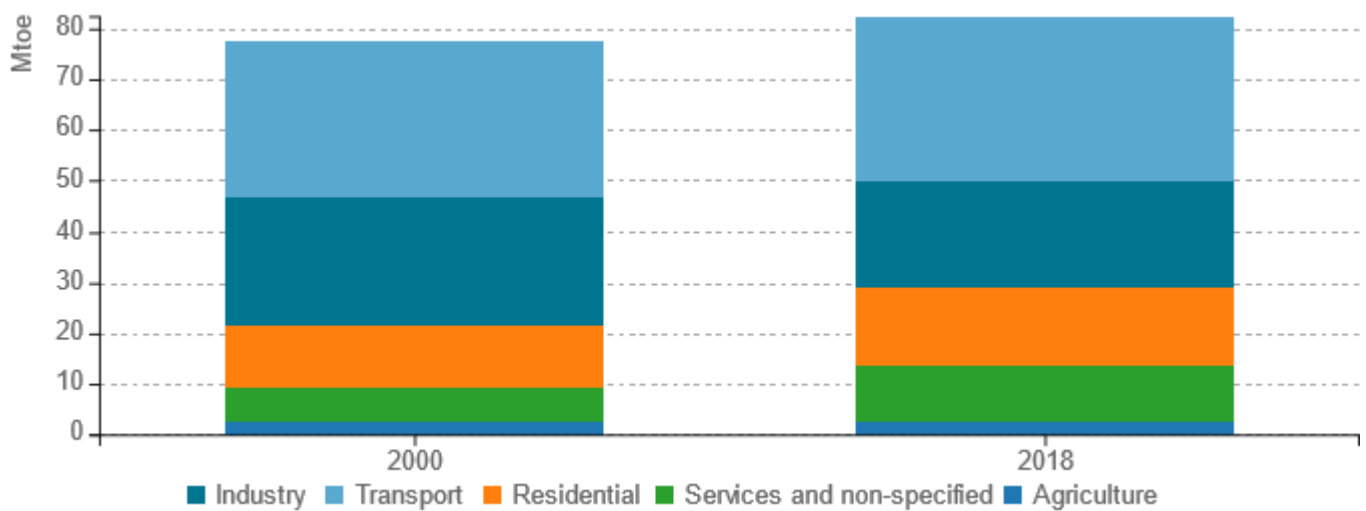


# Energy efficiency trends and policies

## Overview

In 2018, the final energy consumption in Spain, excluding non-energy uses, amounted to 82.1 Mtoe, 1.4% higher than the consumption in 2017. Transport is the most consuming sector with a 39.5% share of consumption. The buildings -residential and services- sector accounts for 31.4% of consumption, 58.1% of which corresponds to housing. Industry makes up 25.4% of demand, showing a continuous decline both in terms of energy demand and GDP contribution in line with the expansion of the services sector in the economy.

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

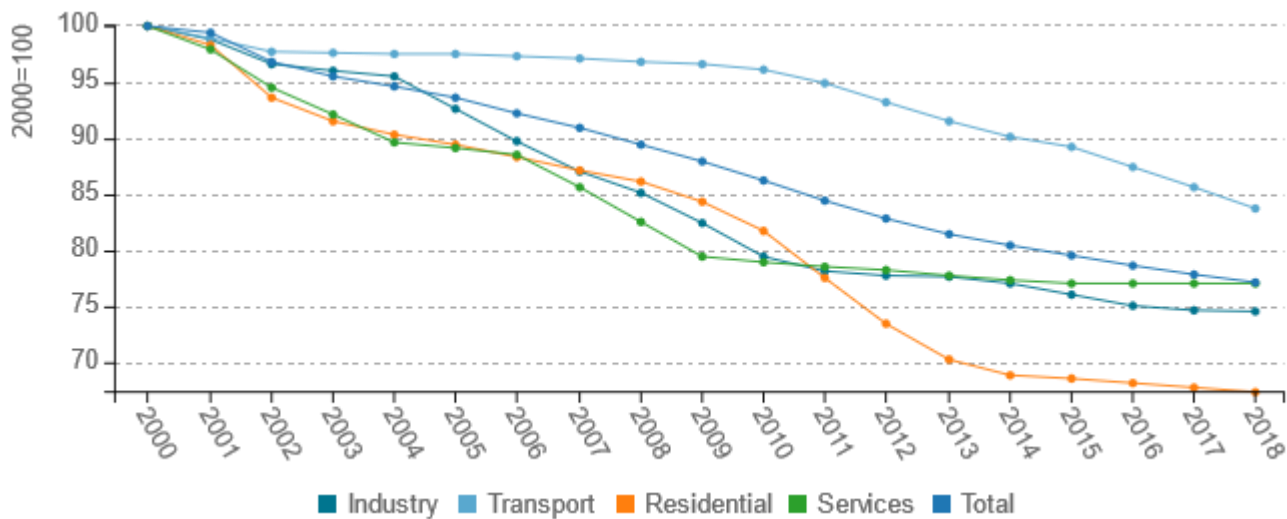


Source: ODYSSEE



According to the ODEX index, the global energy efficiency shows a progress of 1.4%/year (cumulatively 23.0%) throughout the 2000-2018 period. The residential sector presents the greatest advance (+2.2%/year), induced by technological and legislative developments in building and equipment, as well as efficiency measures such as the rehabilitation of existing dwellings. The industry follows with an improvement of 1.6%/year, most of which happened before the crisis. The least progress (+1.0%/year) is registered in transport, behind the services sector (+1.4%/year), due to the crisis impact on freight transport. However, since 2014 this sector shows the greatest progress (+1.8%/year), above the residential sector (+0.5%/year).

