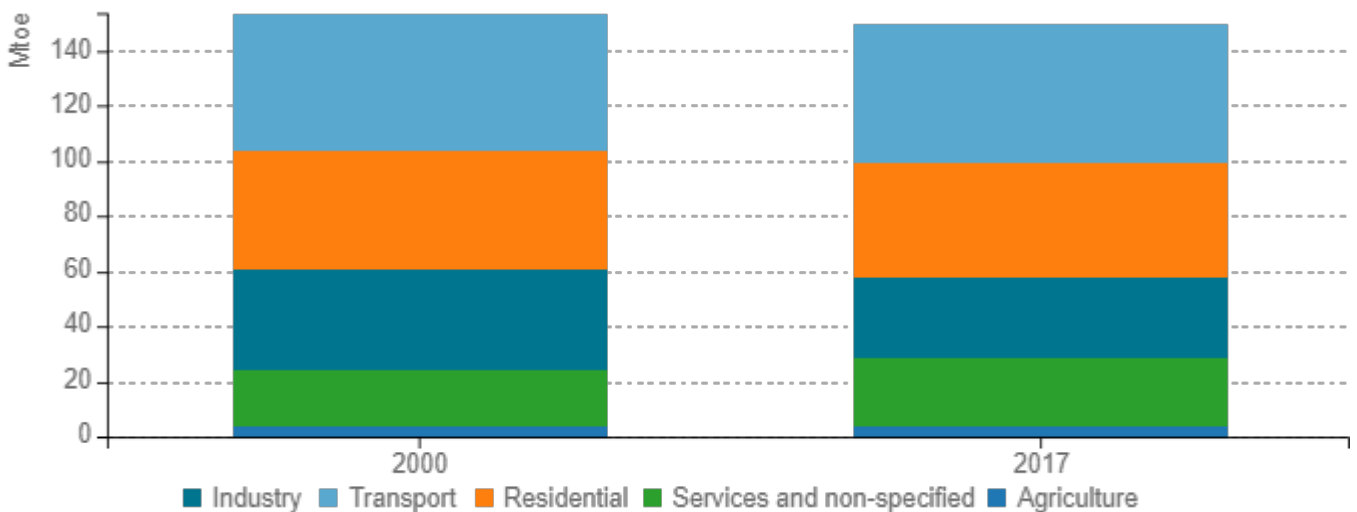


Energy efficiency trends and policies

Overview

In 2017, the final energy consumption in France was close to 150 Mtoe. Transport, the largest consuming sector, recorded a 0.8 percentage points increase of its share in total final energy consumption – from 33.1% in 2000 to 33.9% in 2017. Over the same period, the residential sector kept a steady share of 27.5%, services increased from 13.1% to 16.3%, while industry decreased its share by more than 4 percentage points to 19.7%. The final energy consumption in 2017 was slightly below its 2000 level (-2.6 %).

Figure 1: Final energy consumption by sector

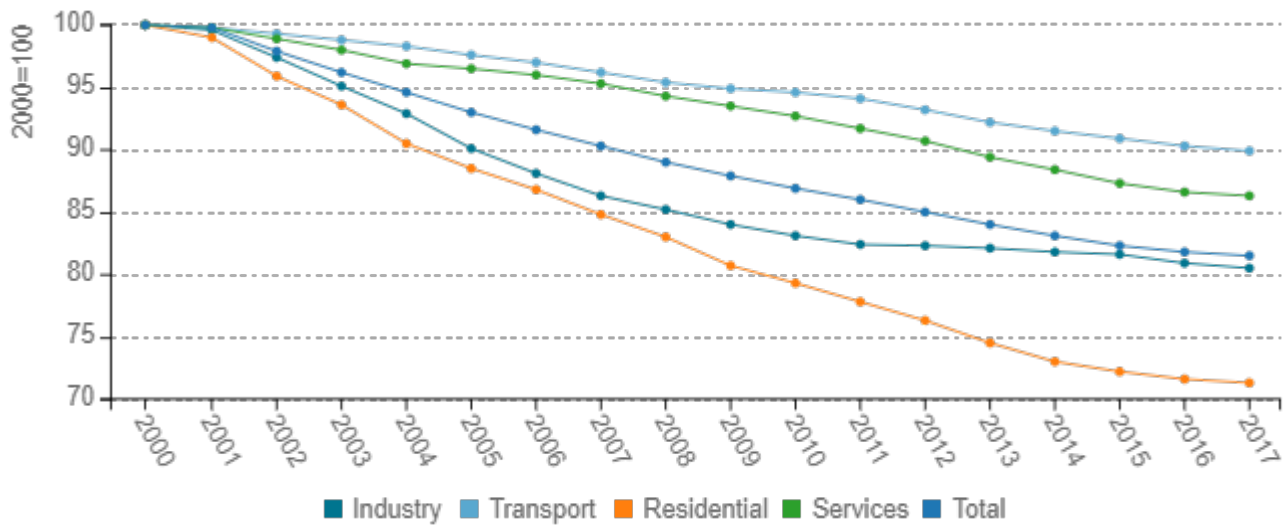


Source: ODYSSEE

Energy efficiency for final consumers, as measured by ODEX, improved by an average of 1.1% per year from 2000 to 2017 or 18 % over the period. In the residential sector, despite the economic crisis, there has been steady progress and larger gains than in the other sectors (1.9% per year). This trend can be explained by the introduction of many regulations affecting buildings and appliances. In services and transport, the pace of energy efficiency improvements has been steady (0.8% and 0.6% per year respectively since 2000). In industry, improvements almost followed the same trend as the global ODEX.



