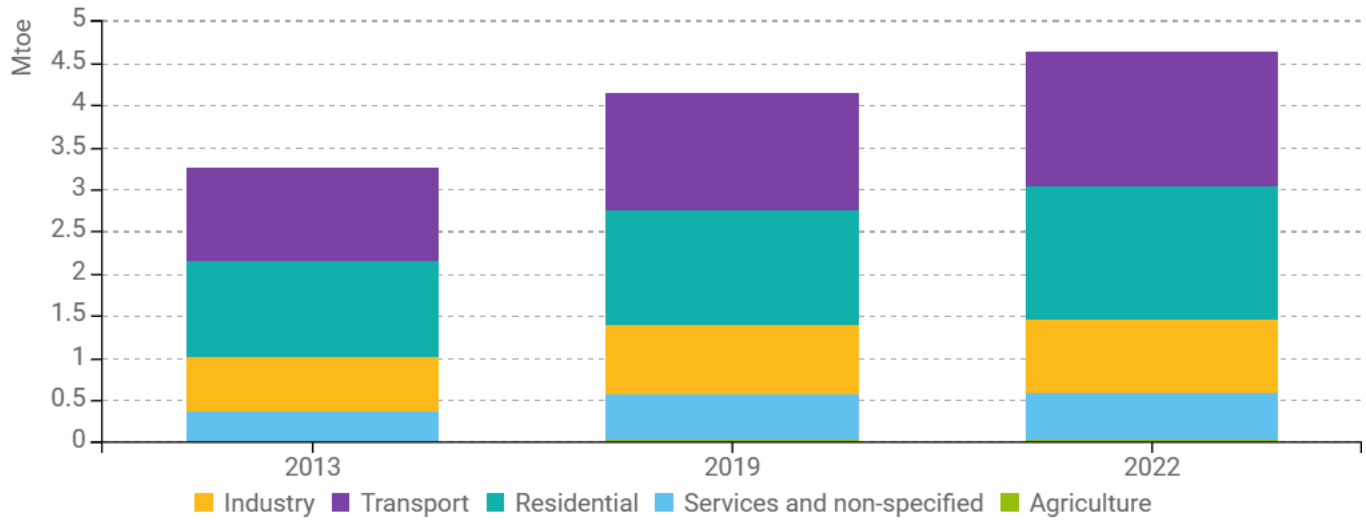
Energy efficiency trends and policies

Overview

In 2022, the final energy consumption in Georgia was 5.2 Mtoe: this represents a growth of 43% or 4%/year since 2013. Transport, the one of the largest consuming sectors, increase in its share in total final energy consumption since 2013 – from 25.8% to 30.7% in 2022. Over the same period, the share of the residential sector decreased by 9 percentage points (from 39.4% to 30.4%), while services and industry kept a steady share around 11% and 15% accordingly. The building sector, comprising residential and services sectors, is the largest consuming sector, accounting for 41% of final energy consumption in 2022.

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



Source: ODYSSEE

Primary energy intensity in 2013 -2022 decreased by 4% - from 0.311 to 0.298, with an annual improvement of 0.5%. Final energy intensity decreased by 6% - from 0.256 to 0.241, with an annual improvement of 0.7%. While industrial energy intensity decreased by 13% between 2013-2022, agricultural intensity rose significantly. Manufacturing energy intensity was 0.69 MJ per constant USD PPP in 2022. Georgia's manufacturing energy intensity largely depends on the makeup of a country's manufacturing sector: certain industries, such as basic metals and pulp and paper, are particularly energy intensive relative to their economic contribution.

