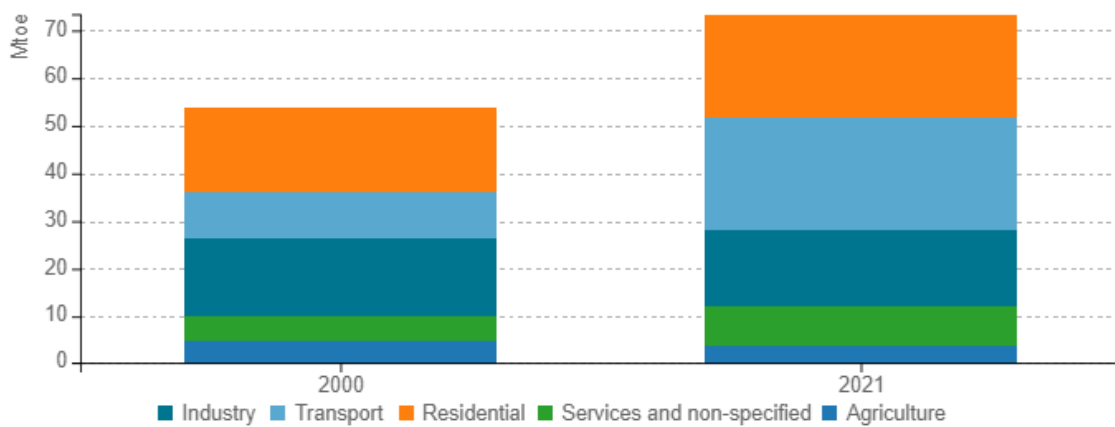


Energy efficiency trends and policies

Overview

Final energy consumption in Poland was increasing by 1.5%/year from 2000 reaching 73.3 Mtoe in 2021 (at normal climate). The biggest consumer was transport sector, which share amounted to 32% in 2021, followed by households with 29.5% share. Energy use of third biggest consumer - industry - decreased by around 0.1%/year during given period and accounted for 22% of final energy consumption in 2021. Service sector, due to a rapid growth of consumption (2.4%/year) increased its share to 11.5% of total final consumption. Consumption in agriculture decreased by 0.1%/year and the share of this sector amounted to 5%.

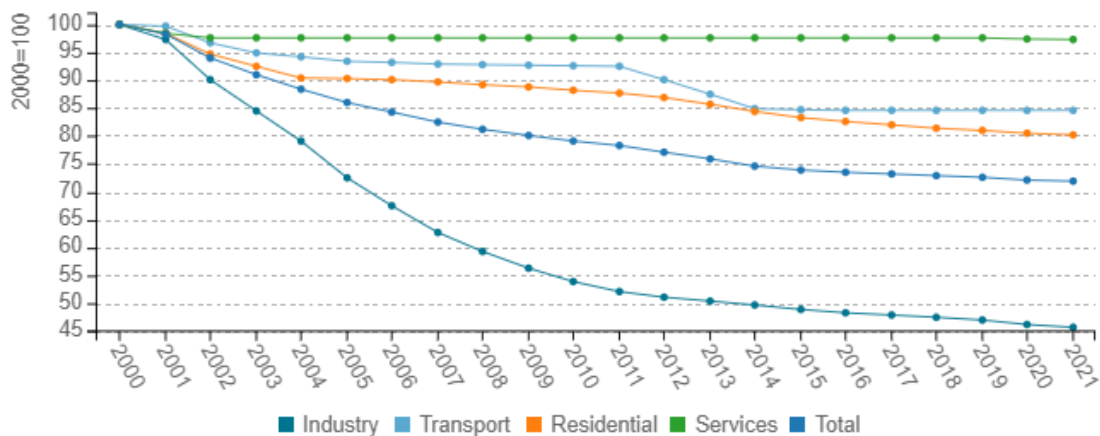
Figure 1: Final energy consumption by sector (normal climate)



Source: ODYSSEE

Energy efficiency in Poland was improving by 1.6%/year over the period 2000-2021. Most progress was registered during the first half of the period (2.4%/year during 2000-2009 in comparison with 0.9%/year over 2009-2021). The most significant improvement was achieved in industry, where energy efficiency improved by 3.7%/year. In the residential sector, we can observe a small progress since 2004 (0.7%/year). The energy efficiency of transport improved by 0.7% per year until 2011, by 2.8%/year between 2011 and 2014, but there was no improvement in the following years.

Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE



Table 1: Sample of cross-cutting measures

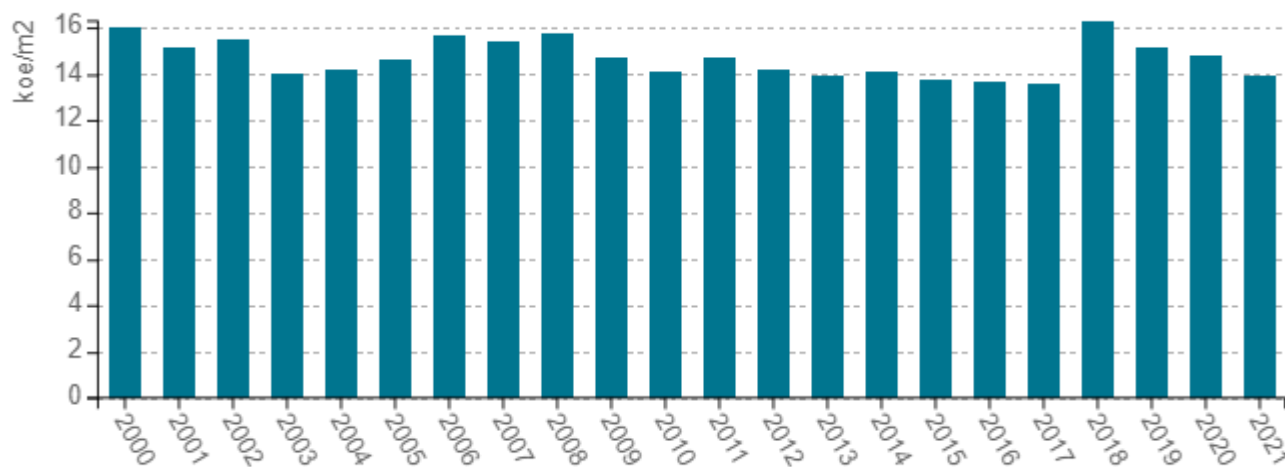
Measures	NECP measures	Description	Expected savings, impact evaluation
Energy Plus programme	yes	The aim of the Energy Plus programme is to reduce the negative impact of companies on the environment. This includes improving air quality by supporting investment projects. Various types of projects are covered by the call, including, but not limited to, projects that reduce the consumption of primary raw materials (or lead to a reduction in the amount of waste generated) in production facilities or industrial installations; projects that contribute to improving air quality by reducing the volume of combustion emissions from sources with a total fuel capacity of more than 50 MW; investments related to distribution/transmission networks that use renewable energy sources for energy production, as well as waste heat and combined heat and power.	The programme will be implemented between 2019 and 2025, with commitments in the form of contracts to be concluded by the end of 2023. The estimated value of the reduction in primary energy consumption is at least 500,000 GJ/year, the reduction in primary raw material consumption is at least 1,700,000 Mg/year and the reduction in CO2 emissions is at least 150,000 MG/year.

Source: MURE

Buildings

Energy consumption of space heating per m² in households with climatic correction was decreasing on average by 0.7% per year in years 2000-2021. The highest consumption was observed in 2018 and amounted to 16.3 koe/m². After that, the energy consumption per m² tended to decrease at the rate of 5.2%/year. Energy consumption by end-use per dwelling grew substantially between 2000 and 2021: in case of electrical appliances and lighting by 20.5% to 0.15 toe/dwelling and in case of water heating by 1.5% to 0.28 toe/dwelling. In case of cooking there was a decrease of 9.7% to 0.14 toe/dwelling.

