



Faculty of Engineering
University of Kragujevac



Ministry of Science, Technological
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**11th International Congress
Motor Vehicles & Motors 2026
ECOLOGY -
VEHICLE AND ROAD SAFETY
- EFFICIENCY
Proceedings**



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FOREWORD

For 47 years, a traditional international gathering - originally known as a Symposium and, since 2006, as the "Motor Vehicles and Motors" Congress - has been held biennially at the Faculty of Engineering (formerly the Faculty of Mechanical Engineering) of the University of Kragujevac. This year, the 11th International Congress "Motor Vehicles and Motors" took place in Kragujevac on October 8th–9th, 2026, under the traditional motto: "Ecology – Vehicle and Road Safety – Efficiency".

A large number of authors from both the country and abroad responded to the organizers' invitation, resulting in numerous high-quality submissions across the event's core areas: "Power Train Technology," "Vehicle Design and Manufacturing," "Vehicle Dynamics and Intelligent Control Systems," "Driver/Vehicle Interface, Information Systems, and Assistance Systems," and "Transport Challenges in Emerging Economies." Additionally, two topics were officially introduced for the first time: "Artificial Intelligence in Automotive Technology" and "Autonomous Vehicles".

A total of 63 papers were accepted for presentation following a rigorous peer-review process. The presentations were organized into sessions, including a newly introduced poster session dedicated to students and young researchers.

The Congress organizers extend their special gratitude to the distinguished scientists in the fields of motor vehicles and transportation who agreed to deliver three inspiring introductory lectures addressing the heart of contemporary issues in the sector: prof. dr Ralph Putz (Landshut University of Applied Sciences, Germany), prof. dr Aleksandar Stevanović (University of Pittsburgh, USA), and prof. dr. Isak Karabegović (Academy of Sciences and Arts of Bosnia and Herzegovina, Bosnia and Herzegovina).

We extend our sincere gratitude to the esteemed members of the Congress Scientific Committee—who also served as reviewers for the papers submitted for presentation—for their significant contribution to the overall quality of the accepted papers.

The organization of the Congress was once again supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, the Faculty of Engineering of the University of Kragujevac, and the International journal "Mobility & Vehicle Mechanics" and we sincerely thank them for their support.

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PREDGOVOR

Već 47 godina, svake druge godine, na Fakultetu inženjerskih nauka (nekada Mašinskom fakultetu) Univerziteta u Kragujevcu održava se tradicionalan međunarodni skup, nekada nazivan Simpozijum, a od 2006. godine - Kongres „Motorna vozila i motori“. Ovogodišnji, 11. Međunarodni kongres „Motorna vozila i motori“ održan je u Kragujevcu od 8. do 9. oktobra 2026. godine, uz tradicionalni moto „Ekologija – Vozilo i bezbednost na putu – Efikasnost“.

Na poziv organizatora odazvao se veliki broj autora iz zemlje i inostranstva, što je donelo veliki broj prijavljenih kvalitetnih radova iz glavnih oblasti skupa: „Tehnologija pogonskog sistema“, „Dizajn i proizvodnja vozila“, „Dinamika vozila i inteligentni upravljački sistemi“, „Interfejs vozač/vozilo, informacioni sistemi i sistemi za pomoć“, „Transportni izazovi ekonomija u usponu“, uz prvi put zvanično promovisane teme – „Veštačka inteligencija u automobilskoj tehnologiji“ i „Autonomna vozila“.

Ukupan broj od 63 radova je prihvaćen za prezentaciju posle rigoroznog procesa recenziranja. Rad je organizovan po sekcijama, uz prvi put promovisanu poster sekciju namenjenu za studente i mlade istraživače.

Organizatori Kongresa su posebno zahvalni istaknutim naučnicima iz oblasti motornih vozila i saobraćaja koji su pristali da održe tri inspirativna uvodna predavanja koja zadiru u srž savremenih pitanja vezana za vozila i saobraćaj, a to su: prof. dr Ralph Putz (Landshut University of Applied Sciences, Nemačka), prof. dr Aleksandar Stevanović (University of Pittsburgh, SAD) i prof. dr Isak Karabegović (Akademija nauka i umjetnosti Bosne i Hercegovine, Bosna i Hercegovina).