**Figure 2: Technical Energy Efficiency Index**



Source: ODYSSEE

The National Integrated Energy and Climate Plan 2021-2030 (PNIEC in Spanish) sent on March 31, 2020 to the EC in its current version (\*), is a planning instrument which is consequence of the provisions of the Regulation (EU) 2018/1999 on Energy and Climate Governance. Its objectives and measures in the area of energy efficiency are in accordance with the National Energy Efficiency Action Plan 2017-2020 to which gives continuity. It assumes an efficiency improvement objective of 39.5% in 2030, equivalent to a primary energy consumption (Art.3, EED) of 98.5 Mtoe (non-energy uses excluded). Likewise, it establishes a binding objective of accumulated final energy savings of 36.8 Mtoe between 2021 and 2030 (Art.7, EED). The latter should be achieved through the implementation of alternative measures in combination with a system of energy efficiency obligations on energy trading companies, which must make an annual financial contribution to the National Energy Efficiency Fund (FNEE). This Fund together with the obligations system will be maintained during the period 2021-2030 (Royal Decree-Law 23/2020). As a novelty, the creation of a system of energy saving certificates is foreseen. This Plan presents 17 energy efficiency measures, of which 10 have been designed under a sectoral approach in order to comply with the savings obligation (Art.7, EED). These measures are subdivided into instruments, some already known (electrification of transport, housing rehabilitation) and others new to be implemented such as green tax reform and the new Climate Change and Energy Transition Law, etc. (\*) According to the EC's assessment, the Spanish PNIEC constitutes a solid basis for designing the climate and energy aspects of the new government-driven Recovery Plan to reactivate the Spanish economy in the post-COVID-19 context.



**Table 1: Sample of cross-cutting measures**

Measures	NEEAP measures	Description	Expected savings, impact evaluation	More information available
The National Energy Efficiency Fund (FNEE)	yes	The National Energy Efficiency Fund (FNEE), assigned to the Ministry for the Ecological Transition and the Demographic challenge (MIETRD) through the State Secretary for Energy, has as its purpose the financing of economic and technical assistance, training, information or other measures in order to increase energy efficiency in the different energy consuming sectors, in a way they contribute to achieve the national energy saving objective established by article 7 of Directive 2012/27/EU.	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/375">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/375</a>
Aids Programme to singular projects for local entities promoting the transition to a low-carbon economy (DUS EELL Programme)	yes	This programme is intended to foster projects carried out by municipalities (or groups of municipalities) with less than 20,000 inhabitants that belong to the same autonomous region or city. These projects will have to reduce CO2 emissions through actions in accordance with the specific targets of specific objectives 431 (improvements in building efficiency, infrastructure and public services), 451 (sustainable urban mobility) and 432 (use of renewable energy sources for electricity production and thermal uses in public buildings and infrastructure) from ERDF Funds – 2014-2020 ERDF Multi-regional Operational Programme (MROP). electricity production and thermal uses in public buildings and infrastructure). For this purpose, it is endowed with a budget of € 987.12 M,	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/379">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/379</a>
Law 15/2012, of 27th December, on tax measures for energy sustainability	yes	This law, which has been in force since 1st January 2013, permanently established tax measures intended to send energy end-users an appropriate price signal in order to promote the rational and efficient use thereof, in line with the basic principles that govern the fiscal, energy and environmental policy of the European Union and with the ultimate goal of acting as a stimulus to improve energy efficiency levels.	Medium	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/376">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/376</a>