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



Source: ODYSSEE

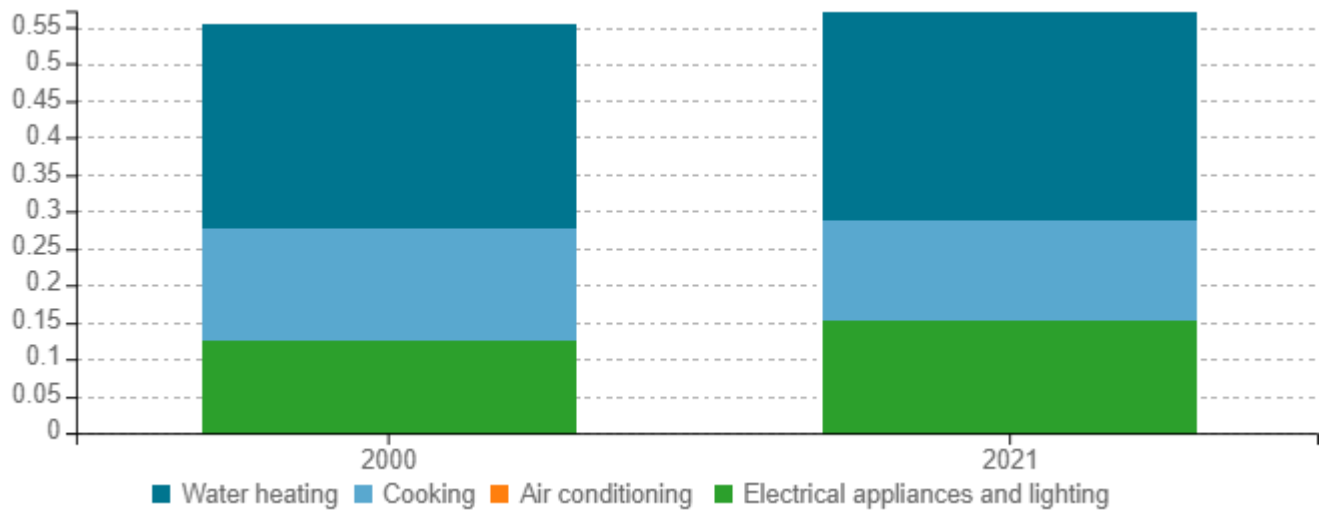
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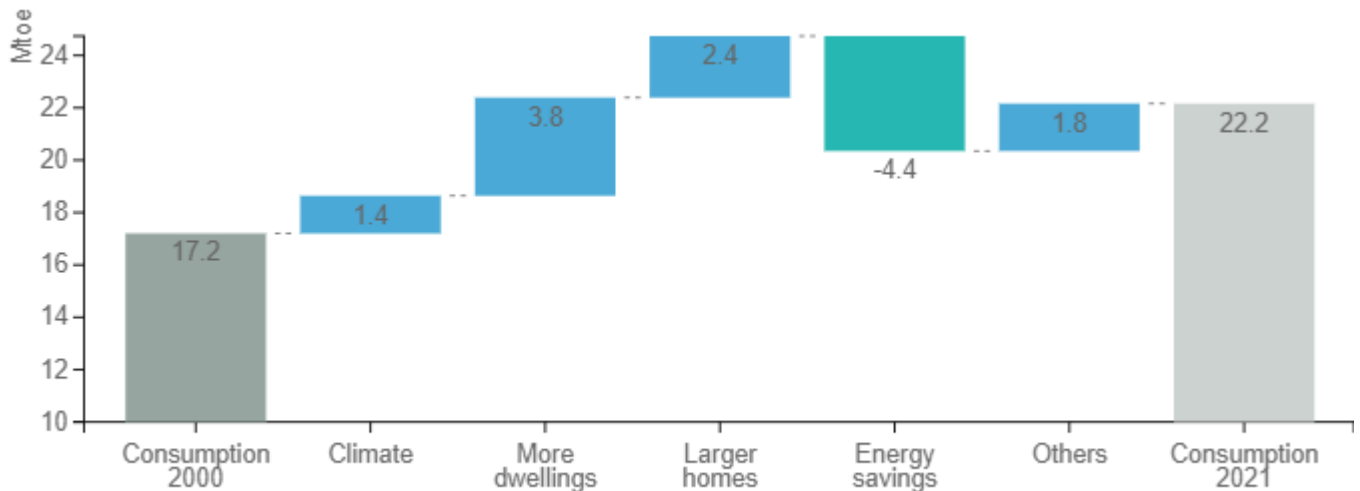
Figure 4: Energy consumption per dwelling by end-use (except space heating)



Source: ODYSSEE

In 2021, energy consumption in households amounted to 22.2 Mtoe, an increase of 29.1% compared to 2000. In the period 2000-2021, energy savings reduced household energy consumption by 4.4 Mtoe, whereas climate increased energy consumption in households by 1.4 Mtoe, more dwellings by 3.8 Mtoe, larger homes by 2.4 Mtoe, and other factors by 1.8 Mtoe.

