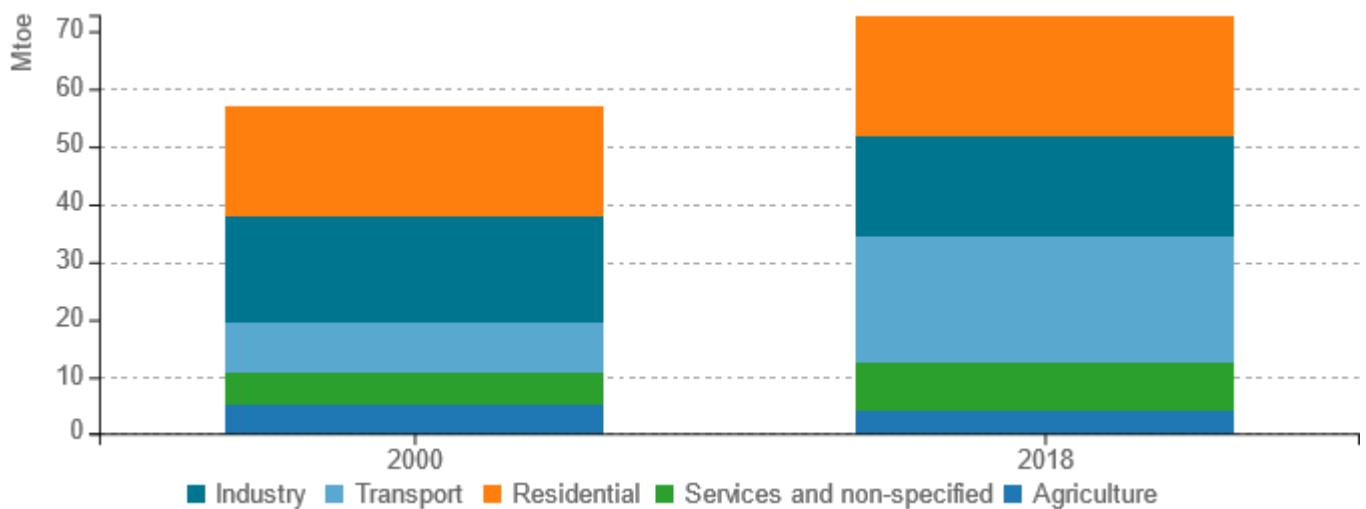


Energy efficiency trends and policies

Overview

Final energy consumption in Poland was increasing by 1.4%/year from 2000 reaching 72.8 Mtoe in 2018 (at normal climate). The biggest consumer was transport sector, which share amounted to 30.2% in 2018, followed by households with 29.0% share. Energy use of third biggest consumer - industry - decreased by around 0.4%/year during given period and accounted for 23.9% of final energy consumption in 2018. Service sector, due to a rapid growth of consumption (+2.5%/year) increased its share to 11.5% of total final consumption. Consumption in agriculture decreased by 1.6%/year and the share of this sector amounted to 5.4%.

