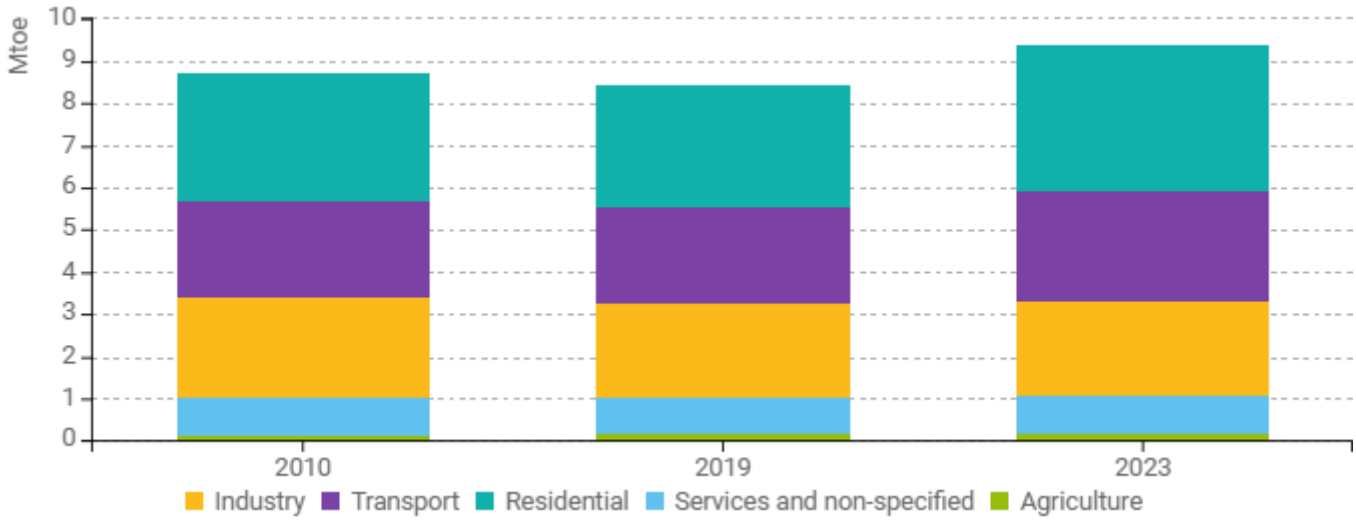
Energy efficiency trends and policies

Overview

In 2023, the final energy consumption in the Republic of Serbia amounted to 9.4 Mtoe, which is 7% more than in 2010. The largest share in the final energy consumption in 2023 was achieved by the household sector (37%). The transport sector with its share of 28% is on the second place, while industry positioned itself in third place with 24%. These are followed by services (10%) and agriculture (2%). Compared to 2010, there was an increase in final consumption in all sectors, except in industry sector. The agricultural sector recorded the highest increase, which (23%). The share of the transport sector increased by 2.4 points compared to 2010, followed by the residential sector (1.8 points). The shares in the services and agricultural sectors are almost identical, while the share of industry sector decreased by 3.8 points.

Figure 1: Final energy consumption by sector (with climatic corrections)



Source: ODYSSEE

Primary intensity in 2023 is estimated to have decreased by 23% compared to 2010 (from 0.417 koe/EUR2015 to 0.323 koe/EUR2015). Final intensity has been decreasing over time at an annual rate of about 1.5%, ie -28% during the observed period (from 0.239 koe/EUR2015 to 0.191 koe/EUR2015).