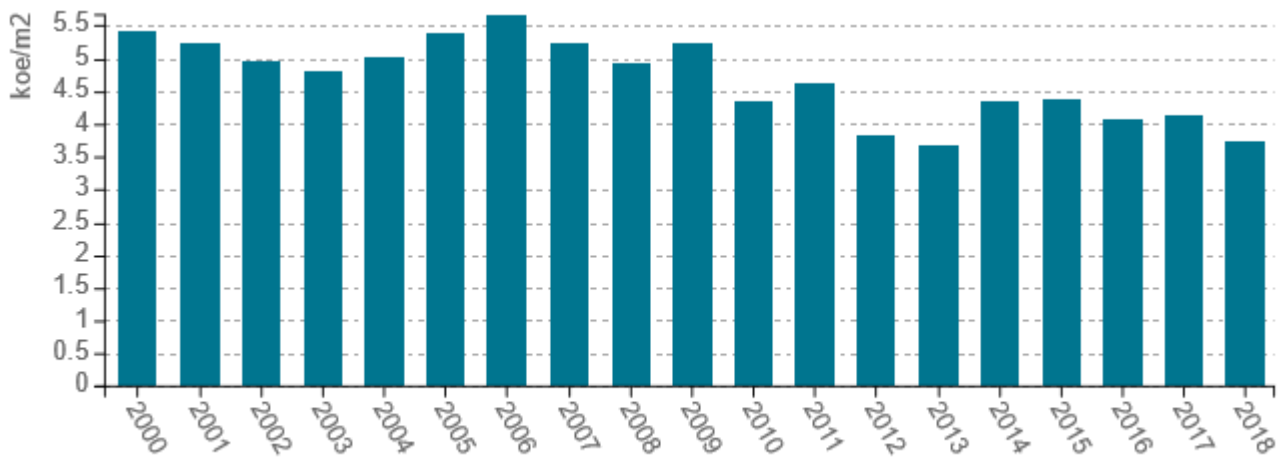
Source: MURE



**Buildings**

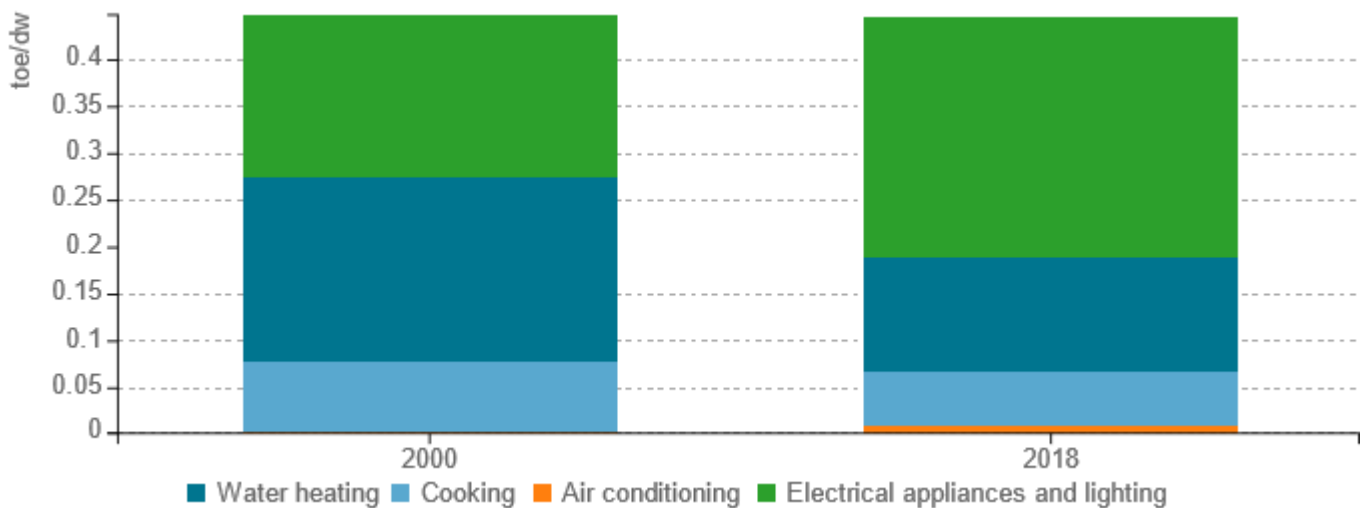
69.4% of the energy demand of buildings in 2018 was concentrated in heating (42.7%) and electrical equipment (26.7%). Hot water, kitchen and lighting, respectively, accounted for 15.1%, 7.3% and 5.1% of consumption, while air conditioning barely exceeded 1%. In the 2000-2018 period, the consumption of buildings has increased by 1.8%/year, driven by electricity demand (+3.1%/year). Since 2000, the consumption associated with household electrical equipment and lighting has increased by 4.2%/year, increasing its share in demand by 13 percentage points. Heating consumption has grown at a slower pace (+0.1%/year), losing 9 percentage points of weight in the energy demand. The consumption related to other uses has remained stable except for refrigeration (+9%/year). The unit heating consumption in general tends to decrease due to efficiency improvements in heating equipment.

*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)*

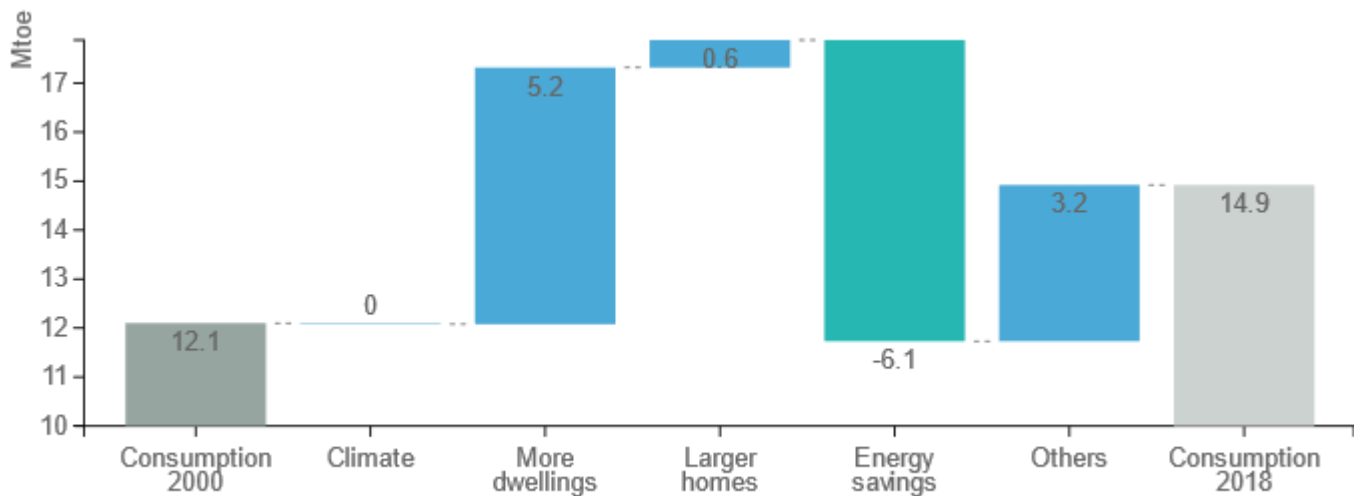


Source: ODYSSEE



Throughout the 2000-2018 period, the energy consumption in the residential sector has increased by 2.8 Mtoe, due to the increase in the number of owner-occupied dwellings (+5.2 Mtoe), especially before the crisis, as well as the increase in comfort (+3.8 Mtoe), associated with the household equipment ownership and a certain shift towards larger homes. These contributions have been partly offset thanks to efficiency improvements in equipment and buildings (-6.1 Mtoe).

