Energy efficiency Trends and Policies in Spain (2000-2022)

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0 Executive summary

This report analyses the situation in Spain within the project ODYSSEE-MURE - *Monitoring the Energy Efficiency Pillar for Climate Neutrality* - (LIFE21-CET-POLICY-OdysseeMure fit-4-55), which allows to assess the progress of energy efficiency in the EU countries, Switzerland and the Energy Community countries[1] through the study of trends and policies at macro and sectoral level.

Energy efficiency occupies a prominent role in the energy planning in Spain, given its strategic importance in the transition towards a more competitive and sustainable economy, being one of the priorities of the National Integrated Energy and Climate Plan (NECP, known in Spanish as PNIEC), the main national strategic orientation tool in this field. Over the last few years, Spain has made a significant effort to improve its energy efficiency, as shown in the different chapters of this report.

- **Chapter 1:** Presents the economic and energy context in Spain, highlighting the main plans and tools that form part of the strategic energy and climate framework, with special attention to the energy efficiency dimension of the PNIEC in its recent update, approved by Royal Decree 986/2024 of 24 September.

- **Chapter 2:** Analyses trends in energy consumption and efficiency at the macro level, as well as the main factors determining their evolution. This chapter is completed with an assessment of the savings achieved because of energy efficiency improvements and a comparison of the global positioning at European level.

- **Chapter 3:** Addresses the sectoral analysis of energy efficiency trends and the main factors explaining their evolution. It also presents an overview of the main energy efficiency policies and measures implemented, considering their contribution to the sectoral objectives of the new PNIEC, and thus to the fulfilment of the national target set out in Art. 8 of the recently revised Energy Efficiency Directive (Directive (EU) 2023/1791).

- **Chapter 4:** Briefly describes the main policies and measures considered in Spain to tackle energy poverty, highlighting the importance of the National Strategy against Energy Poverty, 2019-2024 (ENPE), currently under revision. It also highlights the role of energy efficiency measures, mainly channelled through energy rehabilitation programmes, due to their greater effectiveness in tackling this problem.

In recent decades, energy supply in Spain has moved towards greater diversification, with an increase in the share of renewable energies and natural gas to the detriment of oil and coal. This transformation has been accompanied by a reduction in consumption, especially since 2007, driven by improvements in energy efficiency, as well as structural changes. Despite the economic and energy crises, these trends have continued. In 2022, energy supply and final energy consumption have registered slight decreases of 0.3% and 0.9%, respectively, after the rebound experienced in 2021 in both cases in a context of post-COVID-2019 recovery. However, final energy consumption is still 2.2% higher than in 2000, while energy supply is 5% lower, highlighting the impact of greater energy efficiency and the evolution of the energy supply structure in Spain. Natural gas has played

[1] Bosnia-Herzegovina, Montenegro, Georgia, Ukraine, Northern Macedonia, Albania, Moldova, Kosovo and Serbia.

a key role in 2022 due to the energy crisis triggered by the Russian invasion of Ukraine, which has led to higher energy prices, especially for natural gas.

Energy dependence remains high (70.6%), due to the still high share of fossil fuels in total consumption, mainly linked to the demands of transport and industry, which account for 41.7% and 23.0% of total consumption, respectively. These sectors largely condition the evolution of final energy intensity, given their relevance in the structure of energy demand.

Energy intensities, both in terms of primary and final energy, have followed a downward trend, as has consumption, with cumulative reductions of 30.8% and 24.7%, respectively, over the period 2000-2022. The higher improvement in primary intensity reflects the positive effect of the diversification of the energy supply structure, leading to a higher efficiency of the transformation system over the period.

In general terms, it can be stated that energy saving and efficiency policies, together with technological advances, have played a key role in reducing energy consumption and energy intensity, as can be seen from different analyses based on the decomposition of variations in consumption and final energy intensity according to various explanatory factors.

A more precise analysis of efficiency, based on the ODEX index, shows an annual improvement of 1.4% between 2000 and 2022, with the residential sector leading the way thanks to improvements in buildings and equipment, followed by industry, transport and services. In terms of energy savings, industry and transport have made the greatest progress since 2000, although the residential sector has gained prominence in recent years.

Spain, in the new PNIEC, has revised upwards the final energy savings target, setting it at 53.5 Mtoe in the period 2021-2030 (Art. 8, DEE 2023/1791/EU), which is a challenge to be achieved through the implementation of a wide range of instruments and measures. The transport sector, due to its greater impact in energy and environmental terms, is the sector that contributes most to the savings target (37%), followed by industry (31%).

To advance in improving energy efficiency and achieving the committed objectives, numerous measures have been adopted in recent years, many of them in response to the requirements set by the applicable EU directives in this field. At the sectoral level, measures targeting the transport and building sectors are particularly noteworthy. A significant number of these measures can be found in the MURE database (http://www.measures-odyssee-mure.eu/)."

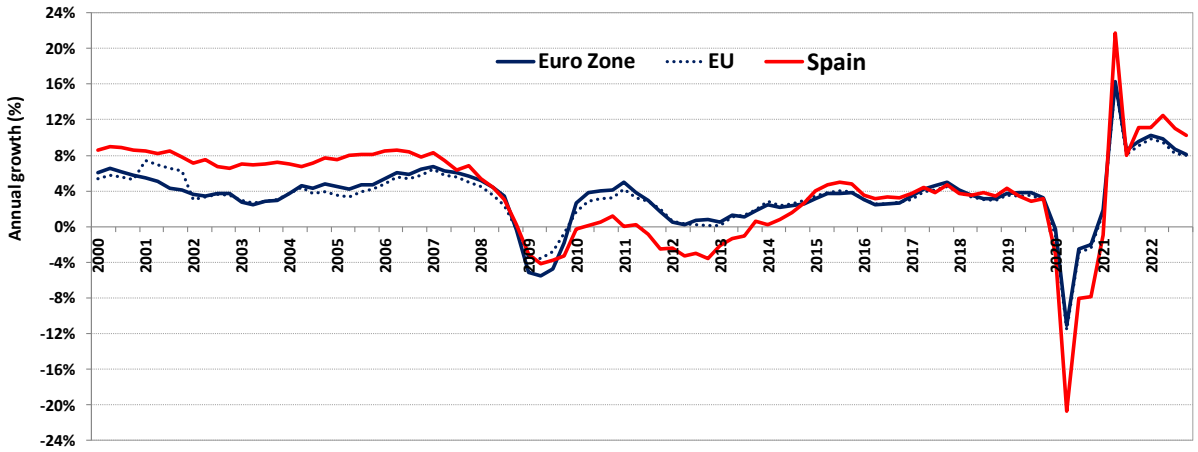
In the framework of the PNIEC, the Recovery, Transformation and Resilience Plan (PRTR) is expected to give a considerable boost to energy efficiency in the coming years. This Plan includes a major agenda of investments and structural reforms, with a strong focus on the green transition, accounting for 40% of the planned investments, which is a major stimulus for energy efficiency and sustainability.

1 Economic and policy context

1.1 Economic context

In 2022, the Spanish economy has consolidated its post-pandemic recovery, recording 5,8%[2] growth, which was similar to the previous year and close to pre-pandemic growth, outperforming Eurozone (+3.5%) and EU (+3.4%) averages (Figure 1). This evolution takes place in a context marked by the impact of inflation, compounded by the war in Ukraine, rising commodity prices and a tightening of monetary policies. The dynamism seen in 2022 can be explained by a combination of factors from both the domestic and foreign demand side, supported by the rollout of the Recovery, Transformation and Resilience Plan (PRTR).

Figure 1: GDP developments in Spain and the EMU



Source: Eurostat.

Note: GDP in current prices.

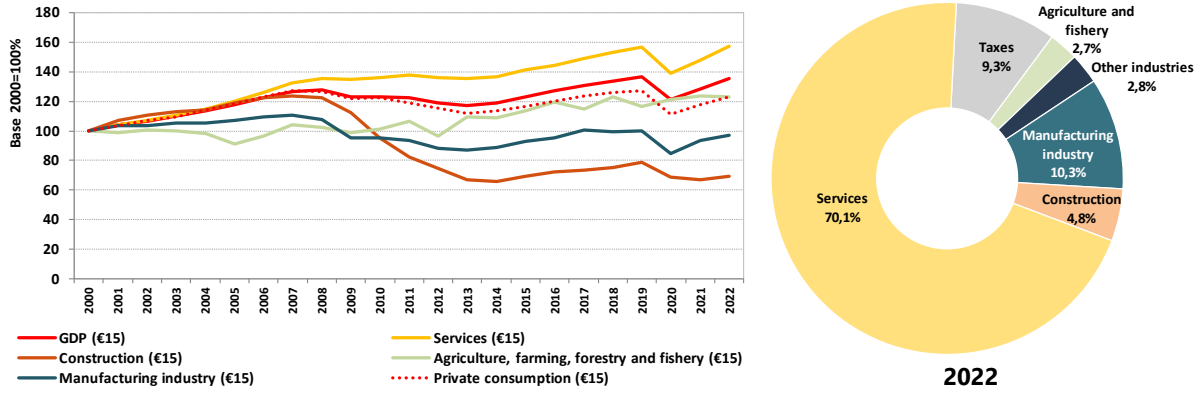
On the domestic demand side, private consumption has been one of the key drivers of the recovery, with 4.4% growth driven by improvements in the labour market and a rebound in household disposable income. The contribution of domestic demand to GDP has also been boosted by investment, notably investment associated with intellectual property products (+5.5%), capital goods (+4.1%) and construction (+4.7%), supported by a positive context of business expectations and financing conditions. However, economic uncertainty and geopolitical tensions have held back greater dynamism in business investment. Meanwhile, net external demand also has contributed to GDP growth, with an increase of 2.4% thanks to the strengthening of exported goods and services (+14.4%) over imports (+7.9%), led by services, especially tourism. The external sector has been key to maintaining the surplus despite higher energy prices.

On the supply side, the major branches of activity have continued their post-pandemic recovery, with the manufacturing industry and services sector particularly thriving. The manufacturing industry has seen its economic influence significantly reduced over the course of the 21st century, having been seriously affected by the economic situation in recent years, in addition to the bandwagon effect of construction. This sector reached its highest share in the economy in the years prior to the

[2] The economic data used in this report correspond to the update carried out by the INE on 18 September 2023, available in the ODYSSEE-MURE project database. The Statistical Revision of the Spanish National Accounts (RE-2024), published by the National Statistics Institute (INE) on 18 September 2024, has involved a revision of the 1995-2023 series, which represents a slight upward increase in GDP growth in 2022, from 5.8% to 6.2%. To ensure consistency with the project's database, it has been decided to maintain the values of the previous update, which have little impact on the analyses carried out in the report.

2008 crisis, then gradually lost influence. The declining share of these sectors in the Spanish economy, which is not unique to Spain, has its counterpart in the services sector, which already accounts for 70.1% of GDP in 2022 (Figure 2).

Figure 2: Evolution of GDP and sectoral contributions in Spain[3]



Source: INE/IDAE

In 2023, the Spanish economy has continued to grow, albeit at a more moderate pace. This slowdown, also observed across the European Union (EU) countries, is due to the ongoing geopolitical uncertainties mentioned above. Nevertheless, Spain's economic growth (+2.5%) has been higher than that of the Eurozone (+0.5%), supported by factors such as national demand, driven by household consumption, fostered by the dynamism of the labour market and public consumption, along with the contribution of net external demand, linked to tourism, and the positive effect of the PRTR.

1.2 General energy policy background

Spain has a **Strategic Energy and Climate Framework**, adopted on 22 February 2019 by the Council of Ministers, which is a key tool for achieving the goal of decarbonisation and a just transition towards a more sustainable, more competitive energy and economic model. This framework is aligned with the guidelines and requirements of the most important international and EU policies on energy and climate change, including the *Paris Agreement*, the *United Nations 2030 Agenda for Sustainable Development* and the '*Clean Energy for All Europeans*' Winter Package. The key components of this framework are: the Law 7/2021, of 20 May, on Climate Change and Energy Transition; the National Integrated Energy and Climate Plan, 2021-2030 (PNIEC); and the Just Transition Strategy.

The combined effect of these pillars guarantees that Spain has a stable strategic framework for the decarbonisation of the economy; a roadmap for the next decade, the 2021-2030 Plan, which defines targets for reducing greenhouse gas emissions, the penetration of renewable energy and energy efficiency; and a strategy of solidarity and just transition, to ensure fair and supportive treatment for the people and regions affected by the transition to a low-carbon economy.

This framework is completed by the Long-Term Decarbonisation Strategy, 2050 (ELP 2050), adopted by the Council of Ministers on 3 November 2020. This document sets out the development of the energy transition from the completion of the PNIEC in 2030 to climate neutrality in 2050, a scenario in which greenhouse gas (GHG) emissions are expected to drop by 90% compared to 1990.

Complementary to this are several strategic initiatives that enable the identification of challenges and opportunities in different sectors and technological areas, providing measures to drive the

[3] Throughout this report, economic figures are expressed in constant 2015 currency, unless otherwise stated.

energy transition. These include the Roadmaps for Self-consumption, Energy Storage, Renewable Hydrogen, Offshore Wind and Marine Power, Biogas, and the Sustainable Management of Mineral Raw Materials, as well as the *Electricity Transmission Grid Planning with a 2026 horizon*. The latter instrument is key to the development of the necessary electricity infrastructure, thereby ensuring a secure supply and driving the energy transition, so that by 2026 renewable energy will account for 67% of the national power generation mix. These instruments complete the structure of the Strategic Energy and Climate Framework.

Additionally, it is worth mentioning the National Strategy against Energy Poverty 2019-2024, (ENPE), adopted by the Council of Ministers on 5 April 2019, which incorporates different initiatives into the public policies to combat energy poverty and ensure access to energy for the most vulnerable groups.

This framework is reinforced by the Recovery, Transformation and Resilience Plan (PRTR), adopted by the Council of Ministers on 27 April 2021, to counter the impact of the pandemic on investment and economic activity through the use of Next Generation EU funding instruments. The PRTR includes a major agenda of investments and structural reforms that are interlinked and feed into each other to achieve four cross-cutting objectives: ecological transition, digital transition, social and territorial cohesion, and gender equality. About 40% of the planned investments will go towards the green transition. Of note in this respect is the Strategic Project for the Economic Recovery and Transformation of Renewable Energies, Hydrogen and Storage (PERTE-EHRA), which seeks to strengthen the areas associated with the energy transition where Spain is well positioned, such as renewable energy, power electronics, storage and renewable hydrogen, and to reinforce those with less presence.

2.2.1. Energy efficiency in the framework of the PNIEC

For **energy planning** purposes, the **National Integrated Energy and Climate Plan (PNIEC)** is the **main tool for guiding national strategy**, which integrates energy and climate policy with a time horizon to 2030. This instrument is derived from Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action and identifies challenges and opportunities in five areas: decarbonisation, including renewables; **energy efficiency;** energy security; internal energy market; and research, innovation and competition. In this context, energy efficiency emerges as one of the priorities of the PNIEC, in line with the principle '*energy efficiency first*' as stated in the Governance Regulation (Art. 2(18)) and highlighted by the Energy Efficiency Directive 2012/27/EU (EED) in its various updates (Directives (EU) 2018/2002 and (EU) 2023/1791).

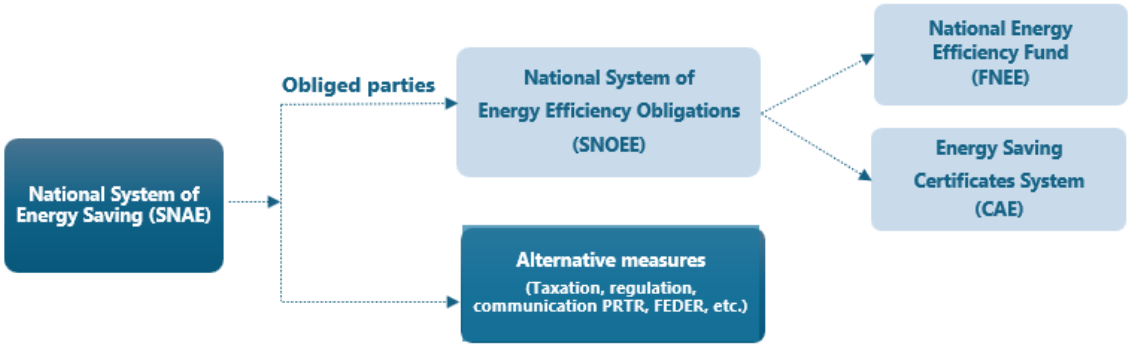
The first PNIEC 2021-2030, submitted on 31 March 2020 to the European Commission and adopted by the Council of Ministers on 16 March 2021, undertook **efficiency improvement targets** for 2030 of 39.5% in terms of primary energy and 41.7% in terms of final energy (Art. 3[4] EED 2012/27/EU; 2018/2002). It also set a cumulative final energy savings target of 36.8 Mtoe between 2021 and 2030 (Art. 7 EED 2012/27/EU; 2018/2002). Since the publication of the first PNIEC, there has been greater climate ambition at the European level, reflected in the European Climate Law and in the 'Fit for 55' and 'REPowerEU' plans[5].
Consequently, in accordance with Regulation (EU) 2018/1999 (Art. 14(2)), the first update of the PNIEC has taken place, with the draft sent to the Commission in June 2023, and finally passed by

[4] The Energy Efficiency Directive (Directives 2012/27/EU and 2018/2002/EU) established a common framework of measures to promote energy efficiency within the European Union with the aim of ensure 20% greater efficiency by 2020 and 32.5% by 2030.
[5] The 'Fit for 55' package aligns EU legislation with the climate targets set out in the European Climate Law, increasing the level of ambition. The REPowerEU plan seeks to end the EU's dependence on Russian fossil fuels in response to the difficulties and disruptions in the global energy market caused by Russia's invasion of Ukraine.

Spanish Royal Decree 986/2024, of 24 September. This update responds to a significant boost in climate ambition at European and national level, in a context marked by the acceleration of the energy transition facilitated by regulatory developments, driven by the need to strengthen strategic autonomy and underpinned by the PRTR. In line with the above, the new plan revises the targets upwards for final energy efficiency improvements and final energy savings. The first of these targets has been increased up to 43% (Art. 4[6] EED 2023/1791), compared to the 38% EU target. This target represents a final energy consumption (non-energy uses excluded) of 71.7 Mtoe in 2030. In terms of primary energy, the initial PNIEC target of 39.5% remains the same, equivalent to a total primary energy consumption of 103.9 Mtoe (98,449 ktoe using the methodology of Directive 2023/1791).

The new PNIEC also raises **the final energy savings target** to 53.5 Mtoe (Art. 8, EED 2023/1791/EU), which represents an increase of 44% compared to the target of the first PNIEC (37.2 Mtoe). This target should be achieved through the implementation of **alternative measures,** including those promoted by the PRTR, in combination with mechanisms based on the **National System of Energy Efficiency Obligations (SNOEE**) with the resources of the **National Energy Efficiency Fund (FNEE)** and the implementation of the **Energy Savings Certificates (CAE) system** (Figure 3).

Figure 3: National System of Energy Saving (SNAE) in Spain



Source: IDAE

The SNOEE is regulated by Law 18/2014, of 15 October, which establishes the FNEE Fund, as an instrument for implementing mechanisms for economic and financial support, technical assistance, training, information or other measures aimed at increasing energy efficiency across all sectors. The fund, managed by the IDAE, may receive contributions from parties bound by the SNOEE, as well as from other sources, such as the General State Budget, EU structural funds (ERDF funds) and other resources intended to finance energy saving and efficiency initiatives. The validity of the SNOEE was extended until 31 December 2030 under Spanish Royal Decree-Law 23/2020, of 23 June, in accordance with the provisions of the EED. Within the framework of the SNOEE, as a complement and alternative to the FNEE, the CAE scheme was legally established by Royal Decree 36/2023, of 24 January. The voluntary CAE scheme will contribute to reaching the cumulative final energy savings target in the period 2021-2030 by improving the efficiency of the SNOEE. It will also allow for flexibility in meeting the target by allowing regulated entities to meet their obligations through this scheme.

The new Plan, in its efficiency dimension, increases the number of measures (23) compared to the first Plan (17). Of these measures, 15 have a sectoral focus in order to meet the final energy savings commitment (Art. 8, EED). The transport sector stands out, with five groups of measures and the

[6] Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency sets an indicative target for 2030 of an indicative reduction of 40.5% for primary energy and a binding reduction of 38% for final energy.

largest contribution to the savings target in the period 2021-2030 (37%), followed by the industrial sector, with two groups of measures equivalent to 31% of the cumulative savings target.

The sectoral measures are divided into different sub-measures or instruments according to the mechanisms used (Table 1). In the 2021-2030 period, the development of new instruments is expected, such as the reforms and investments defined in the PRTR, the green tax reform, the provisions of the Climate Change and Energy Transition Act and the Safe, Sustainable and Connected Mobility Strategy 2030 (EMSCC), and the Spanish Royal Decree 1052/2022 governing low-emission zones, etc.