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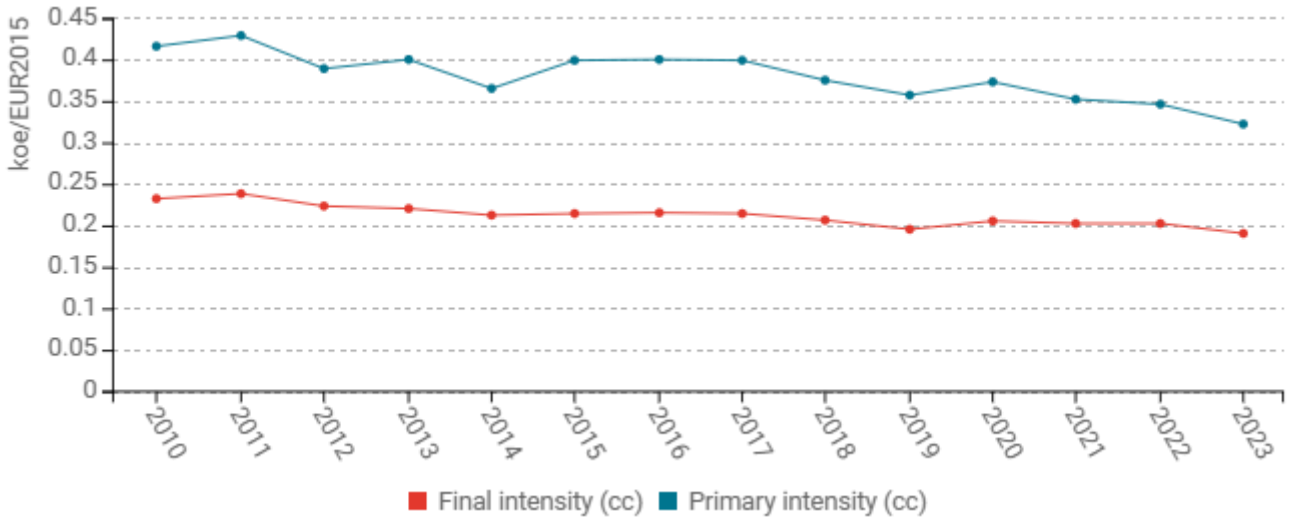
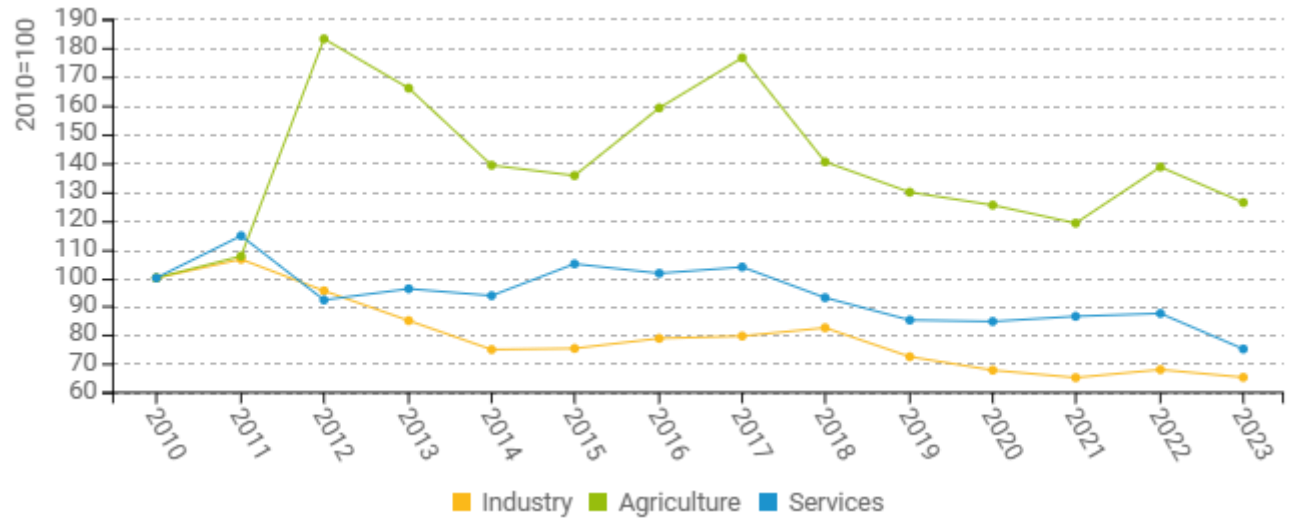
Figure 2: Primary and final intensities (with climatic corrections)



Source: ODYSSEE

The final intensity in industry decreased considerably in the observed period, so the value of this indicator in 2023 was 35% lower than in 2010. When it comes to the service sector, with minor changes up and down, there was also a significant decrease in the final intensity, by 25%. Unlike the previous two sectors, the agricultural sector recorded an increase, such that the final intensity in 2023 was 26% higher than in 2010, with quite intense jumps in certain years (2012 and 2017).

Figure 3: Final intensity by sector



Source: ODYSSEE

The total energy supply in 2023 was almost identical to 2010 (15.7 and 15.6), i.e. there were no significant factors that would lead to any changes.