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

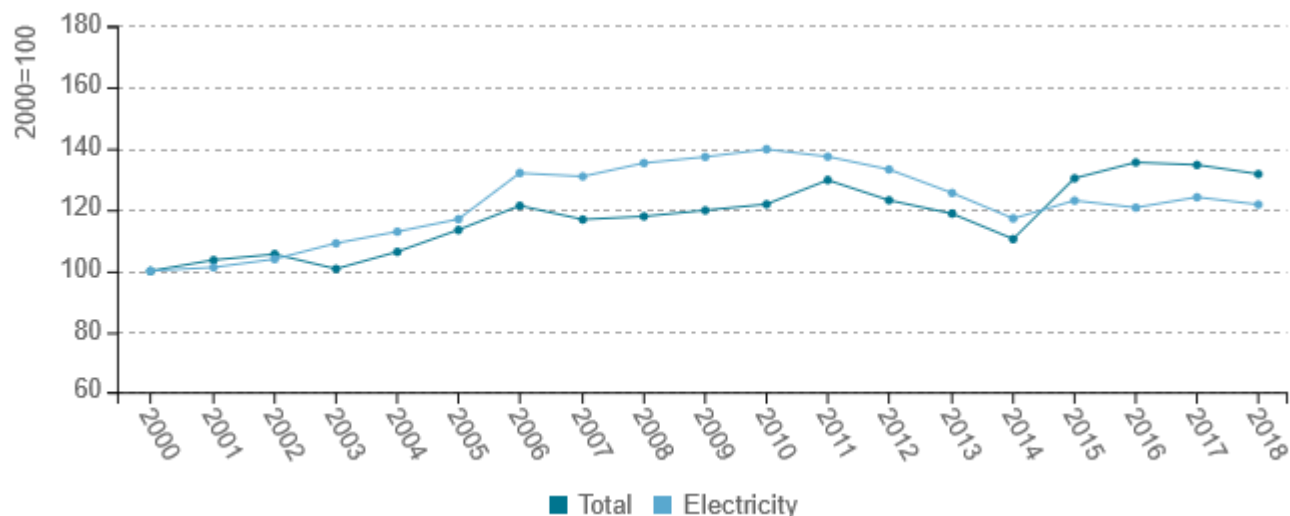


Source: ODYSSEE

Between 2000 and 2010, the unit electricity consumption in the services sector per m2 area grew (+3.4%/year) above the total (+2.0%/year). Subsequently, the divergence between both indicators decreases, under the impact of the crisis during which unit electricity consumption tended to decrease even more. In the context of economic recovery, since 2015 both indicators have tended to stabilize: unit electricity consumption (-0.3%/year) and total (+0.3%/year). The lower growth in electricity demand may be due to improvements in efficiency in lighting and electrical equipment used mainly in the most consuming sectors (offices, trade and hostelry), together with energy management systems, to which could be added the electricity prices effect.



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



Source: ODYSSEE

In the buildings sector, the actions implemented follow EU guidelines, in particular the Directives on Energy Efficiency (EED) and Buildings (EPBD), revised in 2018 in the frame of the “Winter Package”. Regarding this last directive, in recent years there have been advances towards its transposition through different regulatory provisions that increase the requirements of the Technical Building Code (Royal Decree 732/2019), the Regulation on Building Thermal Installations (Royal Decree 238/2013) and the Energy Certification of buildings (Royal Decree 235/2013), the latter two currently under revision process. Regarding the first directive, there are measures in accordance with articles 4, 5, 6 and 7. Among these measures, the recently revised Long-term Strategy for Energy Retrofitting in the Building Sector (ERESEE 2020), the energy renovation of public buildings, the Law 15/2014 on the rationalization of the Public Sector, the Green Public Procurement Plan (PCPE), 2018-2025 as well as economic support measures (PAREER and PREE Programs and the State Housing Plan) stand out.

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

Measures	Description	Expected savings, impact evaluation	More information available
Aid Program for energy rehabilitation actions in existing buildings (PREE)	Program, coordinated by IDAE, responsible for monitoring the aids, managed by the Autonomous Communities, direct beneficiaries of these aids for their distribution among the ultimate recipients of them, through the publication of the corresponding calls in their respective territories. The program, regulated by Royal Decree 737/2020, aims to boost the sustainability of the existing building through actions on the thermal envelope, thermal and lighting installations, giving continuity to the preceding Programs, PAREER-CRECE and PAREER II. It is endowed with a budget of €300M.	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4256">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4256</a>

<p>Ecological Public Procurement Plan of the General State Administration (2018-2025)</p>	<p>This Plan has among its objectives the promotion of the acquisition by the public administration of goods, works and services with the least possible environmental impact, the incorporation of environmental clauses in public procurement, as well as serving as an instrument to promote the Spanish Circular Economy Strategy. The Plan includes criteria for green public procurement, of a voluntary nature, for a set of 20 products, works and services considered priority.</p>	<p>Medium</p>	<p><a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4099">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4099</a></p>
<p>2018-2021 State Housing Plan</p>	<p>The goals of this plan include urban and rural renovation and regeneration. The Plan is structured in nine programmes, among which the “Programme to foster improvements in energy efficiency and sustainability in housing” stands out. This programme is intended to fund works to improve energy efficiency and sustainability, paying special attention to the building envelope of collective residential buildings and single-family houses. The programme considers a number of actions eligible for support. With regard to actions concerning the thermal envelope of buildings, heating, air conditioning, hot water facilities and renewable energy devices, a reduction in yearly energy demand in heating and air conditioning in buildings, referred to energy certificates, must be achieved. This requirement ranges from 20 to 35% based on different climatic areas.</p>	<p>Medium</p>	<p><a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/3942">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/3942</a></p>