Veliku zahvalnost dugujemo našim dragim članovima Naučnog odbora Kongresa, ujedno i recenzentima radova prijavljenih za prezentaciju na Kongresu, koji su mnogo doprineli ukupnom kvalitetu konačno prihvaćenih radova.

Organizaciju Kongresa i ovog puta su podržali: Ministarstvo nauke, tehnološkog razvoja i inovacija Republike Srbije, Fakultet inženjerskih nauka Univeziteta u Kragujevcu i Međunarodni časopis „Mobility & Vehicle Mechanics“, na čemu im se iskreno zahvaljujemo.

Naučni odbor i Organizacioni odbor Kongresa MVM2026

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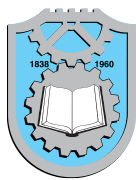
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Marko Lučić¹

Mirjana Grdinić-Rakonjac²

Radoje Vujadinović³

Vladimir Pajković⁴

Ivan Grujić⁵

ENERGY USE IN MONTENEGRO'S ROAD TRANSPORT SECTOR: TRENDS, FUEL STRUCTURE AND DEPENDENCE ON PETROLEUM-BASED FUELS

ABSTRACT: Road transport represents one of the most important sectors of energy use in Montenegro, with a strong dependence on petroleum-based fuels. This paper provides a descriptive analysis of energy use in Montenegro's road transport sector, with special attention to fuel structure and consumption trends. The analysis uses official statistical data for the period 2014–2024 and examines the consumption of diesel fuel, gasoline, liquefied petroleum gas and electricity in road transport. It focuses on the dominant fuel types, shifts in consumption patterns and the extent to which road transport continues to rely on conventional petroleum-based fuels. The results indicate that diesel fuel has the leading role in road transport energy consumption, while gasoline has a lower but still relevant share and liquefied petroleum gas remains marginal. The observed trends confirm that Montenegro's road transport sector is still characterized by a high dependence on petroleum-based fuels, with limited diversification of final energy use away from petroleum-based fuels.

KEYWORDS: road transport, energy use, fuel consumption, petroleum-based fuels, Montenegro

¹ Marko Lučić, University of Montenegro, Faculty of Mechanical Engineering, Džordža Vašingtona bb, 81000 Podgorica, markol@ucg.ac.me, <https://orcid.org/0009-0004-9978-5967>

² Mirjana Grdinić-Rakonjac, University of Montenegro, Faculty of Mechanical Engineering, Džordža Vašingtona bb, 81000 Podgorica, grdinicm@ucg.ac.me, <https://orcid.org/0000-0003-3497-7744>

³ Radoje Vujadinović, University of Montenegro, Faculty of Mechanical Engineering, Džordža Vašingtona bb, 81000 Podgorica, radojev@ucg.ac.me, <https://orcid.org/0000-0002-4356-0556>

⁴ Vladimir Pajković, University of Montenegro, Faculty of Mechanical Engineering, Džordža Vašingtona bb, 81000 Podgorica, pajkovic@ucg.ac.me, <https://orcid.org/0000-0003-2252-5070>

⁵ Ivan Grujić, University of Kragujevac, Faculty of Engineering, Sestre Janjić 6, 34000 Kragujevac, Serbia, ivan.grujic@kg.ac.rs, <https://orcid.org/0000-0003-0572-1205>

POTROŠNJA ENERGIJE U SEKTORU DRUMSKOG SAOBRAĆAJA CRNE GORE: TRENDOWI, STRUKTURA GORIVA I ZAVISNOST OD NAFTNIH GORIVA

REZIME: Drumski saobraćaj predstavlja jedan od najznačajnijih sektora potrošnje energije u Crnoj Gori, uz izraženu zavisnost od naftnih goriva. U ovom radu data je deskriptivna analiza potrošnje energije u sektoru drumskog saobraćaja Crne Gore, sa posebnim osvrtom na strukturu goriva i trendove potrošnje. Analiza je zasnovana na zvaničnim statističkim podacima za period 2014–2024. godine i obuhvata potrošnju dizel goriva, benzina, tečnog naftnog gasa i električne energije u drumskom saobraćaju. Osnovni cilj rada je identifikovanje dominantnih vrsta goriva, promjena u obrascima potrošnje i stepena zavisnosti drumskog saobraćaja od konvencionalnih naftnih goriva. Rezultati ukazuju da dizel gorivo ima vodeću ulogu u ukupnoj potrošnji energije u drumskom saobraćaju, dok benzin ima manji, ali i dalje značajan udio, a tečni naftni gas marginalnu ulogu. Uočeni trendovi potvrđuju da sektor drumskog saobraćaja Crne Gore i dalje karakteriše visok stepen zavisnosti od naftnih goriva, uz ograničene strukturne promjene u finalnoj potrošnji energije.