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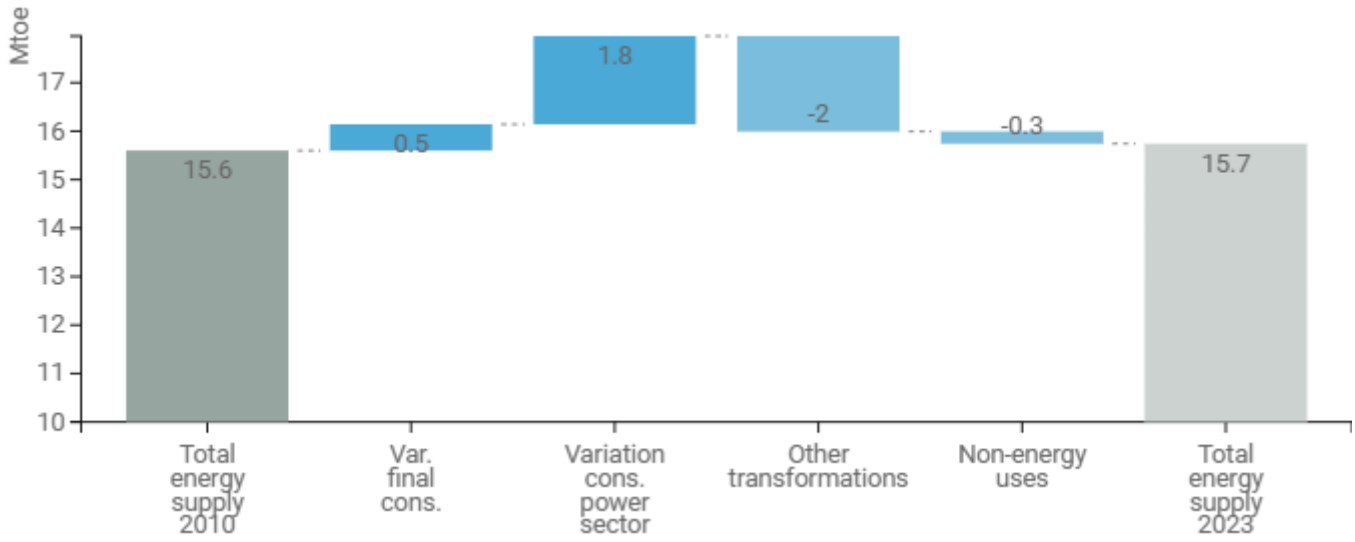
Figure 4: Main drivers of the total energy supply variation



Source: ODYSSEE

Various awareness-raising activities will be organized with the aim to enhance the existing level of knowledge of all end-users. Priority should be given also to the substitution of inefficient appliances and technologies with new energy efficient ones, along with the effective application of energy labelling and eco-design directives. The implementation of energy audits and the development of energy management systems in all end-use sectors including non-SMEs and households will be fostered. The smooth and efficient application of green public procurement procedures will be ensured, while the energy efficiency in street lighting by installing energy efficient luminaries will continue to be improved through specialized financial support schemes from public funds, in addition to the energy performance contracts. The promotion of energy efficiency in the water sector will be assisted, focusing on the examination of the energy-water nexus, the implementation of water management techniques, the installation of water-efficient end-use equipment and the conduction of other energy conservation measures in compliance with the principle "Energy efficiency first". The technical and administrative capacity of the involved policy makers will be reinforced in order to facilitate the effective design, implementation, monitoring and evaluation of the energy efficiency measures through specialized trainings, sophisticated tools and materials.

Table 1: Sample of cross-cutting measures

Measures	NECP measures	Description	Expected savings, impact evaluation
Mandatory conduction of energy audits and development of	Yes	The measure will foresee the continuation of the mandatory development of energy management systems (EMS) and the carrying out of energy audits to the obligated parties for Energy Management System (e.g. big energy consumers from industrial and commercial sector, as well as public sector). The potential	Contribution to fulfilling the expected final energy

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energy management systems		expansion of the measure to additional designated parties will be scrutinized, including the application of Directive (EU) 2012/27 requirements in regards to the energy audits implementation. The aim of the measure is the identification of the most cost-effective energy efficiency interventions, while their financing will be aligned with the planned support scheme. In the following period, obligated EMS parties will be obliged to appoint the required number of energy managers and plan/implement measures to reduce energy consumption in accordance with the requirements set by the Government, as well as to report to the Ministry on the implemented measures. If necessary, in the coming period the regulatory framework for the implementation of the Energy Management System will be improved. In order to monitor the implementation of measures, the Ministry of Mining and Energy will ensure the operation of the necessary information systems. Finally, the appointment of energy managers will be mandatory for the public and municipal buildings, which will, among other duties, monitor final energy consumption, the identification of the most cost effective energy efficiency interventions, the surveillance of the implemented works for the energy renovation of the buildings and the development of energy management systems.	consumption levels
Strengthening the technical and administrative capacity of the involved policy makers	Yes	The measure will continually reinforce the technical and administrative capacity of the involved policy makers in order to facilitate the effective design, implementation, monitoring and evaluation of the energy efficiency measures. Specialized trainings will be organized and sophisticated tools and materials will be prepared, ensuring that the existing level of knowledge and the required skills have reached the satisfactory level. Training may include requirements for the preparation of project/technical documentation in order to increase the quality and the utilization of the projects for the deep renovation of the buildings, but also preparation of technical documentation and design brief for their implementation. Finally, tools will be further improved and, when needed, developed for monitoring the achievement of the established targets and the performance of the implemented policies and measures including the compliance with the “Energy Efficiency First” principle.	Contribution to fulfilling the expected final energy consumption levels
Updating, simplifying and optimizing the	Yes	The measure will examine the update, simplification and optimization of the existing authorization, certification, permit-granting and licensing procedures so as to become more	Contribution to the expected

