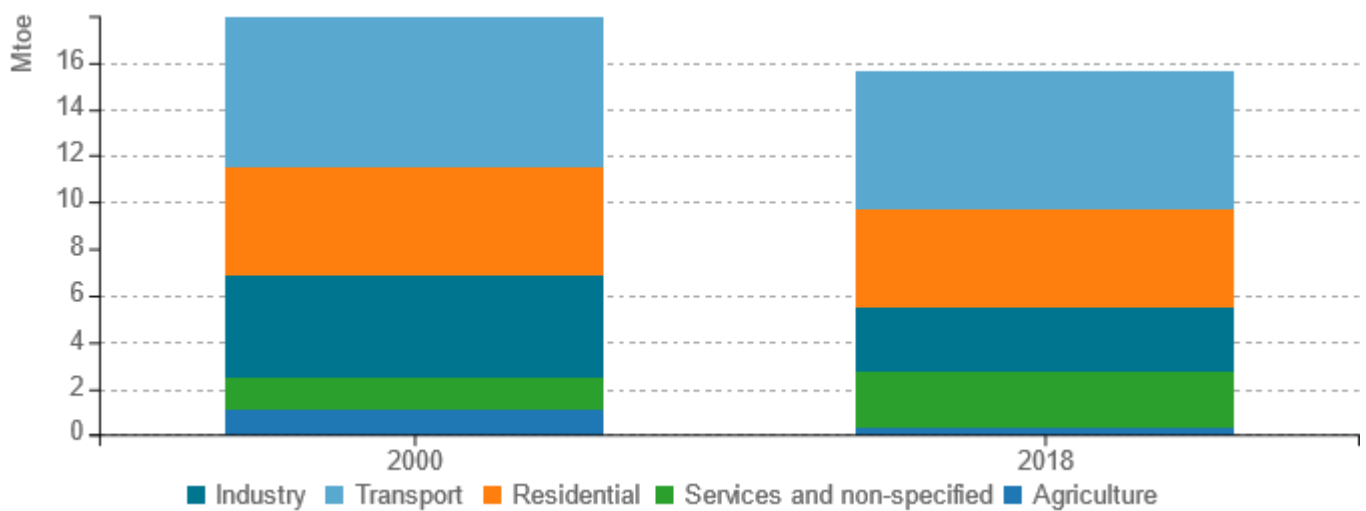


# Energy efficiency trends and policies

## Overview

In Greece total final energy consumption decreased by almost 13% from 2000 to 2018. Transport is the largest consuming sector holding 38% of the final energy use in 2018, showing a decrease of 9% in the period from 2000 to 2018. Residential sector is the second consuming sector holding 27% of the final energy use, showing a decrease of about 8%. Industry with a share of 18% of the final energy use in 2018 decreased by almost 38%, while services have a share of 16% of the final energy use and showed an increase of 86% (Figure 1).

