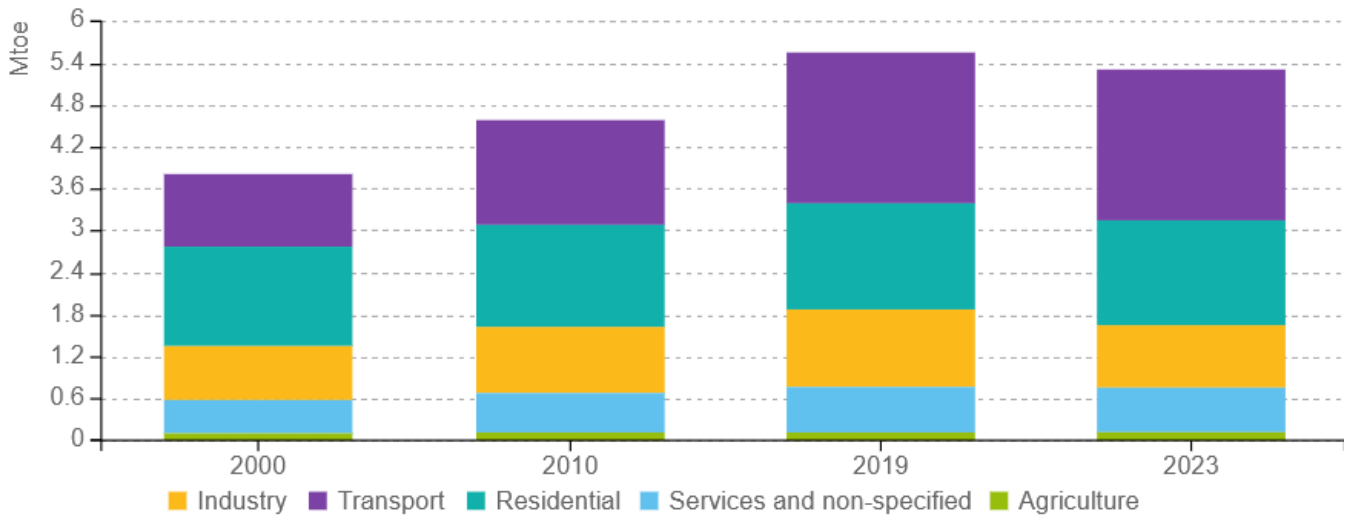
Energy efficiency trends and policies

Overview

In 2023, the final energy consumption (with climatic correction) in Lithuania was 5.3 Mtoe. It has been increasing during 2010-2023 by 1.1% per year. Transport, the largest consuming sector, has recorded a 7.9 percentage points increase in its share in total final energy consumption since 2010, from 32.7% to 40.6% in 2023. Over the same period, the residential sector decreased by 3.6 percentage points (from 31.9% to 28.3%), and industry decreased by 3.8 percentage points (from 20.7% to 16.9%), while service kept a steady share around 12%. The building sector, comprising residential and services sectors, accounted for 40.3% of final energy consumption in 2023 (see Figure 1).

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



Source: ODYSSEE

Energy efficiency for final consumers, as measured by ODEX, improved by an average of 1.6% per year from 2010 to 2023 (see Figure 2). Over 2010-2023, the largest gains of energy efficiency progress were in the industry (4.1% per year). In the transport sector, energy efficiency improvements have been improving at a steady pace of 0.6% per year. In the residential sector, due to the old building renovation process, energy efficiency improvements were about 1.8% per year. In the service sector, the energy efficiency improvements have been steady (0.5% per year).

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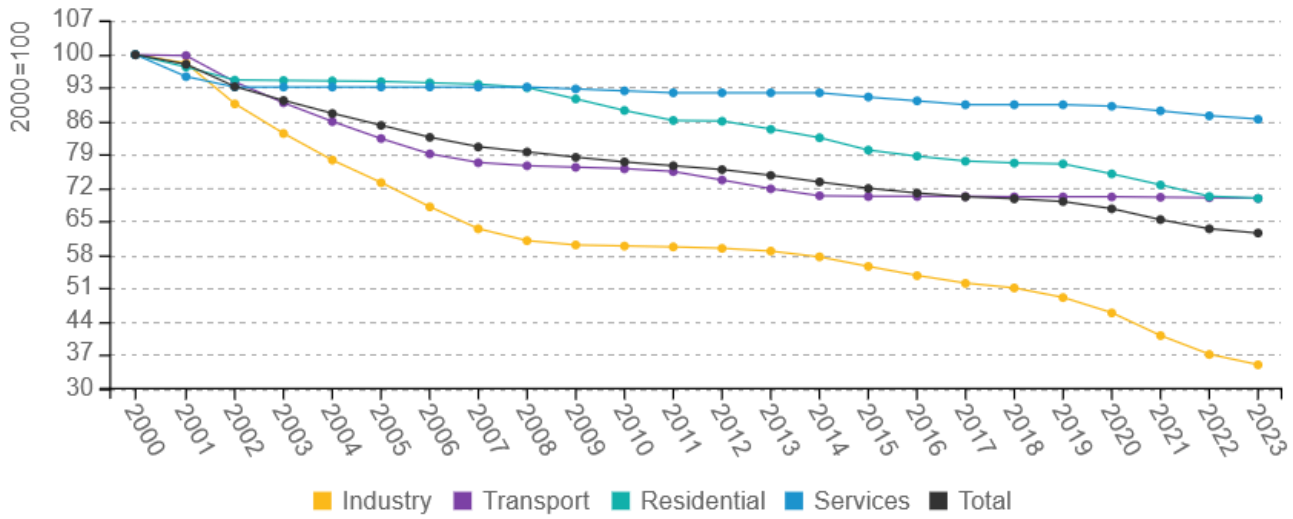
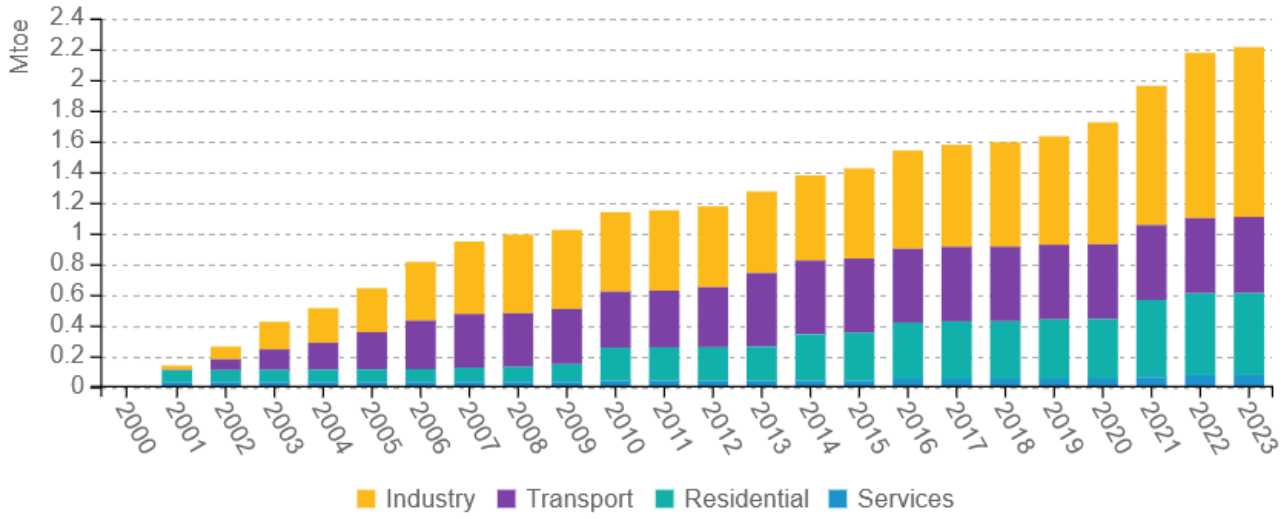
Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE

Energy savings are mainly to be found in the industry sector (1.1 Mtoe in 2023 since 2000). The residential sector and transport come second (0.5 Mtoe in 2023). The services sector saved far less energy (0.1 Mtoe in 2023). The energy price increases following Russia's invasion of Ukraine could explain some of the savings increase observed in all sectors in 2022 (see Figure 3).