Table 1: Sectoral energy efficiency measures of the PNIEC, 2023-2030

Measures	Mechanisms	Saving targets (ktoe)
TRANSPORT		**19,938.9**
2.1. Low-emission zones and modal shift measures	L, A, CIF, O	6,604.7
2.2. Modal shift in freight transport, with a greater share for railways	L, A, CAE, AV, CIF, Inc	4,403.1
2.3. Renewal of rolling stock of vehicles and energy efficiency in management	L, IF, Inc	3,105.0
2.4. Improved efficiency and sustainability of ports	L, A, CAE, O	1,984.9
2.5. Boosting the electric vehicle	L, A, Inc, Fisc, O	3,841.2
INDUSTRY		**16,328.9**
2.6. Improvements in technology and process management systems in non-intensive industries	L, A, CAE, AV, CIF, IDI, Inc	9,283.5
2.7. Improvements in technology and process management systems in intensive industries	L, A, CAE, AV, CIF, IDI	7,045.4
RESIDENTIAL		**6,731.9**
2.8. Energy efficiency in existing buildings in the residential sector	L, A, CAE, Fisc, IF, CIF	4,979.4
2.9. Renovation of residential facilities	L, A, CAE, AV, CIF, O	1,745.2
2.10. District heating and cooling networks	L, A, CIF	599.0
SERVICES		**8,150.0**
2.11. Energy efficiency in buildings in the tertiary sector	L, A, CAE, CIF, Fisc	3,361.5
2.12. District heating and cooling networks in the tertiary sector	L, A, CIF	399.8
2.13. Energy efficiency in cooling equipment and large air conditioning systems in the tertiary sector and public infrastructures	L, A, CAE	4,388.7
AGRICULTURE		**1,851.8**
2.14. Energy efficiency on farms, irrigation communities and agricultural machinery	A, CAE, CIF	1,296.3
2.15. Energy Efficiency in the Fisheries Sector	A, CAE, CIF	555.6
TOTAL Final Energy Savings 2021-2030 (ktoe), Art. 8, EED		**53,593.1**

Source: IDAE/MITERD

Notes:

Types of instruments used within initiatives corresponding to alternative measures/the SNOEE: A: Public support; AV: Voluntary Agreements; CAE: Energy Saving Certificates; CIF: Communication, Information and/or Training; IDI: R+D+I; IF: Financial Instruments; Inc: Monetary and non-monetary incentives; Fisc: Tax; L: Legal; O: Other accompanying measures.

These sectoral measures are complemented by horizontal measures such as the promotion of energy performance contracts and energy audits, efficient public procurement and communication, information and training initiatives. The public sector plays an exemplary role in the field of energy efficiency, promoted by the PNIEC through initiatives aimed at meeting the 3% target for renovation of the public building stock set by the EED, among other initiatives. In addition, the Autonomous Communities and Local Entities (EELL) to adopt this mandatory target, which would allow more ambitious energy savings to be achieved.

More detail on these and other energy efficiency measures is provided in the sectoral chapters of this report.

2 Overall energy efficiency progress and policies

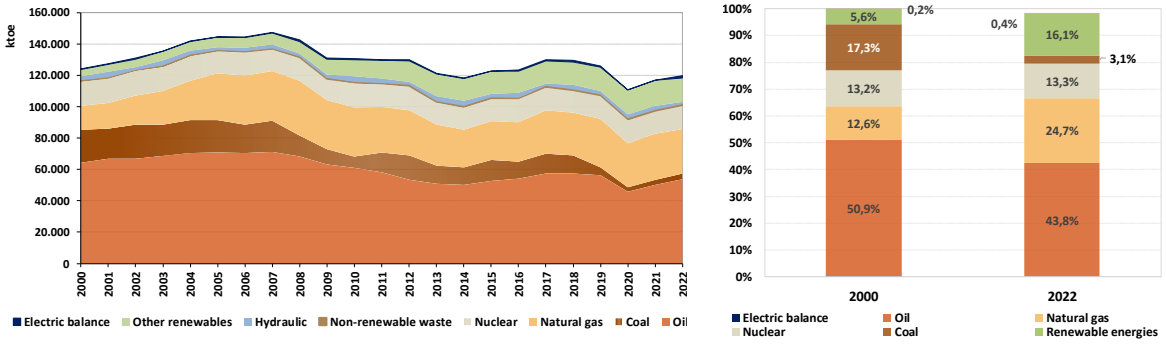
2.1 Development of energy consumption and energy efficiency trends

3.1.1. Energy consumption

The energy supply structure has been moving towards greater diversification, with an increasing share of renewables and natural gas, at the expense of petroleum and coal products (Figure 4). This change in the supply structure has gone hand in hand with a decrease in consumption, especially notable since 2007, energy efficiency being one of the contributing factors. This trend has continued despite the disruptions caused by the various crises up to the present day, followed by periods of economic and energy demand recovery.

In 2022, in a context marked by the energy crisis resulting from the war in Ukraine, energy supply stood at 114,663 ktoe, 0.3% lower than in 2021. This decline, although slight, contrasts with the 5.3% increase in 2021, driven by the recovery in post-COVID 19 activity. The situation in 2022 is explained by a drop in natural gas consumption (-3.7%) associated with the impact of energy prices, and a drop in renewable energy consumption (-1.9%) associated with lower hydroelectricity recorded. This was compensated by a higher consumption of the remaining energy sources, especially petroleum (+3.6%), which continues to be the main source of energy supply in Spain, with a share of 43.8%. However, its share decreased in favour of natural gas and renewables, which gained significance as the second and third most important sources, with 24.7% and 16.1% share respectively, with renewables taking over nuclear energy.

Figure 4: Total energy supply by energy sources in Spain (2000-2022)

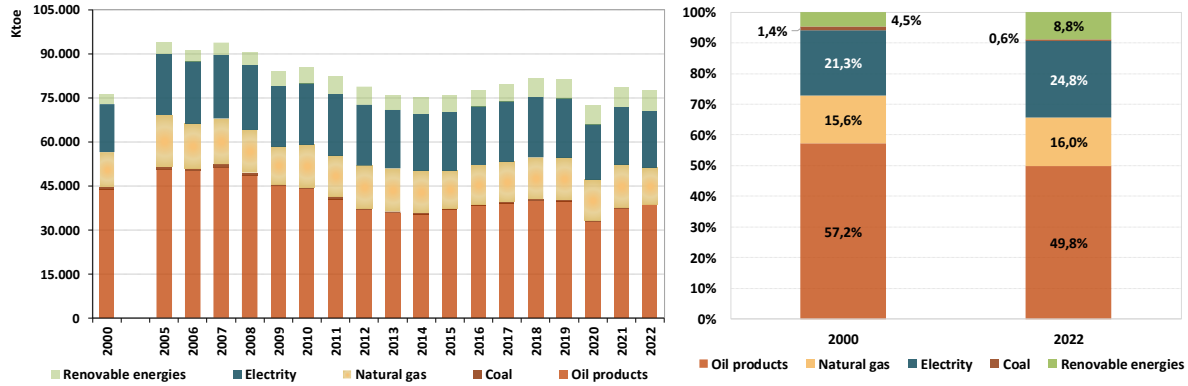


Source: ODYSSEE, IDAE/MITERD

Note: Total Energy supply, excluding ambient heat.

In terms of final energy (Figure 5), demand by energy source follows a similar pattern, showing the same characteristics in its development. In 2022, final energy consumption shows a tendency to stabilise with a slight decline of 0.9%, which occurred in a context of uncertainty resulting from the energy crisis, resulting in higher prices, especially in the case of natural gas. This decline in consumption marks a turning point after the 8.7% rebound in 2021, in the context of the gradual normalisation and recovery of activity after the strong impact suffered in 2020 due to the COVID-19 pandemic. The drop in consumption in 2022 is due to the demand for natural gas (-16.5%) and electricity (-1.5%), as well as the decline in demand for petroleum products, with growth 8.3 percentage points lower than in 2021. Only the demand for coal (+13.3%) and renewables (+3.3%) increased with respect to 2022.

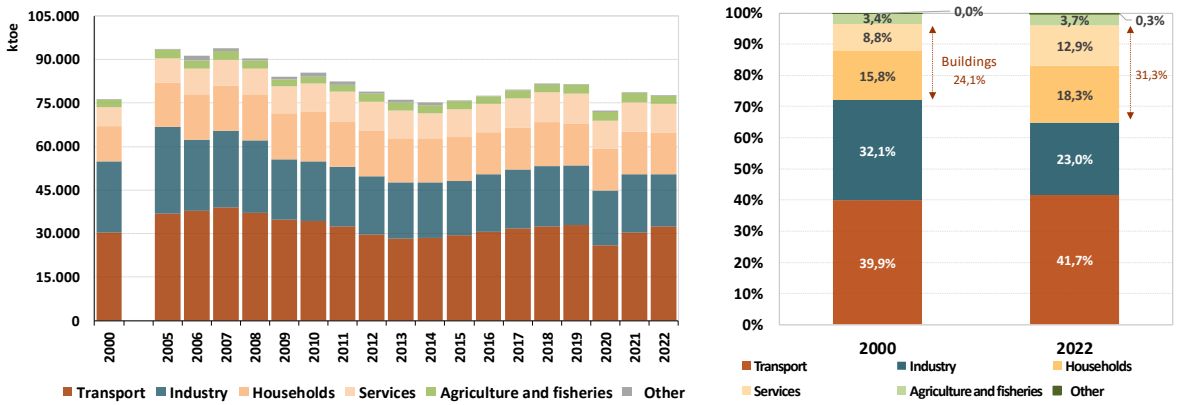
Figure 5: Final energy consumption by energy sources in Spain (2000-2022)



Source: ODYSSEE, MITERD/IDAE.

The structure of final energy consumption (Figure 6) is dominated by fossil fuels, mainly derived from oil products and natural gas, which account for two thirds of consumption. This explains the still high energy dependency (70.6%), associated with sectors such as transport with 41.7% of final energy consumption and industry with 23% of consumption in 2022. The industrial sector shows a progressive loss of relative importance in the sectoral distribution of consumption, in contrast to the set of sectors grouped under the category 'Miscellaneous Use'[7], where consumption has been gaining significance. Since 2006, these sectors have overtaken industry, now accounting for 35.2% of the total.

Figure 6: Final energy consumption by sectors in Spain (2000-2022)



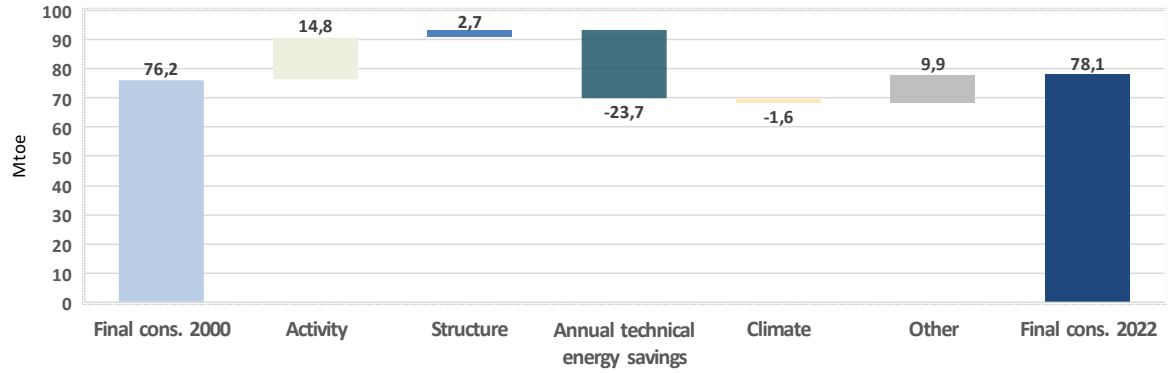
Source: ODYSSEE, MITERD/IDAE.

2.1.1.1 Decomposition of final energy consumption

Between 2000 and 2022, final energy consumption has increased by 2.0 Mtoe, due to factors such as population and economic growth, which drove increased activity in end-use sectors, along with structural changes mainly in the industry and services sectors (Figure 7). These changes have proven to be more pronounced during economic downturns such as the crises that began in 2008 and during the period 2020-2022. Other factors with a negative impact on consumption growth relate to the behaviour and inefficiency of operations in industry and transport, enhanced during periods of crisis due to the underutilisation of production capacities. However, all these factors have been largely offset by developments linked to efficiency policies and technological change.

[7] The 'Miscellaneous Use' sector includes the residential, services and agriculture sectors.

Figure 7: Decomposition of final energy consumption variation in Spain (2000-2022)

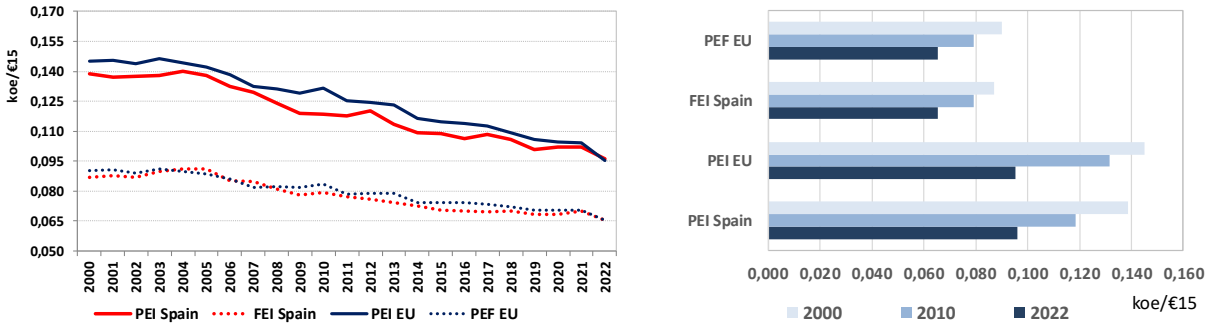


Source: ODYSSEE.

3.1.2. Trends in global Energy intensities

Primary energy intensity[8], in Spain follows a similar pattern to the European average (Figure 8), with a downward trend since 2004. This improvement has been maintained until the present day, albeit with some alterations in certain periods due to the economic fluctuations previously mentioned and climate factors, which affect the availability of renewable resources. In 2022, primary intensity decreased by 5.7%, driven by GDP growth (+5.8%). Over the 2000-2022 period, primary intensity has decreased by 30.8%, at a rate of 1.7% per year, slightly below the European average (-1.9%/year).

Figure 8: Primary and final energy intensities in Spain and the EU (2000-2022)



Source: ODYSSEE, MITERD/IDAE.

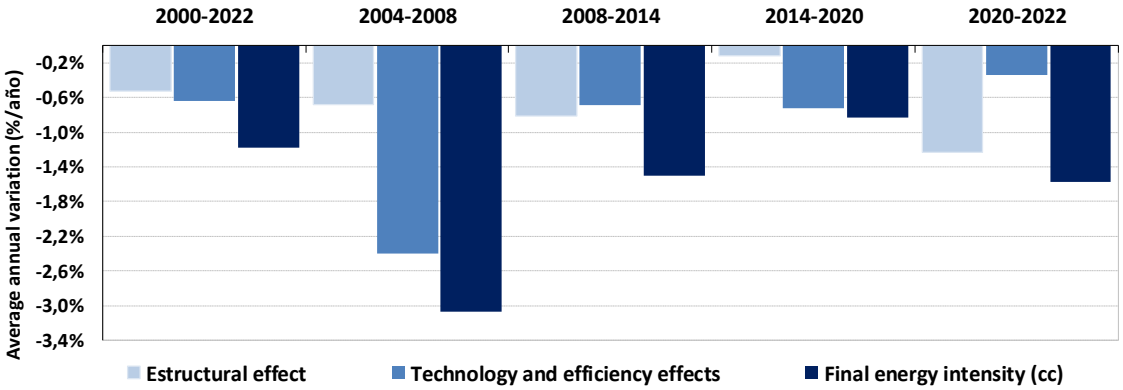
Final energy intensity[9] shows a similar behaviour to that of primary energy intensity. In 2022, final energy intensity has been reduced by 6.3%, which represents a greater improvement than that of primary intensity. This is due to the fall in renewable production, particularly hydropower, resulting in a worse performance of the energy transformation system, contributing to the decline of primary intensity. In the 2000-2022 period, final intensity has improved by 24.7%, at an annual rate of 1.3%, somewhat below the European average (-1.4%/year). In cumulative terms, the improvement in primary intensity is higher due to the progressive diversification of the energy supply structure over the whole period, linked to the evolution of the structure of the electricity generation fleet, throughout the period.

[8] Primary energy intensity for the purposes of this report is calculated as the ratio of total energy supply, excluding ambient heat, to GDP.
[9] Final energy intensity is calculated from the ratio of final energy consumption to GDP.

A period-by-period analysis of the performance of final intensities, real and at constant structure (€ 2015) shows the influence of the different economic cycles on the extent of the improvement in intensity. It also demonstrates the alternating importance of the explanatory factors according to the economic cycles (Figure 9). As such, in periods involving adverse circumstances such as crises, the impact of structural and activity-related changes caused by economic recession are more decisive. On the other hand, in more expansionary periods, when production capacities are better utilised, technological effect becomes more important. The former is evident in the periods 2008-2014 and 2020-2022.

Overall, over the period 2000-2022, technological impact has had the greatest influence on the improvement in intensity recorded, partly due to the impact of savings and efficiency policies, coupled with technological advances.

Figure 9: Variation of final intensity by effects in Spain (2000-2022)



Source: IDAE.

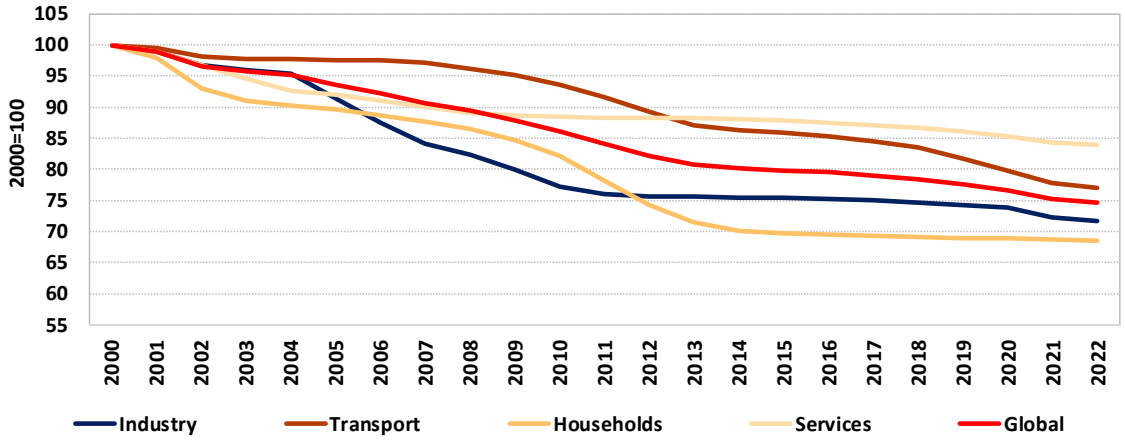
Note: Climate corrected intensities. The reference structure corresponds to 2015.

Progress in energy efficiency is usually assessed based on energy intensity trends, as shown above. However, final energy intensity can be affected by different factors outside energy efficiency, such as structural changes in the different sectors of the economy, changes in lifestyles, behaviour, etc. The ODEX index is an alternative indicator that offers a better understanding of efficiency progress. It is calculated from the weighted average of efficiency progress rates at the level of each subsector or end-use, weighted according to the share of each in final energy consumption.

Based on this index, energy efficiency in Spain has improved at an annual rate of 1.4% in the 2000-2022 period (Figure 10). The residential sector[10] leads the advance (2.0% per year), driven by technological and regulatory improvements in building and equipment, as well as the impact of housing renovation. Industry follows with 1.5% per year, although most progress took place before the 2008 crisis (2.4% per year between 2000 and 2008). The transport and services sectors show less progress since 2000, with respective improvements of 1.2% and 0.9% per year, although their evolution is more favourable from 2014 onwards, especially in transport (1.3% per year), in contrast to the first two sectors, whose progress has slowed down.

[10] The ODEX for the residential sector may have been affected by the change in calculation method for consumption by residential sector uses that was made in 2010. Since then, consumption modelling has been based on the SECH-SPAHOUSEC I study and the Manual on Household Energy Statistics (MESH).

Figure 10: Energy efficiency progress (ODEX) by sectors in Spain (2000-2022)[11]



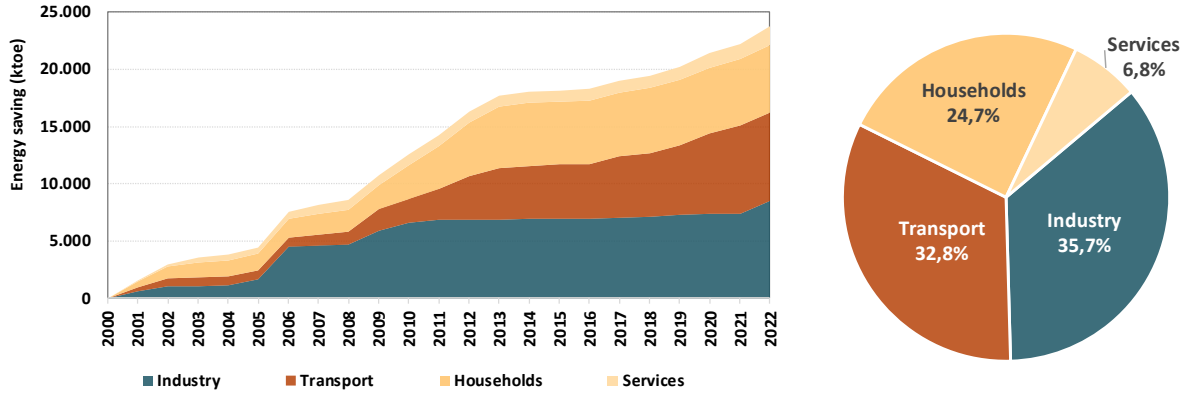
Source: ODYSSEE

Note: The progress of the ODEX index in the residential sector is slightly underestimated due to a lack of detailed information on the stock of household appliances.