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

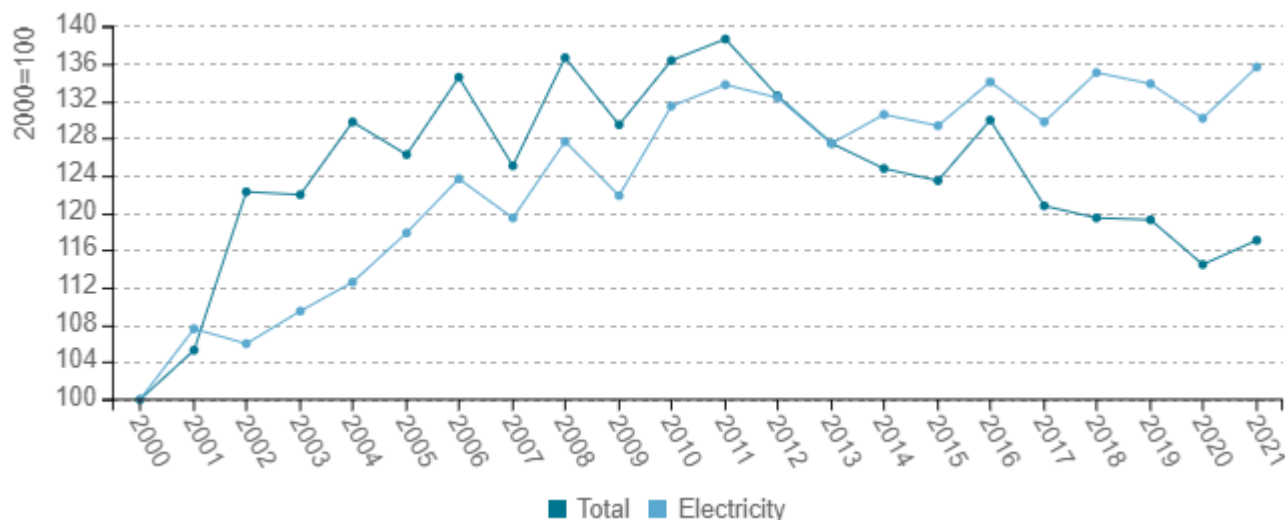


Source: ODYSSEE

In 2021, total energy consumption per employee increased by 17.1% compared to 2000. The highest consumption was recorded in 2011, reaching 38.7% higher consumption than in 2000. In 2021, electricity consumption per employee increased by 35.7% compared to 2000, the highest consumption between 2000 and 2021.



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



Source: ODYSSEE

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

Measures	Description	Expected savings, impact evaluation
Warm Housing	The programme aims to improve air quality and reduce dust and greenhouse gas emissions by replacing heat sources and improving energy efficiency. It targets dwellings in multi-family residential buildings.	The planned value of the reduction in final energy consumption is 2,061,810 GJ/year.
Thermo-modernization and Renovation Fund	The Fund's primary objective is to provide financial assistance to investors undertaking thermo-modernization and repair projects and to pay compensation to owners of residential buildings.	The fund is functioning from 1999. Expected energy savings in the period 2021-2030 - 70 ktoe/year.
My Heat	The programme aims to support the purchase and installation of heat pumps for new single-family homes. This will contribute to reducing low-emissions and increasing the share of renewable energy in final energy consumption.	Planned renewable energy generation of at least 450 MW and a reduction in CO2 emissions of at least 65,00 Mg CO2/year.
Improving air quality by replacing heat sources in multi-family dwellings - pilot project	The objective of the programme is to improve air quality and reduce greenhouse gas emissions by replacing heat sources and improving energy efficiency in multi-family houses. Pilot project in the West Pomerania voivodship.	Planned reduction of final energy consumption by at least 15,8400 GJ/year and reduction of PM10 dust emissions by at least 14 Mg/year.

Source: MURE

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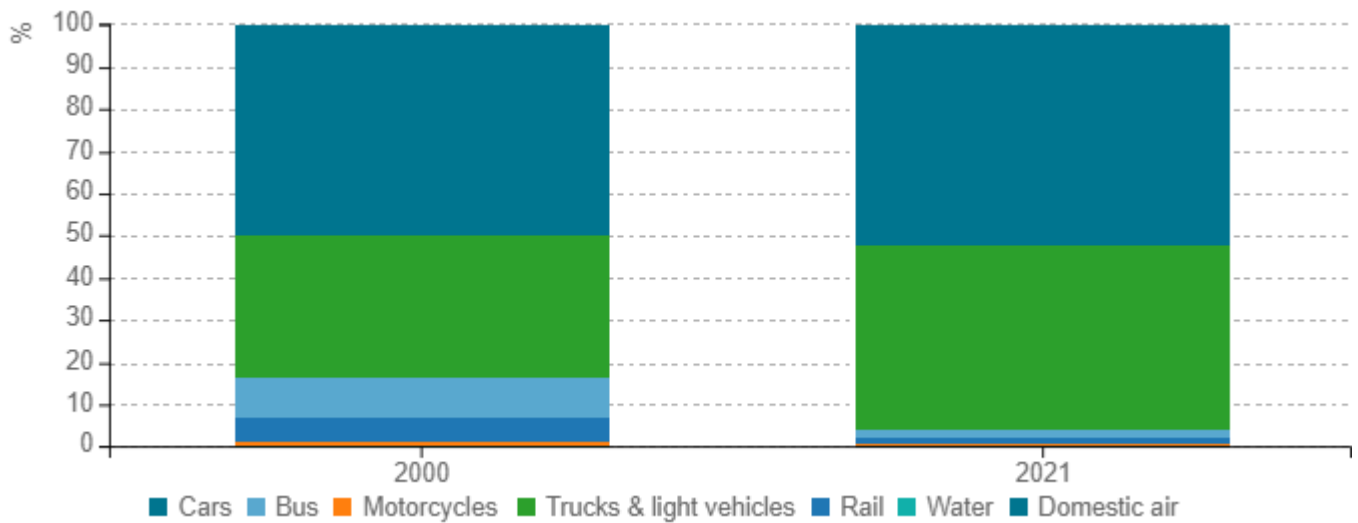