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

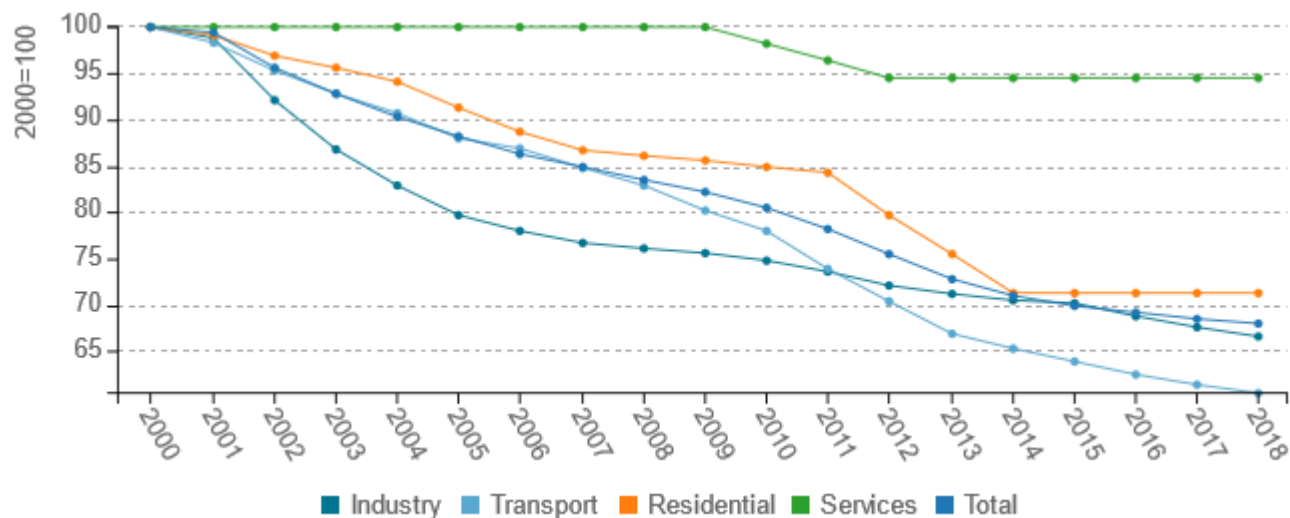


Source: ODYSSEE

Over the period 2000 to 2018 the energy efficiency of final consumers, as measured by ODEX indicator, improved by 32% (Figure 2). The largest improvement (i.e. decrease in ODEX) was registered by the transport sector with 38% (excluding international air transport), then by households with 31% and by industry with 30%, while services had the lowest improvement (4%). The implementation of measures together with the impact of the economic recession are the main reasons behind the decrease in the ODEX indicator.



Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE

Article 7 of the EED was brought in line with Article 9 of Law 4342/2015 (Government Gazette, Series I, No 143, 9.11.2015) regarding the energy efficiency obligation schemes. Paragraph 1 of this Article provides for the adoption of the energy efficiency obligation scheme from 1 January 2017, which ensures that energy distributors and/or retailers defined as obligated parties operating in the Greek territory will achieve a specific cumulative end-use energy savings target by 31 December 2020.

Table 1: Sample of cross-cutting measures

Measures	NEEAP measures	Description	Expected savings, impact evaluation	More information available
Energy efficiency obligation schemes	yes	Energy distributors and/or retailers have an obligation to achieve end-use energy savings.	Cumulative savings 2017-2020: 333 ktoe	<a href="#">Link</a>