Figure 2: Energy efficiency index (by sector)



Source: ODYSSEE

France adopted its third National Energy Efficiency Action Plan (NEEAP), which sets a final consumption target of 131 Mtoe in 2020. The energy savings measures are expected to save 20.5 Mtoe in 2020. The Energy Transition Act of 2015 introduced a provision aimed at halving final energy consumption between 2012 and 2050. As part of the Transition Act, building renovations will be mandatory by 2025 for the least efficient dwellings (specific consumption over 330 kWh/m²). Governmental institutions will have to renew half of their vehicle fleet with low-emission cars; large companies (above 100 employees) will have to establish mobility plans. The 2005 Energy Law implemented energy savings obligations for energy companies, with the possibility of trading energy savings certificates. The energy saving target is 2 133 TWhc ("c" for cumac: lifetime discounted cumulative savings) for the fourth period (2018-2021), which is equivalent to 12 Mtoe of annual energy savings. The 2021-2030 Integrated National Energy and Climate Plan (NECP) targets a 32.6% improvement of energy efficiency compared to European baseline scenario, which corresponds to a final energy consumption targets of 120.9 Mtoe in 2030.

Table 1: Sample of cross-cutting measures

Measures	NEEAP measures	Description	Expected savings, impact evaluation	More information available
Energy Saving Certificates (ESC)	yes	The ESC schemes obliges energy retailers and fuel suppliers to meet specified energy saving. Obligated parties meet these targets by encouraging their customers, mainly in the building sector, to reduce their energy consumption.	High	Link
Heat Fund	yes	The Heat Fund supports development of the use of biomass (forestry, agricultural, biogas, etc.), geothermal energy (through direct use or by means of heat pumps), solar thermal energy, recovered energies, and also development of heat networks using these energies.	Low	Link