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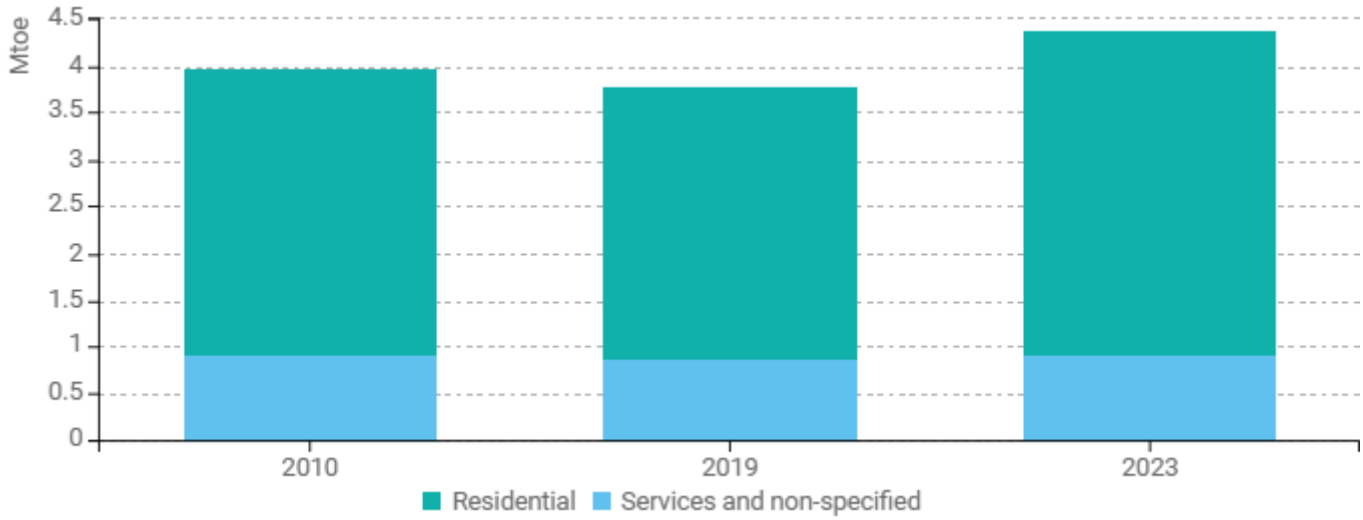
authorization, certification, permit-granting and licensing procedures - Establishment of One-stop shop		operational and to lead to the implementation of the required renewable energy stations for achieving the national targets, the active public participation, the effective protection of public interest, the smooth integration into the networks and the increased social acceptability. Moreover, the different entrepreneurial, environmental and social parameters will be combined and integrated in a fair and transparent framework. The main objective of the measure is to accelerate the completion and commercialization of the planned investments and to create reliable conditions for the potential investors in order to mobilize new investments. Finally, the potential establishment of a one-stop shop will be examined so as to provide the required information and technical guidance to the interested investors facilitating the realization of the planned investments (in accordance with Article 16 or RED II).	RES penetration for electricity production

Source: MURE

Buildings

When it comes to final energy consumption in buildings, the household and service sectors show different trends. Households recorded an increase in energy consumption from 3,056 Mtoe to 3,446 Mtoe, which corresponds to an increase of 13%. On the other hand, final energy consumption in the service sector remained almost unchanged, i.e. in 2023 an increase of only 2% was recorded compared to 2010. Consequently, the total increase of final energy consumption in buildings amounts to 9%.

Figure 5: Final energy consumption in buildings (with climatic corrections)



Source: ODYSSEE

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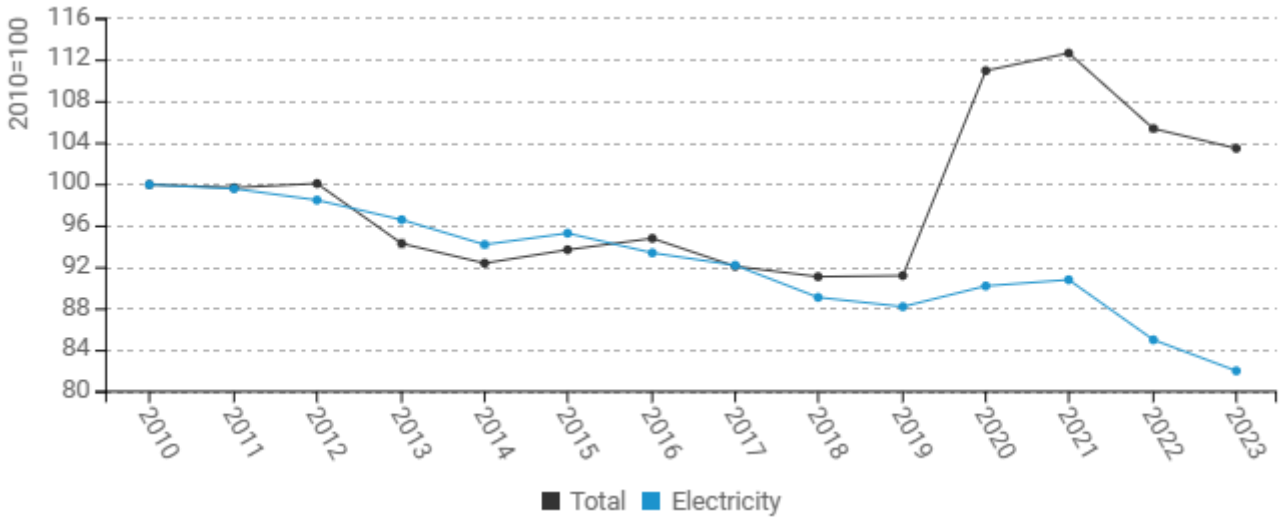
Household electricity consumption is in almost constant decline, at a rate of 1.5% per year, corresponding to a total decrease of 18% for the period 2010-2023. When looking at the total energy consumed in households, it shows a smaller increase, from 1,255 kWh/dw in 2010 to 1,303 kWh/dw in 2023, corresponding to an increase of 4%, but with a decrease of 7.3% recorded in the period 2020-2023.