KLJUČNE REČI: drumski saobraćaj, potrošnja energije, potrošnja goriva, naftna goriva, Crna Gora

INTRODUCTION

Transport represents one of the key sectors of final energy consumption and plays an essential role in economic activity, mobility, tourism and the movement of goods. At the same time, it remains highly dependent on petroleum-based fuels, particularly in road transport. Road transport accounts for the dominant part of domestic transport energy demand, making it one of the most important sectors for analysing energy consumption, fuel structure and opportunities for improving energy efficiency (European Environment Agency, 2025). This dependence also makes transport one of the more challenging sectors in the broader energy transition, as mobility systems continue to rely heavily on fossil fuels and conventional vehicle technologies (Intergovernmental Panel on Climate Change, 2023).

This pattern is also evident at the European level. Road transport is the largest consumer of final energy within the transport sector, while diesel fuel and gasoline remain the dominant energy sources (Eurostat, 2026). Although the use of electricity, biofuels and other alternative energy sources has increased in recent years, conventional petroleum-based fuels still have a leading role in aggregate road transport energy consumption. The structure and evolution of road transport fuel consumption are therefore particularly relevant in countries where the transition towards alternative energy sources in transport is still at an early stage.

The transition towards sustainable mobility has become a central element of transport and climate policy, particularly in Europe. The European Commission's Sustainable and Smart Mobility Strategy defines the transformation of the transport system as one of the key elements of the broader transition towards a more sustainable, smart and resilient mobility system (European Commission, 2020). However, achieving sustainable mobility requires more than the introduction of new, cleaner vehicle technologies. It also involves changes in transport planning, travel behaviour, land use and policy frameworks (Banister, 2008). The transition is further complicated by increasing mobility demand, long vehicle lifetimes and the continued dominance of fossil fuels, making transport one of the more challenging sectors to decarbonise (Creutzig et al. 2015). In this context, examining the consumption of diesel fuel, gasoline, liquefied petroleum gas and electricity can provide insight into current fuel-use patterns and the extent to which conventional energy sources continue to dominate.

A significant part of previous research has focused on the determinants of transport energy demand. Liddle and Huntington (2020) analysed gasoline and diesel demand using a large international panel of countries and demonstrated the importance of economic activity, fuel prices and structural characteristics of the transport sector. Achour and Belloumi (2016) applied decomposition analysis to the transport sector and identified economic output, transport intensity, population and energy intensity as important drivers of energy use. Tsemekidi Tzeiranaki et al. (2023) analysed historical energy consumption trends in the European road transport sector and highlighted the influence of vehicle fleet characteristics, transport activity, fuel prices and energy efficiency policies.

These studies indicate that road transport energy demand reflects a combination of technological, economic and structural factors. However, a clear picture of how energy use itself has evolved over time remains an important starting point, particularly before applying more complex modelling, forecasting or decomposition methods. This is especially relevant for smaller national transport systems, where aggregate consumption data can provide a direct insight into the level of dependence on conventional fuels and the extent of structural change over time.

This perspective is particularly relevant to Montenegro, where road mobility and freight transport continue to rely mainly on conventional petroleum-based fuels. Although sustainable mobility, electric vehicles and alternative fuels have become increasingly prominent in policy discussions, the evolution and composition of final energy consumption in Montenegrin road transport have received limited attention from a simple statistical perspective. For this reason, a descriptive analysis of energy use trends can provide a useful basis for understanding the main consumption patterns and the current position of petroleum-based fuels in the road transport sector.

The aim of this paper is to examine the evolution of energy use in Montenegro's road transport sector over the 2014–2024 period, focusing on fuel structure, changes in consumption and the sector's continued dependence on petroleum-based fuels. The analysis covers diesel fuel, gasoline, liquefied petroleum gas and electricity, which represent the energy sources included in the available road transport energy statistics. Rather than applying modelling, forecasting or emission calculation methods, the study provides a descriptive statistical overview of observed energy consumption patterns and their changes over time, thereby establishing a factual basis for understanding the current energy structure of road transport in Montenegro.