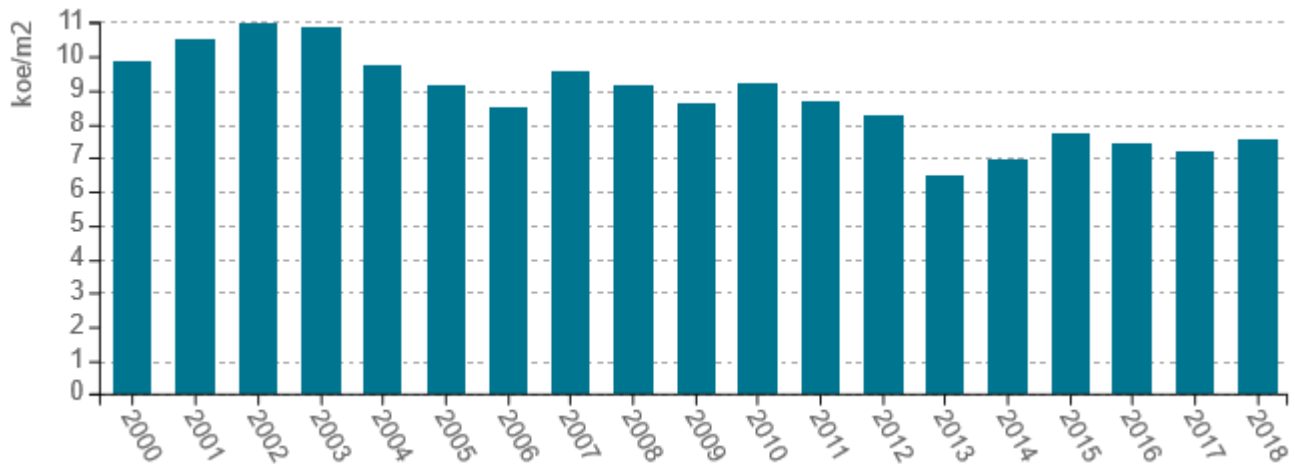
Source: MURE



**Buildings**

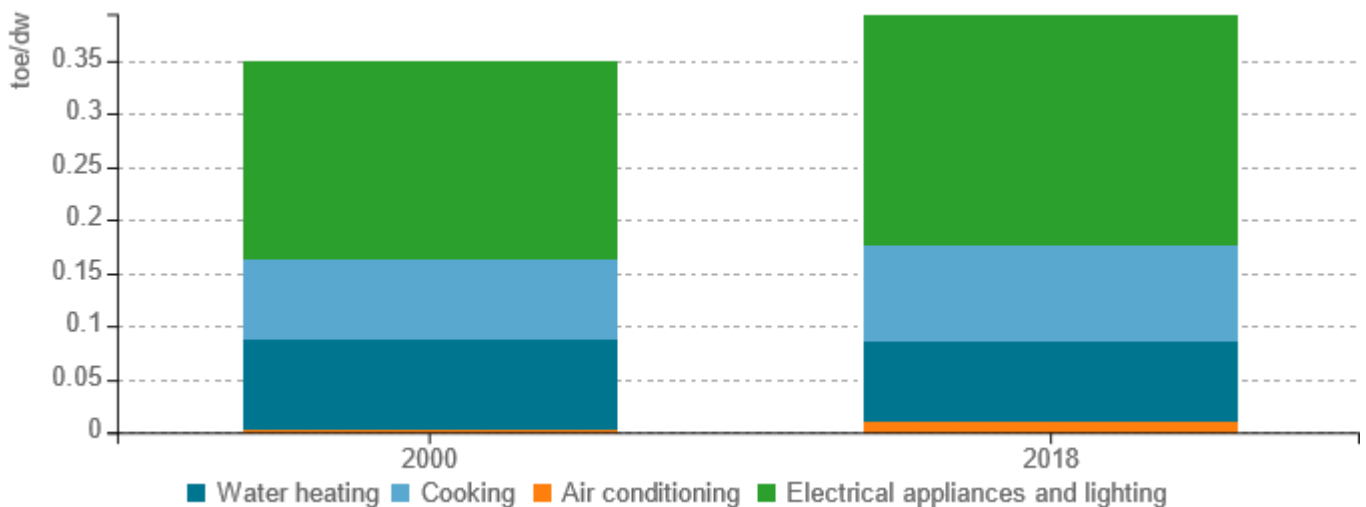
As shown in Figure 3 the energy consumption of space heating per m2 with climatic correction decreased by 24% between 2000 and 2018 in Greece (from 9.9 koe/m2 in 2000 to 7.6 koe/m2 in 2018). This reduction in unit energy consumption is mainly due to the retrofitting of existing buildings, as well as due to behavioural changes (economic recession, energy poverty, etc.).

*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)*



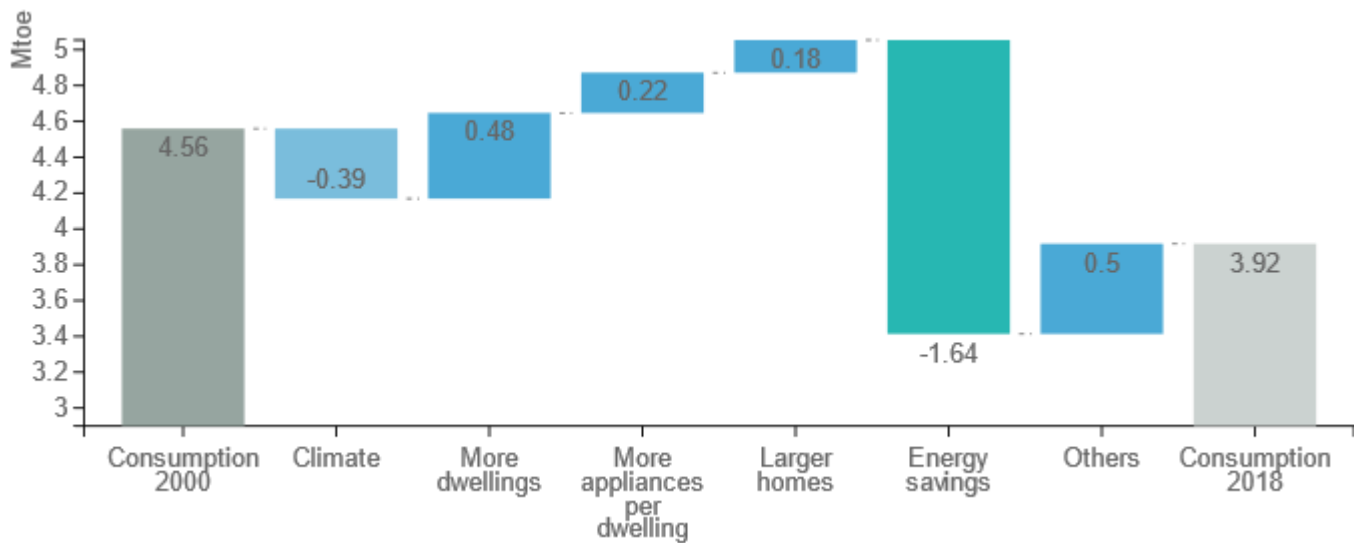
Source: ODYSSEE

In Figure 4 it can be seen that specific consumption of the end uses of cooking, air-conditioning and electrical appliances and lighting increased, while water heating decreased slightly. AC specific consumption is almost 4 times higher in 2018 compared to 2000 but has still a small share. There is also an increase in specific consumption of both electric appliances and cooking by 16% and 19% respectively. Finally, water heating consumption per dwelling has decreased by 12% .



