

Energy efficiency trends and policies

Overview

Final energy consumption has slightly grown between the years 2000 and 2021. In 2021 the final energy consumption reached 25 Mtoe (at normal climate), i.e. it was by 1 Mtoe higher than in 2000. Energy savings and structural changes were not able to fully compensate the energy consumption growth driven by the activity and other effects. Whereas the energy consumption decreased significantly in industry (by 22%) and services (by 18%), it grew in households (by 15%) and in transport (by 64%).

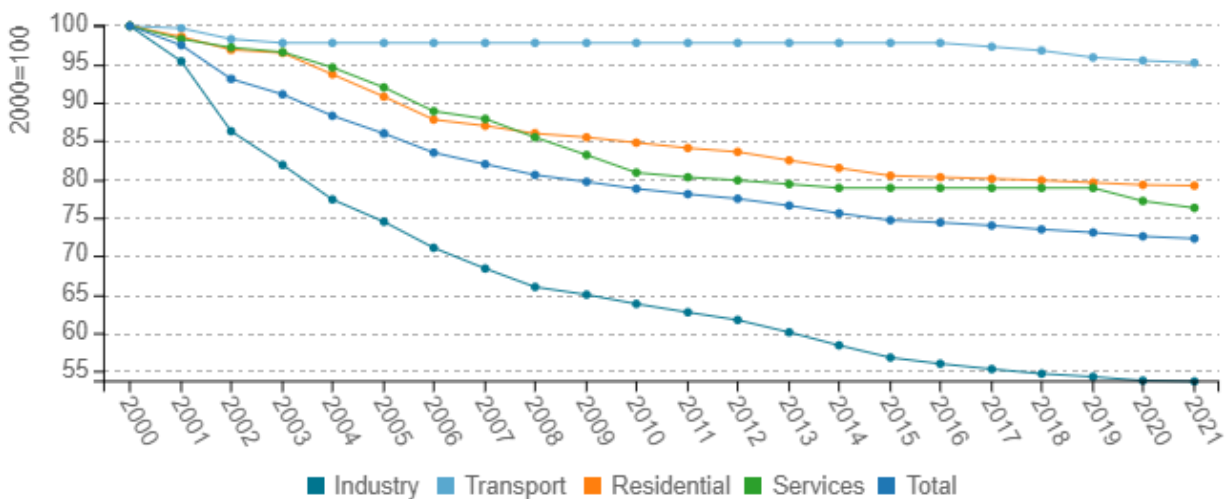
Figure 1: Final energy consumption by sector (normal climate)



Source: ODYSSEE

Energy efficiency of final consumption, as measured by ODEX improved by an average of 1.5%/year from 2000 to 2021 (or 28% in total). Largest energy savings were obtained in the industry sector (2.9%/year), followed by services (1.3%/year) and residential (1.1%/year). A small ODEX decline in the transport started from 2016 and it fell by 2.6% between 2016 and 2020.

Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE



According to the latest NECP update the required end-use energy consumption should decrease from 25.4 Mtoe (latest 2021 data) to 20.2 Mtoe in 2030. The Czech Republic has decided to reach the target by alternative measures. Two measures are the most important - the New Green Savings Programme 2021+, with expected energy total cumulative savings of 2.04 Mtoe in the period 2021 - 2027, which focuses on energy savings in living buildings and the Operational Program Technology and applications for competitiveness 2021-2027 in industry sector with expected total cumulative energy savings of 0.21 Mtoe in the period 2021 - 2027. Big expectations are related to the introduction of the Modernisation Fund, which could bring total cumulative energy savings of 0.7 Mtoe in industry and 0.4 Mtoe in services and public sector. A typical cross-cutting measure is represented by the State programme to promote energy savings 2022+ (EFEKT 3), which concentrates on non-investment subsidies.