3.1.3. Energy Savings

Based on the ODEX indicators mentioned in the previous section, it is possible to estimate the energy savings in the different end-use sectors (Figure 11). These savings are derived from the development of energy indicators and share of each sector. In Spain, industry and transport are the sectors that have racked up the most savings since 2000, although the residential sector has gained importance in recent years.

Figure 11: Energy savings by sectors in Spain (ODEX) (2000-2022)[12]



Source: ODYSSEE

Note: Cumulative savings since 2000 obtained from technical ODEX index.

2.1.1.2 Comparison with other countries

As part of the ODYSSEE project, the "*EU Energy Efficiency scoreboard*" tool[13] has been created, which makes it possible to assess and score the energy efficiency status and progress of EU countries, based on the methodology corresponding to the OECD's Synthetic Indicator. The scoring is based on a selection of indicators for each sector, considering three criteria: energy efficiency level, energy

[11] The technical energy efficiency indexes clean up the negative effect of inefficient use of equipment in crisis situations. In this case, the technical energy efficiency does not decrease as such, as the equipment remains the same, but is used less efficiently.

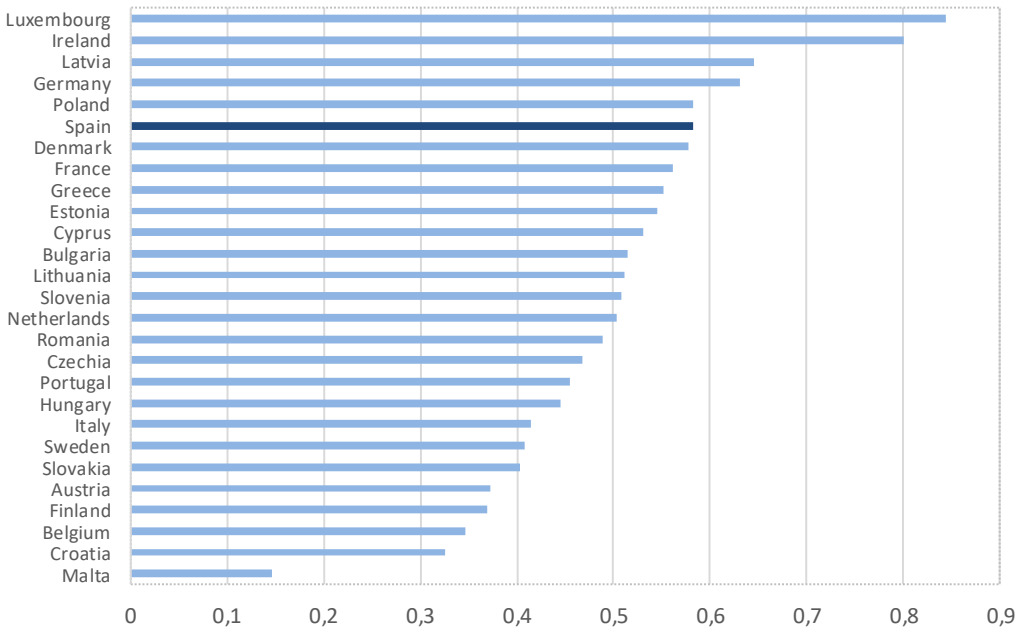
[12] Savings calculated with the ODEX indices differ from those reported in the monitoring of compliance with the savings target of Art.8, EED, due to methodological differences.

[13] 2024 EU Energy Efficiency scoreboard: https://www.odyssee-mure.eu/data-tools/scoring-efficiency-countries.html

efficiency progress, and energy efficiency policies. For each criterion, each country receives a score between 0 and 1 according to the indicators and policies implemented in each sector, based on the information available on the ODYSSEE-MURE database. The overall score is calculated as the average of the scores achieved for each criterion.

According to this tool, Spain ranks fifth in Europe in terms of energy efficiency status and progress (Figure 12).

Figure 12: Overall energy efficiency score in the EU



Source: ODYSSEE.

Differentiating by criteria, the ranking varies, showing the positive effect of the measures and policies implemented on efficiency (Table 2). Nevertheless, there is room for further improvement during the current decade, which will be promoted within the framework of the PNIEC, with the support of programmes financed by the ERDF, the FNEE, the PRTR, among others.

Table 2: Spain's position according to the EU EE Scoreboard criteria

Criteria	Level	Position	Trend	Position	Policy	Position	Global	Position
Spain	**0.741**	**12**	**0.598**	**12**	**0.407**	**9**	**0.582**	**5**
Best score	**1.000**	**1**	**1.000**	**1**	**1.000**	**1**	**0.843**	**1**
Highest rated country	**Lithuania**		**Luxembourg**		**Luxembourg**		**Luxembourg**	

Source: ODYSSEE.

2.2 Cross cutting energy efficiency policies

As indicated in section 2.2.1, the energy efficiency dimension of the PNIEC, in line with the sectoral categorisation of energy efficiency policies and measures used in the ODYSSEE-MURE project, can be considered the main cross-cutting measure in this field, together with the National Energy Efficiency Fund (FNEE), the Energy Saving Certificates (CAE) scheme and the Energy and Climate Law, which affect all end-use sectors.

There are also other important, more specific cross-cutting measures that have been approved in recent years, such as the **Energy Security Plan (+SE)**, adopted by the Council of Ministers on 11 October 2022, in order to address the price crisis resulting from the war in Ukraine. The plan aims to increase the protection of the population against ricing price, particularly vulnerable consumers, to improve energy autonomy and strengthen the EU's security of supply. To this end, a target was set to reduce gas consumption from 5.1% to 13.5%, between August 2022 and March 2023. The +SE Plan leverages PRTR funds, accelerating and facilitating its implementation. In total, it envisages 73 measures, divided into six blocks, one of which focuses on energy saving and efficiency, with 23 specific measures aimed at all sectors. In this area, greater leadership is expected from government and large companies.

Although the SE+ Plan was designed to provide a rapid response in winter 2022/2023, many of its measures have been extended, along with others that contribute to the structural reinforcement of energy security. This Plan is currently one of the measures of the PNIEC, measure 3.1, within the energy security dimension.

The cross-cutting measures also include aid programmes aimed at multiple sectors such as the **Programme DUS 5000 aimed at local entities (EELL) for the development of unique local clean energy projects in municipalities facing demographic challenges**[14]. This programme regulated by Royal Decree 692/2021, of 3 August, and managed by the IDAE, has a budget of €675 million, funded by the PRTR. Eligible projects must be implemented through various measures, including energy efficiency initiatives to reduce energy consumption in public buildings and infrastructures, efficient and smart lighting supported by ICT technologies, and sustainable mobility. The first set of measures include retrofitting the building envelope, HVAC and DHW systems, and indoor lighting fixtures. In terms of mobility, initiatives aimed at promoting modal shift and the use of electric public vehicles are considered.

These measures are available on the MURE database (www.odyssee-mure.eu), which includes a selection of 15 cross-cutting measures, most of which are high impact. Of these measures, six have been adopted after 2020.

[14]Municipalities with up to 5,000 inhabitants and non-urban municipalities with up to 20,000 inhabitants, with singular population entities of up to 5,000 inhabitants.

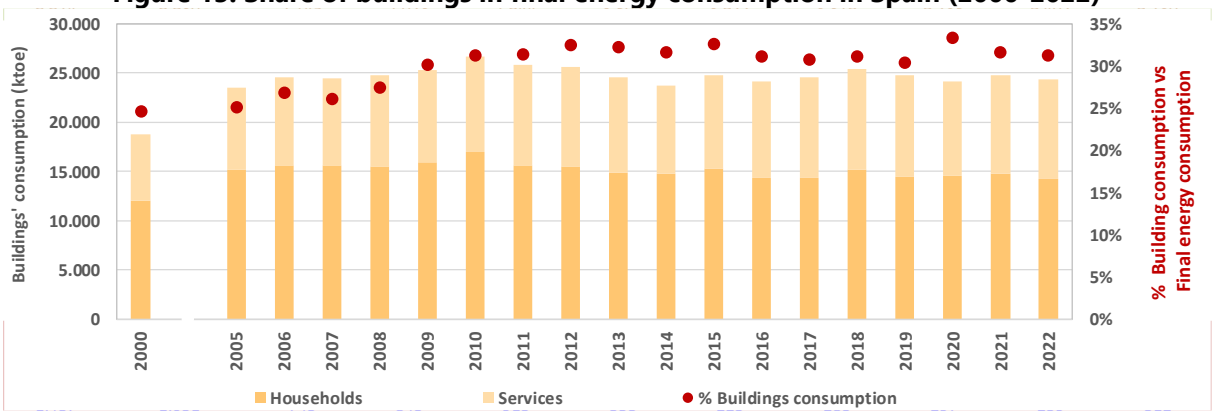
3 Sectoral energy efficiency progress and policies

3.1 Buildings sector

4.1.1. Energy efficiency trends

The buildings sector, both residential and non-residential, has been gaining representation in final energy consumption, overtaking industry since 2006 (Figure 13). From 2010 onwards, the upward trend of previous years is interrupted, giving way to a relative stabilisation of consumption at around 24,500 ktoe.

Figure 13: Share of buildings in final energy consumption in Spain (2000-2022)



Source: ODYSSEE, MITERD/IDAE.

In 2022, building consumption has decreased by 1.9%, in contrast to the 3% increase recorded in the previous year in response to the recovery of activity after a year marked by restrictive lockdown policies adopted during the pandemic. The decline in 2022 is partly due to the impact of the energy crisis and the rise in energy prices following Russia's invasion of Ukraine. In 2022, building consumption accounts for 31.3% of total final energy consumption and 64.1% of electricity consumption, slightly higher than that of all EU buildings in total consumption (40.3%) and electricity consumption (59.0%).

According to estimates made by the Ministry of Housing and Urban Agenda (MIVAU) based on property records, the total built-up area of buildings in Spain exceeds 5 billion m^2. Nearly two thirds of this surface area correspond to buildings in the residential sector, where multi-family dwellings represent 67% of total housing, according to the latest available information from the Spanish Statistical Office (INE). Taking into account the useful floor area of both building types, an average consumption of 133 kWh/m^2 is estimated in 2022, 25% lower than the average consumption of buildings in the EU. This result is consistent with the comparison in terms of average per capita consumption, which in Spain stands at 0.51 toe, one third below the average consumption across EU countries. The difference is largely explained by the warmer climate in Spain.

3.1.1.1 Household sector

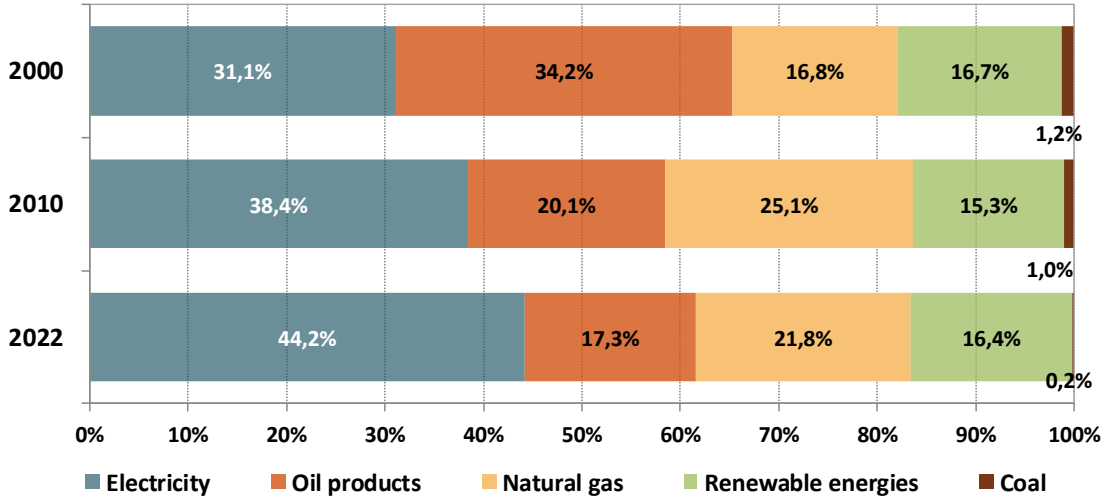
After the upturn in 2021, energy consumption in the household sector has decreased by 3.1% in 2022, mainly due to a 14.2% drop in demand for natural gas triggered by the impact of prices for this fuel following the war in Ukraine. Except for coal, the other sources have recorded moderate increases, ranging from 0.3% (petroleum products) to 1.2% (renewables), which have not been

enough to offset the fall in natural gas, representing 17.3% of final energy demand in this sector in 2022.

The decline in natural gas consumption has been partially offset by its substitution with electricity and renewable energies, whose shares in the energy demand of household have increased in 2022 (Figure 14). These two energy products, together with natural gas, have increased their contribution to meeting the domestic demand, at the expense of coal and oil products, whose shares have decreased over the last two decades, with oil products currently at a similar level to that of thermal renewable energies.

The energy supply structure of Spanish households is characterised by the predominance of thermal uses, such as heating, domestic hot water (DHW) and cooking. These uses rely heavily on fossil fuels and, to a lesser extent, renewables, with contributions of 56.5% and 34.8% respectively. However, electricity has gained importance in the demand linked to these uses, with a share of 15.2%, which is expected to increase in the coming years under the promotion of energy transition and decarbonisation policies, leading to a gradual reduction in the use of fossil fuels.

Figure 14: Energy consumption by energy sources in the household sector in Spain (2000-2022)



Source: ODYSSEE, MITERD/IDAE.

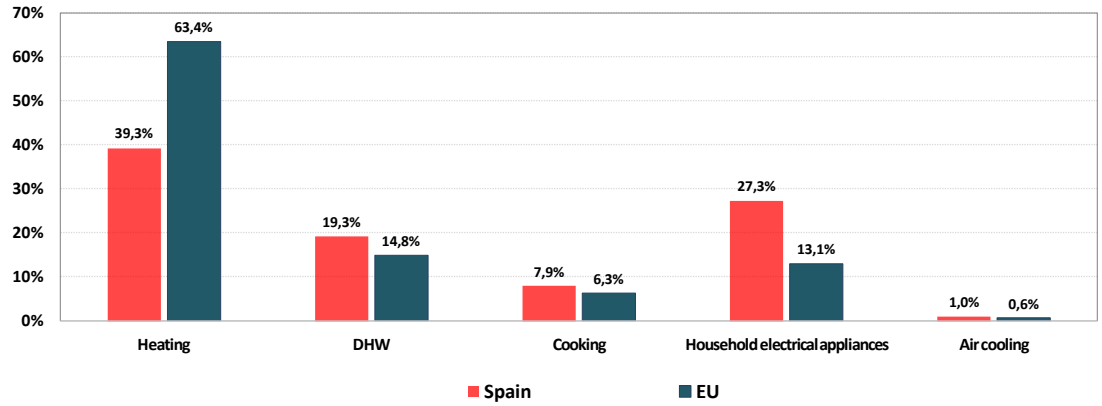
Heating is the most energy-intensive use of households, accounting for about 40% of consumption (Figure 15), implying that the efficiency of thermal technologies and installations used for this purpose, together with usage habits, have a decisive influence on the energy demand and intensity of the residential sector. Despite its importance, heating in Spain is 24 percentage points below the European average, due to its warmer climate.

After heating, household appliances are the second use with the highest impact on the energy demand of the residential sector (27.3%), twice the European average, and the first in terms of electricity demand (61.8%). This is explained by the progressive penetration of household appliances, driven by the digitalisation of households.

While thermal uses dominate the energy demand of households, the acquisition of household appliances has further driven the growth in average electricity consumption (or electricity intensity) of households, as explained below. Added to this is the rise of heating with reversible heat pumps, the trend of replacing natural gas and LPG stoves with electric ones, as shown by a statistical study

conducted by IDAE on the residential sector, and the growing use of ICT technologies, favoured by digitalisation and, more recently, by remote working, which, promoted during the pandemic, now represents 15.0% of employed population, according to the INE.

Figure 15: Energy consumption by end uses in the household sector in Spain and the EU (2022)

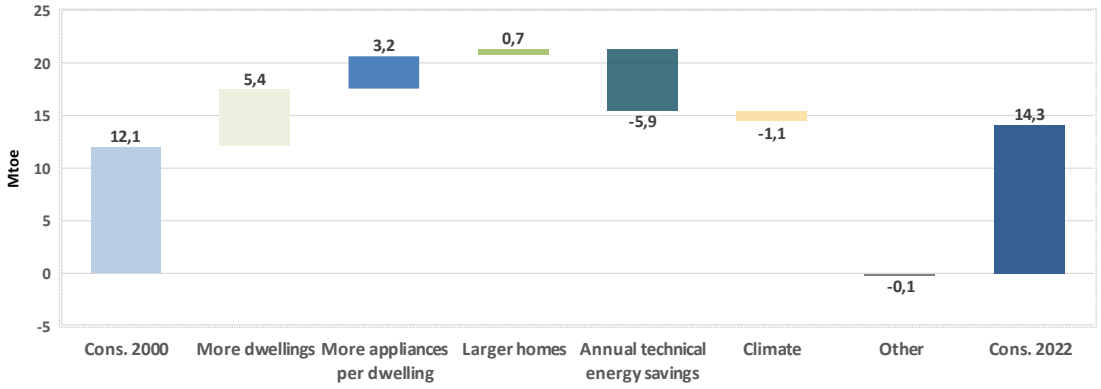


Source: ODYSSEE, IDAE.

Note: The consumption by uses has been modelled based on the SECH-SPAHOUSEC I study and the Manual on Household Energy Statistics (MESH).

In the period 2000-2022, energy consumption in the household sector in Spain has increased by 2.2 Mtoe (Figure 16). This increase is mainly due the growth in the number of occupied dwellings, as well as the higher comfort levels associated with the acquisition of household appliances and a certain shift towards larger dwellings. These factors have been partially offset by improvements in efficiency in both homes and household equipment, supported by stricter standards, as well as energy renovation initiatives driven by different national programmes, in addition to the impact of the climate throughout this period.

Figure 16: Decomposition of energy consumption variation in households in Spain (2000-2022)



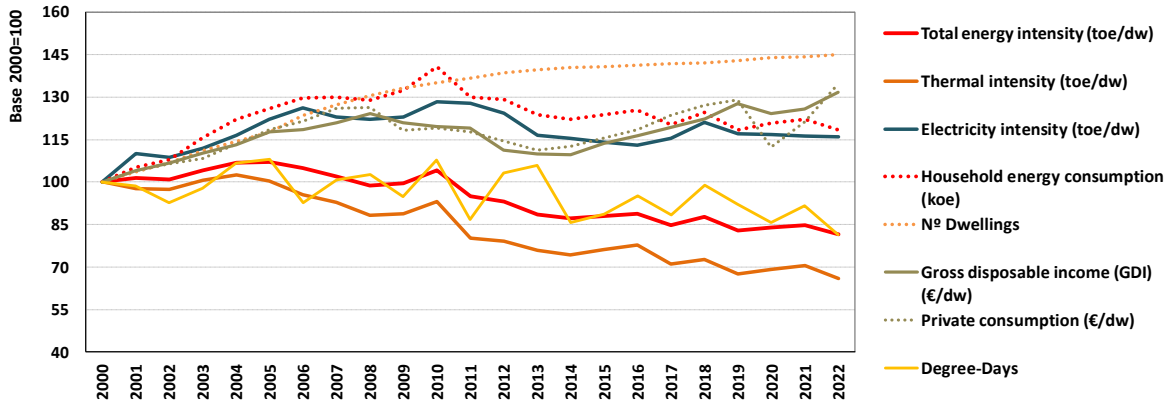
Source: ODYSSEE.

An analysis of the average energy demand per household (or energy intensity[15]) shows a similar pattern to that of thermal uses, given its significance in total consumption (Figure 17). Since 2005 there has been a downward trend, starting in 2010 for electricity intensity. Trends in these indicators are determined by different factors, such as the construction characteristics of dwellings, available equipment, as well as legal and technological developments that influence the energy efficiency of buildings and equipment. Changes in the economic situation also play a role, given their impact on

[15] Total intensity is divided into thermal and electricity intensity according to the fuel consumed (distinguished from electricity or no electricity). The electricity intensities include part of the electricity consumption linked to the thermal uses of heating, cooling and DHW.

household income and purchasing power. In this respect, energy prices have played a key role in the performance of inflation and post-pandemic economic recovery.