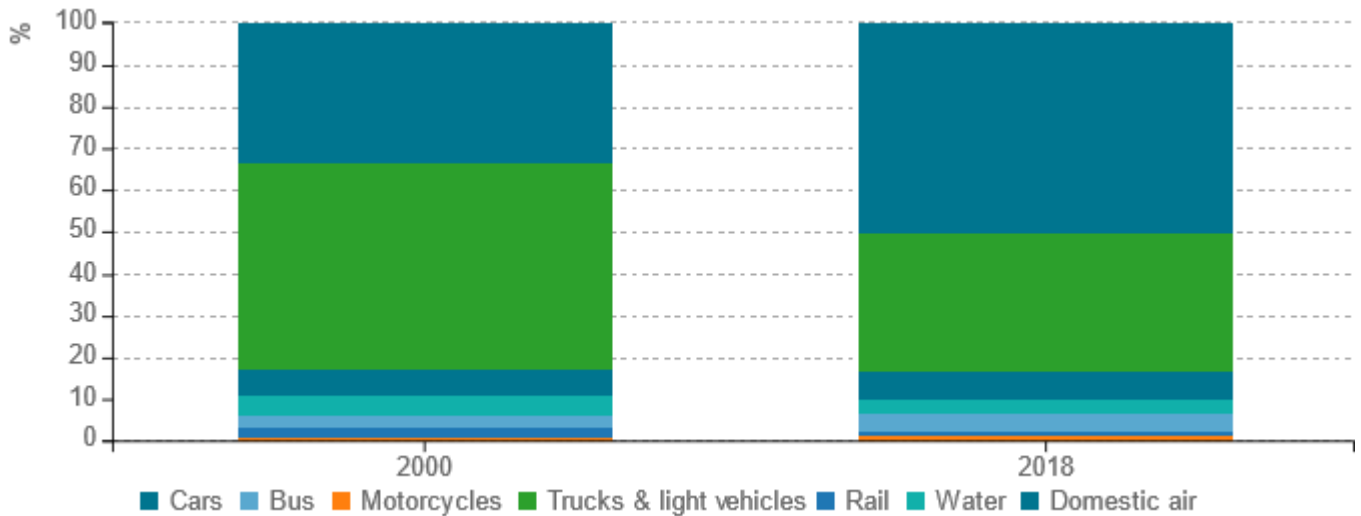
Source: MURE

## Transport

The energy consumption distribution of transport in 2018 continues to be dominated by road (88.3%), whose representativeness has been increased since 2000. National air transport has also slightly increased its share (6.6%). Sea transport (inland) and rail have lost weight, with jointly 4.3% of consumption. Cars make up 50.2% of transport consumption while freight transport (trucks and vans) 33.4%.



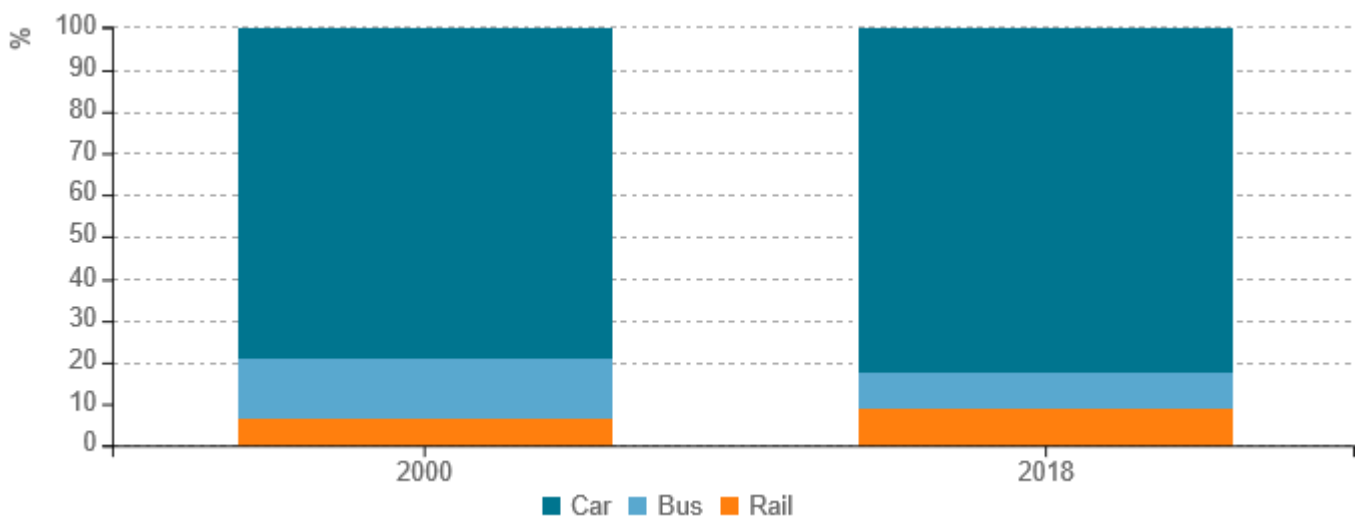
Figure 7: Transport energy consumption by mode



Source: ODYSSEE

The traffic of passengers accounts for 63.1% of consumption in transport. In the 2000-2018 period, the passenger traffic has barely changed (+0.5%/year) due to the crisis impact. With the economic recovery, mobility has reactivated since 2014 (+2.3%/year). In 2018, public transport represents 17.8% of passenger traffic (8.9% buses and 8.8% rail) in contrast to private vehicles (82.2%) whose share has increased 3.3 percentage points since 2000. Rail passenger traffic has improved by 2.0%/year since 2000 (+3.2%/year since 2014). The buses do not present an appreciable change, although a methodological change must be taken into account that affects the accounting of bus and public transport traffic since 2017.