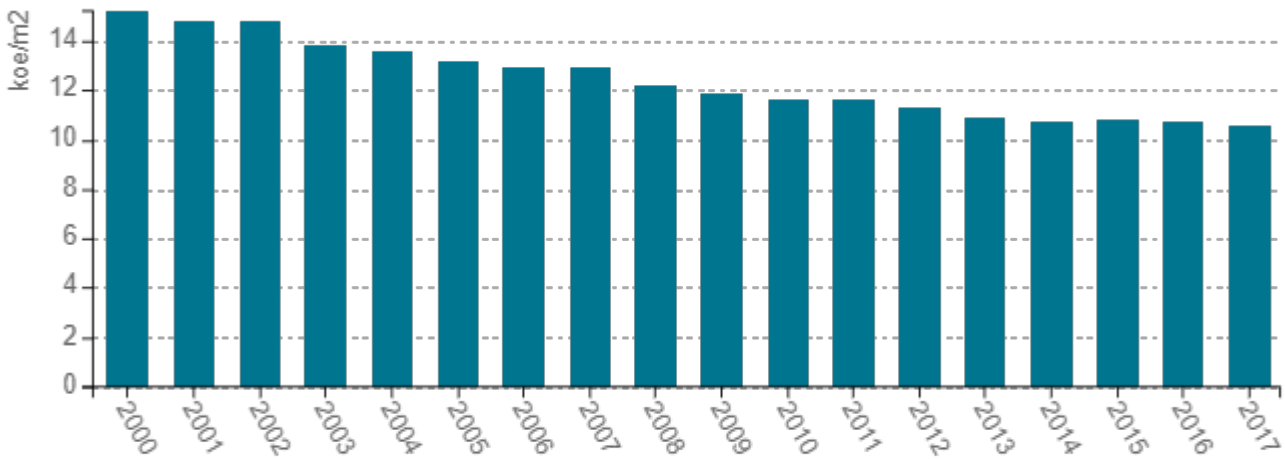
Source: MURE



Buildings

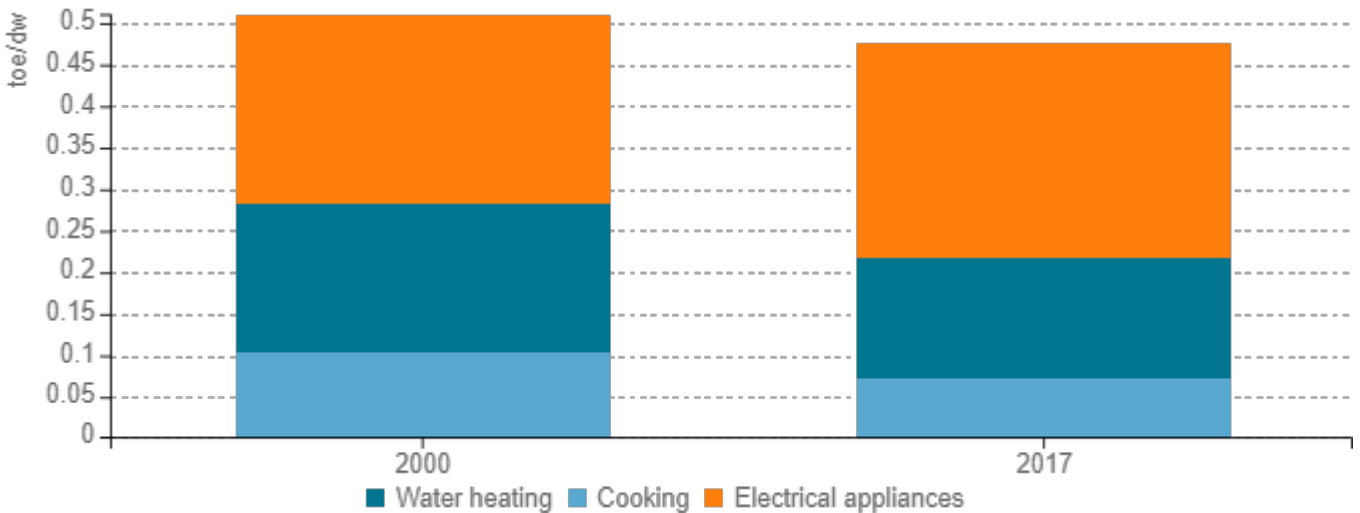
In 2017, space heating accounted for 67% of the sector’s consumption, electrical appliances for 18%, water heating for 10% and cooking for 5%. While electrical appliances recorded a 5 percentage points increase since 2000 with a +1.8%/year trend, space heating consumption share dropped by 10 percentage points over the period. Besides energy consumption of cooking and water heating decreased as well respectively by -0.2%/year and -1.1%/year. Hence residential energy consumption decreased by around 0.2%/year since 2000 thanks in particular to efforts gained through space heating end-use.

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



Source: ODYSSEE

Figure 4: Energy consumption by end-uses per dwelling

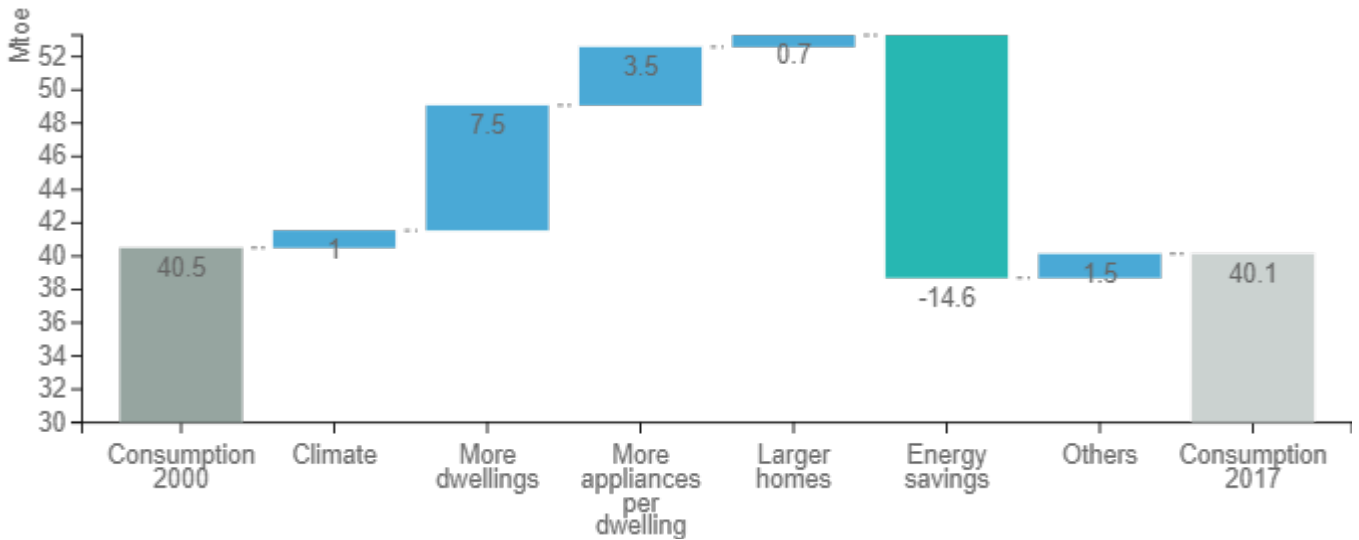


Source: ODYSSEE

The final energy consumption of residential buildings was 0.4 Mtoe lower in 2017 than in 2000. On the one hand, three main factors contributed to increase energy consumption over the period – more dwellings (by 7.5 Mtoe), lifestyles (3.5 Mtoe for “more appliances per dwelling” and 0.7 Mtoe for “larger homes”) and the climate effect (by 1 Mtoe). On the other hand, energy savings (14.6 Mtoe) more than offset the effect of the drivers of consumption growth and explain the observed slight decrease in building sector energy consumption.