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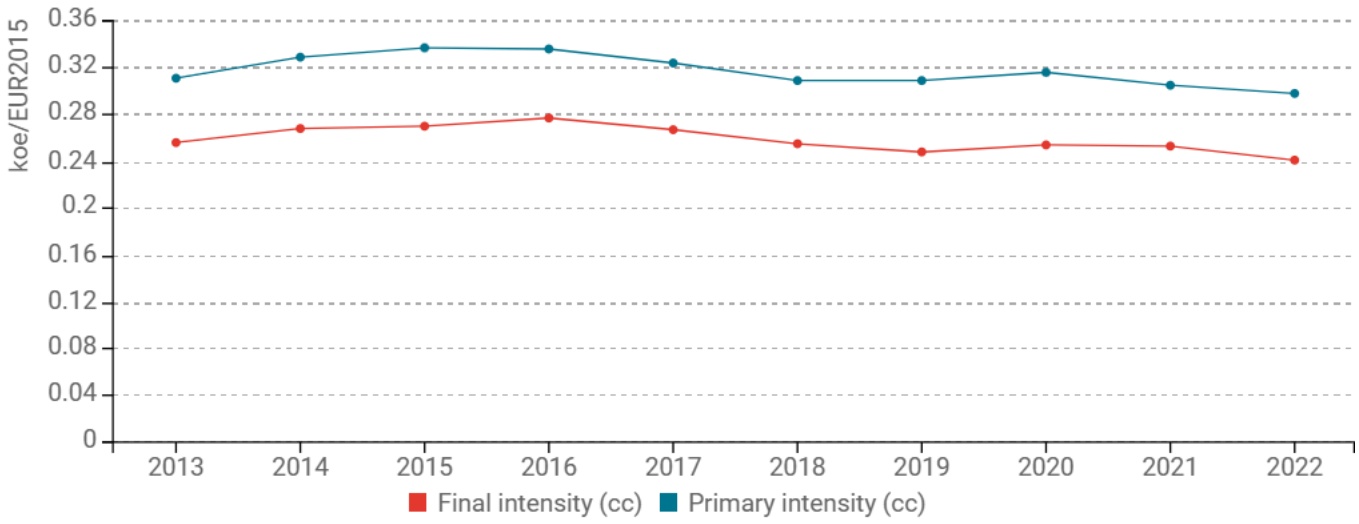
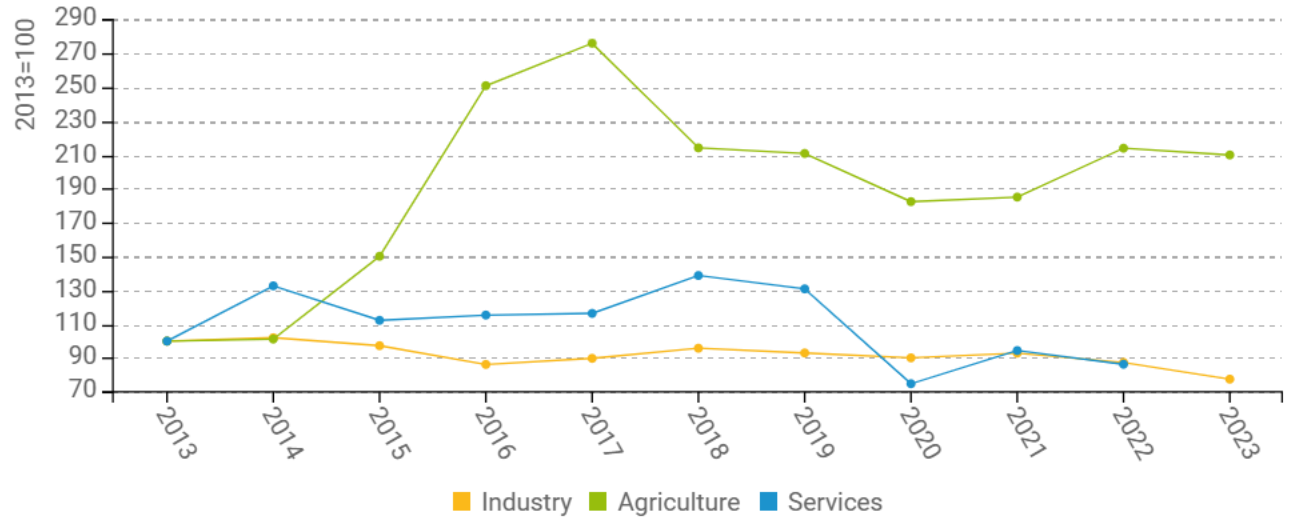
Figure 2: Primary and final intensities (with climatic corrections)



Source: ODYSSEE

Final Energy intensity of industry in 2013 -2023 decreased by 23% - from 0.275 to 0.213, with annual improvement of 2.3%. In the same period energy intensity of agriculture increased by 110% - from 0.011 to 0.023, with annual growth of 7.7%. Over the period 2013-2022 energy intensity of services decreased by 14% - from 0.045 to 0.039, with annual improvement of 1.6%.

