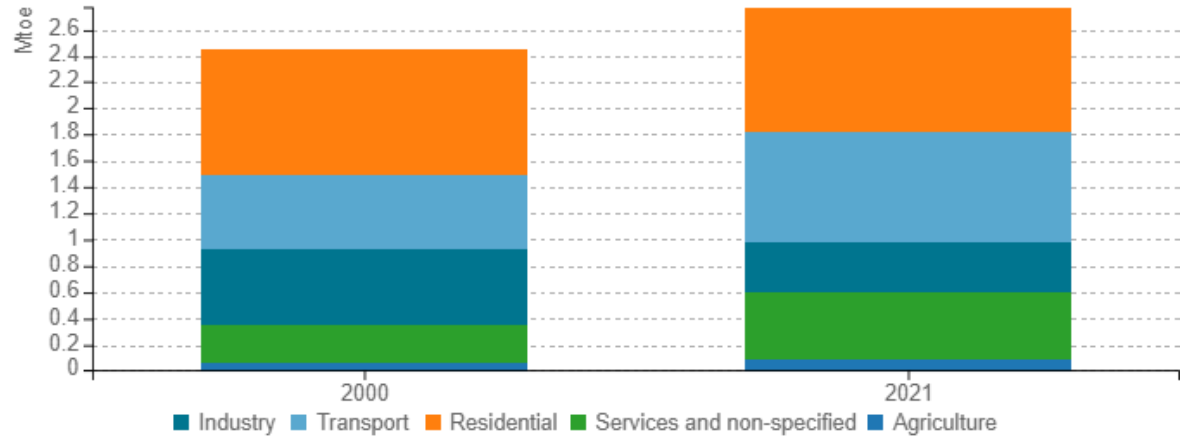
Energy efficiency trends and policies

Overview

In 2021, the final energy consumption in Estonia was about 2.77 Mtoe. The residential sector, which is the largest consumer, experienced a decrease of 4.9 percentage points in its share of total final energy consumption since 2000, dropping from 39.3% to 34.4%. Industry decreased its share by 9.7 percentage points – from 23.6% down to 13.9% in 2021. Over the same period, the transport sector's share increased by approximately 7.5 pp, the tertiary sector by 6.3 pp, and the agricultural sector by 0.8 pp. In 2021, the overall increase in final energy consumption accounted for approximately 13% compared to 2000.

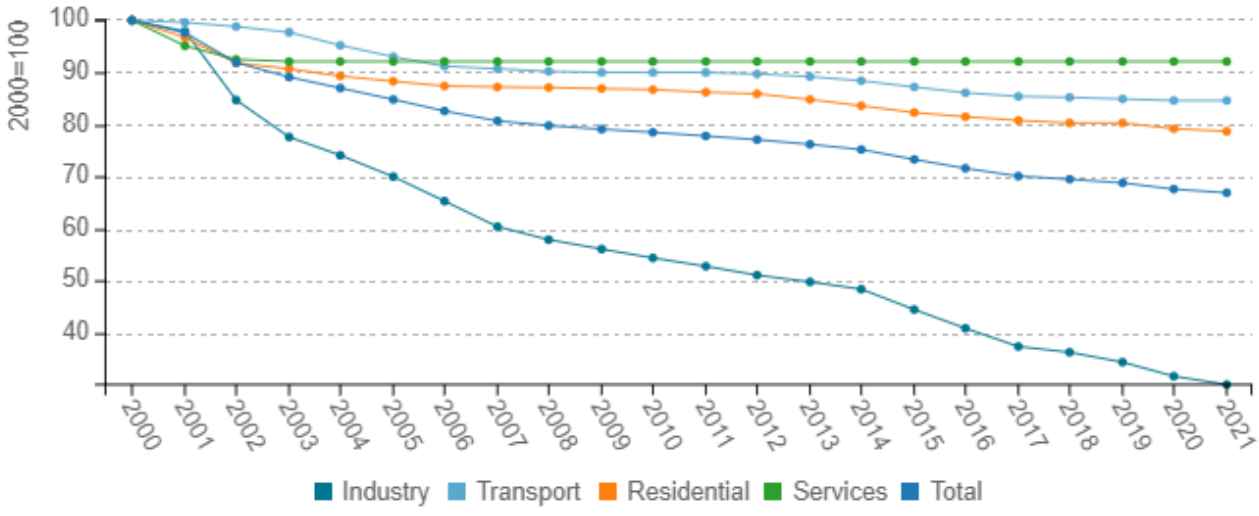
Figure 1: Final energy consumption by sector (normal climate)



Source: ODYSSEE

Energy efficiency for final consumers, as measured by ODEX, improved by an average of 1.9% per year from 2000 to 2021. In industry, the pace of improving energy efficiency has been the highest (since 2000, approx. 5.5% per year), in households - 1.1%, in the transport sector - about 0.8%, and in services - about 0.4% per year.

Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE

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Regarding energy efficiency, Estonia has set a target by 2030 to keep final energy consumption at the level of 32 to 33 TWh/a (about 2.84 Mtoe). According to the new wording of the EU's Energy Efficiency Directive (2023), Estonia's obligation to save energy will also be tightened, and the maximum allowed final consumption for 2030 will be 30 TWh (2.58 Mtoe) instead of the previous 33 TWh (2.84 Mtoe). In 2021, the final energy consumption in Estonia amounted to 2.77 Mtoe, i.e., that the final energy consumption has remained at the same level as in the last ten years. However, there has been some structural shift in the final consumption of energy. The energy demand of the service sector (especially information and communication, trade, professional and technical activities) has increased and the share of energy consumption of the industrial sector in total consumption has decreased. The decrease in energy use in industry is also caused by the significant increase in the price of carbon dioxide after 2017 within the framework of the EU emissions trading system. The impact of the COVID-19 pandemic also reduced industrial energy demand in 2020-2021. Meanwhile transport energy consumption decreased in 2020 but increased in 2021.

Table 1: Sample of cross-cutting measures

Measures	NECP measures	Description	Expected savings, impact evaluation
GEN-EE5014 Requirement for remotely readable electricity meters	yes	In order to achieve energy saving target set for 2030, it is necessary to make all building and apartment-based water, electricity, gas and heating meters remotely readable by 2026.	High impact. Energy savings from the implementation of the measure in the period 2014-2020 was 57.5 ktoe (2,408 PJ). According to the forecast, the expected energy savings in the new accounting period 2020-2030 is 9.1 ktoe 0.4 (PJ).
GEN-EE5023 Fuel and electricity excise duties	yes	In Estonia, excise duties on fuels were introduced in 1995, initially only for motor fuels and at a relatively low tax rate. As a member of the EU since 2004, Estonia has to comply with EU requirements in the taxation of fuels and energy (Directive 2003/96 / EC, as amended by Directives 2004/74 / EC and 2004/75 / EC). All legal issues relating to energy-related excise duties are governed by the Alcohol, Tobacco, Fuel and Electricity Excise Act.	High impact. Energy saving from the implementation of the measure in the period 2014-2020 was 623 ktoe (26.1 PJ). According to the forecast, the expected energy savings in the new accounting period 2020-2030 is 546 ktoe (22.9 PJ).

Source: MURE

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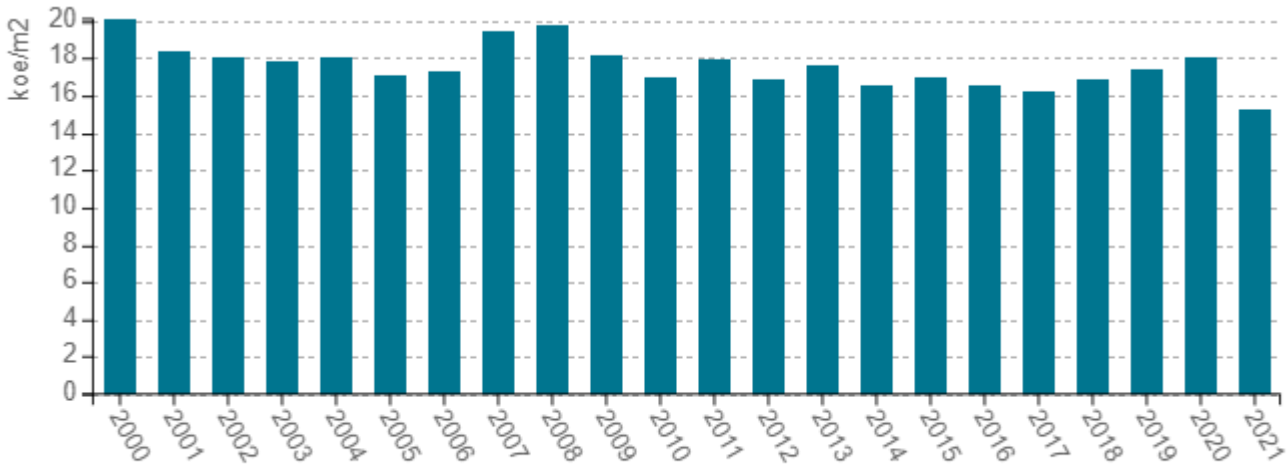
Buildings