Figure 3: Energy savings by sector



Source: Odyssee

Total energy supply remained the same (6.98 Mtoe) between 2010 and 2023 (see Figure 4). The increase in the final energy consumption (0.46 Mtoe) and non-energy use (0.01 Mtoe) was compensated by a reduction in the consumption of the power sector (0.41 Mtoe) and other transformations (0.06 Mtoe). A reduction in the consumption of the power sector was driven by changes in the power mix. The share of electricity generation

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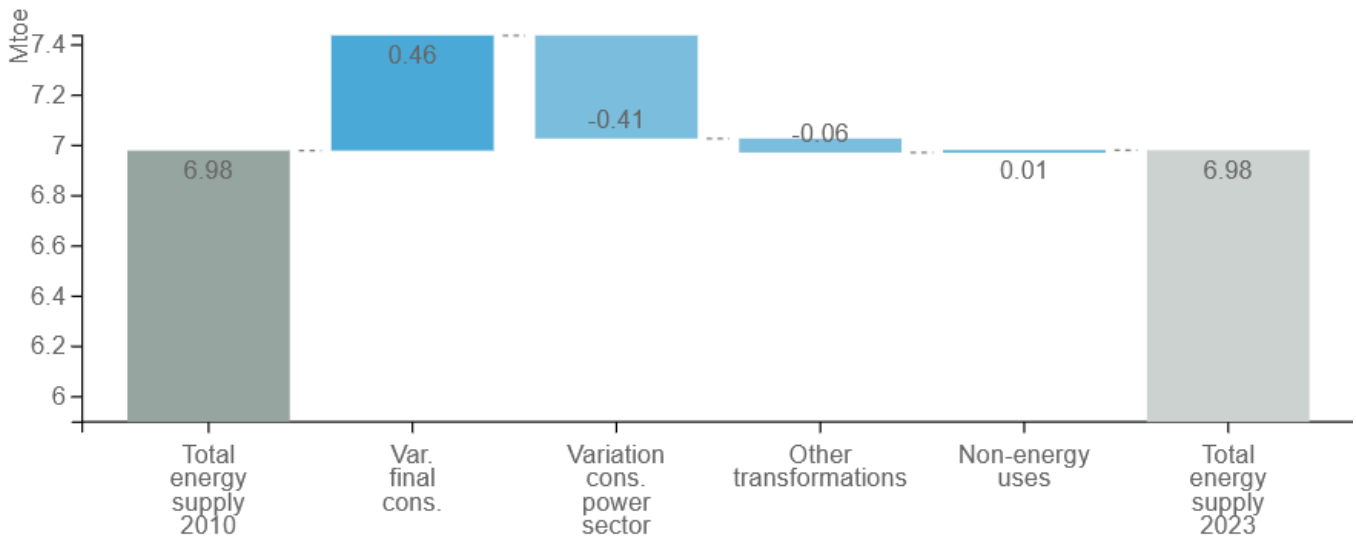
from renewable energy sources increased to 74.2% in the country's total electricity generation in 2023. It was dominated by wind and solar energy.

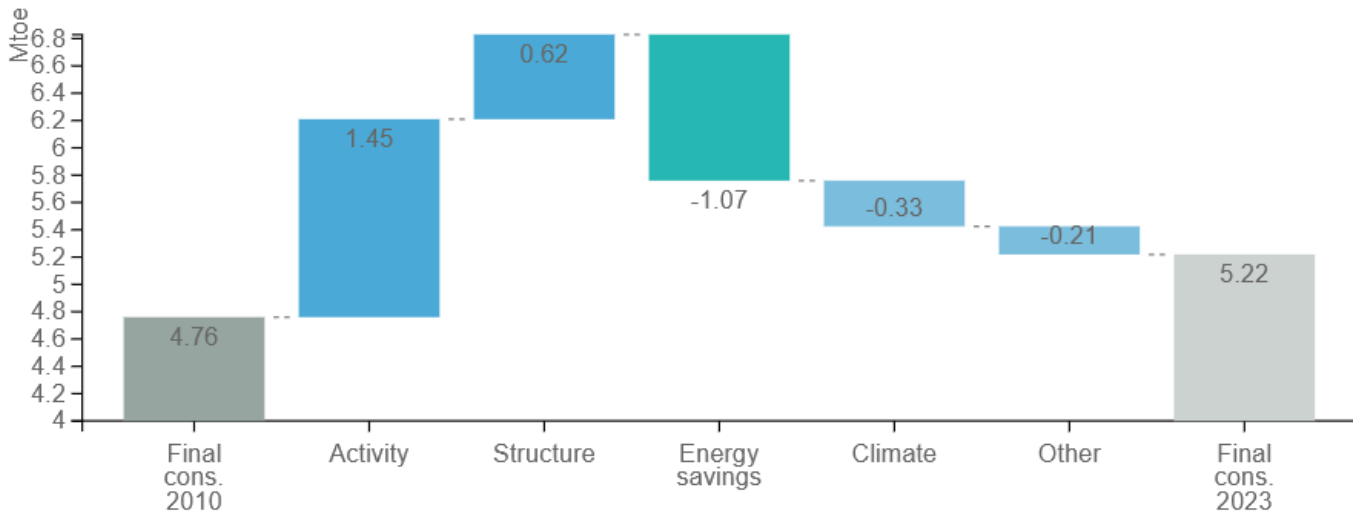
Figure 4: Main drivers of the total energy supply variation



Source: Odyssee

From 2010 to 2023, total final energy consumption in Lithuania increased by 0.46 Mtoe (from 4.76 to 5.22 Mtoe) (see Figure 5). The increase was mainly determined by the activity growth (1.45 Mtoe) and structural changes (0.62 Mtoe). These increases were not compensated by technical energy savings (1.07 Mtoe), climate changes (0.33 Mtoe), and other effects (0.21 Mtoe). Therefore, the total final energy consumption was 10.0% higher in 2023 than in 2010.

Figure 5: Main drivers of the final energy consumption variation



Source: Odyssee

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The Law on Energy Efficiency in Lithuania sets mandatory national energy efficiency targets. During 2021-2030 to save amounts of energy each year that correspond to 0.8% of the average final energy consumed during 2016-2018. Such amounts of energy must be saved every year from 2031 until 2050, except in the case that the long-term energy and climate goals of the European Union for 2050 will be achieved earlier. The Law ensures that in 2030, the primary energy consumption is no more than 5,462 ktoe, the final energy consumption is no more than 4,526 ktoe, and the total amount of energy saved by energy efficiency improvement measures is no less than 27,280 GWh in Lithuania. The National Energy Independence Strategy (NEIS) (2024) is the leading energy policy document, which sets the main strategic goals for Lithuanian energy sector development and their implementation directions up to 2050. The targeted indicator of energy efficiency is final energy consumption not exceeding 51 TWh in 2030, 46 TWh in 2040 and 42 TWh in 2050 in Lithuania. The main directions for achieving the goal of increasing energy efficiency are 1) to promote complex renovation of multi-apartment residential and public buildings; 2) to increase the efficiency of energy consumption by developing a high value-added created and energy-efficient industries; and 3) to promote the electrification of transport, especially of heavy-duty road vehicles, the use of electric cars and their charging infrastructure development. Lithuania prepared the National Energy and Climate Action Plan (NECP of 2024). Within the Dimension of Energy Efficiency, it is assumed to implement existing and planned policy measures. The cumulative energy savings target for 2030 will be achieved with 48.52 TWh from existing energy efficiency measures and a further 8.43 TWh from planned energy savings.