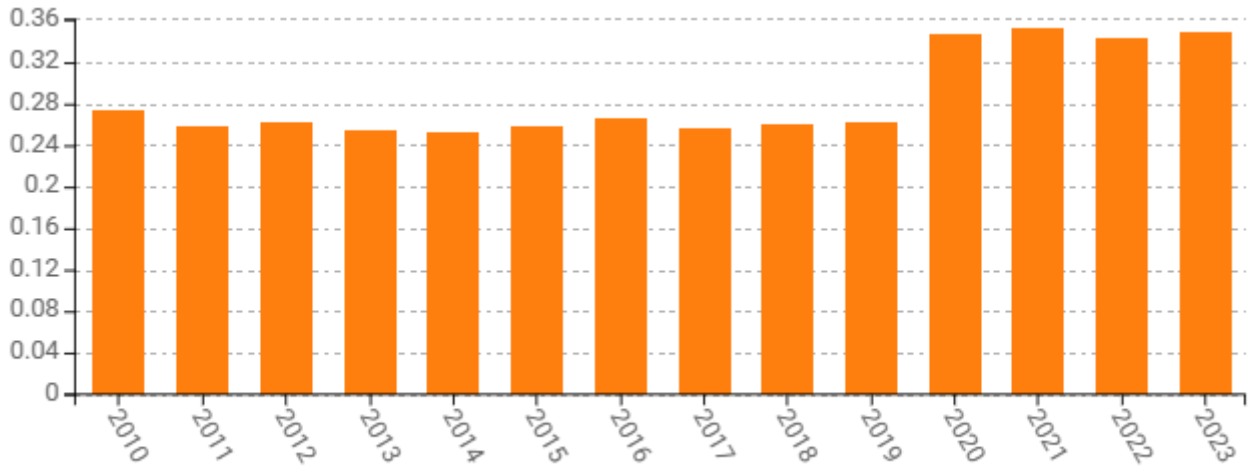
Figure 6: Energy and electricity consumption in households per dwelling (with climatic corrections)



Source: ODYSSEE

Household heating energy consumption increased from 0.274 toe/cap to 0.348 toe/cap, an increase of as much as 27%. However, two periods with relatively constant consumption are observed, one in 2010-2019 and the other in 2020-2023.

Figure 7: Energy consumption per capita for space heating in households (with climatic corrections)



Source: ODYSSEE

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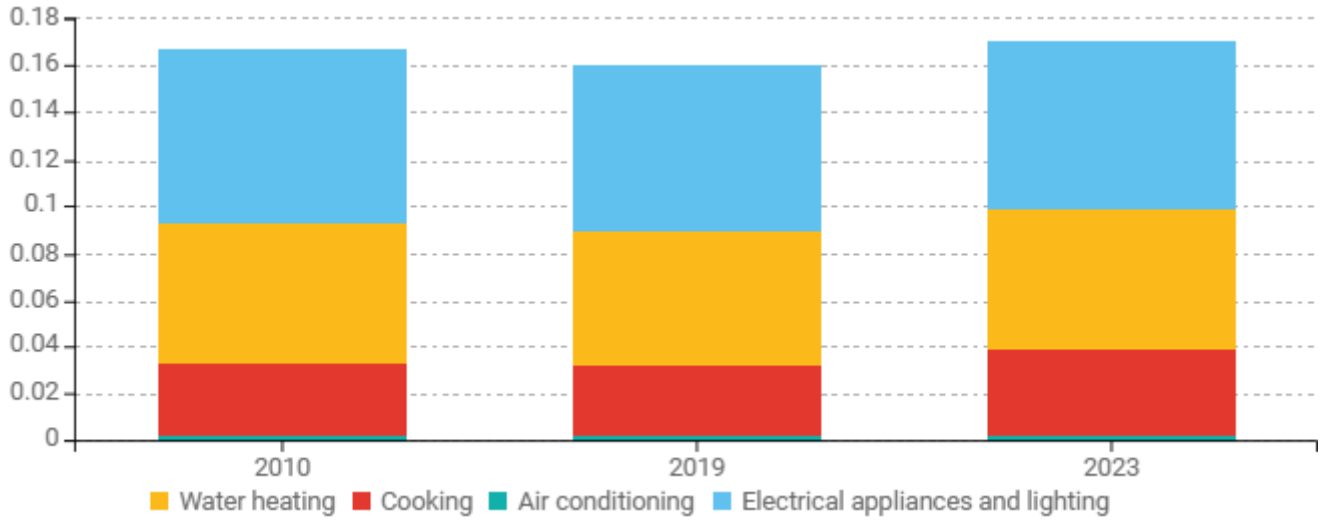
Except for cooking, which increased from 0.031 toe/cap in 2010 to 0.037 toe/cap in 2023, or 20%, all other energy uses in households remained almost constant (with a minimal decrease of 1% or 2%). When it comes to shares, the changes are also minor, so the largest share is still the use of electrical appliances and lighting at 42%, followed by water heating, whose share is 35%. The share of cooking is 22%, and of cooling 1%.