DATA AND METHODOLOGICAL APPROACH

Data sources

The analysis is based on official statistical data published by the Statistical Office of Montenegro. Data on diesel fuel, gasoline and liquefied petroleum gas consumption were taken from the official balance of oil products, while data on electricity use in road transport were taken from the electricity balance (Statistical Office of Montenegro, 2026a, 2026b). The analysis covers the period from 2014 to 2024, comprising eleven annual observations and representing the most recent period for which comparable official data on road transport energy use by energy source were available at the time of the study. The analysis considers four energy sources: diesel fuel, gasoline, liquefied petroleum gas and electricity.

Diesel fuel, gasoline and liquefied petroleum gas are classified as conventional petroleum-based fuels, while electricity is included in order to provide a more comprehensive overview of final energy use in road transport. Given the continued dominance of petroleum-based fuels in Montenegro's road transport sector, the analysis places particular emphasis on their consumption and their contribution to overall energy use.

Data preparation and units

The Statistical Office of Montenegro provides data on petroleum product consumption both in physical units and in energy units. In this paper, values expressed in terajoules [TJ] were used in order to ensure direct comparability between different energy sources. The use of TJ is especially important because petroleum-based fuels and electricity are originally expressed in different units, while a common energy unit is necessary for analysing the total structure of final energy use.

For diesel fuel, gasoline and liquefied petroleum gas, the values expressed in TJ were taken directly from the official balance of petroleum products. For electricity, values expressed in TJ were taken from the electricity balance where available. Electricity use in road transport appears only in the final years of the observed period, while earlier years are presented as 0.0 TJ in the comparative tables.

Total road transport energy use was calculated as the sum of all analysed energy sources:

$$E_{total} = E_{diesel} + E_{gasoline} + E_{LPG} + E_{electricity} \quad (1)$$

E_{total} – total energy use in road transport [TJ];

E_{diesel} – energy use from diesel fuel [TJ];

$E_{gasoline}$ – energy use from gasoline [TJ];

E_{LPG} – energy use from liquefied petroleum gas [TJ];

$E_{electricity}$ – electricity use in road transport [TJ].

Methodological approach

The paper applies a descriptive statistical approach to examine patterns and changes in road transport energy use over the observed period. The purpose of this approach is to present and interpret the main trends in road transport energy use, without applying modelling, forecasting or emission calculation methods. The analysis relies on actual observed statistical data to describe the evolution of energy use and identify its main structural characteristics.

The methodological procedure included several steps. First, annual data were collected for each of the four energy sources considered in the study. Second, total annual energy use in road transport was calculated for each year. Third, changes in the consumption of each energy source were examined separately over time. Fourth, the share of each energy source in total annual energy use was calculated. Finally, the values recorded in the initial year and the final year of the observed period were compared in order to identify the main changes that occurred over the study period and assess shifts in the relative importance of the different energy sources.

The share of each energy source in total road transport energy use was calculated as follows:

$$S_i = \frac{E_i}{E_{total}} \cdot 100 \quad (2)$$

where:

S_i – share of energy source i in total road transport energy use [%];

E_i – annual energy use of the selected energy source i [TJ];

E_{total} – total annual energy use in road transport [TJ].

The absolute change between 2014 and 2024 was calculated as:

$$\Delta E_i = E_{i,2024} - E_{i,2014} \quad (3)$$

where:

ΔE_i – absolute change in energy use of energy source i [TJ];

$E_{i,2024}$ – energy use of energy source i in 2024 [TJ];

$E_{i,2014}$ – energy use of energy source i in 2014 [TJ].

The relative change between 2014 and 2024 was calculated as:

$$R_i = \frac{E_{i,2024} - E_{i,2014}}{E_{i,2014}} \cdot 100 \quad (4)$$

where:

R_i – relative change in energy use of energy source i [%];

$E_{i,2024}$ – energy use of energy source i in 2024 [TJ];

$E_{i,2014}$ – energy use of energy source i in 2014 [TJ].