Table 1: Sample of cross-cutting measures

Measures	NECP measures	Description	Expected savings, impact evaluation
EU related: Energy Efficiency Directive (2012/27/EC) - Law on the Energy Efficiency	No	The purpose of the Law on Energy Efficiency is to ensure more economical energy consumption in all areas of the Lithuanian economy, in accordance with the obligations of the Republic of Lithuania to increase energy efficiency established in the legal acts of the European Union, and to create preconditions for efficient production, supply, and consumption.	
EU-related: Recast Ecodesign Directive for Energy-related Products (Directive 2009/125/EC) - Requirements for ecodesign for energy related	No	It establishes a framework for setting ecodesign requirements for energy-related products with a view to ensure the free movement of products within the internal market of the European Community.	

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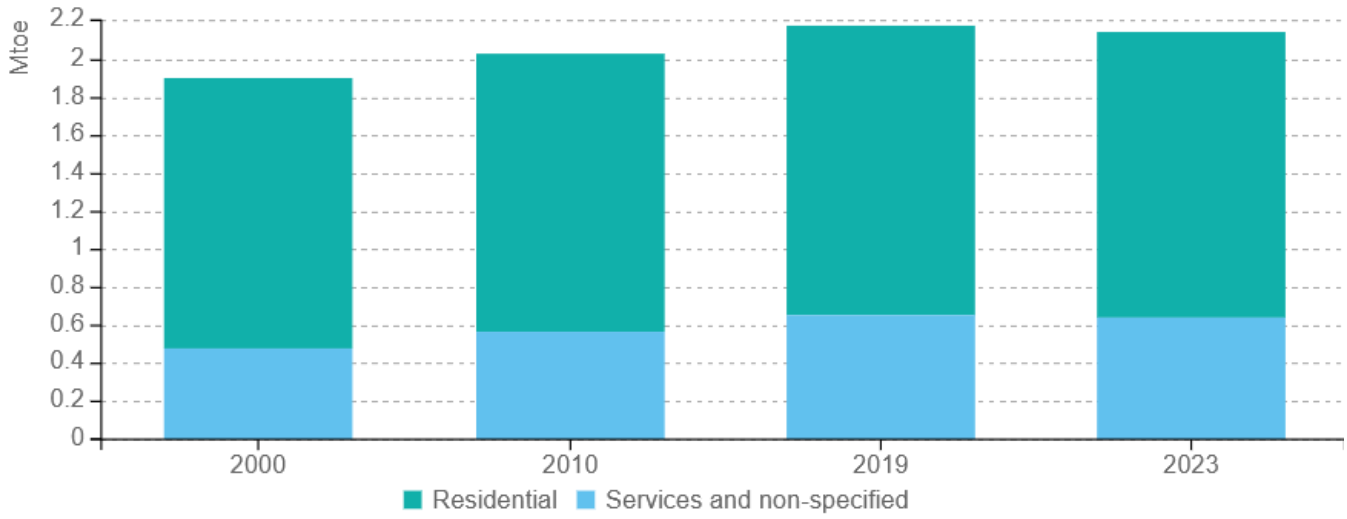
products			
National Energy Independency Strategy	No	Lithuania's energy vision for 2050 is a country that produces and exports energy for its own needs and has created an energy industry that is climate-neutral and creates high added value.	

Source: MURE

Buildings

The final energy consumption of buildings (with climatic corrections) increased by 5.6% between 2010 and 2023 (see Figure 6). In residential buildings, which consume more energy than services, the final energy consumption grew by 0.2% per year, while in the services sector by 0.9% per year.

Figure 6: Final energy consumption in buildings (with climatic corrections)



Source: Odyssee

Among household end-uses, space heating is the main energy consumer, with a share of 68% in 2023 (see Figure 7). This is followed by electrical appliances and lighting (13%), water heating (11%), and cooking (8%). Between 2010 and 2023, energy consumption for cooking increased most rapidly, by 1.8% per year, while that for electrical appliances increased by 0.7%.

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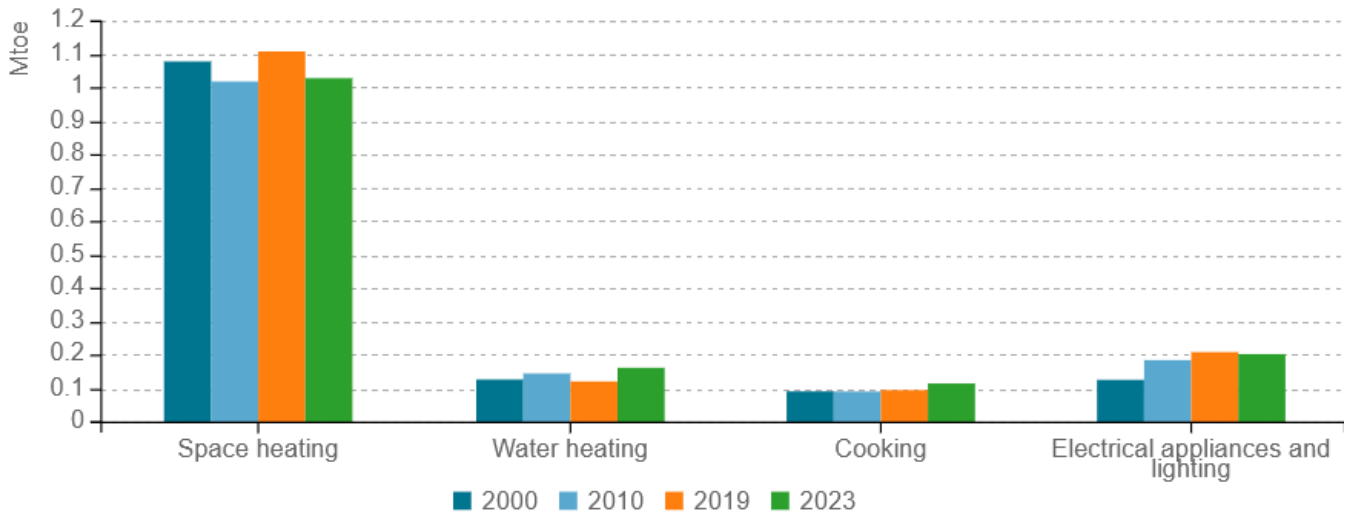
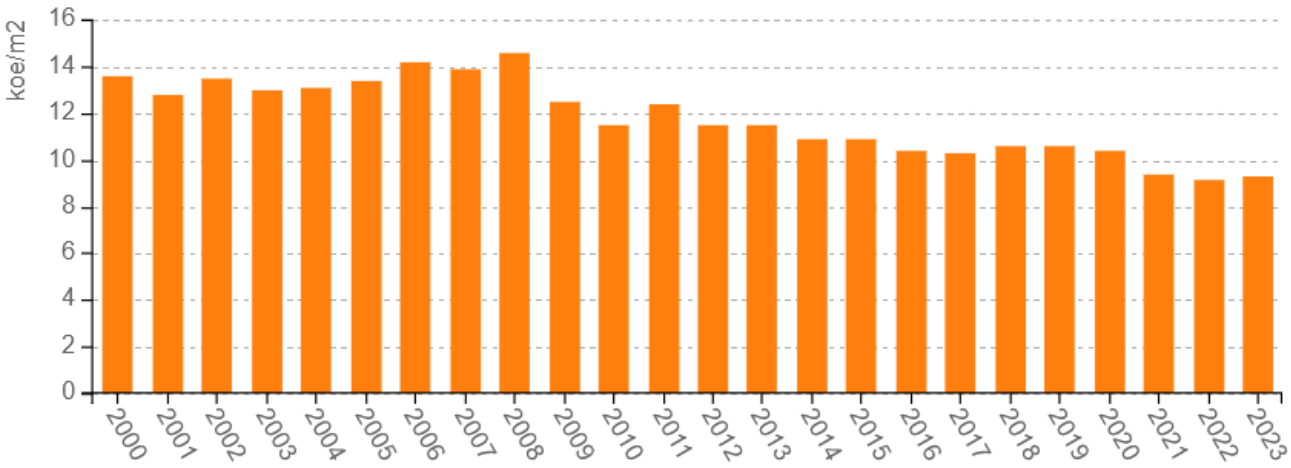
Figure 7: Energy consumption by end-use of households (with climatic corrections)



Source: Odyssee

In 2023, the space heating consumption per m2 (with climatic corrections) was 9.3 koe. This is a decrease of almost 20% compared to 2010, when the average space heating was 11.5 koe/m2. The decrease in space heating consumption per m2 indicates that average energy efficiency has improved by 1.6% per year (see Figure 8).

