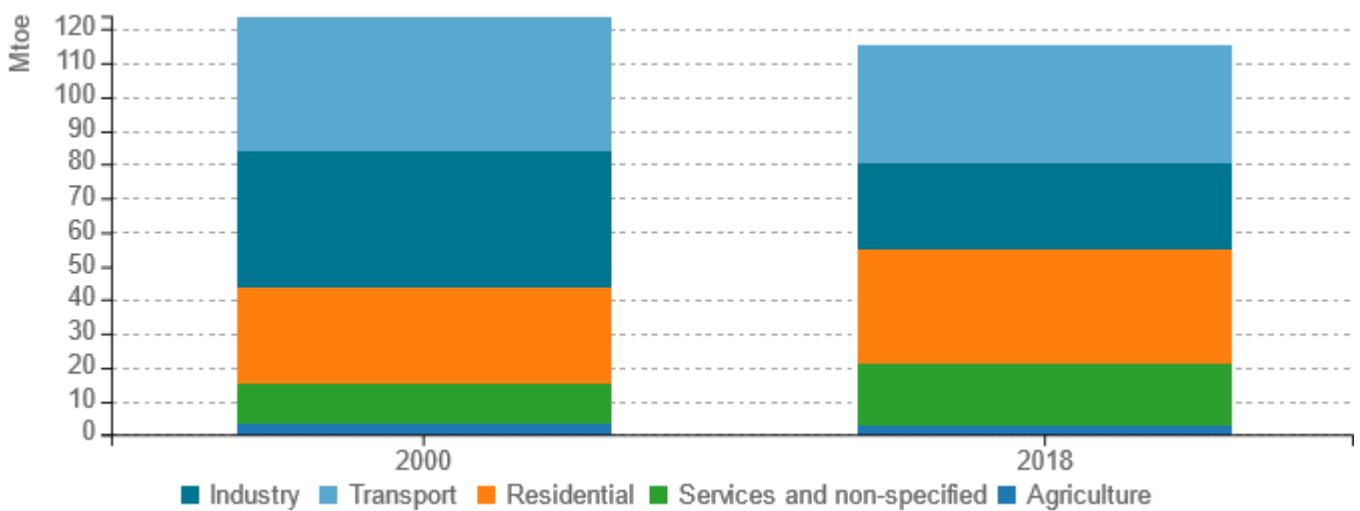


# Energy efficiency trends and policies

## Overview

In 2018 the final energy consumption climate corrected was 115.6 Mtoe, -6.4% since 2000. The largest consuming sector was transport sector representing 31% of total final energy consumption with a 1.1 percentage points decrease since 2000. Over the period 2000-2018 residential and services sectors grew by 5.8 and 5.5 percentage points, respectively: the building sector, comprising residential and services sectors, represents 43.5% of total final energy consumption in 2018. Energy consumption in industry kept on decreasing, -37.1% since 2000.

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

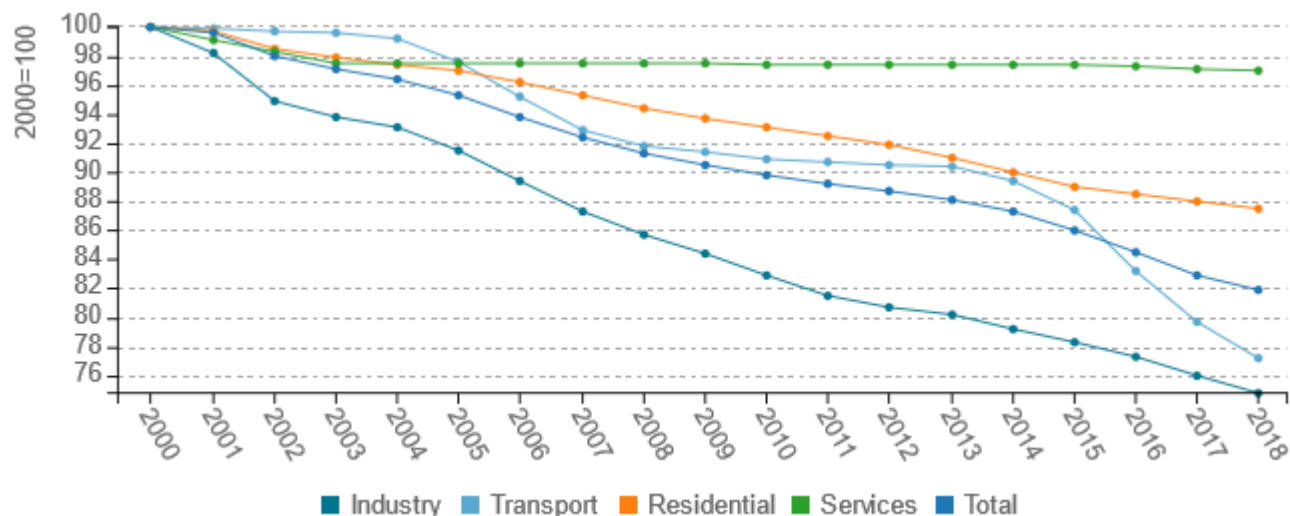


Source: ODYSSEE

Energy efficiency for final consumers, as measured by ODEX, improved by an average of 1.1% per year from 2000 to 2018, 18% over the period. In industry the energy efficiency improvement has been steady and significant: 1.6% per year over the period 2000-2018. The progress in transport sector has been quite constant, 1.4% per year, accelerating in the last years due to fast increase of passenger traffics compared to energy consumption. The residential sector had a steady progress in energy efficiency but slower because of the changes in lifestyle and dwelling comfort: 0.7% per year over the period 2000-2018.



Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE

The NECP sets the national targets to be achieved by 2030 for energy efficiency, renewable energy sources and reduction of CO2 emissions, energy security, development and sustainable mobility. Compared to the binding cumulative energy savings target of 51.44 Mtoe, the proposed measures lead to a cumulative estimated savings of 57.44 Mtoe. 2030 target will be pursued through Obligation Scheme of White Certificates and a mix of fiscal, economic and regulatory alternative measures already active. Some of them will be reviewed and strengthened. Legislative Decree 73/2020 identifies updates in measures for improving energy efficiency aimed at the national energy savings target and contributes to the implementation of the European energy efficiency first principle, mainly White Certificates and Thermal Account scheme. The mechanism of White Certificates was updated by Ministerial Decree of 11 January 2017 and supplemented by Ministerial Decree of 10 May 2018 and by Directorial Decree of 30 April 2019 that defined the list of eligible interventions and updated the eligible project types. Relative to the target for 2011-2020 set in 2017 NEEAP and consistent with 2017 National Energy Strategy, in 2019 energy savings amounted to around 12 Mtoe/year of final energy (77.2% of the target): 26.2% from White Certificates scheme.

Table 1: Sample of cross-cutting measures

Measures	NEEAP measures	Description	Expected savings, impact evaluation	More information available
White Certificates scheme	yes	Obligation scheme to electricity and gas distributors with more than 50,000 final users to achieve energy savings targets. The obligated parties may also achieve the targets by purchasing white certificates from other parties.	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/223">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/223</a>