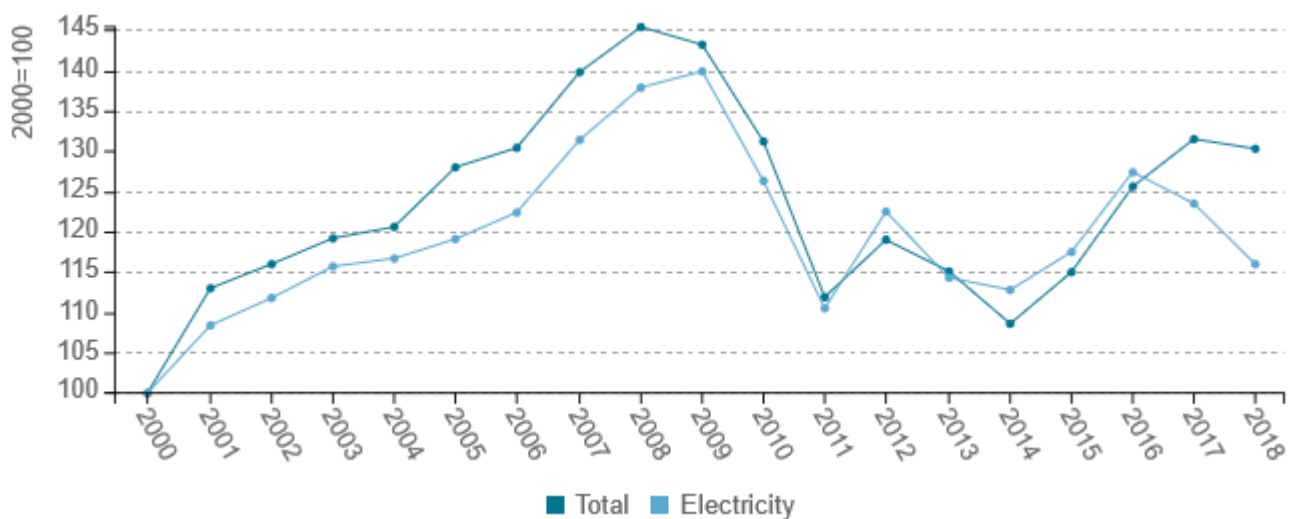
Total final residential consumption was 14% lower in 2018 compared to 2000 (Figure 5). Although the number of occupied dwellings and appliances per dwelling increased, energy savings offset their effect, which explains the small decrease of the consumption. Energy savings can be attributed to the retrofitting of existing buildings and standards for new buildings and appliances, but also to behavioural changes linked to the economic recession (energy poverty, etc.).

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



Source: ODYSSEE

**Figure 6: Energy and electricity consumption per m<sup>2</sup> (normal climate)**



Source: ODYSSEE



Energy efficiency improvement in the residential sector is a combination of regulatory measures for new buildings, that set more strict thermal insulation requirements and set minimum requirements for the efficiency of heating and cooling systems as well as for hot water production, and on the other hand support measures for retrofitting the existing building stock. The "Saving at home" programme is a national programme for residential sector, offering financial support for interventions in building envelope, heating/cooling systems, and installation of RES for domestic hot water production. It was first launched in 2011 and the type of financial support offered was a subsidy ranging from 15% to 70% based on income criteria, with a low-interest loan for the remaining investment. Basic requirement of the programme was the issuing of EPC before and after the interventions.

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

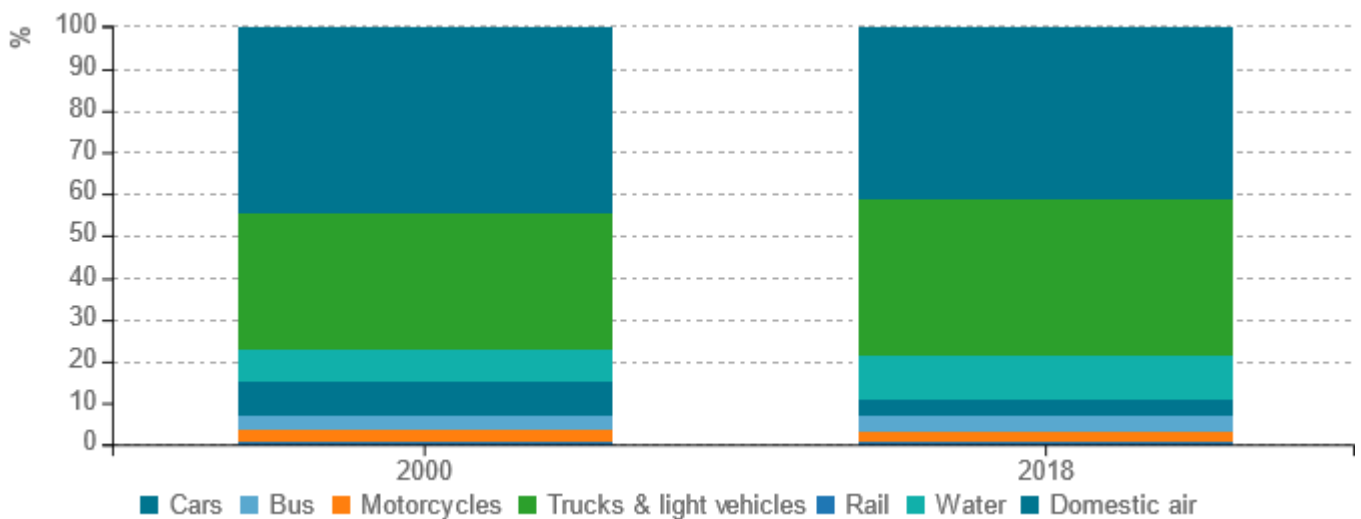
Measures	Description	Expected savings	More information available
'Saving at home' programme II	This program was implemented in the period 2018-2019 and involved grants and low-rate loans for energy efficiency interventions for approximately 63.840 beneficiaries.		