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

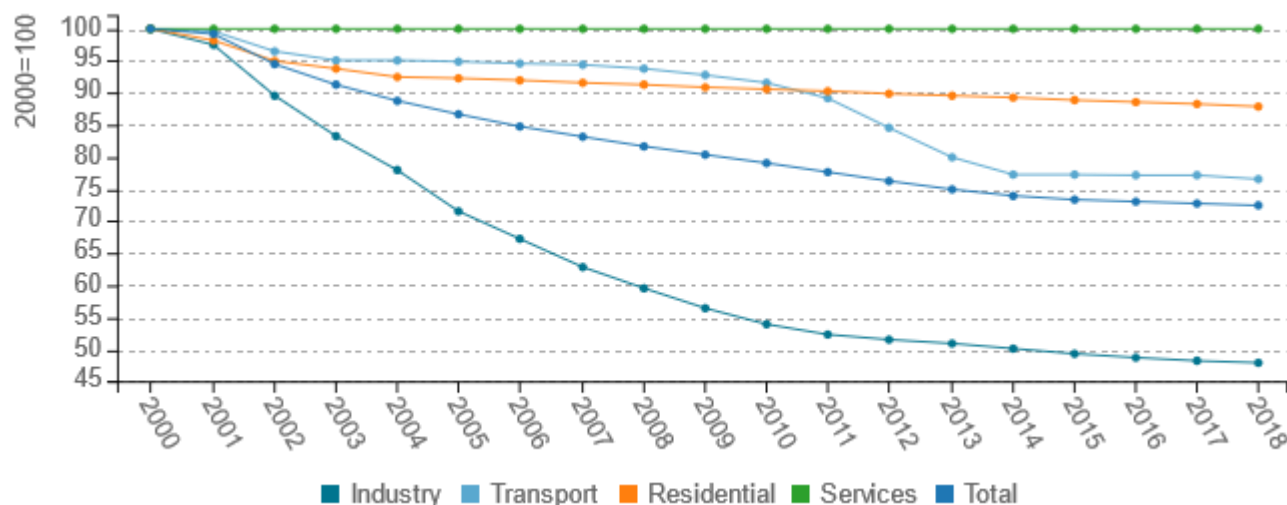


Source: ODYSSEE

Energy efficiency in Poland was improving by 1.8%/year over the period 2000-2018. Most progress was registered during the first half of the period (2.4%/year during 2000-2009 in comparison with 1.1%/year over 2009-2018). The most significant improvement was achieved in industry, where energy efficiency improved by 4.0%/year. In the residential sector, we can observe few progress since 2004 (0.4%/year). Energy efficiency of transport was improving by 0.9%/per year until 2010, by 4.2%/year in years 2010-2014 and by 0.2%/year since 2014.



Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE

Table 1: Sample of cross-cutting measures

Measures	NEEAP measures	Description	Expected savings, impact evaluation	More information available
Energy efficiency improvement scheme (White Certificates) under the Energy Efficiency Law (EEL)	yes	The EEL requires energy sales companies, which sell energy to final customers to obtain energy efficiency certificates, hereinafter referred to as „white certificates”, and submit those certificates for redemption to the President of the Energy Regulatory Office White certificate could be obtained for measures improving energy efficiency in 3 categories: (i) increasing energy savings by end-users; (ii) increase energy savings by energy producers from devices used for their production needs; (iii) reducing the electricity, heat or natural gas loss in transmission or distribution.	Achieved 10,7* Mtoe of final energy savings in 2020. * KAPE expert study The Scheme is expected to remain in effect until 2030, i.e. over the next 10 years, with the annual energy savings it produces averaging 445 ktoe over the timespan. The cumulative final energy savings will be around 55 x 445 = 24 500 ktoe, which represents 80% of the total energy savings required, namely 30 635 ktoe.	https://www.gov.pl/web/klimat/system-zobowiazujacy-do-efektywnosci-energetycznej-inaczej-zwany-bialymi-certyfikatami