Figure 8: Modal split of inland passenger traffic



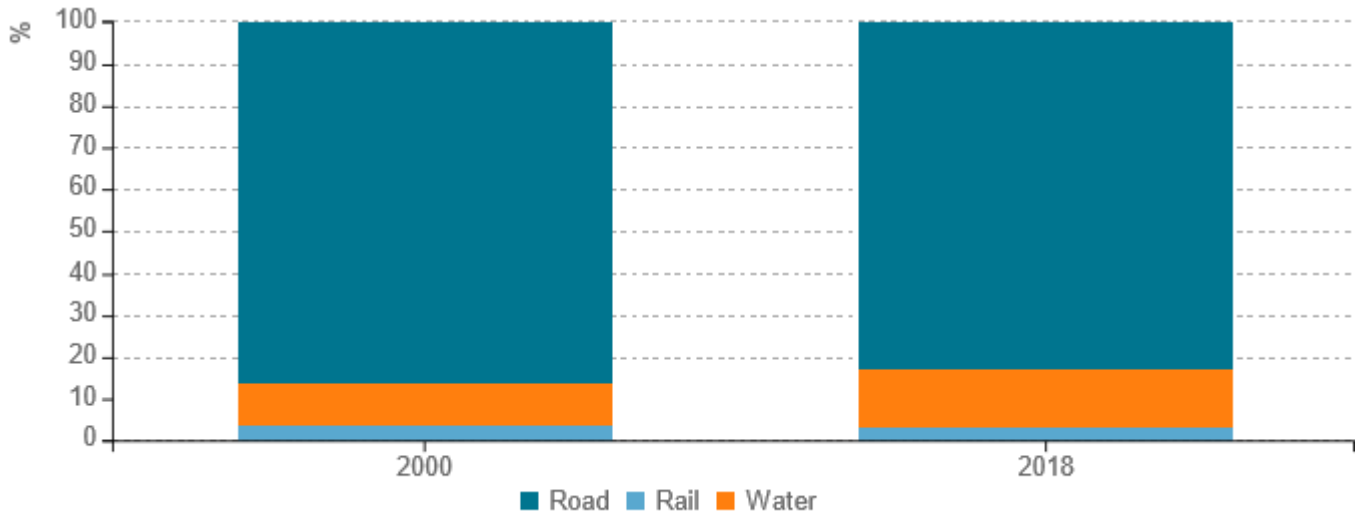
Source: ODYSSEE





The road represents 83.0% of freight traffic in 2018, 3 percentage points less than in 2000. This difference has been practically gained by the sea transport with 13.8% of total traffic. Rail freight transport (3.1%) has lost representation. Following the stagnation of the crisis, freight traffic has increased by 4.4%/year since 2014. This recovery can be seen in all modes, especially sea (+ 4.7%/year) and road (+4.5%/year).

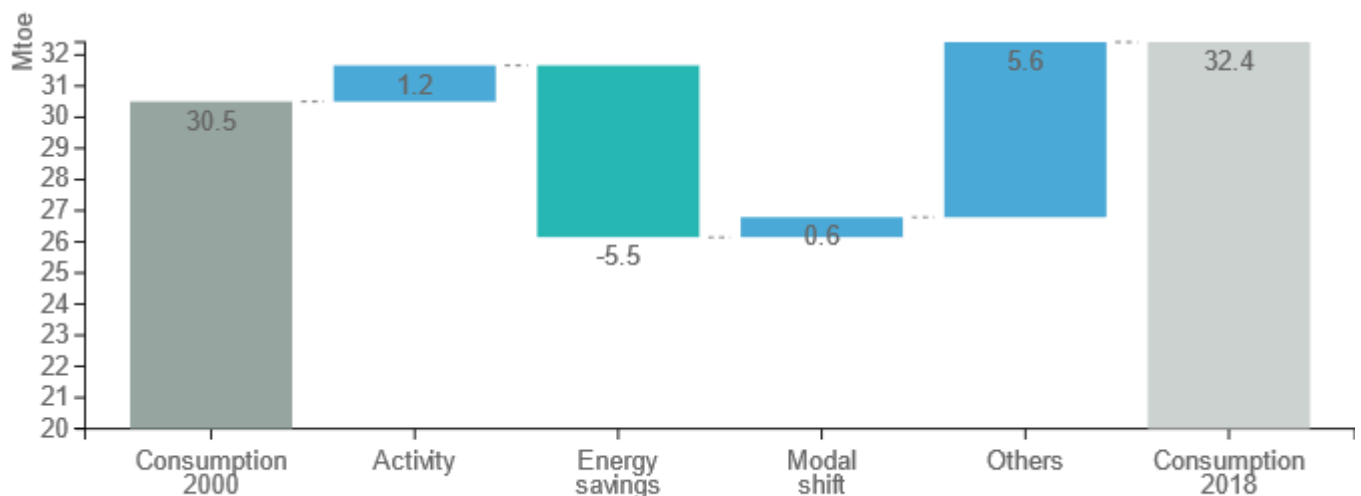
**Figure 9: Modal split of inland freight traffic**



Source: ODYSSEE

The energy consumption in transport has increased by 1.9 Mtoe in the 2000-2018 period. This is explained due to the effect associated with the behaviour and use of vehicles (+5.6 Mtoe), and to a lesser extent by activity (+1.2 Mtoe) and the negative contribution of the modal change with little participation of the most efficient transport modes (+0.6 Mtoe). These effects have been partially offset by efficiency improvements (-5.5 Mtoe) associated with technological developments in engines and vehicle designs.

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



Source: ODYSSEE



Energy efficiency measures in the transport sector fall into three typologies: improvements in the vehicle fleet efficiency through the renewal of fleets, the promotion of modal shift and an efficient use of the means of transport. Within the first two categories the Programs for purchasing vehicles (MOVES, MOVES Singulares, etc.) and the Plan for Infrastructure, Transport and Housing 2012-2024 (PITVI), stand out, respectively. Regarding the third category, the training system for getting the driving license for private and industrial vehicles includes driving techniques since 2014. Moreover, the use of clean vehicles is promoted through a registration tax based on CO2 emissions and the classification of vehicles based on their polluting potential. In the framework of the PNIEC, the transport sector stands out, with four measures, and greater contribution to the savings objective (Art. 7 EED). It is committed to the modal change, the reduction of traffic, the use of collective public transport, sustainable mobility and the electrification of transport.

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

Measures	Description	Expected savings, impact evaluation	More information available
Efficient and Sustainable Mobility Incentives Programme (MOVES Programme)	The MOVES Programme, endowed with a budget of € 45 M, is intended to promote actions to support mobility based on the criteria of energy efficiency, sustainability and the promotion of alternative energy sources, including the provision of charging facilities for electric vehicles. Purchases of alternative energy vehicles are eligible for subsidies provided that an M1 vehicle that is over 10 years old or an N1 vehicle that is over 7 years old is scrapped to purchase new M1 or N1 vehicles; likewise, the implementation of electric vehicle charging infrastructure, electric bicycle rental systems and measures on workplace transportation plans are eligible for subsidies.	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/3903">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/3903</a>
Aid program for singular projects in the field of sustainable mobility (MOVES Singular Projects Program)	The MOVES Singular Projects Program, endowed with €15M, is aimed at selecting and granting aid to singular comprehensive mobility management projects located in World Heritage cities, municipalities with a high pollution index or projects located on islands, and innovative projects, involving electric vehicles. The projects to be encouraged must have a minimum investment of €100,000.	Medium	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/3918">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/3918</a>

