

# Environmental Profile of Spain 2019

PAE



GOBIERNO  
DE ESPAÑA

MINISTERIO  
PARA LA TRANSICIÓN ECOLÓGICA  
Y EL RETO DEMOGRÁFICO



# Environmental Profile of Spain 2019



Madrid, 2020



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**The Environmental Profile of Spain 2019** is a report prepared by the Directorate-General for Environmental Quality and Assessment (National Focal Point of the European Environment Agency in Spain), reporting to the Ministry for Ecological Transition and the Demographic Challenge. This annual series, which began with the Environmental Profile of Spain 2004, aims to make the details of the environmental situation in Spain accessible to the largest possible audience, providing readers with information broken down per autonomous community and reference to the European Union. The structure and content of this edition is the result of a process of evolution and continuous improvement maintaining the guidelines arising from the latest meetings of the EIONET Network, advancing towards more concise and shorter environmental reports. It is comprised of an initial section with a specific thematic analysis, on this occasion dedicated to the situation and relationship between the environment and health. A second section covering four fields of knowledge comprising the 14 environmental and sectoral topics, on which the environmental information is structured, supported by environmental indicators (71 in total), each presented in summary form in a descriptive file. One new feature of this edition is that it is presented horizontal format, offering an analysis of the trends for most indicators and environmental assessment for specific periods of time, depending on the information available. Similarly, the third section, dedicated to the autonomous communities, differs in structure from past editions as, rather than individual files for each autonomous community, the information is presented graphically for six environmental topics, in which the status of each autonomous territory is analysed individually. Section four includes three appendices that complement the contents and use of the document. Since the 2012 edition, the publication has been available to download with mobile devices, formats that have been maintained this year.

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# **Environmental Profile of Spain 2019**

*Indicator-based Report*

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# PRESENTATION

To present the Environmental Profile of Spain 2019 is no easy task amid the uncertainty caused by COVID-19 that is impacting on our health, social, economic and environmental conditions. When I say our I refer to Spain but the same applies in the wider European and indeed global context too. This disease has crossed borders and its effects should be considered in the same way. We should approach the environment similarly. Global problems cannot be resolved by individual countries or regions but must be tackled on a joint basis by everyone. Perhaps today more than ever, we must remember that the measures adopted to protect our environment must be assumed jointly.

In this sense, and coinciding with the crisis arising from the pandemic, the Environmental Profile of Spain 2019 contains a global analysis of the relationship between the environment and health, a global challenge that has concerned us now for some time. I trust that it is a starting point for future research and public information initiatives. There were many environmental events held in 2019, but if there was one worth highlighting it would be the Climate Summit (COP 25) held in Madrid in December 2019 and coordinated by this Ministry in cooperation with Chile in order meet that country's commitment to host the event. There was some gap, however, between the success of the

event itself at the organisational level, planned in record time, and the agreements ultimately adopted. They lacked the immediate response required by the current climate emergency. Spain and most participant countries were expecting something more from this Conference of the Parties. Nevertheless, the Chile-Madrid Time to Act agreement saw countries initially commit to present more demanding climate commitments at the 2020 Climate Summit, due to be held in Glasgow (Scotland), which of course was postponed and is now expected to take place from 1 to 12 November 2021.

Subsequently, taking into account the environmental commitments and responsibilities assumed as a country, on 21 January 2020, the Council of Ministers approved the Declaration of the Climate and Environmental Emergency in Spain, adopting 30 priority lines of action to combat climate change with transversal policies.

While the situation at end of 2019 offered an optimistic and hopeful vision, looking forward to the possibility of closing many of the initiatives that this Ministry had undertaken and assuming the demographic challenge among its competencies, the start of 2020 cut short our planning to a great extent as we were mired in the health, social and economic crisis that COVID-19 generated across the world.

The Environmental Profile of Spain 2019 itself was drafted during the period of lockdown after the State of Emergency was approved as a consequence of the COVID-19 global pandemic. There were a number of new initiatives undertaken as part of the process in terms of the format, presentation and content, with the focus always on providing the final user with the best information and making it as attractive as possible for the reader. I believe that we must congratulate ourselves on being capable of maintaining the excellent level of work in the complex conditions arising from the pandemic and I reiterate the message of recent months: #WeWillStopThisVirusTogether #EsteVirusLoParamos Unidos.

The report's new presentation in landscape format, facilitating online digital reading, and the launch of the interactive adaptation process to illustrate the information by autonomous communities are two examples of improvements implemented in this edition. These changes demonstrate the commitment to publishing environmental information and disseminating it across society using new, constantly evolving digital formats.

In this edition, the Environmental Profile is comprised of 71 indicators organised in 14 chapters across four sections; a structure inherited from last year's edition and that to a great extent reflects the scope of the responsibilities of this Ministry. There is also a specific reference to the "Circular Economy" within the Sustainability section, thus adapting to the new structure of the Ministry, in light of the creation of a Sub-directorate General with responsibility for the prevention and management of waste, sustainable production and consumption, the circular economy and contaminated soils. It is very important to reinforce our regulation of single-use plastics and waste

management, providing all the environmental and economic support we can for the selective collection of waste such as textiles and biowaste and the recycling of municipal waste.

At the same time, the correction of Spain's territorial imbalance is one of the priorities of this Ministry. The chapter on Economy and Society covers the situation experienced in many areas of Spain that are suffering from loss of social and territorial capital, with declining populations and a lack of opportunities. The role of citizens is particularly important within this line of work in order to reach our climate action and environment goals. Their participation in the energy sector, especially in the renewable energy production sector in these same areas of the country, is one of the principal alternatives for employment and for local recovery, simultaneously tackling the energy transition and the demographic crisis. The prominent role of citizens does not end there. The figures for the population at risk of poverty or social exclusion show energy poverty to be one of the conditioning factors and that has been made an area of priority focus. There is a need to reduce it while ensuring the capacity to satisfy the needs of consumers.

While all the chapters of the report are important, I would like to make special reference to Energy and Climate which, along with Emissions and Air Quality, provides crucial information for the management of environmental policy, where the focus on the energy transition and the health of the population has been consolidated. The process of fair transition towards less pollutant energy systems, which enables us to advance towards a decarbonised economy resilient to climate change, requires the design of measures to foster and support those population groups that formed a key part of energy production systems that are now obsolete

and damaging to the environment. In this regard, the structure of the Ministry for Ecological Transition and Demographic Challenge, approved on 28 April, incorporates the Institute for Fair Transition as an instrument to manage the processes of transformation and closure of coal fired and nuclear power plants. Its contribution will be focussed on the socio-economic aspects of the ecological transition, and it will be an important source of information for the forthcoming editions of the Environmental Profile of Spain, by centralising Government action in this area.

So too will the National Plan for Adaptation to Climate Change 2021-2030, approved by the Council of Ministers on 22 September 2020, and which will help us to build a country that is more resilient to the impacts of climate change; the Integrated National Energy and Climate Plan 2021-2030 (submitted to the European Commission in March 2020); the Long Term Decarbonisation Strategy 2050, approved by the Council of Ministers on 3 November and which maps out the path to reaching climate neutrality by 2050; the Climate Change and Energy Transition Bill, currently in the parliamentary processing stage; and the recently approved National Strategy on Green Infrastructure, Connectivity and Ecological Restoration, which constitutes a fundamental planning tool to identify, preserve and recover damaged ecosystems located and interconnected throughout Spain. The Green Infrastructure Strategy will enable us to tackle one of the fundamental challenges to the conservation of nature in Spain which is the deterioration of ecosystems and the services they provide, and their fragmentation.

Last year's edition highlighted the importance of environmental information, its dissemination and, above all, the importance of environmental reports as

fundamental elements of environmental knowledge. For that, the creation of information networks has been, and remains, a fundamental step towards citizen science acquiring an increasingly significant role in the generation of information. Of all the information networks, I would like to mention the important contribution of the EIONET network that, promoted by the European Environment Agency, has representatives for different environmental issues in Spain, at both national and autonomous community level, as well as other collaborating experts. Thanks to them, it has been possible to draft this report. The EIONET network has performed its functions and operations at the highest level even in the difficult circumstances we have had to face, offering an example of strength and resilience.



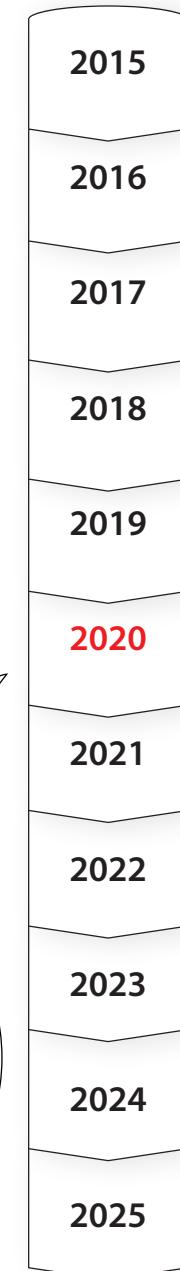
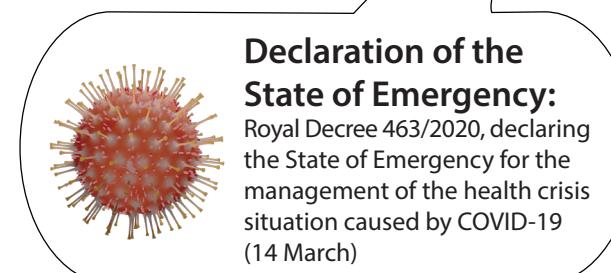
Teresa Ribera Rodríguez  
Fourth Vice-President of the Government  
and Minister for Ecological Transition  
and the Demographic Challenge

# NOTES TO THE PRESENT EDITION

## About Brexit

Council Decision (EU) 2020/135 of 30 January 2020 on the conclusion of the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community was published on 30 January 2020. With this international agreement, the exit of the United Kingdom from the EU-28 was formalised, with effect from 31 January 2020. This will condition the European social, political and economic space from 2020 on. But, moreover, it will condition the presentation of EU information in forthcoming editions of the Environmental Profile of Spain, which, in the European sphere, will refer to the EU-27, comprised of: Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

Given that in 2019 the United Kingdom of Great Britain and Northern Ireland was a full member of the EU, and that the Environmental Profile of Spain 2019 is the last year that will offer information on 2019 (depending on the availability of data for the indicators), references to the European Union are to the EU-28, including the United Kingdom in the comparison with other countries and in European averages.



## About COVID-19

The start of the year 2020 was dominated by the health crisis caused by COVID-19 (an infectious disease caused by the SARS-CoV-2 virus), which emerged in China in late 2019, impacting all aspects of our society with thousands of deaths and placing the health system under unprecedented pressure due to the numbers of those affected requiring treatment. It also precipitated the collapse of the global economy due to the confinement measures adopted to prevent contagion, leading to the interruption of activity in most sectors of the economy.

The evolution of the spread of the disease, declared a pandemic present on all continents, caused real panic on the financial markets resulting in a global recession the consequences of which remain uncertain.

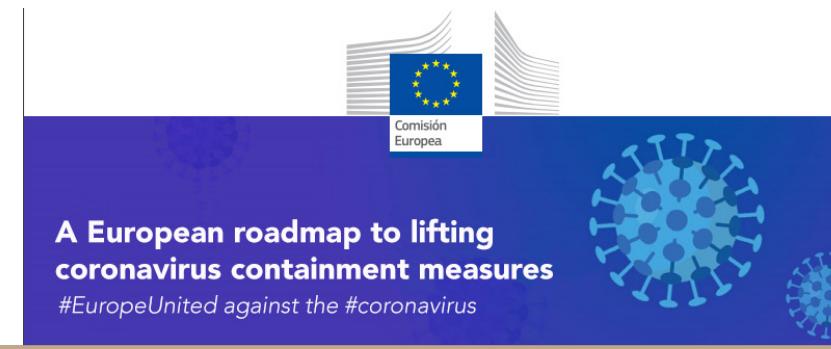
At EU level, on 26 March the members of the European Council agreed a joint Declaration calling for a coordinated exit strategy and integrated recovery plan accompanied by the necessary investment and the drafting of a roadmap for its application. This common European [Roadmap](#) was presented by the European Council to the President of the Commission on 15 April under the title *A European roadmap to lifting coronavirus containment measures*.

On 27 May 2020, the European Commission presented its proposed recovery plan and accompanying investment, completing the provisions established in the Roadmap.

The public health challenge of the first order arising from the spread of the disease led to the declaration of the State of Emergency in Spain and the adoption of extraordinary measures of confinement of the population in their homes and the cessation of most productive activity.

On 14 March 2020, the BOE published *Royal Decree 463/2020, declaring the State of Emergency for the management of the health crisis situation caused*

by COVID-19. This state of emergency was subsequently extended until it ceased. The last extension was contained in Royal Decree 555/2020, of 5 June, extending the State of Emergency declared under Royal Decree 463/2020, of 14 March, declaring the State of Emergency for the management of the health crisis situation caused by COVID-19, in force up to 00:00 on 21 June 2020, the date upon which the State of Emergency will cease to have effect. Established therein are the conditions adopted by the Government of Spain to prevent contagion and initiate the country's recovery and transition to a "new normality".



**A European roadmap to lifting coronavirus containment measures**  
#EuropeUnited against the #coronavirus

*"The recovery phase – revitalising an economy that works for people. While confinement measures are gradually lifted, there is a need to strategically plan the recovery, revitalising the economy and getting back on a path of sustainable growth. This includes enabling the twin transition towards a greener and digital society, and drawing all lessons from the current crisis for the EU's preparedness and resilience. The Commission will develop a recovery plan, based on a revamped proposal for the next long-term EU budget (Multiannual Financial Framework) and including an updated Commission Work Programme for 2020."*

Source: European Commission. 2020. *A European roadmap to lifting coronavirus containment measures*.

Due to this situation, the scenario described for Spain, corresponding to the year 2019 and reflected in this edition of the Environmental Profile of Spain has changed radically over the first months of 2020. It will continue to change over the coming months and it remains impossible to correctly estimate the effects of COVID-19 on our economic structure.

Sectors such as tourism, transport, industry, etc. will be enormously affected by the pandemic in 2020. We can speak, therefore, of the pre-COVID-19 situation for these sectors, a circumstance that is thus reflected in this Environmental Profile of Spain 2019. We must be conscious of the high degree of existing uncertainty regarding the impact and duration of disruption of the economy, the consequences of which will depend on the real fall in production and consumption. The economic and social consequences will have to be evaluated over the medium to long term, when sufficient and accurate data is available for that and, in part, will be reflected in the analysis of the indicators in the future edition of the Environmental Profile of Spain corresponding to the year 2020.

## About the data series and the date of collection of information

The update to the data series for another year may involve the review and correction of previous years' data and, therefore, some differences may be observed in some of the values stated for the indicators if they are compared with the indicators included in other editions.

The correct figure will be that published in this latest report (Environmental Profile of Spain 2019), this being the most recent.

The closing date of this edition, with regard to the collection of, or searching for, information, was 30 June 2020.

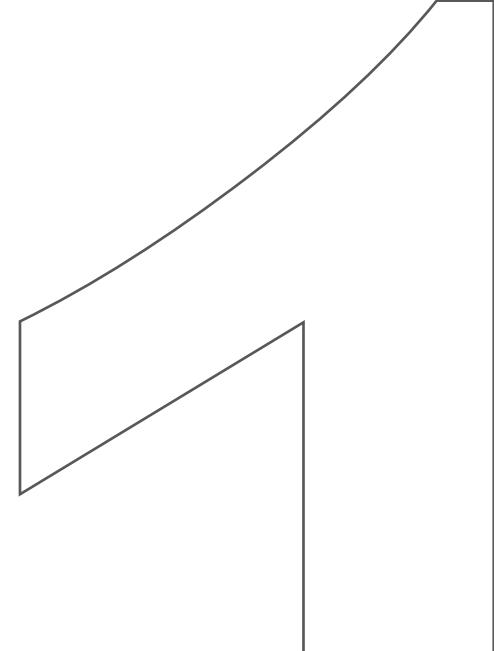
## About the analysis of trends and the clarification notes on the indicators

In this edition, each indicator incorporates, under the graphic, a table in which the evolution of the trend over the last five and ten years is presented, as well as the previous year or other period depending on the availability of the information. This evolution has been estimated as a percentage, when the indicator shows specific physical magnitudes or in percentage points when the indicator refers to a percentage. A green, amber or red-coloured icon has been incorporated to show whether the indicator is performing positively, neutrally or negatively from an environmental perspective. However, there are some indicators for which this evaluation has not been made as they do not have a clear environmental interpretation, presenting only the numerical values of the trend for each period in the table.

The section Methodological notes on the indicators (Appendix I) includes, for those indicators for which it has been considered necessary, clarifications on how to interpret them correctly. These notes may be descriptive or may refer to their calculation procedure. They have been omitted where the definition of the indicators is sufficiently clear or if the methodology used is already included in the source thereof.



# **THEMATIC ANALYSIS. THE ENVIRONMENT AND HEALTH: A GLOBAL CHALLENGE**



## 1. The Environment and Health

Human evolution has always been accompanied by changes in the natural environment. These changes have grown with urban sprawl and increased population density. Above all however, they have increased with the shift towards practices that are more intensive in the consumption of resources and industrial and technological development.

The advance towards improving the welfare state, reaching different parts of the world in an unequal manner, establishes a logical sequence in which the human activities carried out from day to day, both productive and economic and social infrastructure, cause a series of pressures on the environment. These pressures, together with the processes of the natural dynamics of the planet, can alter the human habitability conditions, altering the natural balance of ecosystems that may lead to damage to health, often irreversible.

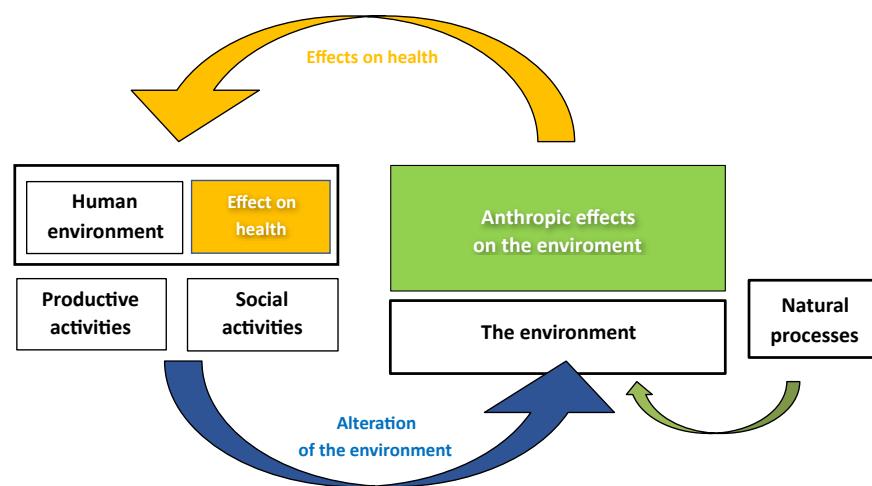
The World Health Organisation (WHO) global strategy project on health, the environment and climate change: transformation necessary for improving life conditions and welfare in a sustainable manner through the creation of healthy environments, presented in Geneva on 18 April 2019 at the 72nd Session of the World Health Assembly, summarises in one paragraph the conclusions of the body's research so that: "Known avoidable environmental risks cause about one quarter of all deaths and disease burden worldwide, amounting to at least a steady 13 million deaths each year. A healthy environment is vital for human health and development. Air pollution – one of the largest risks to health – alone causes seven million preventable deaths per year, with more than 90% of people breathing polluted air and almost 3000 million people still depending on polluting fuels."

For the WHO, the relationship between the environment and health encompasses all the external physical, chemical and biological factors that surround a person and could impact health.

The Commission on Social Determinants of Health (CSDH) is a global network promoted by the WHO to give support in tackling the social causes of poor health and avoidable health inequalities. It is comprised of policymakers, researchers and civil organisations. It was created in 2005 with a mandate to collect and review data on the interventions necessary to reduce inequalities between countries in relation to health and to draft recommendations in that respect.

The Report by the Secretariat of the Commission on Social Determinants of Health of 22 May 2019 (WHA62 9)<sup>1</sup>, drafted by the Commission, helped ensure that the World Health Assembly recognised, in May 2019, the need to reduce health inequalities acting on social determinants of health. The social determinants of health are defined as the "conditions in which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels, which itself depends on the policies adopted". These determinants contribute to explaining the differences of the existing health situation between countries and even within the same country. This report, published in August 2008, proposed the following three general recommendations:

1. To improve the condition of daily life.
2. To combat the unequal distribution of power, money and resources.
3. To measure and analyse the problem.



<sup>1</sup> World Health Organization (WHO). (2009). Commission on Social Determinants of Health Report by the Secretariat. Source [https://apps.who.int/gb/ebwha/pdf\\_files/A62/A62\\_9-sp.pdf](https://apps.who.int/gb/ebwha/pdf_files/A62/A62_9-sp.pdf)

## 1. THEMATIC ANALYSIS: THE ENVIRONMENT AND HEALTH: A GLOBAL CHALLENGE

The objective of this chapter focuses on the analysis of how the environment, altered to a great extent due to human activity, impacts human health, without attempting to cover the entire field of research and analysis of public health problems.

Well-being and health are closely linked to the environment in which we live, which may be defined as "everything around us". One might, for example, talk about the environment of homes, the urban environment, the work environment and, of course, the natural environment. But in any of those environments, good health can only be obtained if there are good quality environmental conditions.

As will be seen, atmospheric emissions arising from our daily activity, (both economic and social), waste water discharge and the generation of waste and the deficient treatment and accumulation thereof, are just part of the problem. We must add to this certain industrial processes that might lead to environmental catastrophes (accidents at industrial facilities, marine discharges, etc.).

With regard to the effects on health of electromagnetic fields, the WHO website offers a summary of this question in which it states that "*over the course of the past decade, numerous electromagnetic field sources have become the focus of health concerns, including power lines, microwave ovens, computer and TV screens, security devices, radars and most recently mobile phones and their base stations*". However, "*to date, no adverse health effects from low level, long-term exposure to radiofrequency or power frequency fields have been confirmed, but scientists are actively continuing to research this areas.*"<sup>2</sup>

The WHO, the principal international body in the area of health, establishes in its general working programme for the period 2019 - 2023 *Promote health, keep the world safe and serve the vulnerable*, establishes its commitment to supporting countries to comply with the Sustainable Development Goals relating to health. To do that it will focus on four priority working areas, the fourth of these being dedicated to "*Effects of climate change and change of the environment on health*". Its specific targets are organised around the following commitments:

- To provide 1 billion people with access to drinking water.
- To provide 800 million people with access to adequate sanitation systems.
- To reduce the mortality rate caused by air pollution by 5%.
- To reduce the number of persons in low and medium income countries treated in hospitals without a reliable supply of electricity or basic water and sanitation services by 40-50%.
- Double the sum of climate funds allocated to health protection in low and middle income countries.
- Reduce the mortality of climate-sensitive diseases by 10%.

It is a global commitment that affects different countries in different ways based on the degree of economic development. No country is immune from the effects of air pollution and the health problems associated

with climate and the importance of access to quality drinking water and an operating sanitation network.

The plan states that the WHO should work on a multi-sector basis and extend its global leadership, tackling climate change and other factors that have an important impact on health, including sectors beyond health.

Within this framework, "air pollution and climate change" are one of the 10 principal threats that the WHO committed to tackling in 2019. That year, the organisation considered air pollution one of the major risks to health, among other reasons because nine of every ten people breathe contaminated air every day. It also stressed the importance of the problem caused by microscopic pollutants existing in the air, due to their capacity to penetrate respiratory and circulatory systems and damage lungs, the heart and the brain. The WHO considers this to be the cause of the 7 million premature deaths every year.

<sup>2</sup> World Health Organization (WHO). (2020). *Electromagnetic Fields (EMF)*. Source <https://www.who.int/peh-emf/about/WhatisEMF/en/>

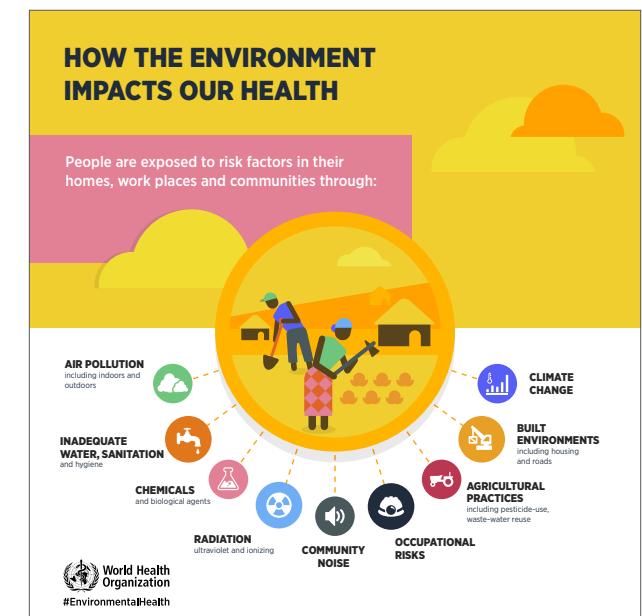


## 2. Consequences of the alteration of the environment for public health

The relationship between human health and the environment has been known for some time. As early as the 4th century B.C., Hippocrates made reference to infectious diseases related to the environment that affected villages. Thanks to the fact that this relationship has been known since antiquity, today it is possible to tackle these diseases from more points of view, considering the interrelation between the individual and their environmental circumstances as arising from human activity. This is due to the change in paradigm in which the state of health was incorporated as a consequence of the environment itself.

As with all other species, humans evolved in a natural environment, to which they adapted gradually

over the course of generations. With the passing of time, humans transformed their environment, creating new substances that previously didn't exist and disposing of them. The exponential increase in population intensified the disruption of the environment and technological development brought with it new forms of electromagnetic radiation. The lack of adaptation to these new substances and radiations led to diverse diseases, or intensified or made more common others such as asthma, allergies or cancer.



With the aim of raising awareness of the global fatal diseases and creating healthy habits among people, in 1948 the World Health Assembly proclaimed 7 April as World Health Day. Since 1950, the year it was first marked, a theme is chosen every year, based on the needs and suggestions of Member States.

The objective of the 2019 campaign was to *"help people better understand what universal health coverage means: what services and support should be available and where"*.

In 2020 the day commemorated the work of nurses and matrons, reminding global leaders of their essential contribution to global health. This could not have been more timely, with the world immersed in the health crisis caused by the coronavirus SARS-CoV-2 (COVID-19), which led to the declaration of the State of Emergency in Spain in the month of March.

This commemoration is a recognition for the work of nurses on the front line of the fight against COVID-19; professionals who, together with doctors, researchers and security and emergency services, among others, were also the protagonists of World Health Day 2020.

## 1. THEMATIC ANALYSIS: THE ENVIRONMENT AND HEALTH: A GLOBAL CHALLENGE

One point of inflection in the development of diseases associated with the environment was the industrial evolution, which changed the economic and production system. With industrial development and the use of fossil fuels, large quantities of toxic substances began to be released into the atmosphere through different forms of production. It also led to discharges and the generation of waste, which began to contaminate soils and water, increasing the toxicity of the environment and causing disease. At the start of the 17th century it was ascertained that environmental pollution caused by industrial activity was a problem for public health, in particular in more industrialised areas where increases in morbidity and mortality were observed. Around the middle of the 20th century, environmental problems began to be considered, due to the effects of human activities on ecosystems and the effects of the environment on the health and well-being of the population. These effects, and the resulting health problems, are most evident in urban areas where there is greater concentration of population and greater intensity of the industrial production activity than rural areas with lower population density and lower industrialisation in general.

Since then, different health organisations have conducted numerous studies to quantify the effects on health arising from man-made changes to the environment. According to the European Environmental Agency's latest *Air Quality in Europe* report, almost 500,000 people, 32,000 of them in Spain, die prematurely in Europe every year,

### 2.1 Classification of environmental factors

According to the WHO, environmental health is determined by chemical, physical and biological factors beyond a person's control:

- Organic and inorganic chemicals. These include: heavy metals, phytosanitaries, biocides, fertilisers, methane,  $\text{CO}_2$ ,  $\text{O}_3$ ,  $\text{NO}_x$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{COV}$ ,  $\text{NH}_3$ , CFC, polychlorinated biphenyls, dioxins and furans, PCBs, fine particles, etc.
- Physical. These include noise and vibrations that can include energy disturbances, ionizing and non-ionizing radiation, temperature, illumination, etc.
- Biological. These include bacteria, viruses, protozoans, toxins, fungi and allergens.

### 2.2 Principal effects on health attributable to environmental factors

The ecosystem services provide benefits to society and contribute to the improvement of people's health and quality of life. There are multiple assets and services that a healthy environment generates, many of them related to the regulating services, such as the availability of clean water, soil make-up, pollination, etc.