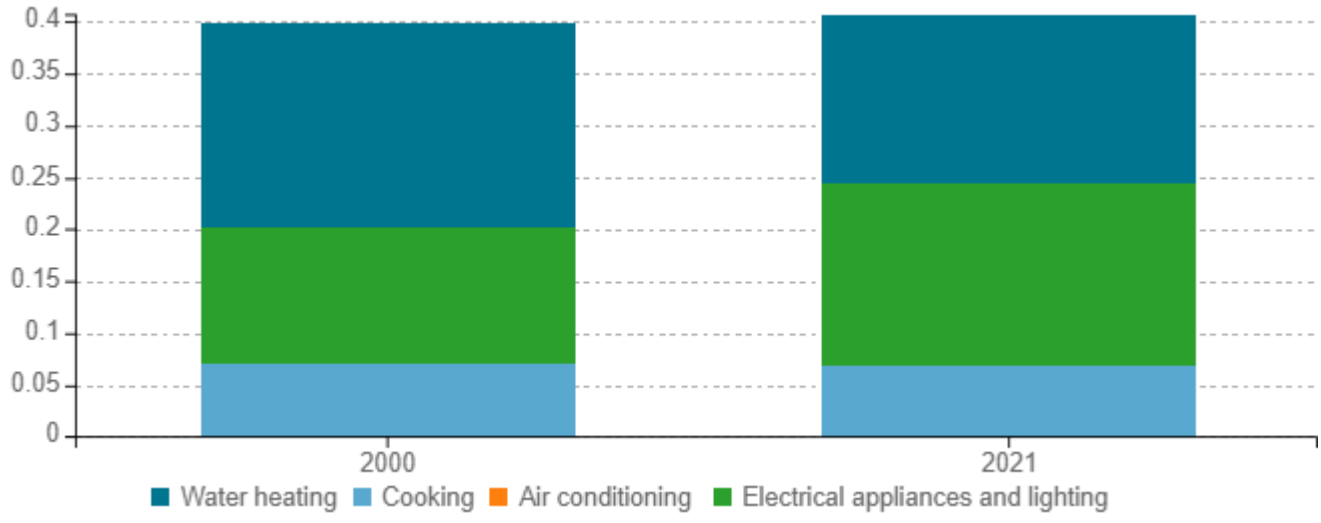
Specific unit heat consumption per m2 in buildings has declined by about 24% since 2000, mainly due to the increased use of heat pumps. The small variations from the long-term trend in some years (e.g. in 2007-2008) can be attributed to the fact that normalization with heating degree days does not "perfectly" correct the impact of weather, especially when there are large annual variations. Figure 4 illustrates the changes in the share of different energy use in households, except for heating. The share of electricity use for appliances and lighting per dwelling has increased (+10 pp) due to the wider use of heat pumps, while energy use for hot water production per dwelling has decreased (-9 pp).

Figure 3: Energy consumption of space heating per m2 (normal climate)



Source: ODYSSEE

Figure 4: Energy consumption per dwelling by end-use (except space heating)



Source: ODYSSEE

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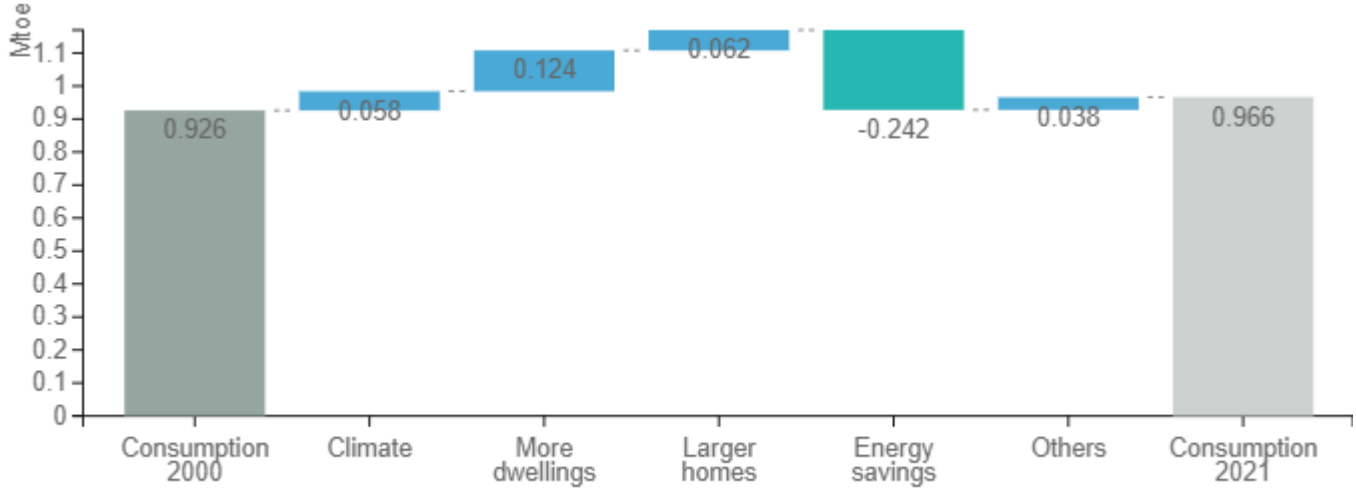
In 2021, energy consumption in residential sector was approximately 0.04 Mtoe higher than in 2000. Energy saving measures implemented in residential buildings helped to reduce energy consumption the most (total energy savings of about 0.242 million toe). At the same time, other factors: the effect of climate (0.058 Mtoe), more dwellings (0.124 Mtoe), lifestyle changes, more electrical equipment, larger homes (0.062 Mtoe), etc.) have unfortunately increased the energy consumption of housing.