Table 1: Sample of cross-cutting measures

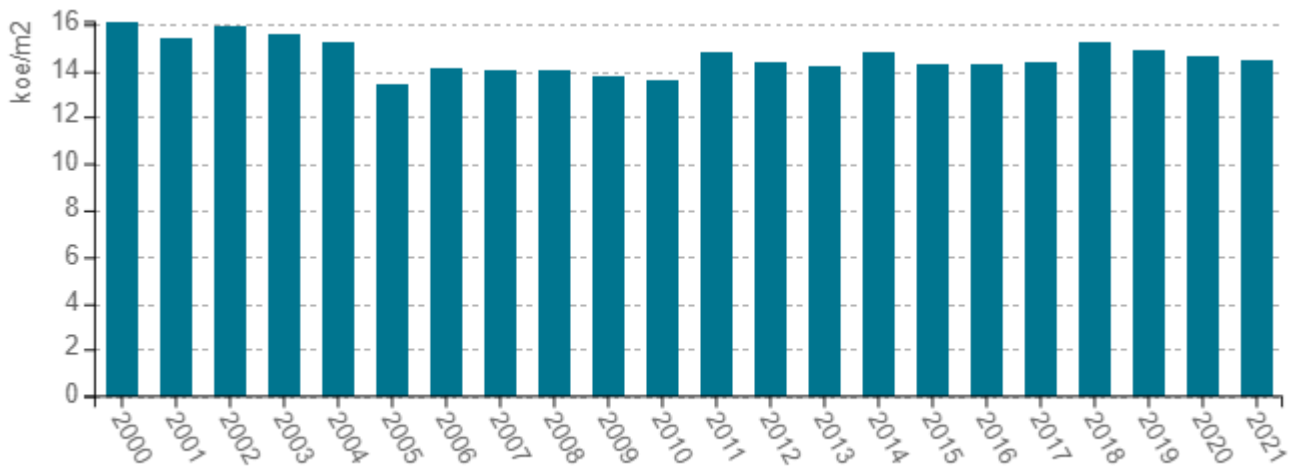
Measures	NECP measures	Description	Expected savings, impact evaluation
State programme to promote energy savings 2022+ (EFEKT 3)	yes	The State programme to promote energy savings (EFEKT 3 / EFEKT 2022+), managed by the Ministry of Industry and Trade, focuses on investment and non-investment aid for energy efficiency support measures. The financial mechanism provides support for specific energy-saving measures with an emphasis on non-investment measures. Examples of measures include: - Individual investment measures: reconstruction of public lighting; - Non-investment measures aimed at motivating the implementation of individual investment measures: targeted consultations with an impact on the implementation of energy-saving measures through the network of the Energy Consulting and Information Centres; preparation of documentation for EPC project preparation; - Non-investment measures: implementation of energy management; events aimed at the active dissemination of information and education in the field of energy savings. From geographical point of view, the programme supports improvements in the energy performance of the business sector in all regions of the Czech Republic (including the capital City of Prague). The lifetime of savings in the case of the implementation of investment measures exceeds the length of the commitment period (12-30 years) while for the energy management and training activities is considered for 2 years.	Total cumulative savings 0.4 Mtoe in the period 2021 - 2027

Source: MURE

Buildings

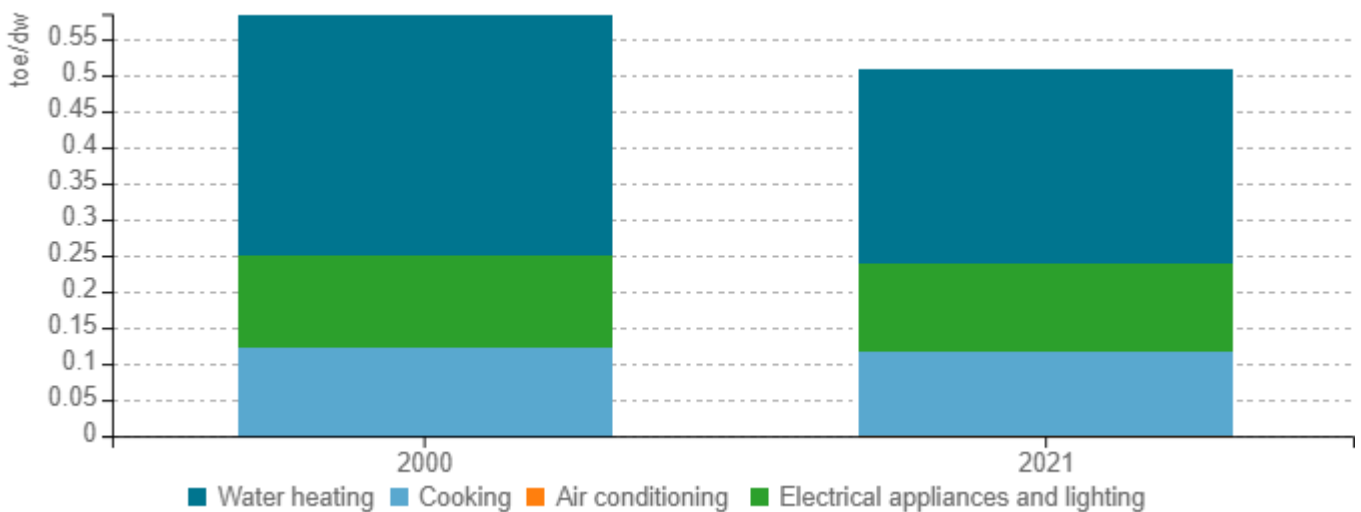
The energy consumption for space heating per m2 decreased by 10% in the period 2000 - 2021, but it stagnated during last 10 years. Energy consumption per dwelling of other uses than space heating decreased by 13% in the same period. In 2021, water heating accounted for 53% of the consumption per dwelling without space heating, electrical appliances and lighting for 24%, and cooking for 23%. Space heating consumption per m2 decreased by 0.5%/year since 2000. Consumption per dwelling of electrical appliances decreased by 0.2%/year, water heating by around 1%/year and cooking by 0.3%/year.