Figure 3: Final intensity by sector



Source: ODYSSEE

Between 2013 and 2022, total energy supply increased by 1.7 Mtoe, which is slightly more than the growth of final consumption for energy uses (+1.4 Mtoe); the difference is due to increase in consumption of the power sector (+0.09 Mtoe), non-energy uses (+0.07 Mtoe) and other transformations (+0.22 Mtoe).Total energy supply grew, driven by increases in final consumption and power sector use. The share of domestic electricity production fell

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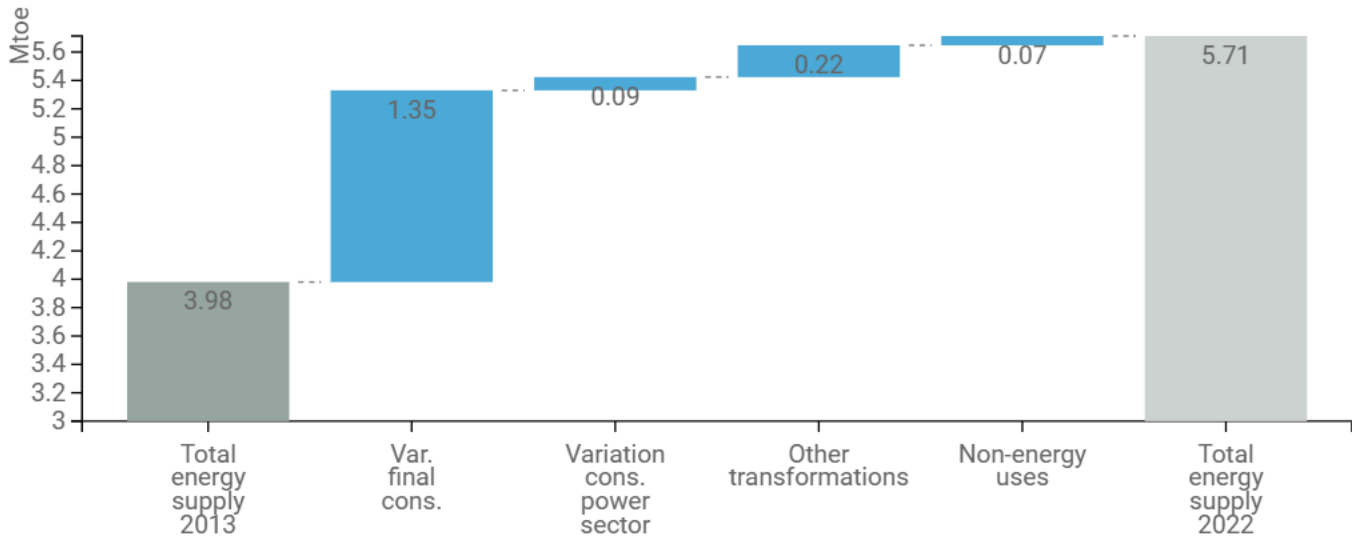
from 89% (2012) to 69% (2022), with more imports needed for gas and oil. Natural gas (around 47%), oil products (around 27%), and hydropower (around 14%) were the leading contributors to TES, with significant bioenergy. Hydropower remained crucial for electricity, with bioenergy (fuel wood) also a significant domestic resource.

Figure 4: Main drivers of the total energy supply variation



Source: ODYSSEE

In the selection of measures for MURE database the Integrated National energy and climate plan (NECP) has been mainly used. Also, the Laws of Georgia related to energy efficiency and climate have been reviewed. The main challenge is the assessment of the impact of the measures and obtain quantified results. The reasons for this are: There are no sufficient data; so, the assumptions and expert estimations are used. In the legislative documents – Laws - the expected results are not defined. Secondary legislation is not developed yet. The implementation of energy and climate laws is very slow. In MURE Database there are three cross-cutting measures. Two of them are from the NECP.