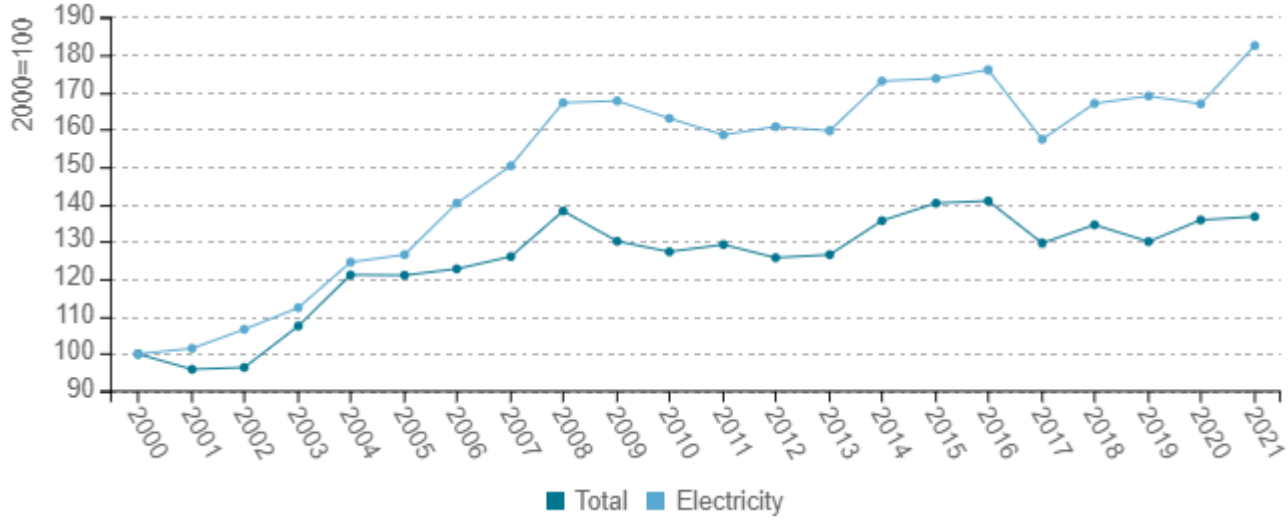
Figure 5: Main drivers of the energy consumption variation of households



Source: ODYSSEE

Both energy consumption and electricity consumption per employee have increased by 83% and 37%, respectively, since 2000. The reason is the introduction of new buildings equipped with air conditioners and the wider use of other electrical equipment. The final energy consumption in the service sector has been fairly stable since 2008, following the same trend as the number of employees.

Figure 6: Energy and electricity consumption per employee (normal climate)



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Up to now, the energy efficiency policy in the buildings sector has been targeted mainly at households through various measures that increase energy efficiency of residential buildings. The Government has decided that investing into buildings for improving the energy efficiency must continue, while the public sector must lead the way in maintaining and constructing buildings. Investments into the energy efficiency of apartment buildings must be continued as well and opportunities to expand state measures for promoting energy efficiency in family houses are to be found. In the heating sector, investments into the development or renovation of district heating systems are supported. Drawing up local development plans for energy supply in municipalities are financially supported by the central Government. Also, it is planned to support local, as alternatives to district heating, heat supply systems if these prove to be the most sustainable solutions for the region and ensure compliance with environmental standards.

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

Measures	Description	Expected savings, impact evaluation
HOU-EE5026 Renovation of apartment buildings	The aim of the measure is to renovate apartment buildings with state support. The aim is to renovate buildings to (at least) energy class C level. 30% of the cost of the work is supported - in some areas even more (up to 50%).	High impact. The energy saving from the implementation of the measure in the period 2014-2020 was 20.2 ktoe (0.844 PJ) ktoe. According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 4.8 ktoe (0.203 PJ).
HOU-EE4476 Renovation of private houses	The reconstruction grant for small houses helps the owners to reconstruct their houses. The purpose and achievable result of the support is to achieve energy efficiency and a better indoor climate in small houses, reduce energy costs, encourage the use of renewable energy, increase the number of dwellings with improved energy efficiency and save the annual consumption of primary energy.	High impact. The energy savings resulting from the implementation of the measure in the period 2014-2020 amounted to 1.8 ktoe (0.077 PJ). According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 3.1 ktoe (0.129 PJ).
SER-EE5034 Renovation of primary and secondary school buildings	The aim of the measure is to contribute to the organization of the school network by ensuring modern learning conditions in elementary school and high school buildings	Medium impact. The energy savings resulting from the implementation of the measure in the period 2014-2020 amounted to 1.03 ktoe (0.043 PJ). According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 15.22 ktoe (0.64 PJ).
SER-EE5035 Renovation of kindergarten buildings	The purpose of the measure is to improve energy efficiency through investments in public sector buildings, reduce the energy delivered to the building and building maintenance costs, or promote the use of renewable energy. Support is provided to achieve the objective of the measure.	Medium impact. The energy savings resulting from the implementation of the measure in the period 2014-2020 amounted to 0,93 ktoe (0.039 PJ). According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 3.44 ktoe (0.14 PJ).