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)

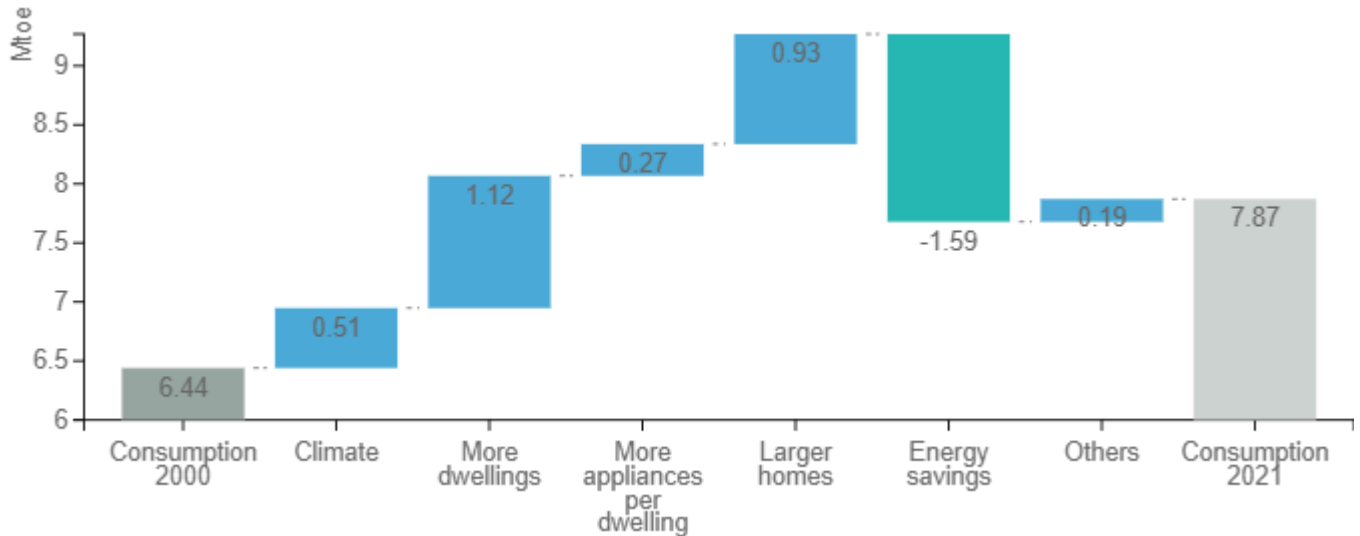


Source: ODYSSEE



Final energy consumption of households increased from 6.44 Mtoe in 2000 to 7.87 Mtoe in 2021. Energy savings (-1.59 Mtoe), thanks to massive insulations of dwellings, were offset by three other factors - more dwellings (+1.12 Mtoe), larger homes (+0.93 Mtoe) and more appliances (+0.27 Mtoe). The change in climate contributed to the growth by 0.51 Mtoe and other factors by 0.19 Mtoe.