The analysis uses the following indicators: annual energy use by energy source [TJ], total annual energy use in road transport [TJ], share of each energy source in total road transport energy use [%], absolute change between 2014 and 2024 [TJ] and relative change between 2014 and 2024 [%].

This methodological approach enables a clear overview of the development of road transport energy use in Montenegro and provides the basis for assessing the extent to which the sector remains dependent on petroleum-based fuels.

RESULTS AND DISCUSSION

The analysis of road transport energy use in Montenegro covers the period 2014–2024. The results are presented in three stages: total energy use, changes in consumption by energy source and the contribution of each source to overall energy use.

Table 1 Road transport energy use by energy source, 2014–2024

Year	Diesel [TJ]	Gasoline [TJ]	LPG [TJ]	Electricity [TJ]	Total [TJ]
2014	5321.7	1489.3	318.9	0	7129.9
2015	5744.5	1516.1	375.1	0	7635.7
2016	7047.1	1574	389.2	0	9010.3
2017	7820.2	1578.5	389.2	0	9787.9
2018	8601.8	1587.4	393.9	0	10583.1
2019	9054.5	1600.8	393.9	0	11049.2
2020	7892.8	1199.5	323.6	0	9415.9
2021	10173.5	1698.9	403.3	0	12275.7
2022	10378.5	1712.3	398.6	0	12489.4

Table 1 (continuation)

Year	Diesel [TJ]	Gasoline [TJ]	LPG [TJ]	Electricity [TJ]	Total [TJ]
2023	10459.7	1850.5	342.3	0.7	12653.2
2024	11014.9	1970.9	304.8	1.1	13291.7

The analysis includes diesel fuel, gasoline, liquefied petroleum gas and electricity, with all values expressed in terajoules [TJ] to enable direct comparison between different energy sources. The underlying data were obtained from the official energy balances published by the Statistical Office of Montenegro: diesel fuel, gasoline, and liquefied petroleum gas from the petroleum products balance (Statistical Office of Montenegro, 2026a) and electricity from the electricity balance (Statistical Office of Montenegro, 2026b). The annual values for each energy source are presented in Table 1.

Total energy use in road transport

The total energy use in Montenegro's road transport sector increased significantly during the observed period. In 2014, total energy use amounted to 7129.9 TJ, while in 2024 it reached 13291.7 TJ. This represents an increase of 6161.8 TJ, or approximately 86.4%. The lowest total energy use was recorded in 2014, while the highest value was recorded in 2024. Table 1 shows that this growth occurred within a highly concentrated energy structure, with diesel fuel remaining the dominant source throughout the period. Its share increased from approximately 74.6% of total energy use in 2014 to 82.9% in 2024. In contrast, the share of gasoline declined from 20.9% to 14.8%, while LPG decreased from 4.5% to 2.3%. Electricity was recorded only in 2023 and 2024 and accounted for a negligible share of total energy use. The trend of total road transport energy use during the analysed period is presented in Figure 1.