Table 1: Sample of cross-cutting measures

Measures	NECP measures	Description	Expected savings, impact evaluation
Reduction of losses in electricity transmission networks and grid integration	Yes	This measure will result in energy savings by developing Georgia's transmission networks to accommodate a larger amount of energy production and consumption while producing less system losses.	2.05 PJ by 2030

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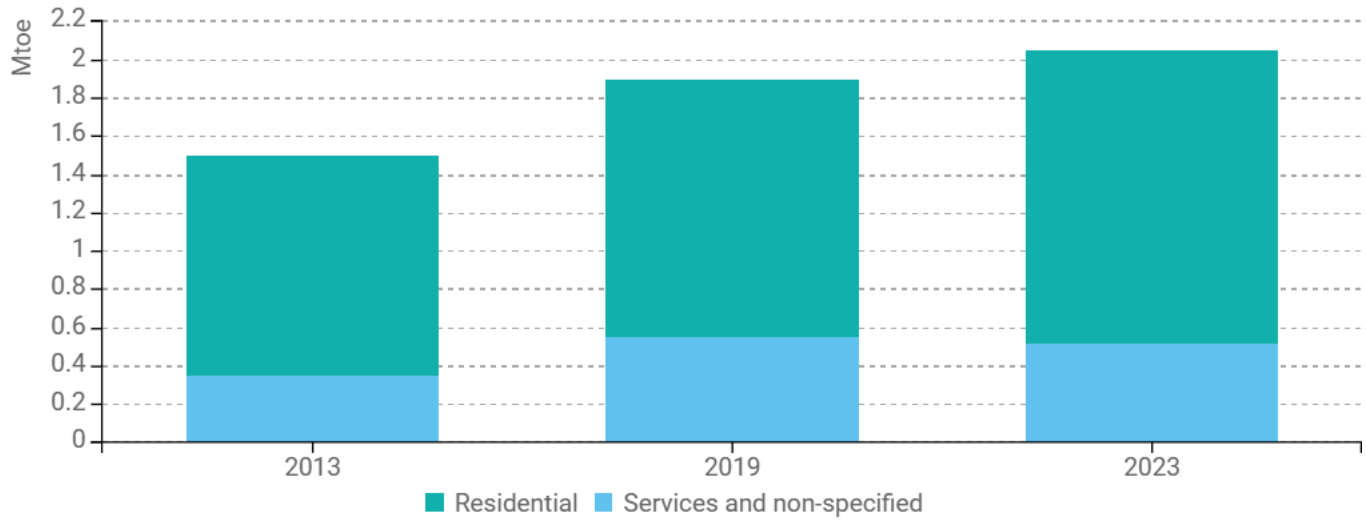
of new generation			

Source: MURE

Buildings

The building sector represents a significant portion of Georgia's total final energy consumption, driven by the energy-intensive heating requirements during colder months and continuous electricity use throughout the year. Many of Georgia's buildings are outdated and poorly insulated, resulting in substantial energy losses. Inefficient heating systems, particularly in residential properties, further compound this issue. As urbanization accelerates, energy demand in both commercial and residential buildings continue to rise. Additionally, modern construction practices and the increasing adoption of electrical appliances are key contributors to this growing energy consumption. Electricity plays a central role in powering appliances, lighting, and some heating systems. Natural gas is widely used for heating and cooking, particularly in urban areas. In rural regions, biomass (fuelwood) remains a significant energy source for heating. However, its usage is gradually declining due to urban migration and increased access to natural gas. In 2013 -2023 the final consumption of residential sector increased by 33% or 3.3%/year, from 1.15 Mtoe to 1.53 Mtoe. Final consumption of service sector for the same period increased faster, by 49% or 4.9%/year, from 0.34 Mtoe to 0.51 Mtoe. In 2023, residential buildings represented 75% of the total consumption of buildings.