Figure 8: Energy consumption per capita by end-use in households (except space heating)



Source: ODYSSEE

A well-balanced mixture of policy measures, financing, fiscal and regulatory, will be implemented in order to support the energy renovation of the building stock and to attain the specified renovation rate. All the planned measures will be systematized in the Long-Term Strategy for Encouraging Investment in the Renovation of the National Buildings Fund of the Republic of Serbia until 2050, and are intended for residential and non-residential buildings, both public and private. Financial support will be provided for fostering the improvement of energy performance and energy modernization of residential and non-residential buildings. Further, the consistency and compliance of the legislative framework with the provisions of the Directive 2018/844/EU, respectively EPBD 2010/31/EU will be ensured, whereby the minimum requirements will be incorporated in the Energy Performance of Building Directive in order to increase the number of near-zero energy buildings. The inspections of the heating and air conditioning systems will be conducted according to the respective provisions. Finally, the role of the Energy Performance Building Certificates will be enhanced aiming at their transformation into renovation passports so as to be fully aligned with the provisions of the revised Directive 2018/844/EU and to facilitate the implementation of the most cost-effective interventions.

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Table 2: Sample of policies and measures implemented in the building sector

Measures	NECP measures	Description	Expected savings, impact evaluation
Installation of solar thermal systems in new buildings and in buildings undergoing extensive energy renovation (Households)	Yes	The measure will facilitate the installation of solar thermal systems in new buildings and those undergoing major renovation, as defined in Directive 2010/31/EU, facilitating simultaneously the further deployment of renewable energy. The planned measure will also be used to combat energy poverty.	1.8 GW capacity of solar thermal systems (primary energy savings 41 ktoe)
Energy renovation of residential, multi-family buildings connected to a district heating system	No	The project aims to improve energy efficiency in multi-family residential buildings connected to district heating systems and transition to billing based on heat consumption. The EBRD plans to provide grants for further development of the Project, preparation of energy efficiency reports and relevant studies, financing of supervision over the execution of works, and assistance in implementation.	A reduction in primary energy consumption of 81 GWh per year is expected, as well as a reduction in CO2 emissions of 20,000 t per year.
Energy efficiency in central government buildings	No	The Ministry of Mining and Energy has launched the project "Energy Efficiency in Central Government Buildings" with the aim of implementing the energy renovation of central government buildings. The Project includes improving the energy efficiency of 26 out of a total of 56 central government buildings. In these central government buildings, energy renovation will be carried out through the reconstruction of the thermal envelope (replacement of joinery and installation of insulation), reconstruction of the heating system, reconstruction of the cooling and ventilation system in buildings where it exists, as well as the installation of	At the level of the entire project, annual energy savings of 22 GWh are expected, with an annual reduction in

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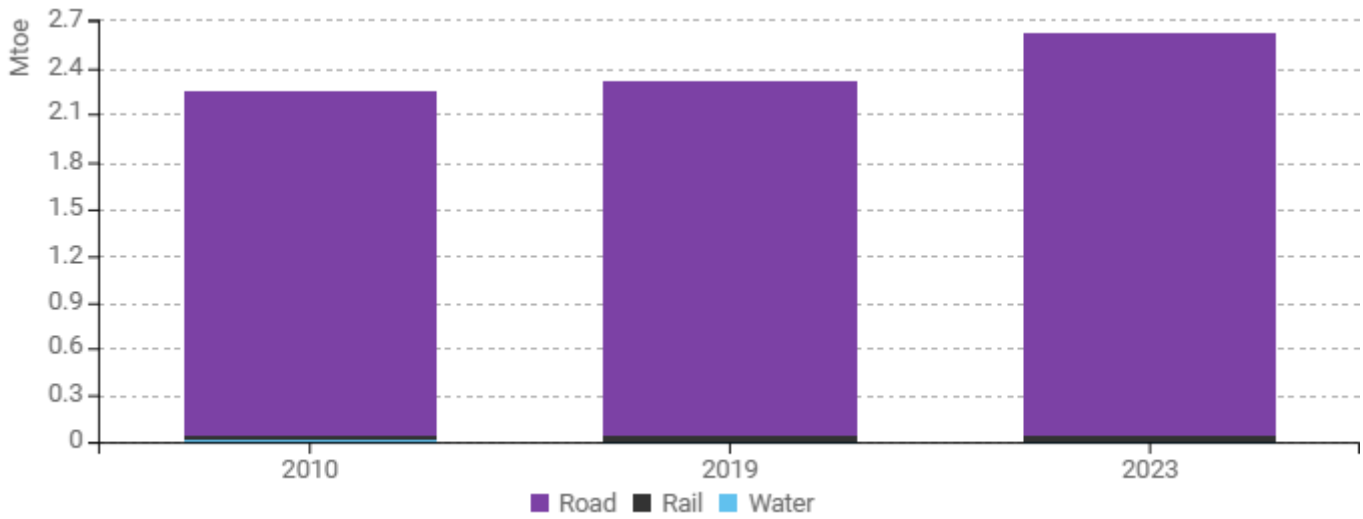
		energy-efficient interior lighting, which will achieve energy savings in these buildings of about 30%.	CO2 emissions of 7,350 tons.