Figure 8: Energy consumption of household space heating per m2 (with climatic corrections)



Source: ODYSSEE

Between 2010 and 2023, a decline in the energy consumption per dwelling was observed for all other end-uses, except energy consumption for cooking. Electrical appliances and lighting show the best improvement with a reduction of 0.5% per year, followed by water heating (0.3% per year). Energy consumption for cooking increased by 0.6% per year.

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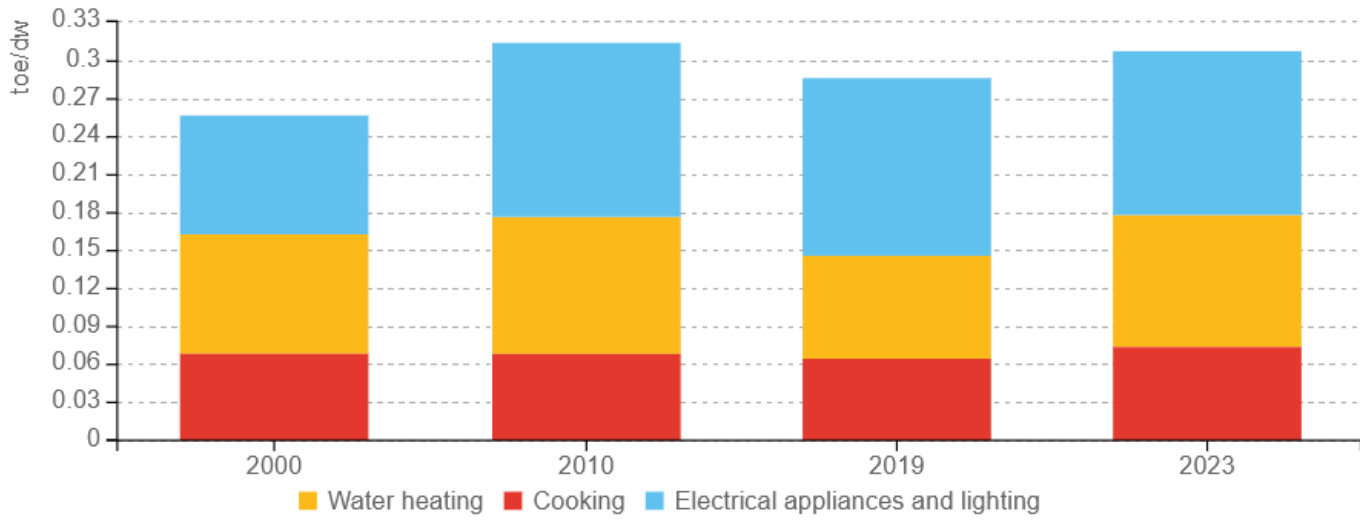
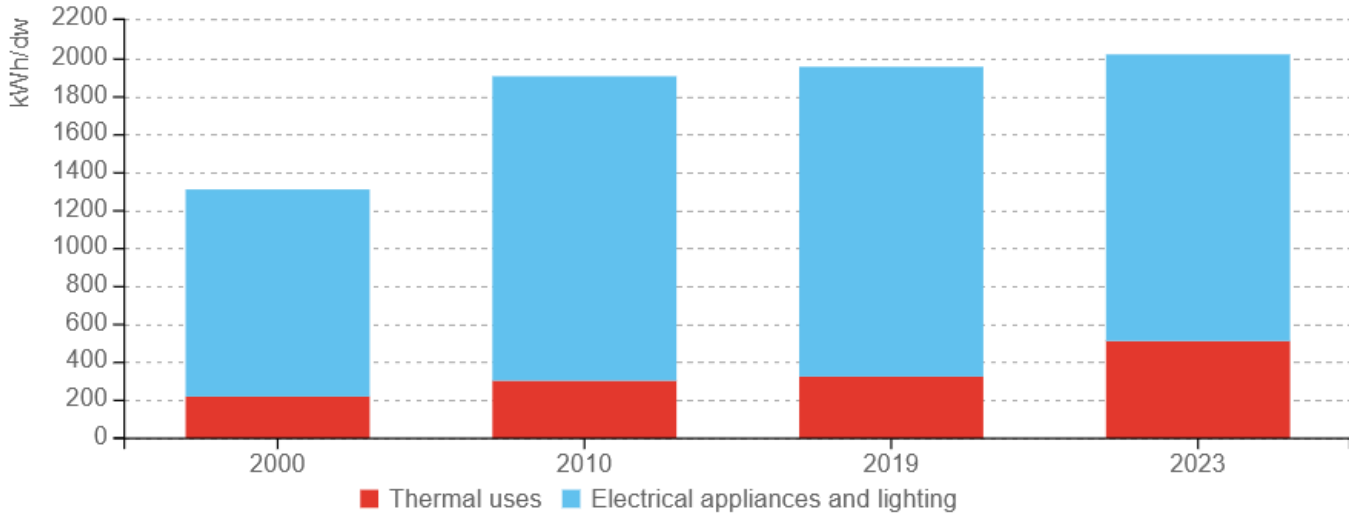
Figure 9: Energy consumption per dwelling by end-use (except space heating)



Source: ODYSSEE

Between 2010 and 2023, electricity consumption per dwelling increased by 0.4% annually (see Figure 10). The increasing number and variety of electrical appliances in homes is leading to a rise in electricity consumption. In 2023, electricity is mainly used in electrical appliances and lighting, which account for 75% of the total electricity consumption in dwellings.

Figure 10: Electricity consumption per dwelling by end-use (with climatic corrections)



Source: Odyssee

The final energy consumption of residential buildings in 2023 was lower by 10% in comparison to 2010 (1.43 Mtoe vs. 1.59 Mtoe). Three drivers contributed to increase energy consumption over the period: more dwellings (0.23 Mtoe), larger homes (0.12 Mtoe), and more appliances per dwelling (0.05 Mtoe). However, the effect of these drivers was more than offset by energy savings (0.32 Mtoe) and climate (0.24 Mtoe).