Figure 17: Main indicators of the household sector in Spain (2000-2022)

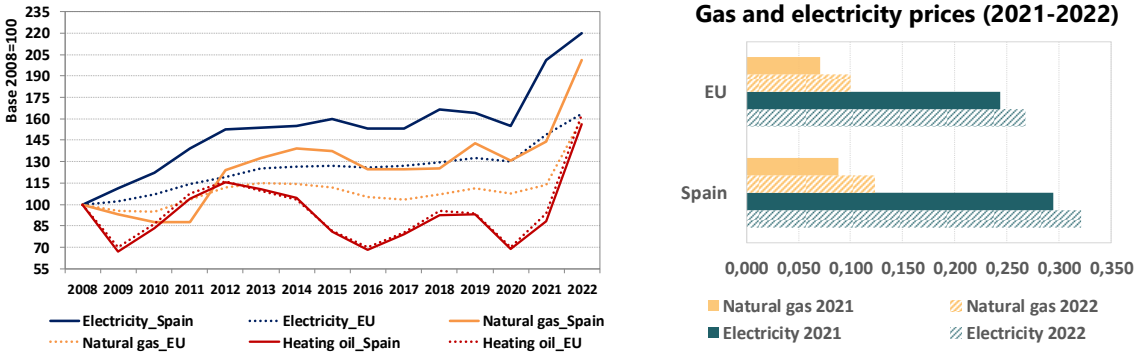


Source: INE/EUROSTAT/MITERD/IDAE.

Notes: Private income and consumption data are at current prices.

The 2022 price spike, driven by geopolitical tensions between Russia and Ukraine, reinforces the upward trend observed since 2008 (Figure 18), with increases above the European average for electricity and natural gas.

Figure 18: Energy prices for households in Spain and the EU (2008-2022)



Source: EUROSTAT/European Commission Oil Bulletin.

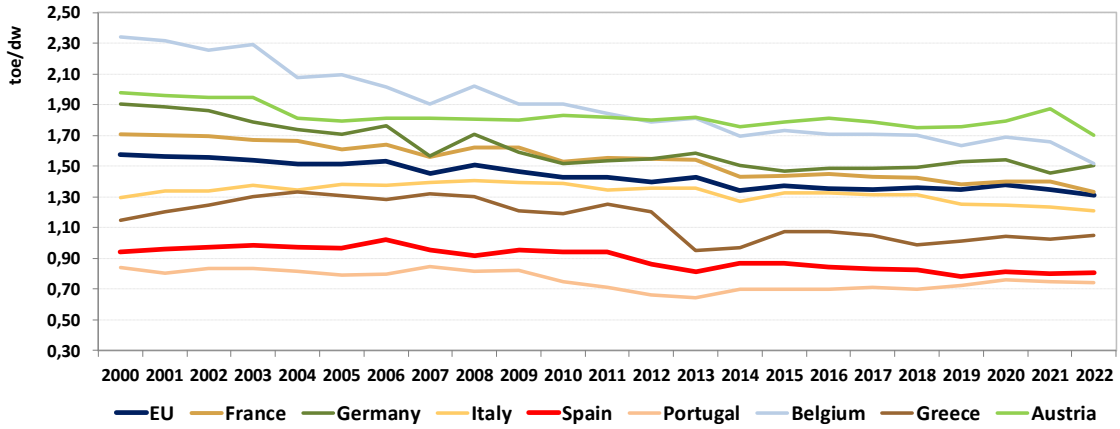
Note: Prices, including taxes, for an average household with electricity consumption between 2,500 and 5,000 kWh/year and gas consumption between 20 GJ and 200 GJ/year.

The rise in energy prices, which began in 2021 due to the increase in demand for energy commodities following the pandemic, has worsened in 2022, affecting household incomes, especially in the second half of the year. Nevertheless, household spending has continued to grow, partly at the expense of savings accumulated during the pandemic. However, the energy crisis has meant an effort to contain energy expenditure and consumption, particularly in the case of natural gas.

In light of the above, in 2022, after a slight increase of 1% from 2021, the total household energy intensity has decreased by 3.7%, below the 6.3% decrease in thermal intensity, closely linked to the lower demand for natural gas. The latter is due to the impact of prices, and the influence of the weather, as 2022 has been one of the warmest years on record according to the Spanish Meteorological Agency (AEMET). As a result, the lower use of heating has led to less demand for gas for heating, reinforcing the fall in thermal demand and intensity. In contrast, electricity intensity has remained stable, with a slight decrease of 0.1%.

The comparison of energy intensity of the residential sector at the European level (Figure 19) shows a similarity between the national indicator and the European average, although Spain remains around 40% below, mainly due to differences in climate. Milder temperatures mean less heating is needed and therefore less consumption, as in other southern European countries such as Greece and Portugal. In Spain, as in other EU countries, there has been a downward trend in intensity, enhanced by the effects of the previous economic crisis. This trend has persisted despite the fluctuations caused by the post-2014 upturn and, more recently, by the COVID-19 crisis and its subsequent recovery, in a context not without disturbances.

Figure 19: Energy intensity in the household sector in Spain and the EU (2000-2022)

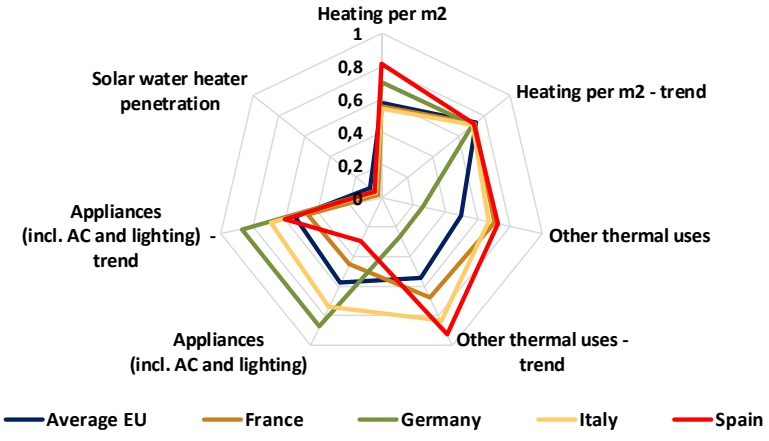


Source: ODYSSEE, IDAE/INE.

Note: Intensities with climate correction.

Considering the scoring methodology used in the *"EU Energy Efficiency scoreboard"* tool, (Figure 20), Spain ranks among the top nine countries, due to the progress recorded in efficiency levels and trends since 2010. This good position is especially reflected in thermal uses, to which efficiency improvements driven by building and equipment regulations may have contributed, as mentioned above.

Figure 20: Score of the household sector in Spain and the EU according to the EU EE Scoreboard



Source: ODYSSEE.

Notes:

Heating per m^2: Unit heating consumption per unit area, adjusted to EU reference climate.

Other thermal uses: Unit consumption of cooking and DHW.

Appliances (incl. AC and lighting): Unit electricity consumption of household appliances.

Penetration of solar energy in the coverage of DHW demand: % of households with DHW systems using solar thermal energy.

3.1.1.2 Services sector

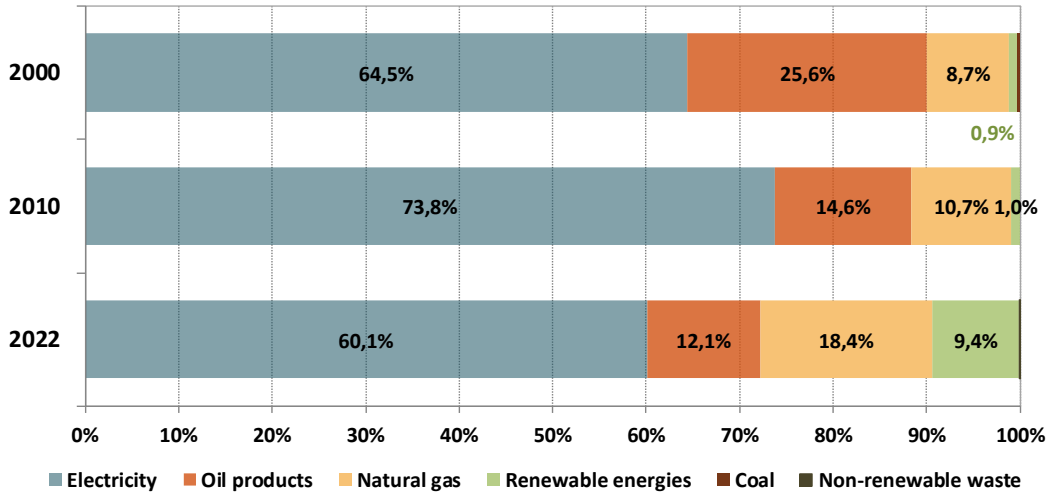
The services sector encompasses a diverse range of activities, including commerce, hotels and catering, health, education, as well as office-based activities, which together account for 12.9% of final energy consumption in 2022, with a contributing 70.1% to GDP.

This sector was one of the hardest hit by the health crisis in 2020 due to the social component of its activities. The drop-in activity led to a 9.5% reduction in energy consumption. The recovery of activity in 2021 was accompanied by an increase in consumption of 5.5%, followed by stagnation in 2022, with a slight decrease of 0.2%.

In 2022, the evolution has been marked by the response to the sharp rise in natural gas prices, reinforced by the *Shock Plan for Energy Saving and Management in Air Conditioning*, adopted with the aim of reducing energy consumption in government buildings, public spaces and shops. As a result, natural gas consumption has fallen by 10.3% in 2022, which has been accompanied by a slight contraction in demand for oil products (-0.4%). Despite the rise in electricity prices, electricity consumption has increased by 1.8%. On the other hand, the consumption of renewable energies has increased by 10.3%, reflecting the efforts of the productive sectors to diversify their energy supply sources and tackle the energy crisis, heightened in 2022 by the Russian invasion of Ukraine.

The structure of demand in the services sector is clearly dominated by electricity (Figure 21), although its share has declined somewhat since 2010. This could be explained by the progressive increase in electricity prices since 2008, which has had an impact on the costs of activities linked to this sector. More recently, a further explanatory factor is digitalisation, driven by the pandemic, which has facilitated the expansion of remote working, currently reaching 15.0% of employed people as mentioned above. The latter is especially relevant in the office sector, where a considerable part of the energy and electricity demand is concentrated.

Figure 21: Energy consumption by energy sources in the services sector in Spain (2000-2022)

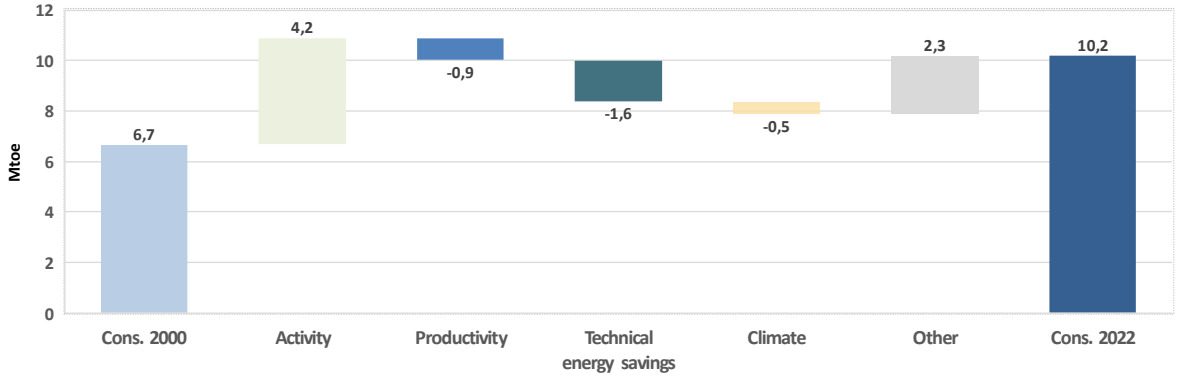


Source: ODYSSEE, MITERD/IDAE.

As for natural gas and renewable energies, their share in the sector's energy demand has been gaining weight, while oil products, in progressive decline, have reduced their contribution, currently below that of natural gas. The latter has had a share barely 3 percentage points higher than that of renewable energies, which are expected to become more important in the current context, marked by the energy transition.

In the period 2000-2022, energy consumption in the services sector in Spain has increased by 3.5 Mtoe, mainly driven by the growth of activity in the different branches, except in periods of crisis (Figure 22). Added to this is the effect of inefficient behaviour and practices in the use of equipment and facilities, the latter aggravated during periods of economic recession. These effects were partially offset by improvements in energy efficiency and labour productivity, measured as the increase in value added per employee.

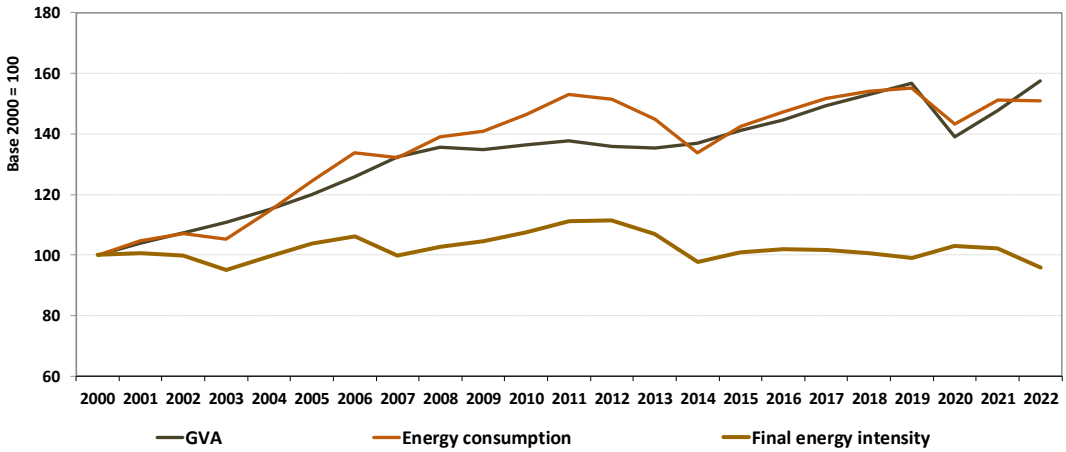
Figure 22: Decomposition of energy consumption variation in the services sector in Spain (2000-2022)



Source: ODYSSEE.

This context of growing energy consumption is also reflected in the evolution of the sector's energy intensity over the last decades (Figure 23). In 2021, the services sector recorded a 6.4% increase in Gross Value Added (GVA), driven by the improved health situation and the high level of vaccination, which enabled the restarting of virtually all activities in the sector. In 2022, the recovery has continued to take hold, especially in hotels and restaurants, commerce and offices, which together account for about 80% of service sector GVA. This dynamism has led to a recovery of pre-pandemic levels of activity, in most areas, with a 6.5% increase in GVA within the sector. This consolidation of activity in general, has been accompanied by a reduction in energy demand, except in offices and the hotel and catering sector, where it has grown by slightly more than 1%. This containment of consumption, as mentioned above, is largely explained by the effect of energy prices in 2022.

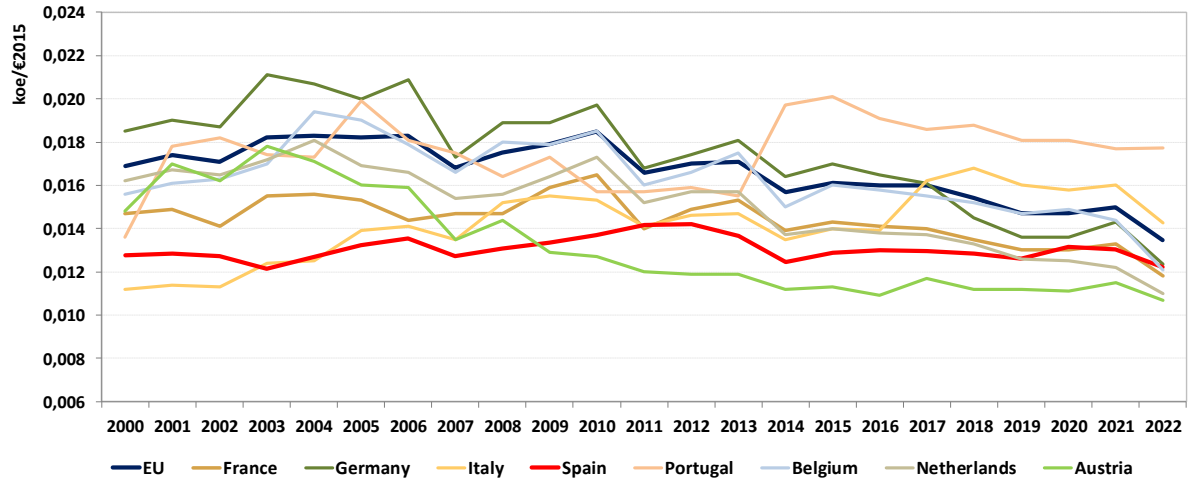
Figure 23: Main indicators of the services sector in Spain (2000-2022)



Source: INE/MITERD/IDAE.

In these circumstances, the energy intensity of the services sector has decreased by 6.3% in 2022, which responds to the growth of GVA (+6.5%) in the opposite direction to that of energy demand (-0.2%). The intensity of the service sector in Spain is below the European average (Figure 24), although the gap between the two indicators has been progressively narrowing given the higher growth recorded in Spain until 2011. Since then, there has been a switch to a downward trend in line with the evolution of the European indicator. However, this trend towards improvement in both cases has been influenced by fluctuations in the economy.

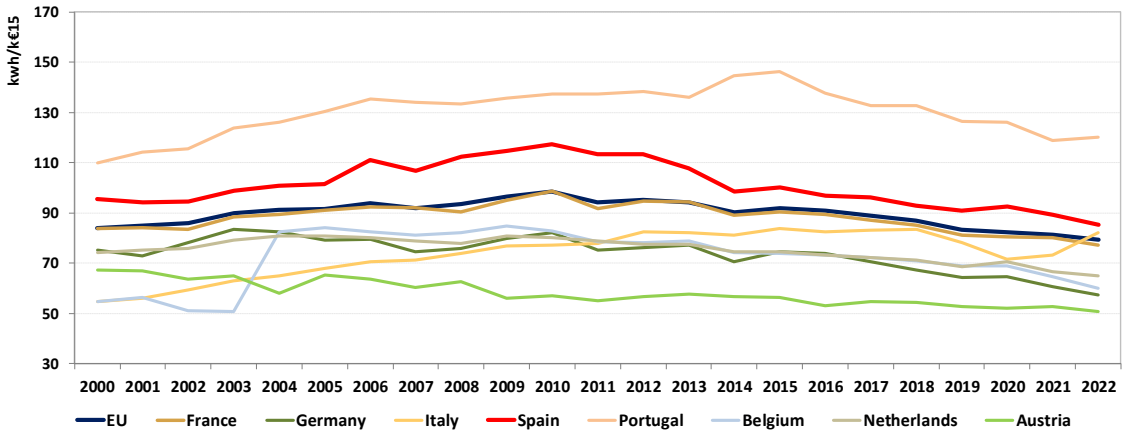
Figure 24: Energy intensity in the services sector in Spain and the EU (2000-2022)



Source: ODYSSEE, IDAE.

In contrast to the overall intensity, the electricity intensity of the services sector in Spain (Figure 25) has experienced greater growth, at a rate 3 times higher (+2.1%/year) in the period 2000-2010, which is also above the European average. The latter is associated with the share of electricity in the coverage of the sector's needs in Spain, around 12 percentage points above the European average. Since 2010, both national and European indicators have been a downward trend under the combined effects of the previous economic crisis and rising energy prices. This is compounded by technological and efficiency improvements made to electrical equipment used primarily in the most consuming sectors (offices, commerce, and hotels and catering), together with energy management systems.

Figure 25: Electricity intensity in the services sector in Spain and the EU (2000-2022)

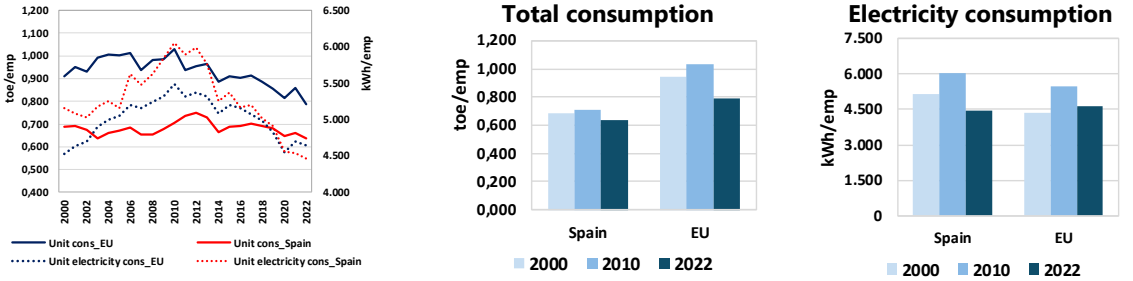


Source ODYSSEE, IDAE.

The downward trend has persisted, despite a slight upturn in 2020, attributable to the structural effect caused by the closure of establishments related tourism and commerce, among others. Since then, electricity intensity has continued to decline, with improvements of 3.4% in 2021 and 4.4% in 2022, due to lower electricity demand growth compared to GVA growth. The improvement in 2022 is lower than that of total intensity, the progress of which has been conditioned by the evolution of thermal demand.

A complementary analysis of this sector is obtained from the trends in unit consumption, expressed as energy consumption per employee, (Figure 26) which in 2022 has decreased by 3.6%. On the other hand, unit electricity consumption has decreased to a lesser extent, by 1.7%, in line with the evolution of intensities. The sharpest drop in intensities is evidence of an increase in labour productivity in 2022, expressed as value added per employee. Unit electricity consumption in 2022 stands at 4,460 kWh per employee, 4% below the EU average, reflecting significant progress in improving this indicator over the last decade, consistent with the reduction observed in electricity intensity.