Source: MURE

## Transport

Cars account for 42% of the transport consumption, followed by trucks and light vehicles with 37.6% share, water with 10% and domestic air with 3.4% (Figure 7).

Figure 7: Transport energy consumption by mode

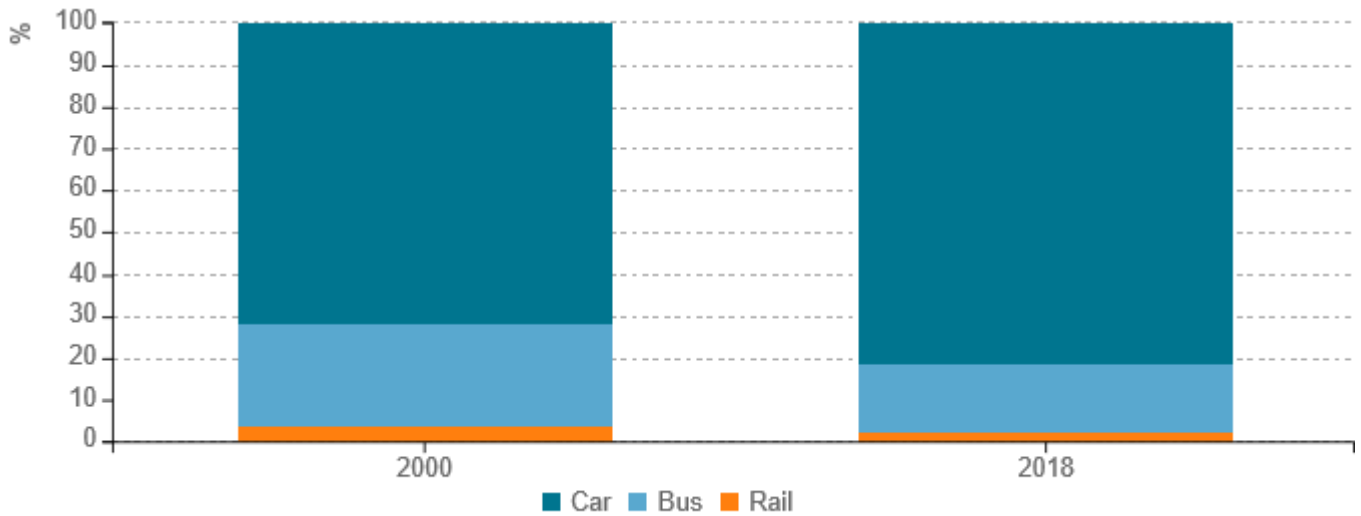


Source: ODYSSEE



Cars represent 81.6% of passenger traffic in 2018, followed by bus with 16.2% and rail with only 2.2%. The share of cars increased by almost 10 points in comparison to 2000, leading to a reduction in bus and rail transport by 9% and 2%, respectively (Figure 8).

