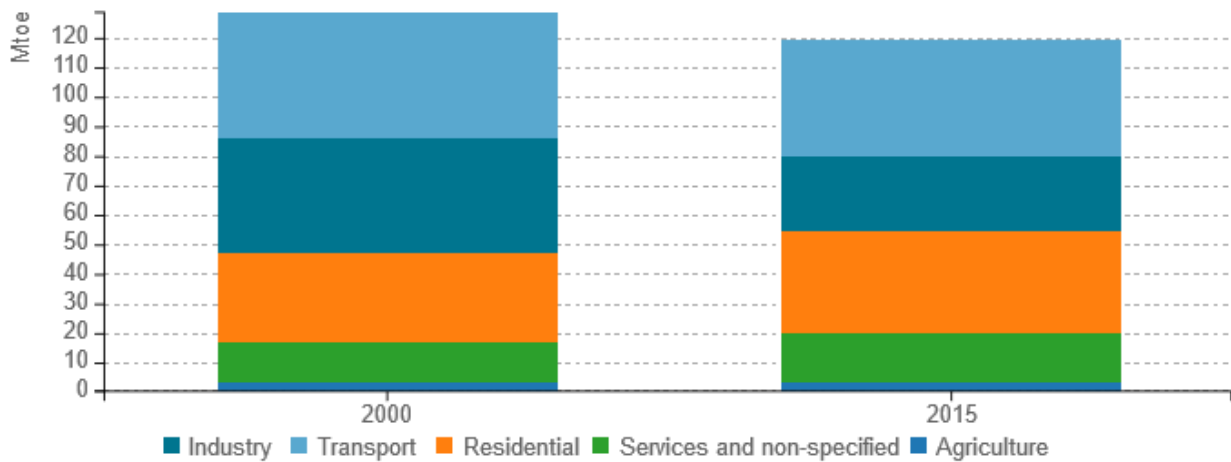


Energy efficiency trends and policies

Overview

In 2015, the final energy consumption was 116 Mtoe with a reduction of 7% compared to 2000. Over the period 2000-2015 the sector with the greatest energy consumption was the transport sector with a steady share around 32%-34%. Residential sector recorded a 6% increase in its share of final energy consumption, from 22% in 2000 to 28% in 2015, followed by the services sector with an increase of 4% over the period 2000-2015. The building sector, comprising residential and services sectors, represents around 42% of total final energy consumption in 2015. The share of industry in final energy consumption decreased by 10%, from 32% in 2000 to 22% in 2015.

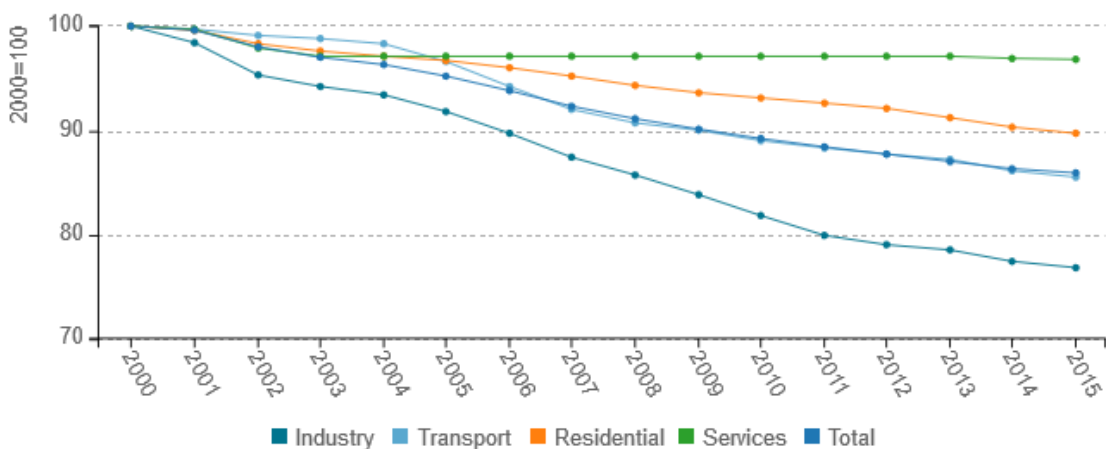
Figure 1: Final energy consumption by sector (normal climate)



Source: ODYSSEE

Energy efficiency for final consumers, as measured by ODEX, improved by 14% over the period 2000-2015, with an average rate of 1% per year from 2000 to 2015. In industry the energy efficiency improvement has been steady and significant: 1.7% per year over the period 2000-2015. The progress in transport sector has been constant (1% per year). The residential sector had a steady progress in energy efficiency but smaller than in 1990s caused by the changes in lifestyle and dwelling comfort: 0.7% per year over the period 2000-2015.

Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE



The fourth National Energy Efficiency Action Plan, submitted in 2017, sets the final end-use energy savings target of 15.5 Mtoe in final energy for 2020. The main energy policy measures adopted are incentive mechanisms (White Certificates, Thermal Account, fiscal deductions for energy renovation and for building renovation) and legislative measures (Legislative Decree 192/05, with reference to the Minimum Energy Efficiency Requirements for buildings). Relative to the target for 2011-2020 set in 2014 NEEAP, in 2015 energy savings amounted to around 5.3 Mtoe/year of final energy (35% of the target), around 40% of such savings derives from the White Certificates scheme. The White Certificates mechanism was recently updated by the Ministerial Decree of 11 January 2017 establishing the quantitative national energy savings objectives to be achieved between 2017 and 2020 and redefining the criteria and methods for ensuring access to the Energy Efficiency Certificates mechanism. The Thermal Account mechanism was updated by Ministerial Decree of 16 February 2016, to promote greater access to resources for enterprises, households and public administration, and implementing regulatory provisions adopted in recent years with an impact on the types of investment for which incentives are provided (e.g. conversion of public buildings into NZEBs).

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	Link
Thermal Account scheme	yes	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.		Link

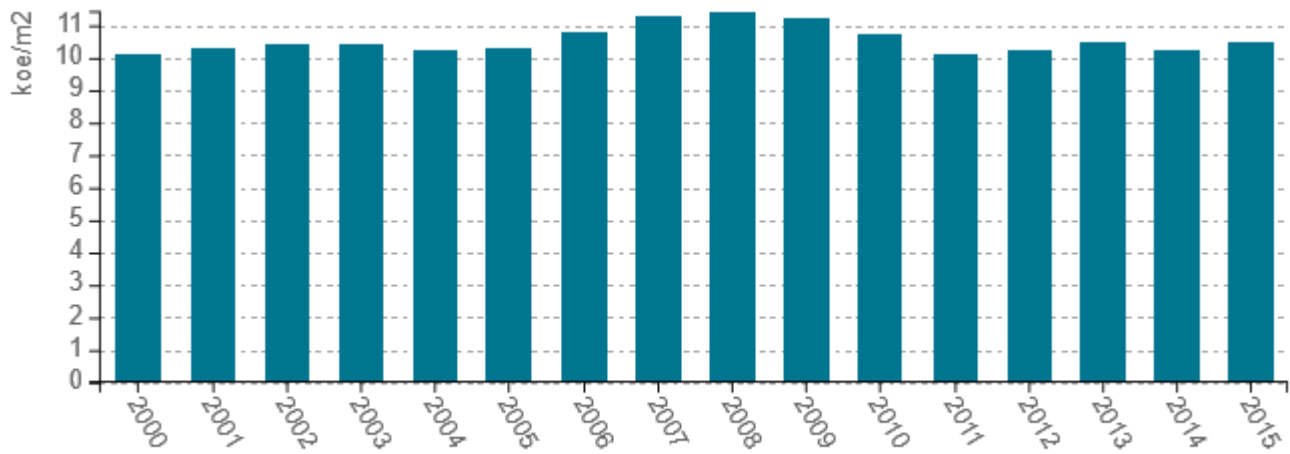
Source:

Buildings

In 2015, the energy consumption of residential sector was around 33 Mtoe: space heating accounted for 68% of energy consumption followed by water heating with 12%, electrical appliances with 11%, cooking with 6% and air-conditioning with 3% (its share has more than doubled since 2000). Over the period 2000-2015 the energy consumption grew by 18% with +1.1%/y. The end-uses had an increasing trend: +1.4%/year for space heating, +1.3%/year for cooking and +8.3%/y for air-cooling. Energy consumption for water heating and electrical appliances remained quite stable (-0.1%/y). The percentage distribution of end-uses consumption was practically constant in the last 10 years.