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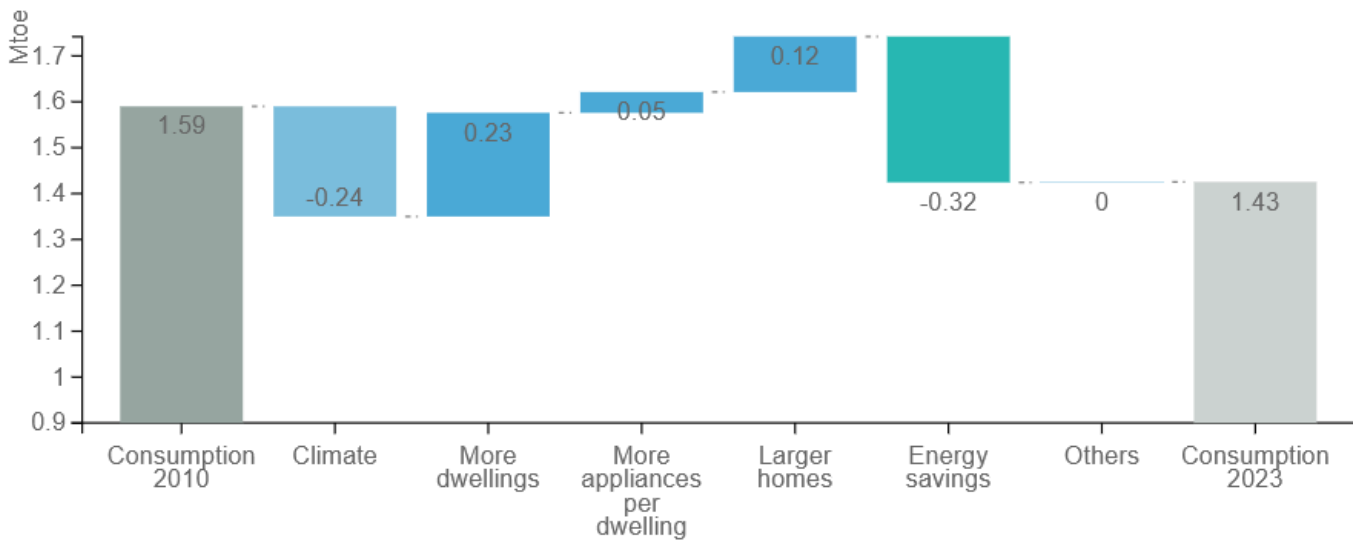
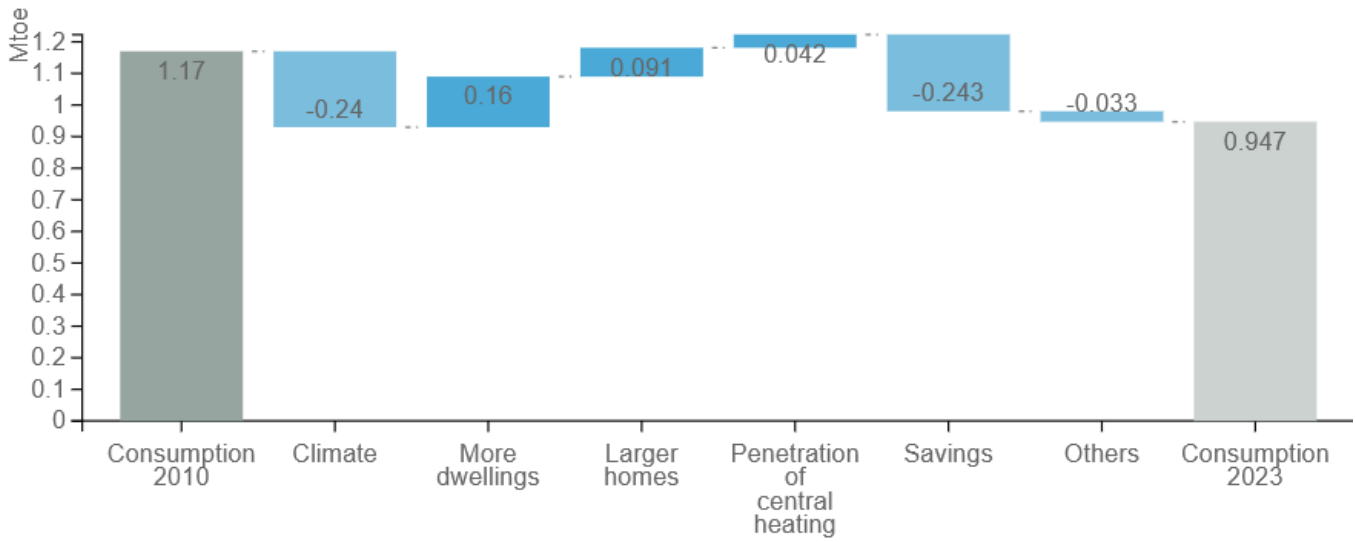
Figure 11: Main drivers of the energy consumption variation in households



Source: ODYSSEE

The space heating consumption was lower in 2023 than in 2010 (0.947 Mtoe vs.1.17 Mtoe). While the more dwelling (0.16 Mtoe), large homes (0.09 Mtoe) and penetration of central heating (0.04 Mtoe) pushed it upward, savings (0.24 Mtoe), climate (0.24 Mtoe) and other drivers (0.03 Mtoe) pushed it downward. The energy price crisis in 2022 played a role in this consumption reduction as well.

Figure 12: Main drivers of the space heating consumption variation of households



Source: Odyssee

The total energy consumption per employee has been decreasing by 0.7% per year since 2010. In 2023, the electricity consumption per employee was almost at the level of 2010. This can be explained by the proliferation

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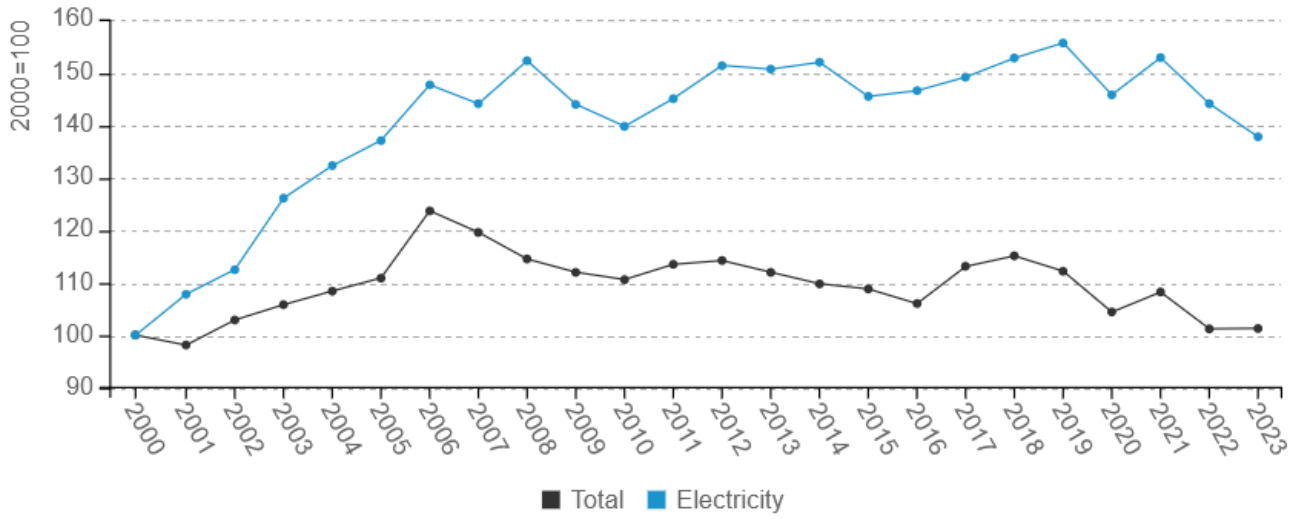
of IT and electrical equipment in offices, which eventually reached saturation point and was offset by increased efficiency.

Figure 13: Energy and electricity consumption per employee in services (with climatic corrections)



Source: ODYSSEE

With the aim of increasing energy efficiency, Lithuania implements programmes and measures in building sector. In the framework of Programme for Renovation of Multifamily Buildings, soft loans (3% for 20 years, linear payment method) are provided to owners, while financial measures are given for the modernization of public buildings of Programme for Public buildings, Renovation of Public Buildings at National and Regional Levels, Modernization Programme for High Schools and Vocational Training Dormitories, Modernization Programme for Buildings of Educational Institutions Reducing Energy Consumption Costs, Climate Change Programme, Programme for Ignalina Public Buildings, Projects for Municipality Public Buildings. Financial resources from the State, municipal budgets, EU Structural Funds and others are used to upgrade buildings.