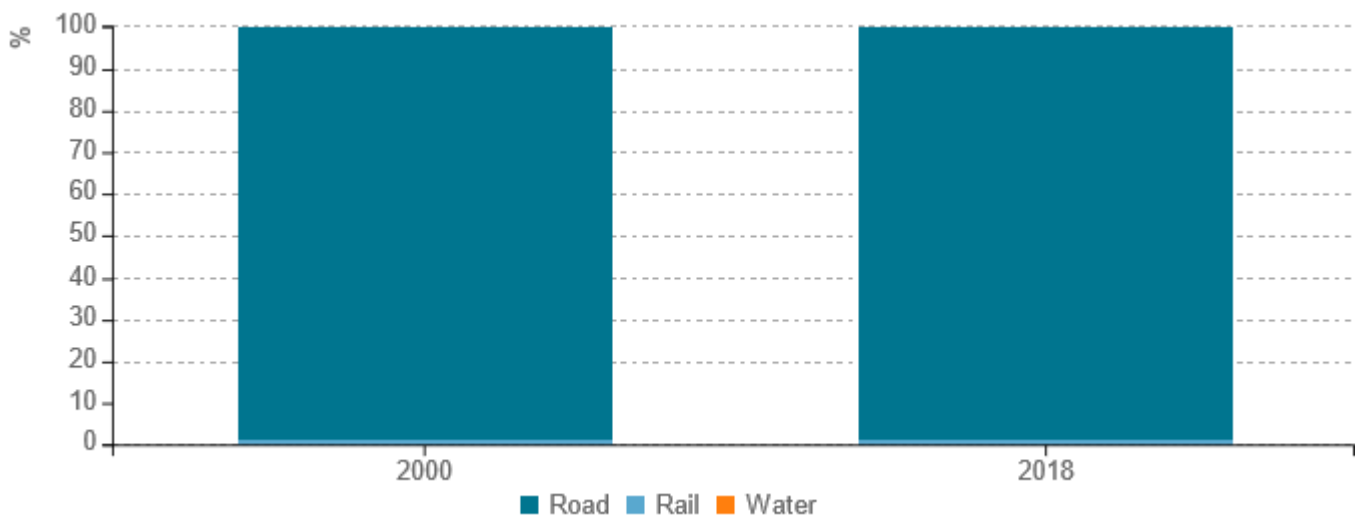
Figure 8: Modal split of inland passenger traffic



Source: ODYSSEE

The breakdown of freight transport remained the same between year 2000 and 2018. Road freight transport is dominant with 98.6% share, while rail freight transport only accounts for 1.4% (Figure 9).

Figure 9: Modal split of inland freight traffic

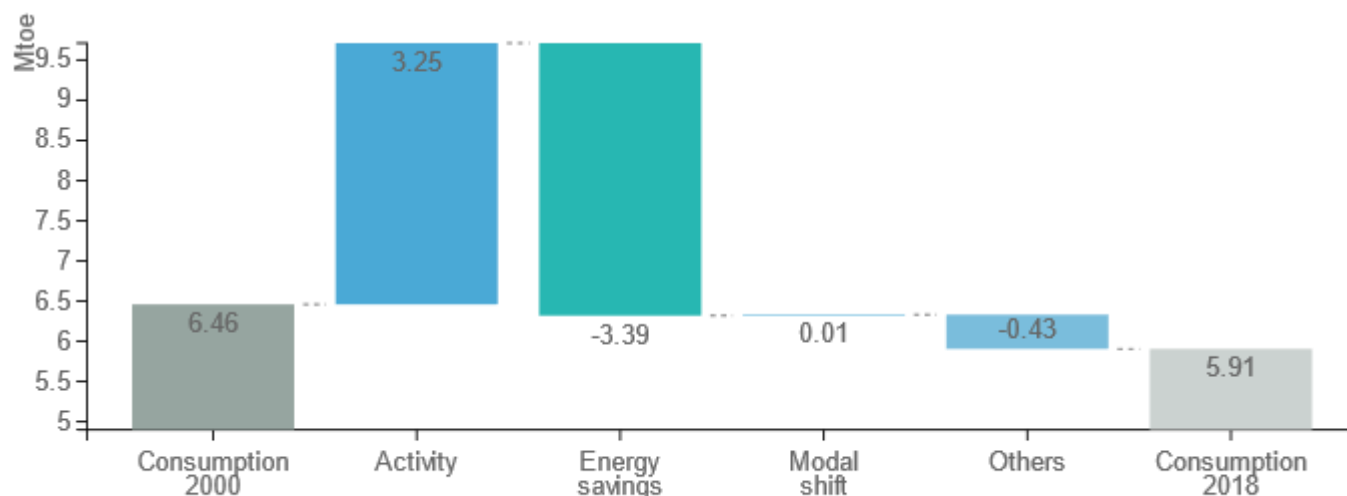


Source: ODYSSEE



Greece's total final energy consumption for transport decreased by 9% from 2000 to 2018. The increasing activity (by 30% for passenger traffic, from 89 Gpkm in 2000 to 128 Gpkm in 2018), contributed to an increase of 3.25 Mtoe, while the energy savings from the implementation of energy efficiency improvement measures contributed to the decrease of transport sector final energy consumption by 3.4 Mtoe (Figure 10).