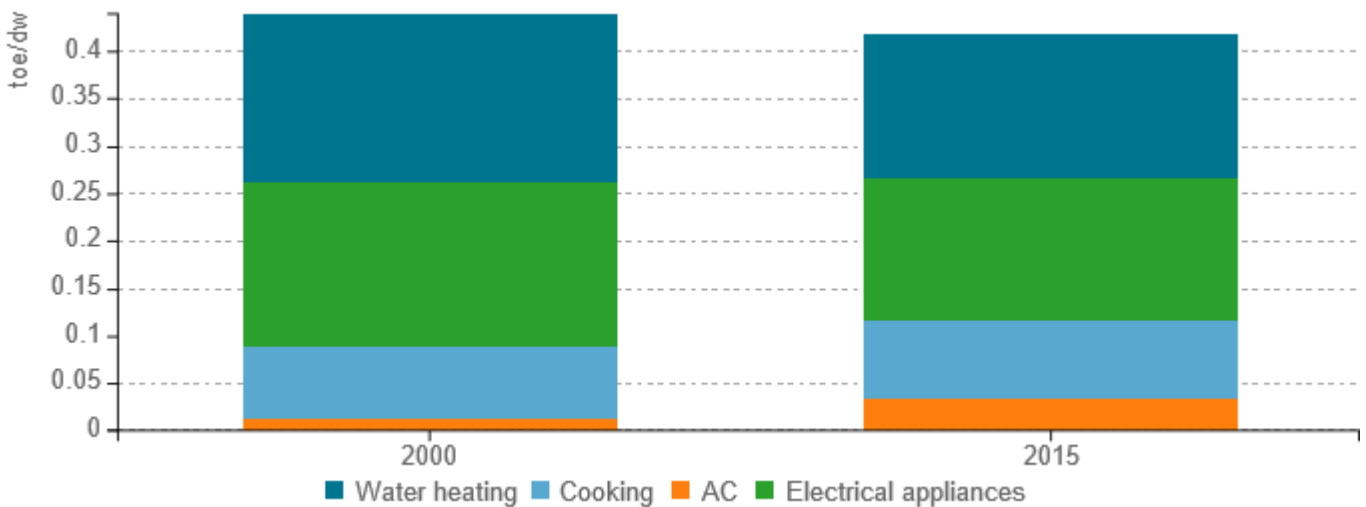


Figure 3: Energy consumption of space heating per m2 (normal climate)



Source: ODYSSEE

Figure 4: Energy consumption by end-use per dwelling

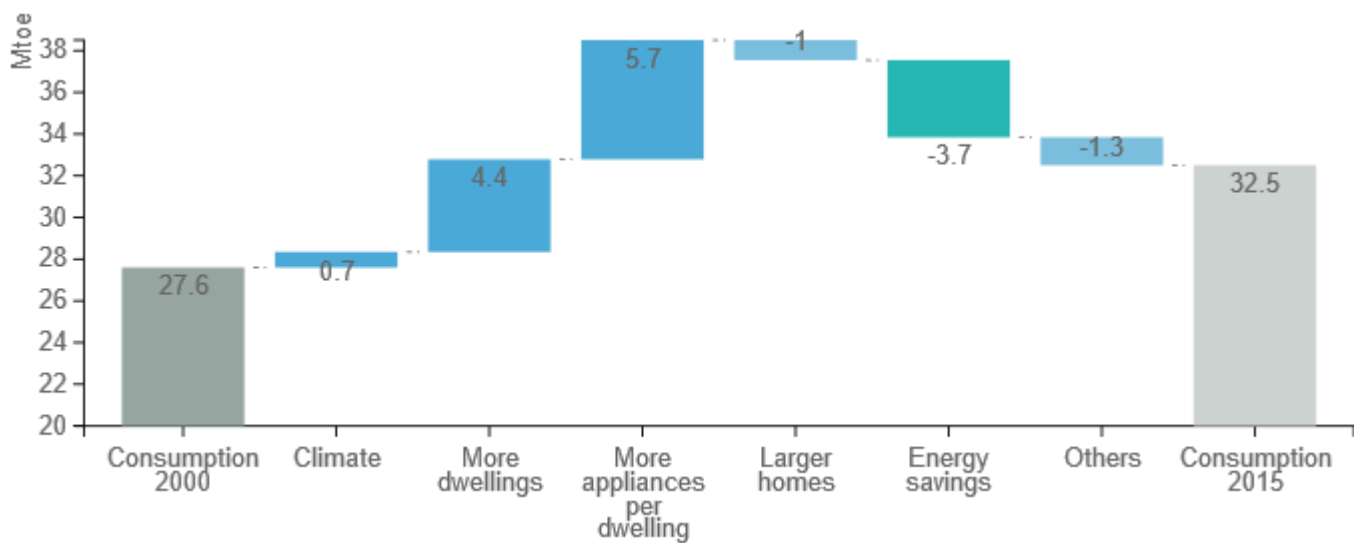


Source: ODYSSEE

In 2015 the energy consumption of residential building was 5 Mtoe greater than in 2000. This increase was due to two factors: more dwelling for 4.4 Mtoe, greater comfort for 4.7 Mtoe (mainly due to more appliances per dwelling). Energy savings have counterbalanced the effects of the drivers of energy consumption growth for 3.7 Mtoe.