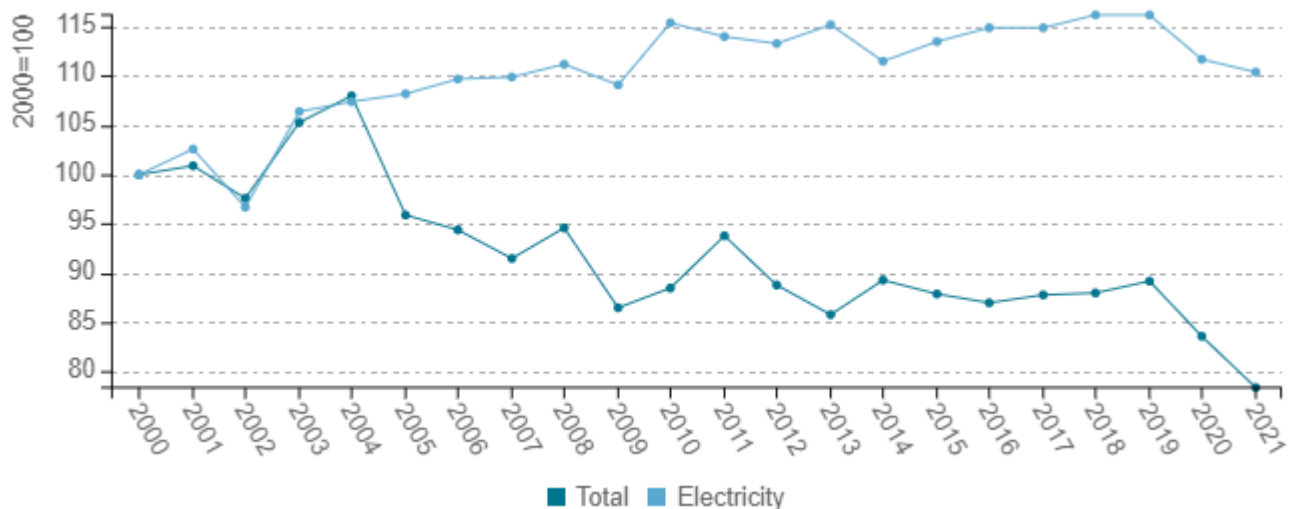
Figure 5: Main drivers of the energy consumption variation of households



Source: ODYSSEE

The energy consumption per employee in service sector decreased by 1.2%/year since 2000. After a stagnation from 2014 to 2019, it dropped significantly in the last two years. The electricity consumption per employee grew by 0.4%/year due to the diffusion electrical appliances in offices over the same period.

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



Source: ODYSSEE



The main measure for the building sector is the New Green Savings Programme 2021+ which focuses on family houses and apartment buildings. The Operational Program Technology and applications for competitiveness 2021-2027 aims, besides others, at improving the energy performance of buildings in the business sector and the Operational Programme Environment 2021-2027 has a Priority Axe supporting improvement of energy efficiency in public buildings. Additional support to public buildings and business sector in the City of Prague (Prague is excluded from most operational programmes) is provided from the Modernisation Fund.

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

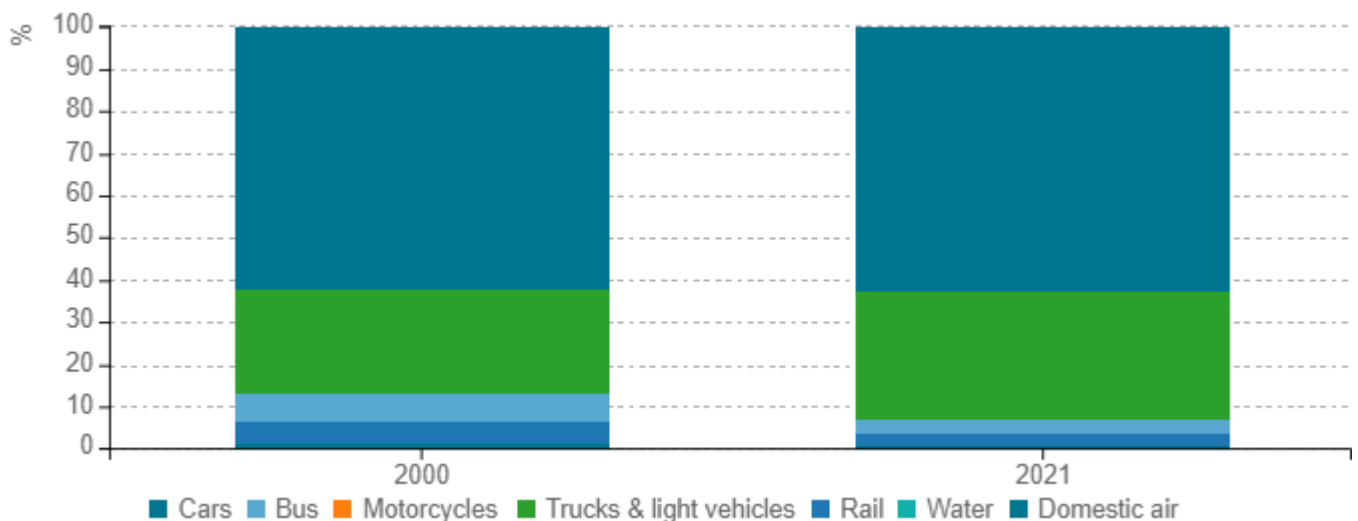
Measures	Description	Expected savings, impact evaluation
New Green Savings Programme 2021+	New Green Savings Programme 2021+ administrated by the State Environmental Fund, focuses on energy savings and the efficient use of the energy sources in structures. This programme is running from and 2021, and has been prepared for the owners and investors behind family houses and apartment buildings.	Total cumulative savings 1.92 Mtoe in the period 2021–2020
Operational Programme Environment 2021 - 2027	Specific target 1.1 of this programme supports energy efficiency and use of RES in public buildings.	Total cumulative savings 0.26 Mtoe in the period 2021 - 2027