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Transport

In 2021, the share of passenger cars in energy consumption in transport amounted to 52.3%, an increase of 2.3 percentage points compared to 2000, and the share of trucks reached 43.4% (a significant increase of 9.8 percentage points compared to 2000). The share of other modes was small and decreased.

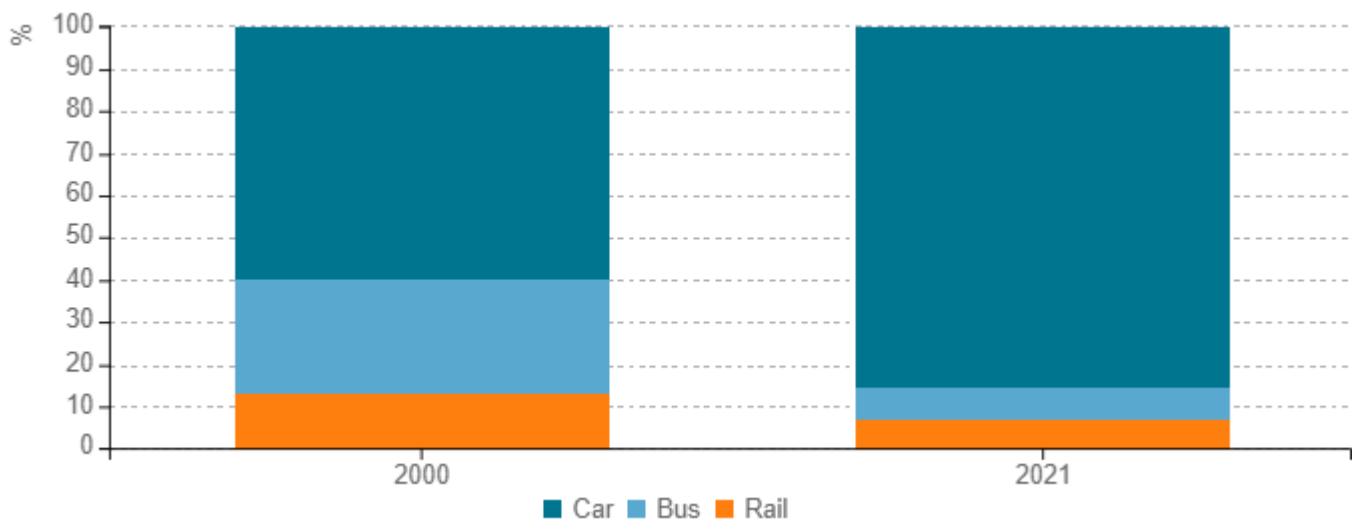
Figure 7: Transport energy consumption by mode



Source: ODYSSEE

In 2021, the share of passenger cars in inland passenger traffic amounted to 85.3%, a significant increase of 25.7 percentage points compared to 2000. The share of buses and trains made up 7.8% and 6.9% respectively – significant decreases in share compared to 2000 by 19.4 and 6.3 percentage points respectively.