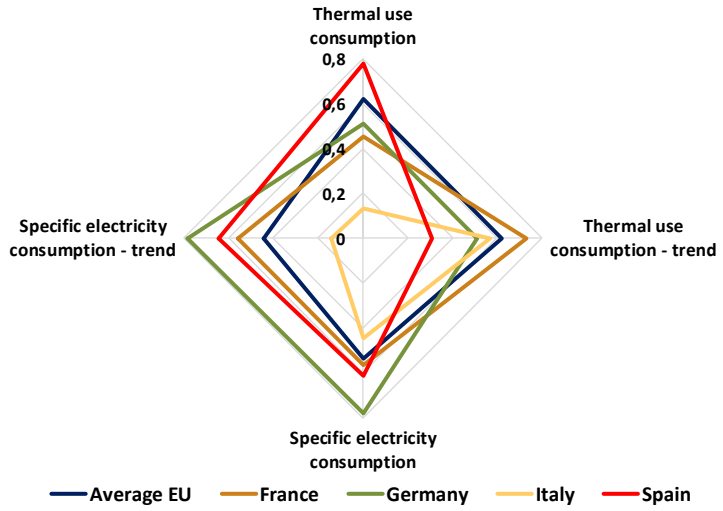
Figure 26: Unit energy consumptions in the services sector in Spain and the EU (2000-2022)



Source: ODYSSEE, MITERD/IDAE/INE.

According to the indicator scoring methodology, Spain ranks eighth in the European comparison of this sector, thanks to improvement in the level of efficiency and the policies implemented. When differentiating the indicators by thermal and electrical uses, a good position is observed in the indicator associated with thermal uses, above the European average. However, it is the electrical uses that have shown the greatest progress (Figure 27).

Figure 27: Score of the services sector in Spain and the EU according to the EU EE Scoreboard



Source: ODYSSEE.

Notes:

Thermal use consumption: Fossil fuel consumption per employee adjusted to EU reference climate, for cooking and DHW.
Specific electricity consumption: unit electricity consumption per employee (kWh/empl.).

4.1.2. Energy efficiency policies

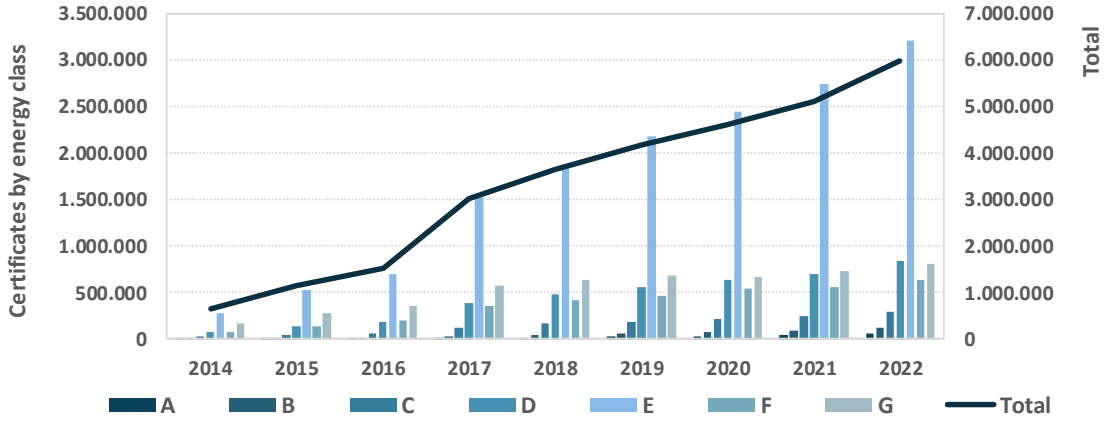
In the **buildings sector** the energy efficiency measures and policies implemented in Spain follow EU guidelines, particularly the requirements introduced by the Energy Efficiency Directive (EED) and the energy Performance of Buildings Directive (EPBD), and their later amendments. In this respect, building legislation has evolved in recent years to adapt to the requirements of these directives. This legal dynamic is complemented by other measures aimed at this sector, mainly of a financial nature, backed by resources from national and European funds. The most recent example is the boost to Next Generation EU funds channelled through the PRTR.

With respect to the **EPBD**, the transposition process has made progress through various statutory provisions establishing higher energy efficiency requirements, such as the **Technical Building Code (CTE)** (Royal Decrees 732/2019 and 450/2022), the **Regulation on Thermal Installations in Buildings (RITE)** (Royal Decrees 238/2013 and 178/2021) and the **Energy Certification of Buildings** (Royal Decrees 235/2013 and 390/2021).

Energy certification is reinforced by the **Law on Land and Urban Rehabilitation**, approved by Royal Legislative Decree 7/2015, of 30 October, which includes the obligation to have a Building Assessment Report, along with a mandatory energy certificate for the building. This requirement affects residential buildings of collective housing typology that are at least 50 years old. Consequently, a significant part of the building stock will have to obtain energy certification, which can contribute to implement the efficiency improvement measures recommended in the corresponding certificate.

In line with the above, since the entry into force of Royal Decree 238/2013, around 6 million certificates for new and existing buildings have been registered (Figure 28). This includes certificates for buildings in the residential and tertiary sectors, the majority corresponding to existing buildings, particularly in the residential sector (94.5%).

Figure 28: Evolution of energy certification in Spain (2014-2022)



Source: IDAE/CC. AA.

Note: Certificates based on emissions.

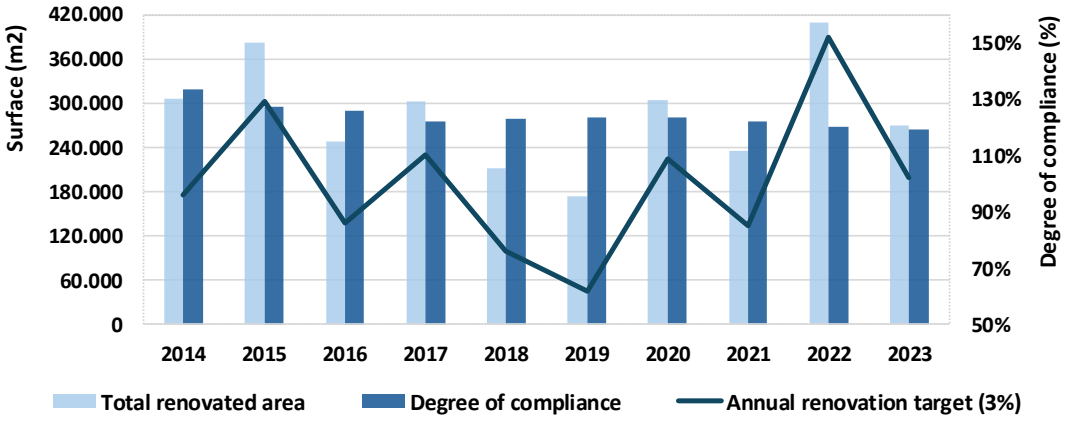
On the other hand, in compliance with Art. 2.bis of the EPBD, the three versions of the **Long-term Strategies for Energy Renovation in Buildings in Spain (ERESEE),** adopted since 2014, constitute an important starting point for driving the energy renovation of buildings in Spain. The latest of

these strategies, ERESEE 2020[16], led by the Ministry of Transport, Mobility and Urban Agenda (MITMA), now the Ministry of Housing and Urban Agenda (MIVAU), is configured as the instrument that develops the long-term strategic vision of the building sector in line with the Strategic Framework for Energy and Climate. This strategy is set to be replaced in 2025 by a National Building Renovation Plan, in accordance with the new EPBD (Directive (EU) 2024/1275).

Regarding the **EED,** progress continues to be made in its transposition into Spanish law through the adoption of various measures. The following are some that affect buildings, in relation to Articles 6, 7 and 8.

Art. 6 introduces the obligation for Member States to renovate 3% of the surface area of central government buildings every year and to carry out energy inventory for this type of building as a basis for meeting this target. To this end, Spain has the **Energy Management Computer System for Buildings of the General State Administration (SIGEE-AGE),** designed and developed by the IDAE. Based on this tool, the inventory has been carried out since 2013 in collaboration with the relevant ministries. At the end of 2023, the number of buildings inventoried amounts to 2,116, with a total renovated surface area of 2,844,494 m^2 corresponding to buildings equipped with heating and/or cooling systems. In cumulative terms, this represents an achievement rate of 101% for the renovation target defined in Art. 6 of the EED (Figure 29).

Figure 29: Evolution of the renovated area in Spain under Art.6 EED (2014-2023)



Source: IDAE.

Spanish law incorporates the obligation established in Art. 6, recently extended to regional and local government buildings. In this sense, in accordance with the PNIEC, mechanisms and collaboration procedures will be established in order to report building assets, combined into a single inventory, which will make it possible to determine the surface area to be renovated by each administration. This extension of the obligation reinforces the proactive and responsible role of the public sector, resulting in savings on the energy bill for public authorities. Energy performance contracts, regulated by Royal Decree 56/2016 of 12 February, will be one of the mechanisms to promote the development of efficiency actions in the public sector.

Another important measure within the scope of Art. 6 is the **Energy Saving and Efficiency Measures Plan for the General State Administration (AGE)**, adopted through Order PCM/466/2022, of 25 May. This Plan promoted by the Ministry for the Ecological Transition and Demographic Challenge (MITERD) and the Ministry of Finance and Public Administration (MHFP),

[16] This strategy was rated by the *Buildings Performance Institute Europe* as the best national strategy submitted to the EU. It was also highly rated by the report *Assessment of the first long-term renovation strategies under the Energy Performance of Buildings Directive* in 2021.

has as its main objectives the rationalisation of the use of administrative buildings and facilities, and the implementation of forms of work organisation models that contribute to energy savings. Additionally, the **Energy Transition Plan in the AGE,** promoted by the MITERD and in force since 2021, pursues the modernisation of public authorities regarding the green transition. It includes measures aimed at energy saving and efficiency in buildings and infrastructures, sustainable mobility and the rollout of thermal and electrical renewable energies within the AGE. Its execution has a budget of €1.07 billion from the PRTR, with which €664.5 million specifically earmarked for the energy renovation of tertiary buildings owned by the national government.

There are also the **Local and Autonomous Programmes to Promote the Renovation of Public Buildings (PIREP),** both funded by the PRTR, aimed at financing the complete renovation of public buildings built before 2009. The Local PIREP Programme, regulated by Order TMA/178/2022 of 28 February, has a budget of €600 million and has made progress towards the goal of combating rural depopulation. This programme will allow for the renovation of more than 1 million m^2 of public buildings, 34% of which are in municipalities with fewer than 5,000 inhabitants. Meanwhile, the Autonomous PIREP Programme, with a budget of €480 million, in force since 2021, is aimed at the public buildings of regional governments, with whom agreements will be signed to carry out the work. In both cases, incentives are provided for initiatives with a higher energy rating.

In addition, there are **other programmes**, also funded by the PRTR, driven by different ministries and **aimed at local entities (EELL)** for the implementation of energy efficiency initiatives in public buildings and infrastructures, as well as in sustainable mobility. These include the **Aid Programme for the Implementation of Sustainability Plans in Tourist Destinations (PSTD),** executed through three calls between 2021 and 2023 with a total budget of €1.8127 billion; the **Aid Programme for Public Infrastructure Plans at municipal level in areas affected by the energy transition**, executed through two calls with a total budget of €116 million; and the **Aid line to strengthen commercial activity in tourist areas**, with an allocation of €85.8 million, under Order ICT/951/2021, of 10 September.

In this context, under the Spanish Multi-regional Programme (POPE) for the period 2021-2027, financed with ERDF funds, the **Aid line for the development of Integrated Action Plans for EELLs** has recently been approved, within the framework of sustainable urban development. This line, regulated by Order HAC/1072/2024 of 2 October, has a budget of over €1.818 million. This initiative covers 40 areas of intervention around digitalisation, sustainable urban mobility, climate change prevention, efficiency and circular economy, among others. Energy efficiency includes support for energy rehabilitation, as well as improvements in public infrastructures. This measure gives continuity to previous experiences, such as the Sustainable and Integrated Urban Development Strategies (EDUSI). This line of support contributes to the Specific Objective SO 5.1[17]of the 2021-2027 EOPE Programme. On the other hand, in relation to Specific Objective SO 2.1[18] of the POPE Programme, it is worth highlighting the implementation of a **Plan to reduce energy consumption in the AGE**, with co-financing from ERDF funds of €397.7 million. To this end, a call for expressions of interest was published on 22 October 2024, aimed at identifying investment projects in energy rehabilitation of buildings and infrastructures to promote the energy transition in the NSA, its dependent or related public bodies and entities. Eligible projects must achieve a minimum reduction of 30% in primary energy consumption through one or more types of action, including comprehensive or partial refurbishment of buildings, as well as interventions in infrastructures other than

[17] OE5.1 of the POPE 2021-2027: *"Promote an integrated and inclusive social, economic, and environmental development, culture and natural heritage, sustainable tourism, and security in urban areas".*
[18] OE2.1 of the POPE 2021-2027: "*Promote energy efficiency and the reduction of greenhouse gas emissions".*

buildings. The IDAE is the body responsible for selecting and monitoring the implementation of these projects.

Continuing in the field of sector buildings, with respect to **Art. 7 of the EED**, the **Law 15/2014**, of 16 September, **on the rationalization of the Public Sector** reinforces the obligation for public authorities within the State Public Sector to acquire high energy performance buildings. This requirement extends to contracts for the construction of a building in cases specified in the **Law 9/2017,** of 8 November**, on Public Sector Contracts**, where the contract costs exceed certain thresholds regarding the acquisition or leasing of buildings for administrative use, requiring a minimum energy rating of C.

The interest in energy renovation extends beyond the scope of public buildings, particularly through the **PREE and PREE 5000 programmes by MITERD** and the **aid programmes for residential renovation and social housing by MIVAU**, all funded by the PRTR. The first two programmes, coordinated by the IDAE, aim to boost the efficiency and sustainability of residential and non-residential buildings by retrofitting the building envelope, green HVAC (heating, ventilation and air conditioning) and DHW systems, and lighting.

Table 3: Recent aid programs for energy efficiency in buildings in Spain

Aid programmes	Regulatory bases	Budget (M€)
Aid program for energy rehabilitation in existing buildings (PREE)	RD 737/2020, of 4 August	402.5
Aid program for energy rehabilitation in existing buildings in municipalities facing demographic challenge (PREE 5000)	RD 691/2021, of 3 August RD 1178/2023, of 27 December	201.5
Aid Programs for Residential Rehabilitation and Social Housing	RD 853/2021, of 5 October	3,970.0

Source: IDAE/MIVAU.

The PREE and PREE 5000 programmes condition the granting of aid on the improvement of the building's energy rating by at least one letter, measured on the emissions scale (kg CO_2/m^2 per year), and requirement that the building must have been constructed before 2007. Furthermore, the amount of aid granted depends on the fulfilment of additional requirements linked to energy efficiency improvements (final energy rating A or B, or a minimum improvement of two letters), the execution of integrated initiatives covering various eligible types, with mandatory action on the thermal envelope, or performing a social criterion, which benefits households in a situation of energy poverty. These programmes are an extension of former initiatives such as the highly successful PAREER-CRECE and PAREER II programmes. Considering the applications in progress, the PREE and PREE 5000 programmes are expected to contribute to the renovation of at least 42,410 dwellings and 1.8 Mm^2 of non-residential buildings. As in the previous programmes, more than 80% of the applications and grants focused on retrofitting the building envelope and thermal systems.

Meanwhile, MIVAU offers aid channelled through six programmes. Of these, the first five, with a total budget of €2,970 million, are aimed at the comprehensive renovation of residential buildings and dwellings. Each differs in scope, with actions implemented at neighbourhood, building and dwelling level. Through these programmes, 510,000 renovation initiatives are planned to go ahead by the end of 2026, with a minimum overall target of a 30% reduction in non-renewable primary energy consumption and a 7% reduction in heating and cooling demand. The sixth programme is aimed at the construction of social rental housing in energy-efficient buildings, with a target of 20,000 energy-efficient rented dwellings, with an allocation of €1,000 million.

There are also other programmes that, although not specifically aimed at energy renovation, contribute to improving the efficiency and energy rating of buildings. Worth mentioning is one of the

IDAE's incentive programmes, regulated by Royal Decree 477/2021 of 29 June, aimed at the implementation of renewable thermal systems, both in the residential sector and in social and public housing. This programme (PI6) includes efficient technological solutions, such as heat pumps, and has a budget of €148.65 million, funded under the PRTR. It can also contribute to mitigating energy poverty, as its beneficiaries include non-profit organisations and other organisations that provide social housing to vulnerable groups.

In addition to aid programmes, legal and fiscal support measures have been adopted. Specifically, the **Law 10/2022**, of 14 June**, on measures to promote renovation in the context of the PRTR** incorporates various measures to address the challenges of renovation and the improvement of the housing stock. On the one hand, it introduces **three new tax deductions** to personal income tax (IRPF), aimed at promoting renovation in primary dwellings and residential buildings. On the other hand, it **amends the Horizontal Property Law** to enable improvements in the regime of owner' associations and thus facilitate the execution of energy renovation works in buildings. It also **amends the Law on Land and Urban Rehabilitation** to strengthen the powers of owners' associations with full legal capacity for credit transactions related to building renovation. Finally, this law creates a **line of guarantee** so that credit institutions can offer financing for residential building renovation projects.

The actions outlined above will contribute to the energy targets set by the PNIEC within the building-oriented measures 2.8 and 2.11, as well as to the energy renovation target of 1,377,000 existing dwellings by 2030. In addition to these measures, there are others specific to the residential and tertiary sectors, as indicated below.

3.1.1.3 Household sector

Within the household sector, other actions of interest are those aimed at household appliances and their efficient use. Regarding the former, these actions include renewal plans to provide aid for the purchase of domestic appliances in different regions in Spain, reinforced by information provided through the energy labelling of domestic appliances. Here, it is worth mentioning the **Sectoral Plan on Market Surveillance of Energy Labelling,** adopted in 2022, developed as part of the General National Strategic Framework for Market Surveillance of Non-Food Products (MENVIME).

In terms of information measures, **communication campaigns** play an essential role in guiding citizens' purchasing decisions towards more efficient appliances, encouraging the adoption of sustainable habits and their commitment to the energy transition. The IDAE has launched numerous campaigns, including the most recent ones: in 2022, '*The Energy Transition: Transformation and Competition*'; in 2023, '*Citizens as Key Players in the Energy Transition*'; and in 2024, '*The Energy that Moves Us and Makes us Grow*'.

These measures have a positive impact on meeting the target set out in measure 2.9 of the PNIEC.

3.1.1.4 Services sector

In the services sector, measures related to energy labelling on appliances are also applied, as well as specific measures particularly for public services. In this area, Spain has a regulatory framework that promotes the application of energy saving and efficiency criteria in public procurement processes for products, services and buildings, in accordance with **Art. 7 of the EED**. The Law 15/2014,

of 16 September, on the rationalization of the Public Sector reinforces these principles by establishing certain requirements for procurement by public authorities. This is complemented by the Law on Public Sector Contracts, which promotes the inclusion of environmental, social and innovation criteria in the award of contracts. This framework is completed by the **Green Public Procurement Plan (PCPE), 2018-2025**, adopted by the Council of Ministers on 7 December 2018, which is a continuation of the Green Public Procurement Plan (PCPV). The PCPE Plan encourages the purchase of products, works and services with low environmental impact, establishing 20 priority categories with specific selection and award criteria, including energy efficiency requirements.

Additionally, there are measures to support efficient lighting, such as the **Aid program for singular projects for the renovation of municipal outdoor lighting facilities**, approved in 2023 with an initial budget of €100 million, funded by the FNEE, which is complemented by a second call, recently published in February 2025, with a budget of €155 million, also from the FNEE. This program, managed by the IDAE and regulated by Order TED/388/2023, of 29 March, is aimed at outdoor lighting facilities on municipal premises owned by public entities such as EELL, municipal associations, or groups of municipalities. The projects must promote scientific and technical research and innovation, meeting requirements above the regulations for energy efficiency in outdoor lighting facilities, incorporating innovative technologies for energy saving, efficiency, reduction of light pollution, and the use of ICT. This measure has significant potential for energy and economic savings, as 68% of the lighting points in Spain – approximately 6 million–, have yet to be adapted to current regulations.

In addition to the above, the aid programmes for EELL, previously mentioned, include initiatives aimed at public infrastructure.

These measures have a positive impact on meeting the target set out in measure 2.13 of the PNIEC.