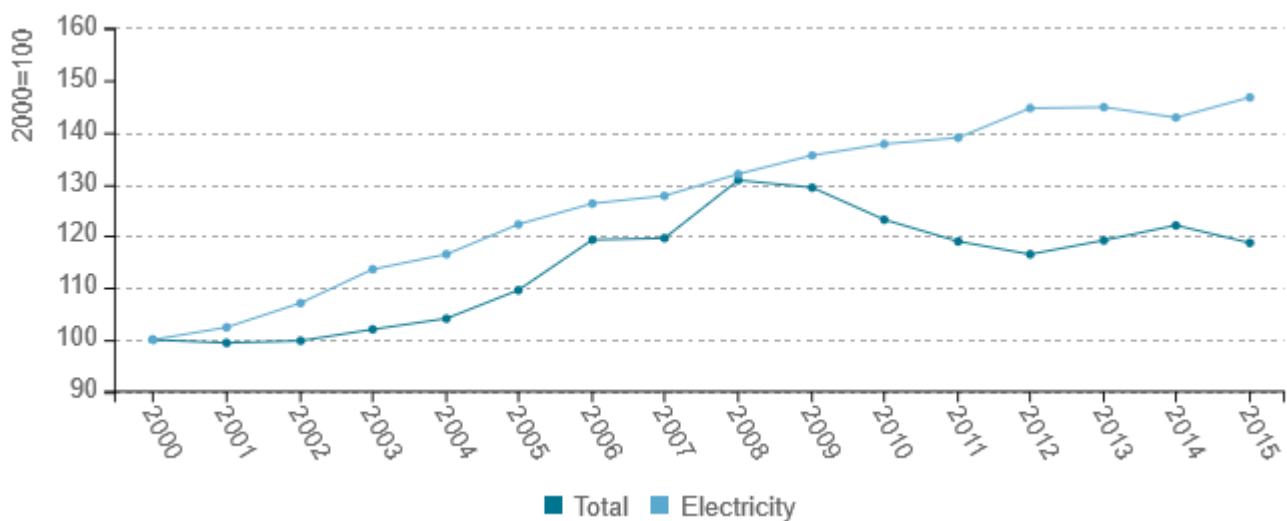
Figure 5: Main drivers of the energy consumption variation in households



Source: ODYSSEE

In services sector, the energy consumption per employee has fallen by 1.3% per year since 2008. On the contrary the electricity consumption per employee grew by 2.6% per year over the period 2000-2015 mainly due to the significant increase in electrical consumption of health and social services. An important effect is also caused by the air-conditioning.

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



Source: ODYSSEE

The Budget Law 2017 extended 65% tax deductions for energy requalification of existing buildings until 31 December 2017. The law also provides for a 70% tax deductions for interventions for energy requalification in the common parts of condominium buildings that involve at least 25% of the building envelope and 75% deduction for interventions designed to improve winter and summer energy performance until 31 December 2021. Tax deductions generated energy savings in primary energy for 0.98 Mtoe/y from energy requalification over the period 2007-2015 and for 1.7 Mtoe/y from building renovation in the period 2006-2015. Legislative Decree 102/2014 (art. 5) states that, every year from 2014 and until 2020, the competent administrations are to prepare the programme for improving the energy performance of the central PA buildings (PREPAC). The Ministerial



Decree of 11 January 2017 updated Minimum Environmental Criteria (MEC) for buildings of PA: for projects of restructuring/maintenance of existing buildings, an energy diagnosis is mandatory to identify the energy performance of the building and the actions to be taken to reduce the energy requirements. The implementation of Legislative Decree 192/05 (Minimum Energy Efficiency Requirements for buildings) produced energy savings for 2.3 Mtoe/year over the period 2005-2016.

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 2017)	Fiscal incentives for the existing buildings: 65% tax-deductions for the energy efficiency measures in existing dwellings (thermal insulation, installation of solar panels, replacement of heating and air-conditioning systems) and for home automation interventions (multimedia devices for the remote control of heating, hot water and air-conditioning); tax deductions, ranging from the 70% to the 75%, for the energy efficiency interventions on the common parts of the condominium buildings.	High	Link
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	Link
PA buildings	The Interministerial Decree 16 September 2016 defines how to implement the programme for improving the energy performance of the central PA buildings. The Interministerial Decree 5 December 2016 approved the program for the years 2014 and 2015, which includes the financing of 68 projects for 73 million euro of investments.		Link