Source: MURE

Transport

The transport sector is dominated by road transport, covering 98% of total consumption in 2023 (which is identical to year 2010). The consumption of rail transport has increased by 41% during this period, but it still accounts for only 2% of consumption. Domestic air traffic does not exist in the Republic of Serbia.

Figure 9: Transport energy consumption by mode



Source: ODYSSEE

The promotion of energy efficient vehicles through the provision of specific tax advantages will be the main instrument for increasing energy efficiency in the transport sector. In the case that the fiscal measures are not sufficient to the fulfilment of the established targets, financial incentives will be provided to end-users so as to foster considerably the replacement of the conventional vehicles with new energy efficient ones. Priority will be given on the promotion of energy efficiency of the freight transport with initiatives, such as the replacement of the vehicle fleets and the facilitation of the modal shift to other means of transport. Furthermore, the promotion of alternative fuels will be supported with the development of the required infrastructure for all the promoted types of alternative fuels maximizing the synergies with the policy measures, which have been integrated into the RES dimension.

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Table 3: Sample of policies and measures implemented in the transport sector

Measures	NECP measures	Description	Expected savings, impact evaluation
Promotion of energy efficiency of the freight transport	Yes	The measure will foster the promotion of energy efficiency of the freight transport with various initiatives, such as the replacement of the conventional light-duty and heavy-duty vehicles with new more energy efficient and the facilitation of the freight transport through specialized taxation measures. A specialized action plan will be prepared identifying the most effective activities, while special focus will be given on how the logistics sector will become more sustainable.	21.1 thousand electric LD vehicles (final energy savings 25 ktoe)
Promotion of energy efficiency in rail transport	Yes	The measure will target to the modernization and extension of the existing railway infrastructure through the provision of either financial, fiscal or regulatory measures. The improvement of the existing railway network and the construction of new railways will be carried out, along with the electrification railway network in parts that it is feasible to be accomplished. New energy efficient trains will be purchased substituting the conventional ones. Moreover, the rail network will be connected to production centres and ports, while smart digital systems for rail traffic management will be installed. With regards to the promotion of modal shift, the use of forms of mass transport by railway will be developed and encouraged, both in intercity and in the area of centres and their metropolitan areas, by developing the city-suburban railway system, in such a way that work, business and mixed zones are accommodated in the planning documents near the railway, and that the railway traffic synchronizes and integrates with other types of traffic into the public transport system.	Contribution to fulfilling the expected final energy consumption levels in transport sector
Supplementary actions for the promotion of energy efficiency in transport sector	Yes	Measure will foresee existing various measures for the promotion of energy efficient tires for all types of vehicles such as the promotion of energy efficient tires and lubricants, the regular technical inspections of vehicles in compliance with specific quality requirements, the promotion of fuel additives, the establishment of a framework for fuel labeling and fuel quality monitoring.	Contribution to fulfilling the expected final energy consumption levels in