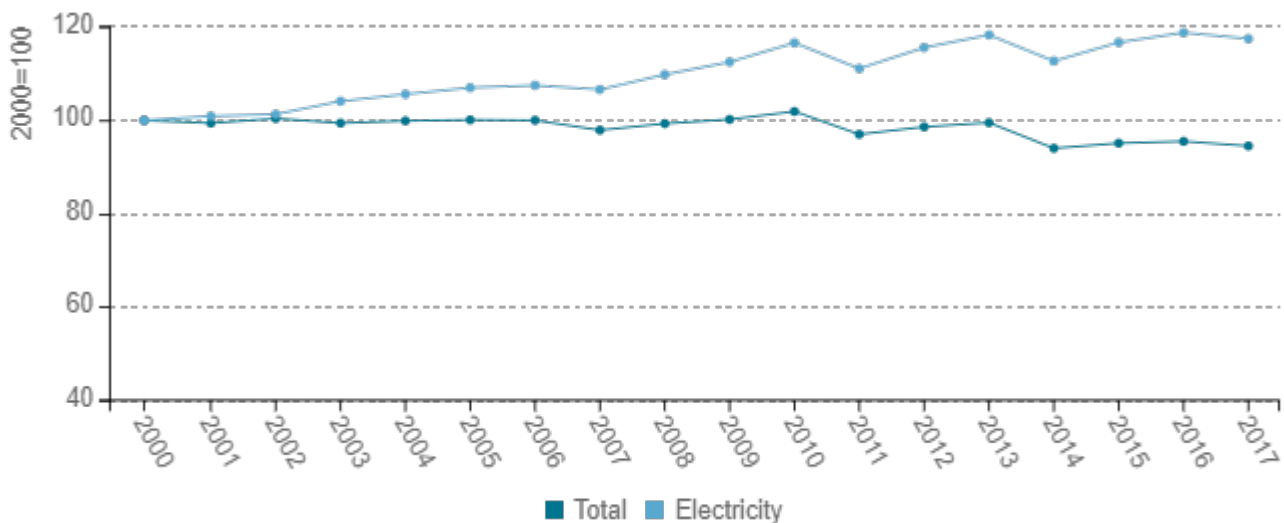
Figure 5: Main drivers of the energy consumption variation in households



Source: ODYSSEE

The energy consumption per employee decreased by 0.3%/year since 2000. However, because of the diffusion of IT and electrical appliances in offices, the electricity consumption per employee is increasing by 1%/year over the same period, despite the fact that most electrical equipment are more efficient .

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



Source: ODYSSEE

In France, the first thermal building code (RT) was implemented in 1974 and has been updated and strengthened six times since then. The last update is particularly ambitious with a maximum consumption of 50 kWh/m² for 5 end-uses . Still, three quarters of the current building stock was built without building codes. As a result, and even with the great efforts made since year 2000, the average performance of the building stock in terms of energy consumption per m² is one of the worst in Europe. Today the potential for energy savings in these older buildings is huge while the building sector is one of the top priorities in the energy efficiency policy roadmap in the country. The specific building-related energy saving goals have been set in the Energy Transition Act of 2015: 28% reduction of final energy consumption in 2050 compared to 2012 level; retrofit of 500,000 existing dwellings each year, of which half should be occupied by vulnerable consumers. The French government offers a mix of policy regulation, incentives and support targeting both residential and commercial buildings, for instance:



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

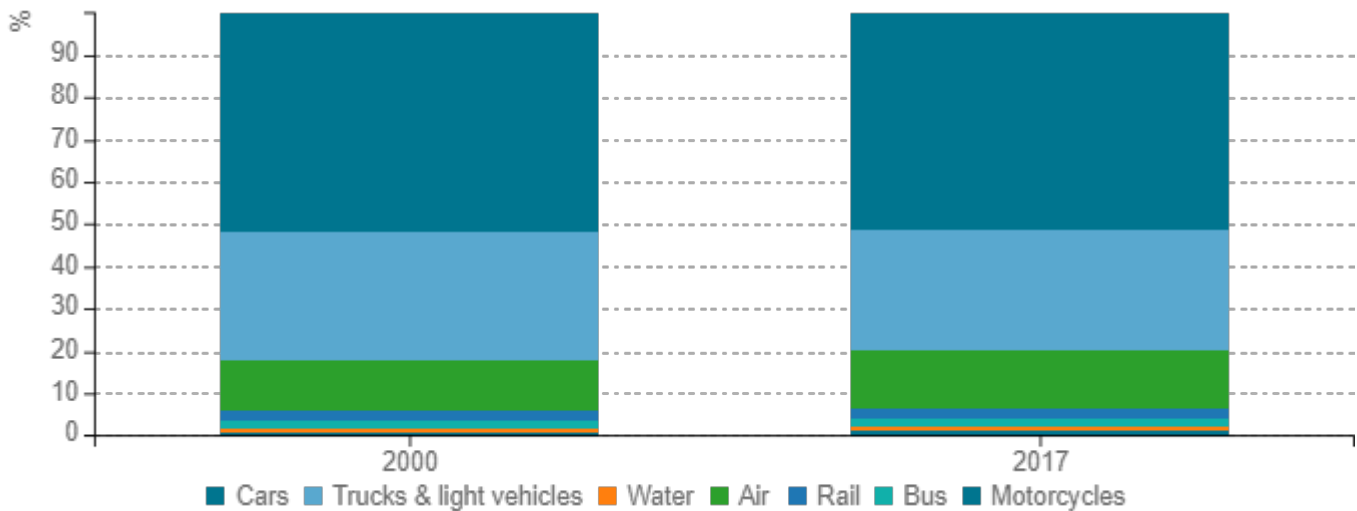
Measures	Description	Expected savings, impact evaluation	More information available
Building codes “RT 2012”-new buildings	Requires all new buildings to meet nearly zero energy building standards (nZEB) established by the EU (i.e., new residential buildings are required to have a primary energy consumption lower than approximately 50 kWh/m ² /year, varying by climate zone).	High	Link
Building codes - renovation	Asks that each building with a surface area more than 1000m ² meet a global energy performance target. Concerning other residential buildings, the element-by-element thermal regulation (called RT element) sets a minimum performance level for elements replaced or installed.	Medium	Link