Source: MURE

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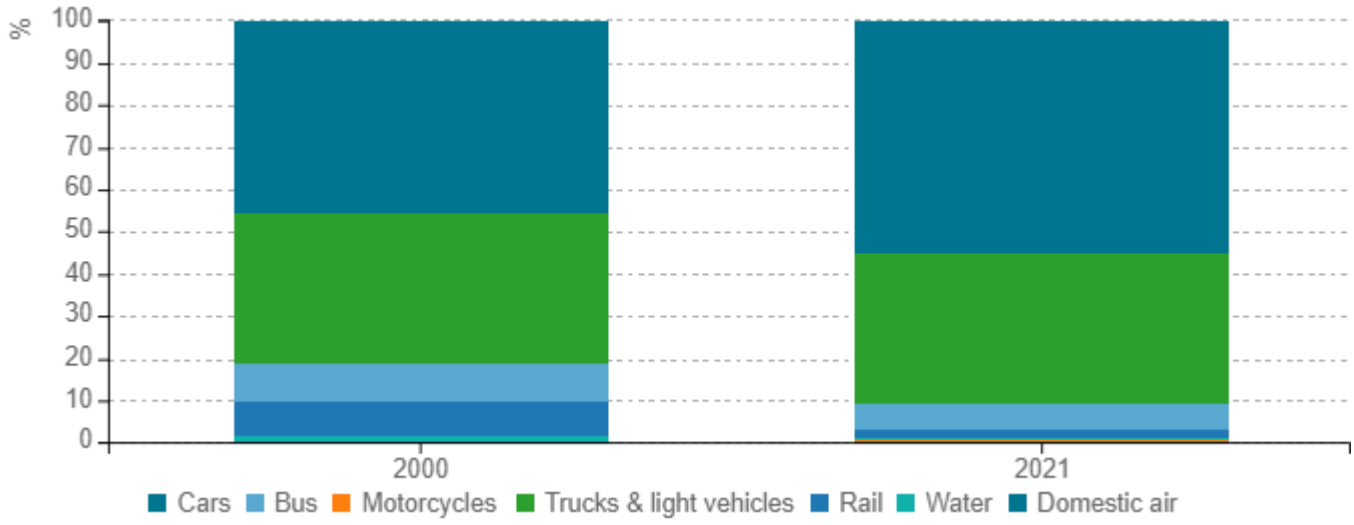
Transport

In 2021, road transport accounted for 97.1% of the energy consumption of the transport sector. Compared to the year 2000, the share of road transport in the entire transport sector has increased by about 6.7 pp. The share of rail transport has decreased from 8.1% in 2000 to 1.9% in 2021. The share of water transport has decreased by 0.5 pp and the share of air transport has remained the same.

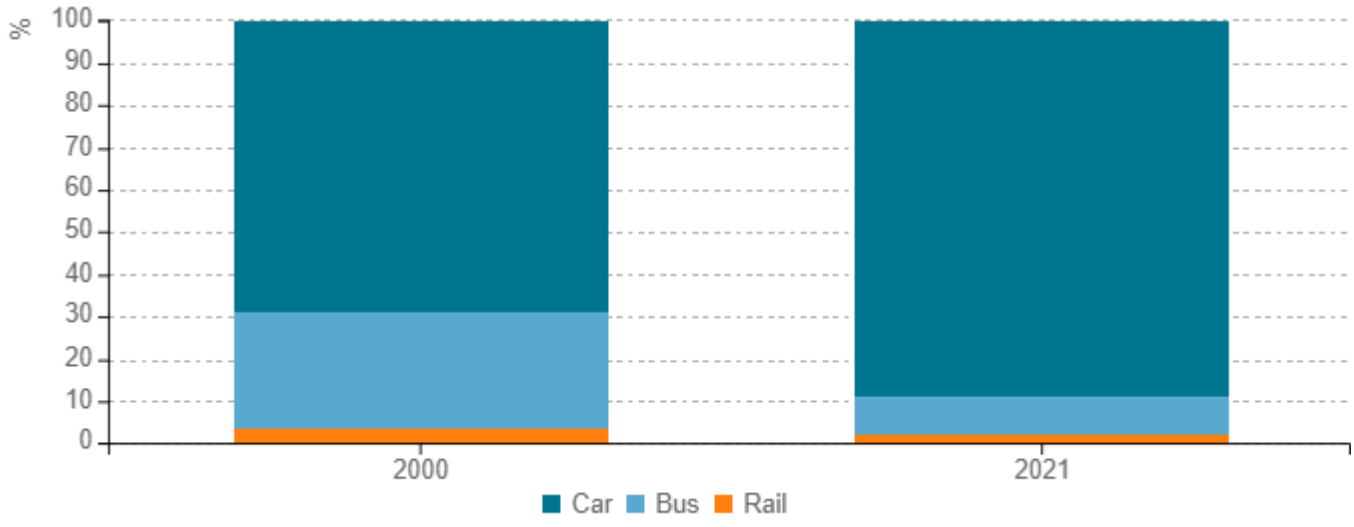
Figure 7: Transport energy consumption by mode



Source: ODYSSEE

In 2021, the passenger traffic volume of bus transport enterprises decreased by 51% and of rail transport enterprises by 9.9% compared to 2000. The volume of passenger transport by private car accounted for 13.1 billion passenger kilometres in 2021, which is approximately 96% higher than in 2000. This increase is mainly due to the increase in the number of cars.

