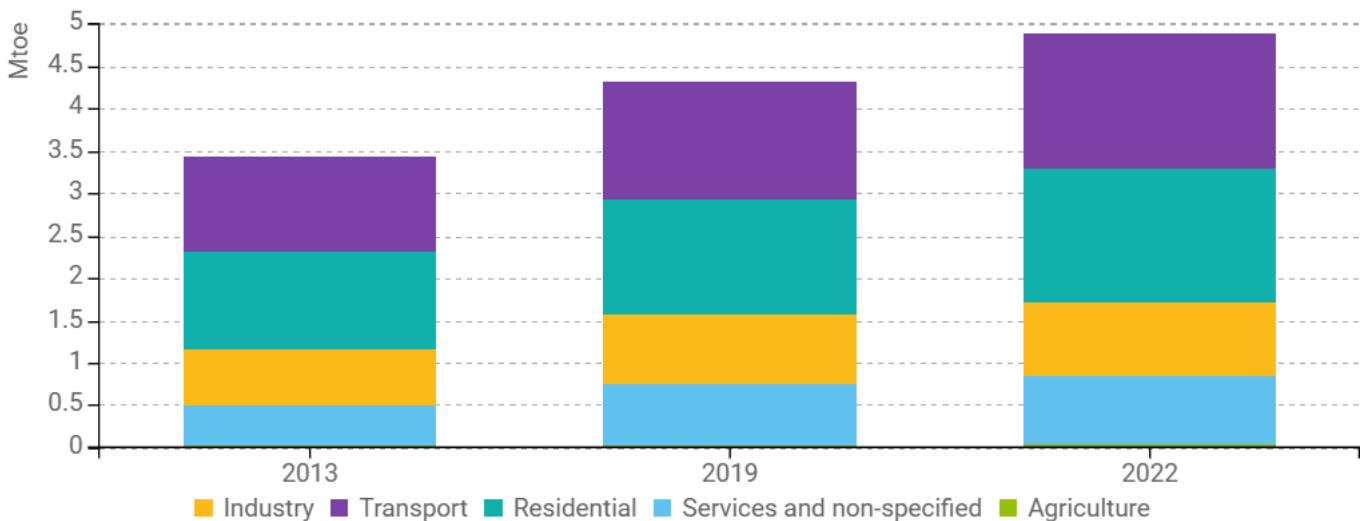


Energy efficiency trends and policies

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 sector, 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, accounted for 41% of final energy consumption in 2022.