Figure 8: Modal split of inland passenger traffic

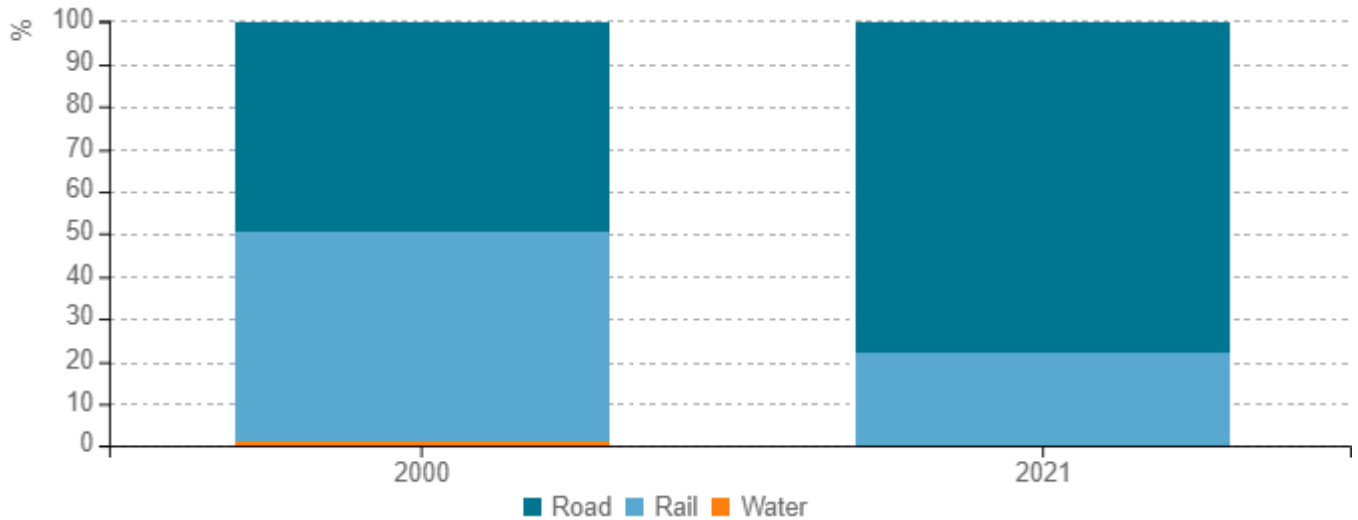


Source: ODYSSEE



In 2021, the share of road transport in inland freight traffic reached 77.7%, a significant increase of 28.1 percentage points compared to 2000. The share of rail transport was 22.3%, a significant decrease of 27.0 percentage points compared to 2000. Water transport of goods remained marginal.

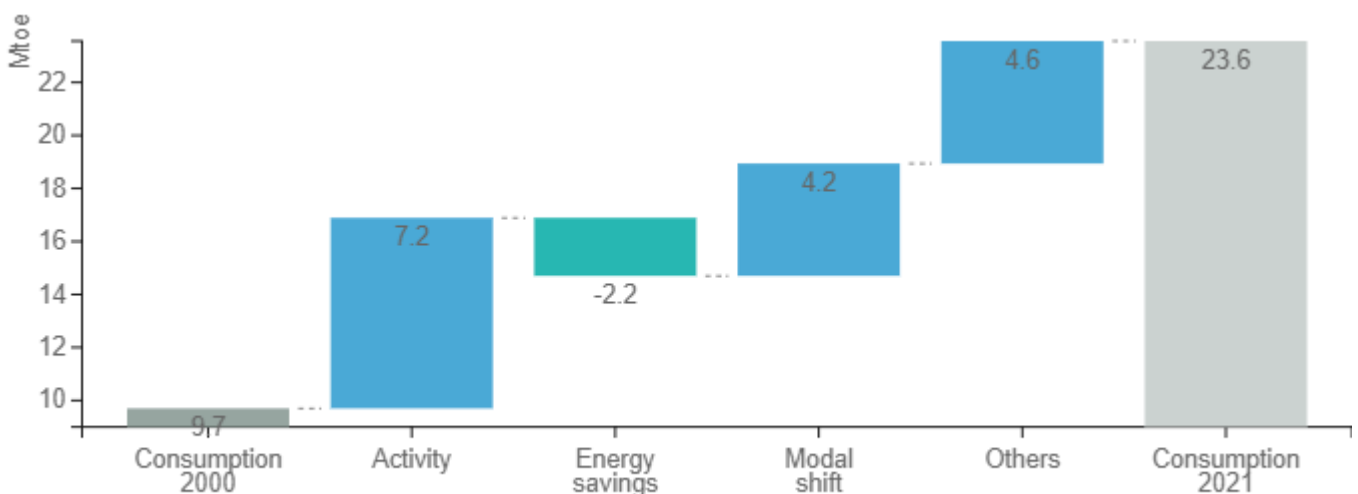
Figure 9: Modal split of inland freight traffic



Source: ODYSSEE

Energy consumption in transport has increased 2.4 times since 2000, the most important factor being the increase in passenger and freight transport, which contributed to an increase in consumption of 7.2 Mtoe. The modal shift from public transport to private cars for passengers and from trains to road for goods increased consumption by 4.2 Mtoe and other factors by a further 4.6 Mtoe. Energy savings (2.2 Mtoe) partially offset the impact of these effects.