Source: MURE

Transport

Cars accounted for 51% of the sector’s consumption and road freight transport for 29% in 2017. Air transport (incl. international air) represented 14%. The remaining was split among rail (2.4%), bus (2%), motorcycles (1.2%), and inland waterways (1%).

Figure 7: Split of the transport energy consumption by modes

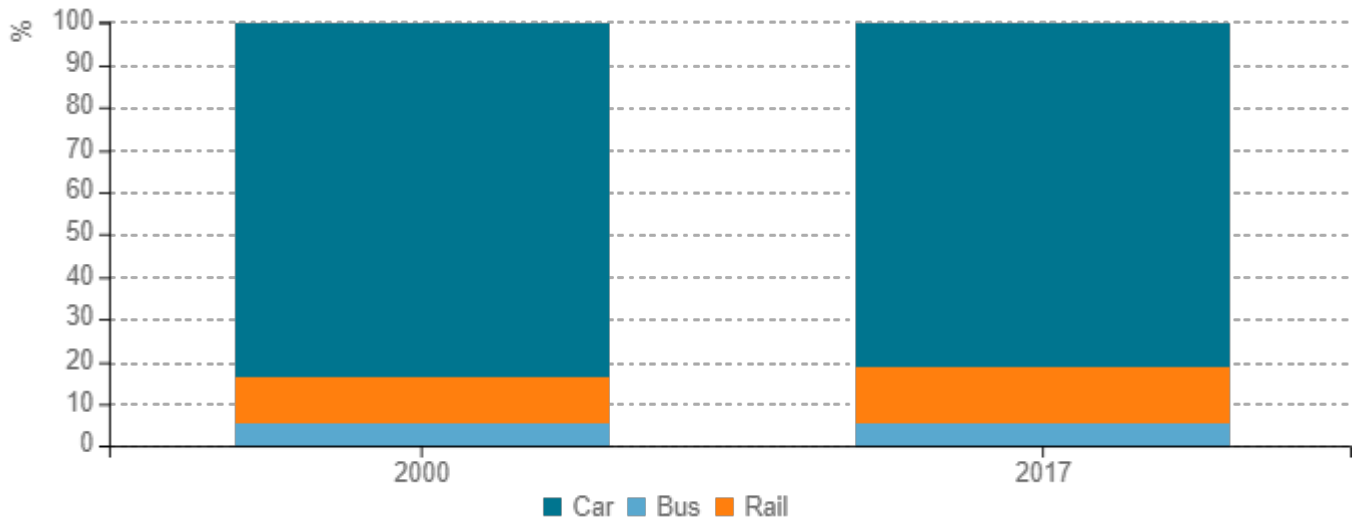


Source: ODYSSEE

The traffic of passengers has been slightly increasing since 2000 (by 0.5%/year). The increase in traffics has been higher in public transport (+1.8%/year for rail and +0.5%/year for buses) than for cars (+0.4%/year). This reflects a modal shift towards public transport.