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

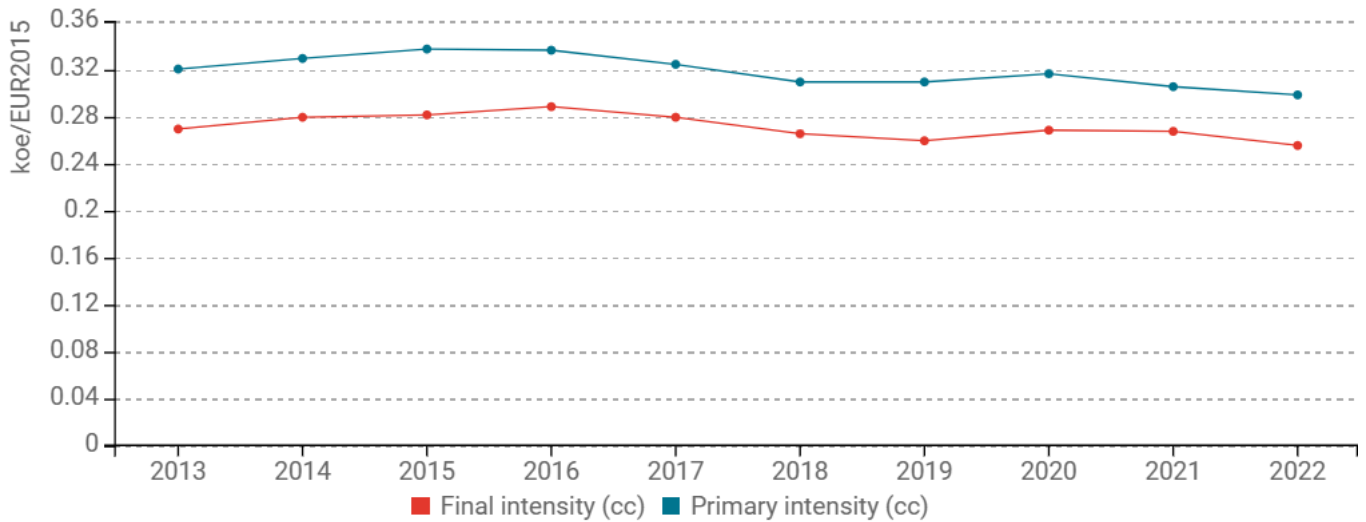


Source: ODYSSEE

Primary energy intensity in 2013 -2022 decreased by 7% - from 0.320 to 0.298, with an annual improvement of 0.8%. Final energy intensity decreased by 5% - from 0.269 to 0.255, with an annual improvement of 0.6%.



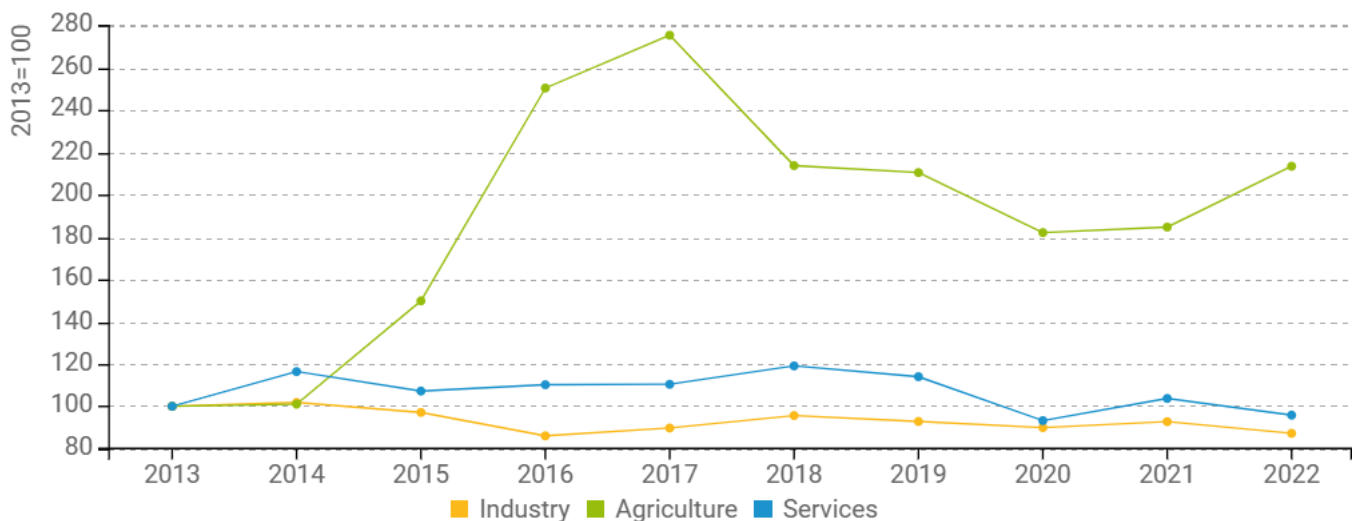
Figure 2: Primary and final intensities (with climatic corrections)



Source: ODYSSEE

Energy intensity of industry in 2013 -2022 decreased by 13% - from 0.275 to 0.240, with annual improvement of 1.5%. In the same period energy intensity of agriculture increased by 114% - from 0.011 to 0.043, with annual growth of 8.8%. Energy intensity of services decreased by 4% - from 0.045 to 0.043, with annual improvement of 0.5%.

Figure 3: Final intensity by sector



Source: ODYSSEE

Between 2013 and 2022, total energy supply increased by 1.6 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 (+0.08 Mtoe), non-energy uses (+0.07 Mtoe) and other transformations (+0.03 Mtoe).