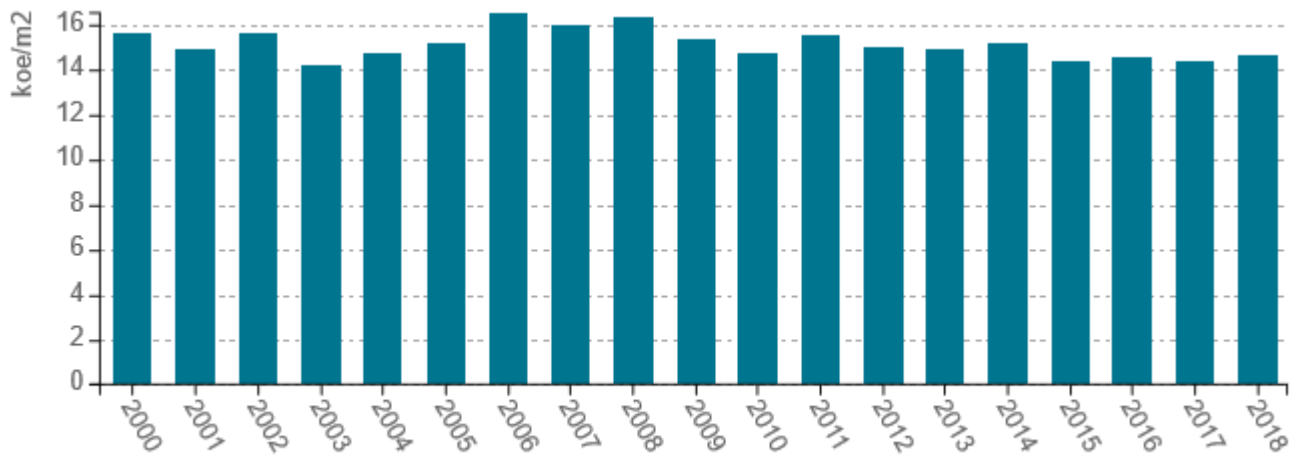
Source: MURE



Buildings

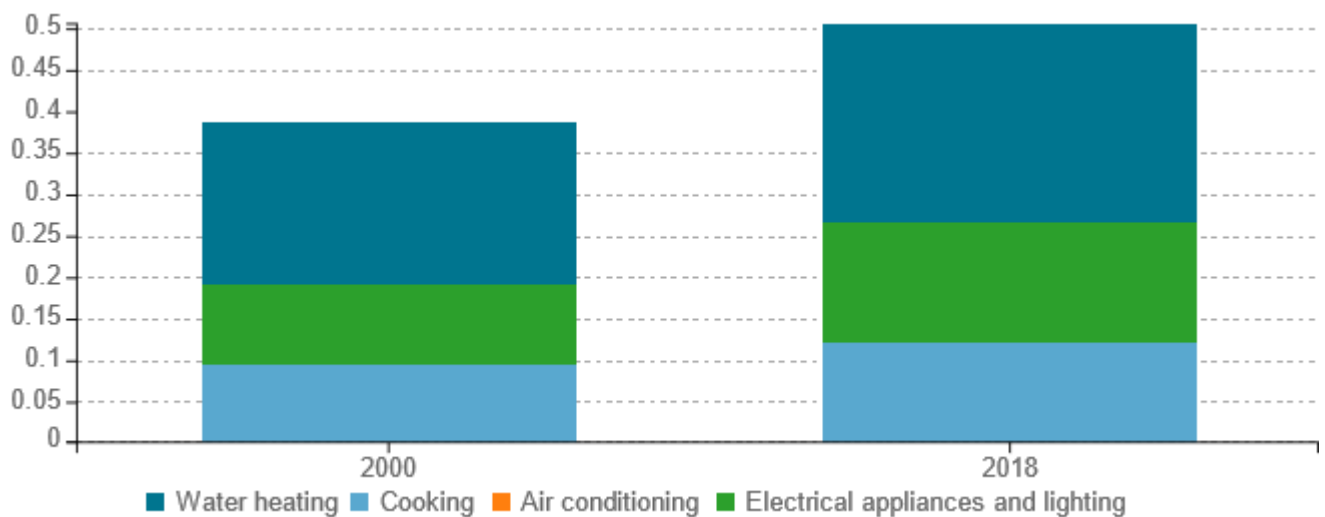
Energy consumption of space heating per m2 in households with climatic correction was decreasing on average by 0.4% per year in years 2000-2018. The highest consumption was observed in 2006 and amounted to 16.5 koe/m2. After that, the energy consumption per m2 tended to decrease at the rate of 1.0%/year. Energy consumption by end-use per dwelling grew substantially between 2000 and 2018: in case of electrical appliances and lighting by 49.9% to 0.145 toe/dwelling, in case of cooking by 30.7% to 0.121 toe/dwelling and in case of water heating by 21.9% to 0.239 toe/dwelling.

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)



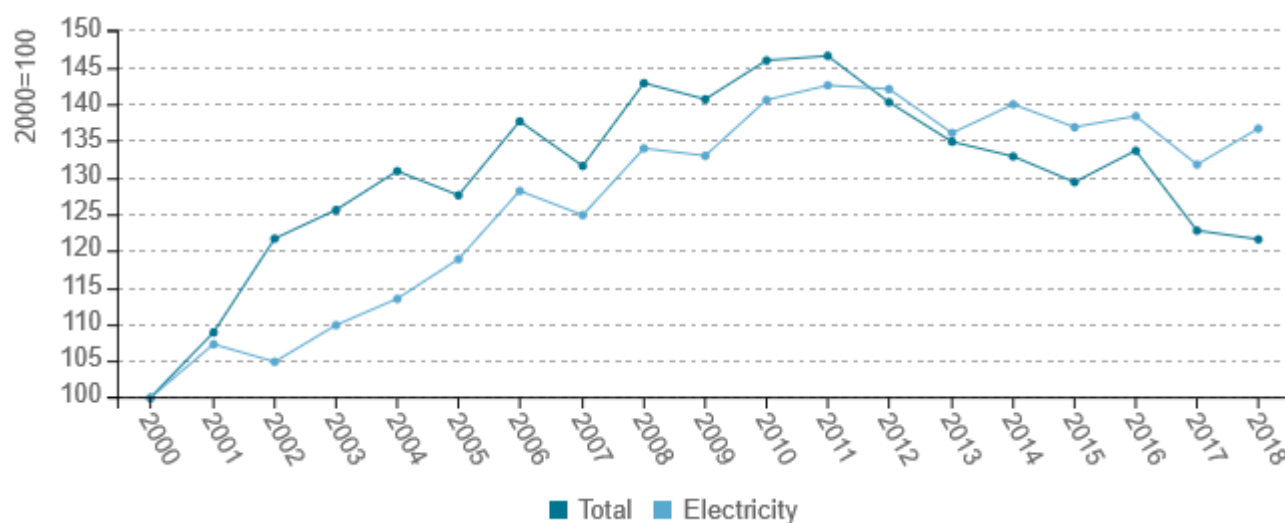
Source: ODYSSEE



Energy consumption in households grew by 2.0 Mtoe between 2000 and 2018. Bigger stock of dwellings, larger dwellings and changes in heating behaviour were the major factors influencing the consumption increase. Achieved energy savings (2.6 Mtoe) have partly offset these factors.