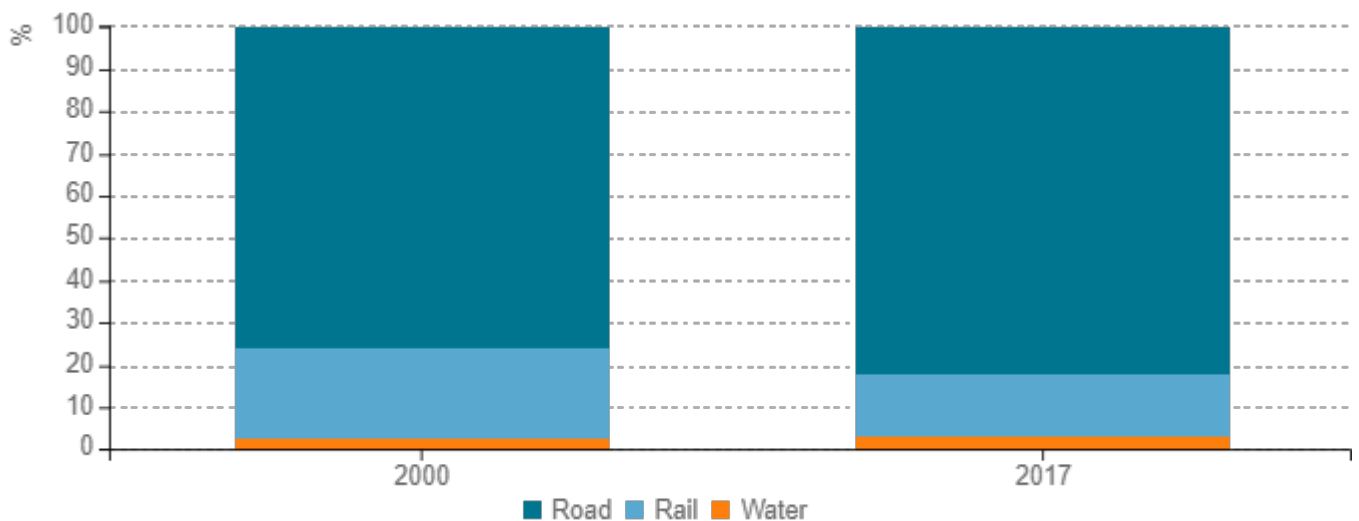
Figure 8: Share of transport in passenger traffic (2000,2017)



Source: ODYSSEE

On the contrary, the traffic of goods (measured in tonne-kilometre) has been decreasing by 1%/year, with a significant decrease in rail traffic of goods (-3.2%/year), which led to a higher share of road in the total traffic, i.e. a trend that goes against the expectation of policy makers.

Figure 9: Share of modes in freight traffic (2000,2015)

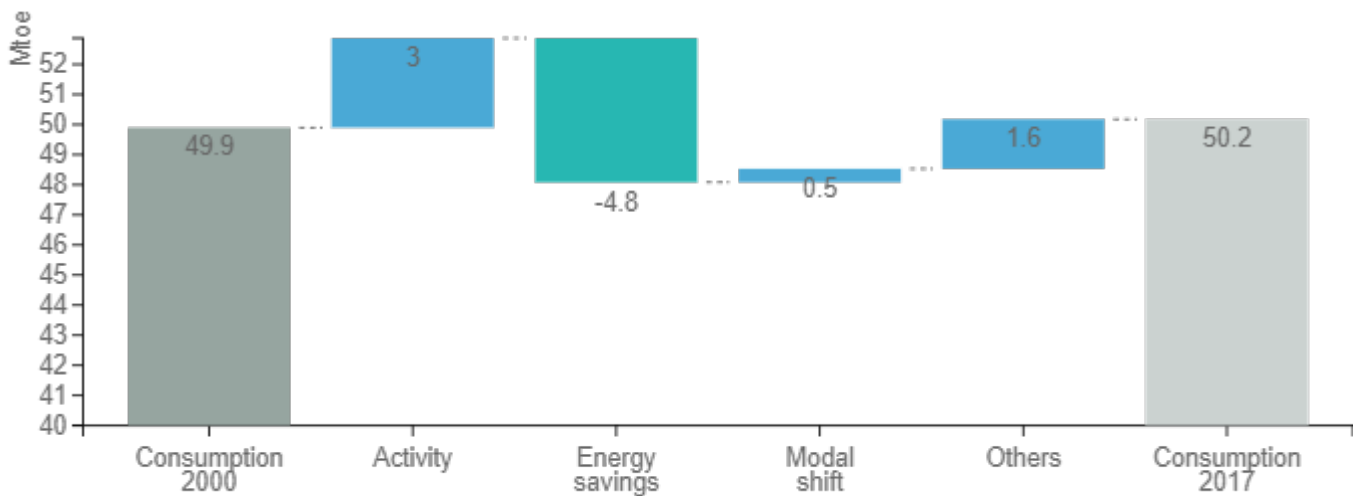


Source: ODYSSEE

Transport energy consumption was only slightly higher in 2017 than in 2000. This trend is due to the fact that energy savings (around 4.8 Mtoe) counterbalanced the effect of the growth in traffic of passengers (3 Mtoe), the effect of modal shift towards road transport (0.5 Mtoe) and other effects (1.6 Mtoe), mainly the decrease in load factors for the transport of goods with the economic crisis (trucks less loaded with an increase in empty running).



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



Source: ODYSSEE

In 2010, the National Engagement for Environment (ENE) enacted the accelerated development of non-road and non-air modes of transport. Ambitious objectives were set by this law: to reduce by 2020 the greenhouse gas emissions of the transport sector to the level recorded in 1990 and to increase the share of non-road and non-air modes to 25% by 2022 (from 14% in 2006). The policies implemented to achieve this objective are mainly based on two points: i) Support low-emission means of transport (modal shift); ii) Improvement of the efficiency of the means of transport used.