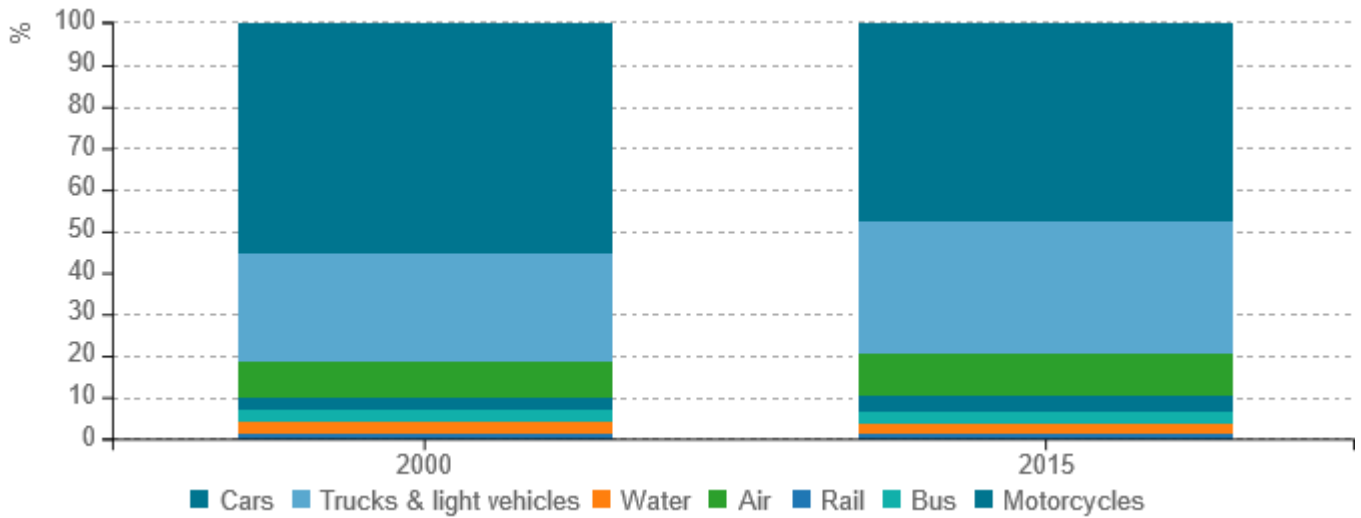
Source:

Transport

Road transport, passengers and freight, is the main mode of transport. In 2015 cars accounted for 47% of the energy consumption, trucks and light vehicles for 33%. The remaining consumption concerns the air transport (10%), motorcycles (4%), bus (3%), inland waterways (2%) and rail (1%).



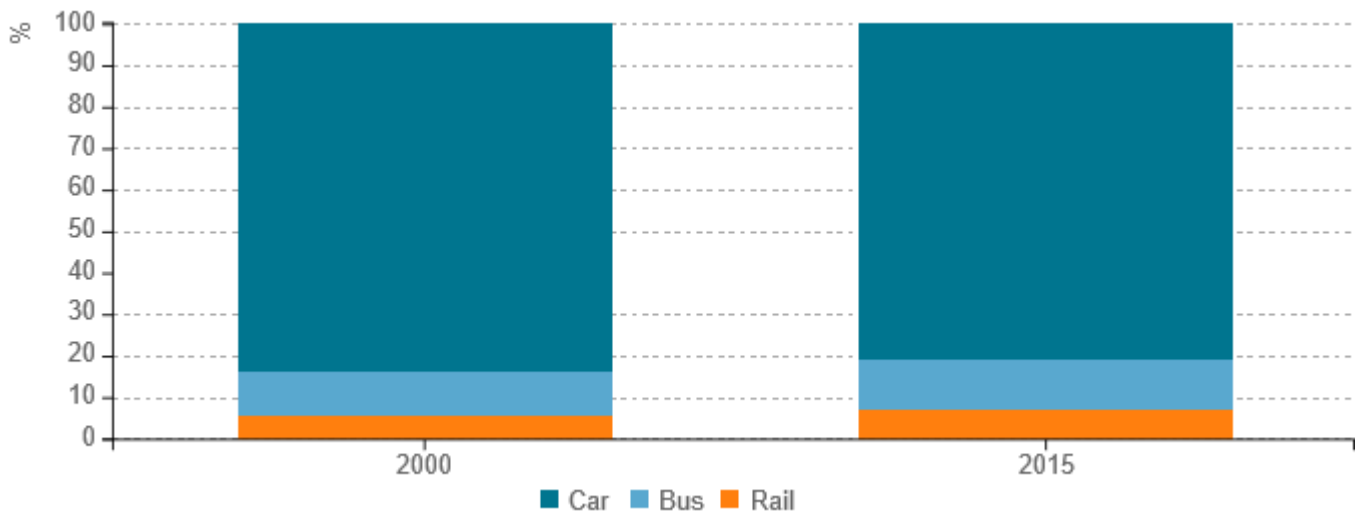
Figure 7: Split of the transport energy consumption by mode



Source: ODYSSEE

The passenger traffic has increased significantly in the last two years (4.0%/y) after the drop over the period 2007-2013 (-2.8%/y). In the period 2000-2015 the cars traffic is slightly decreased by 0.4%/y against a growth of 0.8%/y in public transport (rail and bus), reflecting a modal shift to public transport.