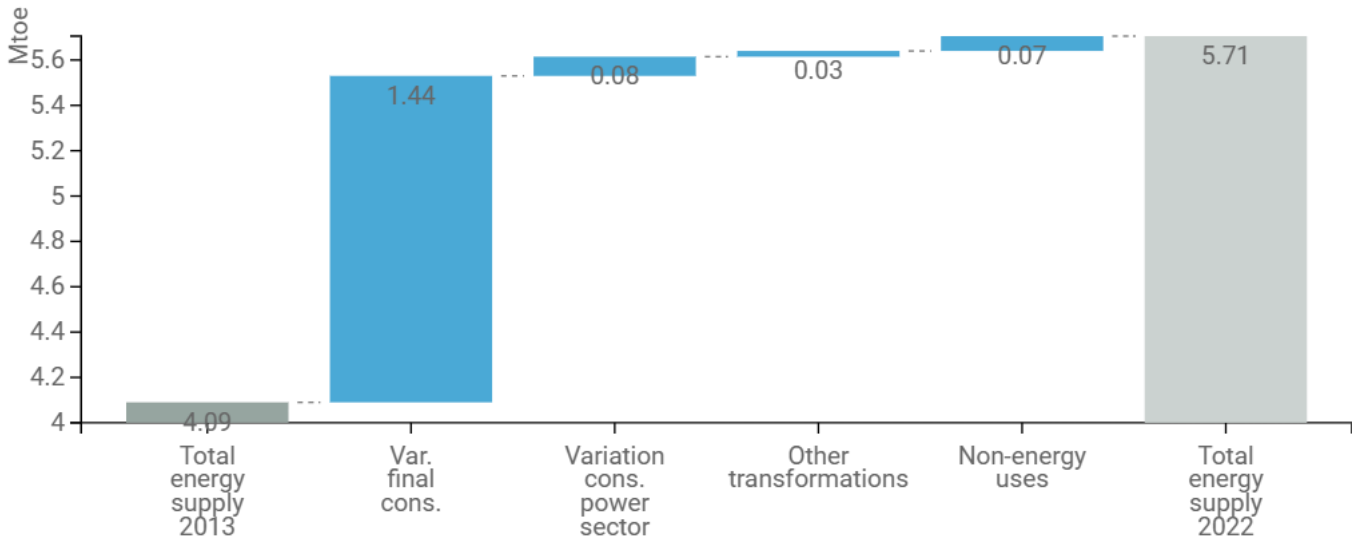
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Figure 4: Main drivers of the total energy supply variation



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 of 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.

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 of new generation	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; 61.9 KT CO2



Utilization of smart meters	Yes	<p>This Twinning Project on Smart Meter Development has involved GNERC and E-Control. A Time-of-Use (ToU)-Tariff-Model was developed for the household and service sectors, which showed potential cost savings for both sectors: the effects are not significant at the beginning of the model but increase steadily over time. A Cost-Benefit analysis was also performed, modelling four different scenarios plus business-as-usual through 2040. The project has shown positive results in all four scenarios compared to business-as-usual, which implies that the country would have an indirect obligation to implement smart metering. GNERC has chosen an implementation strategy (Scenario 3: Smooth and Slow) from the cost-benefit analysis which has the least influence on tariffs. The chosen scenario considers that after 10 years from the decision made by the state 80% of users should have smart metering. This puts the deadline of an 80% roll-out beyond 2030. The target for 2030 is a 60% roll-out of smart meters. The government will continue cooperation with key international organizations and Donors to develop Twinning Projects and other types of bilateral support.</p>	
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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 -2022 the final consumption of residential sector increased by 37% or 3.6%/year, from 1.16 Mtoe to 1.59 Mtoe. Final consumption of service sector for the same period increased twice faster, by 66% or 5.8%/year, from 0.49Mtoe to 0.81 Mtoe. Between 2014 and 2022, energy consumption in the buildings sector increased by 31%, from 1.62 to 2.13 Mtoe. In 2022, residential buildings represented 75% of the total consumption of buildings (+ 3 points since 2011).