Table 3: Policies and measures into force in the transport sector

Measures	Description	Expected savings, impact evaluation	More information available
Carbon tax	The 2014 fiscal law introduced a carbon tax on fossil fuels. The tax rate was raised from €7/tCO ₂ in 2014 to €44.6/tCO ₂ in 2018. The Finance Law 2018 set the carbon tax level at €56/tCO ₂ in 2020 and €100/tCO ₂ in 2030. However, its level remained unchanged since 2018 due to social protests. Revenues from the tax are used to finance the development of renewables	High	Link
Bonus malus	The bonus-malus scheme (called bonus écologique), based on the CO ₂ emissions per km, supports the purchase of vehicles with low CO ₂ emissions by giving bonus (up to €6,000) and penalizes the purchase of high emissions vehicles (more than 110gCO ₂ /km) by giving a malus, up to €12,500 (for cars with emissions higher than 173gCO ₂ /km).	High	Link
Mobility plans for companies	The mobility plan for companies aims at reducing GHG & pollutant emissions, and reducing road traffic by optimizing and increasing the efficiency of employees' travel. It is mandatory for all companies with more than 100 employees on the same site.	Low	Link

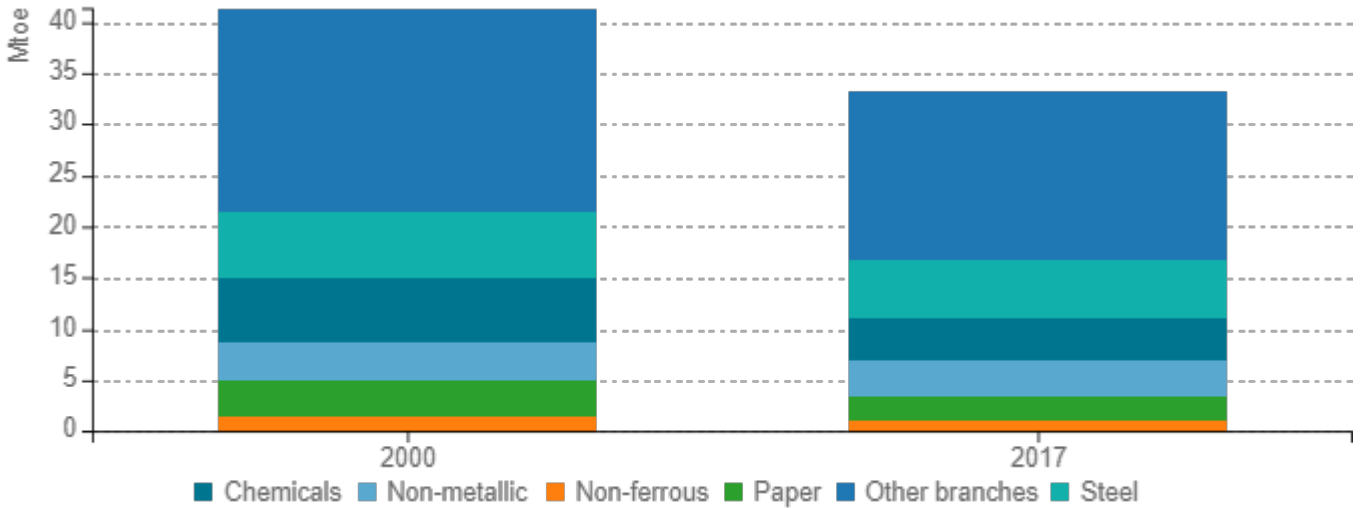
Source: MURE



Industry

Final energy consumption of industry decreased significantly between 2000 and 2017, by 1.3%/year on average. Around 60% of consumption remain concentrated in 5 energy intensive branches, of which 20% in steel industry, 14% in chemicals, 11% in non metallic minerals and the remaining in paper and non ferrous metals industries.

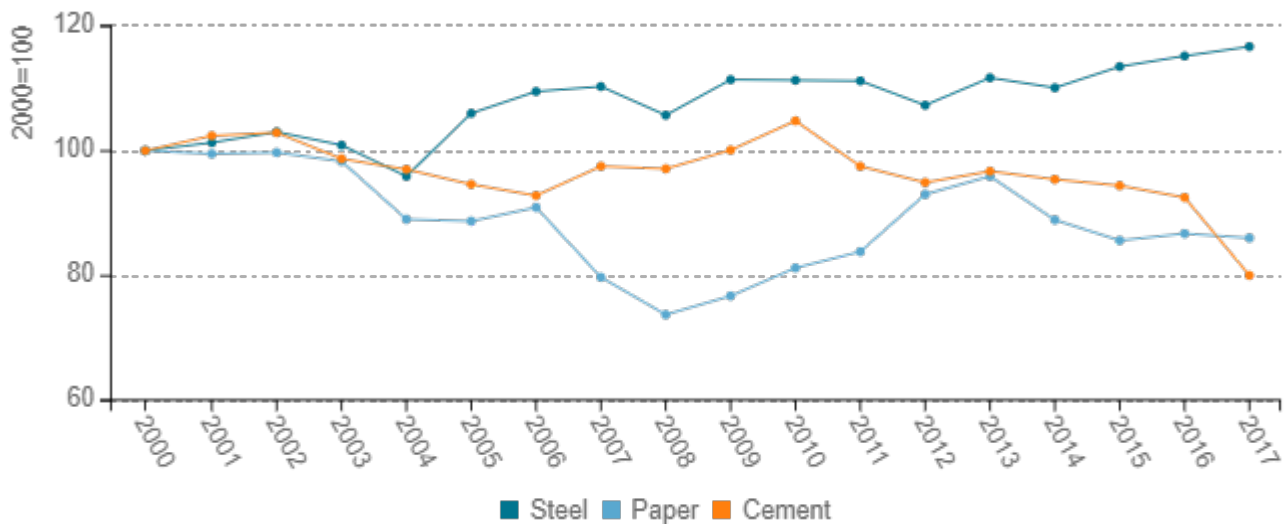
Figure 11: Final energy consumption by branch