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

Measures	NECP measures	Description	Expected savings, impact evaluation
Programme for the renovation/upgrading of multi-apartment buildings	Yes	The purpose of the Program is to promote owners of multi-apartment houses, which were built in accordance with the technical standards of the building valid up to 1993, to renovate (upgrade) multi-family houses in order to increase their energy efficiency and to create conditions for doing so.	
Payment of credit taken for the	Yes	State support if the housing is renovated. If an apartment building is renovated or is being renovated according to an	

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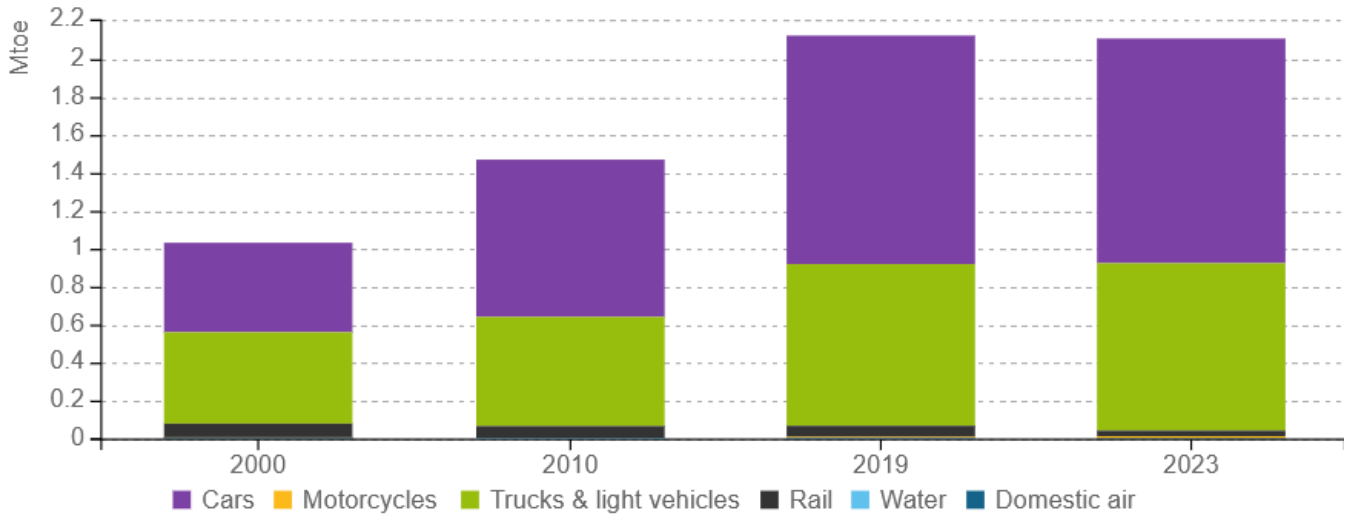
renovation of a multi-apartment building and related interest		apartment building renovation (modernization) project and people who are entitled to receive compensation for heating live in it, the credit and interest payments are fully paid to the homeowner	
Programme for Improving Energy Efficiency in Public Buildings	Yes	The aim is to increase the energy efficiency in public buildings.	

Source: MURE

Transport

In the transport sector, the final energy consumption increased from 1.47 Mtoe in 2010 to 2.11 Mtoe in 2023 (see Fig. 14). The road transport remains the main driver of energy consumption in transport. In 2023, road transport accounted for 98% of the sector's energy consumption. Between 2010 and 2023, the share of trucks and light vehicles in transport energy consumption increased from 39% to 42%. The share of rail consumption has decreased from 4% to 1% and the share of cars consumption remained the same (56%).

Figure 14: Transport energy consumption by mode



Source: ODYSSEE

Between 2010 and 2023, passenger traffic by car grew at an average annual rate of 0.5%, maintaining its dominance in the modal split. By 2023, cars accounted for 92% of inland passenger traffic. In contrast, rail passenger traffic experienced a stronger annual growth rate of 3.7%, though its share of inland passenger traffic remained modest at 1% in 2023. Meanwhile, bus traffic declined by an average of 0.3% per year, representing 7% of the inland passenger traffic by 2023.

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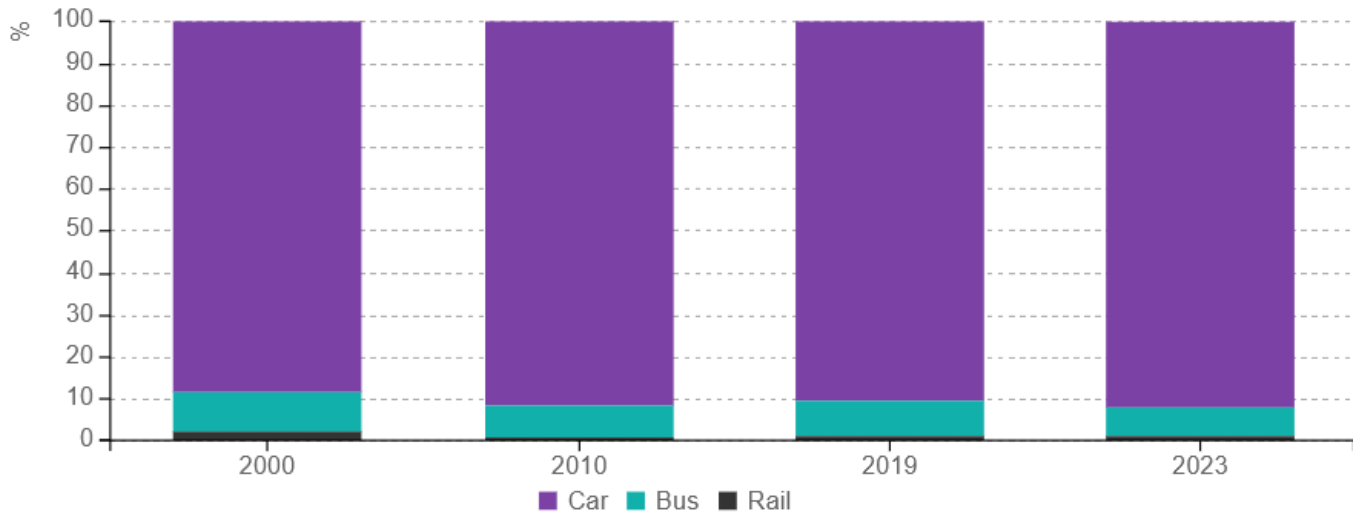
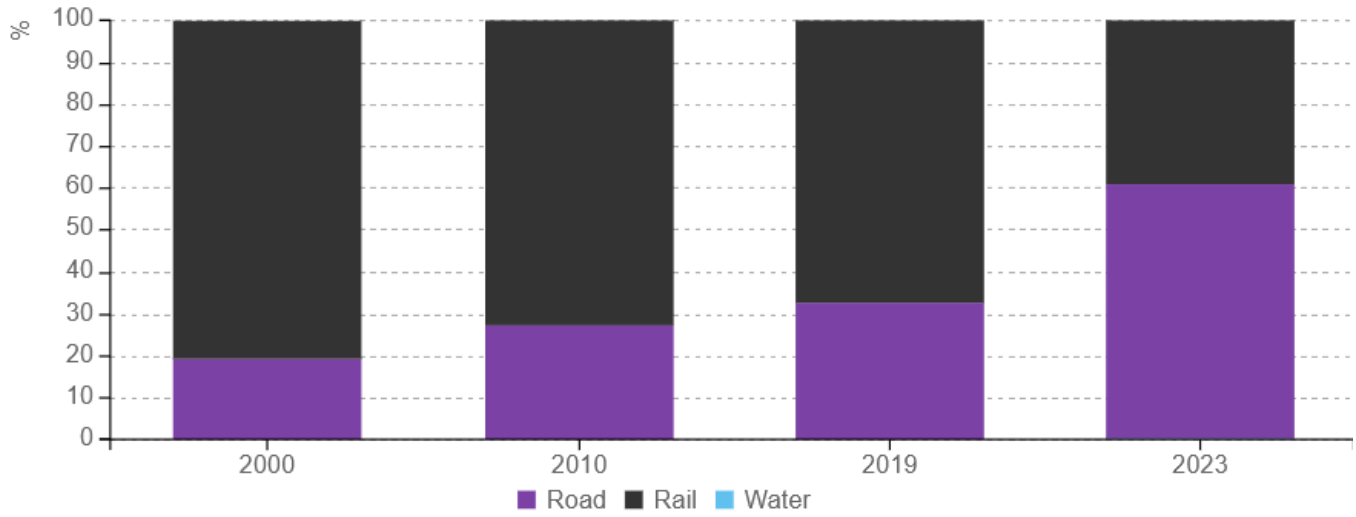
Figure 15: Modal split of inland passenger traffic



Source: ODYSSEE

The goods traffic (measured in tonne-kilometers, tkm) was about 13% lower in 2023 than in 2010, mostly due to a reduction of freight traffic by rail (2 times less). With the outbreak of war in Ukraine, the sanctions adopted by the EU prohibiting the transport of certain goods within the EU territory resulted in 50% decrease in freight transport volumes on the Lithuanian railway in 2022 compared to 2021. In 2023, road traffic accounted for 60.8%, rail traffic 39,1% and water 0.1% in freight transportation (see Figure 16).