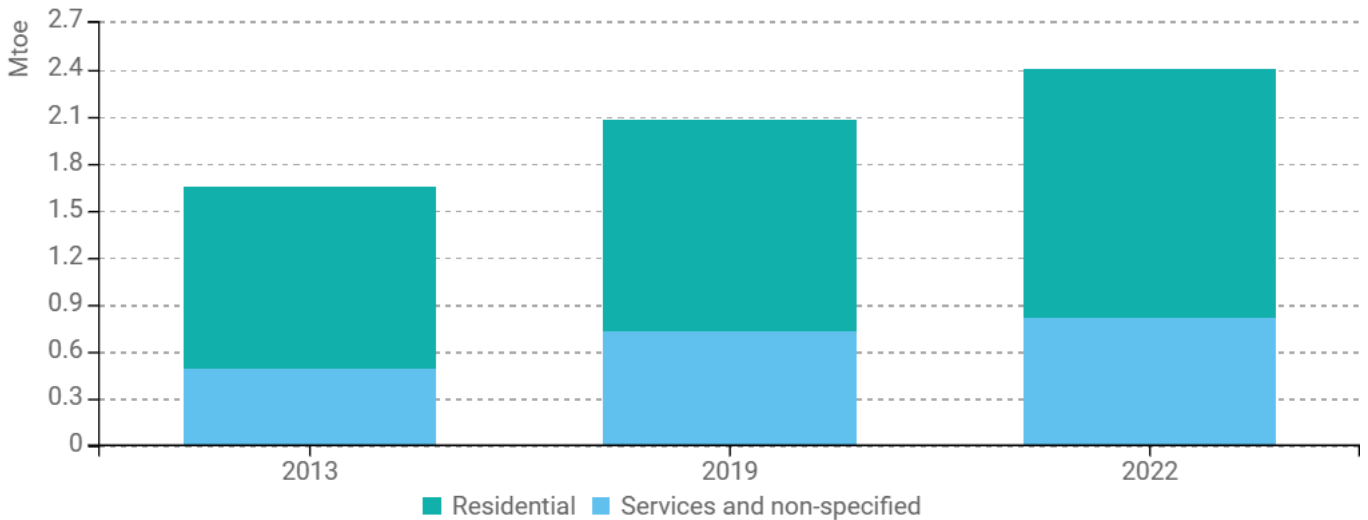
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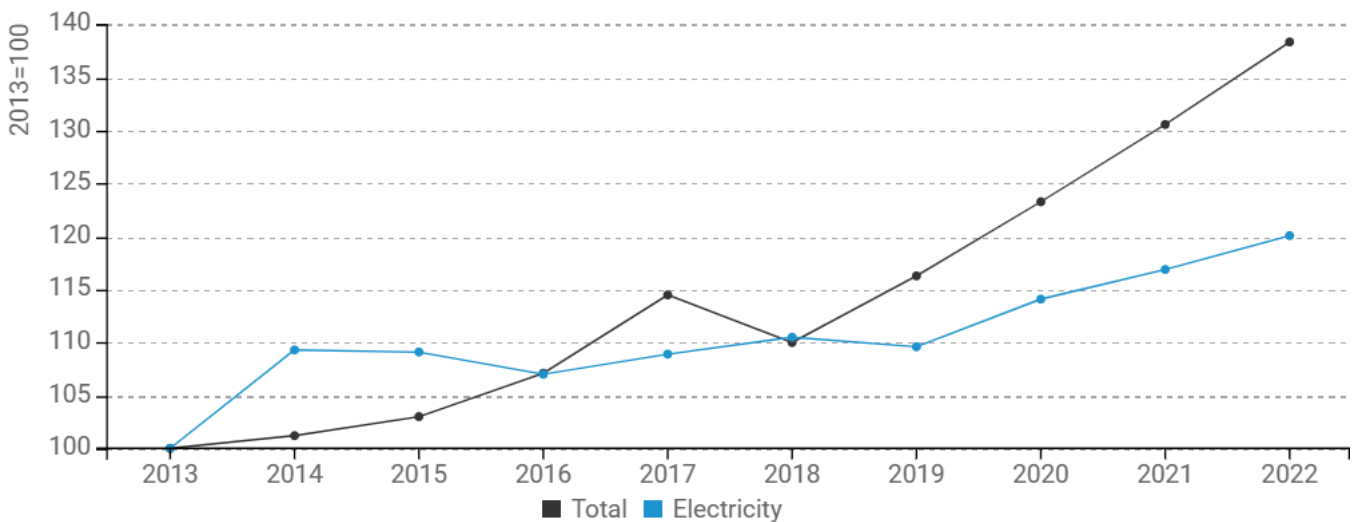
Figure 5: Final energy consumption in buildings (with climatic corrections)



Source: ODYSSEE

Over 2013 -2022 the energy consumption of households per capita increased by 38% (or 3.7%/year), from 0.31 toe to 0.43 toe. Households electricity consumption per capita for the same period increased by 20% (2.1%/year), from 606 kWh to 728 kWh.