We can find examples of this contribution in vegetation, which provides us with clean air, reducing the quantity of particles while also producing oxygen. It also prevents erosive processes and damages arising therefrom, protects the banks and springs of rivers and the rich ecosystems that inhabit these and, at the same time, contribute to ensuring the availability

of clean and quality water. An unaltered atmosphere protects us from ultraviolet radiation. Soil in good condition is live soil, with micro-organisms in balance and high fertility, which allows for the decomposition of waste that can subsequently be used by plants, which then become our food or are used by our animals. In a healthy ecosystem, predators eradicate sick animals, thus reducing epizootic and other diseases and preventing the spread to our livestock. Furthermore, the natural landscape provides multiple benefits such as the reducing stress, anxiety and depression and improving quality of life. On the other hand, access to green spaces (with vegetation) and blue spaces (with water, such as rivers, reservoirs, the seas or ponds and fountains in parks), both in natural spaces and in urban areas, offers important leisure opportunities and advantages in terms of well-being, improving mental and physical health and reducing, for example, the rate of heart disease, one of the leading causes of mortality in Spain. The European Commission's report *The Multifunctionality of Green Infrastructure*<sup>3</sup> supports this approach and highlights how "*green space has a positive effect on health conditions, such as obesity, mental health, circulatory disease and asthma*". We must not forget that according to the founding document of the WHO, "*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*".

Today we are capable of identifying a large number of effects on health caused by environmental factors.

<sup>3</sup> European Commission (EC). (2012). *The Multifunctionality of Green Infrastructure*. Science for Environment Policy. Source [https://ec.europa.eu/environment/nature/ecosystems/docs/Green\\_Infrastructure.pdf](https://ec.europa.eu/environment/nature/ecosystems/docs/Green_Infrastructure.pdf)

According to the European Environment Agency, environmental risks have changed over time. Traditional risks (difficulties accessing drinking water, insufficient basic sanitation, air pollution from carbon and fossil fuels for cooking and heating, insufficient solid waste removal systems and the proliferation of vectors of disease) added to a series of new risks to health: water contamination due to urban, industrial and agricultural discharges; atmospheric pollution due to transport emissions, industry and the energy sector; accumulation of hazardous waste; chemical risks; radiation; new and re-emerging infectious diseases; deforestation; degradation of soil and other important economic changes at local and regional level; climate change, damage to the ozone layer and cross-border pollution. Furthermore, these processes can often generate risks that may be interrelated. For example, accumulation of hazardous waste may lead to an increase in chemical risk as it increases the concentration of certain toxic materials, mainly in the soil, which may be bio-accumulated through the trophic chain and reach humans through ingestion.

Numerous specialised studies alert to the effect on health attributable to environmental factors, such as:

- Respiratory diseases, cardiovascular diseases, cognitive diseases, impacts on birth and allergies caused by air contamination.
- Neurological disorders due to heavy metals, persistent organic pollutants (POPs) such as dioxins, polychlorinated biphenyls (PCBs) and pesticides.
- Cancers caused by a series of agents, such as exposure to solvents.
- Alterations in endocrine process, neurotoxic disorder and different types of cancers due to immunological change caused by exposure to biocides.
- School performance negatively affected by elevated or persistent noise levels close to centres of learning.
- Skin cancers caused by ultraviolet radiation.

The principal environmental agents with effects on health are:

### Chemical agents

Numerous chemical agents can alter our health. We find them in the air and in the water and in the soil. Human activity, specifically the burning of fossil fuels, affects the composition of the atmosphere, adding pollutant chemical agents like  $\text{SO}_2$ ,  $\text{NO}_x$ ,  $\text{NH}_3$ , VOCs and  $\text{O}_3$ . All of these substances negatively affect health in different ways. Sulphur dioxide ( $\text{SO}_2$ ) is a precursor to sulphuric acid ( $\text{H}_2\text{SO}_4$ ) and also causes breathing difficulties, inflammation of the respiratory tracts and irritation of the eyes by forming sulphurous acid ( $\text{H}_2\text{SO}_3$ ) on mucous; it also damages vegetation species through acid rain. Nitrogen oxide ( $\text{NO}_x$ ), is mainly produced by motor vehicles and can cause burns and corrosion on the skin and respiratory system. Volatile organic compounds (VOCs) encompass a large number of chemical substances. They are of natural (benign VOCs) and anthropogenic origin, due to the evaporation of organic solvents (with origin in paints and varnished in industries where these products are used and other types of industries like the steel, wood, cosmetics and pharmaceuticals industries, among others), the burning of fuels, transport, etc. The effects on health are varied and include respiratory problems and irritation of the eyes and throat. They can also cause psychiatric disorders and, over the long term, renal, hepatic, neurological and carcinogenic disorder, such as benzene for example. They are tropospheric ozone precursors ( $\text{O}_3$ ) when they react with intense solar light. Together with nitrogen oxides they cause photochemical "smog", the health consequences of which are wide ranging. They can exacerbate respiratory or heart problems and increase cases of bronchitis, asthma, pulmonary emphysema and bronchial-lung cancer, affecting children and the elderly in particular.

Ozone ( $\text{O}_3$ ) can be found naturally in the stratosphere, acting as a filter against ultraviolet radiation. In its absence, ultraviolet radiation reaches the surface, increasing rates of skin cancer. However, when  $\text{O}_3$  is found on the surface it is damaging to our health. Depending on exposure, it can cause light effects on the respiratory system and even premature deaths. It is caused by the incidence of solar radiation on different atmospheric pollutants such as those comprising photochemical smog.

On the other hand, industry emits or discharges substances and waste with varying effects on the environment and health. In addition to greenhouse gases (carbon dioxide, nitrous oxide, methane and fluorinated gases) Persistent Organic Compounds (COPs) are emitted, which are bio-accumulable, highly toxic chemical substances that persist in the environment and can be transported long distances. Heavy metals are chemical elements linked to pollution with potential toxicity and ecotoxicity that damage health. They can be found in the soil, in the air or in water. The presence of lead, for example, causes poisoning, especially serious in small children and

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can seriously affect their physical and mental development, and can even prove lethal in high doses. In the past it was in paint and pipes and was used as an additive for fossil fuels for decades. It affects the liver, the reproductive system, the nervous system and the immune system. Through the introduction of legislation, it has been possible to reduce exposure to lead.

Another dangerous heavy metal is cadmium, which is part natural in origin (it is released into rivers through the decomposition of rocks, forest fires and volcanic eruptions) as well as human (burning of fossil fuels and urban waste, phosphate fertiliser production and other industrial processes, wearing out of tyres, disused tyres and waste electrical and electronic equipment). It is an irritant for the eyes and respiratory tract and its inhalation can lead to pulmonary edema. It also effects the kidneys and can cause bone and lung lesions. It also causes some types of cancer of the male reproductive apparatus and the lungs. With a great capacity for accumulation in the food chain, it is permeates organic material in the soil where it is passed to plants and to us either directly or through animals we eat that have previously digested it.

Mercury is another heavy metal susceptible to producing various ailments, depending on its chemical form. Methylmercury ( $[\text{CH}_3\text{Hg}]^+$ ) is among the six most dangerous chemical components in the atmosphere according to the WHO's *International Programme on Chemical Safety* and easily absorbed into the intestines. It accumulates in the brain, liver and kidneys. Intoxication causes alterations in the nervous system which manifest themselves in sensory and motor disorders, reproduction and alteration of genetic material. They are found naturally in minerals in rocks and soils, being the cinnabar the most important one.

In the industrial sector it is used in the electrical industry and in electrical apparatus. It is accumulated in the soil and in superficial waters passing to aquatic plants and entering the food chain from where it passes to the trophic chain from where it enters the food chain, particularly in marine fish. It is worth indicating, that in the past it was used in the manufacturing of hats, and affecting this activity in particular, a fact recorded in literature through several characters such as the "Mad Hatter" in Lewis Carroll's *Alice's Adventures in Wonderland*.

Arsenic is a semi metallic element that is toxic to humans depending on the chemical form in which it is ingested. The inorganic compounds are more toxic than those found naturally in fish, molluscs and crustaceans. Inhalation causes gastrointestinal effects and damage to the central and peripheral nervous systems. When ingested it causes injury to the liver and kidneys and other minor effects. It is also carcinogenic and causes lung, skin, liver and bladder cancer.

Spain has subject to a European investigation due to the lack of control over fertiliser and animal waste that filter into aquifers and cause nitrate contamination. Agriculture and livestock are two causes of other environmental pollution of the environment, such as pesticides and particulate matter.

Water can transmit diseases by chemical or biological agents present therein. Human activities discharge numerous compounds, many of them hazardous to health, into water. The reduction of the quantity of water available also affects quality and can lead to concentrations of undesirable compounds. Nitrates, pesticides, polluting agents, inorganic polluting agents soluble in water such as

acids, salts and toxic metals are disposed by industry and other human activities, affecting water quality and causing diseases.

Moreover, exposure to other types of chemical products such as biocides or phytosanitary products can also have effects on health. Biocides are chemical substances and products that are used for the purposes of control of organisms harmful to health and damaging for natural or manufactured materials. For their part, phytosanitary products are used to protect vegetables or products derived therefrom from all harmful organisms or to avoid the effects thereof. However, both may involve risks to persons, animals and the environment due to their intrinsic properties and the steps for use. Both the Biocides Regulation and the Phytosanitary Products regulation intend to guarantee the protection of health and the environment with respect to their use and commercialisation based on the evaluation and authorisation of all the substances and products placed on the market.

It has been demonstrated that atmospheric pollution from particulate matter has harmful effects on health, exacerbating respiratory diseases like bronchitis and cardiovascular conditions. Populations exposed to these fine particles have higher rates of morbidity and mortality and children are more likely to develop asthma and allergies. The particles with a diameter of 2.5 microns or less are one of the most significant air pollutants in terms of the threat to human health as they can reach lung alveoli due to inhalation, carrying dangerous substances to very sensitive areas which may even lead to premature death. This would be the chemical effect of fine particles, while there may also be a physical effect of obstruction of cellular membranes. PM10 are caused by forest fires, volcanic

emissions and human activities (agricultural works, construction, industrial activities and, in the urban environment, combustion engines, etc.). PM2.5 may originate in a primary or secondary source, formed in the atmosphere from a gaseous precursor ( $\text{NO}_x$ ,  $\text{SO}_2$ , VOCs,  $\text{NH}_3$ , etc.).



## Physical agents

Physical agents, such as noise and vibrations are concerning due to the disturbance, alteration and diseases to which they can contribute. Excessive exposure to noise can lead to loss of hearing, psychological stress and anxiety. If produced in small chil-

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dren, it can negatively affect language acquisition, making cognitive processes difficult, such as reading capacity, comprehension short and long-term memory and even motivation. Prolonged exposure to noise can cause different affects such as hypertension and ischemic cardiovascular diseases (corresponding to codes BA40 to BA6Z of the International Classification of Diseases ICD-11, the global standard for health data, clinical documentation and health statistics reporting established by the WHO) and intense discomfort. It can also lead to cognitive problems (concentration, memory, problem resolution, etc.) and serious sleep alterations.

The WHO estimates that it has lost 1.6 million years of healthy life as a result of traffic noise, which places environmental noise as the second most damaging environmental factor in terms of health in the EU, only behind atmospheric pollution.

Our capacity to tolerate different radiations is determined by our evolutionary history and today we are exposed to different types of radiation which our ancestors were not subject to in the same way. Whether it is because we change the atmosphere's protective shield (hole in the ozone layer) or due to radiation of natural origin that accumulates in our buildings, such as radon. Some radiations are not damaging to health, causing diverse types of cancer.

Another physical magnitude to consider is temperature, which allows for the level of cold or heat to be measured. According to the 30 April 2020 draft of the *National Climate Change Adaptation Plan 2021-2030* (presented for public information on 4 May

2020), the average temperature in Spain has risen around 1.7°C since pre-industrial times. The increase of the frequency with which extreme temperatures and the increase in the value of same as a consequence of climate change will be one of the associated health problems with consequences for morbidity (proportion of people who suffer diseases in a specific space in a specific period of time) and mortality (rate of deaths in a population during a given time, in general and due to a specific cause). High temperatures can increase the levels of ozone and other pollutants, aggravating cardiovascular and respiratory diseases, especially in vulnerable groups such as the elderly, increasing mortality.

In this regard, the *Effects of Climate Change in Spain* report of the Spanish State Meteorological Agency (AEMET) of March 2019, states that "*the heat island phenomenon can be defined as a positive thermal anomaly in city centres in relation to the periphery and causes a nocturnal thermal excess that increases minimum temperatures, especially during heat-waves, affecting comfort and with negative effects on health, in particular for those at-risk groups who live in large cities*".<sup>4</sup>

Similarly, falls in temperature can affect the groups most vulnerable to the extreme cold, principally the population at risk of poverty and social exclusion, including the homeless and those with insufficient economic resources to adequately insulate their homes.

### Biological Agents

Biological agents such as bacteria, virus, fungi and allergens can cause numerous diseases and ailments. These may be transmitted by air, water or food by other live beings acting as vectors (flies, mosquitoes, ticks and other parasites) of infection and diseases. Poor air quality may lead to or exacerbate numerous ailments, often respiratory or intestinal. There are bacteria that cause infectious diseases that are transmitted by air, such as tuberculosis or legionella which cause pneumonia and ultimately death. Many viruses are also transmitted by air and people who inhabit environmentally polluted area suffer the consequences more intensely.

Air quality is also a determining factor in the development of diseases. Bacterial ingestion in water is the cause of death of millions of people by diarrhoea, especially during infancy.

<sup>4</sup> AEMET (2019). *Efectos del cambio climático en España*. Viewed June 2020 at: [http://www.aemet.es/es/noticias/2019/03/Efectos\\_del\\_cambio\\_climatico\\_en\\_espana](http://www.aemet.es/es/noticias/2019/03/Efectos_del_cambio_climatico_en_espana)

On 12 January 2010 the capital of Haiti was rocked by an earthquake measuring 7 on the Richter scale. In addition to the initial death toll caused by the earthquake an outbreak of cholera that began in October 2010 caused around 9 800 deaths and affected more than 820 000 people. Cholera is a disease caused by the ingestion of the bacillus *Vibrio cholerae* which usually affects people who lack access to drinking water and sanitation. According to the Pan-American Health Organisation (the Regional Office for the Americas of the WHO), in January 2020 Haiti marked a year free of cholera. According to this body *"In order to end cholera in Haiti and receive validation from the World Health Organization (WHO) for eliminating the disease, the country must maintain effective surveillance systems and remain cholera-free for two more years (three years in total). Early detection and response to possible flare-ups must also continue and addressing the issue of clean water and sanitation for all Haitian people is key to preventing the transmission of cholera, and other water-borne diseases, in the long-term."*<sup>5</sup>

Natural substances such as pollens adhere to particles originating in diesel combustion issued by vehicles, causing inflammation of the respiratory tract, forcing an exaggerated response from the body: allergy, particularly acute in persons predisposed to asthma. Persons who were not originally allergic to a compound, when they encounter the contaminating particle, develop the allergy.

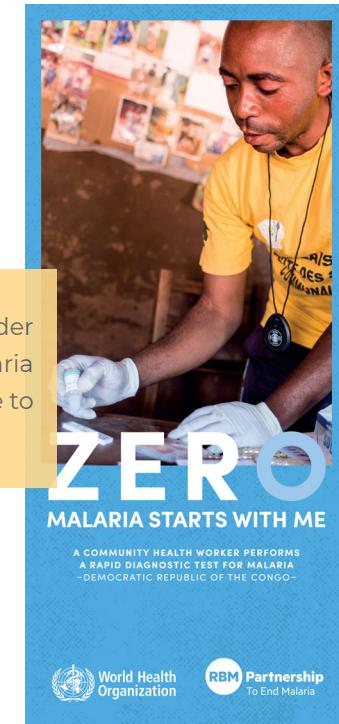
The WHO defines vectors as *"living organisms that can transmit infectious pathogens between humans, or from animals to humans and cause serious disease in humans."* In general, these are diseases more frequent in tropical areas, primarily in areas with difficulty accessing drinking water and adequate sanitation. Nevertheless the alteration of environmental factors due to the conse-

quences of climate change means that is foreseeable that diseases from other latitudes will find a presence in Spain.

25 April every year marks World Malaria Day. In 2019 the campaign was run under the slogan *"Zero Malaria Starts with Me"*. Early diagnosis and treatment of malaria mitigate the incidence of the disease, reduce its mortality effects and contribute to the prevention of transmission.<sup>8</sup>

The most lethal of these vector-borne diseases is malaria, which is caused by five species of parasites, two of these from the *Plasmodium* genus (*P. falciparum* and *P. vivax*) being the most dangerous. It is transmitted through the bites of infected female *Anopheles* mosquitoes. The WHO estimates that in 2018, there were 228 million cases around the world and 450 000 deaths.<sup>6</sup>

Other major diseases transmitted by vectors are: dengue, schistosomiasis, lymphatic filariasis, Crimean–Congo haemorrhagic fever, yellow fever, Chagas disease (American Trypanosomiasis) and African Trypanosomiasis.<sup>7</sup>

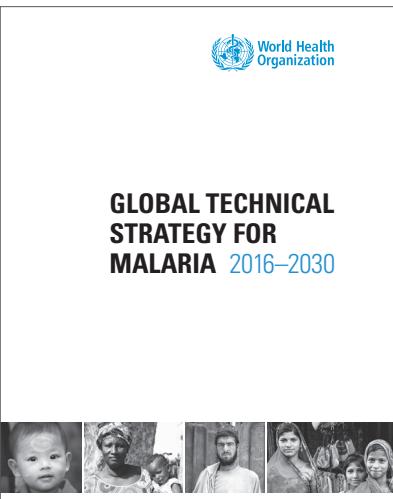


5 Pan American Health Organization (WHO/PAHO). (2020). *Haiti reaches one year free of cholera*. Source [https://www.paho.org/hq/index.php?option=com\\_content&view=article&id=15684:haiti-reaches-one-year-free-of-cholera&Itemid=1926&lang=en](https://www.paho.org/hq/index.php?option=com_content&view=article&id=15684:haiti-reaches-one-year-free-of-cholera&Itemid=1926&lang=en)

6 World Health Organization (WHO). (2018). *Malaria*. Source <https://www.who.int/es/news-room/fact-sheets/detail/malaria>

7 World Health Organization (WHO). (2017). *World Malaria Day – 25 April 2017*. Source <https://www.who.int/campaigns/malaria-day/2017/es/>

8 World Health Organization (WHO). (2019). *World Malaria Day – 25 April 2019*. Source <https://www.who.int/campaigns/world-malaria-day/world-malaria-day-2019>



The current framework to accelerate the eradication of malaria through the formulation of programmes has been established in the *Global Technical Strategy for Malaria for 2016–2025*, which was adopted by the World Health Assembly in May 2015.<sup>9</sup>

The environmental effects of our lifestyle are numerous and we are not yet fully aware of the repercussions for the environment and our health.

In 2016, the then Ministry of Health, Social Services and Equality published the *National Preparation and Response to the Vector-borne Diseases*. The purpose is to reduce the risk and reduce the global impact of these types of emerging diseases. The objective is to prevent, control and eradicate indigenous transmission of dengue, chikungunya and Zika in Spain, transmitted by the bite of the Aedes mosquito.

<sup>9</sup> World Health Organization (WHO). (2015). *Global Technical Strategy for Malaria 2016–2030*. Source <https://www.who.int/malaria/publications/atoz/9789241564991/en/>

### 2.3 Effects of climate change on health

Climate Change is worthy of special attention. It is not caused by a single pollutant. Certain gases we emit into the atmosphere have the capacity to retain infrared radiation. These are the greenhouse gases (GHG) that cause climate change: CO<sub>2</sub>, methane, nitrogen oxides (and nitrous oxide), ozone and CFCs, which have transversal effects on multiple human diagnosis and treatment potentially have a significant effect on humans and even cause many deaths: hurricanes, drought and flooding and more intense snow, rising sea levels, heatwaves, smaller harvests, the increase in infectious disease, etc. All of these effects can impact a significant percentage of the global population. It is forecast that between 2030 and 2050 climate change will cause 250 000 additional deaths per year due to malnutrition, malaria, diarrhoea, etc. We must add to this the greater frequency of extreme meteorological events, which often result in the loss of human life and material damage, injuries, trauma and health problems in the population.

The international community, conscious of this problem, has been tackling the issue since the Rio de Janeiro summit in 1992, later adopting the Kyoto Protocol (1997) and subsequently the Paris Agreement (2015), in which countries commit to limiting the global rise in temperature to 2°C. In December 2019, the COP25 summit took place in Madrid when it became impossible to host the summit in Chile. At this summit, the foundations were laid for asking governments to be more ambitious when it comes to tackling the challenge of climate change, to base decision on scientific data and to respond to the demands of citizens.

In May 2020, the Ministry for Ecological Transition and the Demographic Challenge presented, on 30 April 2020, a draft of the *National Climate Change Adaptation Plan 2021–2030*. Chapter 7 describes the objectives in different areas of work, dedicating one to health. The goals listed are the following:

- To identify the risk of climate change for human health and develop more effective adaptation measures through the integration of climate change into national Health and Environment plans.
- To foster preventive actions with regard to the risks to health arising from excessive temperatures.
- To prevent the risks to health arising from emerging infectious diseases facilitated by climate change.
- To identify the incidence of climate change on air quality and to identify synergies between measures to adapt to and mitigate climate change in this area.
- To prevent the risks of climate change to health in the workplace.

### 3. The European process on environment and health: a starting point

The European Green Deal, presented in December 2019, sets out a new strategy for growth in the EU based on fostering the efficient use of resources base on a clean, circular economy, the restoration of biodiversity and the reduction of pollution. Literally, it “aims to protect, conserve and enhance the EU's natural capital, and protect the health and well-being of citizens from environment-related risks and impacts”.

The initial roadmap states that all EU actions and policies will have to contribute to the European Green Deal objectives. Its drafting, development and application, therefore, cannot be conceived without taking into account a series of preventive initiatives.

In the case of health a selection of the most important initiatives are presented in this section.

#### Health programmes

The working framework of the EU in relation to public health is focussed on prevention and the response to diseases. The aspects of health promotion and improvement, equality of access to modern and efficient healthcare, and coordination for serious threats to health when they affect more than one country are the basic pillars of EU health policy.

The strategies to guarantee good health and healthcare have been proposed through the EU health programmes, legally adopted by agreement of the European Parliament and the Council. The first of these was planned for the 2003-2007 period while the second was in force in the period 2008-2013. At

present, the Third Health Programme (2014-2020) is in force, created through *Regulation (EU) of the European Parliament and of the Council of 11 March 2014 on the establishment of a third Programme for the Union's action in the field of health (2014-2020) and repealing Decision No 1350/2007/EC*. The programme was allocated funding of 449.4 million euros during the period between 1 January 2014 and 31 December 2020. It was implemented through the annual working programmes in which the priority actions to be taken and financing criteria were defined by common agreement.

Its 23 themed priorities are organised across the following four general objectives:

1. Promote health, prevent diseases, and foster supportive environments for healthy lifestyles, taking into account the principle of “health in all policies”.
2. Protect citizens from serious cross-border health threats.
3. Contribute to innovative, efficient and sustainable health systems.
4. Facilitate access to better and safer healthcare for Union citizens.

The programme included a specific working framework for health and contains a single thematic priority that links the environment with health. It is included in objective 2, specifying the following:

*“2.3. Actions required by, or contributing to, the implementation of Union legislation in the fields of communicable diseases and other health threats, including those caused by biological and chemical incidents, environment and climate change. Such action may include activities aimed at facilitating the implementation, application, monitoring and review of that legislation.”*

*es and other health threats, including those caused by biological and chemical incidents, environment and climate change. Such action may include activities aimed at facilitating the implementation, application, monitoring and review of that legislation.”*

#### European ministerial conferences on the environment and health

The EU began to incorporate the effects of the environment, to prevent threats to human health, through the five-yearly ministerial conferences co-ordinated by the European section of the WHO (WHO / Europe). Frankfurt in 1989, Helsinki in 1994, London in 1999 and Budapest in 2004 were the first four of such conferences.. During the fifth conference, held in Parma (Italy) in March 2010, concrete results were achieved in the environment and health process with the approval of the Parma Declaration. In it, the first concrete objectives were established for the reduction of the adverse impact on health of environmental threats for the coming decade.

In April 2015, the European Environment and Health Process – Mid-term Review was held in Israel. There, the countries presented their progress on issues of indoor (within buildings) and outdoor air quality, climate change and noise.

The sixth ministerial conference on the environment and health (and the latest to date) took place in Ostrava in June 2017. In addition to promoting and accelerating matters relating to health and the environment in Member States, there was a commitment to consider the objectives and goal of both issues within the 2030 Agenda for Sustainable Development.

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The Ostrava Declaration was signed as a result of a consultation process and seven key areas for action were identified:

1. Improving indoor and outdoor air quality for all.
2. Ensuring universal, equitable and sustainable access to safe drinking-water, sanitation and hygiene for all and in all settings.
3. Minimizing the adverse effects of chemicals on human health and the environment;
4. Preventing and eliminating the adverse environmental and health effects, costs and inequalities related to waste management and contaminated sites.
5. Strengthening adaptive capacity and resilience to climate change-related health risks and supporting measures to mitigate climate change and achieve health co-benefits in line with the Paris Agreement.
6. Supporting the efforts of European cities and regions to become healthier, more inclusive, safer, resilient and sustainable.
7. Building the environmental sustainability of health systems and reducing their environmental impact.

The results of these conferences establish commitments that countries must consider in their own lines of work.

### The European Strategy on Environment and Health

The *European Strategy on Environment and Health* was presented on 11 June 2003 as a Communication of the Commission to the Council, to the European Parliament and the European Economic and Social Committee.

Implementation in cycles was proposed, each serving based on the following. In this regard, the content of the first cycle (2004-2010) was focussed on clarifying the relationship between environmental aspects and the following four processes.

- Childhood respiratory diseases, asthma, allergies
- Neurodevelopment disorders
- Childhood cancer
- Endocrine disrupting effects

The aim was also to identify and reduce emerging environmental risks, establishing, insofar as possible, relationships of cause and effect. In this regard, the risks to health to be included in the second cycle will be determined.

### The 7th Environment Action Programme

Recital number 25 of the *General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'* argues that environmental problems and impacts continue to pose significant risks for human health and well-being, and that the measures to improve the state of the environment can be beneficial.

The holistic focus of the European strategy and its continued evaluation in progressive cycles introduced the so-called "SCALE initiative" based on the initials of the five key elements: (*Science, Children, Awareness, Legal instrument, Evaluation*).

- It is based on Science: it uses the knowledge of a broad range of expert environment and health experts from Member States and adherent countries, including international organisation.
- It is focussed on Children: children are considered a group vulnerable to environmental risks.
- It will raise Awareness: in an effort to educate the European population on health problems relating to environmental degradation.
- It will use Legal instruments.
- It will be continuously Evaluated for the purpose of verifying the effectiveness of the actions developed.

Specifically, Article 2 establishes that one of the priority objectives of the 7th Environmental Action Programme is to “c) safeguard the Union’s citizens from environment-related pressures and risks to health and well-being”. In this regard, the working areas include air quality and noise pollution, drinking and bathing water quality, chemical products, endocrine disrupting effects and the safety of nano-materials, the use of pesticides and the adaptation to climate change.

It could be argued that the content and commitments of this 7th Programme avoid the lack of continuity in the development of the second cycle of the *European Strategy on Environment and Health* by establishing objectives on the impact of the environment on health in the period 2014-2020.

It is worth noting that it is planned that the Commission will present the *8th Environment Action Programme* for the period 2021-2030 in 2020. With regard to its content, the Council of the European Union highlights, in the conclusions of its October 2019 meeting, the “importance of protecting our citizens’ health, with a particular focus on improving air quality, water quality and preventing or minimising exposure to all substances of concern, especially to substances of very high concern (SVHC), that are put on the market or are released into the environment across Europe”.

Other initiatives of interest developed by the EU materialise as collaborative instruments, implemented with the aim of analysing, evaluating, and placing at the heart of policy initiatives, the effects of the environment on health. They include the following:

### ■ The European Environment and Health Information System

The European Environment and Health Information System (ENHIS) forms part of the WHO and its functions include those of contributing to identifying, prioritising and managing questions relating to the environment and health in European countries while also monitoring the policies, actions and measures adopted.

Its objectives include the presentation of reports on the environmental and health aimed at political agents, professionals and the general public and the exchange of information, data and knowledge, including examples of best practice in the field of public health and the environment.

### ■ The European Environment and Epidemiology Network (E3)

The European Environment and Epidemiology Network (E3) was created by the European Centre for Disease Prevention and Control (ECDC) in response to climate change and global environmental changes that pose a threat to human health. By uniting epidemic intelligence and infectious disease surveillance data with meteorological variables and other environmental, epidemiological and social data, among others, the Network acts as a focal point for information, surveillance and technical support in forecasting, monitoring and responding to the threats of new and emerging diseases.

The ECDC evaluates and supervises the threats of emerging diseases with the aim of coordinating the response to be formulated.



The E3 Geoportal, designed by the ECDC, compiles and offers information to anyone interested in the epidemiology of infectious diseases in Europe.

#### BIENVENIDO AL GEOPORTAL E3



## 1. THEMATIC ANALYSIS: THE ENVIRONMENT AND HEALTH: A GLOBAL CHALLENGE

It would be remiss to close this section without making reference to the 2030 Agenda for Sustainable Development approved in 2015 and which, until 2030, will govern global development programmes, including Europe and, of course, Spain. The 17 Goals and 169 integrated and indivisible target re-align the sustainability of development considering economic, social and environmental factors. These objectives are not legally compulsory, albeit foreseeable that they will be adopted internally by all countries as part of their policy agenda.

There are various working areas that this strategies marks as priorities. The most important of these include: ending poverty in the world; eradicating hunger and achieving food safety; guaranteeing a healthy life and quality education; achieving gender equality; ensuring access to water and energy; promoting sustained economic growth; adopting urgent measures to combat climate change; promoting and facilitating access to justice.