<p>Infrastructure, Transport and Housing Plan (PITVI) 2012-2024</p>	<p>The PITVI Plan proposes a new framework for strategic planning of transport infrastructures. The PITVI has, among its objectives, to promote the use of the railway in the transport of passengers (contribution of the commuter rail networks in large urban centers) and of goods. Likewise, it promotes new innovative technological developments regarding the management of transport systems. 90% of the investments foreseen by the PITVI (€ 138,255) will be allocated to infrastructure and transport actions, prioritizing the railway mode, with 44% of the investment resources, mainly aimed at promoting rail freight transport and the completion of large high-speed rail axes</p>	<p>Medium</p>	<p><a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4098">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4098</a></p>
<p>Classification and labelling of passenger cars and vans based on their polluting potential</p>	<p>Through Ruling 15/V-110 of April 7, 2015, the "zero emissions" tag that will be applied to electric battery vehicles (EBV), extended range electric vehicles (REEV) and plug-in hybrids (PHEV) with a minimum range of 40km in electric mode, fuel cell (FCEV) or hydrogen (HICEV) vehicles, was presented. The Directorate-General of Traffic has approved the "zero", "ECO", "C" and "B" tags, which classify 50% of the fleet based on its polluting potential, through its Resolution of April 13, 2016.</p>	<p>High</p>	<p><a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/2459">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/2459</a></p>

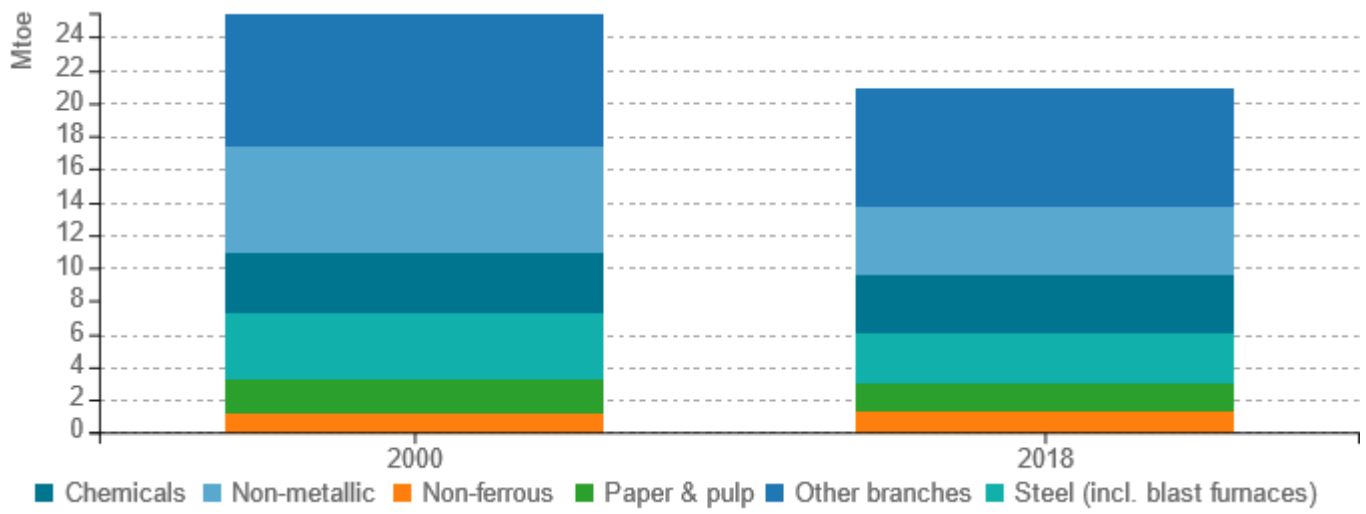
Source: MURE



**Industry**

The energy consumption of the industry in 2018 is 18% lower than in 2000. After a drop in consumption superior to 4%/year along this period marked by the crisis, the consumption has tended to increase (+3.1%/year) since 2015 under the impulse of the economic reactivation. 76.9% of the consumption is concentrated in five branches – metallurgy (20.4%), non-metallic minerals (19.8%), chemistry (16.9%), food (11.4%) and pulp and paper (8.4%) - which determine the intensive nature of the industry.