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



Source: ODYSSEE

Over 2013 -2023 the energy consumption of households per capita increased by 33% (or 2.9%/year), from 0.31 toe to 0.40 toe. It was driven by increased urbanization and electrification of homes. Households electricity consumption per capita for the same period increased by 10% (0.9%/year), from 606 kWh to 665 kWh. While overall electricity consumption decreased by 7.8% in 2023 due to external factors, household demand for natural gas in the residential sector increased slightly by 0.4%. Peak demand for electricity in residential households has shifted from winter months to summer months in recent years.

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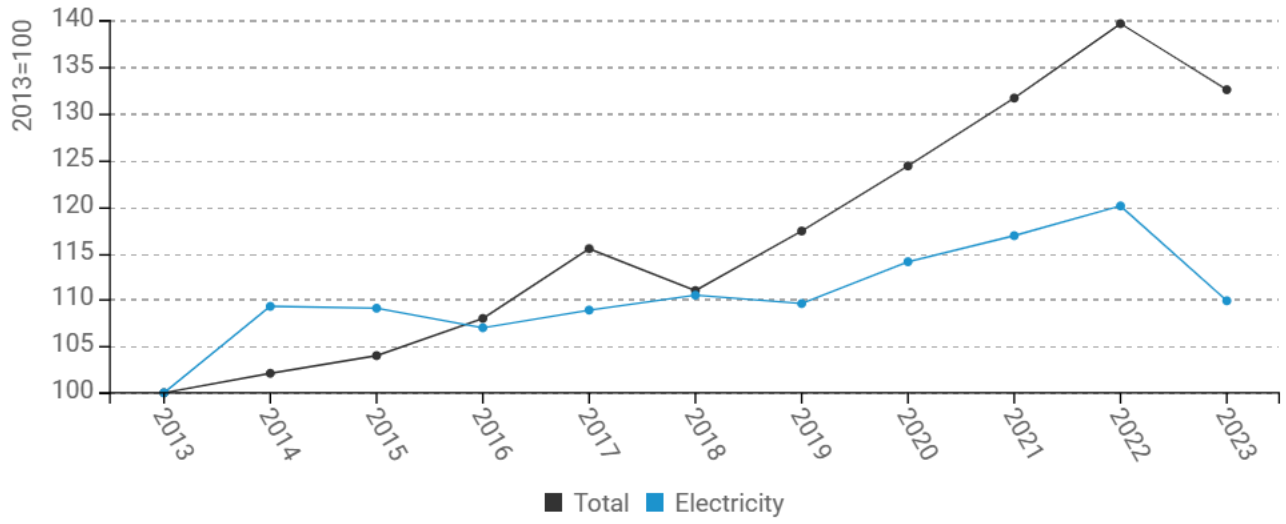
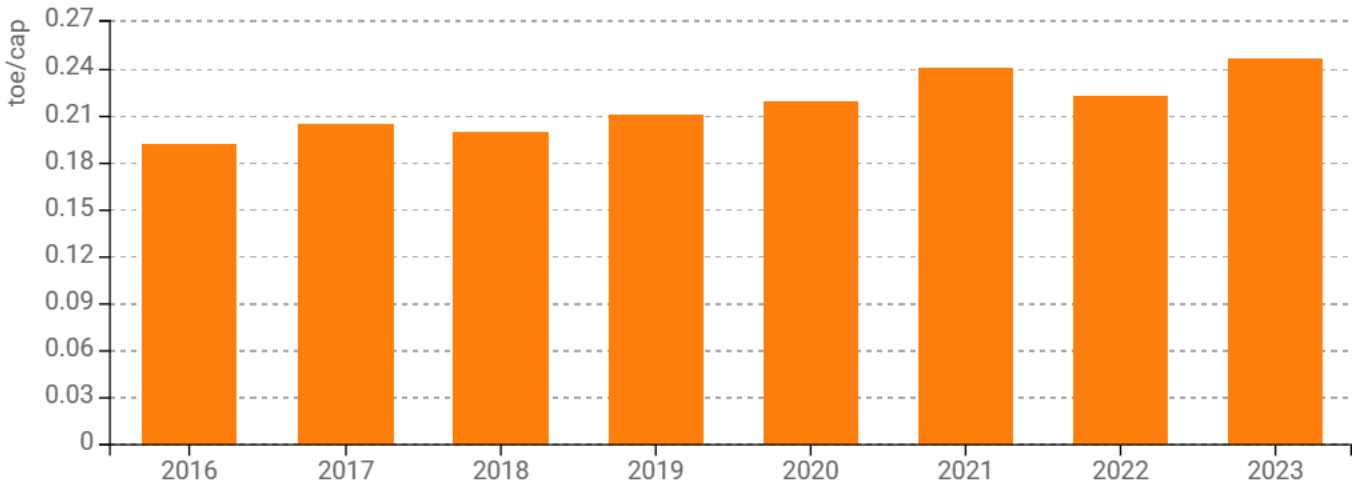
Figure 6: Energy and electricity consumption in households per capita (with climatic corrections)