Two of the 17 SDGs in particular stand out with regard to the inclusion of aspects directly related to the environment and health. These are:

**Goal 3: Ensuring healthy lives and promoting the well-being for all at all ages is essential to sustainable development.**

**Target 3.9:** By 2030, substantially reduce the number of deaths and diseases from hazardous chemicals and air, water and soil pollution and contamination.

**Goal 13: Climate change is a global challenge that affects everyone, everywhere.**

**Target 13.1:** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

**Target 13.2:** Integrate climate change measures into national policies, strategies and planning



## 4. Tackle the incidence of pollution of the environment on health in Spain: a joint challenge

It would perhaps be helpful to start by distinguishing between two very similar concepts like *health* and *healthcare*. Health can be defined as “the condition in which a person normally exercises their functions” and also “the set of physical conditions of a person at a specific moment in time”. Healthcare can be defined as “the set of governmental services ordered to preserve the collective health of the inhabitants of the nation, a province or municipal area”.

In other words, *health* refers to individuals, while *healthcare* encompasses the organisation of the services required to reach a good level of collective health.

Article 43 of the Spanish Constitution recognises the right to health protection and tasks the public authorities with organising and watching over public health by means of preventive measures and the necessary benefits and services. Specifically, it establishes that the competencies for healthcare and hygiene may be assumed by the autonomous communities (Article 148), while the State holds exclusive competency over “*external health measures, basic conditions and general coordination of health matters*” (Article 149). We have, therefore, a clear division of competencies between the State administration and the autonomous communities. The official transfer of competencies in health matters to the autonomous communities is approved in each case through the corresponding Royal Decree.

*Law 33/2011, of 4 October, the General Public Health Act*, establishes the principal legal framework for the

health protection of persons and, as established in Article 1 thereof, its objective is:

*“to establish the basis for the population to achieve and maintain the highest possible level of health through the policies, programmes, services and, in general, actions of all kinds carried out by the public authorities, companies and citizens' organizations with the aim of acting on the processes and factors that most influence health, and thus prevent disease and protect and promote people's health, both in the individual and collective sphere.”*

*“Public health is the set of activities organized by public administrations, with the participation of society, to prevent disease as well as to protect, promote and restore people's health, both in the individual and collective sphere and through health, sectoral and cross-cutting actions.”*

It establishes the commitment and obligation of the administrations to protect the health of persons acting on the elements that affect it both directly and indirectly such along with the transversal or sector-specific processes that cause them.

This is a legal instrument that opens the door to action on environmental aspects that affect health, including those of a transversal or sectoral nature.

Article 30 establishes that for the purpose of increasing health protection from risks arising from environmental factors, the Public Administrations shall implement environmental health programmes. In this regard, the functions of environmental health are the identification, evaluation, management and communication of health risks that may arise from environmental conditions. And the monitoring of

environmental factors of a physical, chemical or biological nature and of environmental situations that affect or may affect health; and the identification of policies in any sector that reduce environmental health risks.

It also specifies that it is the responsibility of the General State Administration, the autonomous communities and the autonomous cities of Ceuta and Melilla, the local authorities, within the scope of their competencies, to organise and manage the monitoring of public health. And to coordinate the different monitoring systems the Public Health Surveillance Network will be created.

### 4.1 Initiatives of the General State Administration

Every year, the Ministry of Health publishes the *Annual National Health System Report*, describing the situation and characteristics of the principal variables relating to health. Since 2015, these reports incorporate the data on the National Health System. In even numbered years, they include individual reports drafted by the autonomous communities, while in odd numbered year they make special reference to the situation of Spain in the European Union.

The latest Annual Report was published in December 2019, corresponding to the year 2018. Nevertheless, the basic information for the report can be found in the application of the Ministry of Health *Key Indicators of the National Health System* which allow consultations on important aspects of health and the Spanish health system. It presents



the information in a table, graphs or maps and offers different options for download. In total, there are more than 275 indicators grouped into 16 categories.

As an example of the content, the section on mortality includes the indicator "Premature mortality due to chronic lower respiratory disease" adjusted for age, per 100 000 inhabitants. This information is very useful in order to analyse the effects of air pollution on human health.

The working framework of the Ministry of Health on health and the environment is included in within the section "Environmental and Workplace Health" which is divided into two sections: "Environmental Healthcare" and "Workplace Health". The former is organised around the following eight headings:

- Health and the Environment
- Sanitation Quality and Waters
- Chemical Products
- Extreme Temperatures
- Air Quality (Indoor and Outdoor)
- Biological Risks: *Legionella*
- Vectors of Disease
- Physical Risks: Electromagnetic Fields, Radiation and Noise
- Climate Change
- Waste

Within the Health and the Environment heading, the *National Health and Environment Plan* occupies a central place with a view to converting it into the strategic framework for all actions to guarantee the health of persons and protection from the effects of the environment.

In 2007, the National Environmental Health Centre, a scientific-technical body of the Carlos III Institute of Health drafted the base report for the drafting of the *National Health and Environment Plan*.

At the Climate Summit held in Madrid in December 2019 and, prior to that, at the 74th session of the General Assembly of the United Nations which took place in the month of September, the Acting Minister of Health, Consumer Affairs and Social Well-being announced that the *National Health and Environment Plan*, was close to being finalised, drafted on a consensus basis with the participation of other ministries, regional governments and experts. The Plan will establish the priority lines of intervention and will consider the principal environmental factors that impact on human health such as air quality, indoor air quality, sanitation quality of water, management of chemical products, emerging chemical risks, endocrine disruptors, biomonitoring, environmental radioactivity and electromagnetic fields and non-ionizing UV radiation, noise, vectors of disease, extreme temperatures, habitat quality and green cities, industrial pollution and the links between climate change and health. Among other indicators, the Plan will include a system of health and climate change indicators. This information can be extended in the press releases of the Ministry of Health of 2 December<sup>10</sup> and 22 September<sup>11</sup> 2019.

It is interesting to highlight that the national plan can be understood as a framework within which all existing instruments of environmental policy such as the *National Programme to Control Atmospheric Pollution*, the *National Air Quality Plan 2017-2019* (and other air quality plans drafted by autonomous communities and local authorities), the *Integrated National Energy and Climate Plan 2021-2030*, the *National Preventive Actions Plan for the effects of excess temperatures on health*, the *National Climate Change Adaptation Plan*, the REACH Regulation, the Biocides Regulation, the Framework Directive on Water of the Future, *National Water Treatment, Sanitation, Efficiency, Saving and Reuse Plan*, etc. The plan itself should strengthen the application of all of these instruments, identify area of interest with shortcomings for developments and promote an integrated monitoring system of aspects of the health.

There are other planning and guidance instruments that it is necessary to consider throughout the process such as the Spanish Urban Agenda. Adopted in 2019, it is a strategic document with no regulatory character which follows the criteria established by the 2030 Agenda, the new Urban Agenda of the United Nations and the Urban Agenda for the European Union. It is comprised of 10 Strategic Objectives, with 30 specific objectives and 291 lines of action to be carried out up to 2030.

<sup>10</sup> Press release of 2 December 2019 of the Ministry of Health, Consumer Affairs and Social Well-being (now Ministry of Health) : <https://www.mscbs.gob.es/gabinete/notasPrensa.do?id=4737>

<sup>11</sup> Press Release of 22 September 2019 of the Ministry of Health, Consumer Affairs and Social Well-being (now Ministry of Health) : <https://www.mscbs.gob.es/gabinete/notasPrensa.do?id=4664>

It conceived or urban systems as delicate areas that can suffer the effects of climate change and in which it is necessary to apply adequate measures. Heat waves can also cause serious damage to health in extreme cases due to the increase of temperatures and cause damage and even death in more sensitive segments of the population (such as the elderly) or exposure to the same. Problems have also been detected among athletes who are exposed to extreme temperatures when practising sporting activity. One must not forget that urban areas are home to most of the world's population and are also responsible for a significant portion of greenhouse gas emissions.

With regard to climate change, one of the initiatives that has been developed in Spain was the creation of the Health and Climate Change Observatory. According to the description on the website, it is “*instrument of analysis, diagnosis, evaluation and monitoring of the effects of climate change on public health and the National Health System*”.

One of its functions is to serve as a leading centre for analysis, evaluation and public dissemination of the best scientific information available on the subject and contribute to the development of climate change mitigation and adaptation to climate change in the field of health.

It was created in 2009 and officials of the Ministry of Health and the Ministry for Ecological Transition and the Demographic Challenge participate directly on its management committee and technical committee. The technical structure is comprised of the following four working groups made up of experts in the area:



- Working Group I: Extreme Temperatures
- Working Group II: Air Quality
- Working Group III: Water Quality
- Working Group IV: Transmissible Diseases

The Council of Ministers of 21 January 2020 approved the *Government Declaration of the Climate and Environmental Emergency in Spain* in response to the “*urgent need to safeguard the environment, health and security of the citizens*”. The agreement establishes a series of specific commitments and priority lines of action

Line 19 specifies the commitment to “*Working on a coordinated basis on health and climate change with the competent administrations on local and regional strategies in the area of health impacts and civil protection. And approve a National Health and Environment Plan*”.

## 4.2 Initiatives of the autonomous communities and other territorial bodies

The autonomous communities, in the exercise of their competencies, as well as providing information, have developed strategies, plans, programmes and/or initiatives, in addition to using regulations that help minimise the damaging effects of environmental effects on the health of the population. Similarly, the local authorities have also contributed to this effort through the implementation of different plans that link health and the environment.

In the autonomous scope, the resources employed to provide a response to risk factors or environmental conditioning factors that might negatively effect on health are varied. For that, the first instrument that has been used is the definition of strategies, such as those addressing climate change that constitute one of the principal models around which to focus environmental concern, both in the scientific sphere and in society more generally. Some autonomous communities such as Madrid, Murcia, Valencia and Castile-La Mancha have climate strategies in place. These strategies, with their specific objectives and measures, reflect the regional commitment so that economic development is accompanied by greater environmental quality a cleaner atmosphere.

Specific cases, such as that of *Madrid (2013-2020)* also have an air quality strategy that is fundamental for reducing the concentration levels of the principal atmospheric pollutants. For its part, the autonomous community of *Valencia's strategy (2018)*, includes the energy sector, using energy management as a strategic tool against climate change.

Another instrument used is the definition of plans. Several autonomous communities have health monitoring plans in place with the aim of analysing the repercussions of environment factors on human health and integrating the environment and health policies. Recurring themes that impact directly on health such as water quality, air quality, noise, chemical products, urban waste, environmental inspection and environmental education are included. Examples of these types of instrument include the *Plan Marco de Sanidad Ambiental de la Comunidad Autónoma de Aragón* (PLAMSA, 2019) or the annual Environmental Health plans drafted by Madrid's Regional Ministry of Health, the latest being the *Plan de Sanidad Ambiental 2019*.

Numerous local authorities also have their own environmental plans in place, in particular for the improvement of air quality. Córdoba's *Plan Local de Mejora de la Calidad del Aire de la Aglomeración Urbana de Córdoba en el ámbito de las competencias municipales (2017)* is one of many examples in our cities. Barcelona, Madrid and Granada, for example, also have their own local plans.

Similarly, there are programmes that establish objectives for the protection and well-being of citizens. The *Programa Marco Ambiental de la Comunidad Autónoma del País Vasco 2020 (2014)* framework has the aim of reducing the incidence of diseases linked to environmental factors and advancing knowledge and management of environmental risks for people's well-being.

In terms of specific regional legislation relating to health, issues such as water, waste management, health monitoring systems, noise, etc. are the most

common, through a range of laws, decrees, orders and agreements. Some examples include *Decree 11/2014, of 20, March, approving the regional Integrated Waste Plan of Castile and León*, or *Decree 60/2009, of 26 February, on contaminated soils and the procedure for the declaration of contaminated soils*, of the Autonomous Community of Galicia. There is also *Decree 83/1999, of 3 June, regulating biosanitary and cytotoxic waste production and management activities in the Autonomous Community of Madrid*. In terms of environmental policies, the report *Análisis de la Lente de la Salud del IV Programa Marco Ambiental (2018)* is one example, which proposes recommendations to maximise the positive effect of Basque environmental policy on the health of the population and health equality.

Other initiatives aimed at compiling and disseminating existing information on the environment and health and promoting research on environmental health are the different existing websites in the autonomous communities. The *Andalusia Health and Environment Observatory (OSMAN)* is an example of a resource put in place by diverse regional institutions. Together with that, the drafting of technical and general reports (air quality and health, chemical pollution, noise and radiation, preventive actions for health, etc.), the completion of systems of indicators and the compiling of data analysis are other instruments with which autonomous communities tackle the link between the environment and health. The document *Salud y Medio Ambiente en la Comunidad Autónoma del País Vasco. Indicadores 2007*, refers to this, as do the *Informes Sectoriales del Plan de Salud 2013-2020*, reports drafted annually in each autonomous community on the alignment of

sector-specific policies with public health objectives. Similarly, the Autonomous Community of Catalonia, with the collaboration of ISGlobal also works on a compendium of criteria and indicators to include the key factor of health in the drafting and environmental assessment of municipal urban planning.

The principal issues tackled in this link between the health of the population and the environment, especially from the autonomous communities and in some cases by local authorities are diverse.

In general terms, primarily, the issue of water is a recurring theme, whether it is water quality, human consumption, sanitation risks, waste water or bathing water. These are commonly the *Plan de Salud de Extremadura 2013-2020 (2013)* tackles, among others, the issues of drinking water and bathing water, as does the *Plan Andaluz de Salud Ambiental 2008-2012 (2008)*, under the heading "water quality".

The effects of climate change, meanwhile, are tackled on the basis of questions like vulnerability, climate risk or health impacts, linked to extreme meteorological phenomena, temperature increase, rainfall variations, etc. The autonomous communities also primarily focus their actions through strategies. Examples include the *Estrategia de Cambio Climático 2050 del País Vasco (2015)* and the *Estrategia gallega de cambio climático y energía 2050 (2019)*.

The management of waste that poses significant health dangers (irritation, toxicity, carcinogens, infection, etc.) is often discussed in the contents of strategies, plans and legal regulations of the autonomous communities. The *Estrategia de Gestión Sostenible de los Residuos de la Comunidad de Madrid*

(2017/2024), Decree 204/1994, of 15 September, on the Regulation of Management of Healthcare Waste in autonomous community of Castile and León, and Law 1/1999, of 29 January, de Residuos de Canarias are a few examples. Plans like the *Plan de Gestión de Residuos Urbanos de Galicia* of 2011, (updated in 2016) or the *Plan Director de Residuos de La Rioja 2016-2026*, are examples of the response of autonomous communities in this area.

One issue that appears in many plans, including the implementation of observatories by the autonomous communities and local authorities is (improving) air quality in terms of atmospheric pollution (PM10, NO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub>), and noise, normally in relation to its effects on the health of the population through risk diseases (acute respiratory disease, cancer, cardiovascular diseases, etc.). The *Plan Calidad Aire de Cantabria 2006-2012* (2009), the *Plan de mejora de Calidad del Aire de la Comunidad Autónoma de Extremadura* (2017) and the autonomous community of Aragon's *DKV Seguros and ECODES Health and Environment Observatory* are three examples that have been launched. In Catalonia, the *Commission on Effects on Health and the Environment* was created to respond to potential impacts of acoustic and electromagnetic on health and the environment and the effects of chemical pollutants on air quality.

The consequences for vector-borne diseases are another concern. As set out in the *National Preparedness and Response Plan for Vector-borne Diseases* (2016), the design of interventions to prevent and control vector-borne diseases is a complex task that requires the collaboration and coordination of multi-

ple sectors. In this regard, many of the competencies are the responsibility of the autonomous communities and local authorities and many activities can be adapted to the characteristics of transmission in each place. Responsibilities in relation to epidemiology, protection of the population from wildlife diseases, the minimisation of risks from vectors and health epidemics are assumed by the autonomous communities through plans, websites and other resources for the purpose of reducing risk and ensuring minimum impact of the transmission of these viral diseases. For example, the *Balearic Islands' Environmental Health website* offers important information in this area.

Several autonomous communities have developed their own reports and plans on how to respond to different vector-borne diseases. The report *Enfermedades Transmitidas por Vectores en Andalucía* (2019) or the *Plan Regional de Vigilancia y Control de Vectores con Interés en Salud Pública en la Comunidad de Madrid* (2018) are two such examples. Some websites, such as that of the *Health Service of Galicia* also cover vector-borne diseases, while other autonomous communities are more focussed on actions relating to diseases transmitted by the Aedes mosquito, such as the *Regional Government of Aragon website*, which provides information on the tiger mosquito, the *Estrategia para la Prevención y Control del Mosquito Tigre en Cataluña* (2010), which seeks to minimise the density and dispersion of this mosquito, and the *Canary Islands Health Service*, which offers information on the monitoring of invasive mosquito species.

## 1. THEMATIC ANALYSIS: THE ENVIRONMENT AND HEALTH: A GLOBAL CHALLENGE

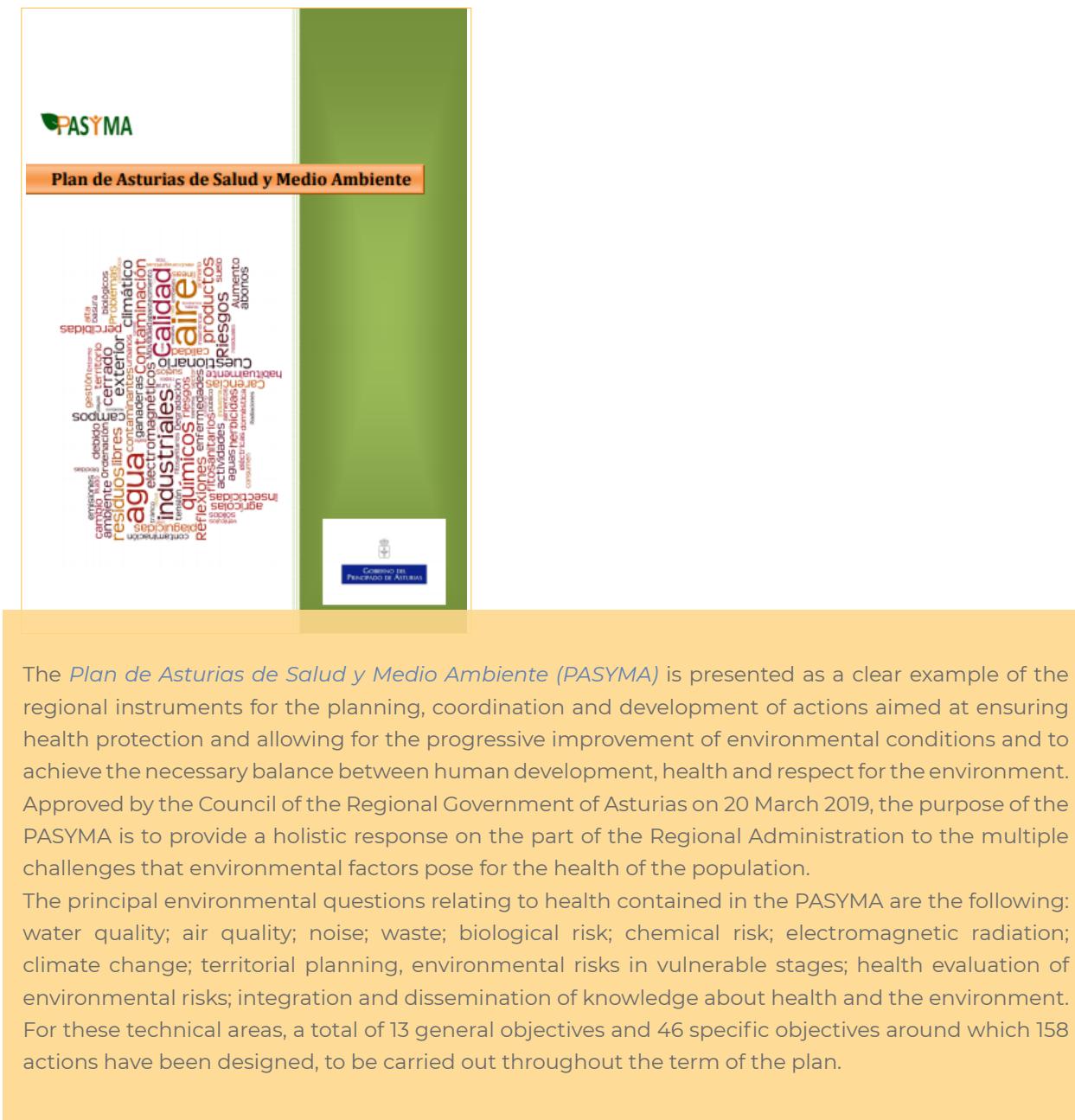
In this regard stands out *Mosquito Alert*, a mobile phone application that came about through a citizens' science project to research and control mosquitoes as vectors of disease coordinated by three public science institutions; the Centre for Ecological Research and Forestry Applications (CREAF), the *Centre d'Estudis Avançats de Blanes* CEAB-CSIC and the Catalan Institution for Research and Advanced Studies (ICREA). Its purpose is to monitor the presence in Spain of the tiger mosquito (*Aedes albopictus*) and the yellow fever mosquito (*Aedes aegypti*), which can transmit diseases like dengue, chikungunya and Zika. Thanks to this platform, the first alert was raised in relation to the presence of another invasive mosquito, the *Aedes japonicus* (in 2018), an important vector of the West Nile virus, and potentially an even more dangerous spreader than the tiger mosquito due to its adaptability.

Turning to COVID-19, the infectious disease caused by the recently discovered coronavirus, the autonomous communities provide reference information, telephone numbers, recommendations, measures and protocols, information on the de-escalation of measures, etc.

The relationship between environmental risks and health, including biological, chemical and radiological, electromagnetic and radiofrequency risks is primarily the responsibility of the autonomous communities through plans such as that of the *Regional Ministry of Health of the Autonomous Community of the Basque Country*, or the *Department of Environmental Health of the Institute of Public Health and Employment of Navarre*.

Another area which must also be taken into account by the autonomous communities is the reduction of health problems linked to territorial planning. Some of the measures implemented by the autonomous communities are the inclusion in planning of preventive guidelines and the delimitation of developments in areas particularly vulnerable to the effects of climate change or the preservation of quality of landscape. This issue is covered in Castile-La Mancha's *Estrategia de Cambio Climático. Horizontes 2020 y 2030* (2018) and Catalonia's document on health and urban development, *Criterios generales para una vivienda y un urbanismo saludables* (2018).

Finally, it must be stressed that environmental training, education, communicating, awareness and information form an important element in this relationship between health and the environment. In general, the autonomous communities take action in these areas through strategic plans. The *II Estrategia de Educación Ambiental de Castilla y León 2016-2020* and the *Educar para la salud y el medio ambiente. Sanidad ambiental: Laboratorio de Salud Pública* initiative of the Autonomous City of Ceuta, where students in the Fourth Year of Compulsory Secondary Education (ESO) are trained in all environmental aspects that constitute a risk to health, are just two examples, but there are many cases linked to the communication of incidents of pollution, etc.



## 5. Conclusions

At the World Health Assembly (the supreme decision-making body of the WHO) held in Geneva on 24 May 2019, the delegations of Member States agreed a new global strategy on health, the environment and climate change. The objective is to tackle the risks and challenges facing environmental health up to 2030, which include environmental factors of a physical, chemical, biological and employment nature.

April saw the presentation of the *draft WHO global strategy on health, environment and climate change: the transformation needed to improve lives and well-being sustainably through healthy environments*.

The strategy defines environmental risks to health as “*all the environmental physical, chemical, biological and work-related factors external to a person, and all related behaviours. It focuses especially on the part of the environment that can reasonably be modified*”.

The strategy is rooted in recognising that the current approaches have been neither sustainable nor efficient in reducing environmental risks and creating favourable environments for health, making it necessary to make changes to the ways in which the environment is managed with regard to health and well-being.

The COVID-19 health and social crisis has made us more conscious than ever of our health and the origin of the causes of deterioration. Any link to people's health condition will be an added value to promote policies to guarantee health protection. In this regard, making health visible within the environment can prove very useful for citizens' awareness

## 1. THEMATIC ANALYSIS: THE ENVIRONMENT AND HEALTH: A GLOBAL CHALLENGE

as in many cases the impact on health of damage to the environment is seen as more significant than the damage to the environment itself.

Health is an important issue to people and it generates concern among society. The focus on health allows us to abandon the notion that the environment is something that only affects wild flora and fauna and explore the idea that environmental problems affect us all.

It is evident from the impact that human activity has on the environment affects people's health as, to a great extent, our health depends on the environment we find ourselves in. It is essential, therefore, that we minimise all impact of human activity on the environment in order to ensure that human health is as good as possible.

To attempt to mitigate the effects of anthropogenic pollution on human health and the health of the environment *a posteriori* is a challenge that in most cases is insurmountable and financially astronomical.

That's why it's crucial both for the health and environment sectors to jointly lead initiatives aimed at preventing, eliminating and minimising pollution generated by human activity at source.

There are many physical and chemical agents that also deserve our attention. Research is currently being carried out into microplastics, antibiotics, endocrine disruptors etc. The different institutions are beginning to take action. See the Communication from the Commission to the European Parliament *European Union Strategic Approach to Pharmaceuticals in the Environment*, of March 2019, places a strategic regional focus on tackling pollution of waters caused

by waste. Or the recent proposal for the restriction of intentionally added microplastics in the framework of the REACH Regulation.

The National Health and Environment Plan is organised in a working framework with the participation of several Ministries and research bodies. It should take into account these final consideration and principles upon which the future strategy for Europe is established.

The working groups established Spanish institutions for the drafting of the report include the following:

- Green cities, air, climate change, industrial pollution, interior air, extreme temperatures and vectors
- Chemicals group
- Waste group
- Natural radiation group
- Water group
- Sea protection group

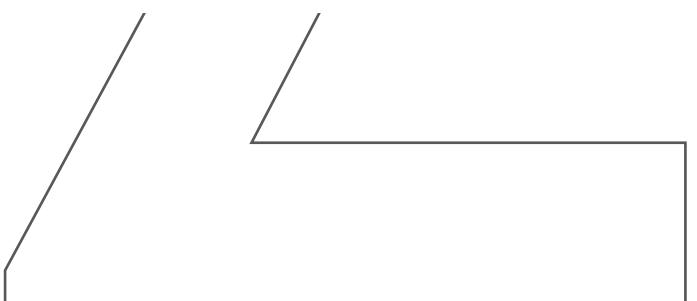
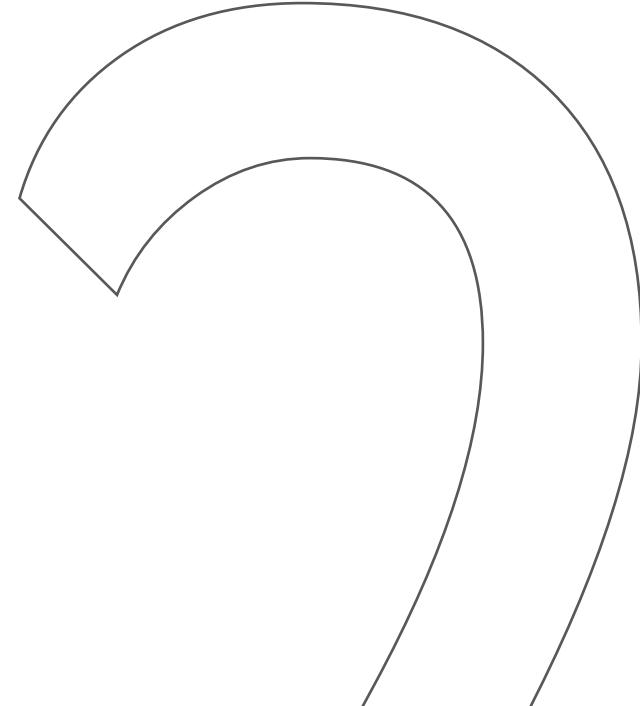
The future National Health and Environment Plan must include within its scope the existing policy instruments (Plans, strategies, guidelines, etc.) and must consider:

- A diagnosis of the situation in terms of the environment and health in Spain.
- The principal environmental risk factors for health in Spain.
- Most important health alteration with environmental implications.
- Proposed specific plans and programmes and management of communication to the population.

- Use of monitoring data on the exposure atmospheric chemical substances among the Spanish population (*biomonitoring*) to establish how it relates to health.
- In term of chemicals, the use of those with a more favourable environmental and health profile should be promoted, fostering rationalisation and sustainability in their use, taking into account the risk to the environment compared to the risk of not using them, supporting industry in the search for new, more sustainable and alternatives that are better for health and for the environment, and exploring the analysis of potential endocrine disruption effects of chemical products.