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



Source: ODYSSEE



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

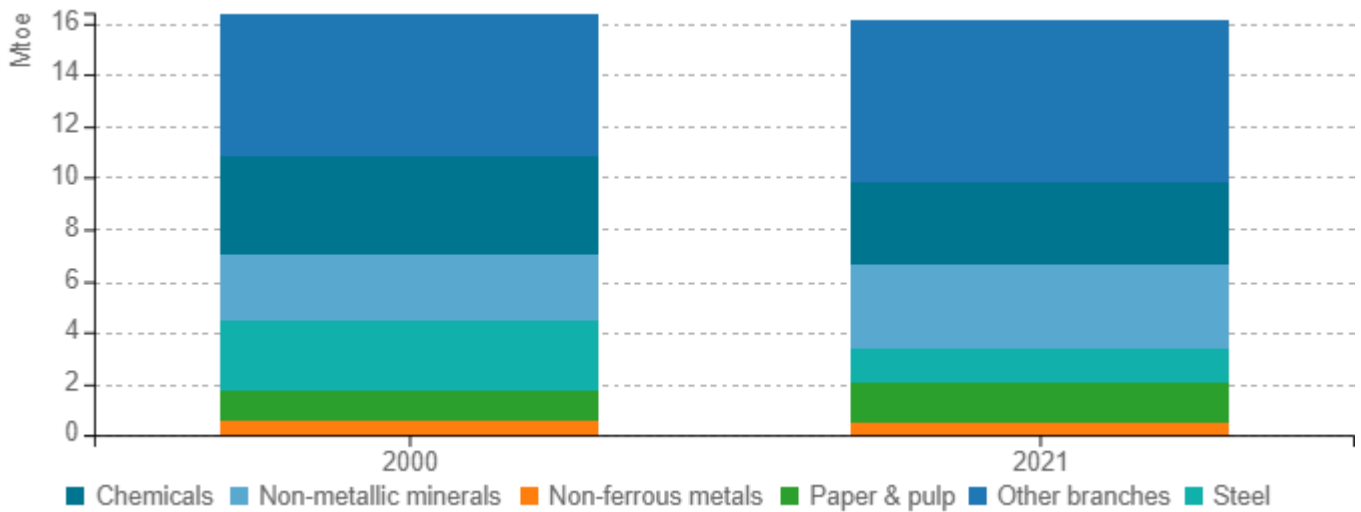
Measures	Description	Expected savings, impact evaluation
My electric vehicle	The objective of the programme is to support projects aimed at reducing the consumption of polluting fuels in the transport sector by providing financial assistance for the purchase or leasing of zero-emission vehicles.	Estimated reduction of CO2 emissions by at least 52,700 Mg, PM10 by 0.37 Mg/year and nitrogen oxides by 50 Mg/year.
Green public transport (Phase I)	The programme is designed to support projects that reduce the use of polluting fuels in public transport.	The implementation of the project will avoid air emissions of at least 16,155 CO2 Mg/year, PM10 dust by 0.046 Mg/year and nitrogen oxides by 11.94 Mg/year.

Source: MURE

Industry

The share of the three most energy-consuming industries (paper and pulp, chemicals and non-metallic) increased from 46% in 2000 to 49% in 2021. The final energy consumption of non-metallic industry increased by 24% compared to 2000, and paper and pulp industry by 38%, whereas the chemical industry decreased by 17%.