Source: ODYSSEE

Natural gas is widely used for heating, especially in urban areas. In rural areas, biomass (such as fuelwood) remains a significant energy source for heating, though its usage is decreasing due to urban migration and accessibility of natural gas. From 2016 to 2021 the energy consumption per capita for space heating in households increased by 28% (3.8%/year), from 0.192 toe to 0.24 toe; it decreased by 7.5% in 2022 to 0.222 toe because of higher energy prices but still increased in 2023 to 0.246. Households electricity consumption increased by an average of 3.6% annually between 2013 and 2023. The household energy consumption per capita in Georgia has shown a steady upward trend between 2013 and 2023, driven by increased urbanization and electrification of homes.

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



Source: ODYSSEE

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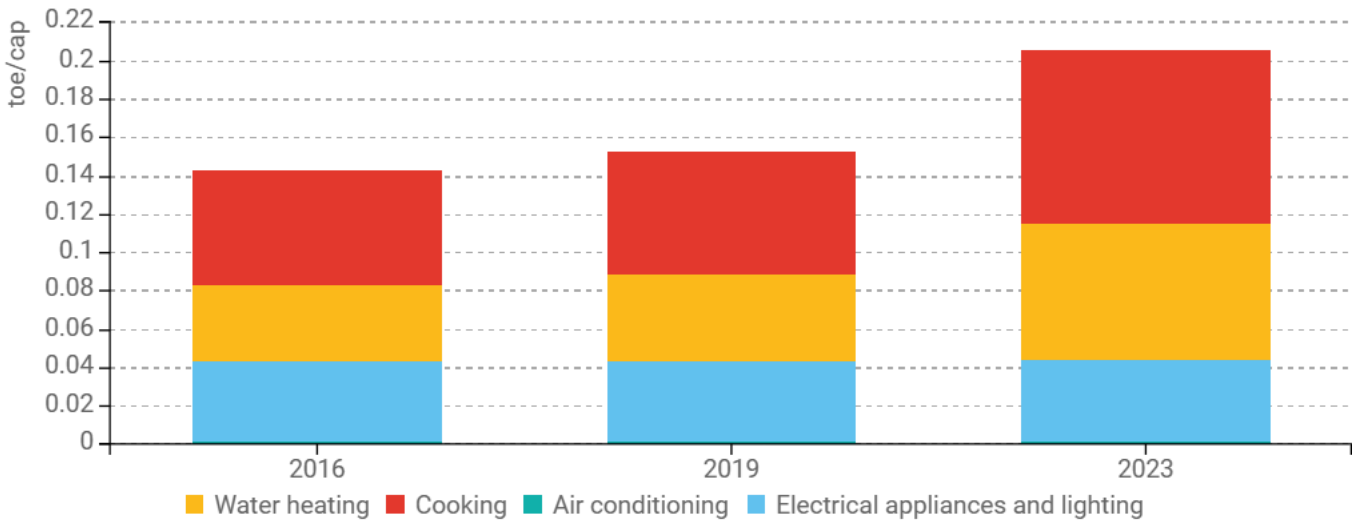
Energy consumption per capita by end-use (except space heating) for the period 2016- 2023 increased by 44% - from 0.143 toe to 0.205 toe (+4.4%/year). The main driver of this growth is consumption for water heating (+80% or 8%/year), followed by cooking (+50% or 5%/year). Insignificant growth in consumption by electrical appliances and lighting is caused by transition on efficient appliances and lighting fixtures.