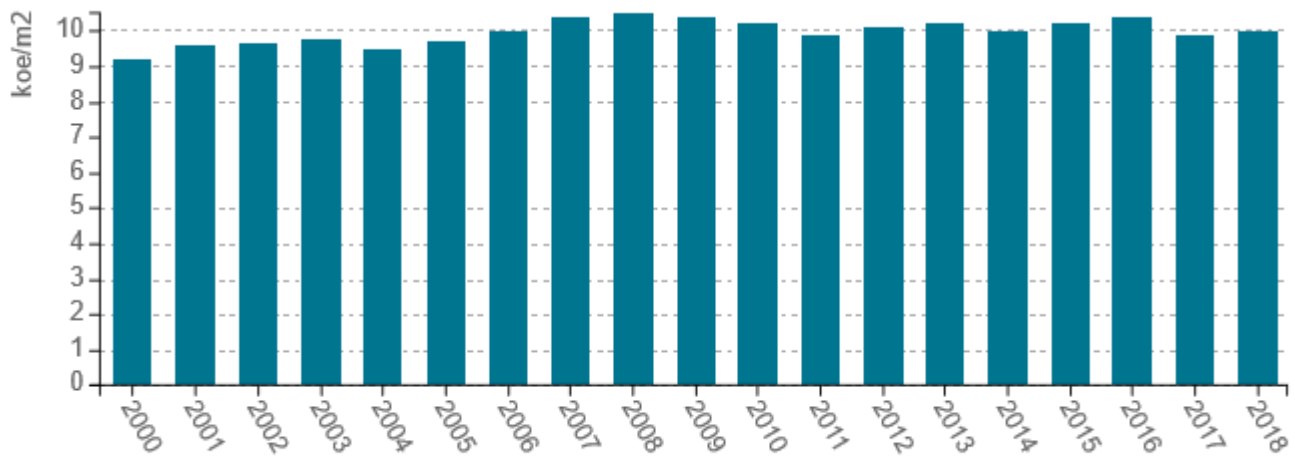
Source: MURE



**Buildings**

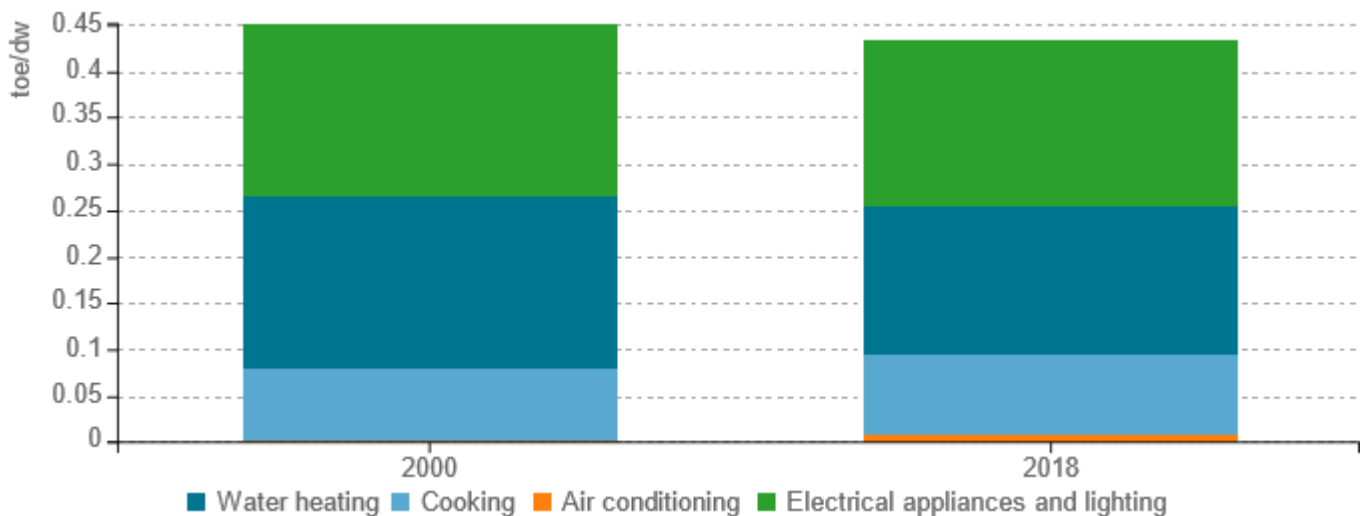
In 2018, the energy consumption of residential sector was around 34 Mtoe, +19% since 2000 (+1.0%/year). The space heating accounted for 69% of energy consumption followed by electrical appliances with 13%, water heating with 11%, cooking with 6% and air-cooling with 1%. The end-uses consumption had an increasing trend: +1.2%/year for space heating, +1.4%/year for cooking, +9%/year for air-cooling and +0.6%/year for electrical appliances. The percentage distribution of end-uses consumption was practically constant in the last 10 years. Energy consumption of electric appliances amounted to 0.18 toe/dwelling in 2018, -3.8% since 2000 and -11.5% since 2011, mainly due to progress in energy efficiency.

*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)*

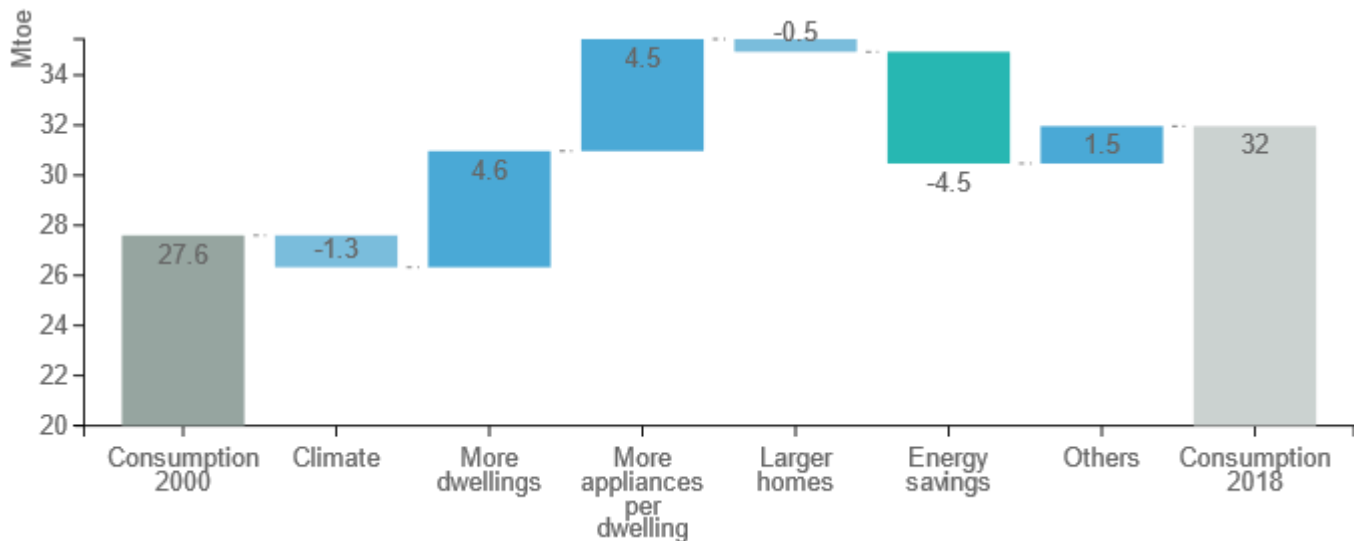


Source: ODYSSEE



Over the period 2000-2018 the energy consumption of residential building grew by 4.4 Mtoe. This increase was mainly due to two factors: more dwellings for 4.6 Mtoe, and greater comfort for 4.5 Mtoe (especially more appliances per dwelling). Energy savings have counterbalanced the effects of the energy consumption growth for 4.5 Mtoe.