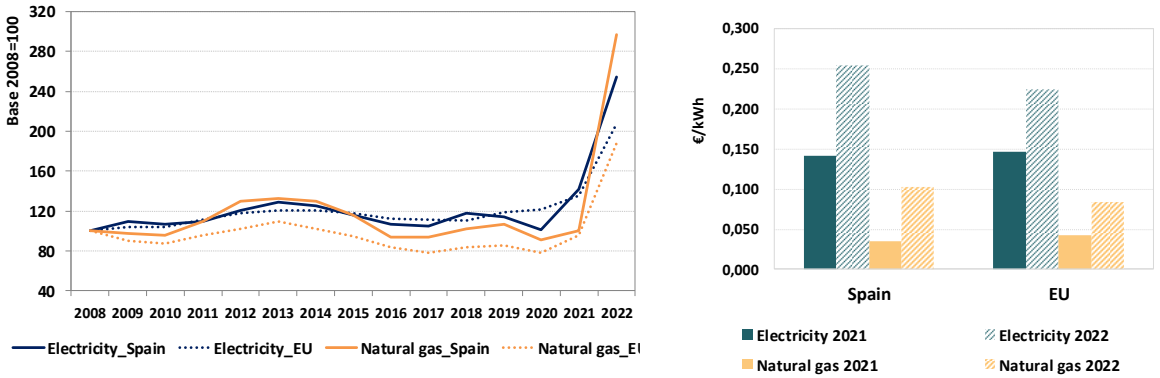
To conclude, many of the measures outlined in section 4.1.2 are available on the MURE database (www.odyssee-mure.eu), which includes a selection of 49 measures applicable to the buildings sector, nine of which are common to the services and residential sectors. The measures are categorised according to their type, impact, implementation period and other criteria. Financial, informational and legal measures predominate, especially financial measures, the number of which has increased since 2020, driven by the PRTR as part of the PNIEC. In recent years, the number of aid programmes approved in the services sector has increased significantly.

3.2 Industry sector

4.1.3. Energy efficiency trends

The industrial sector accounts for 23% of final energy consumption in Spain in 2022, a year in which consumption has fallen by 10.9%, 5% below the level of consumption reached in 2020 during the pandemic. This evolution contrasts with the situation in 2021, when consumption grew by 6.9%, prompted by recovery after the stagnation caused by COVID-2019. The decrease in 2022 is mainly due to the rise in energy prices following the war in Ukraine, especially visible in the case of natural gas, the price of which almost tripled, with higher increases than electricity, as well as above the European average (Figure 30).

Figure 30: Energy prices for industrial consumers in Spain and the EU (2008-2022)

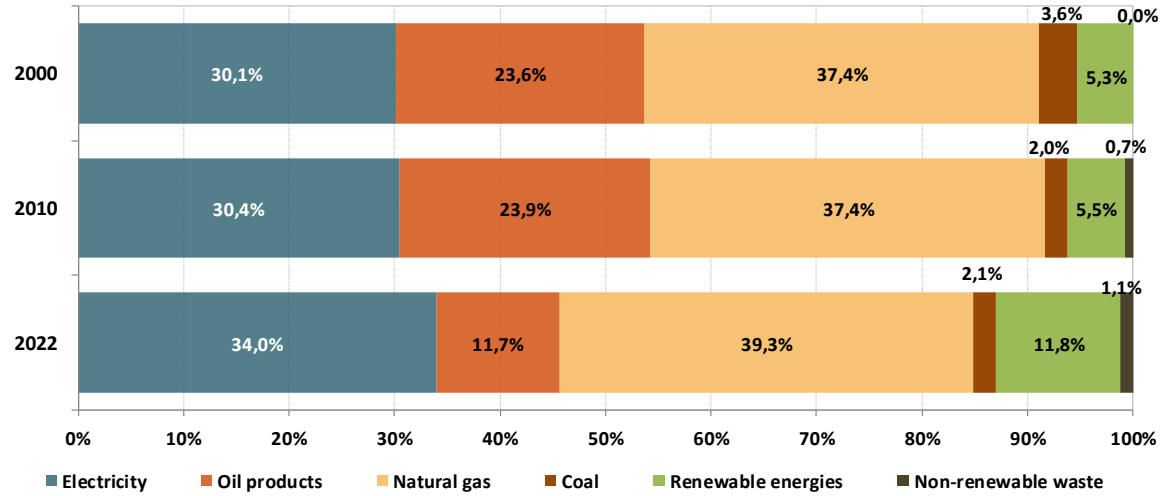


Source: EUROSTAT.

Note: Prices, including taxes, for an average industrial consumer with electricity consumption between 2,000 and 20,000 MWh/year and gas consumption between 10,000 and 100,000 GJ/year.

Natural gas has been the fuel most affected, with a 19.5% drop in demand, accounting for 77.9% of the total reduction in industrial energy consumption. This is partly explained by its greater significance in covering the energy needs of this sector. Similarly, although to a lesser extent, demands for oil products (-10.3%) and electricity (-6.6%) have decreased. By contrast, coal and renewables, not affected by this price increase, have recorded increases of 19.2% and 6.4% respectively. This evolution has led to the renewable thermal contribution surpassing that of oil products in 2022 (Figure 31). This increase is partly due to the need to mitigate the impact of energy prices and to strengthen energy autonomy, leading to a greater use of renewables, as well as the implementation of energy saving and efficiency measures.

Figure 31: Energy consumption by energy sources in the industry sector in Spain (2000-2022)

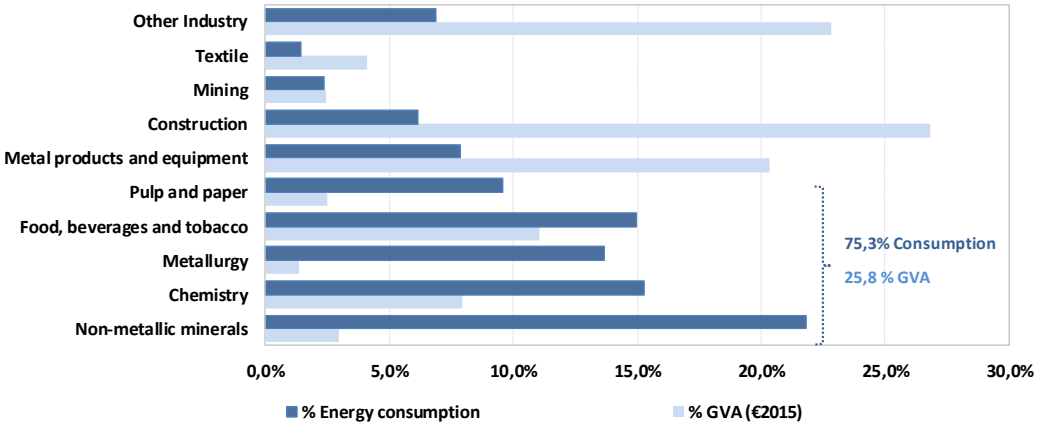


Source: ODYSSEE, MITERD/IDAE.

Renewable energies, together with electricity, have progressively gained significance in the structure of industrial energy demand at the expense of oil products, which in turn have lost weight compared to natural gas. Despite the progressive electrification of the industry, the nature of the processes and activities specific to the different industrial branches continues to determine the thermal character of industrial energy demand.

At the sectoral level (Figure 32), the manufacturing industry accounts for nearly 92% of energy demand, with five branches (metallurgy, non-metallic minerals, chemicals, food, beverages and tobacco, and pulp and paper) accounting for 75.3% of energy consumed in 2022. This contrasts with the lower contribution of these branches to the Gross Value Added (GVA) of industry, almost 3 times lower (25.8%). This difference is explained by the intensive nature of these activities, especially in the case of non-metallic minerals, where its share in energy demand is almost seven times higher than its share in GVA. The sectoral composition of industry, largely determined by the presence of these energy-intensive industries, affects the performance of intensities in this sector, as discussed below.

Figure 32: Energy-economic characterisation of the industry sector by branches in Spain (2022)

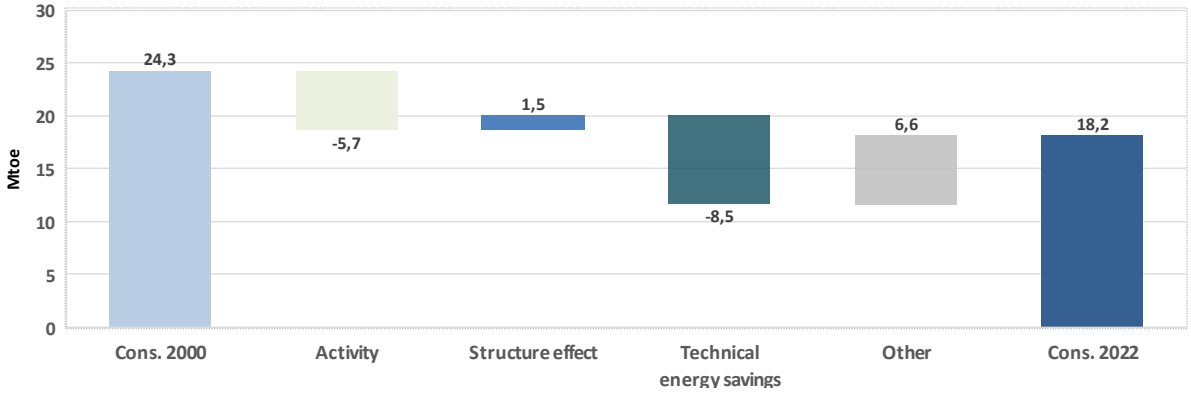


Source: MITERD/IDAE/INE.

Note: Ambient energy supplies are excluded as their sectorisation is not available.

In the period 2000-2022, the industrial sector has reduced its energy consumption by 6.1 Mtoe, mainly due to improvements in process and equipment efficiency over the whole period (Figure 33). Another relevant factor is the decline of activity, enhanced during the economic crisis (2008-2014), the health crisis caused by COVID-19 (2020) and the energy crisis (2022).

Figure 33: Decomposition of energy consumption variation in the industry sector in Spain (2000-2022)

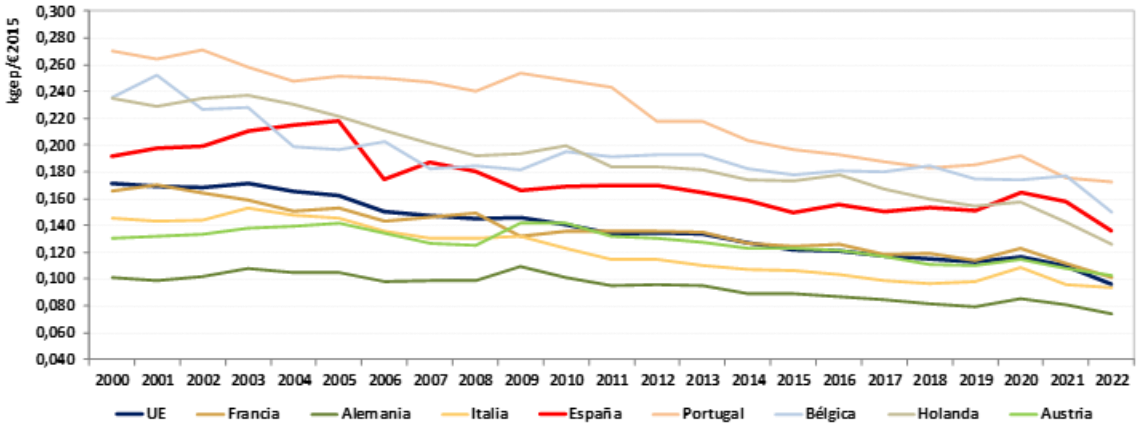


Source: ODYSSEE

These effects have been partially offset by internal shifts in some industrial branches towards more energy-intensive products, as well as by operational inefficiencies, reinforced at the most critical times during the crises. Added to this is the structural effect of industry moving towards more intensive branches. These factors condition the evolution of intensity as explained in the following.

According to the comparative analysis of the intensity of manufacturing industry at the European level, is in an intermediate position, although above the European average and the main EU economies such as Germany, Italy and France (Figure 34). One of the reasons for the higher intensity of the manufacturing industry in Spain lies in structural differences. In Spain, there is a lower presence of less intensive branches, such as those corresponding to machinery and transport equipment, with a joint contribution of 35.4% to GVA, compared to 46.7% as the European average or 58.9% in Germany.

Figure 34: Energy intensity in the manufacturing industry in Spain and the EU (2000-2022)



Source: ODYSSEE, IDAE.

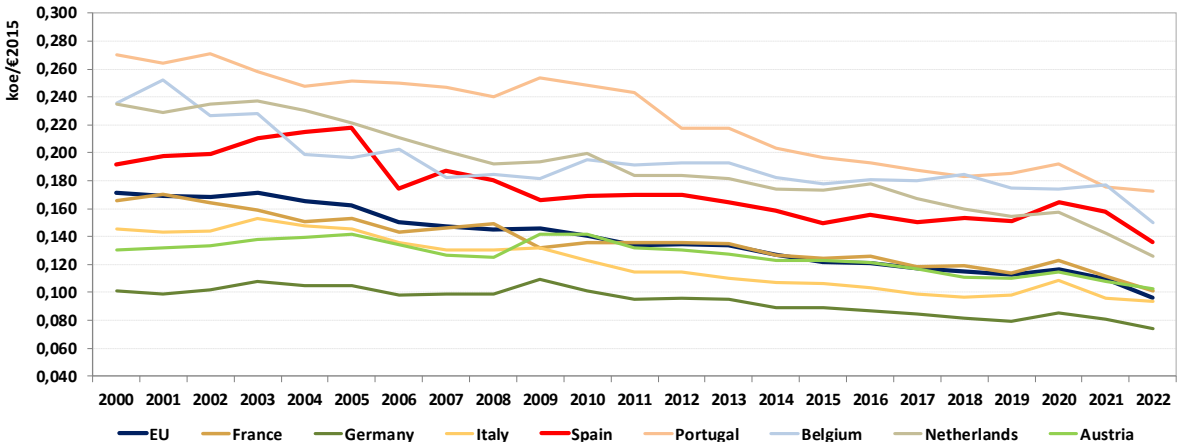
Manufacturing intensity in Spain has generally followed a downward trend since 2005, albeit with some disruptions over time. These shocks are associated with the period of economic recession (2009-2013) and its recovery after 2014. More recently, this has been compounded by the crisis triggered by the COVID-19 pandemic, followed by material supply crises and the consequent rise in the price of raw materials and energy, culminating in 2022 with the energy crisis resulting from the war in Ukraine.

This context helps to understand the 4.4% deterioration in 2020, triggered by the impact of the pandemic, after which intensity appears to resume its downward trend, with improvements of 3.9% in 2021 and 14% in 2022. The extent of the decline observed in 2022 is explained by the adoption of measures and strategies to cope with high costs and energy dependence, especially by the most electricity and natural gas intensive industries, for which demand has contracted significantly in 2022.

The industry as a whole (Figure 35), like the manufacturing industry, reflects a downward trend since 2005, influenced by the aforementioned disruptions. The level of intensity is lower than that of manufacturing industry due to the moderating effect of construction, whose share in the industry's GVA is four times its share in energy demand. This contributes to a closer approximation to the European average intensity, with respect to which Spain is above, at a distance of 12%. The positive effect of construction on the overall intensity has been counteracted during the previous crises, including the last one triggered by COVID-19, due to the decline in construction activity, with a consequent decrease in its value added and share in the industry's GVA. This explains the upturns in intensity observed in these periods, in addition to the impact of the manufacturing industry, which is not itself detached from the performance of construction due to its bandwagon effect on the demand for raw materials and industrial products.

Focusing the analysis of the last three years, a turning point is observed in 2020 under the COVID-19 effect, with a slight increase in intensity of 1.1%, lower than that recorded for the manufacturing industry. This more restrained worsening is explained by the construction sector, whose performance was less unfavourable than that of manufacturing industry overall, helping to mitigate the negative effect of the latter on the overall intensity of industry.

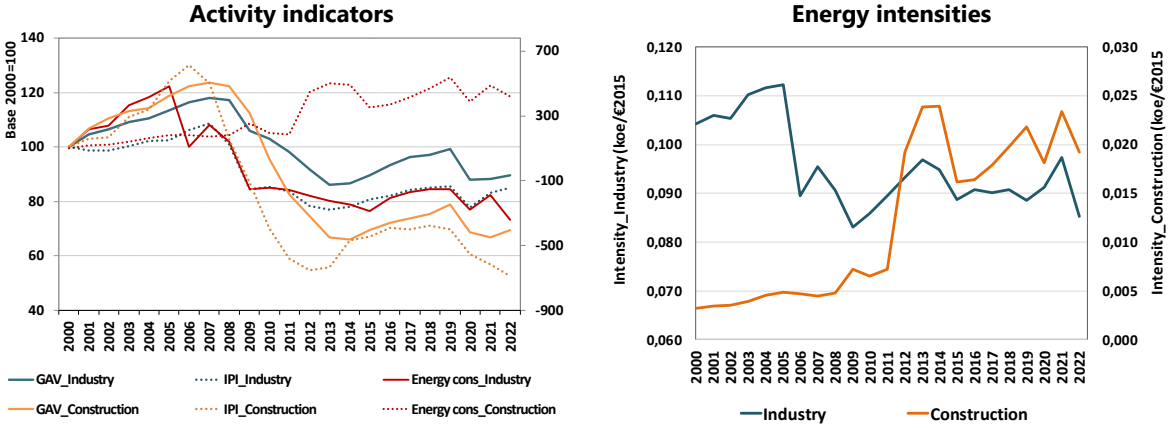
Figure 35: Energy intensity in industry in Spain and the EU (2000-2022)



Source: ODYSSEE, IDAE.

However, in 2021, during the post-COVID-19 recovery, the overall intensity of industry increased by 6.6%, in the opposite direction to manufacturing intensity. This increase seems to be due to the construction sector, where intensity increased by 29%, prompted by the constant slowdown in its activity, coupled with difficulties in the supply of materials. This explains the fall in their value added and IPI (industrial production index), compared to the 25.5% increase in energy demand (Figure 36). After the upturn in 2021, 2022 has seen remarkable improvement of 12.4%. Despite the supply crisis and rising energy prices, construction has performed better, with a 4.1% increase in GVA, above the 3.9% increase for manufacturing. At the same time, energy consumption in construction has decreased by 14.4%, leading to a 17.8% improvement in its intensity, contributing positively to the improvement of industry overall.

Figure 36: Main indicators of industry and construction in Spain (2000-2022)



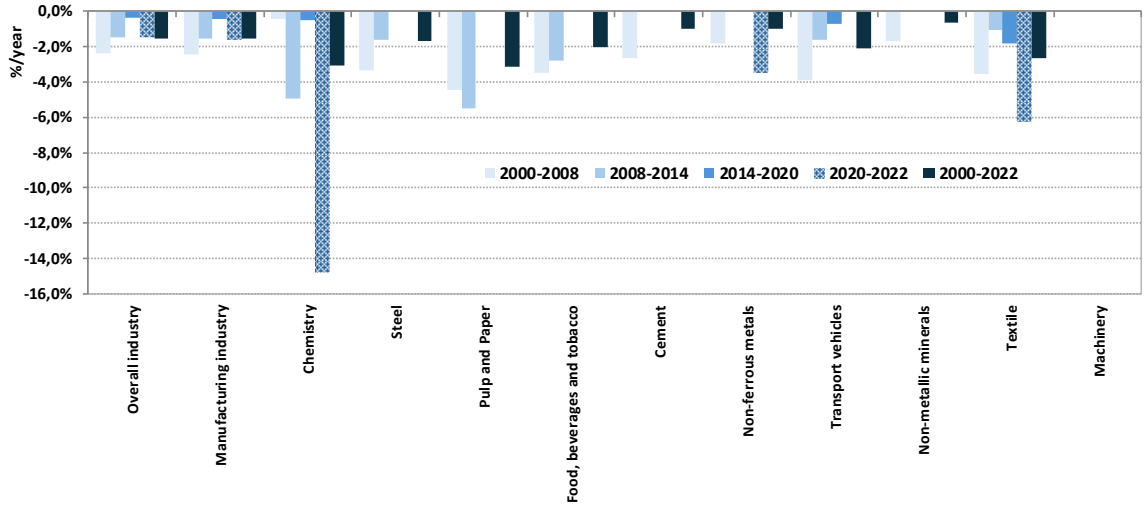
Source: INE/MITERD/IDAE.

The analysis of energy efficiency trends in industry, based on the ODEX technical index, shows an average annual improvement of 1.6% in the manufacturing industry and 1.5% for industry as a whole in the period 2000-2022. Focusing on manufacturing, given its importance within industry,

progress can be seen in all branches except machinery (Figure 37). The paper and chemical industries particularly stand out, with improvements of more than 3% per year. The performance of industry varies from one period to another, with greater progress in aggregate terms before the 2008 crisis (2.4% per year). From then onwards, the improvement has slowed down, due to the crisis-induced decline in the efficiency of production facilities, operating below nominal capacity.

Since 2014, there has been a general stagnation, except in the chemical, textile and transport vehicle industries. In the most recent period, 2020-2022, an average annual improvement of 1.5% has been recorded, higher than in the period2014-2020, which is linked to the evolution of certain branches such as the chemical, non-ferrous metallurgy and textile industries. These improvements could be explained by investments in energy efficiency to mitigate the impact of higher energy prices.

Figure 37: Energy efficiency progress in the manufacturing industry (2000-2022)



Source: ODYSSEE.

At the individual level, the chemical and textile industries stand out, with continued progress despite the impact of the various economic downturns. In the case of the chemical industry, this improvement can be explained by the investments made in process decarbonisation technologies, with a positive impact on energy efficiency. Meanwhile, the paper industry has recorded the greatest progress in the period 2008-2014, although its improvement has subsequently been interrupted, as in other branches of manufacturing industry.