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



Source: ODYSSEE

The building sector is crucial for achieving the EU's energy and environmental goals. At the same time, better and more energy efficient buildings will improve the quality of citizens' life and alleviate energy poverty while bringing additional benefits, such as health and better indoor comfort levels, green jobs, to the economy and the society. The amending directive covers a broad range of policies and support measures that will help national EU governments boost energy performance of buildings and improve the existing building stock. This includes, among others, long-term renovation strategies and minimum energy performance requirements for new buildings, for existing buildings undergoing major renovation, and for the replacement or retrofit of building elements. MURE database contains 6 measures for Household sector and 4 measures for Services sector. 4 of these measures belong to building sector.

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

Measures	NECP measures	Description	Expected savings, impact evaluation
Energy efficiency retrofits in schools and other central	Yes	Georgia's Energy Efficiency Law (Article 17) explicitly requires the renovation of buildings owned and operated by the Central Government. This measure will result in building retrofits to improve energy efficiency in compliance with the Law. The	2.03 PJ by 2030

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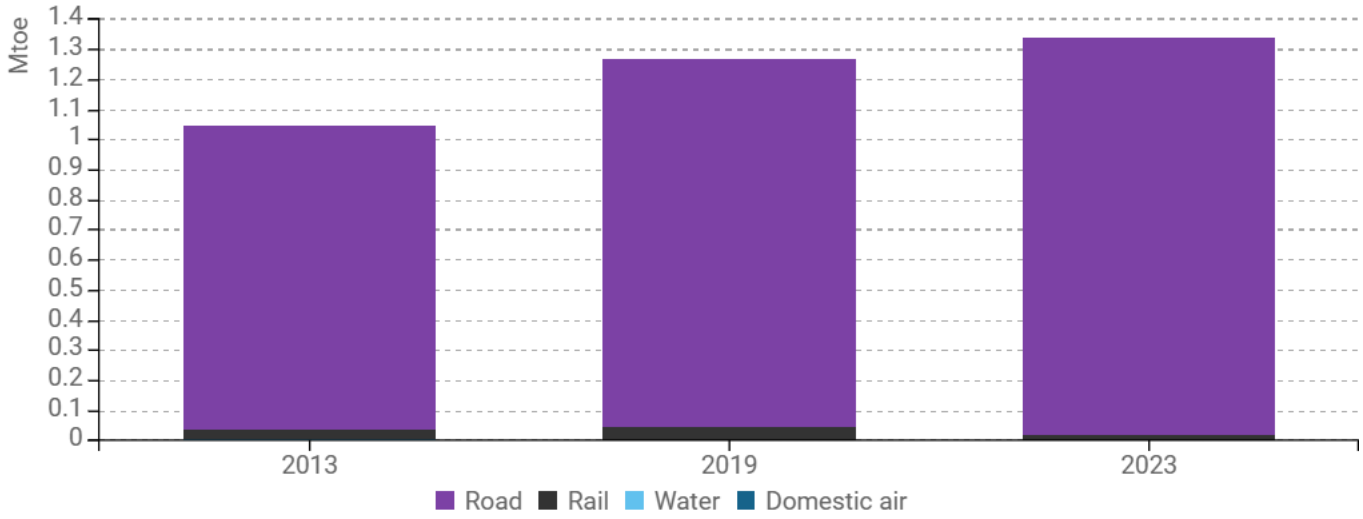
government-owned buildings		minimum target is that 1% of the total useful floor area of heated and/or cooled buildings owned and occupied by public bodies must be renovated each year to meet the minimum energy performance requirements	

Source: MURE

Transport

The transport sector is dominated by road transport, covering 99% of total sectoral share consumption in 2023. The consumption of rail transport accounts for only 1% of consumption (only electricity) in share. Without consumption of pipeline, transport consumption increased by 29% over 2013-2023. The chart does not reflect pipeline consumption (mainly natural gas), which accounts for 18% of consumption of the sector, according to the National Statistics Office.