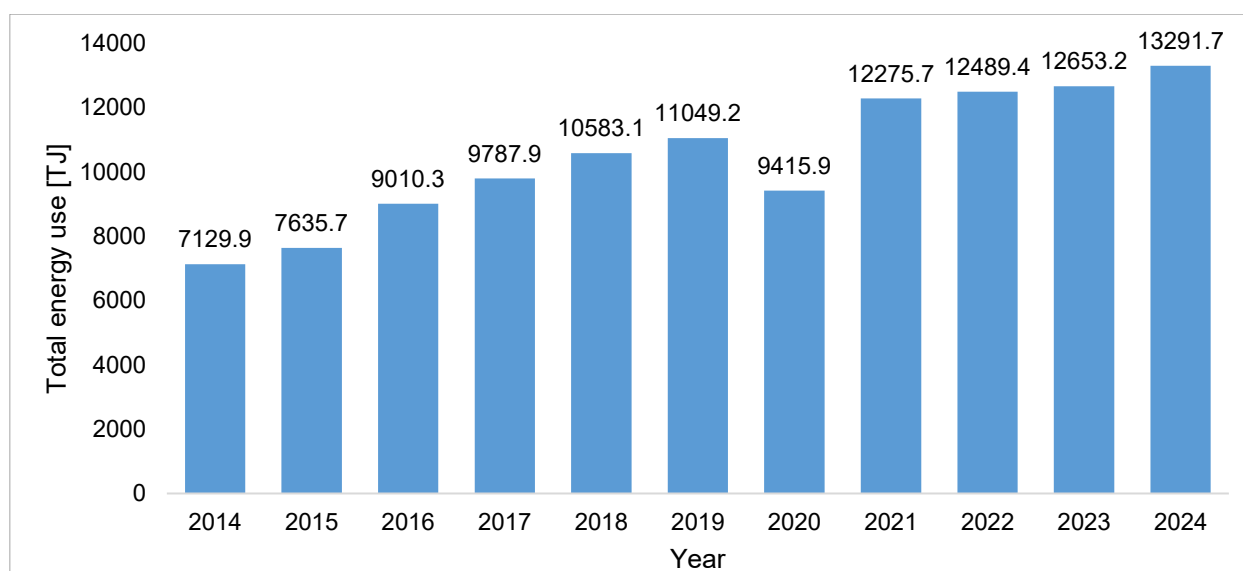


Figure 1 Total energy use in Montenegro's road transport sector, 2014–2024

The general trend therefore reflects both a substantial expansion in energy demand and a strengthening of diesel's predominance. The increase in total energy use was mainly driven by diesel fuel consumption, given its consistently large contribution to the sector. The only notable interruption occurred in 2020, when total consumption decreased from 11049.2 TJ in 2019 to 9415.9 TJ, a decrease of approximately 14.8%. This temporary decline was followed by a strong recovery in 2021, when total energy use increased to 12275.7 TJ, after which the upward trend resumed and culminated in the highest recorded value in 2024. This decline coincided with the COVID-19 pandemic and the associated restrictions on mobility, although the present descriptive analysis does not attempt to quantify the contribution of individual drivers (European Environment Agency, 2025).

These results indicate that, despite discussions on sustainable mobility and alternative energy sources in transport, the aggregate energy demand of road transport in Montenegro remains strongly connected with conventional petroleum-based fuels, with diesel becoming even more prominent over the study period.

Energy use by source

The structure of energy use by source shows that diesel fuel had the dominant role during the entire period. Diesel fuel consumption increased from 5321.7 TJ in 2014 to 11014.9 TJ in 2024. This represents an increase of 5693.2 TJ, or approximately 107.0%. This was the largest absolute increase among the analysed energy sources. Annual energy use by individual energy source is presented in Figure 2.

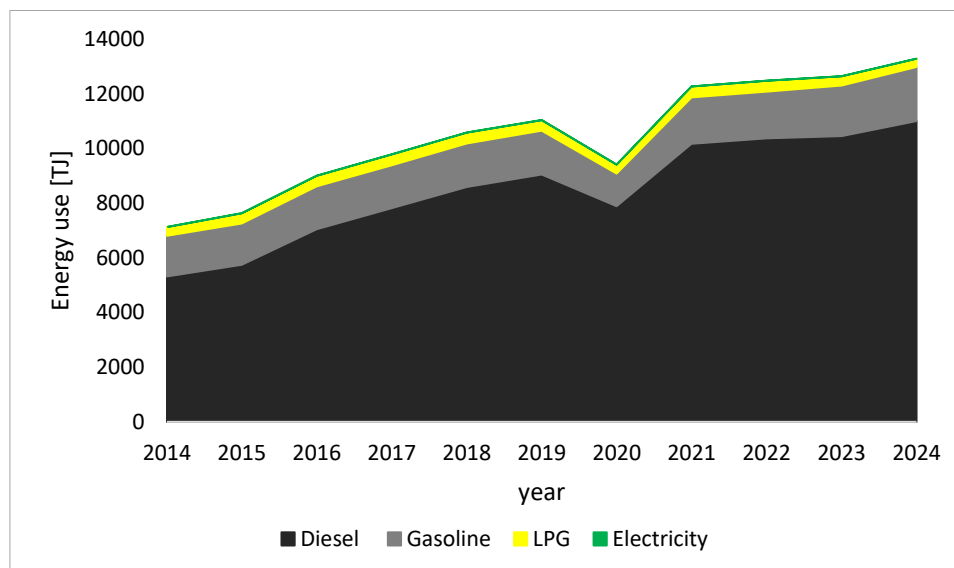


Figure 2 Energy use by source in road transport, 2014–2024

Gasoline was the second most important energy source in road transport. Its consumption increased from 1489.3 TJ in 2014 to 1970.9 TJ in 2024, which represents an increase of 481.6 TJ, or approximately 32.3%. Although gasoline consumption increased in absolute terms, its growth was much weaker than the growth of diesel fuel consumption.