Both energy and electricity consumption per employee were growing after 2000 reaching top in 2011. Since then, energy consumption per employee tended to decrease due to fast employment growth accompanied with little energy consumption increase. In case of electricity the decrease was lower due to more electrical equipment but also often more efficient.

Figure 5: 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	More information available
Priority Programme Improvement of Air Quality. Part II.	The aim of the programme is to reduce/avoid CO2 emission in public buildings by reducing energy consumption and RES deployment. Realisation of programme is predicted for years 2016-2022.	Reduction of primary energy consumption 565800 GJ/year; CO2 reduction of 47600 Mg/year. Budget: 1129567000 PLN	Link
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.	https://www.gov.pl/web/aktywapanstwowe/krajowy-plan-na-rzecz-energii-i-klimatu-na-lata-2021-2030-przekazany-do-ke

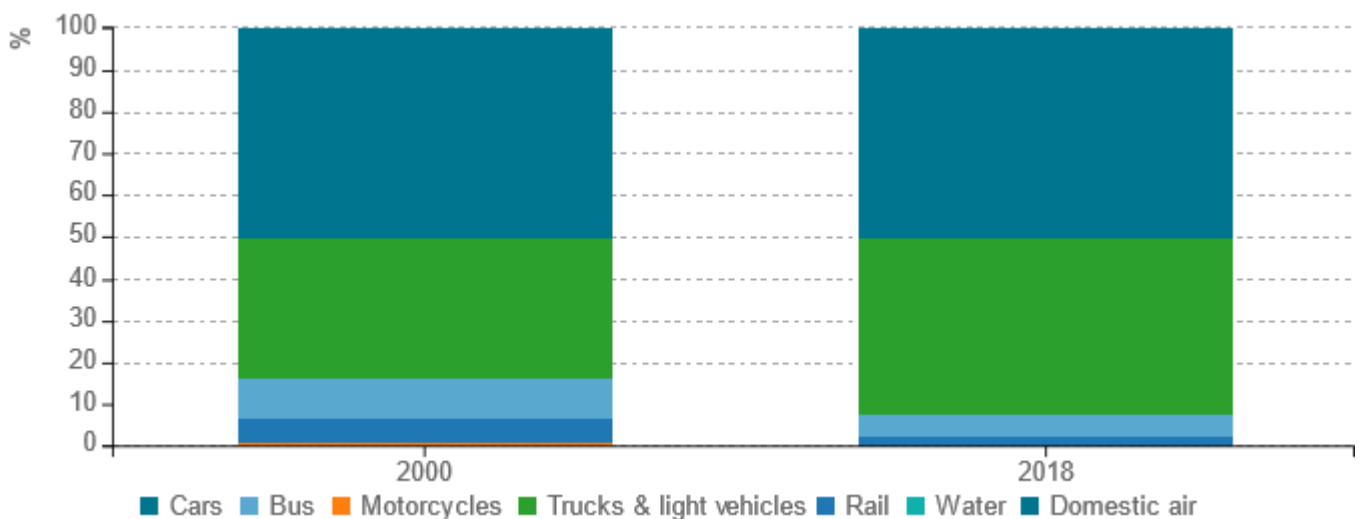
Thermo-modernisation bonus	The thermo-modernisation tax relief allows deduction from income (revenues) of the expenses related to the implementation of thermo-modernization projects in single-family residential buildings.	Expected energy savings in the period 2021-2030 - 200 ktoe/year.	https://www.podatki.gov.pl/pit/ulgi-odliczenia-i-zwolnienia/ulga-termomodernizacyjna/
"Clean Air" Programme	"Clean Air is a comprehensive programme for individuals to improve energy efficiency and reduce or avoid emissions of dust and other pollutants introduced into the atmosphere by single-family houses.	The budget foreseen for project realisation in the years 2018-2029 is 103 billion PLN. Reduction of final energy consumption - 21.8 TWh. CO2 reduction 32200000 Mg/year.	https://czystepowietrze.gov.pl/

Source: MURE

Transport

Highest consumption in transport was achieved by cars (representing 50.3% of the sector’s consumption in 2018) followed by trucks (42.0% share in 2018 in comparison with 33.6% in 2000). Bus represented 5.5% of the consumption in 2018 while rail 1.7%. Other modes of transport consumption were of little significance.