Figure 8: Share of transport in passenger traffic

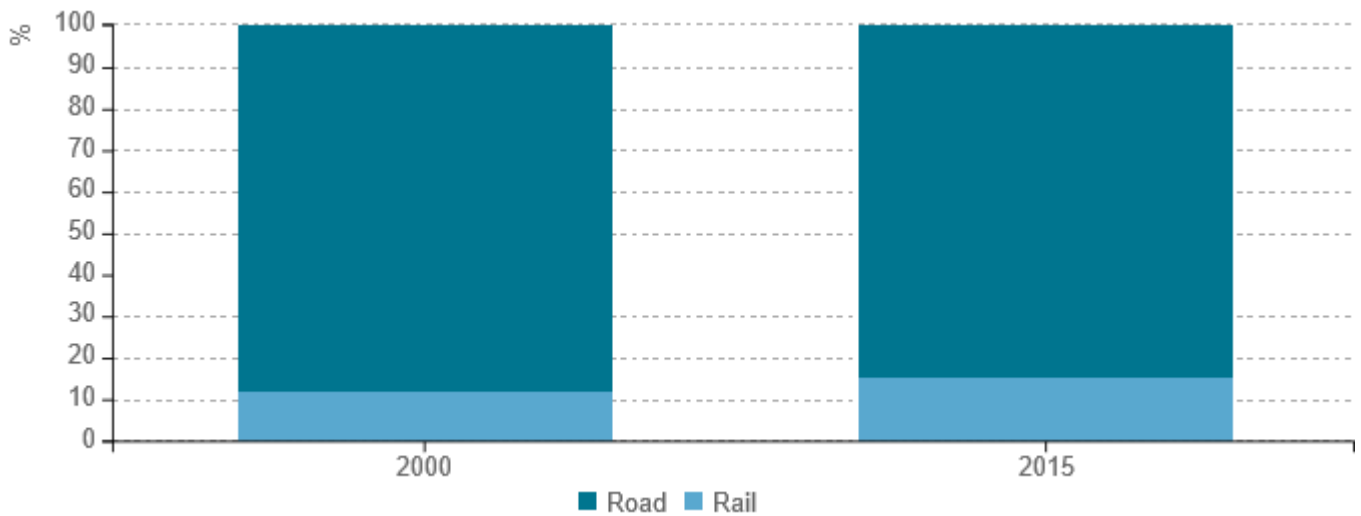


Source: ODYSSEE

Over the period 2000-2015 the freight traffic (measured in tonne-km) reduced at a rate of -2.8% per year due to the significant decrease in road traffic of goods (-3.0%/y) and the drop in rail freight traffic (-1.2%/y).



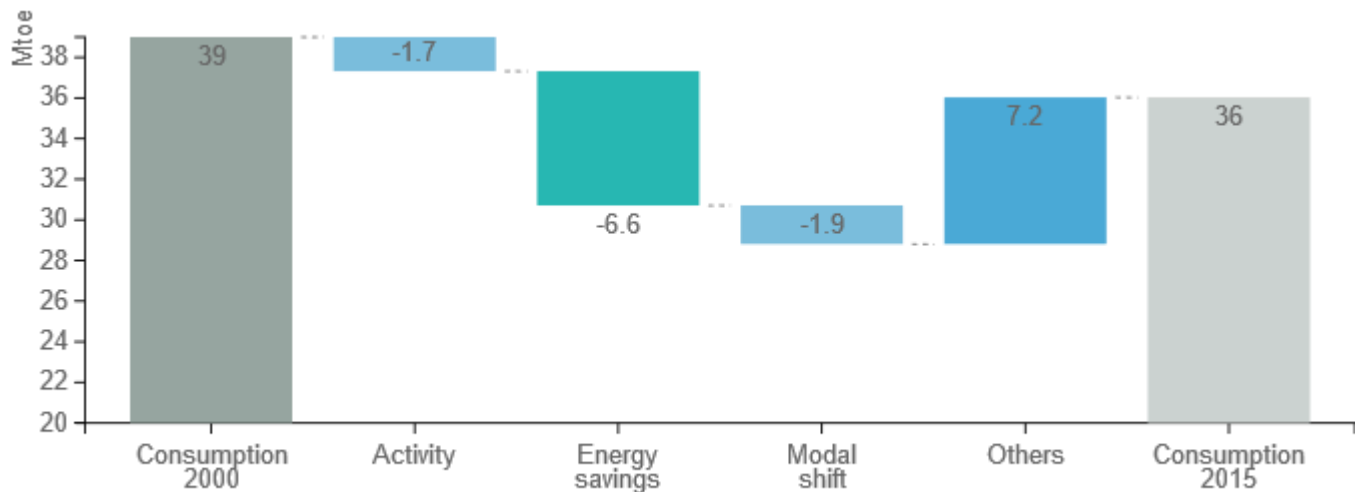
Figure 9: Share of modes in freight traffic



Source: ODYSSEE

Over the period 2000-2015, the transport energy consumption reduced by 3 Mtoe (-7%). This decrease was due to energy savings (-6.6 Mtoe), modal shift (-1.9 Mtoe) and drop in traffic of passenger and goods (-1.7 Mtoe). Other effects, mainly the fall in load factors for the traffic of goods due to the economic crisis, led to an increase in the consumption (7.2 Mtoe).