Source: MURE, Ministry of Industry and Trade, State Enviro

Transport

Road transport consumes 96% of energy in the transport sector. Cars account for 63% of the sector’s consumption and road freight transport for 30.4% (25% in 2000). Bus transport represents 2.9% and rail transport 3%. The rest represents air transport (0.7%) and water transport (less than 0.1%).

Figure 7: Transport energy consumption by mode

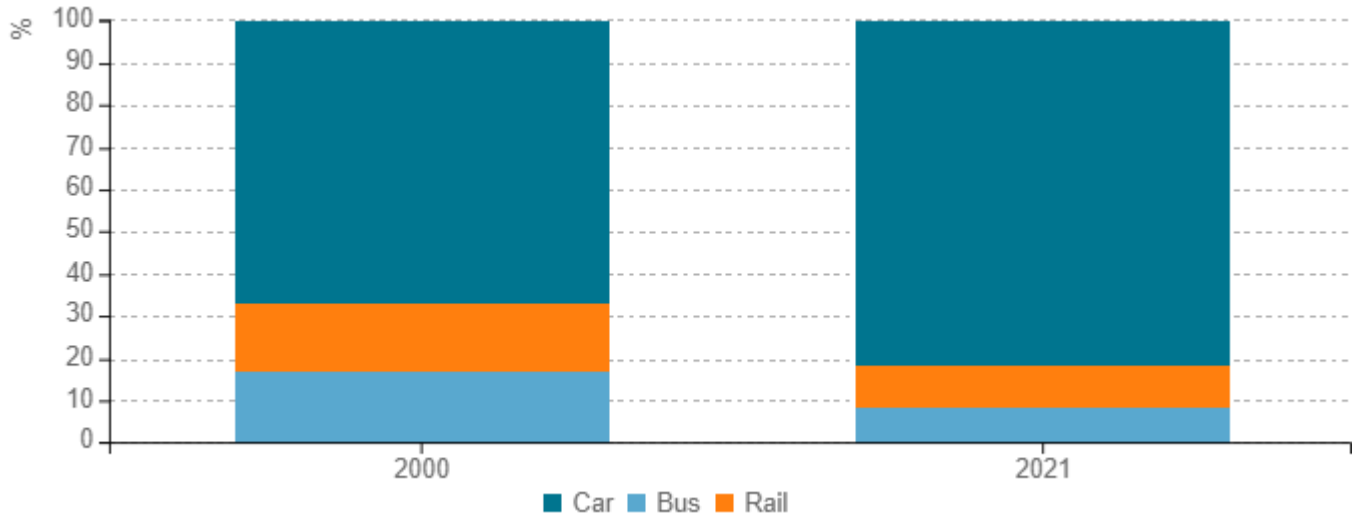


Source: ODYSSEE



We observe an adverse trend in switching from public transport modes to cars in passenger transport. Share of car traffic grew from 67% to 82% between years 2000 and 2021.