Figure 11: Final energy consumption of industry by branch

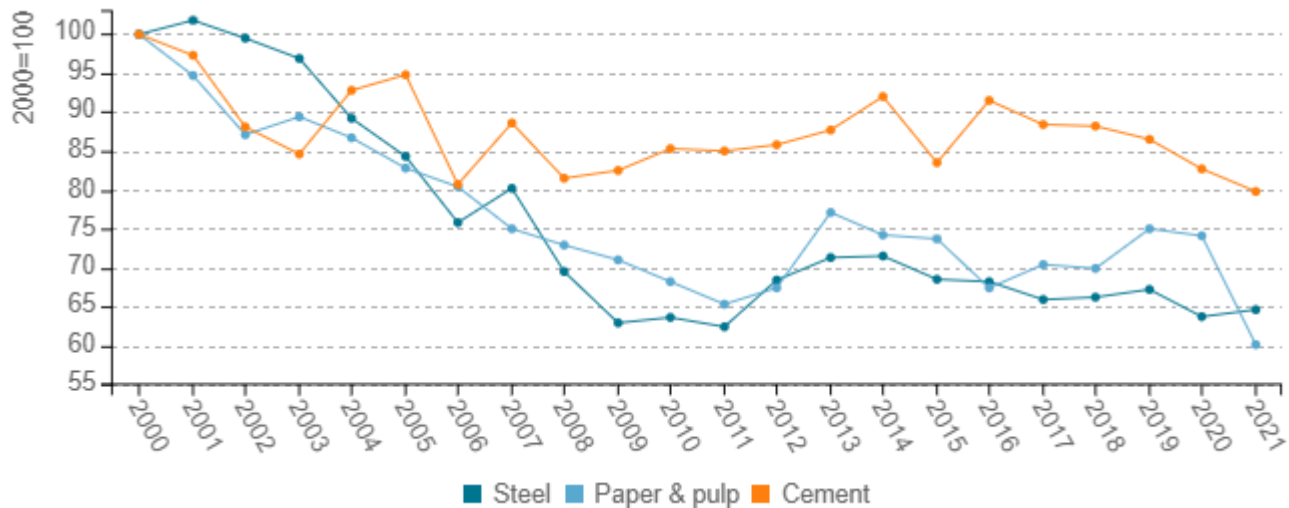


Source: ODYSSEE



Between 2000 and 2021, there was a significant decrease in energy consumption per tonne of steel, paper and cement production, i.e. there was a significant improvement in energy efficiency. In 2021, the unit energy consumption of steel decreased by 35% compared to 2000, the unit consumption of paper decreased by 40%, and the unit consumption cement decreased by 20%.

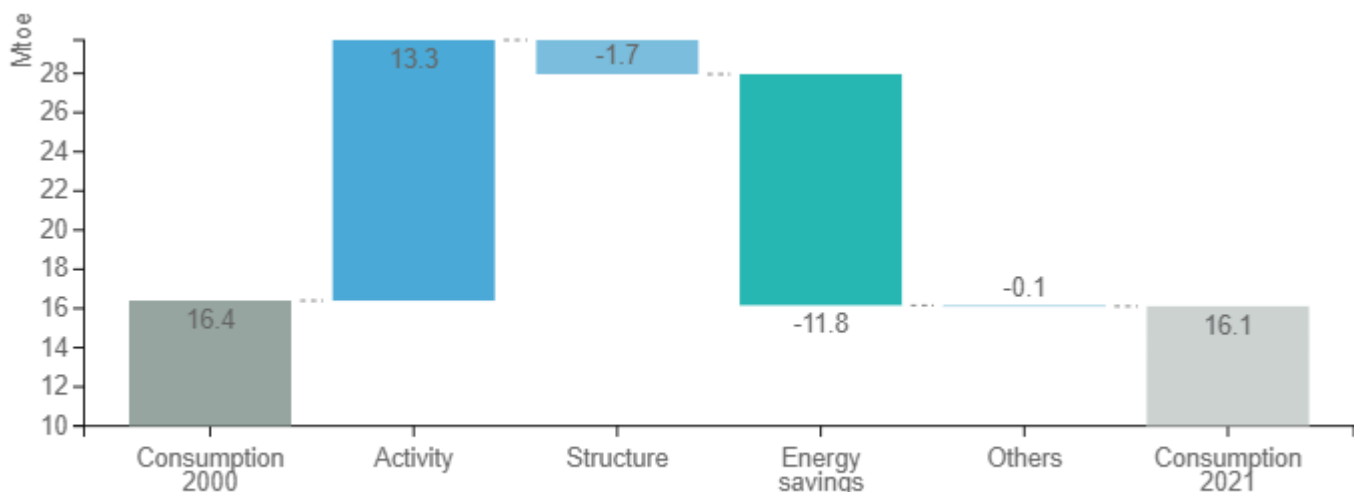
Figure 12: Unit consumption of energy-intensive products (toe/t)



Source: ODYSSEE

Growth of activity in industrial branches contributed to increase in energy consumption by 13.3 Mtoe since 2000. On the opposite energy savings (11.8 Mtoe) and structural changes towards less energy intensive production (1.7 Mtoe) led to decrease the consumption. As a result, energy consumption of industry has decreased by 0.1%/year since 2000.

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



Source: ODYSSEE



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

Measures	Description	Expected savings, impact evaluation
Energy intensive industry - RES	The programme aims to decarbonise energy-intensive industries in Poland by increasing electricity generation from renewable energy sources.	The estimated reduction of CO2 emissions as a result of the project is at least 95,000 Mg/year, the amount of renewable energy generated is 130,000 MWh/year and the creation of additional electricity generation capacity is 85 MWe.
Industry for transformation - increasing the capacity of companies to produce zero and low carbon solutions	The programme is dedicated to the development of a low and zero carbon economy by supporting industry with a focus on the clean mobility and energy sectors.	One of the indicators for the achievement of the objective is the creation of an additional renewable energy generation capacity of at least 1000 MW/year.

Source: MURE