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



Source: ODYSSEE

The 4th NEEAP of Greece, published in 2017, provides a comprehensive overview of the progress made towards the EU 2020 targets and gives the measures implemented in transport sector. The development of energy efficiency improvement mechanisms, such as transport infrastructure projects and resharing of public transport system, as well as the establishment of regulations such as introduction of eco-driving in the training material for getting a driving licence and the linking of vehicle taxation to energy efficiency and CO2 emissions, led to the achievement of energy saving (Figure 10).

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

Measures	Description	Expected savings	More information available
Linking of vehicle taxation to energy efficiency and CO2 emissions	Regulation		
Transport infrastructure projects	Energy efficiency improvement mechanism		

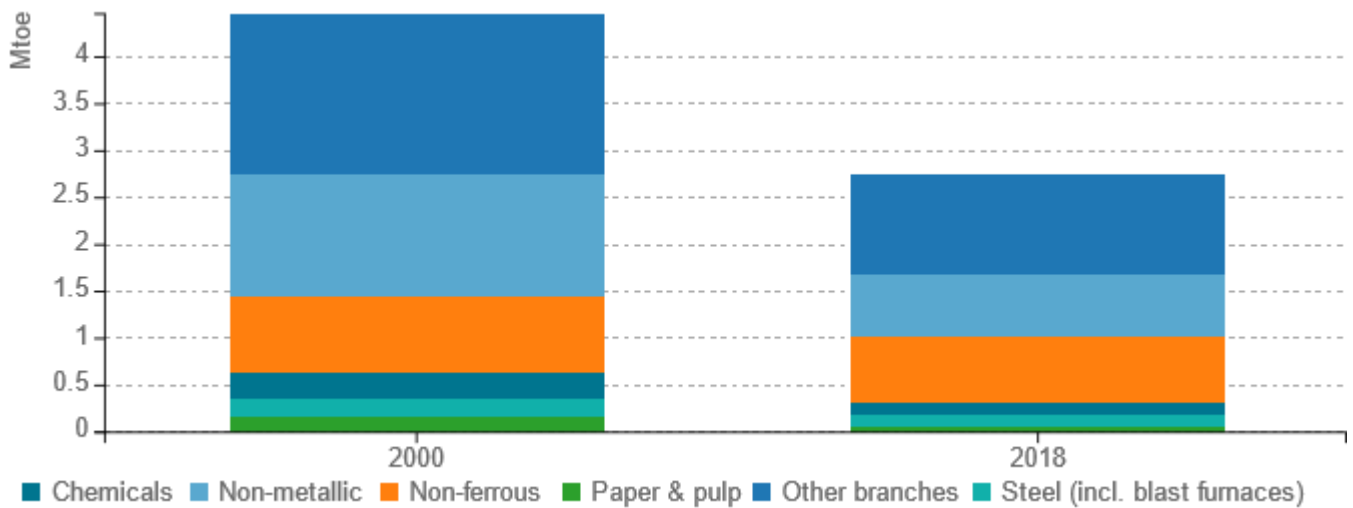
Source: MURE



Industry

The overall industrial energy consumption decreased by 37% between 2000 and 2018. All sectors had a high decrease except non-ferrous metals that showed a small decrease of almost 13%. The industry sector was the main sector which sustained the effects of the economic recession in Greece.

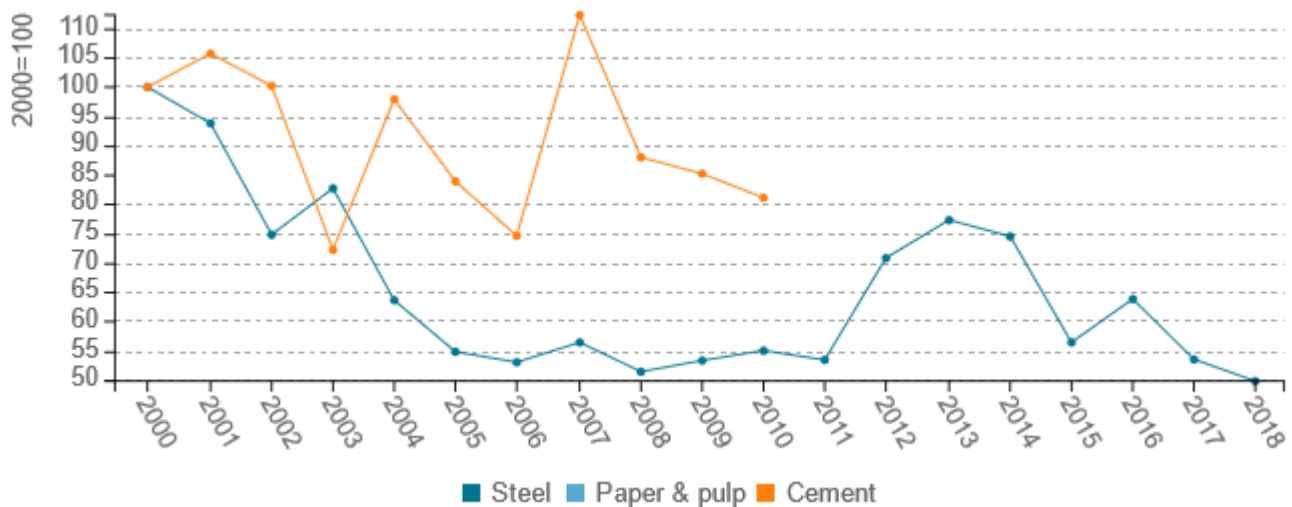
Figure 11: Final energy consumption of industry by branch