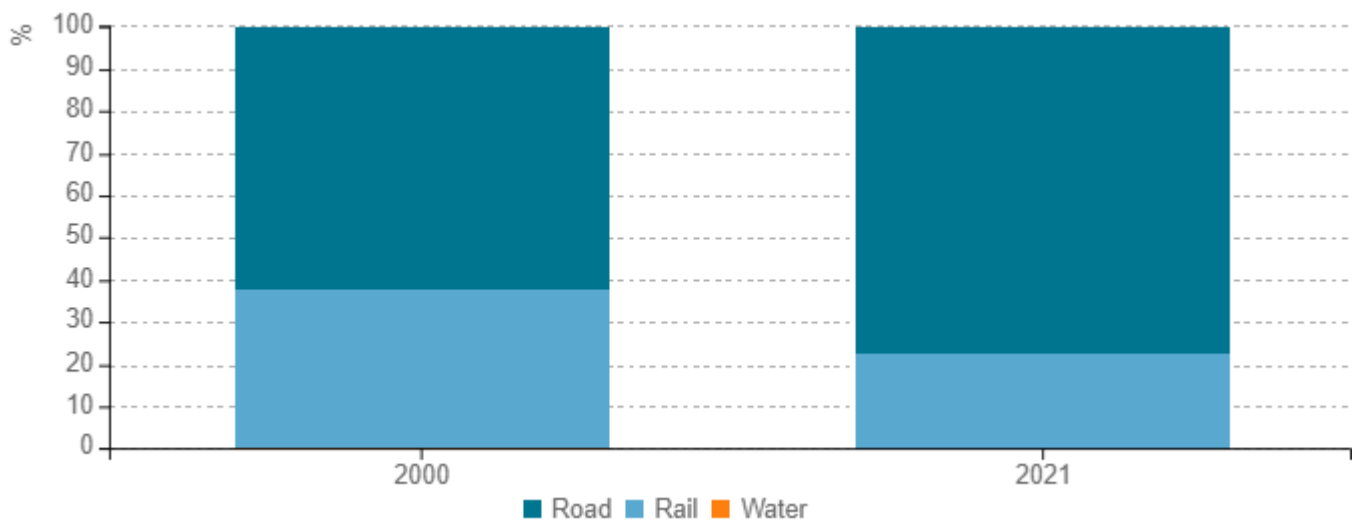
Figure 8: Modal split of inland passenger traffic



Source: ODYSSEE

We can observe a similar adverse trend in switching from railways to trucks in freight transport. Share of freight road transport grew from 62% to 77% between years 2000 and 2021.

Figure 9: Modal split of inland freight traffic

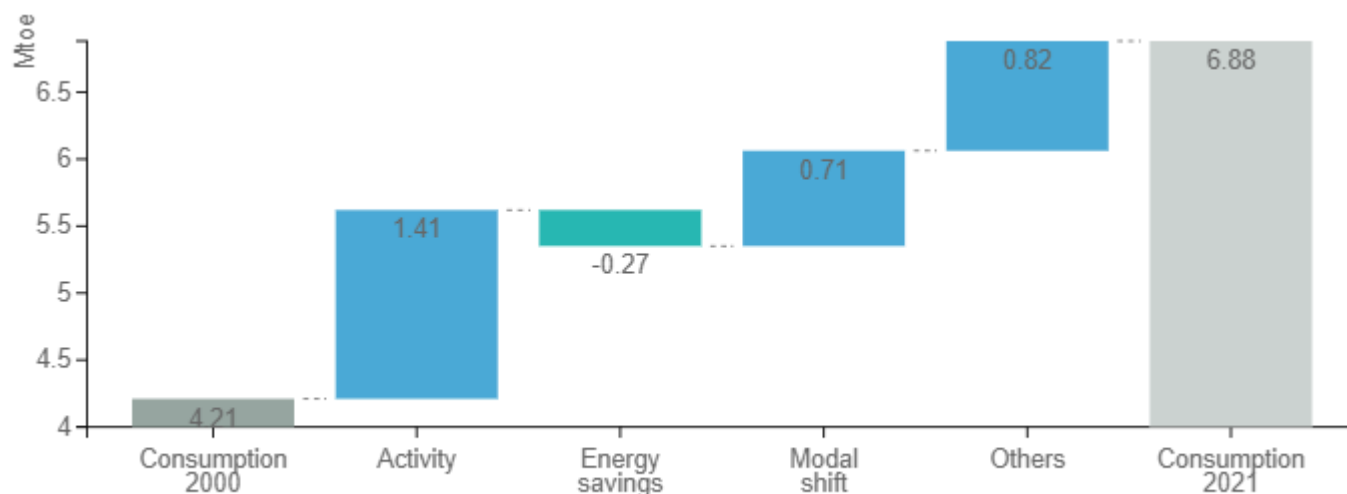


Source: ODYSSEE



Transport energy consumption increased by 63% in the period 2000 - 2021 (2.37%/year). This trend is caused by the development of transport activity (+1.41 Mtoe - more passenger-kilometer and tonne-kilometer), adverse modal shift (+0.71 Mtoe - shift from railways to road transport) and by other effects (+0.82 Mtoe). Energy savings amounted only to 0.27 Mtoe.

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



Source: ODYSSEE

There are two new programmes supporting energy efficiency of transport. Integrated Regional Operational Programme supports purchases of vehicles using alternative propulsion. Modernisation Fund supports modernisation of transport in business sector and of public transport. Support of public transport is important, because switch from public to road transport occurred in the Czech Republic during past years.