## **AREAS OF KNOWLEDGE AND ENVIRONMENTAL TOPICS: INDICATORS**





## 2.1. AIR AND CLIMATE

### 2.1.1. EMISSIONS AND AIR QUALITY

- Greenhouse gas emissions
- Emissions of atmospheric pollutants
- Average annual  $\text{NO}_2$  concentration
- Average annual  $\text{PM}10$  concentration
- Average annual  $\text{PM}2.5$  concentration
- Average annual  $\text{O}_3$  concentration
- Regional background air quality: mean concentrations of  $\text{SO}_2$ ,  $\text{NO}_2$ ,  $\text{PM}2.5$ ,  $\text{PM}10$  and  $\text{O}_3$

### 2.1.2. ENERGY AND CLIMATE

- Primary energy consumption
- Final energy consumption
- Production of electricity from renewable sources
- Guarantees of origin and electricity labelling
- Drought periods
- Carbon footprint register, compensation and absorption projects





## 2.1.1. EMISSIONS AND AIR QUALITY

In 2019, the World Health Organisation (WHO) launched its 13th five-year General Programme of Work based on the SDGs and applicable to all countries. Within this framework, air pollution and climate change constitute one of the principal challenges that the WHO committed to tackling in 2019. For this organisation, air pollution is one of the major risks to health, among other reasons because nine of every ten people breathe contaminated air every day. It also states that microscopic pollutants existing in the air, due to their capacity to penetrate respiratory and circulatory systems, can damage lungs, the heart and the brain. The WHO considers this to be the cause of the 7 million premature deaths every year.

“*BreathLife*” a joint campaign led by the WHO and the Climate & Clean Air Coalition aims to raise awareness among the public in relation to the effects of air pollution on our health. It goes even further in claiming that “*the pollution of the air we breathe in doesn't just impact our health; it impacts our climate's health too*”.

Within the framework of the UN Climate action Summit held in September 2019, Spain, together with Peru, led the “*Climate and Air Quality*” initiative. Its proposal to “*achieve a healthy air quality and the harmonisation of the policies to combat climate change and atmospheric pollution by 2030*” proposed a commitment to adopt air quality and climate action policies designed to reach WHO air quality values, which are even more ambitious than those currently legislated by the EU. It also considered the need to foster sustainable electric mobility and to reduce emissions by road transport.

One of the principal events of 2019 was the COP25 climate summit which was held in Madrid but presided by Chile. The agreement adopted, titled *Chile-Madrid Time for Action*, includes a specific point on air emissions by laying the foundations so that “*by 2020, the countries attending present more ambitious commitments to reduce emissions in response to the climate emergency*”.



In Spain the *Integrated National Energy and Climate Plan 2021-2030 (PNIEC)*, whose strategic environmental study was presented for public consultation in 2019, will lay the foundations for consolidating the path to carbon neutrality of the economy on the 2050 horizon. Its approval will allow for progress in reducing emissions and contributing to the improvement of air quality.

In September 2019 the first *National Air Pollution Control Programme (PNCCA)* was approved. Its 57 measures aimed at polluting sectors will make it possible to achieve the objective of reducing pollution of compounds and substances harmful to health, to protect the health of people and ecosystems and comply with the requirements established for Spain in the Directive on national emission limits for 2030. This Plan provides a continuation after the completion of the *National Air Quality Plan 2017-2019 (Air Plan II)* which itself replaced the *National Air Quality and Atmospheric Protection Plan 2013- 2016 (Air Plan)*.

It is a commitment that has arisen from this Directive, which was transcribed into Spanish law through *Royal Decree 818/2018, of 6 July, on measures for the reduction of national emissions of certain air pollutants*. The national emission reduction commitments were established for 2020 and 2030 for sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), non-methane Volatile Organic Compounds (NMVOCs), ammonium (NH<sub>3</sub>) and fine particulate matter (PM 2.5).

The polluting sectors included in its scope are agriculture, energy generation, industry, road transport, maritime and air transport, domestic heating, the use of non-road mobile machinery and the use and manufacturing of solvents. The sectoral measures proposed are in line with those established in the PNIEC 2021-2030 and other national air quality policies.

## 2.1.1. EMISSIONS AND AIR QUALITY



Although the measures proposed are for the 2020-2030 period, the application of the PNCCA is for the period 2019-2022 due to the obligation to update it every four years.

It is envisaged that compliance with the Ceilings Directive will contribute to preventing any exceedances of the legislated air quality values in the Directive on clean air and a cleaner atmosphere in Europe. In 2019, Spain was subject to two cases of infringement proceedings for exceedances of the thresholds for PM10 particles (in the reasoned opinion phase) and for exceedances of the NO<sub>2</sub> threshold (for which the European Commission has presented actions before the Court of Justice of the European Union).

In this regard, in July 2019 Spain received a letter from the European Commissioner for Maritime Affairs and Fisheries indicating the need to strengthen air quality measures due to the continued exceedances of the nitrogen dioxide (NO<sub>2</sub>) thresholds in the city of Madrid and the Barcelona metropolitan area.

The National Air Quality Index, approved in March 2019 by the Order of the Ministry for Ecological Transition (Order TEC/351/2019), constitutes a key element in the improvement of access to environmental information. The purpose of this index is to facilitate air quality at national levels in a manner that is easily understood by citizens, contributing to public access to environmental information in a clear and homogeneous way.

In another order of things, after the processing of information and the public hearings in 2019 the new draft of the *Climate Change and Energy Transition Bill* (May 2020), remains in the process of approval. This bill will facilitate and oversee the socially just decarbonisation of the Spanish economy up to 2050. Among the new elements it contains is traffic,

one of the principal sources of nitrogen oxide emissions, with a very pernicious effect on health and it forces local authorities with populations of more than 50 000 and island territories to implement low emission zones. With regard to fostering the use of electric vehicles, a charging points information platform will be prepared.



Emissions of atmospheric pollutants have negative effects on quality of life and on climate change and can affect people's health and well-being. In cities, sectors such as urban transport, industry and homes consume energy that, in the course transformation, contaminates the air inhabitants breathe. Industrial sectors, inter-city transport (in all its forms, including air and maritime), agriculture, and waste processing are also sources of pollutant emissions that damage air quality and contribute to climate change. According to the WHO, urban air pollution increases the risk of suffering from acute respiratory infections such as pneumonia, as well as chronic diseases such as lung cancer and cardiovascular diseases.

Some of the principal effects that can be highlighted in general terms include:

- The impact of PM on the population: mortality (general and due to cardiovascular and respiratory conditions), the impacts on health (premature births, low birth weight and other complications), Alzheimer's disease and cognitive development.
- The high presence of tropospheric ozone in the air in Spain has been linked to: mortality (general and due to cardiovascular and respiratory conditions), low birth weight and dementia. Although it is widely known that the principal effect of O<sub>3</sub> is on the respiratory apparatus, it is necessary to continue to research the consequences.
- In Spain, NO<sub>2</sub> has been linked to the risk of suffering: premature mortality (general and for cardiovascular and respiratory reasons), impacts on birth (premature birth, low birth weight and other complications), cognitive development alteration and deficient lung function.



The methodology of the National Air Quality Index is currently being reviewed and the new version will include health recommendations based on the levels reached in air quality.

The *National Air Quality Plan 2017-2019 (Plan Aire II)* offered two measures relating to the impact of poor air quality on health. They are *Info Measure 4: Drafting of recommendations relating to air quality*, and *Info Measure 5: Assess the impact on health of air quality in Spain*, a measure that aims not to mitigate the impact but to measure it.

#### Causes of air pollution



Domestic uses



Industry



Transport



Agriculture



Waste

World Environment Day is celebrated on 5 June every year. In 2019, its central theme was “*Air pollution*”; with the aim of drawing attention to the need to combat it. It is a serious global problem that affects large numbers of people and that leads to inevitable premature death.



## GREENHOUSE GAS EMISSIONS

The indicator shows the total greenhouse gas emissions included in the Kyoto protocol expressed as CO<sub>2</sub> equivalent (CO<sub>2</sub>-eq), calculated according to the atmospheric warming potentials and the applicable emission calculation methodologies used by the Intergovernmental Panel on Climate Change (IPCC).

*The increase in the concentration of GHGs and their emissions makes it necessary to monitor them and apply policies and measures for their reduction.*

*The indicator will allow for the monitoring of the future Law on Climate Change and Energy Transition and the Integrated National Energy and Climate Plan. It also contributes to the monitoring of Sustainable Development Goals 11 (Sustainable cities and communities) and 13 (Climate actions).*

### Source:

European Environmental Agency. (2020). *EEA greenhouse gas - data viewer. Data viewer on greenhouse gas emissions and removals, sent by countries to UNFCCC and the EU Greenhouse Gas Monitoring Mechanism (EU Member States)*. Viewed June 2020  
<https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>

Ministry for Ecological Transition and the Demographic Challenge (2020). *National Inventory of Atmospheric Pollutants. Greenhouse gas emissions. Series 1990-2018*. Data provided upon request by the Sub-directorate General of Air Quality and Industrial Environment of the Directorate General of Biodiversity and Environmental Quality (MITERD).

Estimated greenhouse gas emissions for Spain in 2018 reached 334 255 kt of CO<sub>2</sub>-eq, a reduction of 1.8 % with respect to 2017. In relation to 1990, this figure represents an increase of 15.5 % and, with respect to 2007 (the year of total emissions), a reduction of 25.3%.

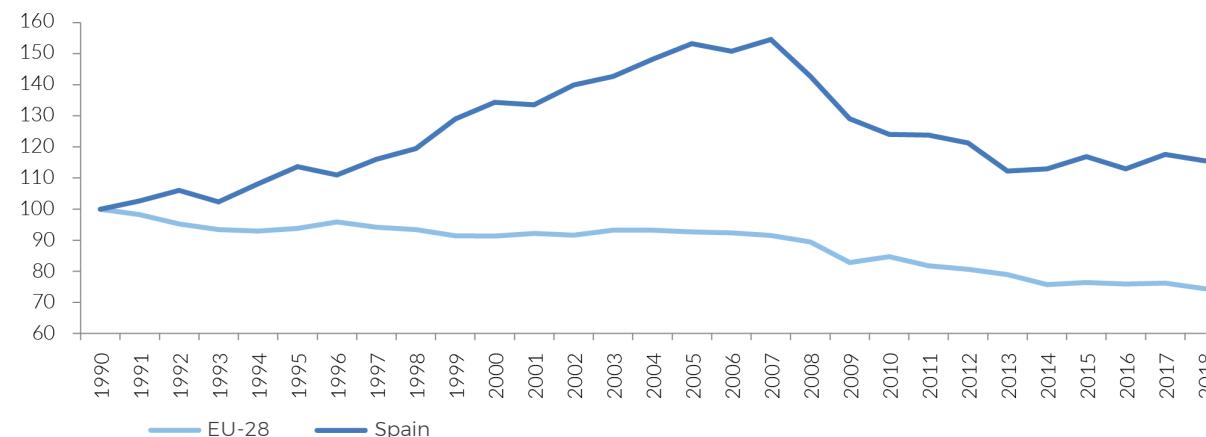
Unlike 2017, 2018 was a wet year, with significant hydraulic energy production increasing 87.4% on 2017 which, together with the increase of 3.6% in wind production, contributed to greater demand for fossil fuels in the production of electricity and the resulting reduction of emissions.

2018 also saw a reduction of agricultural emissions (0.6%), the waste sector (0.6%) and the use of fluoride gases (14.2%). On the contrary, emissions from the industrial (3%), commercial and residential (1.9%) and transport (1.4%) sectors increased.

In the same year, in the distribution by sectors, transport (27%), industrial activities (19.9%) electricity generation (17.8%) and agriculture (11.9%) stand out. Meanwhile, by type of gas, CO<sub>2</sub> is the biggest contributor (80.7%) of total GHG emissions followed by methane (11.9%).

Spain's contribution to total GHG emissions in the EU-28 in the year 2018 maintains the same trend as previous years, accounting for 7.9% of the total, the 6th biggest polluter. Per capita, Spain emitted 7.1 t in 2018, a figure below the 8.2 average for the EU-28 and placing it in 18th position. In relation to GDP, the 285.9 tons per million euros emitted by Spain places us in 14th position in the European ranking in 2018. It is a figure that exceeds the average of the EU-28 which was 266.5 tons per million euros.

**Greenhouse gas emissions (CO<sub>2</sub>-eq)  
Index; 1990=100 and 1995=100 for fluorinated gases**



Indicator/Variable	2009-2018	2014-2018	2017-2018
GHG emissions	-10.5%	2.3%	-1.8%



## EMISSIONS OF ATMOSPHERIC POLLUTANTS

The indicator presents emissions of the five basic pollutants covered by the Gothenburg Protocol and the National Emission Ceiling Directive (Directive 2016/2284/EU): sulphur oxide ( $\text{SO}_x$ ), nitrogen oxide ( $\text{NO}_x$ ), non-methane volatile organic compounds (NMVOCs), ammonium ( $\text{NH}_3$ ) and particulate matter under  $2.5 \mu\text{m}$  (PM2.5).

All pollutants are expressed as an index where the year 1990=100 except PM2.5 for which the year 2000=100.

*It is necessary to monitor emissions of pollutants to verify compliance with the legislated values and their relation to air quality and damage to the Europe's population and ecosystems.*

*The indicator allows for the monitoring of Directive (EU) 2016/2284 on National Emission Ceilings and the Geneva Convention on Long-Range Transboundary Air Pollution. It also contributes to the monitoring of Sustainable Development Goals 11 (Sustainable cities and communities) and 13 (Climate actions).*

### Source:

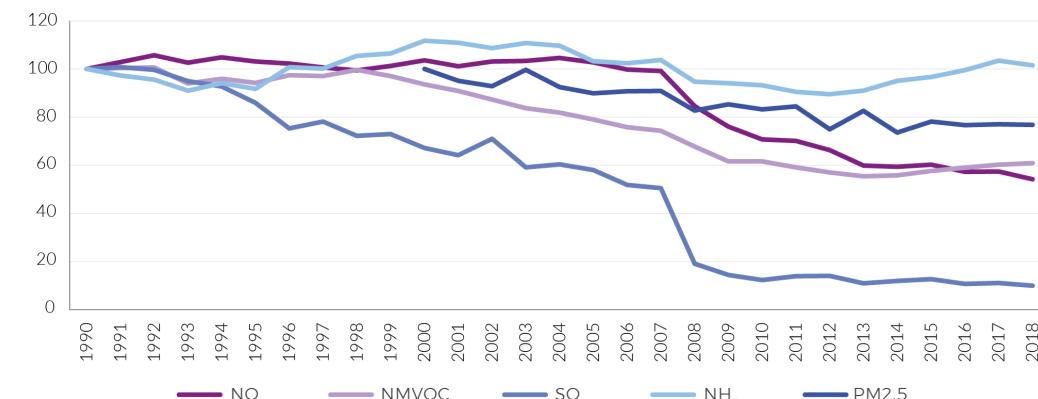
Ministry for Ecological Transition and the Demographic Challenge. (2020). *National Inventory of Atmospheric Pollutants. Emissions of atmospheric pollutants. Series 1990-2018*. Data provided upon request by the Sub-directorate General of Air Quality and Industrial Environment of the Directorate General of Biodiversity and Environmental Quality (MITERD).

In 2018 total emissions for these pollutants stood at: 768.7 kilotons of  $\text{NO}_x$ , 638 kilotons of NMVOCs, 212 kilotons of  $\text{SO}_x$ , 473.8 kilotons of  $\text{NH}_3$  and 128 kilotons of PM2.5.

The last column of the lower table illustrates the evolution of emissions in the last year. The reduction of  $\text{SO}_x$  and  $\text{NO}_x$  principally obeys the decrease in consumption of fossil fuels due to the increase in hydraulic energy for producing electricity. The slight fall in PM2.5 emissions is the result of the aforementioned reduction in the use of fossil fuels offset by the increase in consumption of biomass in the residential, commercial and institutional sectors and in manufacturing industries and construction.  $\text{NH}_3$  emissions, almost entirely of agricultural origin, were reduced due to the lower use of non-organic phosphate fertilisers (including urea). Meanwhile, the increase in NMVOCs seems to have originated in the use of solvents and fuel consumption in the Residential, Commercial and Institutional sectors.

Since 2010, emissions of  $\text{NO}_x$ , NMVOCs and  $\text{SO}_x$  have remained under the ceiling set for Spain. Only ammonium emissions ( $\text{NH}_3$ ) exceeded the maximum limits throughout the entire reference period (2010-2018) with an average excess 25 % above the ceiling.

**Emissions of atmospheric pollutants  
Index 1990=100 (2000=100 for PM2.5)**



Source: MITERD

Indicator/Variable	2009-2018	2014-2018	2017-2018
$\text{SO}_2$ emissions	-30.8 %	-16 %	-9.9 %
$\text{NO}_x$ emissions	-28.7 %	-8.7 %	-5.6 %
$\text{NH}_3$ emissions	7.9 %	6.8 %	-1.9 %
NMVOC emissions	-1.2 %	9.1 %	1 %
PM2.5 emissions	-10 %	4.3 %	-0.4 %



## AVERAGE ANNUAL NO<sub>2</sub> CONCENTRATION

The indicator shows the percentage of the stations included in each of the five ranges into which the annual mean concentration is classified (measured in  $\mu\text{g}/\text{m}^3$ ) of NO<sub>2</sub>, referring to the Lower Evaluation Threshold (LET), Upper Evaluation Threshold (UET) and Annual Limit Value (ALV). These ranges are:

- Concentration of NO<sub>2</sub> below or equal to LET/2 ( $13 \mu\text{g}/\text{m}^3$ )
- Concentration of NO<sub>2</sub> between LET/2 and the LET ( $13\text{-}26 \mu\text{g}/\text{m}^3$ )
- Concentration of NO<sub>2</sub> between the LET and the UET ( $26\text{-}32 \mu\text{g}/\text{m}^3$ )
- Concentration of NO<sub>2</sub> between the UET and the ALV ( $32\text{-}40 \mu\text{g}/\text{m}^3$ )
- Concentration of NO<sub>2</sub> above the ALV ( $> 40 \mu\text{g}/\text{m}^3$ )

Ambient air quality targets are fundamental for preventing or reducing the harmful effects for human health and the natural environment, the procedures and measures for that purpose, and to ensure that information on air quality is made available to citizens.

The indicator allows for the monitoring of the SDGs (goals 3 and 11) and the requirements set out in Law 34/2007, in Royal Decree 102/2011 and Royal Decree 39/2017.

### Source:

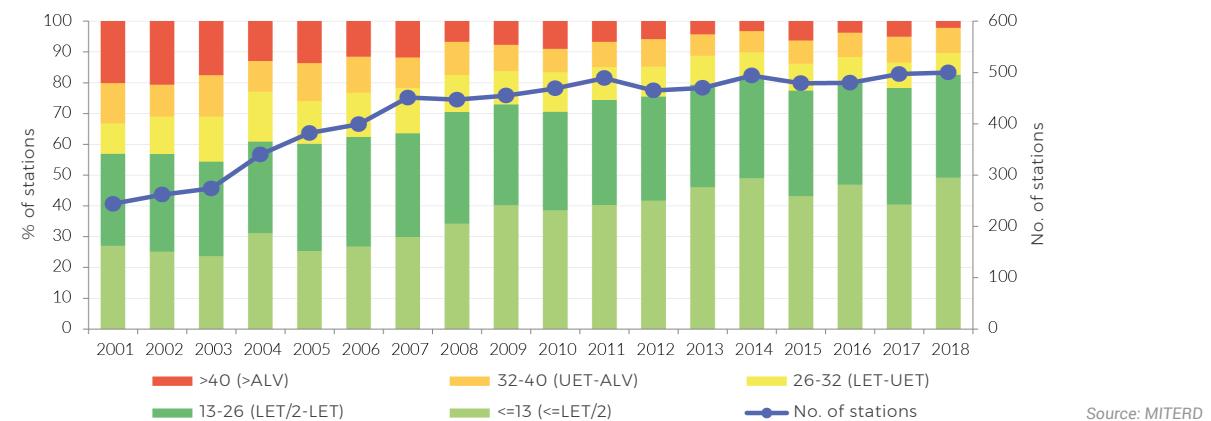
Ministry for Ecological Transition and the Demographic Challenge. (2020). *Air Quality Database*. Data provided upon request by the Sub-directorate General of Air Quality and Industrial Environment of the Directorate General of Biodiversity and Environmental Quality (MITERD).

Only 11 stations present exceedances of the ALV in 2018, an improvement on the figure of 25 in 2017. These exceedances were registered in four areas (Granada and metropolitan area, Area of Barcelona, Madrid and the Henares Corridor) compared to seven areas the previous year, which was also an improvement in terms of the areas with exceedances.

In the rest of the ranges established in the legislation to evaluate air quality, there were also significant falls in the number of stations included in each of them, except for stations with average concentration values below  $13 \mu\text{g}/\text{m}^3$  (half the lower evaluation threshold), which are those that represent better air quality in terms of NO<sub>2</sub>, the number of which rose by 45 stations (22.4 %).

The graphic shows us the improvement in average air quality values analysed through the evolution of the average annual concentration in all stations included in the evaluation. Note how the percentage of stations with higher concentrations of pollutants has fallen and the number of minor concentrations has risen. Nevertheless, this analysis does not reflect the unfavourable situations that may arise at specific stations where there are isolated exceedances of the legislated values.

### Average annual NO<sub>2</sub> concentration: % of stations used in the assessment of air quality classified according to the different ranges established in the legislation and total number of stations used



Indicator/Variable	2009-2018	2014-2018	2017-2018
NO <sub>2</sub> concentrations lower or equal to LET/2 ( $13 \mu\text{g}/\text{m}^3$ )	9	0.2	8.8
NO <sub>2</sub> concentration between LET/2 and the LET ( $13\text{-}26 \mu\text{g}/\text{m}^3$ )	0.7	0.8	-4.4
NO <sub>2</sub> between the LET and the UET ( $26\text{-}32 \mu\text{g}/\text{m}^3$ )	-3.8	-1.3	-1.2
NO <sub>2</sub> concentration between the UET and the ALV ( $32\text{-}40 \mu\text{g}/\text{m}^3$ )	-0.4	1.3	-0.3
NO <sub>2</sub> concentration above the ALV ( $> 40 \mu\text{g}/\text{m}^3$ )	-5.5	-1	-2.8

\* For these variables the trend reflects the difference in percentage values in the periods indicated



## AVERAGE ANNUAL PM10 CONCENTRATION

The indicator shows the percentage of the stations included in each of the five ranges into which the annual mean concentration is classified (measure in  $\mu\text{g}/\text{m}^3$ ) of PM10, referring to the Lower Evaluation Threshold (LET), Upper Evaluation Threshold (UET) and Annual Limit Value (ALV).

These ranges are:

- Concentrations of PM10 below or equal to LET/2 ( $10 \mu\text{g}/\text{m}^3$ )
- Concentration of PM10 between LET/2 and the LET ( $10-20 \mu\text{g}/\text{m}^3$ )
- Concentration of PM10 between the LET and the UET ( $20-28 \mu\text{g}/\text{m}^3$ )
- Concentration of  $\text{NO}_2$  between the UET and the ALV ( $28-40 \mu\text{g}/\text{m}^3$ )
- Concentration of PM10 above the ALV ( $> 40 \mu\text{g}/\text{m}^3$ )

See justification of the average  $\text{NO}_2$  concentration indicator.

### Source:

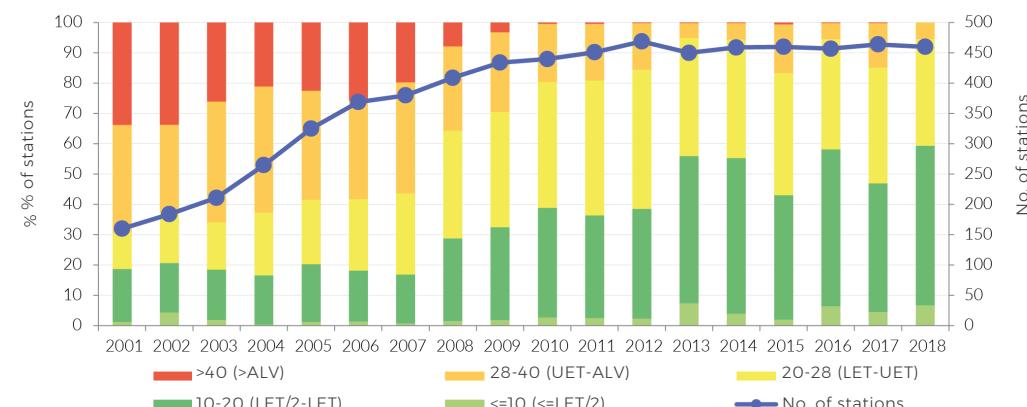
Source: Ministry for Ecological Transition and the Demographic Challenge. (2020). *Clean Air Database*. Data provided upon request by the Sub-directorate General for Air Quality and Industrial Sustainability of the Directorate General of Biodiversity and Environmental Quality (MITERD).

In the year 2018, no station of the network exceeded the annual limit value of PM10 (concentration above  $40 \mu\text{g}/\text{m}^3$ ), improving even further on the situation of the years 2016 and 2017 in which there were exceedances of just one station.

This year, there has also been a noted improvement in the rest of the ranges established by the legislation for assessing air quality, with an increase of number of stations with less than  $10 \mu\text{g}/\text{m}^3$  (at 10 stations) and between  $10$  and  $20 \mu\text{g}/\text{m}^3$  (at 45 stations). This increase in the number of stations with lower concentration of PM10 arises to the detriment of the stations with higher concentration, which fell in 2018.

From the analysis of the period, we can conclude that there was an improvement in average value of average annual concentration of PM10 in all stations including the evaluation, with the fall in the percentage of stations with the worst concentration levels of pollutants and an increase in lower concentrations. Nevertheless, this analysis does not reflect the unfavourable situations that may arise at specific stations where there are isolated exceedances of the legislated values. One must not forget that Spain shows high levels of particles due to the natural increase from intrusions of African air masses.

### Average annual concentration of PM10: % of stations used in the assessment of air quality classified according to the different ranges established in the legislation and total number of stations used



Source: MITERD

Indicator/Variable	2009-2018	2014-2018	2017-2018
PM10 concentrations below or equal to LET/2 ( $10 \mu\text{g}/\text{m}^3$ )	5	2.8	2.2
PM10 between LET/2 and the LET ( $10-20 \mu\text{g}/\text{m}^3$ )	22	1.2	10.2
PM10 concentration between the LET and the UET ( $20-28 \mu\text{g}/\text{m}^3$ )	-2.8	-3.8	-2.9
Concentration of PM10 between the UET and the ALV ( $28-40 \mu\text{g}/\text{m}^3$ )	-20.8	0	-9.2
PM10 concentration above the ALV ( $> 40 \mu\text{g}/\text{m}^3$ )	-3.2	0	-0.2

\* For these variables the trend reflects the difference in percentage values in the indicated periods



## AVERAGE ANNUAL PM2.5 CONCENTRATION

The indicator shows the percentage of the stations included in each of the five ranges into which the average annual concentration is classified (measured in  $\mu\text{g}/\text{m}^3$ ) of PM2.5, referring to the Lower Evaluation Threshold (LET), Upper Evaluation Threshold (UET) and Annual Limit Value (ALV).

These ranges are:

- Concentration of PM2.5 below or equal to LET/2 ( $6 \mu\text{g}/\text{m}^3$ )
- Concentration of PM2.5 between LET/2 and the LET ( $6-12 \mu\text{g}/\text{m}^3$ )
- Concentration of PM2.5 between the LET and the UET ( $12-17 \mu\text{g}/\text{m}^3$ )
- Concentration of PM2.5 between the UET and the ALV ( $17-25 \mu\text{g}/\text{m}^3$ )
- Concentration of PM2.5 above the ALV
- ( $> 25 \mu\text{g}/\text{m}^3$ )

See justification of the average  $\text{NO}_2$  concentration indicator.

**Source:**

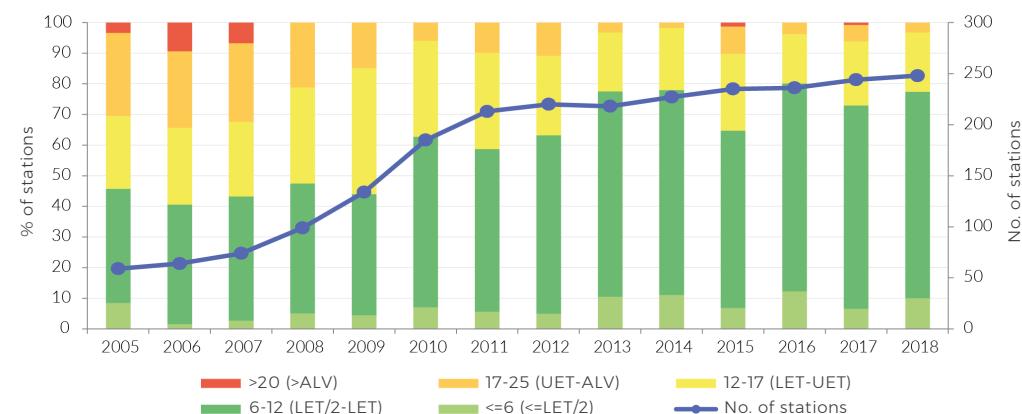
Ministry for Ecological Transition and the Demographic Challenge. (2020). *Clean Air Database*. Data provided upon request by the Sub-directorate General of Air Quality and Industrial Environment of the Directorate General of Biodiversity and Environmental Quality (MITERD).

As in the case of PM10, 2018 saw no exceedances of the annual limit value of PM2.5 (concentration greater than  $25 \mu\text{g}/\text{m}^3$ ) at any of the stations of the network included in the assessment. We return, then, to the situation observed from 2008 on, with the exception of 2015 and 2017 in which 3 and 2 stations exceeded this value respectively.

2018 also saw an increase in the number of stations with concentrations below  $6 \mu\text{g}/\text{m}^3$  and concentrations between  $6$  and  $12 \mu\text{g}/\text{m}^3$  and a fall in stations with concentrations of  $12 \mu\text{g}/\text{m}^3$ .