Source: ODYSSEE, steel including blast furnaces

Among the 5 energy intensive branches, the unit consumption of cement and paper decreased respectively by 1.3%/year and 0.9%/year. However, steel industry, representing a significant share of industry final energy consumption (20% in 2017), had an increasing trend in its unit consumption in particular since 2012 (+0.9%/year since 2000, +1.7%/year since 2012).

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

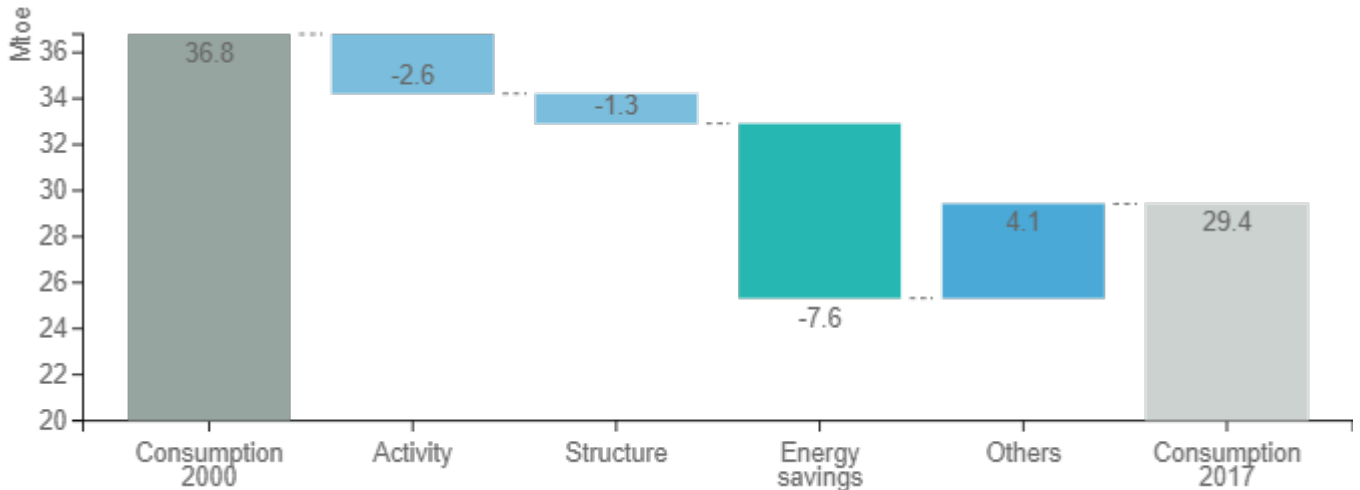


Source: ODYSSEE



Since 2000, most factors contributed to a decrease in industrial energy consumption (-11.5 Mtoe), of which the decrease in activity (-2.6 Mtoe), structural changes towards less energy-intensive branches (-1.3 Mtoe) and, mainly, energy savings (-7.6 Mtoe). These effects are partly offset by other effects (+4.1 Mtoe). Since the economic crisis in 2008, energy savings have had a much lower impact because of a lower renewal rate of equipment and inefficient operations.

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



Source: ODYSSEE

The French policy in terms of energy efficiency in the industrial sector focuses on five points: market instruments (in particular the EU emission trading scheme); financial incentive measures; regulatory measures, in particular within the framework of the transposition of the Energy Efficiency Directive (2012/27/EU); support to these normalisation procedures and qualification; support to the development of more energy-efficient technologies, in particular for the development of future investments systems.

Table 4: Policies and measures into force in industry

Measures	Description	Expected savings, impact evaluation	More information available
Loans for SMEs	This loan (called Eco-energy loan) is available for SMEs which want to improve their energy efficiency (installation of efficient equipment, work to bring them up to standard...)		Link
Mandatory energy audit	Large firms (with more than 250 employees or revenues exceeding 50 million euros) are obliged to make energy audits every four years. It concerns around 5,000 firms in France.	Low	Link

Source: MURE