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

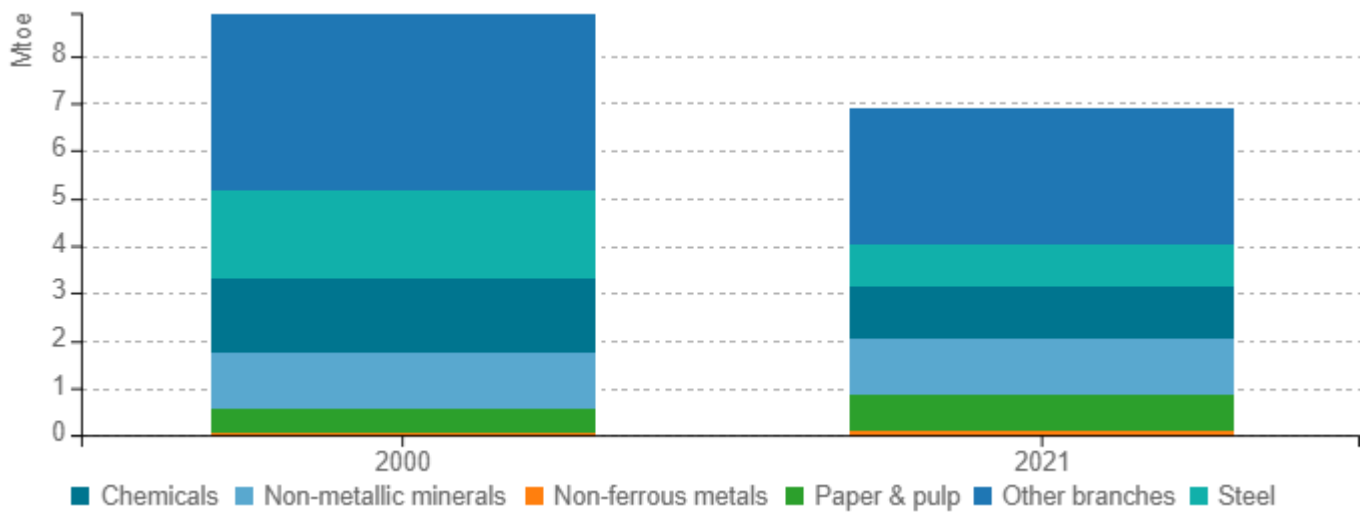
Measures	Description	Expected savings, impact evaluation
Integrated Regional Operational Programme 2021-2027 - SC 2.1 Sustainable multimodal urban mobility	Investment support for the acquisition of public transport vehicles using alternative propulsion.	Cumulative total savings 0.27 Mtoe
Modernisation Fund 2021-2030 (part transport)	The Modernisation Fund has two parts related to transport: - TRANSCoM – The modernisation of transport in the business sector - TRANSGov – The modernisation of public transport	Cumulative total savings 0.37 Mtoe

Source: MURE

Industry

The industry sector exhibits the fastest decline in the energy consumption. Its final energy consumption decreased rapidly by 1.2 %/year. The largest share of 17% is attributed to the industry of non-metallic minerals. Chemicals, steel, non-ferrous and paper industries constitute 42% of the total energy consumption in industry.

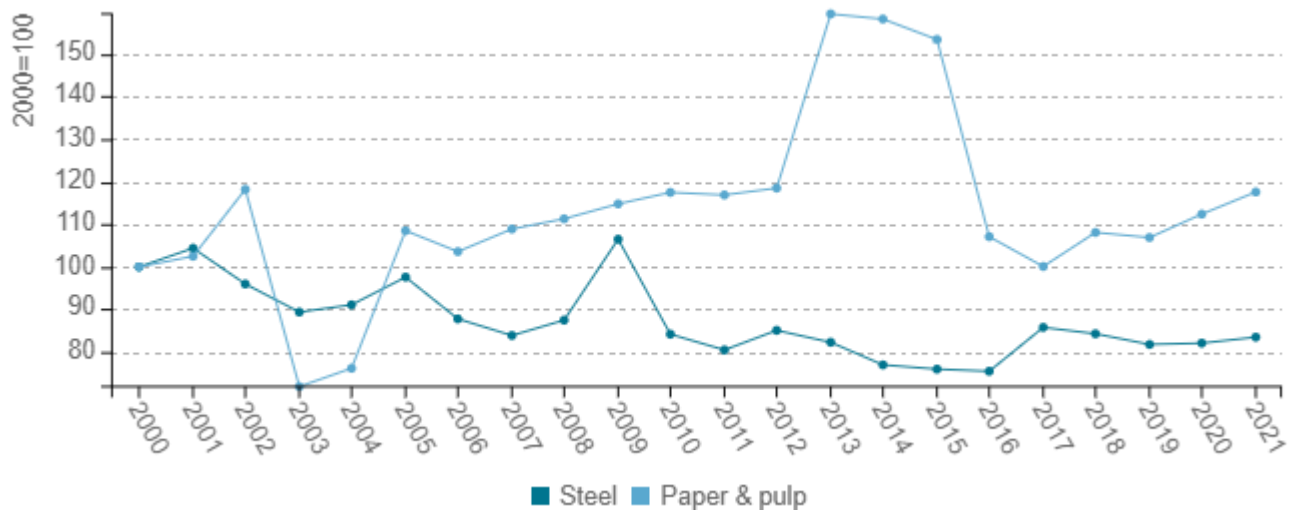
Figure 11: Final energy consumption of industry by branch