This same situation observed last year can be observed generally from 2009 on. The fact that the number of stations with lower concentrations of particles has increased and the number of those with higher concentrations has fallen (with those exceeding the annual limit value disappearing) shows an improvement in average air quality in terms of PM2.5. Much like the previous indicators, this analysis does not reflect the unfavourable situations that may arise at specific stations where there are isolated exceedances of the legislated values. One must not forget that Spain shows high levels of particles due to the natural increase caused by intrusions of African air masses.

### Average annual PM2.5 concentration % of stations used in the assessment of air quality classified according to the different ranges established in the legislation and total number of stations used



Source: MITERD

Indicator/Variable	2009-2018	2014-2018	2017-2018
Concentrations of PM2.5 below or equal to LET/2 ( $6 \mu\text{g}/\text{m}^3$ )	5.6	-0.9	3.5
PM2.5 concentration between LET/2 and the LET ( $6-12 \mu\text{g}/\text{m}^3$ )	27.8	0.4	0.9
PM2.5 concentration between the LET and the UET ( $12-17 \mu\text{g}/\text{m}^3$ )	-21.7	-0.9	-1.5
PM2.5 concentration between the UET and the ALV ( $17-25 \mu\text{g}/\text{m}^3$ )	-11.7	1.5	-2.1
PM2.5 concentration exceeding the ALV ( $> 25 \mu\text{g}/\text{m}^3$ )	0	0	-0.8

\* For these variables the trend reflects the difference in percentage values in the periods indicated.



## AVERAGE ANNUAL O<sub>3</sub> CONCENTRATION

For ozone (O<sub>3</sub>), the indicator shows the percentage of stations with sufficient data volume included in each one of the three reference ranges into which the maximum daily values of eight-hour running averages are classified, which, for the protection of human health, must not exceed more than 25 times the average values within a term of three years. Two thresholds are established that define the legislated values: the Target Value (TV) and the LTT (Long-term Target).

These ranges are:

- Concentrations of O<sub>3</sub> below or equal to the LTT (120 µg/m<sup>3</sup>)
- O<sub>3</sub> concentrations between the LTT and the TV
- Concentrations of O<sub>3</sub> above the TV (120 µg/m<sup>3</sup> and 25 exceedances in 3 years)

See justification of the NO<sub>2</sub> average annual concentration indicator.

### Source:

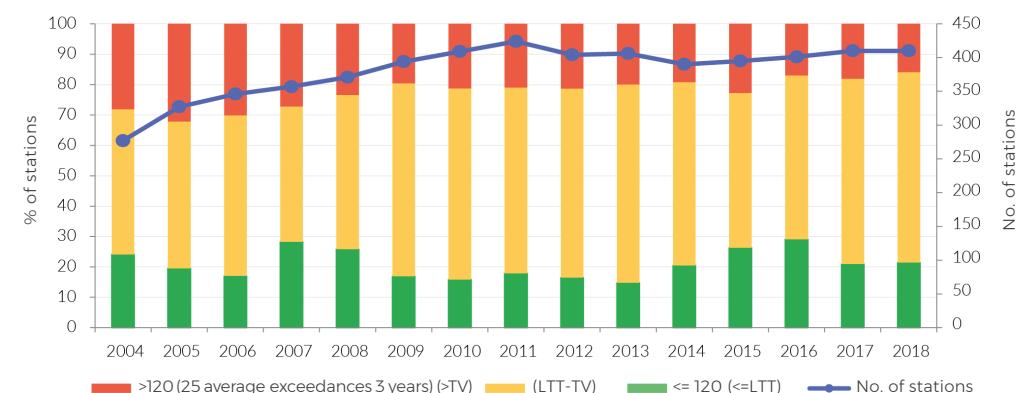
Ministry for Ecological Transition and the Demographic Challenge. (2020). *Clean Air Database*. Data provided upon request by the Sub-directorate General of Clean Air and Industrial Sustainability of the Directorate General of Biodiversity and Environmental Quality (MITERD).

Solar radiation that reaches Spain is one of the factors that conditions the formation of ozone in the lower part of the atmosphere (from its precursors). It must be pointed out that 2018 was a warm year in Spain. The average temperature of 15.5° C exceeded the average annual values by 0.4° C (reference period 1981-2010).

In 2018 the number of stations that presented concentrations of O<sub>3</sub> below or equal to the LTT and also the number between the LTT and the TV. At the same time, the number of stations exceeding the TV fell.

These stations (410 in total) were located in 126 areas across Spain. Of these, 35 areas registered values in excess of the TV, 80 areas presented values between the TV and LTT and 11 areas recorded concentrations below the LTT. These values were similar to last year's with 36, 78 and 12 areas, respectively, recording significant changes in the evaluation of ozone for the protection of people's health.

### Average annual concentration of O<sub>3</sub>: % of stations used in the assessment of air quality classified according to the different ranges established in the legislation and total number of stations used



Source: MITERD

Indicator/Variable	2009-2018	2014-2018	2017-2018
O <sub>3</sub> concentrations below or equal to the LTT (120 µg/m <sup>3</sup> )	4.5	1	0.5
O <sub>3</sub> concentrations between the LTT and the TV	-0.8	2.4	1.7
O <sub>3</sub> above the TV (120 µg/m <sup>3</sup> and 25 exceedances in 3 years)	-3.7	-3.4	-2.2

\* For these variables the trend reflects the difference in percentage values in the periods indicated



## REGIONAL BACKGROUND AIR QUALITY: MEAN CONCENTRATIONS OF SO<sub>2</sub>, NO<sub>2</sub>, PM2.5, PM10 AND O<sub>3</sub>

The indicator shows the average concentrations corresponding to the annual average of SO<sub>2</sub>, NO<sub>2</sub>, PM2.5, PM10 and O<sub>3</sub> in the background stations of the EMEP/VAG/CAMP network.

*The evaluation of atmospheric pollution at regional level in three areas isolated from the direct emission points through representative stations allows for the monitoring of the level of regional pollution due to anthropogenic, natural, regional, or cross-border sources located at great distances.*

*It complies with the obligations arising from the EMEP Strategy and the VAG and CAMP Programmes and allows for the monitoring of the SDGs (objectives 3 and 11).*

### Source:

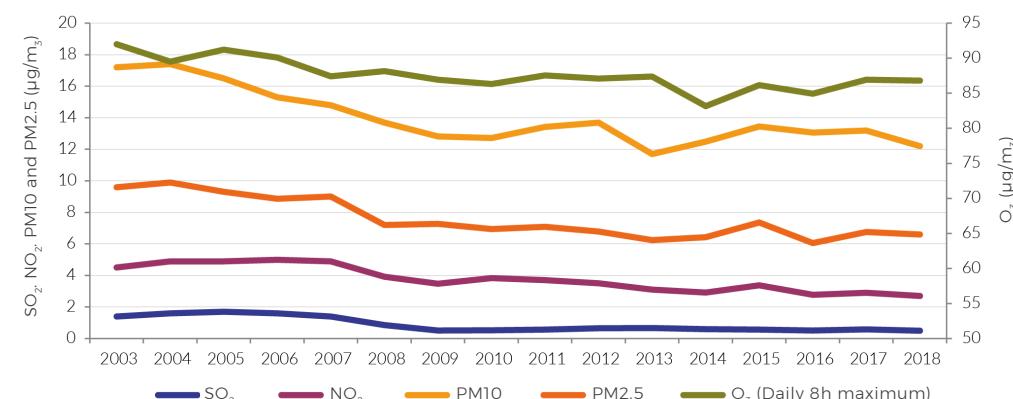
Ministry for Ecological Transition and the Demographic Challenge. (2020). Air Quality Database. Data provided upon request by the Sub-directorate General of Air Quality and Industrial Environment of the Directorate General of Biodiversity and Environmental Quality (MITERD).

Spain's EMEP/VAG/CAMP network observes the chemical composition of the atmosphere at stations some distance from sources of pollution is comprised of 13 stations at specific locations.

The analysis of the five pollutants in 2018 shows us how average concentration has fallen for all of them after the increase recorded in 2017. Average values recorded for SO<sub>2</sub> and NO<sub>2</sub> are low, remaining below the values legislated for the protection of health and vegetation. In terms of tropospheric O<sub>3</sub>, the secondary source created from complex chemical reactions of other pollutant gases by the action of solar radiation means that it is present and makes it the pollutant with the highest concentration at background stations.

Over the last 10 years (2009-2018) there has been an improvement with regard to background pollution, especially for NO<sub>2</sub> which has seen a reduction of more than 22 %. Over the last five years (2014-2018) there has been a notable reduction in SO<sub>2</sub>, while PM2.5 and ozone have seen increases in average concentrations.

**Average concentration of annual averages at background stations of the EMEP Network.**  
(Particles: daily data; SO<sub>2</sub> and NO<sub>2</sub>: hourly data; O<sub>3</sub>: daily eight-hour maximums)



Source: MITERD

Indicator/Variable Average concentration of annual averages in the EMEP Network	2009-2018	2014-2018	2017-2018
SO <sub>2</sub> : hourly data	-2 %	-15.3 %	-13.8 %
NO <sub>2</sub> : hourly data	-22.4 %	-7.5 %	-6.9 %
PM10: daily data	-4.8 %	-2.2 %	-7.5 %
PM2.5: daily data	-9.2 %	2.6 %	-2.2 %
O <sub>3</sub> : Daily eight-hour maximums	-0.1 %	4.4 %	-0.1 %



The Intergovernmental Panel on Climate Change: (IPCC), the principal international body for the assessment of climate change, created by the *United Nations Environment Programme* (UNEP) and the World Meteorological Organization (WMO), have been warning of the causes and consequences of emissions arising from human activities since 1988. The data are systematically corroborated and virtually no doubts remain regarding the relationship between anthropogenic emissions and climate. Year after year records are broken for CO<sub>2</sub> concentrations and, consequently, average world land and ocean temperatures continue their rising trend.

In 2019, the IPCC published two *Special Reports*. The first, on the ocean and the cryosphere in the context of climate change, stated that glacier melt and warming of the ocean will affect a billion people. The other looked at terrestrial ecosystems, specifically desertification, land degradation, sustainable land management, food security and flows of greenhouse gases in terrestrial ecosystems.

The European Union amended the Energy Efficiency Directive in 2018. The key amendment is the energy efficiency target of at least 32.5 % by 2030, in comparison to the 20 % set for 2020. The energy efficiency and the energy labelling targets incentivise the industry to innovate and invest, while more efficient buildings from an energy perspective provide energy savings as well as economic, environmental and health benefits. In absolute terms, the new targets mean that, from the moment the United Kingdom ceases to apply European legislation, the EU should not exceed 1 128 mtoe of primary energy and 846 mtoe of final energy.

In its *26th Declaration on the state of the world climate*, the WMO reported that 2019 was the second warmest year since records began and that the five-year period 2015-2019 included the five historically warmest years. This trend is not isolated as the decade 2010 to 2019 was the warmest since 1850, when records began. This declaration also highlights that all the parameters arising from increased temperatures continued their negative trends: rising sea levels, marine heat waves, acidification of the oceans, the melting of icecaps and glaciers, drought, flooding and wildfires, are expected to continue. It is also estimated that 70 % of internal migrations were as a consequence of meteorological and climate disasters.

In December 2019 the United Nations Climate Change Conference (COP25) was held in Madrid. It had been due to be held in Chile, but the venue was changed in light of the social unrest that broke out in the country in October. The conclusions of COP25 were criticised for a lack of ambition and for failing to regulate the purchase and sale of carbon credits, with that action postponed to the COP26 conference which was due to be held in Glasgow in 2020 but which has now been postponed to 2021 due to the coronavirus pandemic affecting the planet.



The climate challenge we face is enormous because it means substantially changing our development model, including energy sources. It is evidenced that the challenge transcends the scientific disciplines and affects the economic sphere when we see the programme of the Annual Meeting of the World Economic Forum in Davos in 2019, which analysed the climate and the loss of nature as risks to achieving social and economic progress within the framework of the UN's Sustainable Development Goals for 2030.

After the Climate Change Summit on 24 September in New York, the global citizens' response to the climate crisis was substantial with large crowds protesting in all countries, including Spain.

In December 2019, the president of the European Commission, Ursula von der Leyen, presented the *European Green Deal*. It is a plan comprised of fifty concrete actions to make Europe the first climate neutral continent by the year 2050. Shortly before that, in November, the European Parliament



declared the climate emergency. Following the European line, in January 2020, Spain's Council of Ministers approved the agreement of the *Declaration of the Climate and Environmental Emergency in Spain*, committing to developing 30 lines of action to tackle the climate crisis.

The Paris Agreement of 2015 lays the foundations for achieving a carbon neutral ecological and economic transition, replacing the economy based on fossil fuels and boosting renewable energies. Spain is on course to reach the EU's binding objective of achieving at least 32.5 % of energy from renewable sources for 2030. According to the International Renewable Energy Agency, in the year 2019 Spain entered the world top 10 in terms of renewable capacity with a total of 54 592 MW. And according to data from grid operator Red Eléctrica Española, in 2019, Spain added 6 456 megawatts of new electric power from renewable sources.

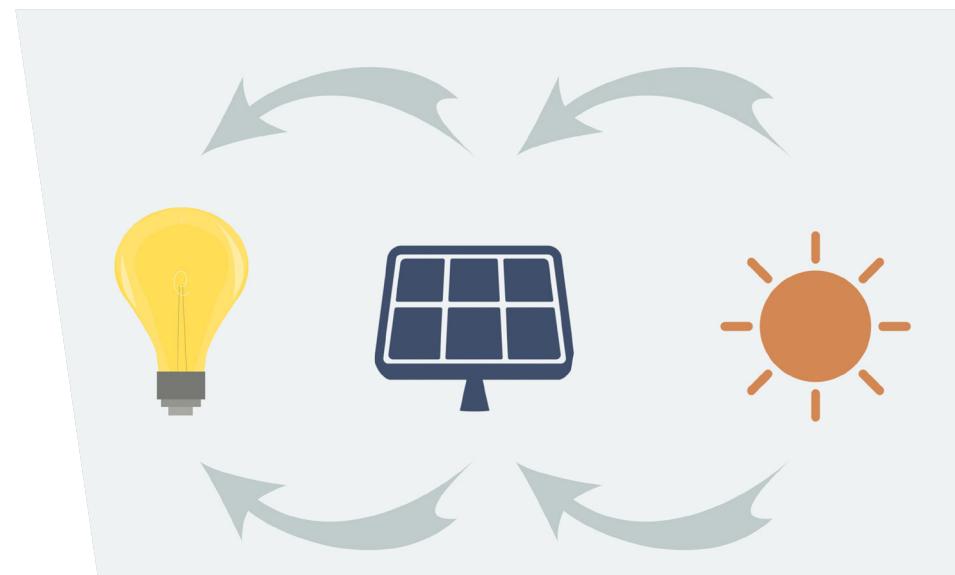
Despite that, the weight of renewables in the energy mix fell in 2019 compared to the previous year (37.5 % compared to 38.5 % in 2018), due to the fact the 2018 was an exceptional hydrological year and energy generation using natural gas, which practically doubled its contribution (11.5 % in 2018, 21.9 % in 2019).

This intense development of energies comes after the change in regulation in late 2018, which disincentivised the development of photovoltaic solar energy and placed barriers on domestic consumption. Furthermore the cheapening of technology costs saw increased competitiveness of these energy sources with respect to fossil fuels. These data are in line with the government target for 74 % of the energy generated in Spain from renewable sources by

2030, from the 108 gigawatts (GW) installed currently to 157, most from wind energy and photovoltaic solar energy. The latter is the technology that most increased its presence in the Spanish generation fleet with an increase of 66 % on 2018, with more than 7 800 MW of power installed.

With regard to wind energy, over 1 600 MW was added to the generator fleet, ending the year above the 25 200 MW installed. 2019 was the first year to see marine wind energy capacity installed with the construction of the first offshore wind turbine off the island of Gran Canaria.

Spain's fleet of power generation facilities is becoming increasingly more renewable, with renewables representing almost half (49.3 %) of the total. In 2019, 36.8 % of electricity generated in the country was renewable and 58.6 % was CO<sub>2</sub> emission free (adding renewable energies and nuclear power).





## 2.1.2. ENERGY AND CLIMATE

The structure of the Ministry for Ecological Transition and Demographic Challenge, approved on 28 April, joins the Institute for Fair Transition as an instrument to manage the processes of transformation and closure of coal fired and nuclear power plants. It will allow for the opportunities of industrial and economic activity to be optimised, guaranteeing employment and development of the affected area, all within the framework for the ecological transition. Its contribution will improve the socio-economic conditions of areas that contribute to the decarbonisation of the economy and the reduction of greenhouse gas emissions due to the change in the energy mix.

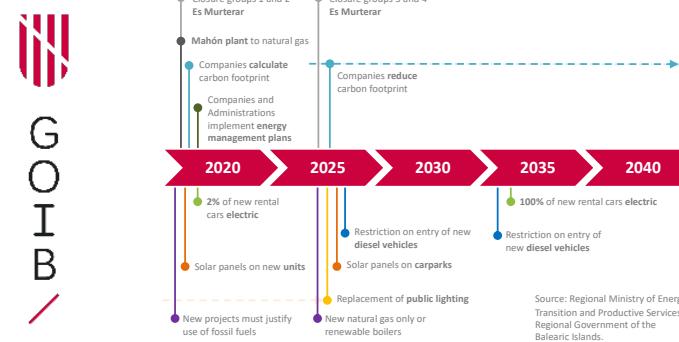
The *Carbon Footprint and Compensation and Absorption Projects Register*, in place since the year 2014 sees an increase in the number of requests received every year, with a total of 2 712 at the end of 2019. Most requests, 94 % of the total, are for the calculation of carbon footprints.

In compliance with the Energy Efficiency Directive, Spain is developing the *National Integrated Energy and Climate Plan (PNIEC) 2021-2030*, which was debated with the different stakeholders throughout 2019 and the draft plan was sent to the European Commission on 31 March 2020. The plan establishes the following goals for 2030:

Targets for the year 2030 in the National Integrated Energy and Climate Plan (PNIEC)	
Reduction of GHG emissions with respect to 1990	21 %
Renewable energies as share of final energy use	42 %
Improvement in energy efficiency	39.6 %
Renewable energy in electricity generation	74 %

During 2019 negotiations continued between the different stakeholders to achieve a consensus on the Climate Change and Energy Transition Act. The text was submitted to public consultation and a number of submissions were taken on board. After the analysis of Environment Advisory Council, the Sectoral Conference and the Council of State, in mid May 2020, the Council of Ministers finally sent the *draft Climate Change and Energy Transition Bill* to Parliament. With that, the process began in Parliament for Spain to reach neutral emissions no later than 2050, coherent with the scientific criteria and the demands of citizens. Among the objectives of this Law are the reduction of GHG emissions by at least 20 % from 1990 by the year 2030 and to generate 70 % of electricity using renewables, so that at least 35 % of final energy consumption comes from

renewables. The aim is to improve energy efficiency by at least 35 %. The draft bill is complementary and coherent with the PNIEC and both constitute the Strategic Energy and Climate Framework for the period 2021-2030. The draft bill includes making it compulsory for municipalities with a population over 50 000 to implement low emission zones and breaks down the measures to be carried out to boost the development of electric mobility while dedicating more resources to the fight against climate change. Through this law, it is intended to promote adaptation to climate change and enhance citizen participation in the development of different plans, strategies and instruments.



One example of the initiatives developed by the autonomous communities can be found in the Balearic Islands. In 2019, the regional government approved Law 10/2019, of 22 February, on climate change and energy transition. Among the objectives it proposes are the stabilisation and reduction of energy demand, the reduction of external energy dependence and progressing towards energy self-sufficiency and the decarbonisation of the economy.



## PRIMARY ENERGY CONSUMPTION

The indicator shows primary energy consumption, which is energy needed from any natural source for its transformation into final energy (direct use).

The unit of measurement for energy is tons of oil equivalent. The sources used for these consumption figures are the following: petroleum, carbon, natural gas, nuclear energy, renewable sources (hydraulic, wind, solar, biomass, waste, etc.) and non-renewable waste.

*The evolution of primary energy consumption allows for the monitoring of energy efficiency objectives.*

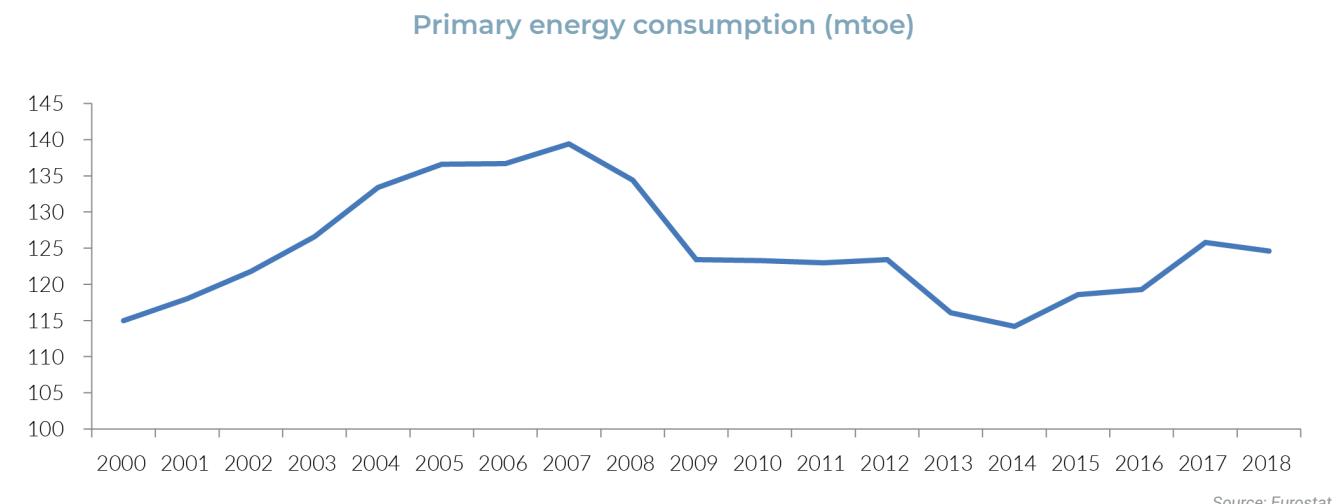
*The indicator contributes to the monitoring of the binding climate strategies and objectives of the European Union. In Spain, the indicator will allow for the monitoring of the future Law on Climate Change and Energy Transition and the Integrated National Energy and Climate Plan. It also contributes to the monitoring of Sustainable Development Goals 7 (Affordable and clean energy) and 13 (Climate action).*

Primary energy consumption in the EU rose to 1 551 million tons of oil equivalent (mtoe), 0.7 % lower than the previous year. Consumption in Spain represented 8 % of the total in the EU. The countries with the highest primary energy consumption were Germany (18.8 %), France (15.4 %), United Kingdom (11.3 %) and Italy (9.5 %), with Spain in fifth position.

In 2018, primary energy consumption in Spain stood at 124.6 mtoe and this constituted an increase of 0.9 % on 2017. The series for the last ten years (2009-2018) indicates how, after the decrease in the initial years, 2014 marked a tipping point (114.2 mtoe). There was a gradual increase from 2014 up to 2017 when consumption reached 125.8 mtoe with the downward trend commencing in 2018. Between 2007, the year with the highest consumption, and 2018, there was a reduction in consumption of 10.6 %.

The intensity of primary energy expresses primary energy consumption per unit of GDP generated and measures the degree of energy efficiency of the economy of a country. After the economic crisis in 2007, in 2014 Spanish GDP began to grow again, as did energy consumption. However, energy consumption grew at a much slower pace than GDP, thus improving the efficiency.

The general trend is towards greater energy efficiency. The improvement from the year 2009 was 8.7 %, waning to 2.2 % in 2018 with regards to the previous year.



### Source:

Eurostat. (2020). Primary energy consumption (sdg\_07\_10). Viewed July 2020  
[https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=sdg\\_07\\_10](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=sdg_07_10)

Indicator/Variable	2009-2018	2014-2018	2017-2018
Primary energy consumption	1 %	9.1 %	-0.9 %



## FINAL ENERGY CONSUMPTION

The indicator shows final energy consumption, which is the energy supplied to the consumer converted into useful energy. The value is generally lower than that of primary energy, as its transformation and transport can cause losses.

In addition to total final energy consumption, the indicator encompasses the contribution made by the principal sources of energy employed in Spain (carbon, gas, petroleum products, renewables and electricity).

See explanation of the indicator “Primary energy demand”.

### Source:

Eurostat. (2020). Primary energy consumption (sdg\_07\_11). Viewed July 2020 [https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=sdg\\_07\\_11](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=sdg_07_11)

Institute for Energy Diversification and Conservation (IDAE). (2020). Balances de Energía Final (1990-2018). Viewed June 2020 <http://sieeweb.idae.es/consumofinal/>

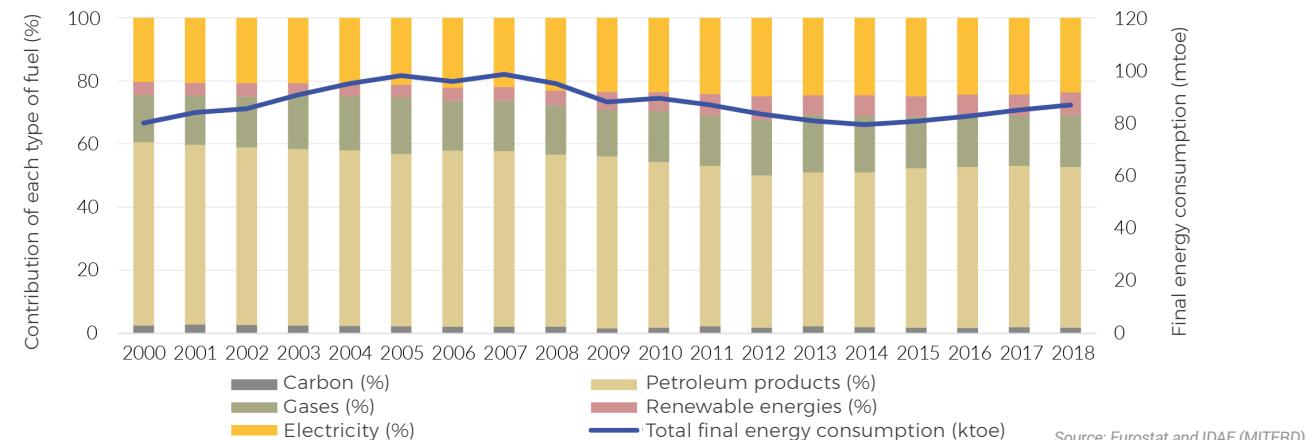
According to the data from Eurostat, final energy demand in the EU stood at 1124.1 mtoe in 2018, practically the same as in 2017 (1122.9 mtoe). Consumption in Spain represented 7.7 % of total consumption in the EU-28. The countries with the highest final energy consumption in the EU were Germany (19.2 %), France (13 %), United Kingdom (12 %) and Italy (10.4 %) with Spain in fifth position. In 2018, final energy consumption in Spain stood at 86.8 mtoe and this constituted an increase of 2.6 % on 2017.

Over the last ten years (2009-2018), final energy demand in Spain fell 1.3 %, while between the years 2004 and 2018 it grew by 9.6 % and between 2017 and 2018, 2.6 %.

In 2018, the energy balance of the IDAE shows that petroleum products represented more than half (51 %) of final energy consumed, with a gradual increase from the year 2000, up to the year 2012 in which they made up 48.3 %, before beginning to grow again. Electricity (23.6 %) and gas (16.4 %) are the next most used sources of final energy, with percentages similar to previous years. Renewable energies represented 7.2 % of final energy consumption in 2018, the second highest figure after the 7.6 % in 2012.

The last ten years (2009-2018) have seen a noticeable reduction of 3.5 % percentage points in petroleum products, which contrasts with the increase in renewable energies, growing 1.5 percentage points.

**Total final energy consumption (mtoe) and contribution of each type of fuel (%)**



Indicator/Variable	2009-2018	2014-2018	2017-2018
Final energy consumption	-1.3 %	9.6 %	2.6 %



## PRODUCTION OF ELECTRICITY FROM RENEWABLE SOURCES

The indicator reflects the evolution of electricity generation from different renewable sources expressed in gigawatt hours (GWh). The results are represented on a national and autonomous scale, also indicating the percentage generation of renewables with respect to the generation of total electricity.