Source: ODYSSEE

Specific consumption of steel and paper show a strong decreasing trend in the period from 2000 to 2018. In 2018, unit consumption for paper production and steel was 73% and 50% lower in 2018 than in 2000, respectively (Figure 12).

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



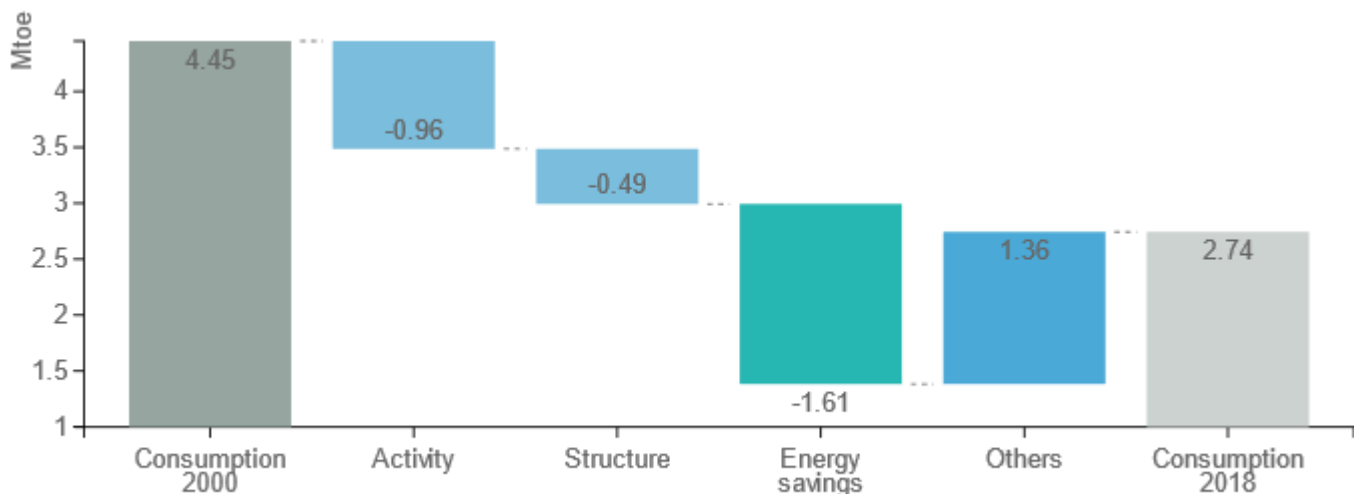
Source: ODYSSEE





Greece's total final energy consumption for industry decreased by 38% from 2000 to 2018. Main drivers for this decrease are energy savings, reduced activity and structural changes. The majority of energy reduction is due to the energy savings resulting from the implementation of energy efficiency improvement measures, which contributed to decrease the final energy consumption of industry sector by 1.61 Mtoe (36% reduction -Figure 13). The reduced activity and structural changes have also contributed to reduce the industry's final consumption by 0.96 and 0.49 Mtoe, respectively. "Others" correspond mainly to the "negative" savings due to inefficient operations in industry during the recession.

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



Source: ODYSSEE

The 4th NEEAP of Greece, published in 2017, gives the measures implemented in industry sector. The grant of business loans with favourable terms under the project "Innovative Entrepreneurship, Supply Chain, Food, Drinks" as well as other Financial incentives, such as incentives for relocation of enterprises, led to the achievement of energy saving (Table 4).

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

Measures	Description	Expected savings, impact evaluation	More information available
Innovative Entrepreneurship, Supply Chain, Food, Drinks	Business loans with favourable terms		
Relocation of enterprises to industrial-business zones and business parks	Financial incentives		

Source: MURE