Liquefied petroleum gas had a much smaller role in road transport energy use. LPG consumption decreased from 318.9 TJ in 2014 to 304.8 TJ in 2024, representing a decrease of 14.1 TJ, or approximately 4.4%. Although LPG can be considered an alternative petroleum fuel, its contribution to total road transport energy use remained limited throughout the analysed period.

Electricity appeared in the official data only in the final years of the observed period. Electricity consumption in road transport amounted to 0.7 TJ in 2023 and 1.1 TJ in 2024. Compared with diesel fuel, gasoline and LPG, these values are extremely low. Therefore, electricity is statistically visible, but its contribution to total final energy use in road transport remains negligible.

Fuel structure and dependence on petroleum-based fuels

The analysis of fuel shares provides a clearer insight into the structure of road transport energy use. In 2014, diesel fuel accounted for 74.6% of total energy use in road transport. By 2024, its share increased to 82.9%. This confirms that diesel fuel not only increased in absolute terms, but also became more dominant in the overall fuel structure.

Gasoline had a different trend. Although gasoline consumption increased in absolute terms, its share in total energy use decreased from 20.9% in 2014 to 14.8% in 2024. This shows that gasoline remained a relevant energy source, but its relative importance declined due to the stronger growth of diesel fuel consumption.

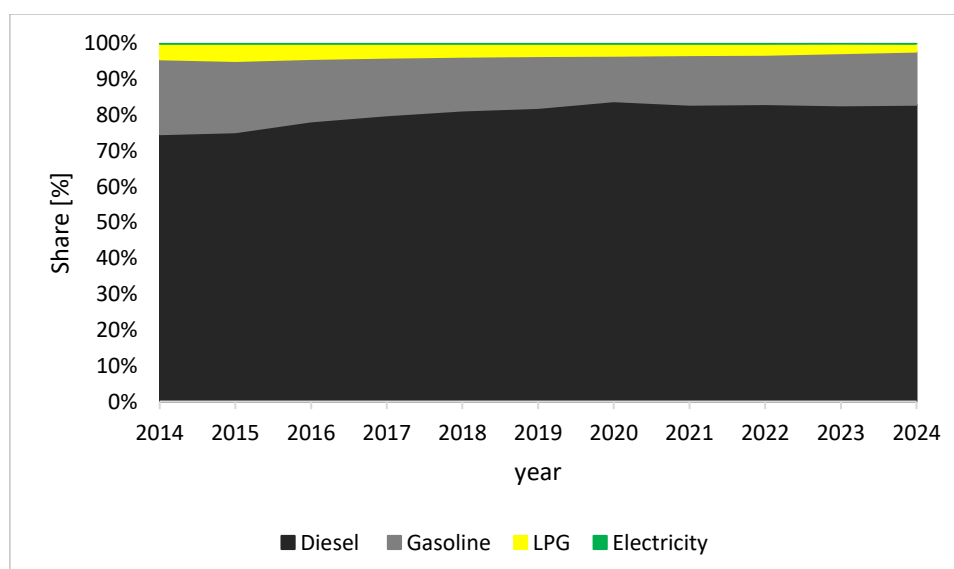


Figure 3 Fuel structure of road transport energy use, 2014–2024

The share of LPG decreased from 4.5% in 2014 to 2.3% in 2024. This confirms the marginal role of LPG and indicates that this fuel did not contribute significantly to the diversification of road transport energy use. The share of electricity in 2024 was approximately 0.01%, which further confirms that electricity has not yet become an important energy source in aggregate road transport energy indicators. Figure 3 presents the fuel structure of road transport energy use and shows the relative contribution of each analysed energy source to total annual consumption. For comparison, the EU-27 road transport energy mix in 2023 was less concentrated in diesel: gas/diesel oil accounted for 63.7%, motor gasoline for 26.2%, renewables and biofuels for 6.7%, liquefied petroleum gases for 2.1%, natural gas for 0.8%, and electricity for 0.5% of final road transport energy consumption (Eurostat, 2026). This comparison highlights the particularly strong diesel dominance and the still very limited role of electricity in Montenegro.