Figure 8: Modal split of inland passenger traffic



Source: ODYSSEE

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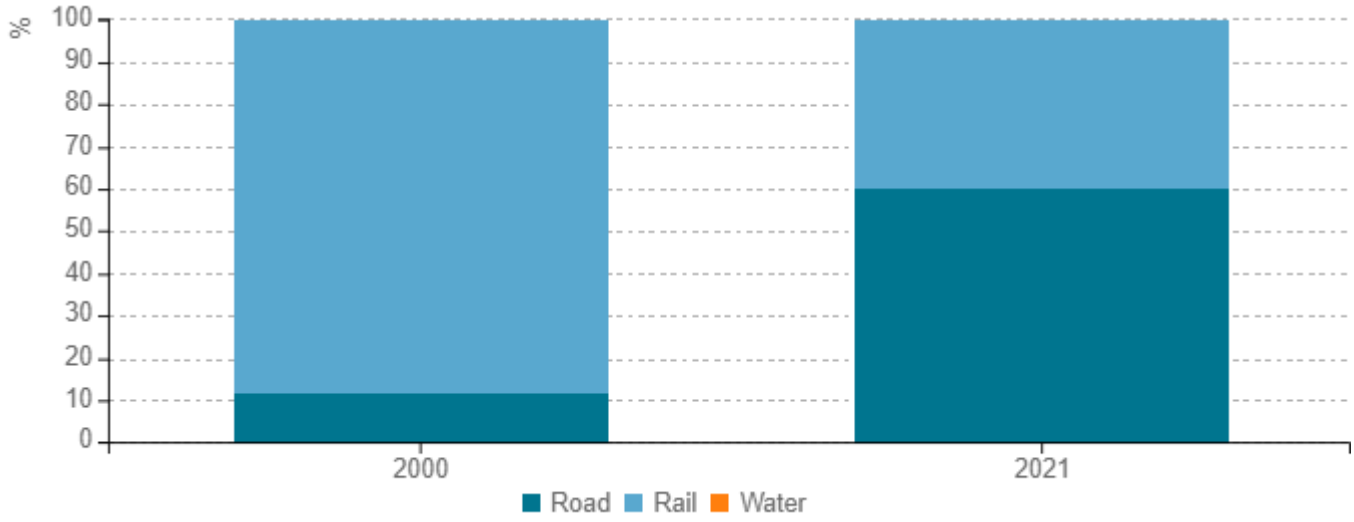
There was a sharp decrease in the carriage of goods by rail – from 8.10 Mtkm in 2000 to 2.12 Mtkm in 2021. The freight volume of Estonian road transport enterprises almost tripled (3.17 Mtkm in 2021 versus 1.06 Mtkm in 2000). The high share of road transport in total traffic is a trend contrary to the expectations of policymakers.

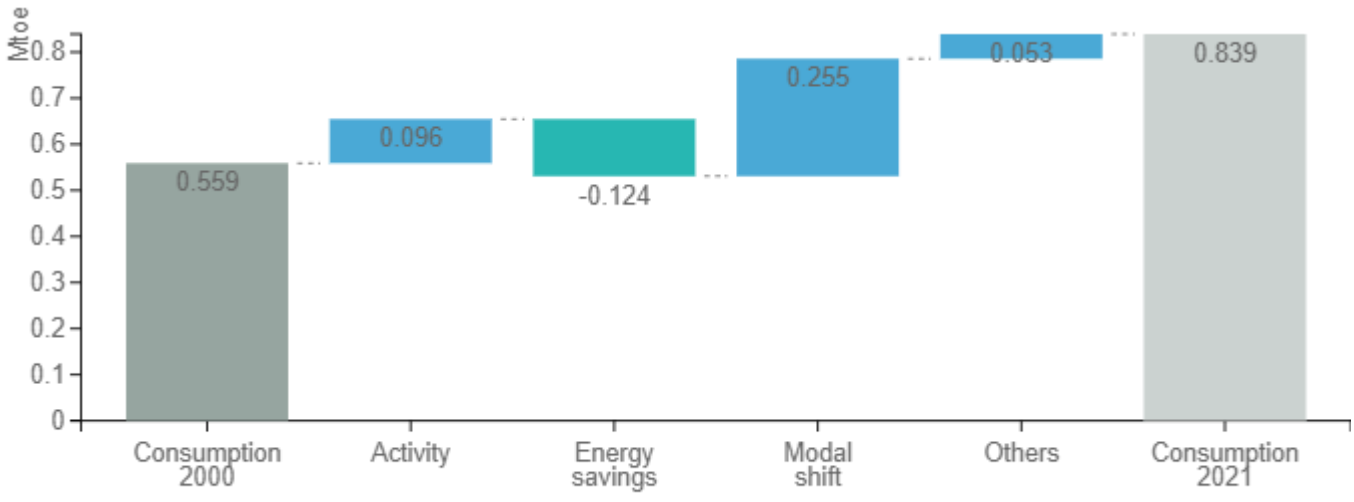
Figure 9: Modal split of inland freight traffic



Source: ODYSSEE

In 2021, energy consumption in the transport sector was 50% higher than in 2000. This trend is mainly due to the increase in passenger traffics (+0.255 Mtoe) and changes in the structure (higher share of private cars and road freight in traffics that pushed up consumption by 0.013 Mtoe). These effects are higher than energy savings effects (-0.124 Mtoe).

