in a certain entity or in this specific case - a sector, that is, the transport sector. The conditions are displayed in three parts:

1 — Strategic compliance

2 — Organizational capacities

3 — Performance of tasks in order to achieve results.

The displayed compliance traffic light has the purpose of showing what the conditions are from a formal and functional point of view. If major discrepancies are found, they are listed in the notes.

I. STRATEGIC COMPLIANCE

	CRITERION	TRAFFIC LIGHT						MAIN NOTES
		Formal			Functional			
		x	+/−	√	x	+/−	√	
1	Legal regulation of climate change obligations.				■			The Government of RNM drafted a draft Law on Climate Action more than a year ago and it has not yet been adopted by the Assembly of RNM.
2	Clearly established strategic direction for reducing greenhouse gases in the transport sector.	■						Green mobility and logistics, focused on the environmental effectiveness of the transport sector, have not yet been introduced.
3	Established legal obligation to prepare the National Plan on Climate Change.	■			■			The Law on Environment provides for the adoption of a National Plan on Climate Change.
4	Established legal obligation to prepare a National inventory of the anthropogenic emissions by sources and sinks of greenhouse gases.	■			■			The Law on Environment provides for the adoption of a National inventory of the anthropogenic emissions by sources and sinks of greenhouse gases.

5	Regular preparation and adoption of the National Plan on Climate Change.			Currently, the Fourth National Plan on Climate Change has been adopted.
6	Established institutional cooperation among relevant climate change stakeholders.			
7	Timely responsiveness of relevant stakeholders to climate change.			Greater coordination between relevant climate change stakeholders is needed.
8	Established National inventory of the anthropogenic emissions by sources and sinks of greenhouse gases.			Established practice for the preparation of the National inventory of the anthropogenic emissions by sources and sinks of greenhouse gases.

II. ORGANIZATIONAL CAPACITIES

	CRITERION	TRAFFIC LIGHT						MAIN NOTES
		Formal			Functional			
		x	+/-	√	x	+/-	√	
1	There is a clear distinction, that is, there is no overlap in the scope of work tasks among different entities within the sector.							In certain entities, there is an overlap of competences.
2	The employees within the sector understand the basic functions and organizational set-up of the institution.							
3	Key jobs (those through which the main goals within the sector are achieved) are filled with appropriate staff.							Traffic engineers should be placed in high positions in the transport sector, which is actually a matter of general and special laws.
4	Management clearly communicates reform plans, strategic goals and improvement measures to employees.							

5	All planned activities/tasks in the institution are performed.			Work tasks are performed on the basis of available resources and are largely determined by them.
6	Each employee performs tasks arising from his/her job description.			A functional analysis of the entities within the system is required in order to answer this question.
7	There are no systematized jobs within the sector that are unnecessary.			A functional analysis of the entities within the system is required in order to answer this question.
8	Employees within the sector generally possess competencies for fulfilling activities and achieving strategic goals.			A functional analysis of the entities within the system is required in order to answer this question.
9	Employees within the sector have opportunities for professional development and training.			A functional analysis of the entities within the system is required in order to answer this question.
10	Employees within the sector have opportunities for promotion.			A functional analysis of the entities within the system is required in order to answer this question.

III. PERFORMANCE OF TASKS IN ORDER TO ACHIEVE RESULTS

	CRITERION	TRAFFIC LIGHT						MAIN NOTES
		Formal			Functional			
		x	+/−	√	x	+/−	√	
1	Within the sector there is adequate organization, prioritization of goals.							A functional analysis of the entities within the system is required in order to answer this question.
2	Decision-making within the sector takes place through established protocols.							A functional analysis of the entities within the system is required in order to answer this question.
3	Clear written procedures for work processes are established.							A functional analysis of the entities within the system is required in order to answer this question.

4	There is good and regular communication among entities within the sector.			A functional analysis of the entities within the system is required in order to answer this question.
5	At the sector level, there is an established public relations system.			A functional analysis of the entities within the system is required in order to answer this question.