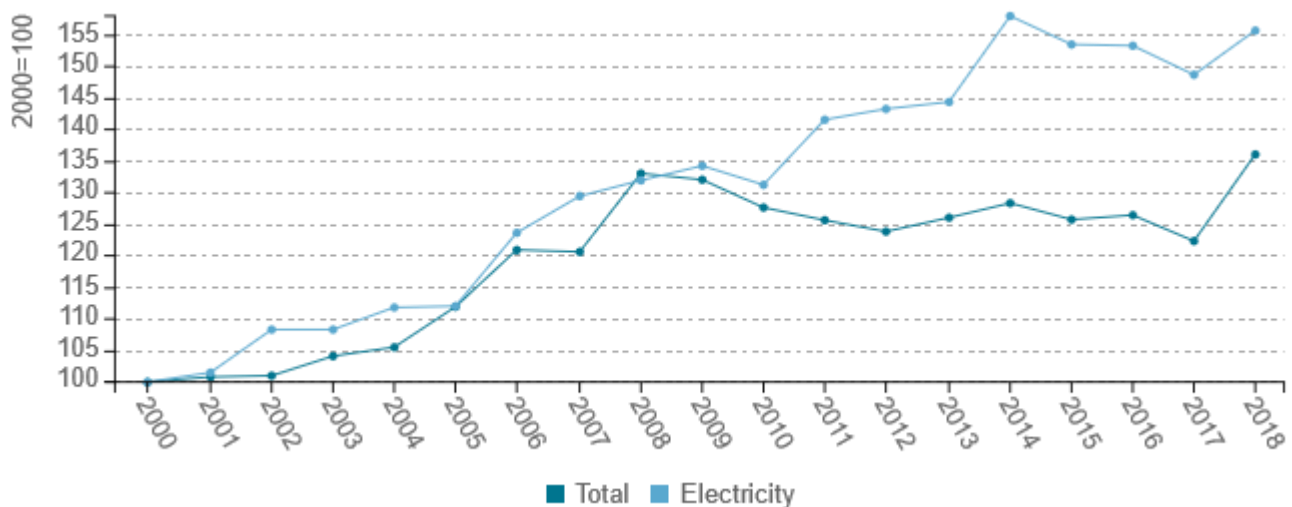
**Figure 5: Main drivers of the energy consumption variation of households**



Source: ODYSSEE

The energy consumption per employee in service sector grew significantly in 2018 due to high increase of gas and heat consumption in the last year. The electricity consumption per employee grew by 2.3%/year over the period 2000-2018 mainly due to significant increase in electricity consumption of health services since 2011: for the other branches the unit consumption grew until 2011 and then decreased.

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



Source: ODYSSEE



Horizon 2020  
European Union funding  
for Research & Innovation

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Budget Law 2020 extended tax deductions for energy requalification of existing buildings (Ecobonus) and fiscal deductions for building renovations (Bonus Casa) until 31 December 2020 with regard to expenditure incurred from 1 January to 31 December 2020. Law Decree 34/2020 raised the tax deduction rate for some energy efficiency and anti-seismic interventions to 110% of the expenditure incurred (Superbonus) to give an important boost to the economy following the Sars-CoV-2 pandemic. Legislative Decree 48/2020 provides for a long-term strategy to support the renovation of the national park of residential and non-residential buildings, both public and private, in order to obtain a decarbonised and energy-efficient real estate park by 2050. The strategy will be incorporated in the NECP. The NECP establish to stabilize the tax deductions for the energy requalification and renovation of buildings for a period of at least three years, to take all the incentives in a single mechanism, to modulate the benefit in relation to the expected energy savings. The programme for the improvement of the energy performance of the central PA buildings (PREPAC) has been refinanced for the period 2021-2030 (Legislative Decree 73/2020). In 2019 energy savings from tax deduction amounted to 3.2 Mtoe/year of final energy (26.7% of total energy savings).

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

Measures	Description	Expected savings, impact evaluation	More information available
Tax deduction scheme (Ecobonus and Superbonus)	<a href="#">Link</a>	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/738">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/738</a>
Energy Performance of Buildings	Minimum requirements for new and for the existing buildings which undergo to major renovation according to the type of building and the climatic area. New PA buildings, owned or occupied shall be NZEB from 1 January 2019, all other new buildings from 1 January 2019 (Legislative Decree 192/2005, amended Legislative Decree DL 63/2013 and converted into Law 90/2013).	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/740">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/740</a>
PA buildings	Interministerial Decree 16 September 2016 defines how to implement the programme for improving the energy performance of the central PA buildings. In the period 2014-2019, the eligible projects were 231 (482 projects submitted) for 316 million euro in investments.		<a href="https://www.mise.gov.it/index.php/it/energia/efficienza-energetica/pubblica-amministrazione">https://www.mise.gov.it/index.php/it/energia/efficienza-energetica/pubblica-amministrazione</a>