Figure 10: Main drivers of the energy consumption variation in transport



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Up to the present, the primary instrument for influencing energy use in the transportation sector has been excise duties, and the fuel excise has been raised on ten occasions during the last 22 years. The Government has decided to foster the use of cars with lower fuel consumption and environmental impact. Projects aimed at improving energy efficiency in the transportation sector have been implemented under the green investment scheme. The consumption of energy by the transport sector is planned to be reduced through three lines of activity: decreasing the need for transport, including making freight transport more efficient and environmentally sustainable and considering sustainable commuting principles in the planning process; increasing the use of public transport and making vehicles more ecological.

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

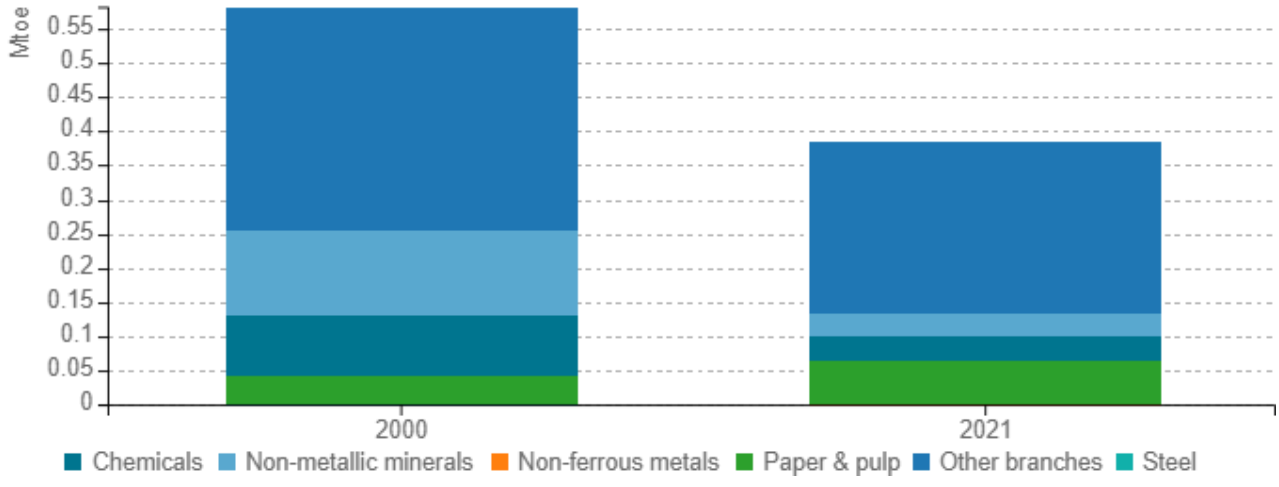
Measures	Description	Expected savings, impact evaluation
TRA-EE5018 Walking and cycling roads	The measure encourages residents to consider alternative sustainable modes of transport (public transport, bicycles, walking) and thus contributes to the achievement of energy saving goals.	High impact. The energy saving from the implementation of the measure in the period 2014-2020 was 12.8 ktoe (0.535 PJ). According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 110 ktoe (4.6 PJ).
TRA-EE5022 Eco driving	The aim of sustainable driving training is to reduce vehicle fuel consumption, environmental pollution and increase road safety. All new license holders are expected to receive mandatory sustainable driving training.	High impact. The energy saving from the implementation of the measure in the period 2014-2020 was 10.1 ktoe (0.421 PJ). According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 24.12 ktoe (1.01 PJ).

Source: MURE

Industry

The energy consumption of the industrial sector has decreased significantly between 2000 and 2021, by approximately 1.9% per year. Approximately a quarter of the energy consumption of the industrial sector is consumed by energy-intensive industries - the non-metallic mineral industry and the paper industry.

Figure 11: Final energy consumption of industry by branch



Source: ODYSSEE

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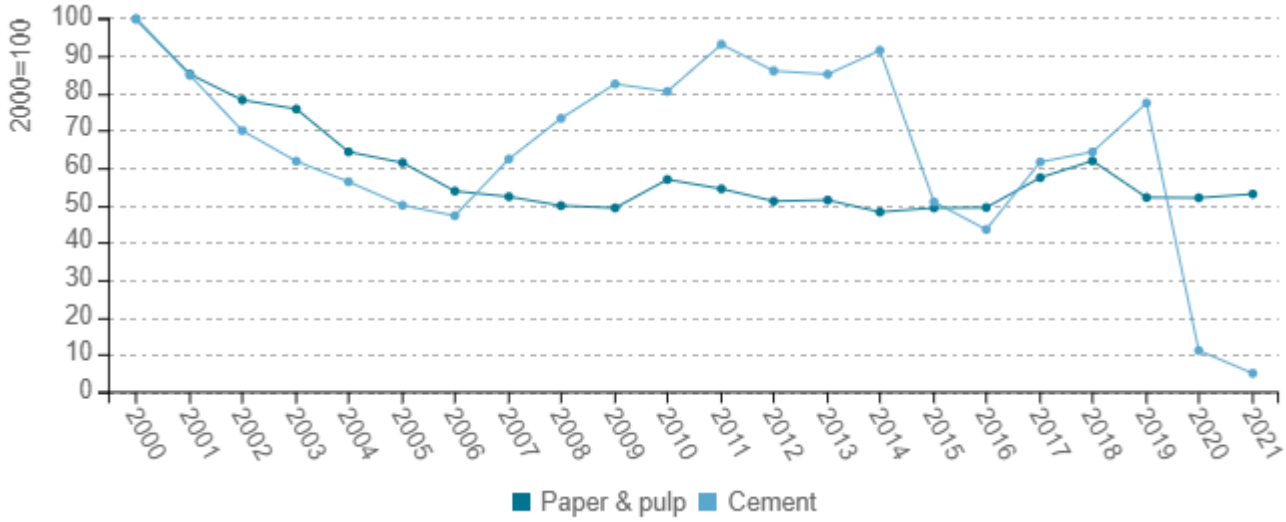
Since 2000, cement has been produced in Estonia from imported clinker. Therefore, the energy consumption required to produce one unit of cement has decreased by 95% in 2021 compared to 2000. The energy consumption required to produce one unit of paper has decreased by about 47% (3% per year) over the same period.