RECOMMENDATIONS AND IMPROVEMENT PLAN

I. STRATEGIC COMPLIANCE

- It is necessary to pass the Law on Climate Action.

- Consistent achievement of the set strategic goal - Introducing green mobility and logistics, focusing on the environmental effectiveness of the transport sector and reaching the target of reducing greenhouse gas emissions by transport by 15.1% in 2025 and by 18.6% in 2030.

- Strengthening the coordination of all stakeholders in the process of reporting and informing about greenhouse gases.

- Continuous efforts for timely preparation of national climate change documents.

II. ORGANIZATIONAL CAPACITIES

- To make a functional analysis of the individual entities in order to detect the conditions in the existing acts for their internal organization and systematization.

- The key positions, especially the managerial positions, should be filled with persons with appropriate professional qualifications and work experience.

- To work on continuous education and development of the working skills of the employees.

III. PERFORMANCE OF WORK TASKS IN ORDER TO ACHIEVE RESULTS

- If not established, to develop working processes and decision-making handling protocols, that is, clear written procedures for communication among entities within the sector.

- If not established, to develop public relations handling protocols at the sector level.

- To make a more detailed analysis of the situation and needs with IT technology, software and other work tools, as well as adequate staff.

- To take advantage of the opportunities provided by the programs of the EU and other countries and organizations to apply for projects, and especially to develop staff that will monitor these projects and will be properly trained to use them.

ANNEX 1

PESTLE Analysis

For the needs of this document, an analysis, which should show and anticipate certain factors that have an impact on the transport sector, was made.

PESTLE identifies and analyzes critical drivers of change outside the sector and presents an evaluation to review the objective, features or plans. It can be used to initiate a strategy formulation or to revise such a strategy periodically by revisiting the indicators. It is also a serious strategic tool not only for the entire sector, but also for the individual entities of which it is composed.

PESTLE analysis is usually applied to six areas (Fig. 11).

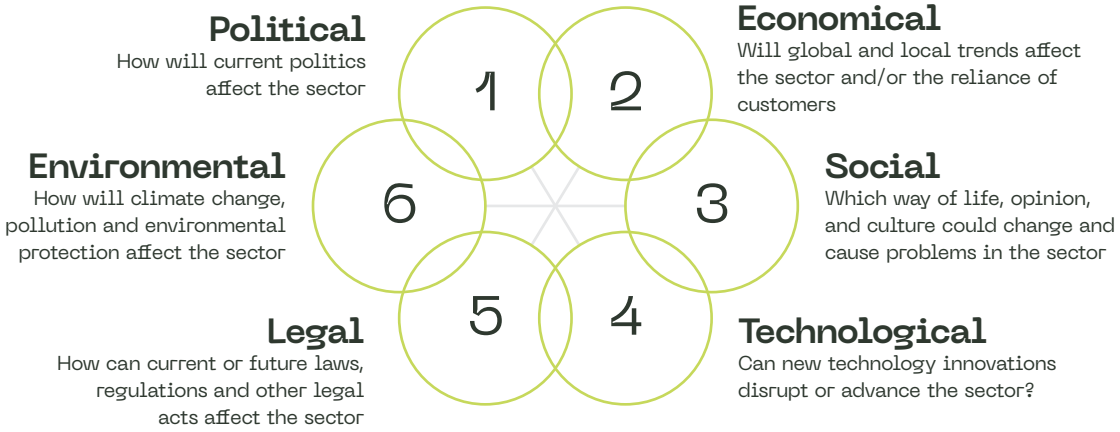

Fig. 11: Areas of PESTLE analysis
Source: [27]

The questions and answers in all areas in more detail within this analysis, are as follows:

POLITICAL

• What is the policy on the impact of transport on climate change?

✓ Starting from the fact that the Government of RNM in all legal acts provides for the adoption of strategic documents for both transport and climate change, there is a formal relation between these two sectors, but the functional one is not sufficiently developed.