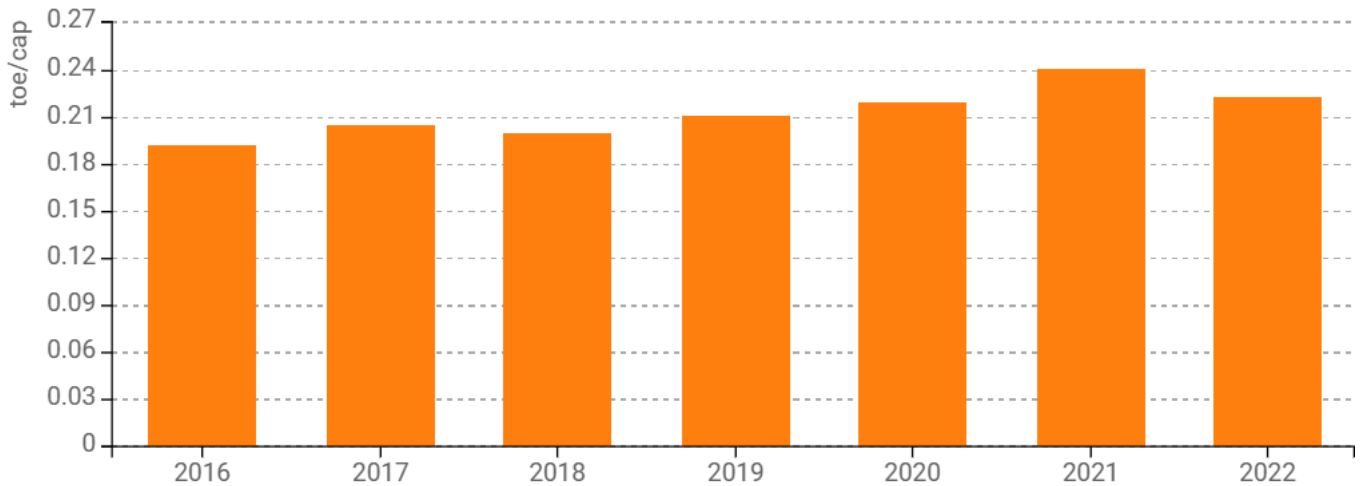
Figure 6: Energy and electricity consumption in households per capita (with climatic corrections)



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 25% (4.5%/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.

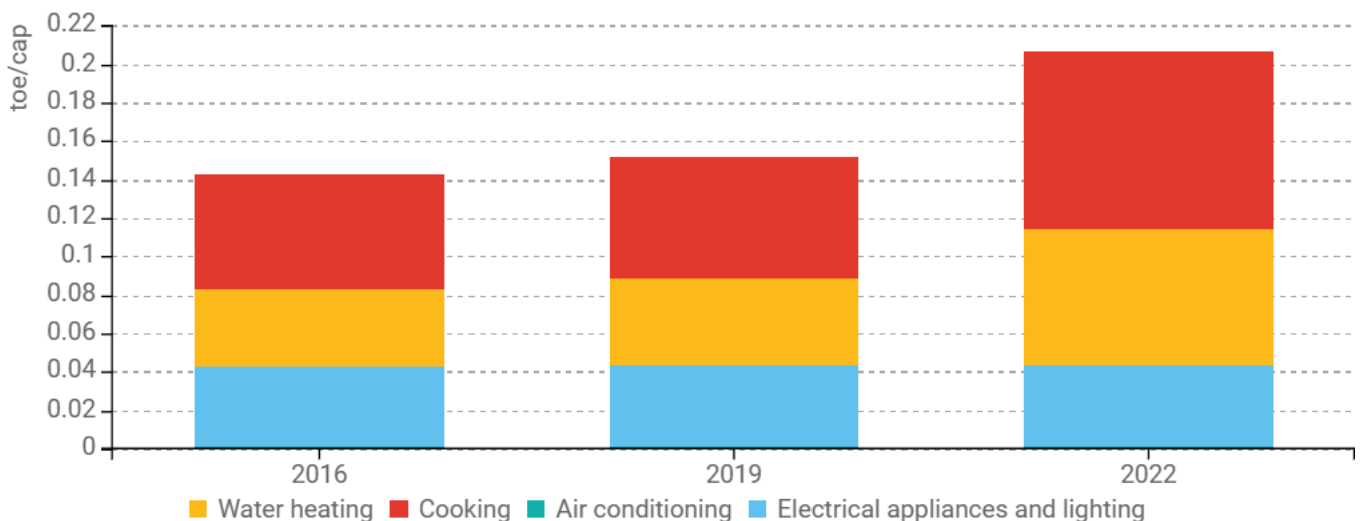
Figure 7: Energy consumption per capita for space heating in households (with climatic corrections)



Source: ODYSSEE

Energy consumption per capita by end-use (except space heating) for the period 2016- 2022 increased by 45% - from 0.143 toe to 0.207 toe (+6.3%/year). The main driver of this growth is consumption for water heating (+78% or 10%/year), followed by cooking (+53% or 7.5%/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 4 measures for Household sector and 4 measures for Services sector. 3 of these measures belong to building sector.