*The supply of safe, clean and efficient energy to consumer sectors involves significant technological challenges and difficulties. The role of renewable energies is key for reaching energy security, as is their evident contribution to the decarbonisation of the energy system.*

*In Spain, the indicator will allow for the monitoring of the future Law on Climate Change and Energy Transition and the Integrated National Energy and Climate Plan. It also contributes to the monitoring of Sustainable Development Goals 7 and Affordable and clean energy and 13 Climate action.*

### Source:

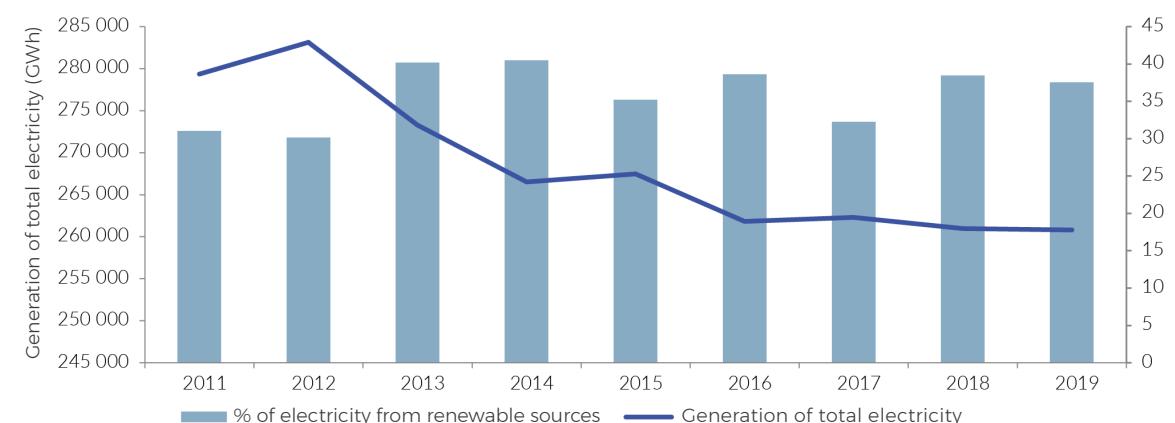
Red Eléctrica de España. (2020). *Generation of total electricity and from renewable energies by autonomous community 2011-2019*. Data provided on express request.

In 2019, electricity production from renewable sources was 97 887.7 GWh, an increase of 2.4 % on the figure for 2018 (100 344.4 GWh). The distribution of electricity generation by autonomous community is very unequal, with some communities with very low production, and others producing almost a fifth of the national total. As has been seen every year since 2011, Castile and León is the autonomous community which produces the most electricity, generating 19 085.9 GWh in 2019, constituting 19.5 % of total domestic electricity generation from renewable sources. In second place was Galicia (16 203.9 GWh, 16.6 %), followed by Andalusia (12 886.4 GWh, 13.2 %) and Castile - La Mancha (12 113 GWh, 12.4 %). The rest of the communities showed figures below 10 000 GWh.

The proportion of electricity from renewable sources as a share of total electricity in Spain during 2019 was 37.5 %, 0.9 percentage points lower than the previous year. In the case of the autonomous communities (2018), Castile and León produced the highest proportion of electricity from renewable sources, with 85.2 % followed by Navarre (65.2 %), Aragon (54 %), Galicia (55.4 %) and Castile-La Mancha (53 %). The regions or autonomous cities with the lowest proportion of renewables in 2019 were Ceuta (0 %), Melilla (2.5 %), the Balearic Islands (6.2 %) and the Canary Islands (13.6 %).

According to data from Eurostat, the percentage of primary renewable energy in the EU (data from 2018) was 18 %, 0.5 % lower than the previous year. Spain, with 17.5 % was close to the European average.

**Total electricity production and percentage of renewable sources in Spain**



Source: REE

Indicator/Variable	2011-2019	2015-2019	2018-2019
Total electricity generation	-6.6 %	-2.5 %	-0.1 %
* Generation of electricity from renewable sources as a percentage of total electricity generation	6.5	2.4	-0.9
* In this variable the trend reflects the difference in percentage values in the years indicated			



## GUARANTEES OF ORIGIN AND ELECTRICITY LABELLING

The indicator expresses the evolution of the number of companies that adhere to the Guarantee of Origin and Electricity Labelling System and its certified production, expressed in gigawatt-hours.

*The Guarantee of Origin (GoO) is an instrument that certifies that a quantity of electricity has been produced from high-efficiency renewable or cogeneration sources within Spain and provides information on the environmental impact associated with production.*

*The indicator contributes to the monitoring of Sustainable Development Goals 7 (Affordable and clean energy) and 13 (Climate action).*

### Source:

National Commission on Markets and Competition. (2020). *Agreement on statistical information of the guarantee of origin system relative to energy produced in 2019 (and before). Annex statistical information of the guarantee of origin system relative to energy produced in 2019 of 28 April 2020.* Viewed June 2020 [https://gdo.cnmces/CNE/resumenGdo.do?informe=garantias\\_etiquetado\\_electricidad](https://gdo.cnmces/CNE/resumenGdo.do?informe=garantias_etiquetado_electricidad)

Red Eléctrica de España. (2020). *Las energías renovables en el sistema eléctrico español 2019.* Viewed July 2020 [https://www.ree.es/sites/default/files/11\\_PUBLICACIONES/Documentos/Renovables-2019.pdf](https://www.ree.es/sites/default/files/11_PUBLICACIONES/Documentos/Renovables-2019.pdf)

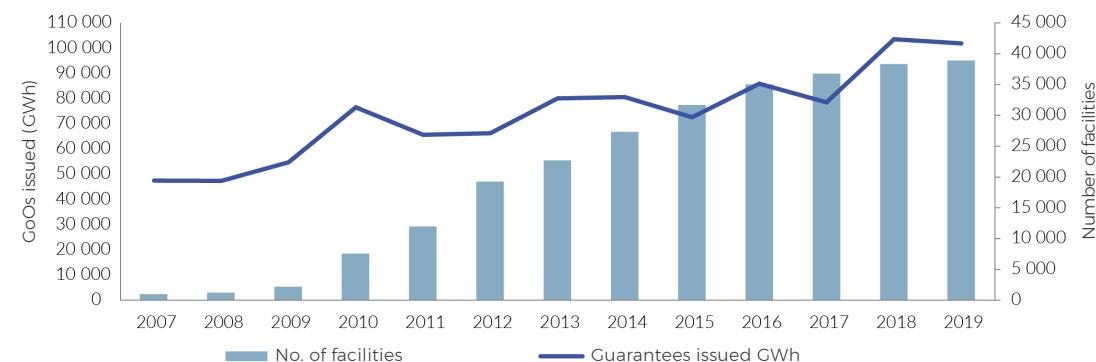
The number of facilities certified by the National Commission on Markets and Competition (CNMC) in 2019 was 38 762 facilities, 1.4 % higher than the previous year. In terms of certified capacity, that reached 33 589 MW, constituting a reduction of 30 % on the previous year.

The guarantees issued reached 101 799 GWh, corresponding to 87.7 % renewable energies and 12.3 % cogeneration. Despite the different in proportions between one and the other, the upward trend maintains the proportion of cogeneration. The guarantees issued full by 1.6 % compared to 2018, in contrast with the significant increase of 31.8 % the year before. The facilities that increased most, proportionally, were cogeneration fuel oil and natural gas plants (28.6 % and 12.8 % respectively), while in absolute numbers photovoltaic plants had the highest growth, with 1 302 new plants.

According to the report *Las energías renovables en el sistema eléctrico español 2019* (REE, 2019), renewables accounted for 55 349 MW, 37.5 % of total generation, somewhat lower than the 38.4 % in 2018. That was followed by combined cycle generation (21.9 %) and nuclear (21.2 %). Wind energy reached 20.6 %. The reduction in carbon, which stands at a meagre 5 %, is significant, the lowest value since records began.

The contribution to the mix of renewable energies in the year 2019 fell by 1.2 % compared to the previous year, due to the lower hydraulic production, 27.6 % lower than 2018 due to a bad hydrological year. The significant decrease in coal plant production, with almost 66 % less compared to the previous year, which caused a reduction in carbon dioxide emissions, falling from 0.3 to 0.2 kg/kWh compared to 2018. From 2007, the increase in renewable production in Spain was 16.4 %, while production and marketing of energy from carbon fell practically by 20 %. Emissions also fell, some 50 % from 0.4 to 0.2 kg/kWh.

**Guarantees of origin issued (GWh) and number of facilities accredited**



Source: CNMC

Indicator/Variable	2010-2019	2015-2019	2018-2019
Guarantees of origin issued	33.1 %	40.3 %	-1.6 %



## DROUGHT PERIODS

The indicator compares the average annual rainfall for the period 1947-2019 with the average situation established for a 30-year reference period (1981-2010) which gives rise to a general classification ranging from different levels of drought-humidity based on precipitation levels.

*Drought is an extreme phenomenon whose geographic and temporal boundaries are difficult to determine and may become a natural disaster where the capacity to manage hydraulic resources does not exist. The effects of climate change lead to a scenario of a general increase in the severity of drought, both meteorological and hydrological, due to the combined effects of reduced rainfall and the increase in evapotranspiration.*

*The indicator contributes to the monitoring of Sustainable Development Goals 2 (Zero hunger) and 13 (Climate action).*

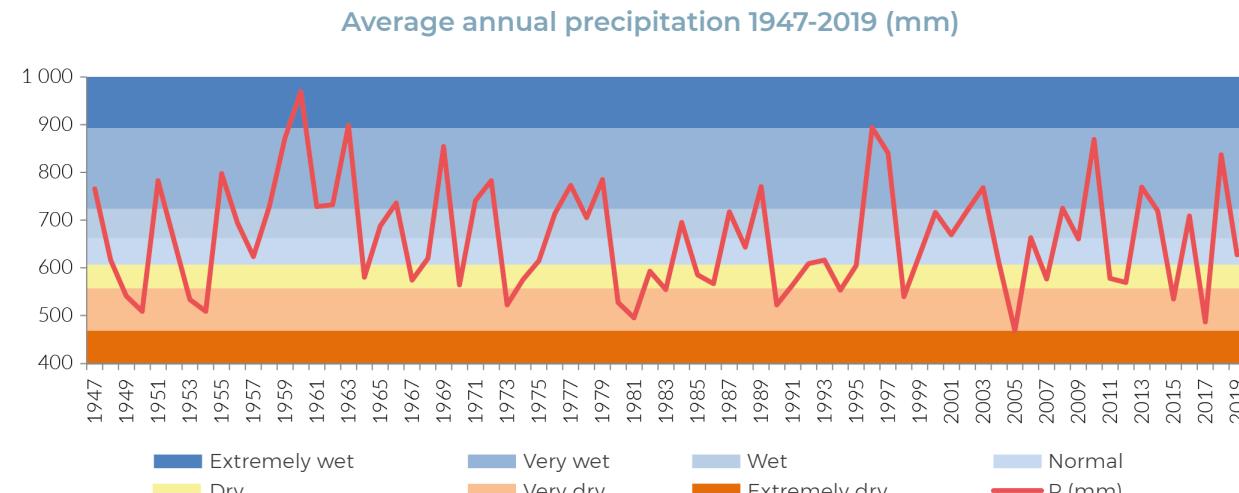
### Source:

Spanish State Meteorological Agency (AEMET) of the Ministry for Ecological Transition and the Demographic Challenge. (2020). Data provided on express request.

Most of peninsular Spain has Mediterranean climate, characterised by a dry period in summer and irregularity in the precipitation regime. The current patterns may be intensified due to climate change, accentuating periods of drought. According to the State Meteorological Agency (AEMET) the period 1981-2010 is representative of the precipitation regime and based on the following classification is used to classify years in terms of wetness: "Extremely dry" (precipitation below 468.2 mm), "Very dry" (between 557.1 and 468.2 mm), "Dry" (between 606.9 and 557.1 mm), "Normal" (between 662.5 and 606.9 mm), "Wet" (between 723.8 and 662.5 mm), "Very wet" (between 893.3 and 723.8 mm) and "Extremely wet" (precipitation above 893.3 mm).

The provisional data from 2019 show that average annual precipitation in Spain was 627.5 mm, some 200 mm less than the previous year, a reduction of more than 25 %. While 2018 was the sixth wettest year in the series, 2019 was considered a "normal" year according to established intervals.

Of the 73 years in the data series, 12 of these (16.4 %) saw precipitation within the interval considered "Normal" while 35 of them (47.9 %) saw higher precipitation. In the remaining 26 years (35.6 %) precipitation was lower than normal, with one "Extremely dry" year in 2005.



Source: prepared by the authors with data from AEMET

Indicator/Variable	2010-2019	2015-2019	2018-2019
Average annual precipitation	-27.8 %	92.6 %	-25 %
Average annual precipitation of a territory is intrinsically variable over time, and there is no causal relationship between the data from one year and another, nor are the values accumulable. It is necessary to avail of long data series to evidence trends and compare years with the average for the reference period. The table drafted does not reflect trends and only compares average precipitation for the last year (2019) with average precipitation 10 years ago (in 2010), 5 years ago (in 2015) and the previous year (in 2018).			



## CARBON FOOTPRINT, COMPENSATION AND ABSORPTION PROJECT REGISTER

The indicator presents the Number of carbon footprints, absorption and compensation projects registered annually on the *Carbon Footprint and Compensation and Absorption Project Register* of the Ministry for Ecological Transition and the Demographic Challenge. The indicator presents the total number of carbon footprint entries per sector of activity from May 2014 to 31 December 2019.

*The purpose of the Carbon Footprint and Compensation and Absorption Project Register is to promote the calculation and reduction of carbon footprints on the part of different Spanish organisations. Another objective is to promote the projects that improve the capacity of Spain's carbon sink, constituting a mitigation measure against climate change.*

*The indicator reflects the level of involvement of organisations in policies to mitigate climate change and for the decarbonisation of the economy.*

### Source:

Spanish State Meteorological Agency (AEMET) of the Ministry for Ecological Transition and the Demographic Challenge. (2020). Data provided on express request.

In May 2014, the *Carbon Footprint and Compensation and Absorption Project Register* was introduced. Since then, the number of requests received has continued to increase every year, and in 2019 had received a total of 2 712 entry requests.

The register has three sections: a) Carbon footprint and reduction commitment section, b) Carbon dioxide absorption project section and c) Carbon footprint compensation section. In the period 2014-2019, the carbon footprint and reduction commitments is, by some difference, the section with the most entries (94 % of the total) followed by carbon footprint compensation (3.5 %) and the CO<sub>2</sub> absorption projects (2.5 %).

The increase in demand for requests has been constant and since the launch of the Register (2014-2019 period) has grown 698.1 %. Requests increased by 21.9 % between the year 2017 and 2018 and 40.5 % between 2018 and 2019, for example. In 2019, the section that saw the highest number of entries was the carbon footprint and reduction commitments section, receiving 93 % of requests. Nevertheless, the other two sections are becoming more prominent. Between 2018 and 2019, the CO<sub>2</sub> absorption projects section went from 11 entries in 2018 to 19 in 2019 and the carbon footprint compensation section from 23 to 40 entries. Behind that is the interest in increasing the degree of environmental commitment of companies and the interest in completing the recognition, obtaining the stamps they are missing.

**Carbon Footprint and Compensation and Absorption Project Register entry requests by section of register.**



Indicator/Variable	2014-2019	2018-2019
Total entry requests for the register	698.1 %	40.5 %



## 2.2. NATURE

### 2.2.1. NATURAL ENVIRONMENT

- Protected areas
- Forest defoliation
- Environmental monitoring
- Forest fires

### 2.2.2. LAND

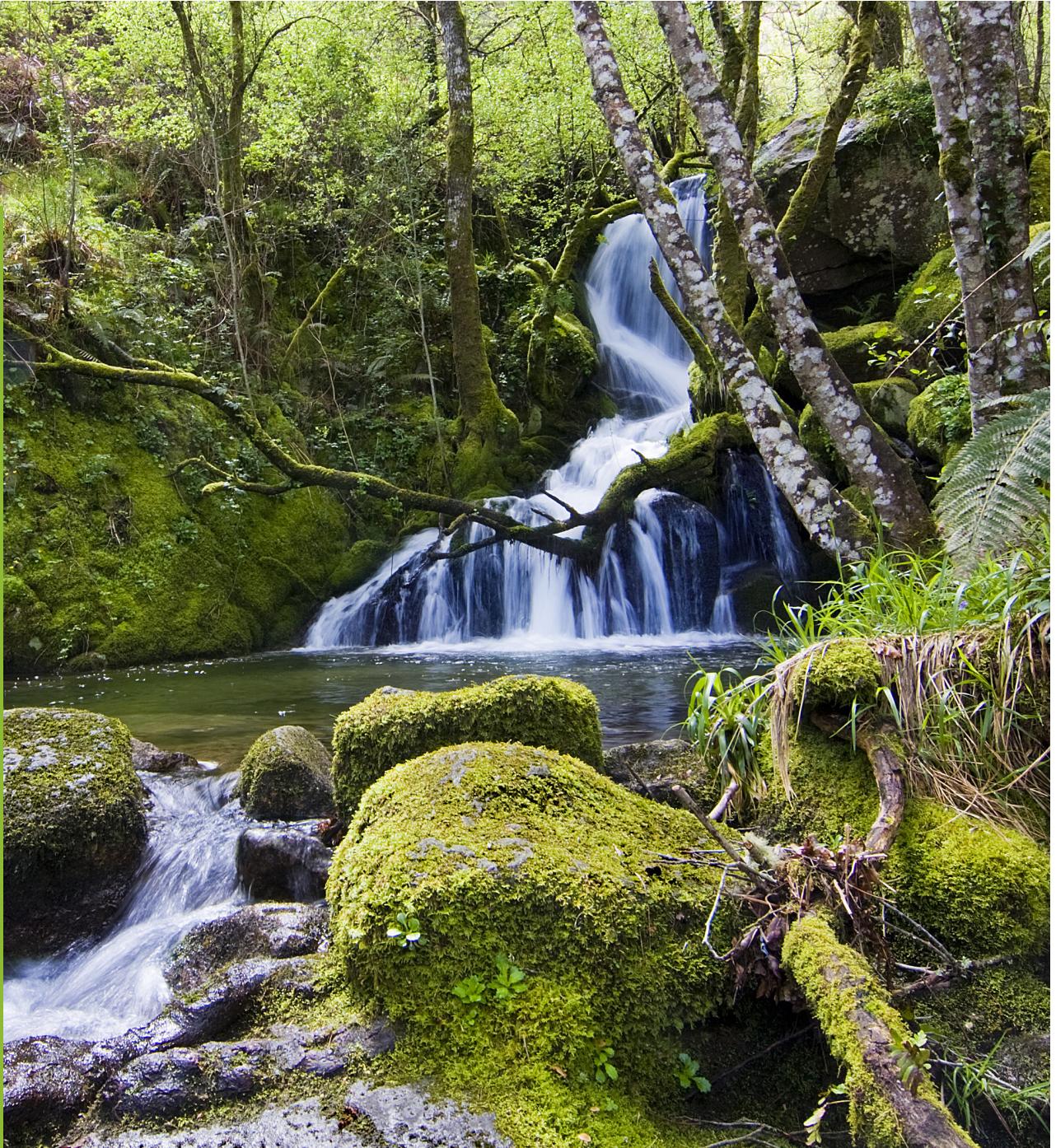
- Variation in the area of urban plots and the area of built-up plots between 2009 and 2019
- Soil loss due to erosion
- Land use distribution

### 2.2.3. COASTS AND MARINE ENVIRONMENT

- Marine litter on beaches
- Spanish Network of Marine Protected Areas (RAMPE)
- LIFE IP INTEMARES
- Quality of coastal bathing water

### 2.2.4. WATER

- Reservoir water levels
- Groundwater resources
- Non-conventional water resources
- Status of surface waters
- Status of groundwater bodies
- Quality of inland bathing water





## 2.2.1. NATURAL ENVIRONMENT

2019 was an important year for Spanish biodiversity. It was a year of commemorations, international meetings for the preparation of next objective post-2020, presentation of Nature Directives, among other events. The principal landmarks and latest news are reviewed below.

In January 2019, the now Ministry for Ecological Transition and the Demographic Challenge, through the National Parks Network and in collaboration with the Biodiversity Foundation, made a commitment to draft, together with those responsible for the management of Spain's Biosphere Reserves, an action plan to boost the development of the territories where the Reserves are located and to transform these protected spaces into examples of excellency, combining nature conservation with rural development and meeting the 2030 Agenda Sustainable Development Goals.



Spain has the highest number of Biosphere Reserves in the world, with 49, which contain diverse characteristic ecosystems and landscapes and cover an area of approximately 11 % of the total area of the country, with more than 5.5 million hectares and a population of almost 2 million inhabitants (4.1 % of the national total).

In February 2019, the Council of Ministers approved the extension of the Archipiélago de Cabrera National Park, making it the biggest in the western Mediterranean and the biggest National Park in Spain. Thanks to its area of more than 80 000 hectares, it encompasses a good representation of the 12 marine natural systems that, according to the National Parks Act, must be present in the National Park Network. Two of the natural systems are not yet present in the Network, with the so-called "*pelagic area of passage, reproduction or common presence of cetaceans or large migratory fish*".

In May 2019, the 7th Plenary Meeting of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) was held in Paris. This meeting saw the approval of the *Global Assessment of Biodiversity and Ecosystem Services*, the most complete scientific review to date on the state of the planet's natural heritage, identifying the principal causes of the loss of biodiversity: changing use of land and sea, the exploitation of species, climate change, pollution and invasive exotic species.

The presentation of the IPBES assessment coincided with the publication of the *Eurobarometer 481 Attitudes of Europeans towards Biodiversity* (European Commission). The percentage of people who know the meaning of the term biodiversity is rising

(41 % both for the whole of the European Union and for the the poll in Spain) although the figure falls to 6 % for the percentage of Spaniards familiar with Natura 2000 Network, European ecological network of areas of biodiversity conservation and the main instrument for nature conservation in the European Union. For most Spaniards (51 %), the most important actions that the EU can carry out to protect biodiversity are to strengthen existing legislation on the conservation of nature and biodiversity, measures to restore nature and biodiversity to compensate for the damage caused by human activity or infrastructure (47 %), to improve the information provided to citizens (44 %), to extend protected areas (43 %) or to improve the implementation of existing legislation relating to the conservation of nature (42 %).

In the sphere of wild species, it is worth highlighting that in June 2019, the Government amended the annex to Royal Decree 139/2011 which develops the list of Wild Species subject to Special Protection and the Spanish Catalogue of Endangered Species, to include 27 threatened flora and fauna species in Spain on these registries. Meanwhile, March saw the amendment of Royal Decree 630/2013, regulating the Spanish Catalogue of Exotic Invasive Species, adding species that are a concern for the outermost regions of the Canary Islands. It is worth highlighting that the iconic Iberian Lynx has exited "critical danger of extinction" after 20 years of conservation efforts and there are currently over 700 specimens between Spain and Portugal. At the September 2019 Environment Sector Conference, two conservation strategies were approved for endangered flora that jointly combat the threats and conservation prob-

## 2.2.1. NATURAL ENVIRONMENT



lems of 97 plants: the *Strategy for the conservation and combating threats to protected plant species at high peaks* and *Strategy for the conservation and combating threats to protected plant species linked to water*.

In 2019, the Sexennial Reports on the Monitoring of Species and Habitats of the Birds and Habitats Directive were presented. Together they constitute the principal tool for the conservation of fauna, flora and natural and semi natural habitats in Europe and create the Natura 2000 Network. Article 11 of the Habitats Directive establishes the need to monitor species and habitats listed in its annexes by Member States and Article 17 establishes the need to report to the European Commission every six years. Similarly, Article 10 of the Birds Directive supports the protection and assessment of bird species naturally present in the European Union (some 450 species of birds) and Article 12 establishes the need to report on progress every 6 years. In 2019, the sexennial reports on both directives for the period 2013 to 2018 were presented. These sexennial reports are the basis for the reports of the European Commission on the "State of the Nature in the European Union", a summary presenting and assessing the results of both Directives simultaneously and examining the contribution of Natura 2000 to the state of nature and trends. For the period 2013 to 2018, it is worth highlighting that, in relation to the previous sexennial report, Spain has increased the number of assessments of species of community interest in the terrestrial environment (47 new assessments), exceeding the 90 % of species assessed in the terrestrial biogeographical regions. These new assessments have produced an increase in both species

with a favourable conservation status (24 new taxa in this category) and with unfavourable status (23 new taxa). In the marine environment, on the contrary, unknown species evaluations continue to predominate, between 63-97 %. Fish, amphibians and invertebrates reach greater percentages of species with unfavourable conservation status. In the case of fish, the situation is particularly serious, with 100 % with unfavourable status. In the case of amphibians, 71 % have unfavourable status, and for invertebrates 68 % are classified as unfavourable. Flora, mammals and reptiles present unfavourable conservation percentages of between 37-53 %. In terms of habitats, the percentage of evaluations performed also increased (and habitats with unknown conservation status fell to 17 %). Only 9 % of the habitats of community interest currently hold favourable conservation status.

Spain is home to 56 % of the types of habitat and 32 % of species of community interest identified in the Habitats Directive, and is also home to 56 % of the species in the Birds Directive.

In December 2019, Spain has a total protected surface area of 33.6 % of the terrestrial environment and 12.2 % of the marine environment. Spain is therefore the biggest surface area contributor to the Natura 2000 Network.

The Natura 2000 Network is not just the principal instrument for nature conservation in the European Union. It is also very profitable in economic terms as the income generated by the Network has a very beneficial impacts on local, regional and national economies, as evidence in the recent publication *Economic Benefits of the Natura 2000 Network in Spain* (2019) published by the Ministry for Ecological Transition and the Demographic Challenge.





## 2.2.1. NATURAL ENVIRONMENT

In August 2019, the 18th Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES CoP18) took place in Geneva, attended by 170 countries and numerous organisations and which concluded with a number of decisions to increase pressure on the trafficking of species. Along the same lines, 2019 saw the *Spanish Action Plan against Illegal Traffic and International Poaching of Wild Species* (the TIFIES Plan) with the central objective of preventing illegal traffic and poaching by addressing its causes at root, involving the public administrations and civil society, at both national and international level. The TIFIES Plan entered into force in April 2018, making Spain the first country in Europe to transpose the *European Union Action Plan against the Trafficking of Wild Species* (2016-2020) in the national context. Among other actions within the TIFIES Plan, Operation Taxideralia was concluded in February 2019, with the intervention of over 200 specimens of naturalised protected species from illegal taxidermy workshops. Similarly, Operation Celacanto was brought to a close in July 2019, confiscating 2 296 specimens of 70 fauna species protected by international agreements and valued at over one million euros. In Spain, over 2 000 inspections were carried out at animals for sale establishments, wholesalers, private collectors and antique shops. At the same time, coordinated inspections were carried out at ports and airports.

In December 2019, a system for the early detection of woods protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The illegal trafficking of tropical wood accounts for 80 % of the volume of traffic in wild species, of both vegetation and animals, throughout

the world. This new tool consists of an Early Alert Guide for Wood, which includes all types of wood protected by the CITES Convention which is accompanied by a kit and allows agents to complete the inspection and detection of fraud in this area. Furthermore, to ensure the legality of wood brought to market, the FLEGT licensing system is applied. In three years since Indonesia began to issue FLEGT licenses (November 2016 to November 2019) the Ministry of Agriculture, Fisheries and Food, through the then Directorate General of Rural Development, Innovation and Forestry Policy as competent authority for FLEGT in Spain, validated 5 000 FLEGT licenses for imports from Indonesia to Spain. These systems ensure compliance with national legislation on environmental matters and forest management and ensure compliance with employment and community well-being legislation and payment of the required taxes. Although Indonesia is the first and to date only country to begin to issue FLEGT licenses, the European Union is in negotiations with other countries. One of those countries is Ghana, whose representatives of AVA FLEGT met with the MAPA in October 2019. At present, this is the competency of the Directorate General of Biodiversity, Forests and Desertification, under MITERD.

Spain's forestry policy is at a turning point, with the drafting of a new European Forestry Strategy for 2020-2027 and the review of the Spanish Forestry Strategy and the Forestry Plan. On the other hand, over the course of 2019, statistical operations that include cycles of data collection, such as the National Soil Erosion Inventory, that offer sheet, gully and ravine erosion, risk of mass movements, erosions at sources of watercourses or torrential catchment basins and the risk of wind erosion for each province.

In 2019, there were also some negative aspects, environmentally speaking. The European Commission published its decision to take Spain before the Court of Justice of the European Union for the environmental conditions in Doñana and breach of European law on the protection of nature which could lead to significant sanctions for Spain. This comes in the year that marks the 50th anniversary of the declaration of Doñana as a National Park. Meanwhile, the Government, through the Guadalquivir River Basin Authority, began the process to declare the overexploitation of its aquifer. Another wetland showing serious signs of environmental degradation is the Mar Menor, which suffered an ecological collapse due to a major episode of eutrophication after years of agricultural development and uncontrolled urban development.

Doñana National Park marked its 50th anniversary with the challenge of adapting to climate change, which threatens its ecosystems, and tackling the challenges that constitute the overexploitation of the aquifer due to the proliferation of illegal wells associated with intensive agriculture like the cultivation of red fruits such as strawberry.

With regard to fires, an ever more pressing problem, 2019 was a torrid year across the globe, with massive fires in the Amazon and Congo basins, Siberia and Indonesia and devastating wildfires in Australia in November. Spain itself didn't escape the scourge, with large-scale wildfires such as those on the island of Gran Canaria which, in addition to the loss of 10 000 hectares of natural vegetation, forced the evacuation of thousands of people. Nonetheless, it is worth mentioning the constant improvement in the information on forest fires,



with the web application to compile all information from the different autonomous communities becoming fully operational in 2019.

In March 2019, the fourth session of the UN Environment Assembly (UNEA-4) took place. It concluded without any advance for the elimination of plastic marine pollution and postponed the decision to initiate the process for the approval of a global, legally binding agreement on plastic for 2030.