• Does the climate change mitigation policy have a comprehensive approach to the transport sector?

✓ Within the climate change mitigation policy, no special focus on the transport sector has been identified.

ECONOMIC

• What is the economic forecast?

✓ The current degree of economic uncertainty, especially energy, is unfavorable, and that is a global trend. Energy is the basic driver in transport, but currently oil and gasoline as the most used fuels have a high price. Forecasts do not favor price stabilization in the foreseeable future.

• Is the exchange rate volatile to dramatic changes, which may affect the sector?

✓ The exchange rate is stable.

• Can users afford the products provided by the sector (i.e., transport services)?

✓ Due to the global energy crisis, transport services have a higher price, thus they are not acceptable for all social groups to meet their daily travel needs.

SOCIAL

• Is there a growth or decline in the population at the state level?

✓ At the state level, there is statistically a decline in the population.

• What are the current cultural/societal trends and are they reflected on the sector?

✓ Emigration is one of the biggest threats, as well as rural-urban internal migration is a trend that should be noted.

• Do users trust the sector and its services?

✓ Lack of trust can be ascertained in terms of the transportation services in the road and railway transportation of passengers, since the services do not have the necessary quality.

TECHNOLOGICAL

- **What is the state of technology within the sector?**

✓ The sector has IT within the usual capacities.

- **How frequently are new technologies implemented at the sector level?**

✓ New technologies at the sector level are not being implemented at the frequency at which they are becoming available.

LEGAL

- **Is the greenhouse effect legally regulated?**

✓ There is no comprehensive legal act in RNM that regulates issues related to climate change mitigation. Therefore, the Government has proposed the Law on Climate Action, which has not yet been adopted by the Assembly of RNM.

- **Are the laws and by-laws that regulate the area of greenhouse gas of the transport sector applied?**

✓ In essence, there is a certain degree of application of the laws and by-laws that regulate the area of greenhouse gases of the transport sector, but still not all the acts have been adopted despite the fact that there is an obligation to do that, especially in the part of the environmental categorization of vehicles in road transport.

ENVIRONMENT

- **Do some services that are created and provided within the sector have a negative impact on the environment?**

✓ Yes, all services from the transport sector have a negative impact on the environment and on greenhouse gas emissions.

- **Will climate change impact the sector?**

✓ Climate changes have an impact on the sector, that is, on the resilience of the transport infrastructure.

According to this analysis, the following arises:

Political

RNM complies with all international obligations undertaken by the ratification of international institutions and organizations in the area of climate change. However, despite the political will, RNM is already lagging behind in regulating issues related to climate change mitigation, evident from the fact that the Draft Law on Climate Action was drafted in 2022.

Economic

The global trends in the economy are reflected directly on the local ones. Thus, financial issues affect the sector and users' trust. The current degree of economic uncertainty, especially energy, is unfavorable, and it is a global trend, and due to the global energy crisis, there is an impact on the growth of the price of transport services.

Social

In terms of social issues, there is a decline in the population, which demographically has implications in all sectors, including transport. Emigration is one of the biggest threats, and rural-urban internal migration is also a visible trend. The consequences in the transport sector can be seen in terms of the reduction in the number and frequency of passenger transport lines in suburban and intercity traffic.

Technology

The state of IT is at a standard level, taking into account the capabilities of society and the state as a whole. New technological innovations, including IT can only advance the sector as a whole.

Legal

Climate change is not linked to the national legislation, but taking into account the effects of climate change, regulation is primarily at the international level. However, the regulation on the impact of transport sector on the greenhouse gases should be clearly regulated and it should be the basis for creating an insight into this sector of climate change in the RNM.

Environment

The transport sector has a significant negative impact on climate change. At the national level, in the energy sector, transport is the second largest source of greenhouse gas emissions. On the other hand, climate change also has an impact on the sector, especially in terms of the resilience of the transport infrastructure.

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