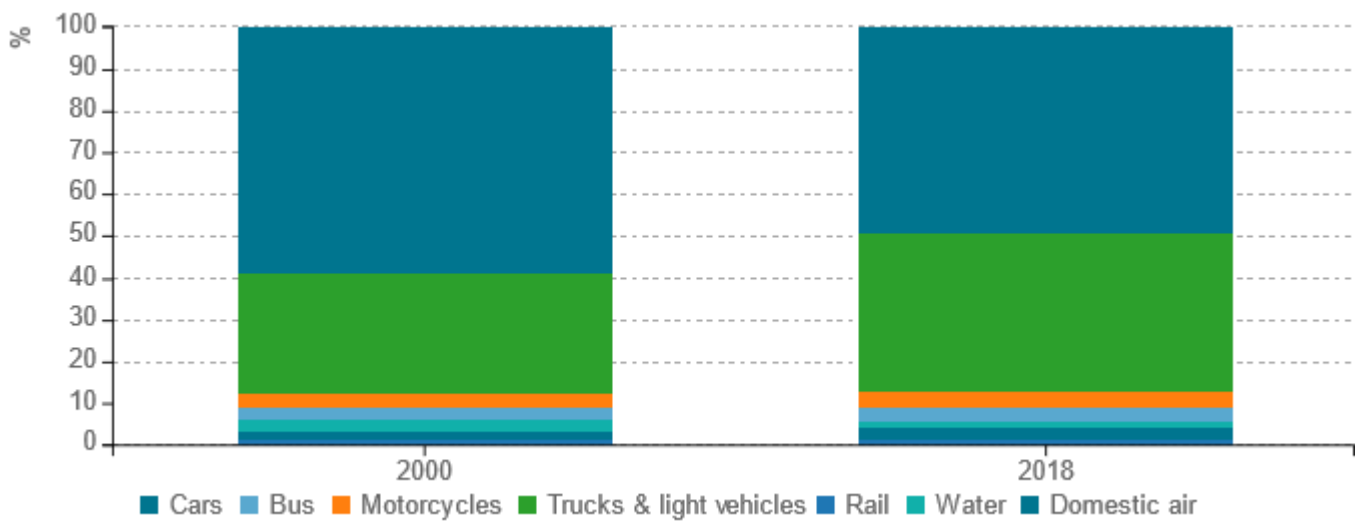
<p>Thermal Account scheme (Conto Termico)</p>	<p>Incentive scheme to encourage Public Administrations and private parties to implement energy efficiency improvement actions in buildings and technical installations as well as for the generation of renewable thermal energy. The actions may be carried out via ESCO by signing an energy performance contract (PA) or through an energy service contract.</p>	<p><a href="https://www.gse.it/servizi-per-te/efficienza-energetica/conto-termico">https://www.gse.it/servizi-per-te/efficienza-energetica/conto-termico</a></p>
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Source: MURE

### Transport

Road transport, passengers and freight, is the main mode of transport with over 90% of transport energy consumption. In 2018 cars accounted for 49% of energy consumption, trucks and light vehicles for 38%. The remaining consumption was used by domestic air transport (3%), motorcycles (4%), bus (3%), water (2%) and rail (2%).

Figure 7: Transport energy consumption by mode

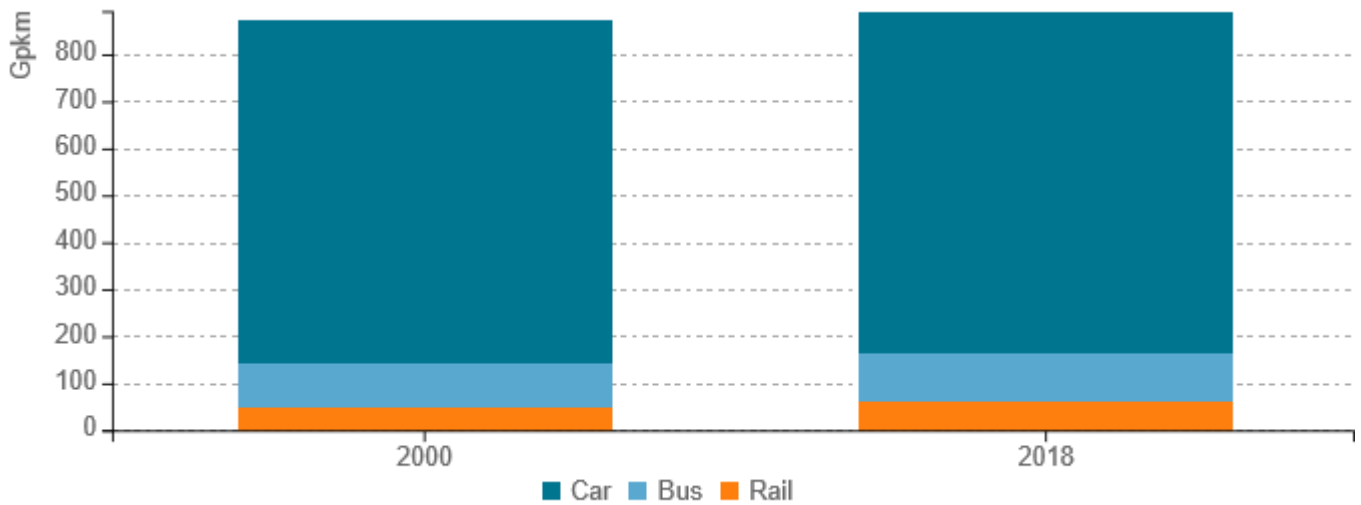


Source: ODYSSEE



The passenger traffic has been growing continuously since 2012, with the exception of the last year, at 3.3%/year over the period 2012-2018 after the drop in the years 2007-2012: + 3.4% in the period 2000-2018. The share of cars is slightly decreasing, -3 percentage points, in 2000-2018.