Figure 16: Modal split of inland freight traffic



Source: ODYSSEE

Energy consumption of cars per passenger-kilometres (pkm) increased by 4.6% per year between 2010 and 2019, but has been declining by 2.8% per year since 2019 (see Fig. 17). Two main factors contribute to the reduction in

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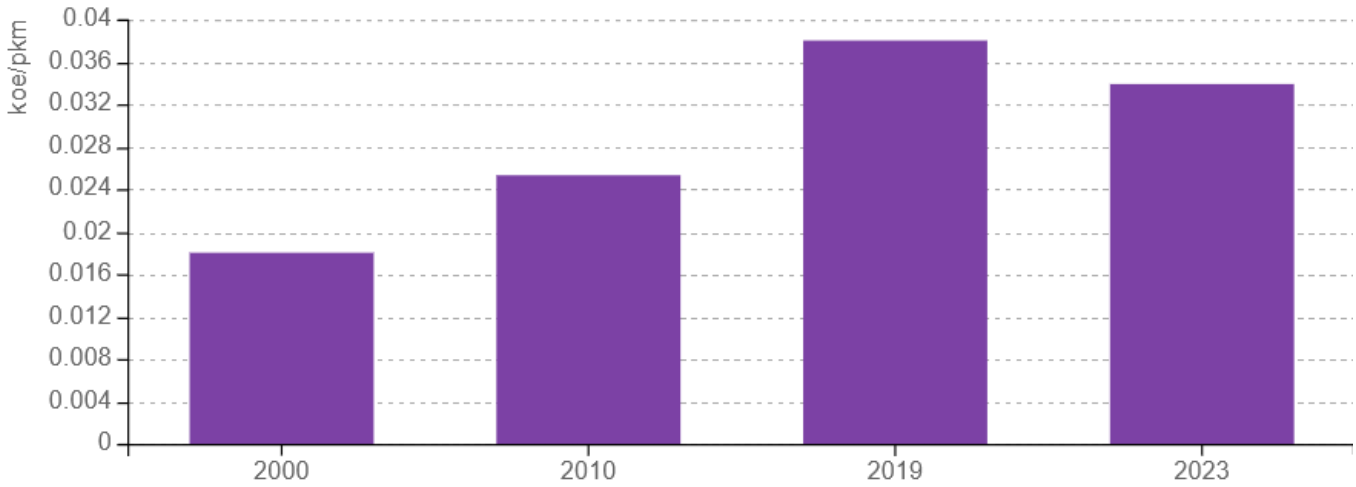
energy consumption: technological efficiency, driven by the renewal of the vehicle fleet and the use of alternative fuel vehicles, in particular hybrid and electric cars.

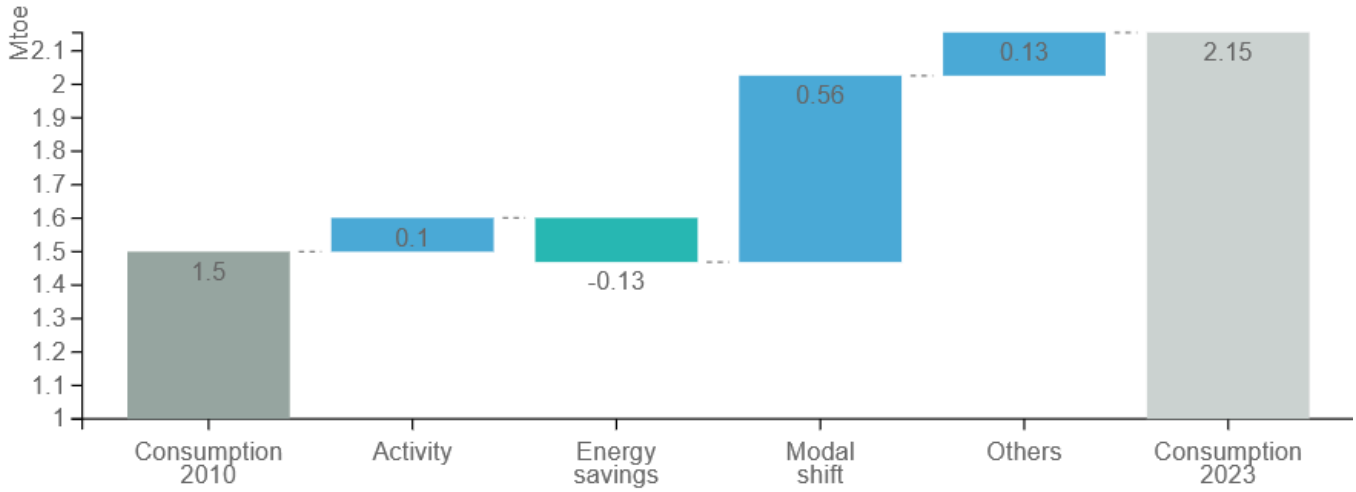
Figure 17: Energy consumption of cars per passenger-km



Source: ODYSSEE

The final energy consumption in the transport sector was 0.65 Mtoe higher in 2023 than in 2010. The split in modal shift, the growth in activity and other effects pushed up transport consumption (by 0.56 Mtoe, 0.1 Mtoe and 0.13 Mtoe respectively). This significant increase of energy consumption was not counterbalanced by energy savings (0.13 Mtoe).

Figure 18: Main drivers of the energy consumption variation in transport



Source: ODYSSEE

In the transport sector, measures are focused on the promotion of electric vehicle purchase and installation of related infrastructure, development of road infrastructure, upgrading of public transport fleets and

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informational/educational purposes like ecological driving or a day without a car. EU Structural funds, State budget funds and financial resources from the Special Programme for Climate Change are used. In addition, increased value added tax is applied to fuels and an excise tax on some types of fuels, including gasoline, LPG and diesel. Great attention is paid to the implementation of energy efficiency tasks in the transport sector to develop sustainable mobility in cities, to improve traffic safety, to implement intelligent transport systems, the introduction of more efficient means of transport, the development of environmentally friendly transport.

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

Measures	NECP measures	Description	Expected savings, impact evaluation
EU-related: Promotion of clean and energy-efficient road transport vehicles (Directive 2009/33/EC) - Purchase of efficient vehicles in public procurement procedures	Yes	All contracting authorities purchasing vehicles must take into account the energy and environmental effects of the vehicle service period and choose the most efficient vehicles	
EU related: Community framework for the taxation of energy products and electricity - Law on Excise Duty	Yes	This Law regulates the imposition of excise tax on certain goods.	
Promotion of electric vehicle purchases	Yes	Measure includes promotion of the purchase of pure electric vehicles (individual and corporate); promoting the purchase of zero-emission passenger cars in the public sector; replacing polluting public transport with electric vehicles as needed in remote rural areas; a ban on the registration of cars with internal	