The limited progress in recent years is closely linked to the performance of more intensive branches such as steel, non-metallic minerals and the paper industry. Although these branches have made improvements to production processes in recent decades, with a positive impact on efficiency, the ODEX index indicates that there has been no significant progress in recent years. However, improvement is expected in the coming years through efficiency programmes currently underway, funded by the FNEE and the PRTR, coupled with recent energy efficiency investments triggered by the energy crisis in 2022.

According to the indicator scoring methodology, Spain is in a mid-range position in the European comparison of the industrial sector (Table 3), which is explained by its ongoing high intensity and reduced progress in efficiency in recent years, as has been observed. However, the ranking improves in terms of policies, with Spain in seventh place. Under the impact of policies, an improvement in its overall ranking is expected in the future.

Table 4: Position of the industrial sector in Spain according to the EU EE Scoreboard criteria

Criteria	Level	Position	Trend	Position	Policy	Position	Global	Position
Spain	0.584	20/25	0.108	19/25	0.307	7/27	0.333	14/25
Best score	1.000	1/25	1.000	1/25	1.000	1/27	0.683	1/27
Highest rated country	Cyprus		Estonia		Poland		Estonia	

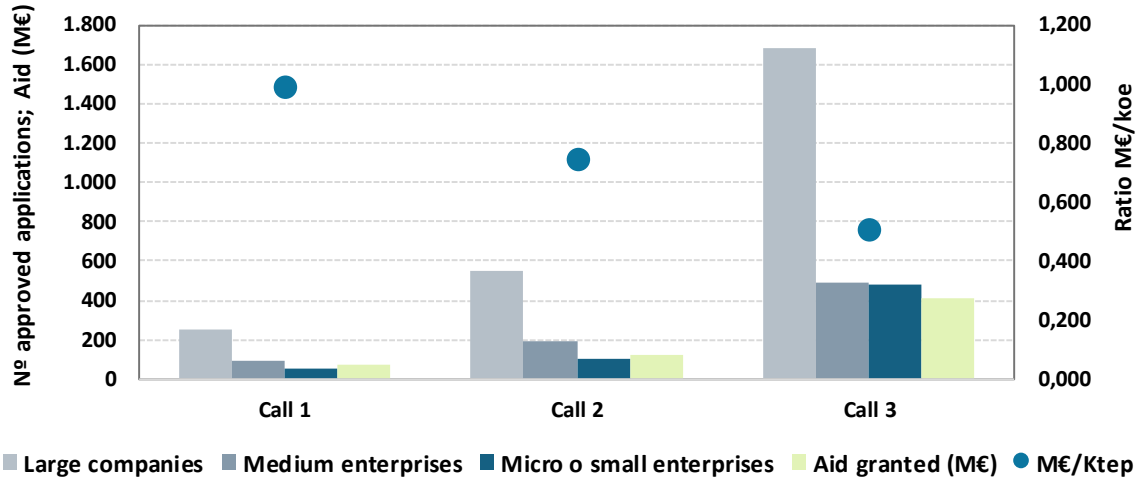
Source: ODYSSEE.

4.1.4. Energy efficiency policies

Energy efficiency measures in industry, generally framed within the different efficiency plans, and more recently within the PNIEC, are aimed at promoting investments in efficiency projects through technological improvements and the implementation of management systems and energy audits. Under the new PNIEC, greater emphasis is expected to be placed on energy-intensive industries. The most recent measures include the Aid programme for energy efficiency in SMEs and large companies in the industrial sector, funded by the FNEE; the obligation to carry out energy audits in large companies imposed by Royal Decree 56/2016, of 12 February; and financial aid for the manufacturing industry funded by the Recovery Plan (PRTR).

The **Aid programme for SMEs and large companies in the industrial Sector**, coordinated by the IDAE, approved in May 2015, aims to promote energy efficiency improvement actions through technological improvements in equipment and processes and the implementation of energy management systems. The economic-energy ratio of the actions must be less than 14,379 €/toe in the first case and 14,501 €/toe in the second one. Since its launch, there have been three calls of the programme, with a total budget of €909.5 million, of which €652.08 million corresponds to the last call, in force since April 2019. In total, nearly 6,500 applications have been received, with 60% receiving a positive assessment. More than half of these applications are concentrated in the third call.

Figure 38: Applications under the FNEE-Aid programme for SME and large companies



Source: IDAE.

The high number of applications received together with the efficiency of the actions implemented, assessed based on the ratio between aid granted and energy savings generated, with significant

improvements achieved in each call of the programme, mean that this programme has great potential for energy savings in industry (Figure 38). It is therefore expected to have a positive impact on meeting the savings target set by the PNIEC in this sector.

Aid granted to the manufacturing industry under the PRTR (Table 4) includes aid for the **implementation of innovation and sustainability plans (IDI),** as well as aid for the **Strategic Projects for the Economic Recovery and Transformation (PERTE)**[19] of Electric Vehicle and Connected **(PERTE VEC),** the Naval Industry **(PERTE Naval), and Industrial Decarbonisation**. The Ministry of Industry and Tourism (MINTUR) is responsible for managing and granting all these financial aid schemes.

Table 5: Aid lines for energy efficiency in industry under the PRTR

Aid lines		Regulatory bases	Budget (M€)
Aid line for innovation and sustainability plans in the manufacturing industry (IDI)		Order ICT/789/2021, of 16 July	432.0 (1)
PERTE VEC	Aid line for integrated actions in the industrial chain of plug-in electric vehicles	Order ICT/739/2022, of 28 July	2,957.0
	Aid line for electric vehicle battery production projects	Order ICT/736/2023, of 5 July	1,137.0 (2)
PERTE Naval	Aid line for actions to integrate and transform the industrial value chain in the naval sector	Order ICT/739/2022, of 28 July	190.0
PERTE Industrial Decarbonisation	Aid line for integrated action towards the decarbonisation of the manufacturing industry	Order ITU/1434/2023, of 26 December	999.8

Source: IDAE/MINTUR.

Notes: Aid includes loans, grants or a combination of both; (1) Includes 2021, 2022 and 2023 calls; (2) Includes 2023 and 2024 calls.

Overall, financial aid schemes promote efficiency through the implementation of plans or projects framed within different lines of action, including incentives for sustainability, energy savings and efficiency, and innovation in each investment.

In addition to these measures, the recent approval by the Ministry of Industry and Tourism (MINTUR) of a **Line of aid to electro-intensive industrial** consumers stands out, as compensation for the charges associated with the financing of the specific remuneration for electricity production from renewable energy sources and high-efficiency cogeneration, and for additional financing in non-mainland territories (extracost). These aids are conditional on meeting a range of obligations, such as the implementation of energy efficiency actions following audits under the energy management system, which beneficiary companies must have as a requirement. The amount of aid approved in the 2024 programme amounted to €31.878 million.

Further details of all these measures are available on the MURE Database (www.odyssee-mure.eu), which includes a total of 10 selected measures within the industrial sector, most of them of a financial nature and with a high impact expected in terms of energy savings. The PNIEC provides for the implementation of new mechanisms such as CAEs and voluntary agreements, both with representative associations of industrial sub-sectors and with trade union organisations to facilitate the rapid adoption of efficient technologies.

[19] PERTEs are public-private instruments involving the collaboration of public authorities, companies and research centres. They seek to promote major initiatives that explicitly contribute to the transformation of the Spanish economy. To date, twelve PERTEs have been adopted in different strategic areas.

3.3 Transport sector

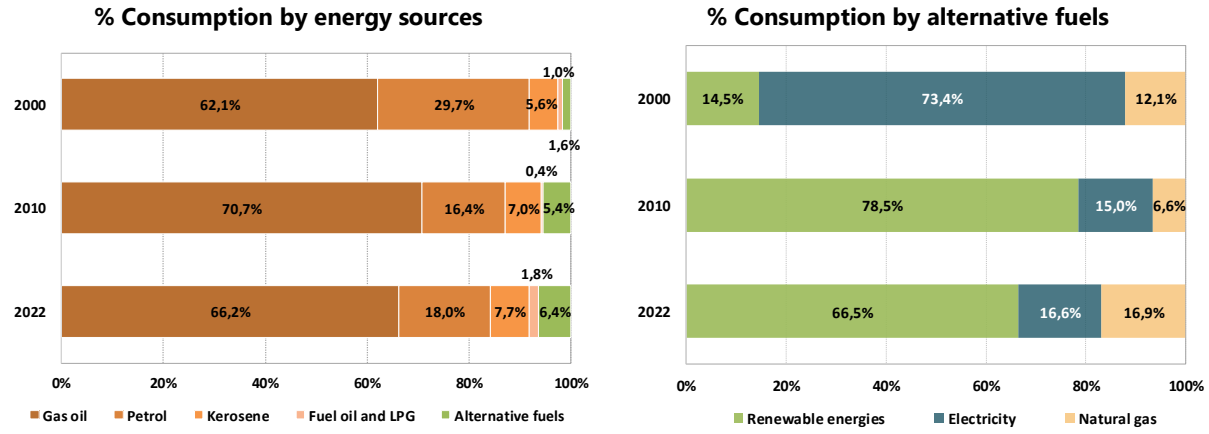
4.1.5. Energy efficiency trends

Transport remains the sector with the highest consumption, reaching a 41.7% share of final energy consumption in 2022. In 2022, transport energy demand has grown by 7%, down from a record increase (+16.5%) in 2021 following the recovery of transport after pandemic restrictions were lifted. The slowdown seen in 2022 seems to be linked to the impact of inflation and high energy prices on transport costs, in a context of uncertainty produced by the tension between Russia and Ukraine.

The increased demand in 2022 is mainly due to oil products, which account for 93.6% of transport consumption. All fuels, except renewable energies (-2.0%), have experience an increase in consumption, with variations ranging from 7.3% (oil products) to 23.6% (natural gas). In 2022, there has been less demand for oil products compared to the previous year (+17.4%), largely due to diesel, whose demand has grown 5 times less than in 2021, possibly due to the high prices of this fuel.

Alternative fuels, which are increasingly common, cover barely 7% of transport energy demand (Figure 39). More than 80% of alternative fuel consumption is concentrated in road transport, mainly in the form of biofuels, especially biodiesel, which accounts for 92% of the consumption of these products. In recent years, natural gas and electricity have gained more importance thanks to the increased purchase vehicles powered by these fuels. However, their combined share in 2022 does not exceed 1.0% of road transport demand. By 2030, a significant change in the energy supply structure of transport is expected to be stimulated by the PNIEC, boosting the electrification of transport and the use of advanced biofuels in line with transport decarbonisation and climate neutrality targets.

Figure 39: Energy consumption by energy sources in the transport sector in Spain (2000-2022)



Source: ODYSSEE, MITERD/IDAE.

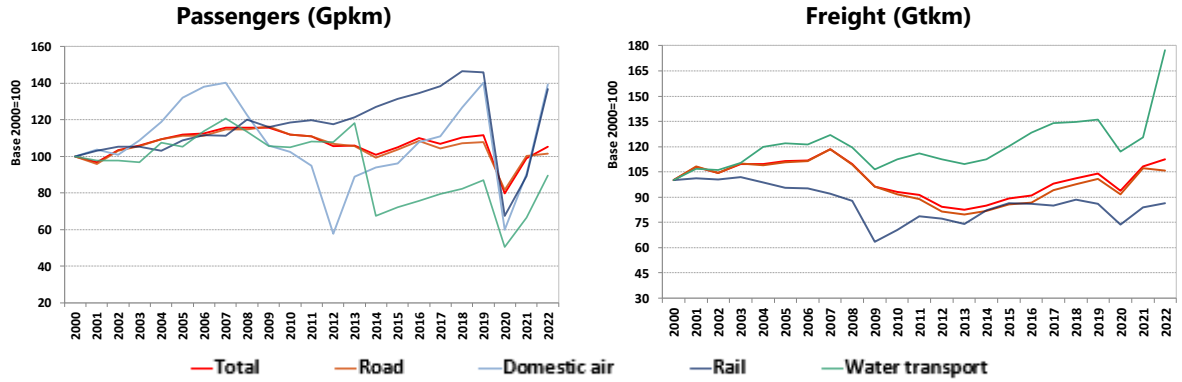
Note: The consumption of international air transport is excluded.

In contrast to 2021, which was characterized by a recovery in mobility across almost all modes of transport, especially road transport, in 2022 there has been a change in the economic situation, largely associated with the evolution of diesel prices[20]. This explains the loss of momentum in road transport, especially freight transport (Figure 40), where activity has stagnated compared to 2021, thus limiting energy demand growth to 4.0%, more than 3 times lower than that seen in 2021. The

[20] This situation was partially alleviated by the diesel price rebate applied under Royal Decree-Law 6/2022 of 29 March.

other modes of transport, less affected by the price situation, have recorded higher growth than in 2021, both in terms of activity and energy demand.

Figure 40: Passenger and freight traffic in Spain (2000-2022)

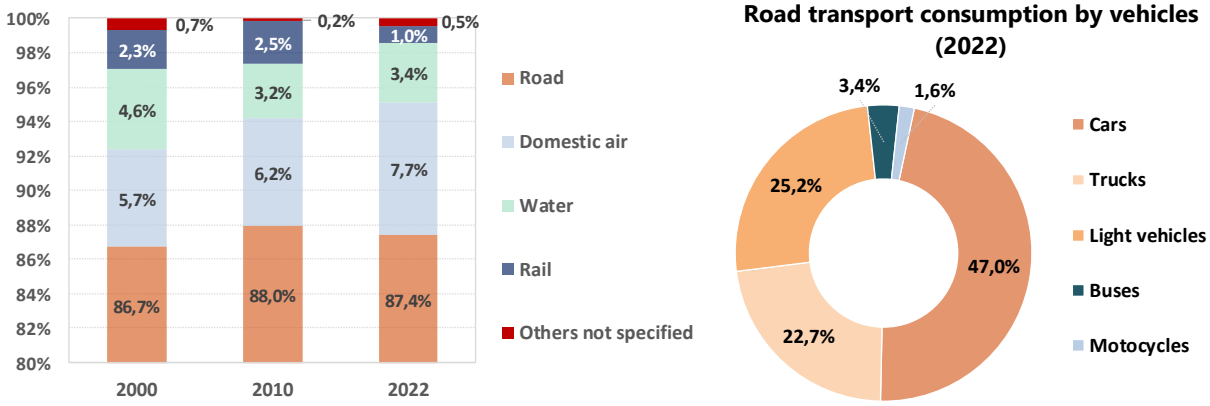


Source: MITERD/MTMS/IDAE/DGT.

Note: Air freight barely represented 0.02% of domestic freight traffic, so it has not been included in the figure.

Despite fluctuations in energy prices, road remains the dominant mode of transport, with about 90% of transport consumption (Figure 41). Domestic air transport follows further behind with less than 8% of total consumption. Meanwhile, water transport and rail transport maintain shares of less than 4%. The prominence of road transport is explained by the use of trucks and light vehicles, which account for more than 80% of freight transport, and private vehicles, with a similar percentage in passenger transport. The dominance of these vehicles over other more efficient transport modes such as rail and public transport determines the intensive nature of national transport and its energy dependence on oil products.

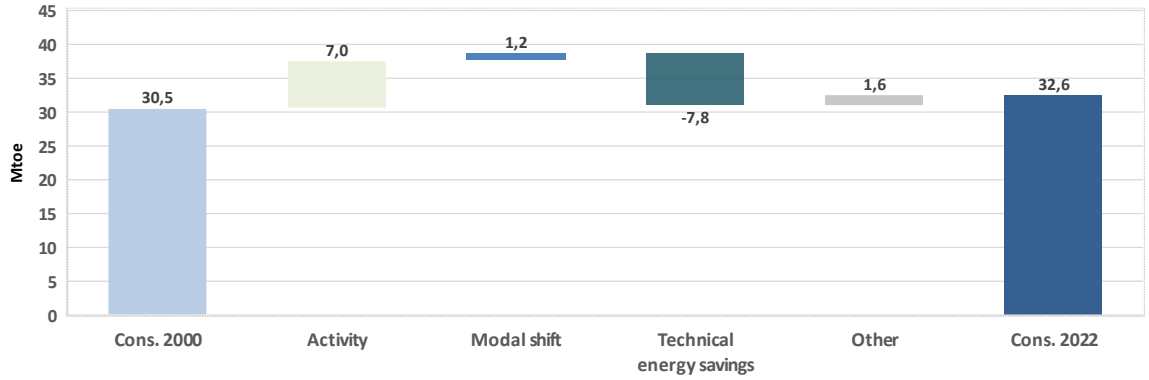
Figure 41: Energy consumption by transport modes in Spain (2000-2022)



Source: MITERD/IDAE/DGT.

In the period 2000-2022, energy consumption in the transport sector has increased by 2 Mtoe, driven by passenger and freight traffic, despite disruptions caused during times of crisis (Figure 42). Other factors such as inefficient use of vehicles and the limited intermodality have also contributed to the increase. This trend has been partially counteracted by energy efficiency improvements driven by technological advances in vehicles. The impact of these factors varies across periods, as explained below in the analysis of energy intensity.

Figure 42: Decomposition of energy consumption variation in the transport sector in Spain (2000-2022)

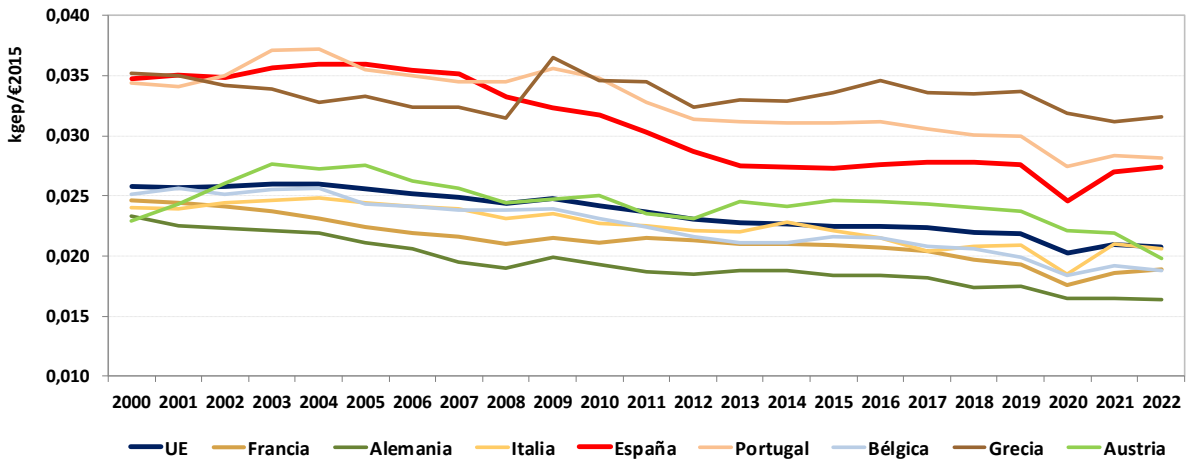


Source: ODYSSEE.

The modal structure of transport dominated by road, together with the age of the vehicle fleet and the limited development of intermodality, among other factors, explain the higher intensity of transport in Spain compared to the European average (Figure 43). However, this gap has narrowed over the last two decades, in line with a progressive decrease in the national indicator. This has been influenced by efficiency improvements resulting from energy saving and efficiency policies, technological advances that have boosted the market penetration of more efficient vehicles, as well as other effects triggered by various economic conditions. However, the renewal of the vehicle fleet has slowed down in recent years due to the supply crisis, which has been passed on to the supply of newer, more efficient vehicles.

In the last three years, intensity has been erratic due to disruptions in the economy. A sharp decline was recorded in 2020 under the impact of mobility restrictions, followed by an upturn of 9.9% in 2021 due to the rebound in demand following the recovery of activity post-COVID-19. In 2022, intensity has continued to worsen, albeit more moderately, with an increase of 1.4%. All in all, it can be said that activity-related effects on intensity in the post-pandemic context countered the positive impact of technology.

Figure 43: Energy intensity in the transport sector in Spain and the EU (2000-2022)

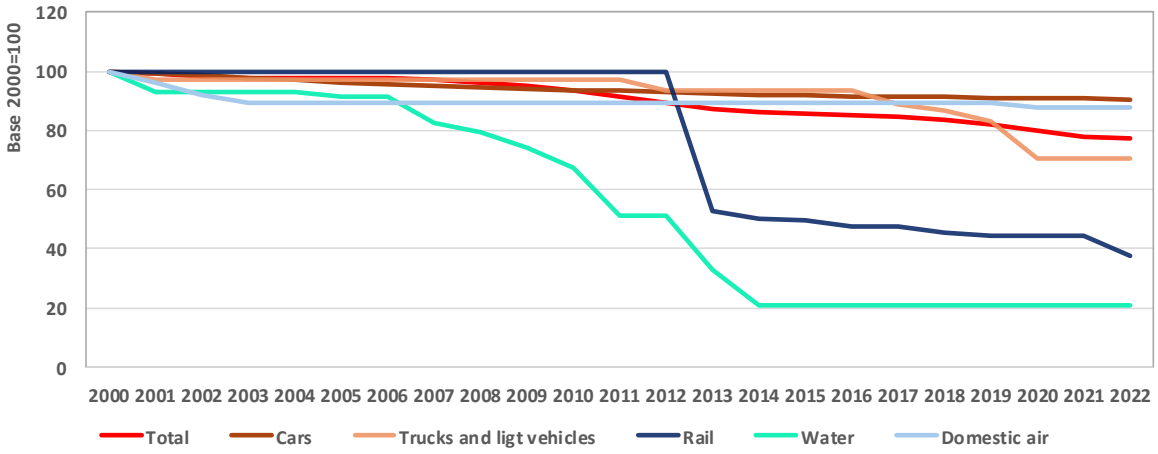


Source: ODYSSEE, IDAE.