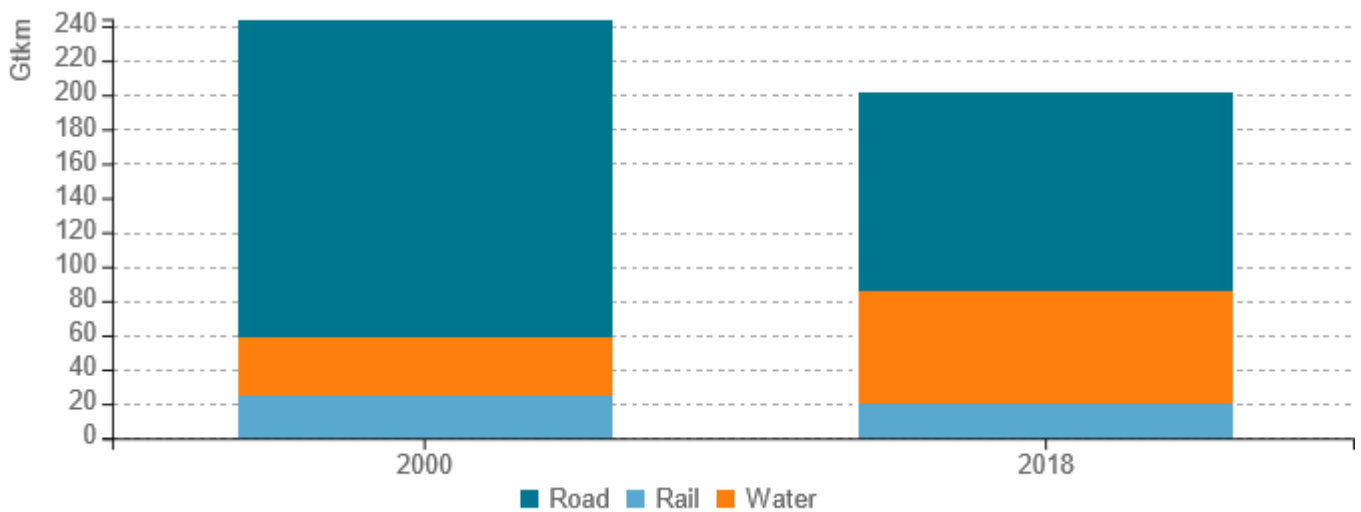
Figure 8: Modal split of inland passenger traffic



Source: ODYSSEE

The freight traffic (measured in tonne-km) has been increasing in the last years but it reduced by 17% (-1.0%/year) since 2000. This drop over the period 2000-2018 is driven by the significant decrease in road goods traffic (-2.6%/year), especially since 2011, and in rail traffic (-1.0%/year). On the contrary, water goods traffic is increasing, +3.7%/year.

Figure 9: Modal split of inland freight traffic

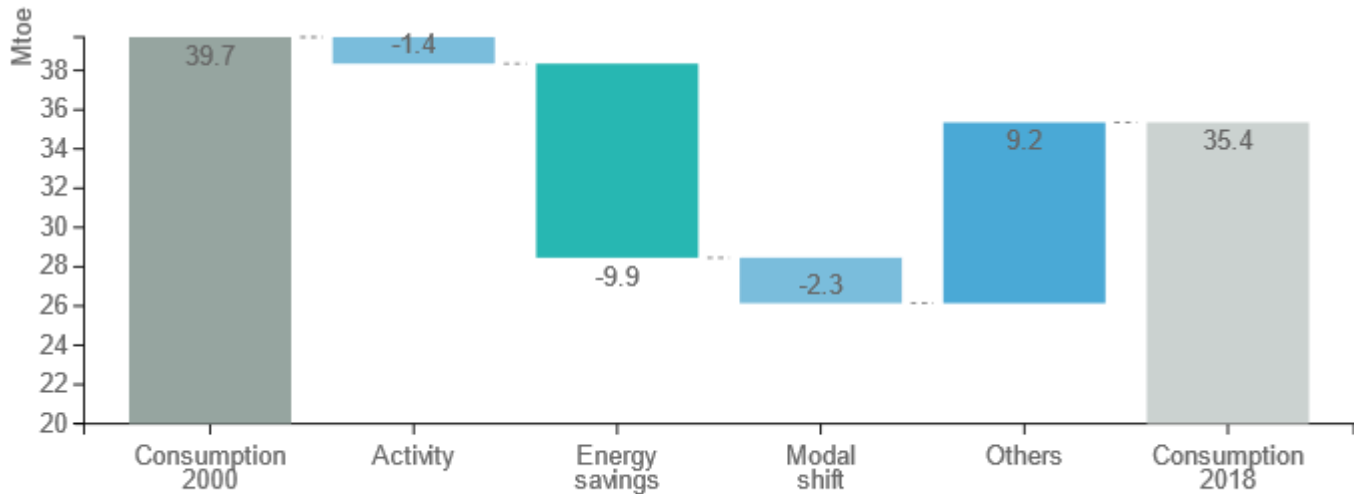


Source: ODYSSEE



Over the period 2000-2018, the transport energy consumption reduced by 4.3 Mtoe (-11.0%). This trend was caused by a decrease in activity (-1.4 Mtoe) due to a reduction in freight traffic greater than the increase in passenger traffic, energy savings (-9.9 Mtoe) and modal shift (-2.3 Mtoe). Other effects, mainly the fall in load factors for the traffic of goods, led to an increase in the consumption (9.2 Mtoe).

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



Source: ODYSSEE

The "National Strategic Plan for Sustainable Mobility" provides 3.7 billion euro for 2019-2033 for the renewal of the bus fleet with electric, methane and hydrogen vehicles. Budget Law 2020 provided for incentives for the scrapping of old vehicles and the purchase of new vehicles for passenger transport "Euro VI" and powered by natural gas, hybrid and electric. The Law establishes the obligation from January 2020 for PA to purchase or rent vehicles powered by electricity, hybrid or hydrogen no less than 50% of the total when renewing the vehicles. 2021 Budget Law refinanced until 2026 the incentives for the transfer of goods from road to sea (marebonus) and rail (ferrobonus).