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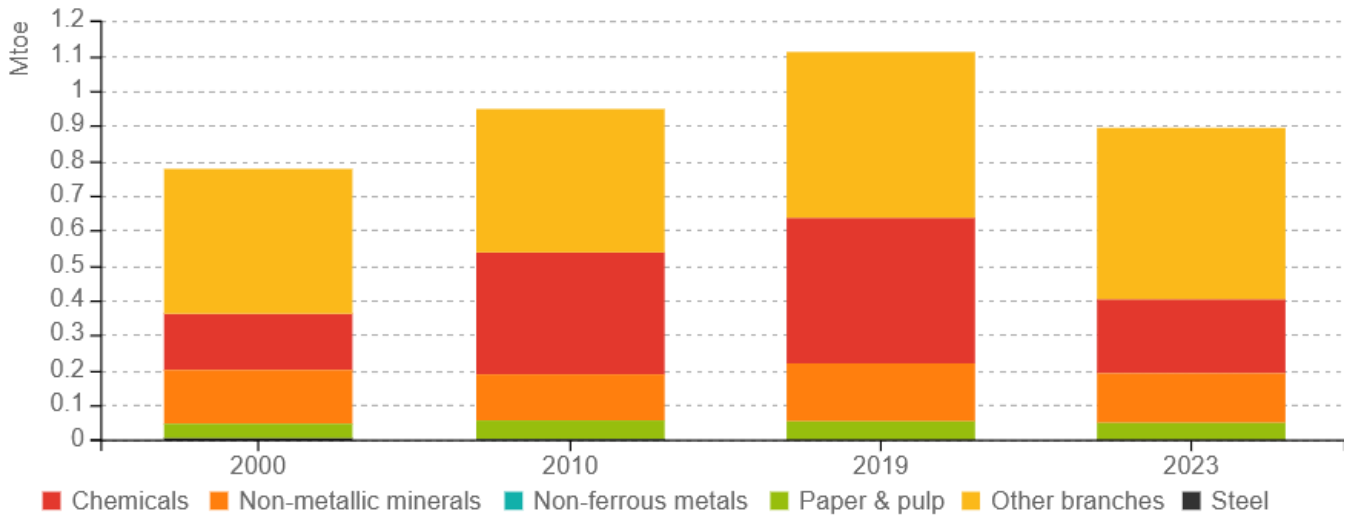
		combustion engines; and other concessions for RES vehicles.	

Source: MURE

Industry

The final energy consumption of industry decreased by 5.6% between 2010 and 2023 (see Figure 19). In 2010, the most important energy consumer was the chemical industry, but its share decreased significantly from 37% to 24% in 2023. The significant increase in natural gas prices due to Russia's war against Ukraine led to a surge in fertilizer production costs, making fertilizer production in Lithuania unprofitable. Fertilizer producers were forced to temporarily halt production.. The share of the other energy-intensive branches (non-metallic minerals, pulp and paper) remained almost the same and accounted for 21% in 2023.

Figure 19: Final energy consumption of industry by branch



Source: ODYSSEE

Energy intensity in the manufacturing industry decreased by 5.1% per year, while in the industry it decreased by 4.5% per year (see Figure 20). The introduction of new efficient technologies, the expansion of renewable energy sources, the use of waste heat, etc. in industry are leading to a decrease in energy intensity.

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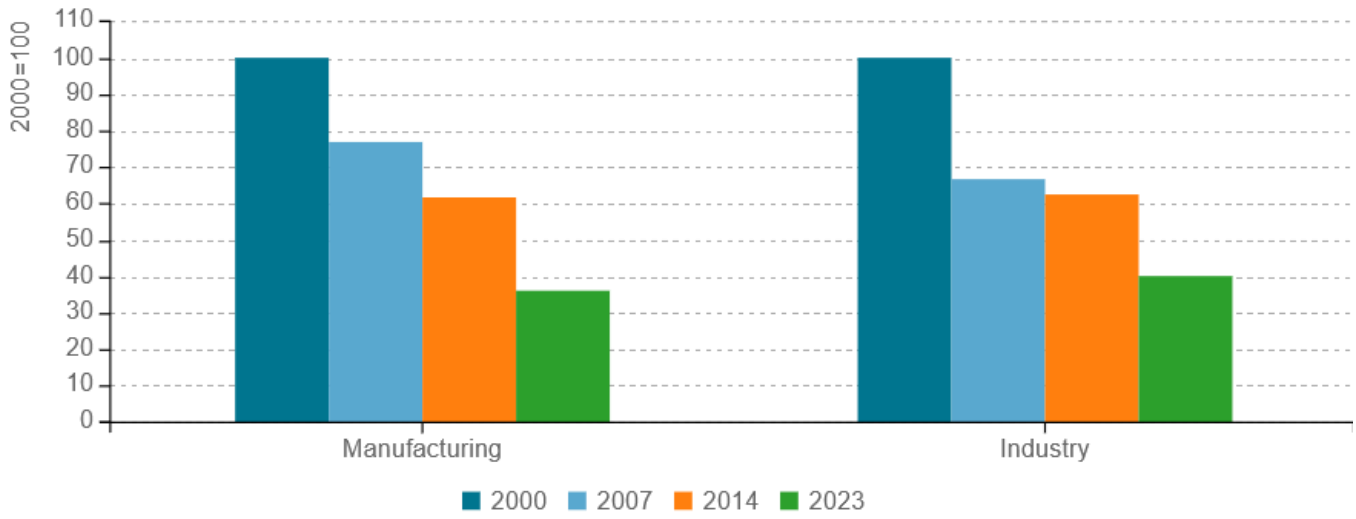
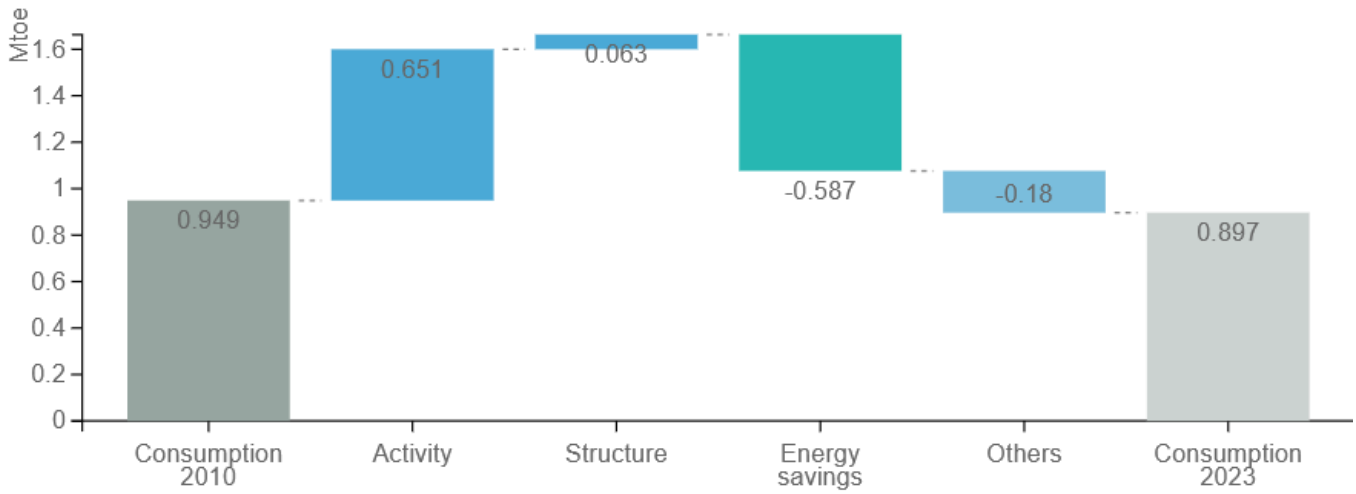
Figure 20: Energy intensity of industry (at purchasing power parities)



Source: ODYSSEE

In 2023, the industry sector represented about 17% of the final energy consumption in Lithuania. The final energy consumption in industry was 0.05 Mtoe lower in 2023 than in 2010. Industry economic growth and structural changes pushed up the energy consumption (by 0.65 Mtoe and 0.06 Mtoe, respectively). These effects were fully offset by energy savings (0.59 Mtoe) and by other effects (0.18 Mtoe).

Figure 21: Main drivers of the energy consumption variation in industry



Source: ODYSSEE

The Lithuanian policy in terms of energy efficiency in the industrial sector focuses on financial incentive measures for energy efficiency investment, CHP investment, investments in clean fuels and capacities (renewables and waste). Investment subsidies and partial compensation of interest for energy efficiency and renewable energy projects are provided through EU Structural Funds, Lithuanian Environment Investment Fund and Special

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Programme for Climate Change. Financial resources are oriented towards improvement of energy production efficiency by providing support for more efficient cogeneration and heat supply systems.

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

Measures	NECP measures	Description	Expected savings, impact evaluation
EU Structural Funds 2021-2027 (Building data bank)	No	The measure supports the establishment of building data bank	
EU Structural Funds 2021-2027 (Investment support to solar PV power plants on land)	No	The measure provides investment support to solar PV power plants on land	

Source: MURE

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