Analysis based on the ODEX technical index shows an average annual improvement of 1.2% in the energy efficiency of transport in the period 2000-2022 (Figure 44). By mode, inland waterway and rail transport stand out with average annual improvements of 6.9% and 4.3% respectively, while air transport shows the smallest increase (0.6% per year) over the period.

The evolution of road transport, with an average annual improvement of 1.9%, is a determining factor in the progress of transport efficiency, given its share in the sector's consumption. Technological improvements in private vehicles and trucks contribute to the progress of road transport. In the case of private cars, most of their improvement have taken place before the 2008 crisis. This may be due to the slowdown in the pace of vehicle fleet renewal under the impact of this crisis, recently compounded by the supply crisis, affecting the supply of efficient vehicles.

Figure 44: Energy efficiency progress in the transport sector in Spain

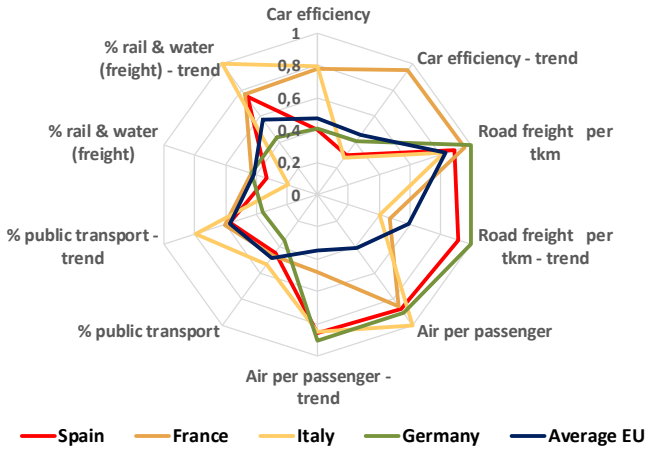


Source: ODYSSEE.

Despite the progress of inland waterway transport in the 2000-2022 period, rail showed the most progress since 2013. This could be due to efficiency investments made by rail network operators, including the expansion of infrastructure including more efficient high-speed trains, regenerative braking systems and the implementation of efficient driving techniques.

According to the scoring methodology used in the EU Energy Efficiency scoreboard, Spain, despite its still high intensity, ranks fourth in the European comparison. This is mainly due to progress in efficiency trends and the impact of adopted energy efficiency policies (Figure 45). On a more detailed level, Spain holds a similar position in terms of the specific consumption of air transport and freight transport, above the EU average in both cases. However, the situation is less positive for private vehicles and the share of less intensive modes in freight and passenger transport, ranking similarly to the EU average. On the other hand, in inland waterway and rail freight transport, the trend shows progress, with a score above the EU average.

Figure 45: Score of the transport sector in Spain and the EU according to the EU EE Scoreboard



Source: ODYSSEE.

Notes:

Specific consumption of cars (goe/km)
Specific consumption of trucks and light-duty vehicles (goe/tkm)
Specific consumption of air transport (goe/pass))
Share of passenger traffic in public transport (%)
Share of freight traffic in rail and inland waterway transport (%)

As detailed below, there are currently a range of measures aimed at transport, which are expected to aid the decarbonisation of this sector and improve its energy efficiency.

4.1.6. Energy efficiency policies

The transport is a key sector in the achievement of energy efficiency, decarbonisation and climate neutrality targets, which is why it has seen a wide range of energy efficiency policies and measures in Spain. In general, all these measures are divided into three action axes: **improving the efficiency of the vehicle fleet** through vehicle renewal; **promoting modal shift** towards more efficient and sustainable modes of transport; and the **efficient use of transport modes**. These three axes remain in force through the different measures set out by the PNIEC within this sector, associated with the highest percentage of sectoral savings (37%) in relation to Art. 8 of the EED.

Regarding the **first axis**, **improving the efficiency of the vehicle fleet**, numerous measures and aid programmes have been implemented in recent years aimed at renewing the vehicle fleet towards sustainable mobility, prioritising the electrification of transport. These measures include the **MOVES, MOVES Singular Projects** and **MOVES FLOTAS programmes promoted by the MITERD** and coordinated by the IDAE, as well as the **Programme for the sustainable transformation of freight and passenger fleets of the Ministry of Transport and Sustainable Mobility (MTMS)** (Table 5). These programmes have been funded by the PRTR, except for the first edition of the MOVES programme.

Table 6: Recent aid programs for energy efficiency in transport in Spain

Aid Programmes	Legal Basis	Budget (M€)
MOVES II & III (Incentive programmes for efficient and sustainable mobility)	RD 569/2020, of 16 June (1) RD 266/2021, of 13 April (1)	119.83 1,550
MOVES Singular Projects II (Incentive programme for singular projects in electric mobility)	Order TED/800/2021, of 23 July	130.0 (2)
MOVES FLOTAS (Incentive programme for light vehicle fleet electrification projects)	Order TED/1427/2021, of 17 December	2,957.0
Programme for the sustainable transformation of freight and passenger fleets	RD 983/2021, of 16 November (1)	400.0

Source: IDAE/MTMS.

Notes: (1) The legal basis of these programmes has been modified through different Royal Decrees; (2) Includes 3 calls approved between 2022 and 2023.

The MOVES Programme was adopted in February 2019 with an initial budget of €45 million. It sought to fund initiatives to support electric mobility based on efficiency, sustainability and the promotion of alternative energy. Eligible actions included the purchase of electric vehicles, the implementation of electric charging infrastructures, bicycle loan schemes and the implementation of measures included in Transport to Work Schemes (PTT). Following this first edition, two new ones have been launched, MOVES II in June 2020 and MOVES III in April 2021, with a combined budget of €1,669.83 million. Throughout these new editions, some requirements have been changed in order to improve the available use of funds and the contribution to the transport decarbonisation targets set out in the PNIEC. As such, the third version of the programme focuses more on the electrification of mobility, with a greater incentivising effect.

Since the adoption of this programme, the purchase of more than 150,000 vehicles, mainly pure electric cars (BEVs), has been stimulated, facilitating the implementation of around 120,000 electric charging points, both public (18.5%) and private (81.5%).

This programme is complemented by the MOVES FLOTAS Programme, aimed at promoting integrated projects for the electrification of light vehicle fleets using electric and fuel cell vehicles, operating in more than one region in Spain. Since its adoption in January 2022, three rounds of the programme with a total budget of €130 million have been launched. Eligible actions include the purchase of electric and fuel cell vehicles, the installation of electric vehicle charging points in the car parks of applicant companies or entities, and other measures aimed at transforming fleets towards electrification.

Meanwhile, the MOVES Singular Projects II Programme reinforces the drive towards efficient and sustainable mobility seen under the previous programmes. This programme is a continuation of the former MOVES Singular Projects I Programme, adopted in July 2019 with an allocation of €15 million, focusing on innovative electric mobility projects. These aids are aimed at technological development and innovation that promote the technological leap towards electric vehicles and boost technological readiness.

These programmes are complemented by the Programme for the sustainable transformation of freight and passenger fleets, which aims to decarbonise professional road transport by renewing the fleet of heavy goods and passenger vehicles (excluding those that are publicly owned). The programme promotes the adoption of propulsion technology based on low-carbon alternative energy sources. Actions under this programme include the scrapping of vehicles, the purchase of low-emission alternative vehicles, the retrofit of fossil fuel vehicles to zero-emission vehicles, and the installation of electric recharging infrastructure. This programme is significant from an energy and environmental point of view, given the volume of GHG emissions generated by heavy-duty road transport fleets in Spain (8.2%), despite representing only 2% of the vehicle fleet.

In addition to these programmes, there are other initiatives such as the Energy Efficiency Strategy for the State Road Network (RCE), adopted by the Council of Ministers on 25 October 2022, which seeks to improve the efficiency of the state road network and reduce energy consumption by 50% by 2030. This strategy, managed by the General Directorate of Roads (DGC) foresees the renewal of the vehicle fleet by 2030, prioritising the replacement of conventional vehicles with low-emission vehicles, with an estimated investment of €10 million in this type of measure. There are also numerous aid programmes available to EELL aimed at infrastructure and mobility improvements, as indicated in section 4.1.1.

The drive to renew and improve the efficiency of the vehicle fleet is underpinned by legislation that promotes the use of clean, efficient vehicles in road transport and the electrification of transport through the removal of regulatory barriers, and the regulation of the provision of energy recharging services for electric vehicles. Of relevance in this regard are the following recently enacted legal provisions: Royal Decree-Law 24/2021[21] of 2 November; Royal Decree-Law 29/2021 of 21 December; Royal Decree 184/2022 of 8 March; and Order TMA/277/2023 of 21 March. These measures (Table 7) are aligned with Royal Decree 639/2016[22], of 9 December, which establishes a framework of measures for the implementation of an alternative fuel infrastructure, thereby reinforcing the boost to electric mobility and the sustainability of transport.

Table 7: Recent regulatory provisions supporting electric and sustainable mobility

Provisions	Relevant points
Royal Decree-Law 24/2021, of 2 November	Minimum public procurement targets for clean vehicles by 2025 and 2030
Royal Decree-Law 29/2021, of 21 December	• Specific obligations and deadlines for the installation of high-capacity recharging points. • Bringing forward the obligation to install recharging points at petrol stations. • Requirement to incorporate minimum electric vehicle charging infrastructure in car parks in non-residential buildings and existing car parks.
Royal Decree 184/2022, of 8 March	Requirements for the provision of recharging services at publicly accessible electric vehicle charging infrastructures.
Order TMA/277/2023, of 21 March	Simplification of the administrative requirements for obtaining authorisations for recharging points on the State Road Network.

Source: IDAE.

Support programmes for electric mobility and legal developments have contributed to the expansion of the electric vehicle fleet and charging infrastructure, set to reach 448,279 vehicles and 29,300 public charging points by the end of 2023, which is 50.8 and 38.5 times the 2013 figures respectively. However, further impetus is needed through measures such as those outlined above in order to achieve the desired electromobility targets.

Taxation also helps provide incentives to improve the efficiency of transport through measures such as tax on new cars according to CO_2 emissions, in accordance with Spanish Law 34/2007 on air quality. Other measures include tax credits for the purchase of plug-in and fuel cell electric vehicles, and the installation of recharging infrastructures, as adopted under Royal Decree-Laws 5/2023, of 28 June and 8/2024, of 23 December. Moreover, creating a mechanism for assessing energy efficiency criteria[23] when granting aid to public transport systems has a positive impact on transport efficiency. Similarly, the use of environmental badges[24] for vehicle classification supports the shift towards cleaner and more efficient vehicles. This measure is an effective instrument within municipal policies, including both traffic restrictions and the promotion of new technologies through tax benefits. In some cities, this badge is used to restrict traffic during high pollution spells.

Lastly, the Safe, Sustainable and Connected Mobility Strategy 2030 (EMSSC 2030)[25], adopted in December 2021, should be noted for its expected contribution to improving the efficiency of all modes of transport in the coming years.

[21] This Royal Decree transposes, inter alia, Directive (EU) 2019/1161 of 20 June 2019, amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles.

[22] This Royal Decree transposes Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure, recently repealed by Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure.

[23] Measure, approved by Spanish Law 22/2013 on the General State Budget, of 23 December (Art. 117).

[24] By means of Resolution of 13 April 2016, Spain's Directorate-General for Traffic has introduced 4 badges ('zero', 'ECO', 'C' and 'B') according to the environmental impact of vehicles, affecting 50% of the most efficient fleet.

[25] This Strategy replaces the former Strategic Plan for Infrastructure, Transport and Housing (PITVI, 2012-2024).

The measures that fall under this axis are expected to have a positive impact on meeting the targets set by the PNIEC within measures 2.3 and 2.5.

Under the **second axis, modal shift,** the Sustainable Urban Mobility Schemes and Transport to Work Schemes are particularly important. These Plans received a boost following the enactment of the Law 2/2011, of 4 March, on Sustainable Economy, which introduced a legal framework for promoting them. More recently, the Law on Climate Change and Energy Transition has given new impetus to these schemes by making their adoption mandatory in municipalities with more than 50,000 inhabitants, on island territories and in municipalities with more than 20,000 inhabitants that exceed the legal pollutant limit. Measures under these plans include defining low-emission zones (LEZs), promoting active mobility (walking, cycling and other modes of transport) and improving the use of the public transport network, including multimodal integration measures. This measure is complemented by Royal Decree 1052/2022, of 27 December, which governs the minimum requirements of LEZs.

Public support is also available through an **Aid programme aimed at municipalities for the implementation of LEZs and the digital and sustainable transformation of urban transport**, regulated by Order TMA/892/2021 of 17 August. This programme, funded by the PRTR, includes two calls totalling €1,500 million. Its lines of action include implementing LEZs, promoting modal shift in urban and metropolitan environments towards more sustainable modes of transport, prioritising public transport and active mobility, and transforming public passenger and freight transport towards zero-emission activity.

In addition to the above, the Line of aid for the development of Integrated Action Plans of EELL, mentioned in section 4.1.1, includes support for sustainable urban mobility through the development of cycling infrastructure. In the field of sustainable urban mobility, the **State Bicycle Strategy**, approved by the Council on 8 June 2021, stands out. It seeks to move towards sustainable mobility through a modal shift towards cycling. The aim is to increase the share of cycling in daily commuting and in urban goods delivery. The promotion of cycling is reinforced by financial aid to local authorities to support investment in cycling infrastructure, under Order TMA/1131/2022 of 11 November. This financial aid, amounting to an initial budget of €4.7 million, is aimed at municipalities other than provincial capitals with less than 50,000 inhabitants.

Within the modal shift actions, the PNIEC pays special attention to rail as an alternative to road freight transport, given its high efficiency in terms of energy consumption per tonne transported. However, its share of freight transport barely exceeds 4%, well below the European average (17.2%), making it necessary to reinforce its use. In this regard, there is the **2018-2030 Plans to Combat Climate Change of RENFE**, leading railway operator, **ADIF and ADIF-AV**, responsible for managing the infrastructures of the General Interest Railway Network. These entities attached to the MTMS, have various lines of action to promote rail transport efficiency and modal shift. Other measures promoted by the MTMS are the Indicative Strategy for the development, maintenance and renewal of rail infrastructure, adopted under Order TMA/1338/2022 of 23 December, and the **Freight 30** initiative, published on 7 June 2022, which will help to strengthen the efficiency of the railway system and intermodality. These measures are aligned with the priorities of the EMSSC 2030 Strategy, which envisages raising the share of rail to 10%, as well as promoting the use of sustainable mobility solutions in urban and metropolitan environments.

In line with the above, there is the **Programme to support Sustainable and Digital Transport (PATSYD),** regulated by Order TMA/370/2022 of 21 April and allocated with an total budget of €477.05 million from the PRTR. This programme, developed through two calls, will contribute to

the increase of rail freight transport, as it aims to improve freight transport operations and efficiency, and to rebalance the distribution towards less polluting modes, such as rail.

The measures that fall under this axis are expected to have a positive impact on meeting the targets set by the PNIEC within measures 2.1 and 2.2.

Under the **third axis**, **efficient use of transport modes,** there are measures relating to fleet management and efficient driving. Regarding the former, the use of ICT makes it possible to optimize the management of transport services and infrastructures, improving efficiency in the use of modes of transport. This is why the digitalisation of transport is being promoted through the PNIEC. As for the latter, the training system has included driving techniques for getting a driving licence for passenger cars and commercial vehicles since 2014. These measures are expected to have a positive impact on meeting the targets set out in measure 2.3 of the PNIEC.

Most of the measures referred to are available on the MURE database (www.odyssee-mure.eu), where further details can be found. This database includes a selection of 24 current measures within the transport sector, half of which were approved after 2019, most notably financial measures, largely driven by the PRTR.

4 Special focus: Energy poverty policies

Spain has adopted several initiatives in recent years aimed at reducing energy poverty, starting in 2009 with the introduction of the subsidised rate[26], which gives a discount on electricity bills for vulnerable consumers, thus impacting disposable income. Since then, progress has been made in meeting consumer protection requirements, a key milestone being the adoption of Royal Decree 897/2017, of 6 October, which concerns the role of the vulnerable consumer, the subsidised rate and other protection measures. In 2018, the subsidised rate for thermal uses[27] was established by Royal Decree-Law 15/2018, of 5 October, on urgent measures for the energy transition and consumer protection. This Royal Decree-Law represented a step forward in cementing the legal framework on energy poverty by introducing the obligation to adopt a specific strategy to tackle this problem within six months of its entry into force.

In compliance with this obligation, the Council of Ministers of 5 April 2019, adopted the **National Strategy against Energy Poverty, 2019-2024 (ENPE),** which defines the concept of energy poverty in Spain for the first time. It sets out the framework and lines of action to approach this problem holistically in the medium and long term. The Strategy, divided into four axes, provided for a total of **19 measures** of different types (social benefits, structural, informative, etc.) and scope, under **nine lines of action**. An important aspect of the Strategy is the need to improve knowledge on energy poverty (Axis 1), which includes a monitoring study of a selection of vulnerable households. This study is currently underway with the backing of the IDAE and is expected to provide a better understanding of the problem, as well as an assessment of the measures applied in this area. During the validity period of the ENPE Strategy, most of the planned measures have been adopted, in addition to other special measures to address exceptional situations such as the health crisis caused by COVID-19, and later the energy crisis resulting from the Russian invasion of Ukraine. In line with this, consumer protection has been further strengthened with the introduction of a **minimum living supply** through Royal Decree-Law 17/2021, of 14 September, on urgent measures to mitigate the impact of the escalation of natural gas prices in the retail gas and electricity markets. This Strategy, which has come to an end, will be continued through a **new strategy**, currently being drafted, which will cover the **period 2025-2030**.

Moreover, the **ERESEE 2020 Strategy** for energy renovation of buildings pays special attention to energy poverty, in line with the ENPE. The upcoming revised strategy is expected to reinforce this approach through a renovation plan, in line with the new EPBD (Directive (EU) 2024/1275).

The fight against energy poverty is also a key element within the **PNIEC,** through 'Measure 4.2: The fight against energy poverty[28]', which is framed within the scope of the Strategy regarding this issue.

At a more specific level, within the structural measures, which have a greater impact than the short-term financial measures, it is worth mentioning the aid programmes for the energy refurbishment of existing buildings, which include households affected by energy poverty among their target groups. MITERD, through the IDAE, coordinates the **PREE and PREE 5000** programmes mentioned in section 4.1.2, which include a social aspect, as they focus on granting aid for actions in buildings that contain vulnerable households. In accordance with the ENPE Strategy, owners are required to

[26] Those who wish to apply for it must have contracted the voluntary price for small consumers (PVPC) and meet certain income criteria.
[27] Additional mechanism that takes the form of a single payment by bank transfer.
[28] In the previous version of the PNIEC, the fight against energy poverty formed part of Measure 4.11.

have the subsidised rate in order to access this aid. The PREE 5000 Programme, aimed at demographically challenged municipalities, serves to mitigate energy poverty even further, given the prevalence of this problem in rural areas. It also raises the level of both basic (20-50%) and additional aid for all types. In addition, there are the **MIVAU aid programmes** for **residential renovation** and **energy efficient social housing**, also referred to in section 4.1.2. The support given under these programmes can be up to 100% of eligible costs for the most vulnerable households.

In addition, various **actions of an informative and behavioural nature** are underway, promoted by different types of actors, highlighting the role played by **third sector entities** due to their proximity to and knowledge of the reality of the most vulnerable groups. These actions include advice on applying for social aid, which affects income by reducing energy bills, as well as energy empowerment and information actions, providing consumers with tools to manage their energy consumption more efficiently.

To summarise the types of measures currently available in the field of energy poverty, the following table presents a selection of different types of relevant actions.

Table 8: Selection of energy poverty measures in Spain

Benefits (*)	Structural	Informative/Behavioural
• Subsidised electricity rate	• Energy renovation programmes: PREE (RD 737/2020); PREE 5000 (RD 737/2020)	• Energy Consumer Information Points Network (PICE Network) (PICE)/ACA
• Subsidised thermal energy rate	• Programmes for energy renovation and the promotion of efficient social housing (Royal Decree 853/2021)	• ENERSOC Energy Social Management Tool/ECODES
• Energy justice electricity rate	• Incentive Programme 6 for the support of RES-E thermal facilities in the residential sector (RD 477/2021).	• Workshops organised by Third Sector entities (EAPN, Naturgy, etc.)
• Minimum Living Supply (SMV)	• Naturgy Solidarity Fund for Energy Renovation	• Energy Price Comparison of the CNMC

Source: IDAE. Policy brief "*Main energy poverty measures in Europe: Characterisation from the EPOV and the EED perspectives" (2024)*

Note: (*) In recent years, the application of subsidised rates has been increased by raising the level of aid and income thresholds for qualifying as a vulnerable consumer, as well as other improvements in the processing of aid.

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