A comparison between the first and the last year of the observed period is presented in Table 2.

Table 2 Comparison of energy use and shares between 2014 and 2024

Energy source	2014 [TJ]	2024 [TJ]	Absolute change [TJ]	Relative change [%]	Share in 2014 [%]	Share in 2024 [%]
Diesel	5321.7	11014.9	+5693.2	+107	74.6	82.9
Gasoline	1489.3	1970.9	+481.6	+32.3	20.9	14.8
LPG	318.9	304.8	-14.1	-4.4	4.5	2.3
Electricity	0	1.1	1.1	-	0	0.01
Total	7129.9	13291.7	+6161.8	+86.4	100	100

The comparison confirms that the structure of road transport energy use changed primarily through the increasing dominance of diesel fuel. Diesel fuel increased both in absolute consumption and in percentage share. Gasoline increased in absolute terms, but its share decreased, while LPG decreased both in absolute and relative terms. Electricity appeared only at the end of the period, but its share remained negligible.

These findings confirm a high dependence of Montenegro's road transport sector on petroleum-based fuels. In 2024, diesel fuel, gasoline and LPG together accounted for almost the entire final energy use in road transport. The most important structural characteristic is the dominant and increasing role of diesel fuel, which strongly determines the total energy profile of the sector.

The results also show that fuel diversification in road transport remains limited. LPG did not increase its role, while electricity is still too small to change the aggregate structure of energy use. Therefore, the energy transition in road transport is not yet clearly visible through final energy consumption indicators.

From the perspective of transport energy policy, these results suggest that short-term improvements should focus on energy efficiency, rational fuel use and gradual reduction of dependence on diesel fuel. Measures related to vehicle fleet renewal, improved technical condition of vehicles, better fuel efficiency and more efficient organization of road transport could be particularly important. In the longer term, stronger fuel diversification and a gradual increase in the use of alternative energy sources will be necessary in order to change the current structure of final energy use.

Overall, the analysed period shows that Montenegro's road transport sector experienced a significant increase in final energy use, while remaining strongly dependent on conventional petroleum-based fuels. The dominant role of diesel fuel, the secondary role of gasoline, the marginal role of LPG and the negligible contribution of electricity represent the main characteristics of the sector's energy structure.

CONCLUSIONS

This paper analysed energy use in Montenegro's road transport sector for the period 2014–2024, with special focus on fuel structure, consumption trends and dependence on petroleum-based fuels. The analysis was based on official statistical data and all values were presented in terajoules in order to enable direct comparison between different energy sources.

The results show that total energy use in road transport increased significantly during the observed period, from 7129.9 TJ in 2014 to 13291.7 TJ in 2024. This represents an increase of approximately 86.4%. The increase was mainly driven by diesel fuel consumption, which more than doubled during the analysed period. Diesel fuel remained the dominant energy source in road transport, increasing its share from 74.6% in 2014 to 82.9% in 2024.

Gasoline remained the second most important energy source, although its relative importance decreased. Its share declined from 20.9% in 2014 to 14.8% in 2024, despite an increase in absolute consumption. Liquefied petroleum gas had a marginal role in the fuel structure and its share decreased from 4.5% to 2.3%. Electricity appeared in the

official data only in the final years of the observed period, but its contribution to total road transport energy use remained negligible.

The main conclusion of the paper is that Montenegro's road transport sector is still strongly dependent on conventional petroleum-based fuels, particularly diesel fuel. The analysed data do not indicate substantial diversification away from petroleum-based fuels. On the contrary, the fuel structure became increasingly concentrated in diesel, whose share of total road transport energy use increased from 74.6% in 2014 to 82.9% in 2024. Therefore, future transport energy policies should place stronger emphasis on energy efficiency, vehicle fleet renewal, rational fuel use and gradual diversification of energy sources in road transport.

The findings provide a concise statistical basis for further discussion on sustainable mobility and energy use in Montenegro's road transport sector. Future research could extend this analysis by including vehicle fleet characteristics, emission indicators, electricity use in road transport and scenario-based assessments of future transport energy demand.

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