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



Source: ODYSSEE

Directive 2014/94/EU was transposed by Legislative Decree 257/2016: the Decree sets out minimum requirements for the construction of infrastructure for alternative fuels, including charging points for electric vehicles and filling stations for liquefied and compressed natural gas, hydrogen and liquefied petroleum gas, as well as common technical specifications for charging points and filling stations, and requirements concerning information to be provided to users. The Stability Law 2016 introduced incentives for the period 2016-2018 in support of combined road-rail freight goods (Ferrobonus) and road-sea freight goods (Marebonus).



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

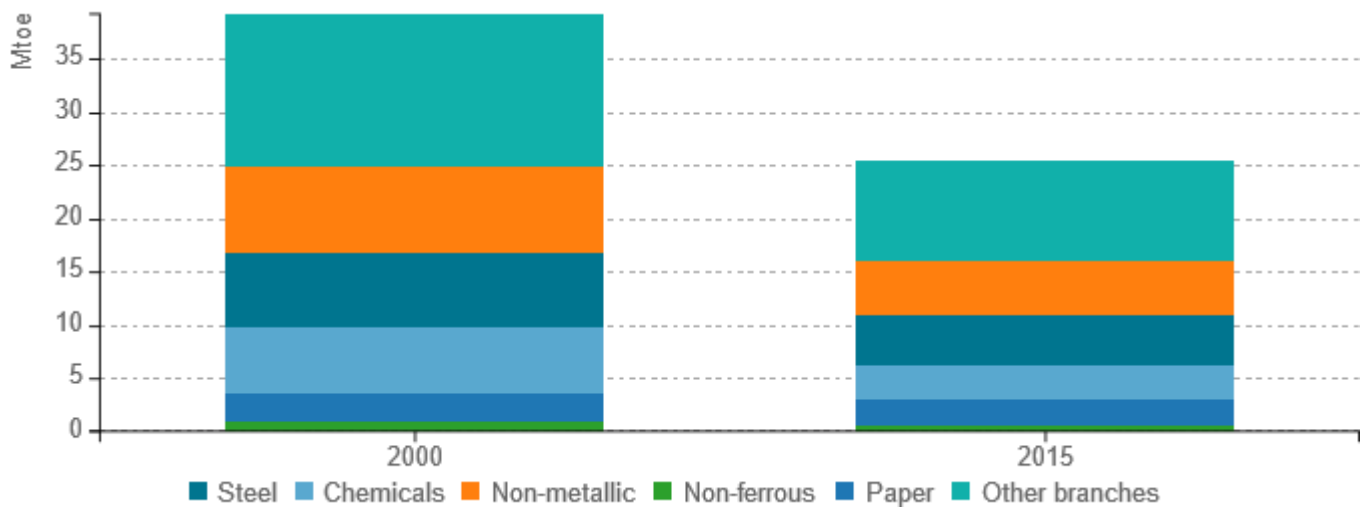
Measures	Description	Expected savings, impact evaluation	More information available
Standards new passenger cars	Car makers are required to achieve minimum efficiency standards for new cars.	Medium	Link
National Intelligent Transport System (ITS) Action Plan	The Plan specifies the requirements for the 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.		Link

Source:

Industry

Over the period 2000-2015 the final energy consumption of industry reduced by 2.8%/y, from 39 Mtoe in 2000 to 26 Mtoe in 2015. The energy intensive branches (chemicals, steel, non-metallic, non-ferrous and paper) represent around 2/3 of energy consumption.