Figure 6: Transport energy consumption by mode

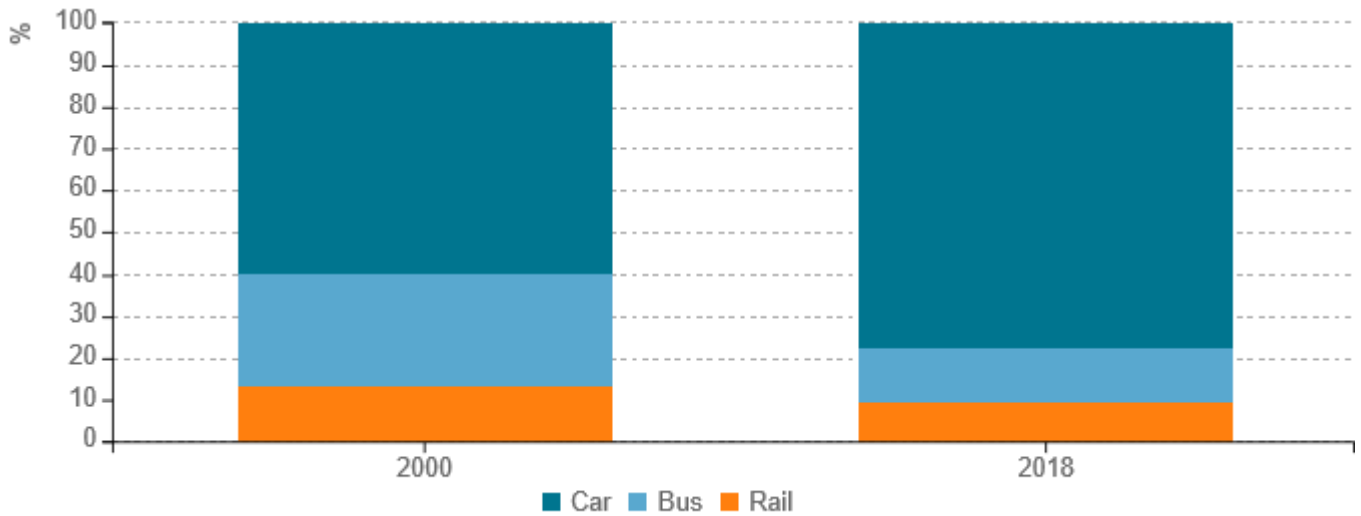


Source: ODYSSEE



During 2000-2018 period the shift towards bigger private cars is observed. The traffic of cars was increasing since 2000 (by 2.6%/year). The share of public transport (in total passenger traffic) decreased from 27.1% to 13.2% in case of buses and from 13.2% to 9.4% in case of trains.

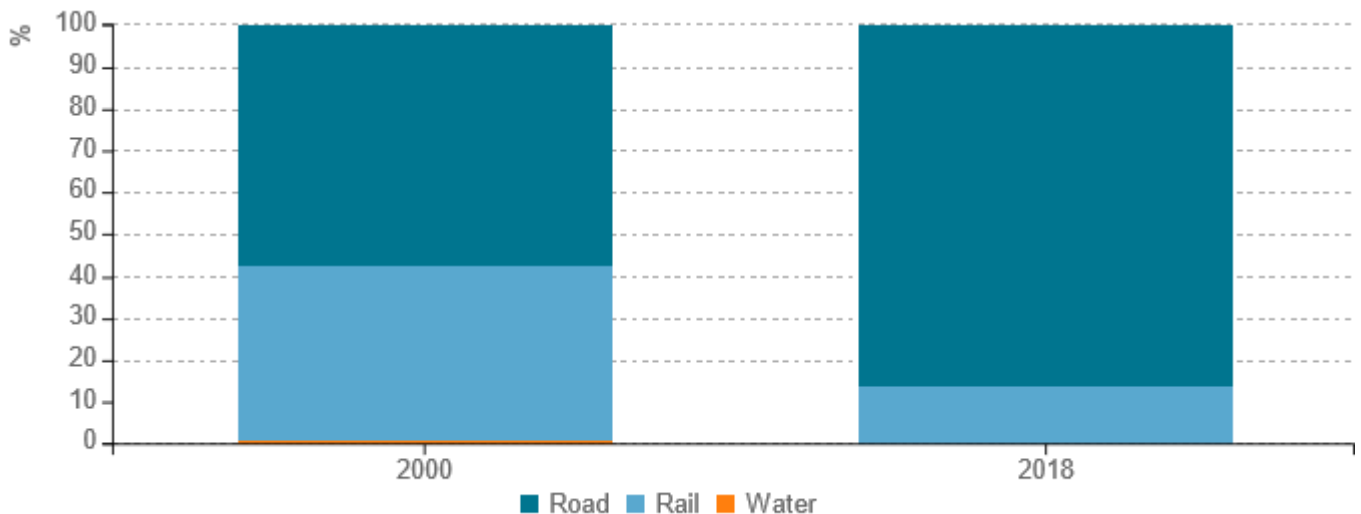
Figure 7: Modal split of inland passenger traffic