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

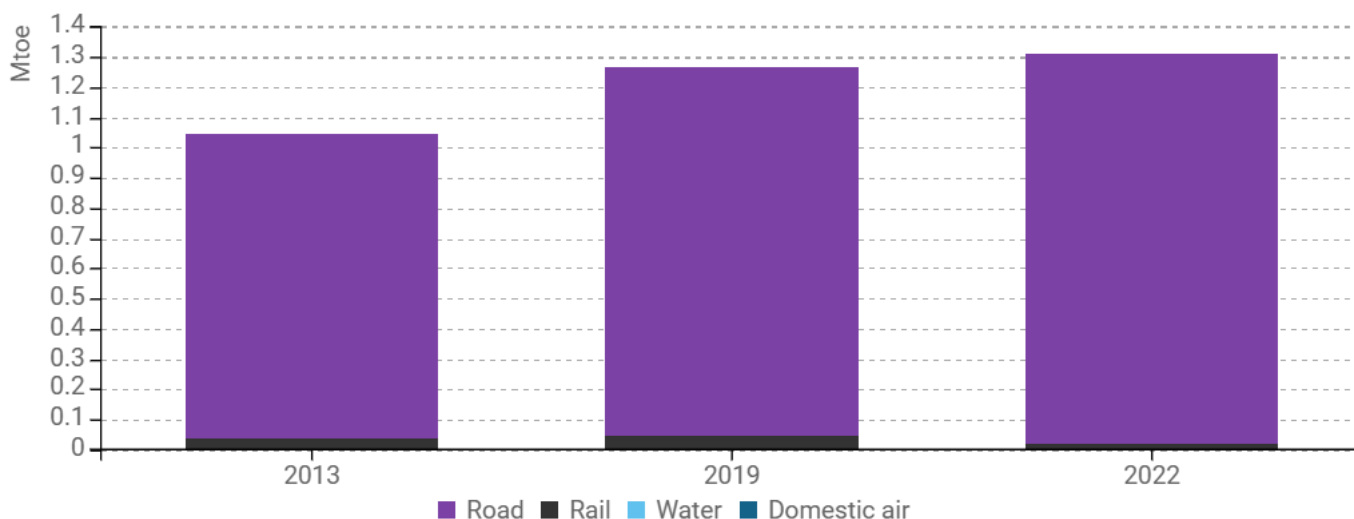
Measures	NECP measures	Description	Expected savings, impact evaluation
Development of building energy performance certification scheme	Yes	This measure involves the national scale transposition and enforcement of the Energy Performance in Buildings Directive (2010/31/EU). It will establish the building energy performance requirements through building codes and certification. The current construction code includes a statement on energy efficiency but does not set up any minimum energy performance requirements (MEPR) for buildings.	1.23 PJ; ~37 kt CO2
Development of building minimum performance standards	Yes	This measure involves the national scale transposition and enforcement of the Energy Performance in Buildings Directive (2010/31/EU). It will establish the building energy performance requirements through building codes and certification. The current construction code includes a statement on energy efficiency but does not set up any minimum energy performance requirements (MEPR) for buildings.	0.76 PJ; ~23 kt CO2
Energy efficiency retrofits in schools and other central government-owned buildings	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 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.	2.03 PJ; ~113 kt CO2

Source: MURE

Transport

The transport sector is dominated by road transport, covering 81% of total sectoral consumption in 2022. Pipeline transport accounts for 18% of consumption. It uses mainly natural gas. The consumption of rail transport accounts for only 1% of consumption (only electricity). Without consumption of pipeline, transport consumption increased by 42% over 2013-2022.