*Figure 11: Final energy consumption of industry by branch*

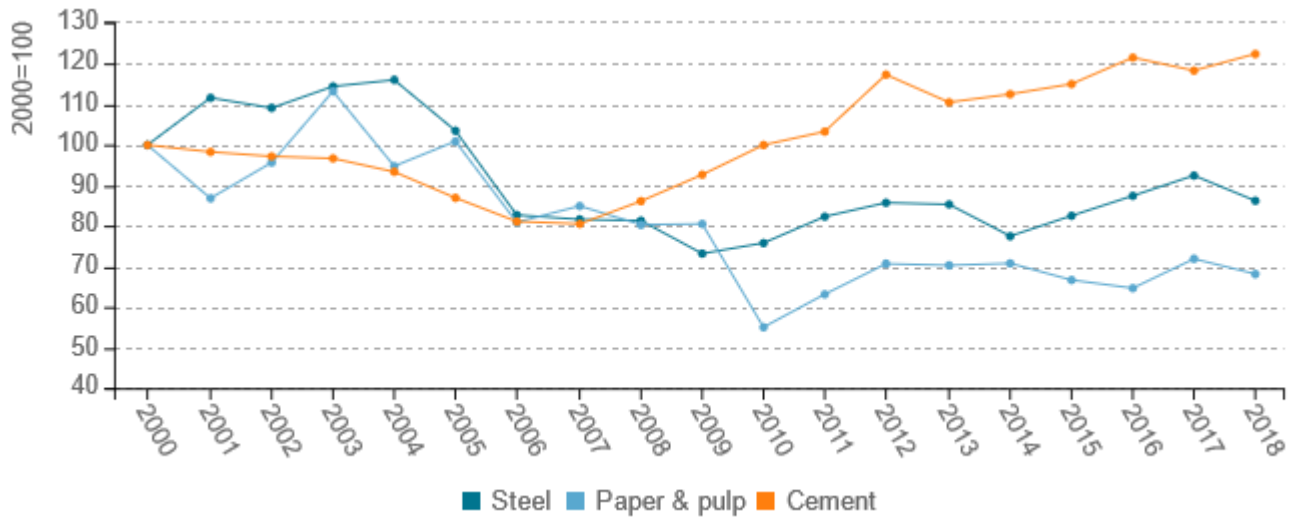


Source: ODYSSEE

The 2008-2012 period represents a break in the improvement trend of the unit consumptions of steel and especially cement, with respective worsening of 1.3%/year and 8.0%/year due to the crisis impact on the performance of equipment and processes. Subsequently, although the indicators have not recovered the previous trend, they do show a slowdown in their increases, between 0.1%/year (cement) and 0.7%/year (steel). This is associated with a better use of productive capacities by increasing activity with the economic recovery. The paper industry shows a downward trend since 2003 (-3.8%/year), which could be related to high recycling rates, variations in pulp production and efficiency improvements.



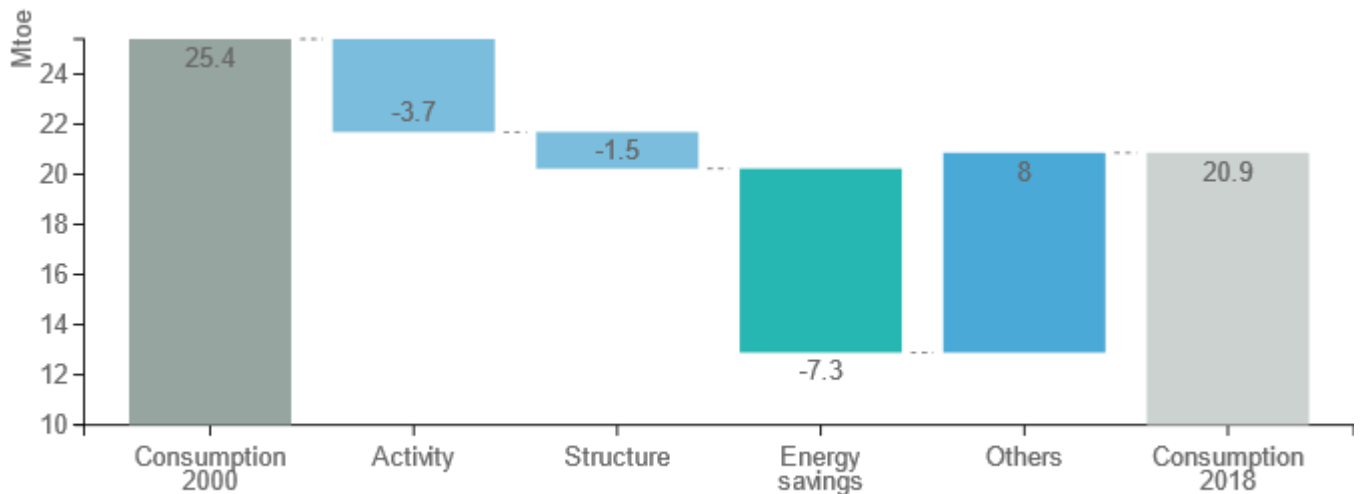
Figure 12: Unit consumption of energy-intensive products (toe/t)



Source: ODYSSEE

Between 2000 and 2018, the energy consumption of the industry has decreased by 4.5 Mtoe, mainly due to efficiency improvements (-7.3 Mtoe) and the fall in activity (-3.7 Mtoe) reinforced during the crisis and to a lesser extent to structural changes towards less intensive branches (-1.5 Mtoe). These effects have been partially counterbalanced by operational inefficiencies (+8.0 Mtoe) that occurred mainly under the crisis impact.

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



Source: ODYSSEE



The measures to improve energy efficiency in the industrial sector, generally framed in the different efficiency plans, are aimed at promoting investments in efficiency improvement projects and conducting energy audits. Likewise, within the framework of the public policy to promote competitiveness, there are efficiency actions through financial support for industrial investment. The current measures include, among others, the aid program for SMEs and large companies, the obligation to carry out energy audits in large industrial companies and the aid program for R+D+i projects in the manufacturing industry, where sustainability, efficiency and decarbonization are prioritized.

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

Measures	Description	Expected savings, impact evaluation	More information available
Aids program for SME and Large Companies in the Industrial sector	This program, which was endowed with a budget of €591 M, is intended to fund actions in the following categories: improvements in technology equipment and industrial processes, and the implementation of energy management systems.	High	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1352">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1352</a>
Energy audits and management systems	Pursuant to Royal Decree 56/2016, of 12 February, whereby article 8 of the Energy Efficiency Directive is transposed, large industrial companies (or groups of companies that comply with certain requirements) are bound to carry out energy audits. These audits must be held every 4 years and must cover at least 85% of final energy use of facilities located in Spain and that are part of the activities managed by the companies and groups in question.	Medium	<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1353">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1353</a>
Aid Program for R+D+i projects in the manufacturing industry	Calls for grants (loans) from the Ministry of Industry, Commerce and Tourism approved in 2019 and 2020 for carrying out R+D+i projects in the manufacturing industry for a total accumulated amount of €115M. These grants are aimed at projects related to sustainability, circular economy, decarbonisation and energy efficiency, among other thematic priorities. With regard to energy efficiency and decarbonization, projects should be oriented, among other purposes, to the implementation and use of more efficient technologies and production processes, raw materials with lower environmental impact, technologies for decarbonization or energy storage.		<a href="https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4257">https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4257</a>

Source: MURE