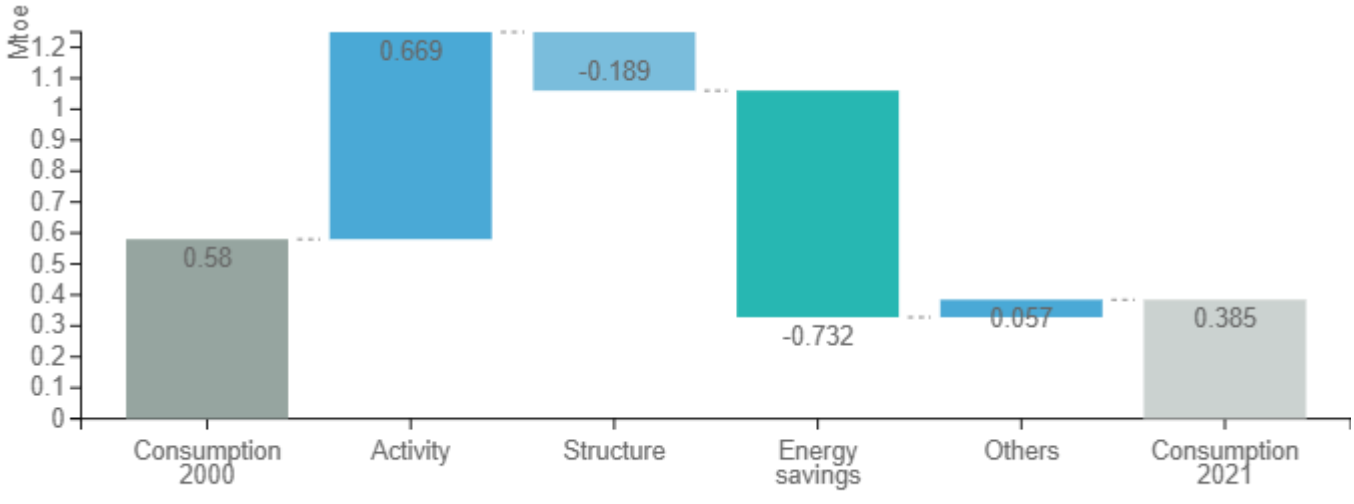
Figure 12: Unit consumption of energy-intensive products (toe/t)



Source: ODYSSEE

Energy savings (-0.732 Mtoe) as well as structural changes towards less energy intensive branches (-0.189 Mtoe) led to decrease energy consumption since 2000. On the opposite, the growth in activity (0.669 Mtoe) has partly offset the saving effect. As a result, energy consumption has decreased by 0.2 Mtoe over the period 2000-2021.

Figure 13: Main drivers of the energy consumption variation in industry



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It has been estimated that in industry, there is the potential for a 30% of heat and 10% electricity conservation and attaining; this will require adoption of new technologies and an increase in awareness. The focus of energy efficiency in industry must be on the development of energy and resource efficiency. The measure designed to inform industrial companies about the potential for energy savings and resource efficiency as well as to analyse resource use has been launched.

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

Measures	Description	Expected savings, impact evaluation
IND-EE5016 Resource efficiency measure to support investments in manufacturing and mining industry	The measure is intended to increase energy and resource efficiency in companies and industry. The activities of the measure were financed with a total of 67 million euros from the Regional Development Fund of the European Union. Most of the budget, 66 million euros, was intended for investment in companies (177 projects). For example, activities related to the transformation of the production process and increasing efficiency were supported, which in turn reduce the resources used in production. In Estonia, the greatest potential for saving resources is in the mining, food, wood, paper and pulp industries, as well as in the processing of mineral materials.	High impact. Energy savings from the implementation of the measure in the period 2014-2020 was 12.6 ktoe (0.528 PJ). According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 28.5 ktoe (1.27 PJ).
IND-EE5117 Electrointensive enterprises excise duty reduction	The electricity excise duty discount is accompanied by the obligations of ISO 50001, which promotes energy savings for each energy carrier.	High impact. Energy savings from the implementation of the measure in the period 2014-2020 was 4.9 ktoe (0.207 PJ). According to the forecast, the expected energy savings in the new calculation period 2020-2030 is 7.4 ktoe (0.31 PJ).

Source: MURE

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