In December 2019, the 25th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP25) was held in Madrid. The conference was the first climate summit as part of a new cycle, marked by the Paris Agreement and its Rulebook, to boost implementation, for all stakeholders to do more and sooner. This is reflected in the final result approved by the COP25. COP25 has confirmed that the fight against climate change is a transversal issue. As a response to the special reports of the IPCC published in 2019, the Climate Conference will hold a dialogue on the oceans and another on land uses at the June 2020 session. The text also underlines the role of nature-based solutions in helping reach the objective of not exceeding the temperature increase of 1.5 °C established initially in the negotiations and the need to tackle the loss of biodiversity and the fight against climate change from comprehensive approach.

In 2020, within the framework of the European Green Deal adopted in December 2019, the new *EU Strategy on Biodiversity for 2030* presents a number of global objectives and commitments to tackle the principal root causes of the loss of biodiversity in the EU, and configured as a fundamental pillar for the conservation of biodiversity.





## PROTECTED AREAS

The indicator presents the protected area in hectares and the percentage of terrestrial and marine area for the year 2019. It offers a breakdown by type of protected area: Protected Natural Areas, Natura 2000 Network spaces and areas protected by international instruments (Biosphere Reserves, the RAMSAR Convention, Specially Protected Areas of Mediterranean Importance and the Oslo-Paris Convention).

It must be noted that the same territory may be included in more than one form of protection.

*The indicator allows for the evaluation of progress made in Spain in the application of biodiversity management and protection instruments and its habitats, both terrestrial and marine, and, at the same time, the situation in relation to different objectives assumed via international agreements, such as the Aichi Agreement or SDG 15.1 of the 2030 Sustainable Development Goals. Conserve and use ecosystems in a sustainable manner.*

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). Sub-directorate General for Terrestrial and Marine Biodiversity. Directorate General of Biodiversity, Forests and Desertification. Data provided on express request

In 2019, the total terrestrial protected area in Spain reached 33.6 % of total area (17 030 678.7 ha), an increase of 2.5 % of protected surface area on the previous year, having extended the total area by 417 642.1 ha, a surface area similar to the total for the national parks of Spain. On the other hand, the marine protected area represented 12.2 % of the total (13 123 733.3 ha), an increase of 257 606.7 ha on the 2018 figures, due primarily to the extension of the Archipiélago de Cabrera National Park, becoming the largest national park by surface area.

The surface area of Protected Natural Areas grew slightly in 2019, as did areas belonging to the Natura 2000 network, representing 14.6 % and 27.4 % of the total surface of Spain respectively. In terms of areas protected by international instruments, Biosphere Reserves have experienced a significant increase this year, reaching almost 12.4 % of the surface area of Spain, and practically doubling the marine area.

The autonomous communities with the highest percentage of protected terrestrial surface area are the Canary Islands (77.3 %) and La Rioja (51.3 %) which show no variation from the previous year, followed by Madrid, which has protected 22 800 ha more to reach 44 %.

### Protected area in Spain Year 2019

Protection category	Land		Marine		Total protect-ed area (ha)
	(ha)	(%)	(ha)	(%)	
Protected area (ha)	17 030 678.7	33.6	13 123 733.3	12.2	30 154 412
PNA	7 403 238.6	14.6	5 256 610.8	4.9	12 659 849.4
Natura 2000 Network	13 849 073.3	27.4	8 432 208.5	7.9	22 271 724.8
MAB	6 273 918.1	12.4	938 962.3	0.9	7 212 880.3
Other International Instruments	282 694	0.6	25 605.8	0	308 299.8
SPAMI	51 857.9	0.1	96 625.7	0.1	148 483.6
OSPAR	0	0	2 034 219	1.9	2 034 218.9

Source: MITERD

Indicator/Variable	2015-2019	2018-2019
Protected Area	20.8 %	2.2 %
PNA	61.5 %	0.7 %
Natura 2000 Network	0.2 %	0 %
MAB	25 %	19 %
RAMSAR	0.5 %	0 %
SPAMI	0 %	0 %
OSPAR	0 %	0 %



## FOREST DEFOLIATION

The indicator shows the percentage of trees damaged in Spanish forests classified into the following two groups: healthy trees, which are those with defoliation of less than 25 % (Classes 0 and 1) and damaged trees, which are those with defoliation in excess of 25 % and grouped into classes 2, 3 and 4 (the latter corresponding to dead trees).

*Forest defoliation is the process by which a plant species loses its leaves due to pathological or climate stress which provokes the premature or abnormal loss of leaves.*

*Allows for the monitoring of various objectives of the 2030 Agenda, mainly SDG 15.2.1 Progress towards sustainable forest management and 15.5 Degradation and loss of biodiversity.*

**Source:**

Ministry for Ecological Transition and the Demographic Challenge. (2020). Sub-Directorate General of Forestry Policy and the Fight against Desertification; Directorate General of Biodiversity, Forests and Desertification. Data provided on express request

Average defoliation observed in 2019 was 23.9 %. After the positive data in 2018, a consequence of a particularly rainy year, in 2019 the data reveal something of a setback in relation to the general condition of the forest area assessed. We can check it by comparing the percentage of healthy and damaged trees in 2019 with the average values of the last five years. The percentage of healthy trees with less than 25 % defoliation (Classes 0 and 1) have fallen (73.1 % of the total sample, with respect to 78.9 % of the average), while the percentage of damaged trees, those with defoliation in excess of 25 %, Classes 2, 3 and 4) has risen (26.9 % of the total in the sample in 2019 compared to 21.1 % of the average).

Decay is noted in both coniferous and hardwood trees, most acute in the case of the former, where the percentage of Class 0 and 1 fell to 73.3 % in 2019 and 80.5 % for the five-year average. The percentage of Class 2, 3 and 4 rose to 26.7 % of the trees (19.5 % of the average). In the case of hardwood trees there was a drop in Class 0 and Class 1 (73 % of the year 2019 and 77.3 % of the average), increasing the percentage of Class 2, 3 and 4 significantly with 27 % of the trees in this category and 22.7 % of the average considered. *Pinus halepensis* and *Quercus ilex* are the most affected coniferous and hardwood species respectively.

The principal natural cause of death for these trees was damage caused by wood-boring insects (28 %), principally by *Ips acuminatus*. Death due to fire represents 27 %, while death due to abiotic damage represents 19 %, primarily due to the action of drought, followed by snow and, finally, the effects of the wind.

**Degree of defoliation in coniferous and hardwood forests % of healthy and damaged trees**



Note: the data regarding 2015 are provisional  
Source: IDF MITERD

Indicator/Variable	2010-2019	2015-2019	2018-2019
Healthy trees (Classes 0 and 1)	-12.2	-8.5	-4.1
Damaged trees (Classes 2, 3 and 4)	12.2	8.5	4.1

\* In these variables, the trend reflects the difference in percentage values the indicated years.



## ENVIRONMENTAL MONITORING

This indicator refers to the number of interventions relating to the environment carried out by SEPRONA and the other units of the Guardia Civil. Actions understood as the sum of infractions registered (both criminal and administrative) and the arrests made.

*The competencies of the Guardia Civil's Nature Protection Service (SEPRONA) include compliance with provisions relating to the conservation of nature and the environment, protected spaces, hydraulic and forest resources, waste, pollution, animal and plant health, animal welfare, hunting and fishing, protected species and the investigation of forest fires. At the same time the Environment and Urban Planning Prosecutor works to achieve a higher degree of legal protection through the investigation and prosecution of cases.*

*The indicator offers information that indirectly affects the objectives of SDGs 6, 12, 13, 14 and 15.*

### Source:

Nature Protection Service (SEPRONA). Guardia Civil. (2020). Data provided on express request.

General State Prosecutor. (2019). *Report of the General State Prosecutor 2019* (year 2018). Ministry of Justice. Viewed May 2020 <http://centrodescargas.cnig.es/CentroDescargas/catalogo.do?Serie=SIOSE>

In 2019, SEPRONA registered a total of 107 908 environmental infractions, 4.5 % more than in 2018. Of these, 96.5 % (104 090 infractions) corresponded to administrative infractions, while the remaining 3 818 were criminal. Both values were above the number of infractions committed the previous year, with an increase of 6 %, in criminal infractions and 4.4 % in administrative infractions.

With regard to the number of arrests for environmental crimes, these increased by 19.8 % on 2018 with a total of 3 629 arrests. In the last 10 years (2010-2019 period), the number of arrests for these types of crimes has risen by 246.9 % and 21 902 arrests have been made.

The *Report of the General State Prosecutor 2019* (Ministry of Justice) offers information for the year 2018, on the activities of the General Prosecutor, including the specialised areas of the environment and urban development. Among the extensive content, attention is drawn to the notable increase in the number of prosecutors specialised in the environment and urban development, with 184 in the year 2018 compared to 170 in 2017.

The statistical data on interventions in the environment in 2018 reveal the initiation of 3 023 investigation cases (550 for the environment, 1 124 for urban development and territorial planning, 120 for historical heritage, 266 for crimes against flora and 812 against fauna, 410 for forest fires and 228 for abuse of domestic animals). Of this total, 1 105 were reported or brought by the Prosecutor's Ministry and 999 were shelved, with the remainder in process. 2017 saw an increase of 19.7 % on the number of cases filed with 2 525 investigations initiated that year.

**Number of interventions (criminal and administrative infractions and arrests) relating to the environment registered by the Guardia Civil**



Source: Prepared by the authors using data from SEPRONA

Indicator/Variable	2010-2019	2015-2019	2018-2019
Total infractions	-9 % -	-11.3 % -	4.5 % -
Arrests	246.9 % -	59.6 % -	19.8 % -

Note: the table shows the variation in each period without assessing the environmental nature of the interventions. This is due to the different interpretations that may arise as to whether an increase in arrests is positive or negative from an environmental perspective.



## FOREST FIRES

The indicator encompasses the surface forest area and the number of forest fires that have occurred annually.

The forest area affected is divided between wooded and treeless areas.

*The year-on-year variation in this indicator helps determine the principal causes that favour or reduce the risk of forest fires and their magnitude. It provides a lot of useful information on the prevention mechanisms for these kinds of disasters.*

*At the same time, the indicator is in line with Objectives 13.1.2, Countries that adopt and apply national strategies for the Reduction of Risk of disaster in line with the Sendai Framework for the Reduction of Risk of Disaster 2015-2030, and 15.1.1, Forest area in proportion to total area, of the 2030 Agenda for Sustainable Development.*

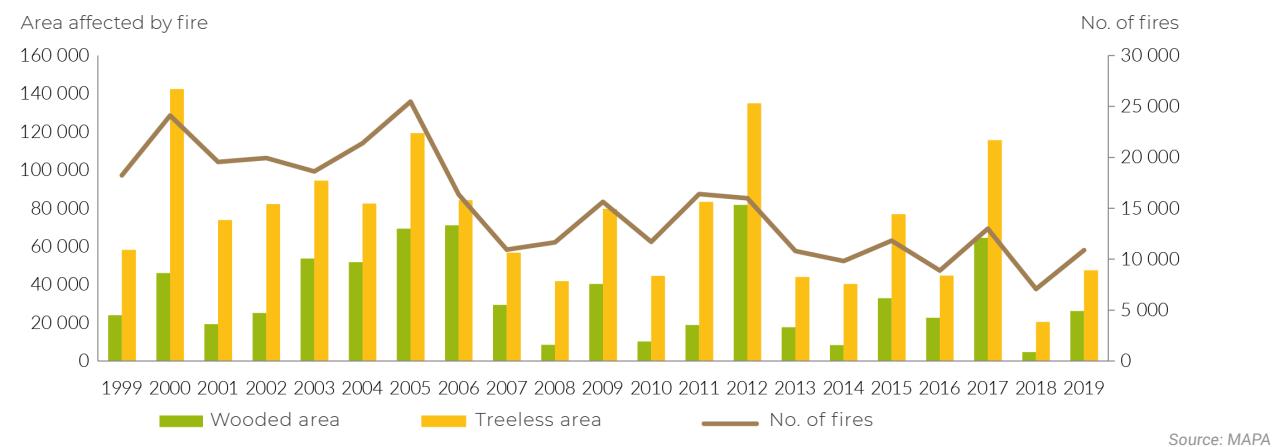
### Source:

Ministry of Agriculture, Food and Environment. (2019). *Los Incendios Forestales en España. 01/01/2019 – 31/12/2019. Avance Informativo Incendios Forestales*. Viewed: [https://www.mapa.gob.es/es/desarrollo-rural/estadisticas/avance\\_1\\_enero\\_31\\_diciembre\\_2019\\_tcm30-537398.pdf](https://www.mapa.gob.es/es/desarrollo-rural/estadisticas/avance_1_enero_31_diciembre_2019_tcm30-537398.pdf)

In 2019 forest fires in Spain burned 26 252.3 ha of forest surface, according to the data from *Avance informativo: Incendios Forestales 01/01/2019 – 31/12/2019*, drafted by the Ministry of Agriculture, Fisheries and Food in 2019, with that figure being very close to the figure for the year before. In total, 10 883 fires were recorded, 3 593 of which were over one hectare, practically double the previous year but under the average for 5 years. There were 14 Large Forest Fires (LFFs), affecting over 500 hectares, constituting a third of the total area burned. There was significant increase in LFFs compared to 2018, but their number remains low compared to the average of 23 over the last ten years.

56 % of the total area burned in 2019 was concentrated in the autonomous communities of Asturias, Cantabria, Castile and León, and the Canary Islands, with Asturias the worst affected region, at 17.6 %. The other two LFFs that occurred in 2019 were distributed over large areas, in the provinces of Asturias, A Coruña, Huelva, Tarragona, Ávila, Toledo, Almería, Alicante, Zaragoza, Cuenca and Las Palmas, accounting for 34 % of the total area affected that year.

### Forest area affected by fire and number of fires, 1999-2019



Indicator/Variable	2010-2019	2015-2019	2018-2019
Wooded area	157.8 %	-20.2 %	451.8 %
Treeless area	6.6 %	-38.2 %	132.8 %
No. of fires	-7.1 %	-7.8 %	53.7 %



Land and soil perform a number of important functions: environmental, economic, social and cultural, that are fundamental to life. However, this vital resource is subject to increasing pressure on the part of society, amending the quantity and quality of the services and the potential intrinsic benefits on offer.

It is necessary to progress towards a more sustainable system in which society acquires an understanding of soils as a complex system, indispensable for life and that it is fundamental to preserve it in good condition

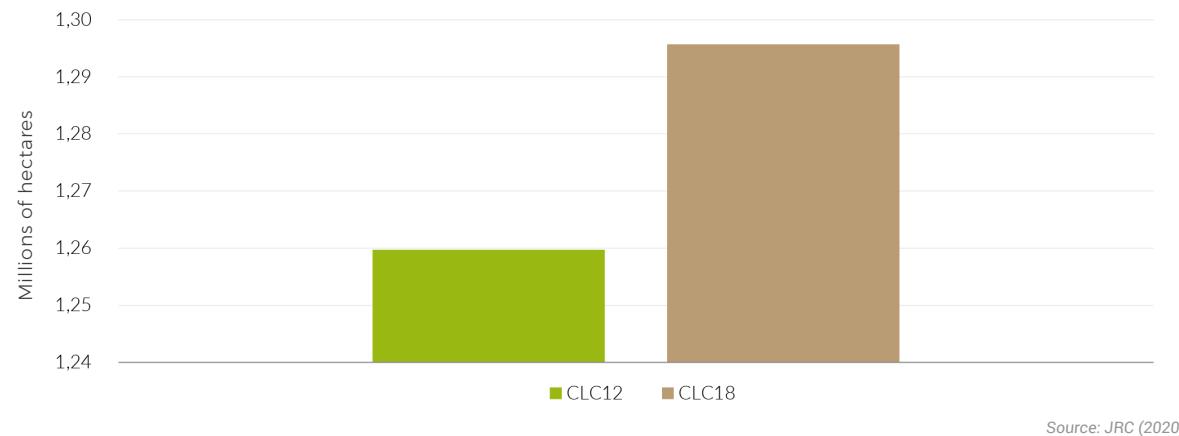
In general terms, climate change constitutes one of the principal global threats we must tackle this century, and contribute greatly to the process affecting soil. Human activities relating to soil are very different and vary according to the country, the type of society, the land use strategy and the use of space and technologies employed, the principal of these being the start of desertification of soil globally, especially in vulnerable areas.

Different global policies, including the UN 2030 Agenda's Sustainable Development Goals (SDGs) include land and soil directly and indirectly. Many of these SDGs cannot be reached without healthy soils and without sustainable use of soil. Thus, these goals set the reduction of levels of soil degradation to zero for 2050 (SDG 15 Life on Land) and their success is largely based on effective monitoring process, review and monitoring (SDG 13 Climate action).

Moreover, lower availability of land, increased soil degradation and biodiversity, and greater frequency and seriousness of extreme weather events, together with the impact of climate change on agriculture which aggravates the situation, make improving the health of soils essential for the eradication of hunger and fighting climate change and its consequences (SDG 2. Zero hunger and SDG 12. Responsible Production and consumption)

One of the international bodies working on the implementation of guidelines for the sustainable management in terms of minimising the risk of erosion is the Food and Agriculture Organisation of the United Nations (FAO). In May 2019, at its headquarters in Rome, the body organised the Global Symposium on Soil Erosion (GSER 19), under the slogan "Stop

**Occupation of soil by artificial surface (ha) Years 2012 and 2018**



One of the aspects to consider is the loss of soil due, among other factors, to the increase of artificial surfaces. According to data from Corine Land Cover (CLC) 2012 and 2018, there was an increase of 35 960 ha in the artificial surface area in this period, rising from 1 259 706 to 1 295 667 ha, and growth of 2.9 %.

An increase in the weight of artificial soil on other uses is also detected, rising from 2.5 % in 2012 to 2.6 % in 2018.

This increase in artificial soil stands in stark contrast to the evolution of population in this period (0.4 %), while urban growth has been more moderate than in the previous decade, with significant growth based on widespread and highly expansive urban development.

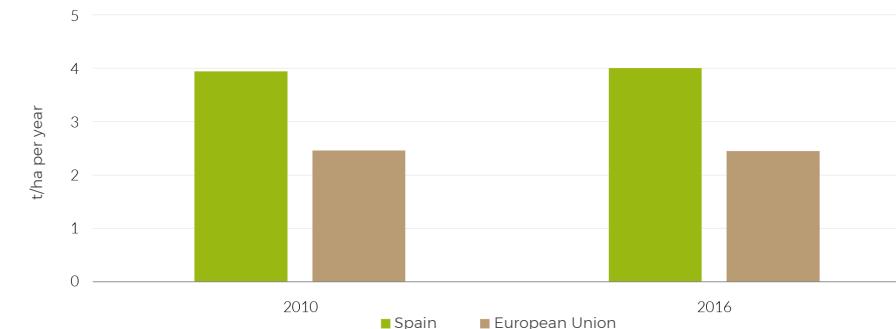


soil erosion, Save our future". The aim of this meeting was to establish a common platform upon which to present and discuss the latest information on the state of interventions and innovations in the field of the prevention of soil erosion and the land management. The symposium allowed for scientific and legal evidence to be translated into decisions and measures to reduce soil erosion to a minimum, in order to guarantee food security and ecosystem services and to promote the restoration of eroded areas.

The symposium also saw the publication of the book *Soil erosion: the greatest challenge for sustainable soil management*, which demonstrates how water, wind and farming erosion continue to pose a great threat to the health of ecosystem services in many regions of the world. It also stresses the need for more research on how to measure rates of soil loss and greater budgets to implement solid erosion control measures in many areas of the world.

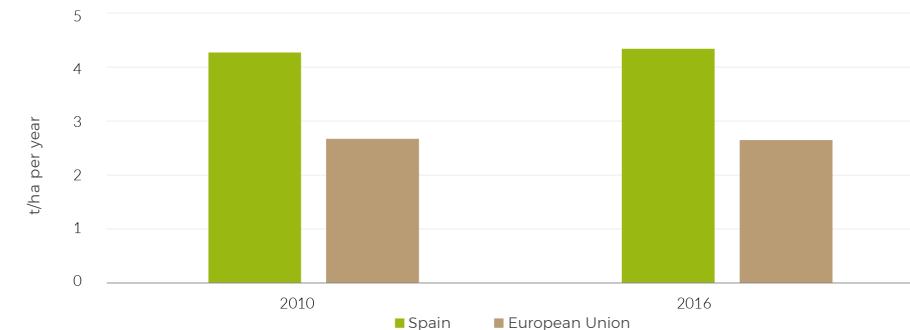
For their part, in the European sphere, in early 2020 the Joint Research Centre (JRC) of the European Commission published the document *A soil erosion indicator for supporting agricultural, environmental and climate policies in the European Union*, the principal aim of which is to present the development of the soil erosion indicator as a response to agro-environmental requests of the EU. This study comes five years after the assessment of the soil loss due to water erosion in the EU (*Environmental science & policy*, 2015). The results suggest the need for a more incisive set of soil conservation measures to mitigate erosion throughout the EU.

**Comparison of average soil erosion rates for all lands (t ha  $^{-1}$  year  $^{-1}$ )**



Source: JRC (2020)

**Comparison of average rates of soil erosion for arable land (Classes CORINE 21X) (t ha  $^{-1}$  year  $^{-1}$ )**



Source: Prepared by the authors using data from CLC 2012 and 2018.

The document JRC shows that Spain is one of the Mediterranean countries with the highest rates of soil erosion. The JRC study shows that the long-term estimated average rate of erosion in the EU fell slightly between 2010 and 2016, for all lands and for cultivation land (0.4 and 0.8 respectively). On the contrary, in Spain there was a significant increase in these erosion rates (1.5 and 1.7 %).



Sustainability of soil is important and that's why a number of EU initiatives have been launched. The *European Green Deal* (2019), presented as a response to the climate and environment challenges and is an integral part of the strategy of the Commission to apply the 2030 Agenda and Sustainable Development Goals, contains specific references to soil. In this document, the Commission proposes the 2021 adoption of a "zero pollution" action plan for air, water and soil, responding to the problems arising from pollution, protecting European citizens and ecosystems. This plan is focussed on preventing and repairing soil contamination.

For its part, the *EU Biodiversity Strategy for 2030* (2020), also part of the Green Deal, establishes the commitment to recover damaged soil, update the EU strategy for soil protection and reach international and Union commitments on neutrality on soil degradation.

In Spain, the Agreement of the Council of Ministers approving the *Government Declaration of the Climate and Environmental Emergency in Spain* (2020) is a response to the general consensus of the scientific community calling for urgent action to safeguard the environment, health and citizen security.

One of the priority lines of action in relation to soil will be to boost synergies with rural development policies, biodiversity protection and recognition of environmental services, fostering energy transition opportunities and renewable energies to generate new green jobs, and actions designed in the

framework of the strategy against depopulation and the demographic challenge. In this context, the Government, in accordance with the Agreement, will, among other initiatives, draft the *Strategy to Combat Desertification* and the *National Forestry Strategy*. In addition, there is the continued development of the *New National Programme to Combat Desertification* which aims to combat the effects of drought, prevent soil degradation and stimulate the recovery of lands suffering desertification.

On the other hand, May 2020 saw the submission to Parliament of the first *Draft Climate Change and Energy Transition Bill*, with which Spain hopes to reach neutral emissions by 2050 at the latest. Spain is tackling significant risks arising from the deterioration of resources essential to our well-being like water, fertile soil and biodiversity, threatening people's quality of life and health.

Compared to the effects of climate change, in relation to soil, the Government will incorporate into the application of the Common Agricultural Policy, as well as other strategies, plans and programmes on agricultural policy and rural development, and in the Spanish Forestry Plan, measures geared towards reducing vulnerability to climate change of agricultural soils, mountains and forest lands and to facilitate their preservation.

This future law establishes that the *National Plan for Adaptation to Climate Change (PNACC) 2021-2030*, published as a draft on 4 May 2020 for public consultation, the term of which ended on 30 June

2020, is the basic planning instrument to promote coordinated action against climate change in Spain for the next decade. In addition, the draft of the PNACC, with regard to soil, preventing desertification and degradation of soil and fostering the restoration of degraded soils.

Finally, in June 2020, Spain submitted the *Waste and Contaminated Soils Bill* to public consultation.<sup>1</sup> The proposal reviews the current legislation on waste and contaminated soil to comply with new objectives established in the European Directives of the Circular Economy Package and those arising from the single use plastics directive. The principal objective will be to establish measures aimed to protect the environment and human health through the prevention and reduction of waste and impacts on the environment.

<sup>1</sup> The term for sending observations and comments began on 3 June and ended on 3 July 2020, both inclusive.



## Soil contamination

### Local contamination

#### Contaminating activities

- Industrial production and commercial services
- Energy production plants
- Storage of polluting substances
- Processing and disposal of municipal waste
- Processing and disposal of industrial waste
- Petroleum industry
- Other, including spills from transport, mining and the military

### Diffuse pollution



Agriculture



Transport



Industry

Image: EEA SIGNALS 2019. Land and soil in Europe. Why we need to use these vital and finite resources sustainably. © EEA, Copenhagen, 2019.

The European Environment Agency (EEA) dedicated the 2019 edition of its annual report *Signals* to analysing soils in Europe. [Land and soil in Europe](#) explains the impact on land and soils of issues like urban sprawl, pollution and intensive use of agricultural lands. In terms of soil contamination, it states that the most important source of pollution are industrial activities. In areas where these activities are developed, there is serious contamination of soil, principally in the form of metals, tars and related substances.



## VARIATION IN THE AREA OF URBAN PLOTS AND THE AREA OF BUILT-UP PLOTS BETWEEN 2010 AND 2019

The indicator presents the variations registered in the Land Registry of the total area of urban plots and the built area over the last decade.

*The indicator allows us to get a clear picture of the urban ground situation in different autonomous communities and of the growth in built area plots.*

*The indicator supports Strategic Objective no. 1 of the Spanish Urban Agenda 2030: "Order the territory and provide the rational use of soil, conserve it and protect it".*

*It is also related to SDG 11 Sustainable cities and communities.*

### Source:

Ministry of Finance. Directorate General for Land Registry. (2020). *Estadística del Catastro Inmobiliario Urbano*. Viewed 19 May 2020 [http://www.catastro.meh.es/esp/estadistica\\_1.asp](http://www.catastro.meh.es/esp/estadistica_1.asp)

Open Data Euskadi. (2020). *Indicadores municipales de sostenibilidad: Superficie urbanizable (%)*. Viewed 19 May 2020 <http://opendata.euskadi.eus/catalogo/-/indicadores-municipales-de-sostenibilidad-superficie-residencial-urbanizable/>

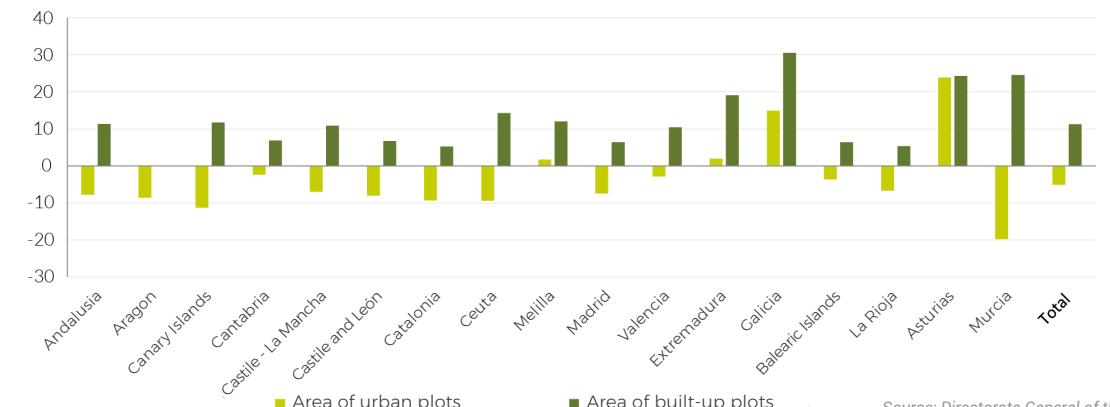
In 2019, the area of urban plots in Spain, according to the data provided by the Directorate General of the Land Registry (excluding the Basque Country and Navarre which have their own land registry) was 1 019 494 hectares, of which 64.9 % was built up-plots, a slight increase of 0.3 % on the 2018 figures.

If the evolution of the area of urban plots is analysed in this period, it can be observed that it has fallen for all autonomous communities with the exception of Asturias (increase of 23.8 %), Galicia (14.9 %) Extremadura (2 %), and Melilla (1.7 %), for a total reduction of 5.1 %. On the contrary, the area of built urban plots has increased in all autonomous communities, with the most significant growth observed in Galicia (31.1 %), Murcia (24.5 %), Asturias (24.3 %) and Extremadura (19.1 %).

For its part, the Basque Country produces a catalogue of municipal sustainability indicators, including an indicator of urban land eligible for development. The values offered for the autonomous community are 12.2 % of the residential area for development in 2019, corresponding to a change of -9.8 % compared to 2010.

Finally, the growth of the Spanish urban area must be geared towards a sustainable model of planning, occupation, transformation and land use, adapted to territorial and urban planning and the effects of climate change and their prevention, as set out, in its different goals, in the *Spanish Urban Agenda (AUE)* (2019).