Source: ODYSSEE

Road freight transport was developing very rapidly since 2000 and its share in total freight traffic grew from 57.4% in year 2000 to 86.4% in 2018. At the same time the use of trains increased in absolute terms by 9.1% but its share fell from 41.7% to 13.6%. Water freight transport is marginal in Poland.

Figure 8: Modal split of inland freight traffic

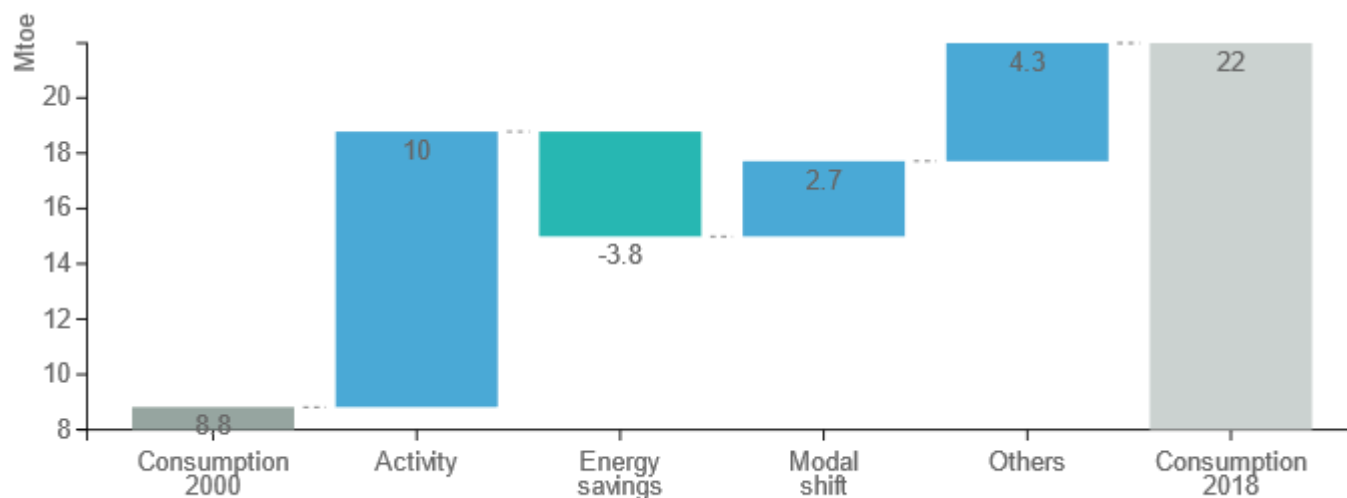


Source: ODYSSEE



Energy consumption in transport has more than doubled since 2000. The main driver was the growth in traffic for passenger and goods, which caused the increase of consumption by 10.0 Mtoe. Modal shift from public vehicles to private cars and from trains to road in case of goods added 2.7 Mtoe to consumption while other factors 4.3 Mtoe. Energy savings (3.8 Mtoe) counterbalanced partially the effect of these factors.