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

Measures	Description	Expected savings, impact evaluation	More information available
Standards new passenger cars	Car makers are required to achieve minimum efficiency standards for new cars.	Medium	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/2242">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/2242</a>





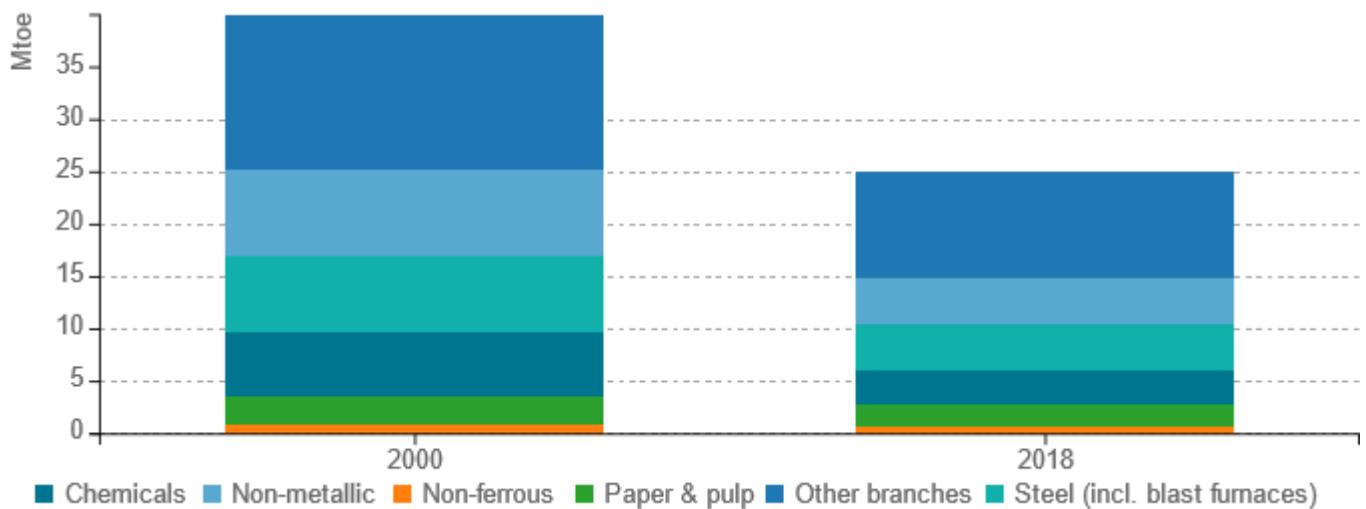
<p>Modal shift – Marebonus and ferrobonus</p>	<p>Marebonus is an incentive for road/sea shift, through the creation of new maritime services and the improvement of existing ones. Ferrobonus is an incentive for road/rail shift, through the use of intermodal transport and transshipment transport to and from Italian logistics hubs.</p>		<p><a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4145">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4145</a></p>
<p>National Intelligent Transport System (ITS) Action Plan</p>	<p>The Plan specifies the requirements for the diffusion of intelligent transport system (ITS). It analyses the state of the art of ITS deployment in Italy and identifies strategies and policies to be undertaken, for each of the four priority areas included in the 2010/40/EU Directive.</p>		<p><a href="#">Link</a></p>

Source: MURE

### Industry

Over the period 2000-2018 the energy consumption of industry reduced by 2.5%/year, from 40.0 Mtoe in 2000 to 25.1 Mtoe in 2018. The share of energy intensive branches (chemicals, steel, non-metallic, non-ferrous and paper) decreased by 4.1 percentage points. Blast furnaces weigh is around 6% until 2013, then drop to 3% in 2018.