Figure 9: Transport energy consumption by mode



Source: ODYSSEE

MURE database contains 4 measures for transport sector. Two of them are form the NECP.

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

Measures	NECP measures	Description	Expected savings, impact evaluation
Tax incentives for electric and hybrid vehicles	Yes	This measure describes a policy already in place to increase the market penetration of hybrid and electric vehicles, and lead to a gradual replacement of the existing fleet. It will also increase the demand for renewable energy by switching away from fossil fuels	10.9 PJ by 2030

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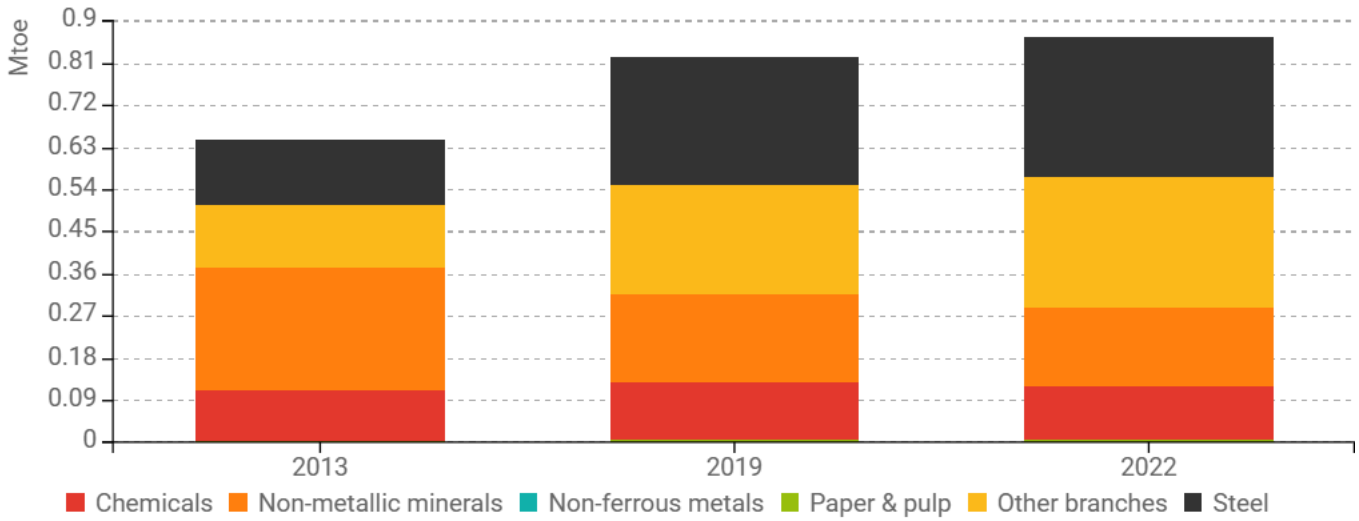
		to electricity from the grid, which is primarily powered by renewables	

Source: MURE

Industry

In 2022, the iron and steel sub-sector was the main industrial energy consumer, with 35% of total industry consumption, most of it met by electricity and coke-oven coke. The other large energy users are non-metallic minerals (19%), chemical and petrochemical (13%).

Figure 10: Final energy consumption of industry by branch



Source: ODYSSEE

MURE database contains 2 measures for industry sector: - Incentivizing / mandating energy efficiency in industry, and - Energy audits and management systems, boiler inspections in the industry sector. Both measures are from the NECP.

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

Measures	NECP measures	Description	Expected savings, impact evaluation
Energy audits and management systems, boiler inspections in the industry sector	Yes	This measure requires large enterprises to conduct energy audits or EnMS and provide support to small- and medium-sized enterprises to encourage these to also conduct energy audits. The measure involves two energy saving actions: - Energy audits; - Inspections of boilers / air conditioning systems.	3.34 PJ by 2030

Source: MURE

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