Figure 9: 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	More information available
Low emission transport fund	Development of electromobility and transport based on alternative fuels, including CNG, LNG, biocomponents (e.g. for fleet purchases, charging infrastructure, public transport, promotional and educational activities)	The budget foreseen for project realisation - 6.7 bln PLN. Years of realisation 2021-2025.	https://www.gov.pl/web/klimat/fundusz-niskoemisyjnego-transportu
Public transport in cities	Support for low-emission public transport in cities from the EU Cohesion Fund will be continued under the Operational Program Infrastructure and Environment in the period 2021-2027. The program includes infrastructure investments: adaptation, construction, reconstruction, and expansion of the urban transport network.	Expected energy savings - 130 ktoe/year.	https://www.gov.pl/web/aktywapanstwowe/krajowy-plan-na-rzecz-energii-i-klimatu-na-lata-2021-2030-przekazany-do-ke

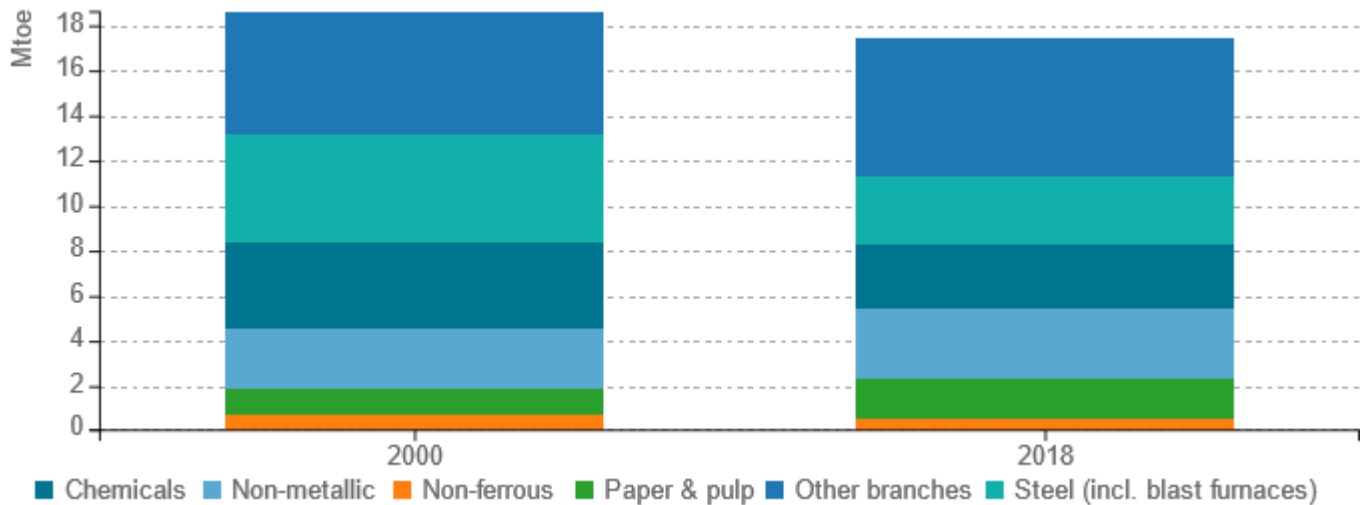
Source: MURE



Industry

The share of three biggest energy consuming industries (chemical, non-metallic minerals, steel) has decreased from 61.1% in 2000 to 51.7% in 2018. Non-metallic minerals after consumption growth by 18.0% became largest consumer, while steel and chemicals with consumption down by 38.5% and 25.2% respectively became second and third largest energy consumer.

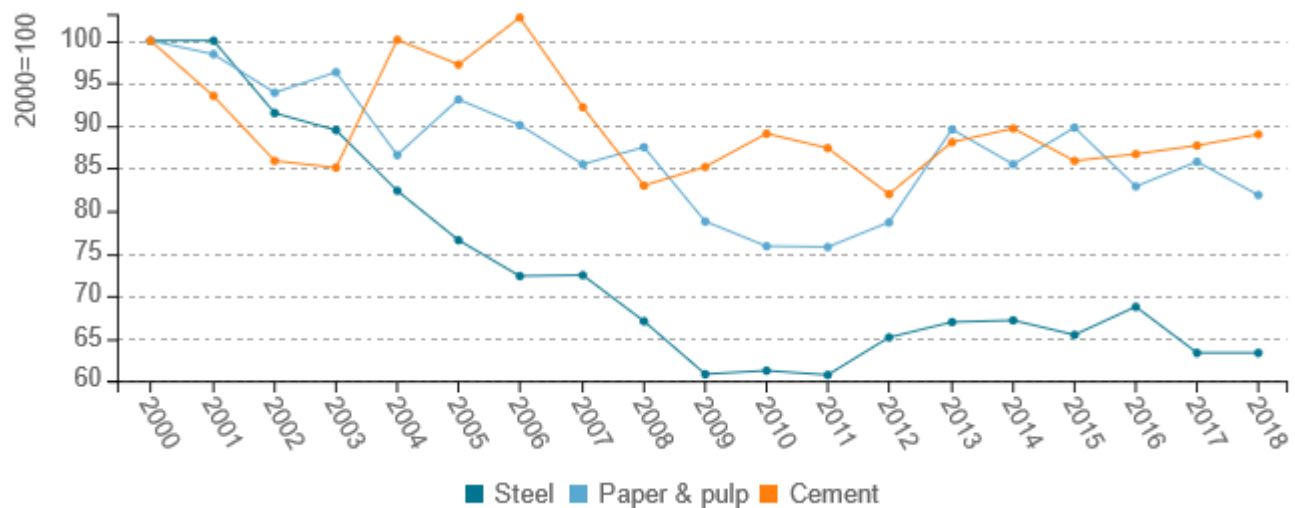
Figure 10: Final energy consumption of industry by branch