Source: ODYSSEE

Steel industry exhibits decreasing trend of energy intensity, it decreased by 17% in the period 2000 - 2021. A rather opposite trend was observed for the specific energy consumption of pulp and paper production, which grew by 18% in the same period, with quite big fluctuations.

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

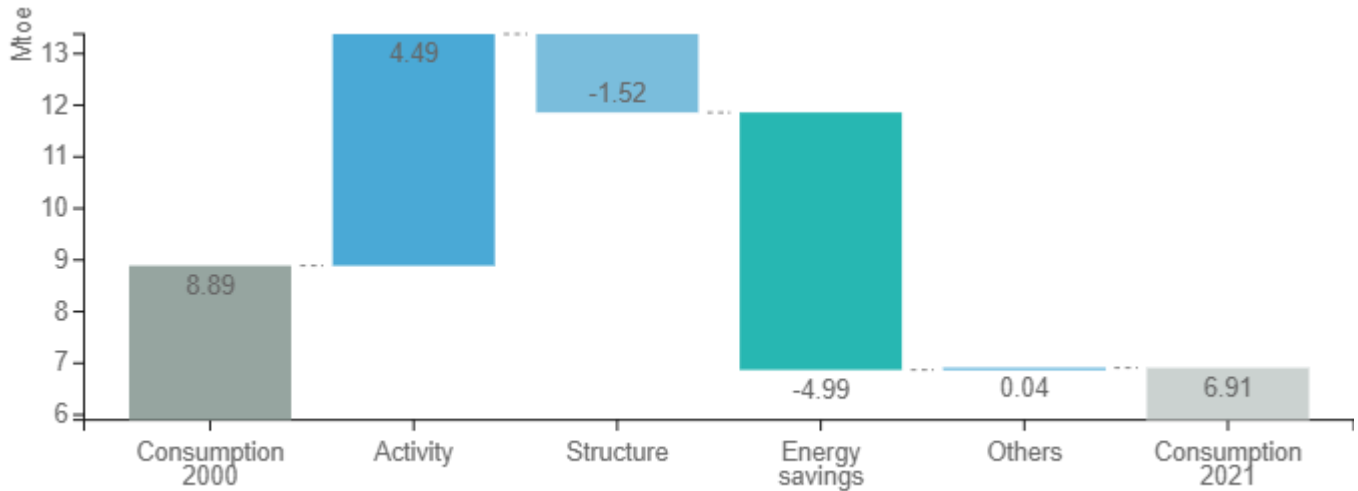


Source: ODYSSEE



Industry reached remarkable energy savings (4.99 Mtoe) in the period 2000 - 2021 and structural changes brought about another 1.52 Mtoe of savings. The increased activity led to higher energy consumption by 4.49 Mtoe. As the savings were higher than the activity driven growth, the total energy consumption in industry dropped by 1.98 Mtoe.

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



Source: ODYSSEE

The Operational Programme Technology and applications for competitiveness remains one of important measures also in the period 2021 - 2027. It offers support to energy efficiency in industry through financial incentives (investment subsidies and low interest loans). Expected total cumulative savings are 8.8 Mtoe. However, the Modernisation Fund became the biggest source of subsidies in industry with expected savings of 29.5 Mtoe.

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

Measures	Description	Expected savings, impact evaluation
Operational Programme Technology and applications for competitiveness	Increasing the energy efficiency in industry and using renewable energy sources	Total cumulative savings 0.21 Mtoe in the period 2021 - 2027
Modernisation Fund 2021-2030 (part industry)	The Modernisation Fund in the Czech Republic in industry focuses on investment aid business buildings and improving energy performance of technological and production processes in industry	Total cumulative savings 0.7 Mtoe in the period 2021 - 2030

Source: MURE, Ministry of Industry and Trade