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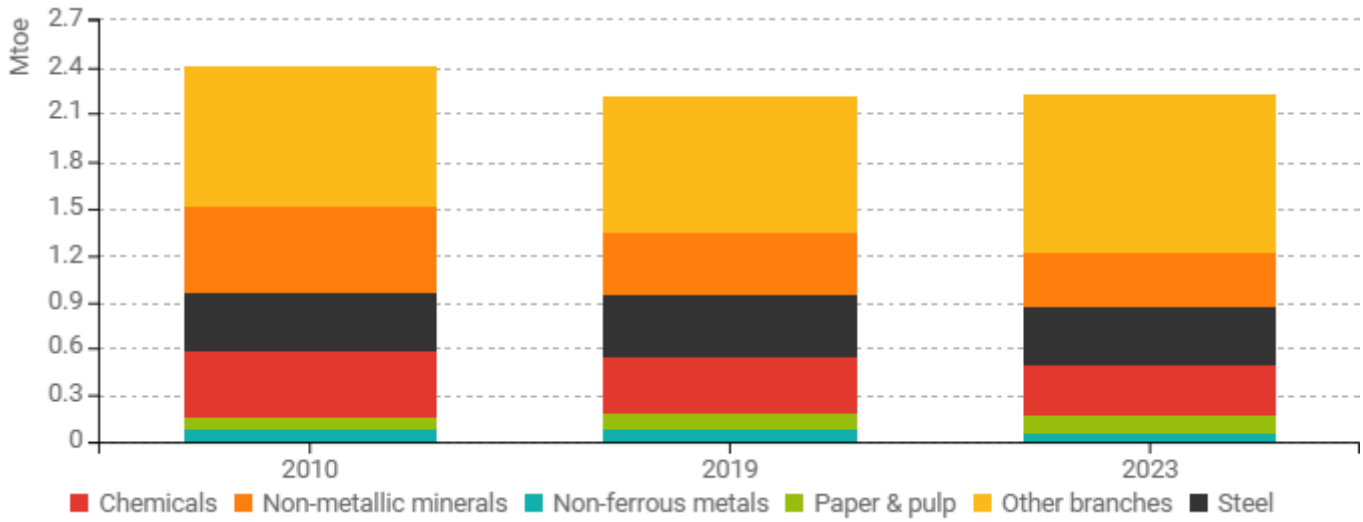
			transport sector

Source: MURE

Industry

Final energy consumption in the industrial sector in 2023 amounted to 2.2 Mtoe (8% less than in 2010). Most of this consumption in 2023 was concentrated in four branches of industry: steel industry (17% of total energy consumption in industry), industry of non-metallic mineral products (15%), chemical industry (14%) and industry of paper and pulp (5%). The largest change in individual shares was recorded in industry of non-metallic mineral products - the share decreased by 7.5 points. On the other hand, other branches of industry have overall increased their share by 8 points.

Figure 10: Final energy consumption of industry by branch



Source: ODYSSEE

Support schemes will be designed for the implementation of energy efficiency projects in the industrial sector by combining various financial instruments, such as direct financial support, low interest loans, tax deductions, credit lines and guarantees. Various supplementary actions will be implemented through the provision of financial and fiscal incentives in order to promote energy efficiency in industrial sector. The further exploitation of renewables for electricity, heating and cooling production and the promotion of other alternative fuels will contribute to the improvement of energy efficiency.

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Table 4: Sample of policies and measures implemented in the industry sector

Measures	NECP measures	Description	Expected savings, impact evaluation
Promotion of measures for improving energy efficiency in electricity infrastructure	Yes	The measure will promote measures for increasing the energy efficiency of the electricity infrastructures, which will be conducted by the respective operators within the framework of their development programs. Targeted technical measures will be initiated for reducing the losses in transmission and distribution network, load management, improving the network interoperability and facilitating the penetration of decentralized electricity generation installations. Electricity infrastructure operators will be obliged to prepare reports on annual basis describing analytically the actions performed, while the required measures and investments will be specified for the materialization of the most cost-effective energy efficiency interventions in the network infrastructure including a timetable for their implementation. Moreover, incentives will be given on electricity transmission and distribution network operators in order to have a higher return on the invested capital if they attain specific energy efficiency targets. Obviously, in the case that the energy efficiency targets will not be achieved a reduction to the return on the invested capital must be foreseen. Moreover, the energy efficiency first principle will be used for taking the most effective decision in regards to the design and operation of the energy transmission and distribution networks contributing meaningfully to the fulfillment of the established energy efficiency targets.	Reduction of the losses equal to 3.7% and 5.6% in 2030 compared to 2023 in the transmission and distribution network, respectively.
Regulatory measures for the promotion of energy efficiency in industrial sector	Yes	Measure will facilitate the further deployment of the best available technologies in compliance with the respective legislation (Industrial Emission Directive), while the development of the appropriate monitoring and surveillance mechanism will be considered as a vital prerequisite for the implementation of the measure. Moreover, the application of the eco-design requirements will ensure the penetration of energy efficient technologies and equipment. The measure must be in correlation with "Mandatory conduction of energy audits and development of energy management systems".	Contribution to fulfilling the expected final energy consumption levels in the industrial sector

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Support schemes for the promotion of energy efficiency in the industrial sector	Yes	The measure will initiate a targeted support scheme for the implementation of energy efficiency projects in industrial sector combining various financial and fiscal instruments, such as direct financial support, low-interest loans, tax deductions, credit lines and guarantees. The implementation of the Measure is linked also with measure "Mandatory conduction of energy audits and development of energy management systems", which foresees the mandatory conduction of energy audits and development of energy management systems in order to identify the most cost-effective energy efficiency interventions for being supported economically.	Contribution to fulfilling the expected final energy consumption levels in the industrial sector

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