Source: ODYSSEE

Unit consumption of steel decreased by 36.6% since 2000, reaching lowest value in 2011. Since then, the production was increasing by 2.2%/year, while consumption was increasing little faster (2.7%/year). Unit consumption of paper and pulp decreased by 18.1%, reaching bottom also in 2011. Unit consumption of cement decreased lowest and remains quite stable since 2008.

Figure 11: Unit consumption of energy-intensive products (toe/t)

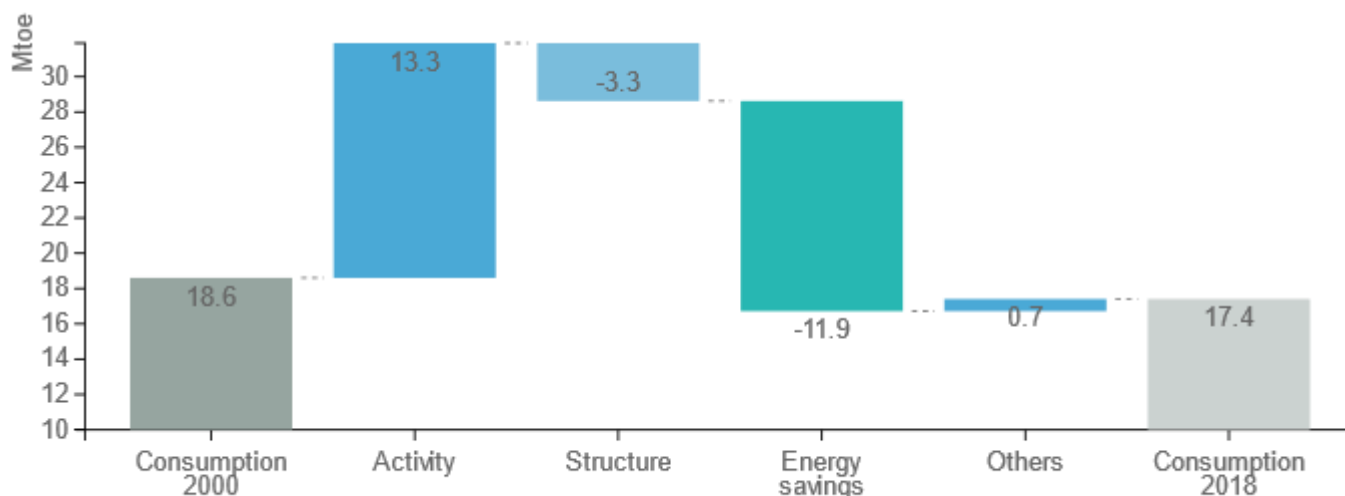


Source: ODYSSEE



Growth of activity in industrial branches contributed to increase in energy consumption by 13.3 Mtoe since 2000. On the opposite energy savings (11.9 Mtoe) and structural changes towards less energy intensive production (3.3 Mtoe) led to decrease the consumption. As a result, energy consumption of industry has decreased by 0.4%/year since 2000.

Figure 12: 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	More information available
Priority programme - Energy Plus (Energia Plus)	Energy Plus (Energia Plus) – intended for projects aimed at reducing the negative impact of enterprises on the environment, including for renewable energy development. The programme will be implemented in the years 2019 - 2025.	Pool of funds of PLN 4 billion. Expected reduction of primary energy consumption - 500 000 GJ/year. Expected reduction of CO2 emission - 150 000 Mg/year	Link
Infrastructure and Environment Operation Programme 2014-2020 (activity 1.2) – Support for Energy Efficiency and Renewables Deployment in industrial enterprises	Modernisation and development of production lines of improved energy efficiency; Deep thermo-modernisation of industrial buildings; Technologies improvement; Modernization of local heat generators, including RES deployment; Heat recovery adaptation.	Budget: 150.32 million EURO (from Cohesion Fund)	Link

Source: MURE