Figure 11: Final energy consumption by branch

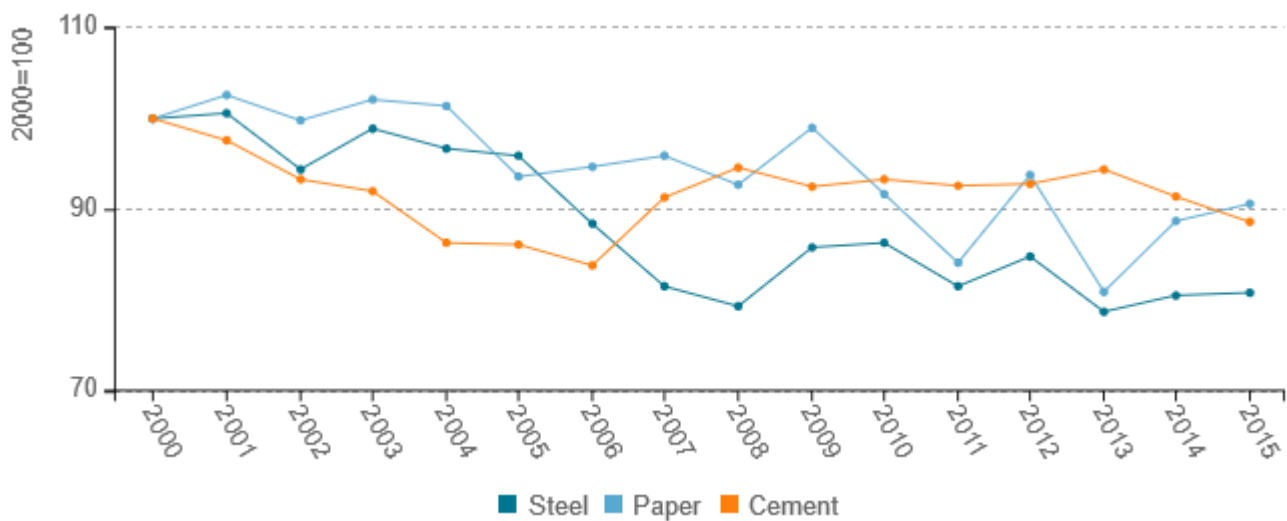


Source: ODYSSEE

The unit consumption of steel and paper decreased, respectively, by 1.4%/y and 0.7%/y over the period 2000-2015, with some “negative” years due to non-used production capacity due to the economic crisis. The unit consumption of cement reduced by 0.8%/y: it remains quite stable since 2008, only in the last years is decreasing.



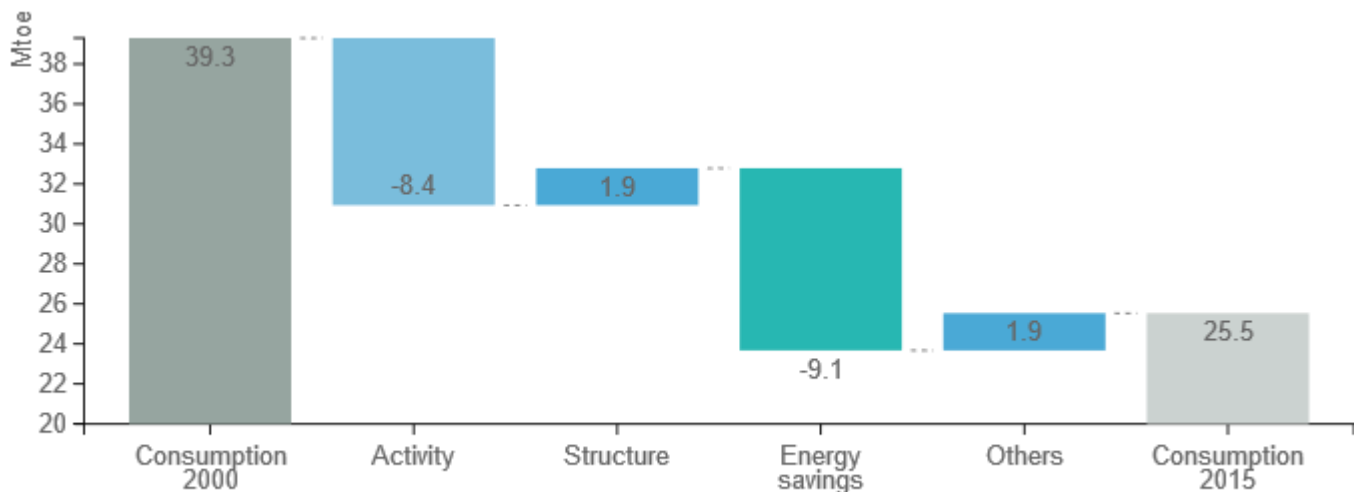
Figure 12: Unit consumption of energy-intensive products (toe/t)



Source: ODYSSEE

The decrease in the energy consumption of industry over the period 2000-2015 was 14 Mtoe (-35%). The drop was mainly driven by energy savings (9.1 Mtoe) and the decrease in activity due to the economic crisis and the recession (8.4 Mtoe).

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



Source: ODYSSEE

The Legislative Decree 102/2014 (art. 8) reserves up to EUR 15 million per year over the period 2014-2020 for the co-financing of regional programmes aimed at supporting the implementation of energy diagnosis or the adoption of management systems compliant with ISO 50001 in SMEs. It's estimated that 15,000 SMEs will be involved per year and just as many energy efficiency projects will be originated by energy diagnosis. At 31 December 2016 15,154 audits were carried out, corresponding to 8,130 enterprises.



Table 4: Policies and measures into force in industry

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	Link

Source: MURE