Figure 11: Final energy consumption of industry by branch

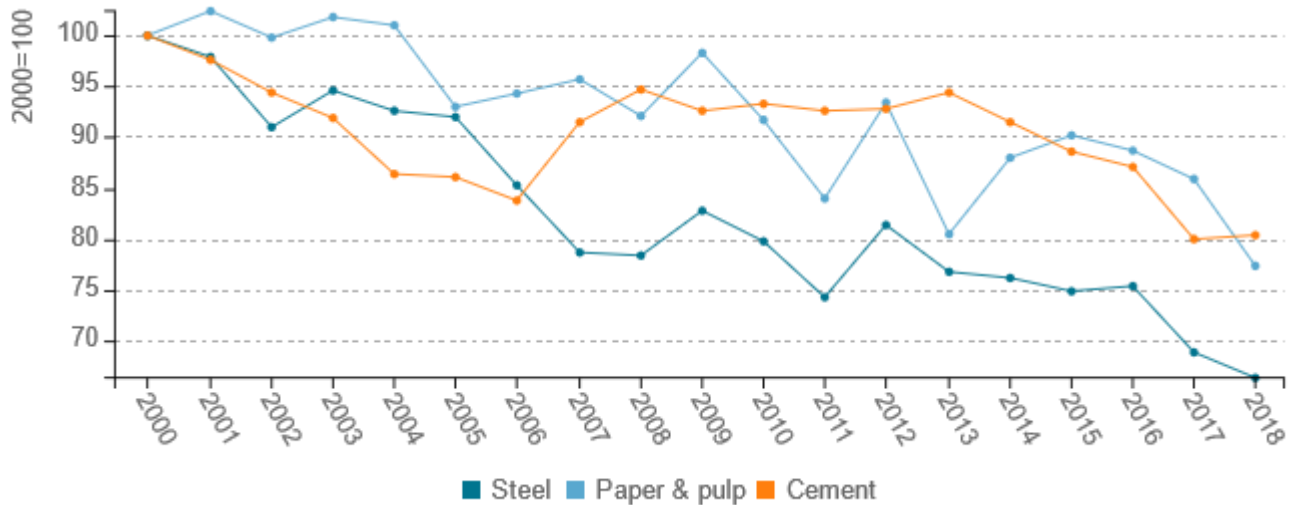


Source: ODYSSEE



The unit consumption of steel, including blast furnace consumption, decreased by 2.2%/year over the period 2000-2018, with some “negative” years due to non-used production capacity due to the economic crisis. The unit consumption of cement reduced by 1.2%/year: it remains quite stable over the period 2008-2014 and then it has been decreasing.

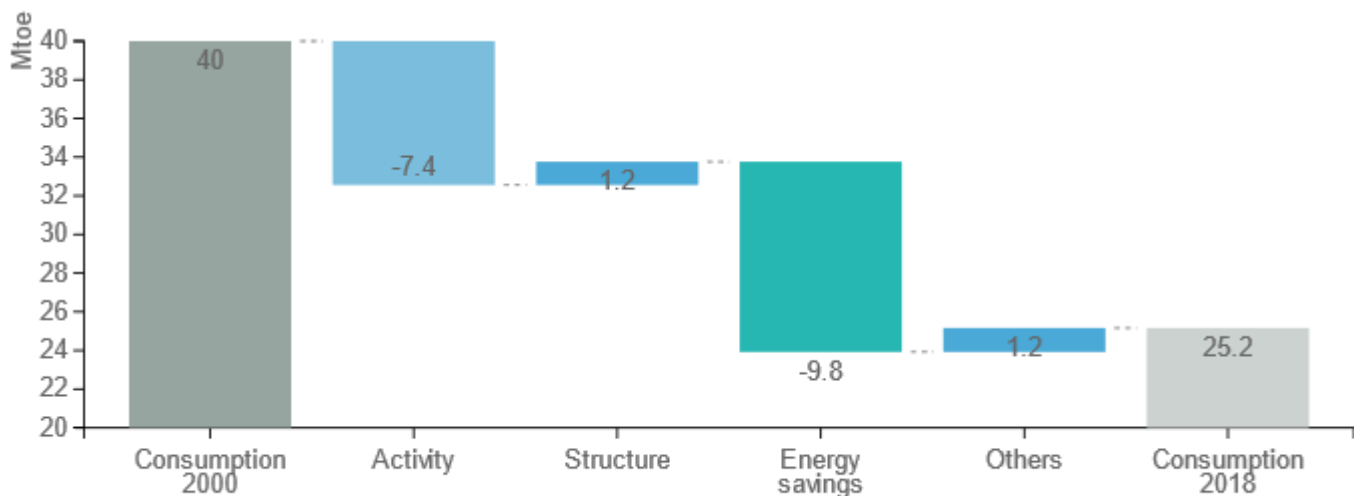
**Figure 12: Unit consumption of energy-intensive products (toe/t)**



Source: ODYSSEE

The decrease in the energy consumption of industry, including blast furnace consumption, was 14.8 Mtoe (-37%) over the period 2000-2018. The drop was mainly driven by energy savings (-9.8 Mtoe) and decrease in activity due to the economic crisis and recession (-7.4 Mtoe).

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



Source: ODYSSEE



Budget Law 2020 launched Transition Plan 4.0 to incentivize and support companies through tax credits for investments in the process of technological transition and environmental sustainability (capital assets, research and innovation, training 4.0). The Law also refinanced “Nuova Sabatini” for years 2020-2025. Budget Law 2021 increased tax credit for investments in capital assets, 10% until 31 December 2022, in research and development, technological innovation, 20% up to 4 million euro, for ecological transition and digital innovation 4.0, 15% up to 2 million euro.

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

Measures	Description	Expected savings, impact evaluation	More information available
Mandatory Energy Audit	For large enterprises and those with high energy consumption, it introduces energy audits mandatory: they must run it within 5 December 2015 and then every four years.	Medium	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1198">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1198</a>
Transition Plan 4.0 (Piano Transizione 4.0)	It supports private investments for innovation and digitalization of production processes, the ecological transition, improvement of technical skills of employees and the development of new products and processes through the tax credit.		<a href="https://www.mise.gov.it/index.php/it/transizione40">https://www.mise.gov.it/index.php/it/transizione40</a>
Nuova Sabatini	It supports micro and SMEs for investments in new capital goods, machinery, equipment and digital technologies.		<a href="https://www.mise.gov.it/index.php/it/incentivi/impresa/beni-strumentali-nuova-sabatini">https://www.mise.gov.it/index.php/it/incentivi/impresa/beni-strumentali-nuova-sabatini</a>

Source: MURE