Figure 9: Transport energy consumption by mode



Source: ODYSSEE

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

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

Measures	NECP measures	Description	Expected savings
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 to electricity from the grid, which is primarily powered by renewables.	10.9 PJ; ~399 kt CO2
Improved public transportation and shifts to sustainable transportation modes	Yes	This measure will result in a shift in modal share from private vehicle-use to public transport and non-motorised transport by improving the capacity, ridership, and efficiency of municipal public transport systems and non-motorised transport infrastructure. This measure builds on activities by the municipalities of Tbilisi, Batumi, Rustavi, and Gori.	23.55 PJ; ~932 kt CO2

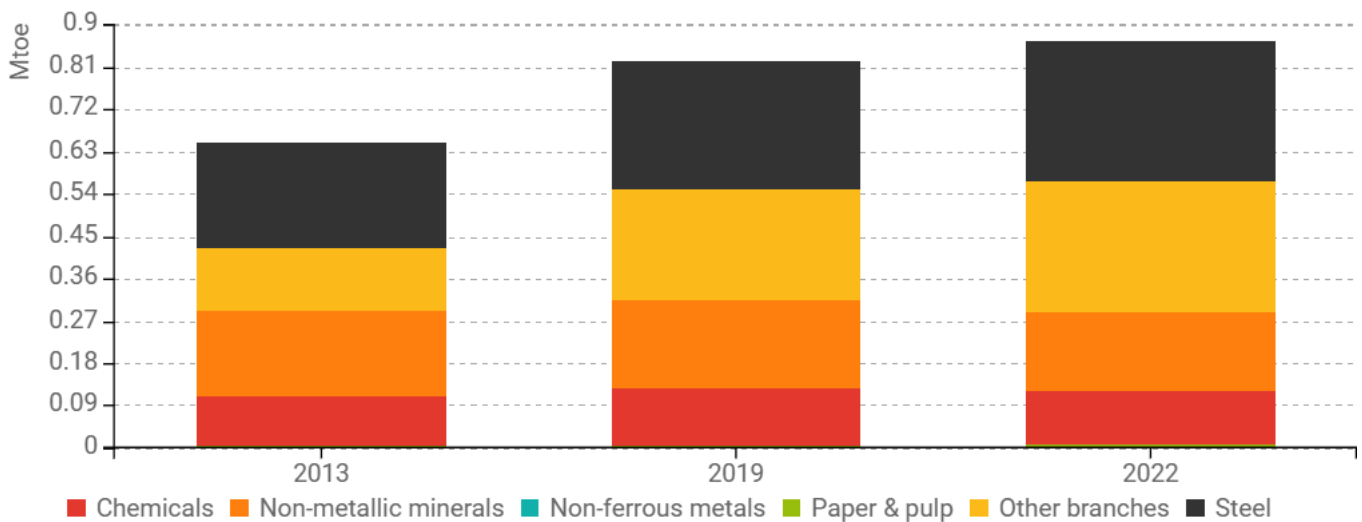
Control of vehicle emissions on roads	No	In order to strengthen the control of vehicle emissions on the roads, the addition of traffic police crews equipped with field measuring devices for measuring vehicle emissions. The activity involves the introduction and implementation of a technical mechanism for controlling the level of emissions from vehicles.	
Implementing the measures included in Tbilisi Transport Policy	No	Activity involves: • Upgrading bus fleet and introduction of a new route network; • Modernizing the metro and increasing its capacity; • Cable car construction; • Introduction of a smart transport system; • Rehabilitation of streets in accordance with the principles of multimodal planning	

Source: MURE

Industry

In 2022, the iron and steel sub-sector was the main industrial energy consumer, with 30% of total industry consumption, most of it met by electricity and coke-oven coke. The other large energy users are non-metallic minerals (28%), chemical and petrochemical (14%) and construction (13%) sub-sectors.

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.



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

Measures	NECP measures	Description	Expected savings, impact evaluation
Incentivizing / mandating energy efficiency in industry	Yes	This measure involves developing and entering into energy savings agreements with (a) large industrial companies and (b) important energy intensive industrial sectors. Incentive programs to encourage energy efficiency in industry can take many forms. Given the relatively small size of Georgia’s industrial sector, energy-saving agreements will signal to industry that the Government is supportive of energy efficiency investments by first introducing support mechanisms and introducing a carbon fee on fossil fuels and electricity by 2025 which could be reduced based upon the achievement of efficiency benchmarks according to a voluntary agreement.	1.23 PJ; 20.6 kt CO2
Energy audits and management systems, boiler inspections in the industry sector	Yes	This measure will introduce a requirement that large enterprises conduct energy audits or EnMS and provide support to small- and medium-sized enterprises (SMEs) 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; 48.1 kt CO2

Source: MURE