**Variation in the area of urban plots and the area of built-up plots between 2010 and 2019 (%)**



Source: Directorate General of the Land Registry

Indicator/Variable	2010-2019	2015-2019	2018-2019
Area of urban plots	-5.1 %	-10.2 %	0.3 %
Area of built-up plots	11.3 %	2.2 %	0.7 %



## SOIL LOSS DUE TO EROSION

The indicator shows the annual soil loss due to "sheet and rill" erosion calculated by the *National Soil Erosion Inventory* (INES) based on the international *Revised Universal Soil Loss Equation* (RUSLE) model, expressed in tonnes/ha referring to the total erodible area of each autonomous community, calculated by deducting water sheet and wetlands from the geographic area.

Erosion is a serious environmental problem that affects the natural environment in Spain and Europe. It is caused by the loss of fertility in agricultural and forestry soils, the acceleration of the degradation of the vegetation cover and the reduction of the natural regulation of waters.

The indicator is closely linked to SDG 15 Life of Terrestrial Ecosystems.

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). Sub-Directorate General of Forestry Policy and the Fight against Desertification; Directorate General of Biodiversity, Forests and Desertification. Data provided on express request.

Soil erosion directly reduced its functional capacity. It is worth remembering that Sustainable Development Goal 15.3 sets out, by 2030, to "combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world". It is also one of the eight threats set out in the *Thematic Strategy for Soil Protection*, the principal policy instrument of the EU for soil protection. According to different studies, the Mediterranean region and more specifically Spain is among those historically most affected by erosion.

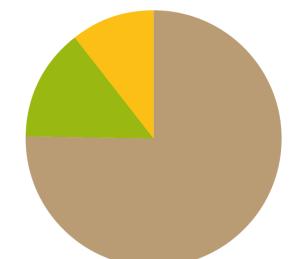
The *National Soil Erosion Inventory* (INES) aims to locate, quantify and analyse continuously the evolution of the principal erosion phenomena in the national territory. According to the INES data, completing the totals by province, almost 25 % of the erodible area of Spain is subject to moderate or high erosion (soil loss of in excess of 10 t/ha per year).

The average soil loss in Spain is 12.2 t/ha, which varies by autonomous community, with Catalonia, Andalusia and Cantabria those with the highest loss (23.7 t/ha, 23.2 t/ha and 21.2 t/ha) respectively. At the other end of the scale are the autonomous communities of Castile and León (4.7 t/ha), Castile-La Mancha (5.8 t/ha), Aragon (7.2 t/ha), Extremadura (8.2 t/ha), Madrid (8.5 t/ha) and the Canary Islands (9.7 t/ha) with the lowest soil loss rates, all within the category of moderate loss (0-10 t/ha).

In 2019, unlike the previous year, the information on the Basque Country was included, with average soil loss of 13.5 t/ha recorded.

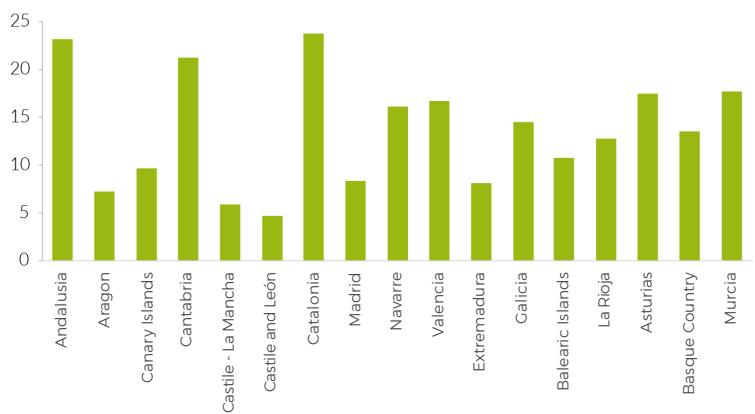
For all that, it is necessary to draft and put in place initiatives with the aim of combating the effects of erosion and stimulating the recovery of affected lands. The *Strategy to Combat Desertification* announced by the Council of Ministers in January 2020 within the *Government Declaration of the Climate and Environmental Emergency in Spain* responds to this, to be followed by a New National Programme to combat Desertification.

**Area affected by erosion processes in Spain (%)**



- Moderate erosion processes (75.26 %)
- Medium erosion processes (14.13 %)
- High erosion processes (10.61 %)

**Average annual soil losses (t/ha)**



Source: MITERD



## LAND USE DISTRIBUTION:

The indicator presents the distribution of the percentage occupation of soil in Spain according to the Corine Land Cover (CLC) projects 2012 and 2018 in the five first level classes into which types of occupation are grouped: artificial area, agricultural areas, forest areas with natural vegetation and open spaces and water surfaces.

*Land occupation looks at the characteristics of the surface land according to the land cover (LC) and the land use (LU).*

*It provides information for the monitoring of SDG 11 (Sustainable cities and communities).*

*The indicator supports Strategic Objective no. 1 of the Spanish Urban Agenda 2030: "Order the territory and provide the rational use of soil, conserve it and protect it".*

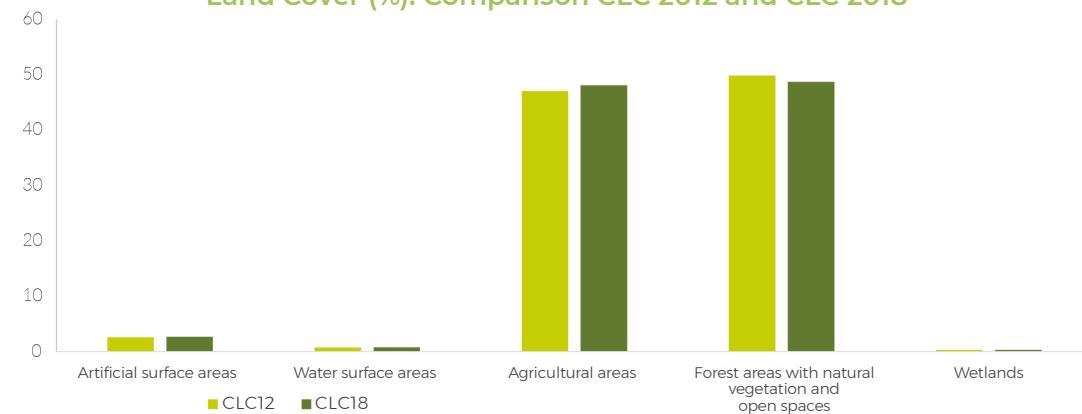
### Source:

National Geographic Institute (IGN) (2020). CORINE Land Cover. Centro de Descargas del CNIG. Viewed May 2020 <http://centrodedescargas.cnig.es/CentroDescargas/catalogo.do?Serie=SLOSE>

In the last two campaigns of the Corine Land Cover Project corresponding to 2012 and 2018, the distribution of land occupation in Spain varied relatively little. The distribution of artificial surface areas and of water increased one tenth from 2.5 % to 2.6 % and from 0.6 % to 0.7 % respectively, while wetlands remained at the same level as the previous two years, occupying 0.2 %. The proportion of agricultural area went from 46.9 % to 48 % and the forest area with natural vegetation and open spaces fell in occupation from 49.7 % to 48.6 %.

In absolute terms, there was an increase of 960.5 ha in artificial surface (increase of 2.9 %) from 8 905 ha in wetlands (growth of 9.2 %), 14 562 ha in surface water (increase of 4.5 %) and 518 358.4 ha in agricultural area (increase of 2.2 %). On the contrary, forest areas with natural vegetation and open spaces fell by 577 786.7 ha, which represented a reduction of 2.3 %. The graph does not include the columns corresponding to "Wetlands" for problems of scale as, in both inventories (2012 and 2018) represent only 0.2 % of the total surface.

**Distribution of land use according to principal classes of Corine Land Cover (%). Comparison CLC 2012 and CLC 2018**



Source: Prepared by the authors using data from CLC 2012 and 2018.

Indicator/Variable	2012-2018
Artificial surface	2.9 %
Water area	4.5 %
Agricultural areas*	2.2 % ---
Forest areas with natural vegetation and open spaces	-2.3 %
Wet Areas	9.2 %

\* No environmental assessment is made of the 2.2 % increase in agricultural areas between CLC 2012 and CLC 2018



Spain is a country with a great maritime heritage. It boasts a coastline of more than 10 000 km in length and a marine surface area of approximately one million km<sup>2</sup>, the second largest among European Union member states. The natural heritage and biodiversity of our coastal and marine environment covers three biogeographic regions (NE Atlantic, Macaronesia and Mediterranean) and includes more than 11 000 known marine species according to the *Spanish Inventory of Marine Habitats and Species* (IEHES)<sup>1</sup>.

The ecosystem services that the Spanish coastal and marine environment provides us with are also worthy of mention. According to the *The EU Blue Economy Report 2019*<sup>2</sup>, Spain is the number one country in terms of employment contribution to Europe's blue economy, and second in terms of gross added value, the first being the United Kingdom, which is no longer a member of the European Union since 31 January 2020.

The ocean is subject to a set of pressures that know no borders and that require joint, international actions. In this international context, the year 2019 has been very important for the protection of our oceans and knowledge of the threats they face.

In September 2019 the *Special Report on the Ocean and Cryosphere in a Changing Climate*<sup>3</sup> by the Intergovernmental Panel on Climate Change (IPCC) was published. This report looked in great depth at the nexus between ocean and climate and the challenges we face. It prepares an analysis of the changes and impacts observed; subsequently explains the changes and risks projected and finally considers the set of responses necessary: "Responding to changes: challenges, options and facilitators".

### Special Report on the Ocean and Cryosphere in a Changing Climate (2019)

#### Principal conclusions<sup>4</sup>

- The ocean has absorbed more than 90 % of the excess heat in the climate system. Since 1993, the pace of warming has doubled.
- The rise in sea levels in the 20th century on a global scale stands at some 15 cm, but the current rate of the rise has more than doubled (3.6 mm annually) and, according the evidence in the report, continues to accelerate.
- Sea levels will continue rising for centuries. From here to 2100 we could see a rise of between approximately 30 and 60 cm even if a drastic reduction in greenhouse gas emissions is achieved and global warming remains below 2 °C. However, if emissions continue to rise strongly, the rise in sea levels could be in the region of 60 to 110 cm.
- The rise in sea levels will increase the frequency of extreme sea level episodes, for example during high seas and intense storms. This will require an increase in investment in adaptation.
- The warming of oceans and chemical changes are already disrupting at all levels of ocean food networks, and that impacts marine ecosystems and the people who depend on them.
- The warming of oceans reduces the mix between water levels and, as a consequence, the supply of oxygen and nutrients for marine life.
- The frequency of marine heat waves has doubled since 1982 and it continues to intensify. Forecasts point to a further increase in frequency, duration, extension and intensity.
- The acidification and warming of the oceans, the loss of oxygen and changes in the supply of nutrients are already affecting the distribution and abundance of marine life in coastal areas, the open seas and the seabed.

1 MITERD. (2020). *Inventario Español de Hábitats y Especies Marinas*. Viewed <https://www.miteco.gob.es/es/costas/temas/proteccion-medio-marino/biodiversidad-marina/habitats-especies-marinos/inventario-espanol-habitats-especies-marinos/inventario-habitats-especies.aspx>

2 European Union. (2019). *The EU Blue Economy Report 2019*. Viewed <https://opeuropa.eu/en/publication-detail/-/publication/676bbd4a-7dd9-11e9-9f05-01aa75ed71a1/language-en/>

3 IPCC. (2019). *Special Report on the Ocean and Cryo-*

*sphere in a Changing Climate*. Viewed <https://www.ipcc.ch/srocc/home/>

4 Prepared by MITERD based on the "summary for policy makers", focussed on the oceans component of the report.



## 2.2.3. COASTS AND MARINE ENVIRONMENT

- The ecosystem services provided by the ocean and cryosphere can benefit from measures for the protection, restoration and management of renewable resources based on the ecosystems and the reduction.
- Coastal communities are tackling the challenge of responding in a joined-up manner to rising sea levels. The response must strike a balance between costs and benefits and may encompass different types of measures: protection, accommodation based on ecosystems, progress and shoreline recession.
- Climate resilience and shoreline development depend critically on ambitious and urgent measures to mitigate greenhouse gas emissions.

This special IPCC report on oceans and the cryosphere was presented in detail at the COP 25 summit of the United Nations Framework Convention on Climate Change (UNFCCC) which took place in Madrid in December 2019.

The month of December also saw the 21st Meeting of the Contracting Parties to the Barcelona Convention (COP21) for the protection of the marine environment and coastal areas of the Mediterranean Sea. At the Conference, where Spain participated as a party to the convention, 13 Thematic Decision were approved, including the definitive inclusion of the Mediterranean Cetacean Migration Corridor on the List of Specially Protected Areas of Mediterranean Importance (SPAMI). The inclusion of the corridor was proposed by Spain at the previous conference and after the approval of the national regulation declared it a Marine Protected Area in the year 2018, it received the formal inclusion on the SPAMI list of the Barcelona Convention at the aforementioned COP 21. The conference also approved the roadmap for the possible designation of the Mediterranean Sea as an Emission Control Area (ECA) for sulphur oxides.

In Spain, 2019 was a year of consolidation of development measures relating to Law 41/2010, of 29

*December, on the protection of the marine environment.* After the approval of the first cycle of marine strategies in 2018, 2019 saw the second cycle with the update of the assessment of the condition of the marine environment within the five marine demarcations. The assessment is carried out based on indicators, one of these being the report on marine waste on beaches, which is included in this publication. 2019 also saw an assessment of the environmental status and the approval of the Council of the Ministers of the objectives of the 2nd cycle of marine strategies.

*Another important landmark was the approval of Royal Decree 79/2019, of 22 February, regulating the compatibility report and establishing the criteria for compatibility with marine strategies.* This standard establishes the criteria that must be considered when it comes to assessing the compatibility of human activities in the marine environment with marine strategies.

With regard to marine biodiversity, we have continued to advance in the preparation and updating of management plans for different Marine Protected Areas. Moreover, different actions have been carried out in the context of the LIFE IP INTEMARES project (see detail in Indicator).

Marine waste, as well as producing a significant socio-economic impact, is a threat to human health. *Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment* forms part of the efforts of the European Union to fulfil its role in the prevention of, and fight against, marine waste, aspiring to become a world leader in establishing standards in this respect.

Coastal bathing water quality and the water quality of mollusc breeding grounds are also important elements in relation to human health. In Spain, both of these are competencies of the autonomous communities. In 2019, Spain once again positioned itself as one of the best countries in terms of beaches. 566 "blue flags" were awarded, setting the best beaches in comparison to 591 assigned in the year 2018. Among its other consequences, COVID-19 has led to an increase in the use of facemasks, with high plastic content, which end up in our seas and on our coasts. The [awareness campaign](#) "Unforgettable memories. The facemask is for you, not for nature" ran in the summer of 2020 by the Spanish government, alerted to the need for sustainable management. On the contrary, an increase in plastic waste from facemasks, disposable gloves and containers disinfectant hydroalcoholic gel in our seas and on beaches is expected.



## MARINE LITTER ON BEACHES

The indicator shows the abundance, composition and origin of marine litter found on Spanish beaches.

It also offers a typology of material, detailing the percentage of the total and the number of litter items found on beaches by marine demarcation.

Marine litter is used as a descriptor of the good environmental status (D10) in the Marine Strategies to evaluate the state of the marine environment through a specific monitoring programme that includes, among others, an indicator relating to litter on beaches. Moreover, the indicator allows for the monitoring of Sustainable Development Goal 14 (Life below water) and, specifically, its target 14.1 to reduce marine pollution.

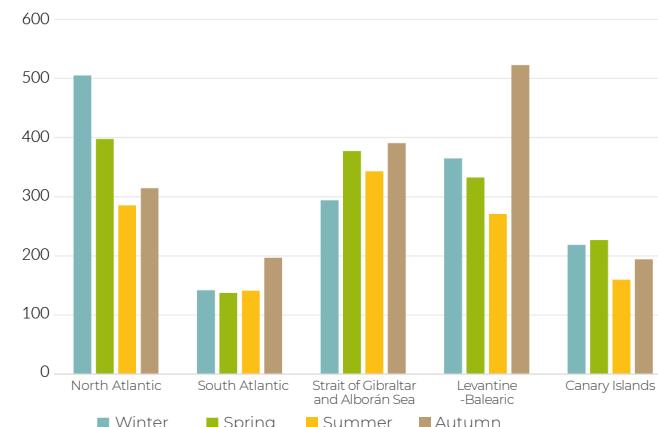
The *Marine Waste on Beaches Monitoring Programmes* at 26 beaches of the 5 marine demarcations in 2019, consisting of a total of 104 sampling campaigns, with an average quantity of 327 items per campaign. The Strait and Alborán demarcation provided a higher number of items per campaign with 647, while only 118 items were found on average in the South Atlantic Demarcation.

The total of the campaigns in the five marine demarcations in the period 2013 to 2015 rose to 708, with an average number of 337 items per campaign. The total abundance of marine litter is not showing a clear trend in the time series covered.

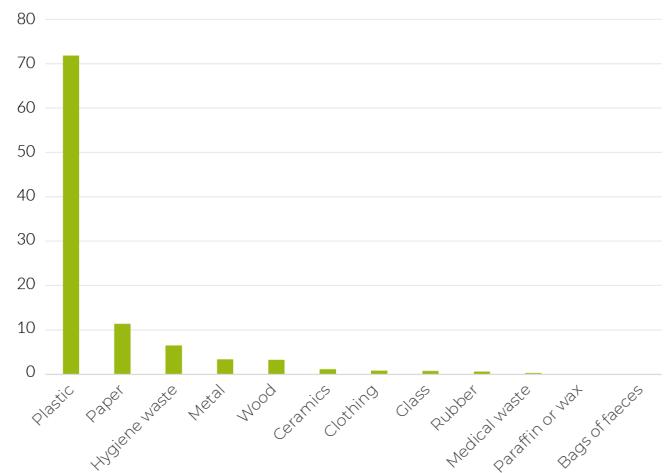
The type of items found is very extensive but when taken together, plastic stands out in particular, accounting for 71.8 % of the waste, with paper accounting for 11.4 %, hygiene for 6.5 %, metals 3.4 % and wood 3.2 %.

Most litter of known origin was related to tourism activities (25.8 %), marine transportation or navigation (14.8 %) or sanitation networks (6.9 %), with much lesser impact of litter from fishing activities (2.5 %) or agriculture (0.6 %). Litter of unknown origin or from more than one source accounted for the majority (49.5 %).

Average items per marine demarcation per campaign 2013-2019



Percentage of types of objects in Spain overall Period: 2013-2019



Source: MITERD

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). *Programa de seguimiento de basuras marinas en playas informe de resultados – 2019* (and previous years). Directorate General for Coastal and Marine Sustainability. Data provided and drafted on express request.

Indicator/Variable	2013-2019	2018-2019
Total abundance of marine litter	25.6 %	-8.9 %
Abundance of plastic	51 %	-14.3 %



## SPANISH NETWORK OF MARINE PROTECTED AREAS (RAMPE)

The indicator presents the degree of development of the network: number of protected marine spaces included, state of RAMPE guideline plan. It also reports on the need to adopt common criteria for coordinated and coherent management and drafting of an annual report on a record of actions and the network's report every three years.

*The RAMPE is our country's contribution to the Global Network of Marine Protected Areas in the framework of the United Nations and the Convention on Biological Diversity, and serves to comply in part with the obligations and commitments acquired by Spain as a contracting party in numerous agreements, conventions and protocols within the international and European framework.*

*The indicator allows for the monitoring of Sustainable Development Goal 14 (Life below water) and, specifically, target 14.5 to conserve coastal and marine areas.*

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). Information provided and drafted on express request by the Directorate General for Coastal and Marine Sustainability

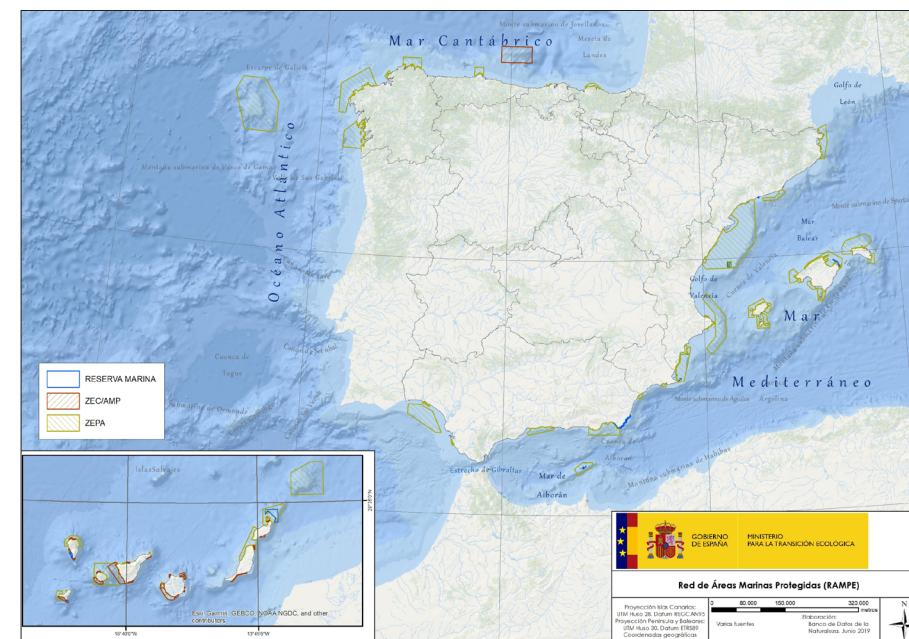
The RAMPE is configured as a network of marine protected areas, regardless of the protection figure (Marine Protected Area, Marine Reserve, etc.) and its management body (General State Administration or autonomous communities).

81 spaces currently make up the RAMPE network: 24 Special Protection Areas (SPAs), one Marine Protected Area (which is also listed as an SPA), 46 Special Protection Areas for Birds (SPABs), 5 marine reserves of fishing interest and the external waters of another 5. The integration criteria for the spaces of the Network were approved through Royal Decree 1599/2011, of 4 November.

The coordination of the Network for the correct delivery of objectives shall be established by the Master Plan currently in force (maximum term of 10 years). The main purpose is to establish the strategic and cooperation and collaboration objectives and to identify the actions to be carried out through RAMPE to ensure compliance with national and international requirements. As of today, the first Network Master Plan has yet to be approved, although a draft has been drawn up in collaboration with coastal autonomous communities and other competent administrations in the management of Marine Protected Areas through a participative process.

The management of marine spaces included in RAMPE must adapt to the new common criteria drafted to ensure coordinated and coherent management of the Network. These guidelines must be drafted by the General State Administration and coastal autonomous communities. They are currently in the draft phase and must be approved by the Sectoral Environmental Conference and be included in a Royal Decree.

A monitoring report must be drafted annually on the actions carried out within the framework of the RAMPE and a report on the status of the project every three years.





## LIFE IP INTEMARES

The indicator presents the degree of execution of the actions of the LIFE IP INTEMARES project for the 2019 period, and the degree of involvement of independent entities and organisations.

It also collates the number of complementary projects financed through the different calls for aid of Fundación Biodiversidad for the purposes of reaching the objectives of the project and the framework of priority action in Spain.

*The LIFE IP INTEMARES project has the primary objective of achieving efficient and integrated management of marine spaces of the Natura 2000 network, using research and the active participation of all stakeholders as the basis for decision making.*

*This project is coordinated by Fundación Biodiversidad, part of the Ministry for Ecological Transition and the Demographic Challenge. The Directorate General for Sustainability of the Coast and Sea, the Spanish Oceanographic Institute, the Spanish Fishing Confederation, SEO/BirdLife and WWF-Spain participate as partners.*

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). Results of the LIFE IP INTEMARES project. Information provided and drafted on express request by the Directorate General for Coastal and Marine Sustainability

The LIFE IP INTEMARES project and the mission towards a change in the management model for marine protected areas was launched in January 2017. Since then, more than 800 organisations and 3 000 people have become involved. In this regard, in 2019 alone 11 participative workshops were held within the framework of the project, 9 of which were dedicated to the updating of the management plans of the 24 marine Special Protection Areas (SPAs) within the marine demarcation of the Canary Islands. A workshop was also held with the competent administrations for the drafting of the *Marine Protected Areas Network Master Plan* as well as an additional workshop to determine potential insufficiencies in the current Natura 2000 Network for the protection of coastal and marine birds.

In parallel, there were also working groups and meetings of experts on specific issues such as the updating of the Master List Of Marine Species (of the Spanish Inventory of Marine Habitats and Species), the drafting of the *conservation strategy for sea turtles*, analysis of the status of the noble pen shell and the definition of a common geographic information system.

In addition, five oceanographic campaigns were developed at the marine SICs of the system of underwater canyon systems of Avilés, Cap Bretón, Escarpe de Mazarrón - Seco de Palos, the Minorca Channel, and the Ses Olives, Ausias March and Emile Baudot underwater mountains to the south-east of the Balearic Islands.

Four training sessions were also held by the Public Administrations on marine biodiversity, aimed at the Maritime Service of the Guardia Civil and the Spanish Navy.

A strategic alliance has been formed to promote citizen science with the Sea Observers platform (which has more than 70 million scientists, 300 entities and over 2 000 citizens). It has participated in 12 national and international summits, most notably *Before the Blue COP* and the COP25 on Climate Change, both held in Madrid.

Finally, 212 complementary courses have been supported since the start of INTEMARES, with 80 of them selected and adhered to the project in 2019.

The INTEMARES project has been awarded with the 2019 Maritime Rescue Prize for its contribution to SDG 14 (Life below water).





## QUALITY OF COASTAL BATHING WATER

The indicator shows a percentage of the total, of the sampling points in coastal bathing waters according to four categories of quality established by the legislation ("Insufficient"; "Sufficient"; "Good" and "Excellent").

There is also the "Unclassified" category, for areas where sufficient samples were not obtained for the last evaluation period or bathing areas which remain closed.

*The health authority monitors the quality of bathing water in order to protect public health. Sampling is carried out during the bathing season.*

*This indicator is based on the European bathing water directive and the research of the WHO, registering the incidence of gastrointestinal illness linked to bathing.*

*The indicator also allows for monitoring of different sections of SDG 14 (Conservation and sustainable use of the oceans).*

### Source:

Ministry of Health. (2020). *Informe Técnico. Calidad de las Aguas de Baño en España (2019)*. Viewed April 2020 [https://www.mscbs.gob.es/profesionales/saludPublica/saludAmbLaboral/calidadAguas/aguasBano/docs/INFORME\\_AB\\_2019\\_05\\_03\\_2020.pdf](https://www.mscbs.gob.es/profesionales/saludPublica/saludAmbLaboral/calidadAguas/aguasBano/docs/INFORME_AB_2019_05_03_2020.pdf)

The number of maritime bathing areas was 1710 in the year 2019, in which 1968 water sampling points were located. 93 % of the sampling points recorded excellent quality, 4.6 % recorded good quality, 1.5 % recorded sufficient quality and 0.4 % recorded insufficient quality.

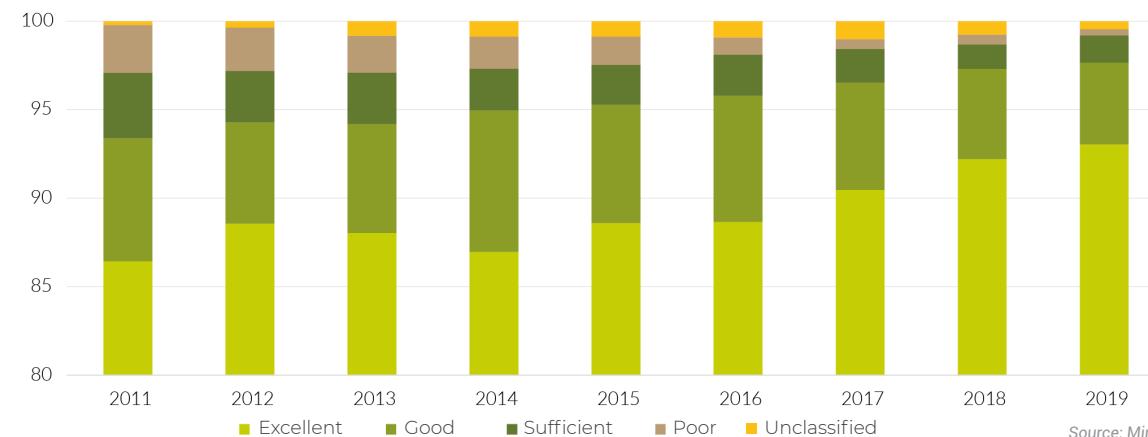
The sampling points that recorded "Excellent" quality have maintained a positive trend since 2014, having registered an increase of 1% compared to 2018.

As can be observed from the chart, the numbers of bathing waters classified as "Good" have fallen most seasons due to the increase in the higher classifications.

The sampling points in bathing areas with "Insufficient" quality have continued to fall due to the increase in sampling points with better quality. With regard to the category "Sufficient" quality, the same occurs, except in the year 2019 when there is an increase of 11.1 % with respect to 2018. At the same time, the number of unclassified sampling points in coastal bathing areas fell by 40 % in 2019, from 15 points in 2018 to 9 in 2019.

The 2019 bathing season lasted 133 days on average, with a maximum of 303 days in the Canary Islands and a minimum of 92 days in Galicia. In the trends table the quality categories have been grouped into three ranges. This grouping provides a clearer idea of the evolution of bathing water quality, due to the fact that waters with an inferior quality range have been falling in favour of better certifications.

Percentage change in classification of coastal bathing water areas



Indicator/Variable	2011-2019	2015-2019	2018-2019
"Excellent" and "Good" quality	4.3	2.4	0.4
"Sufficient" quality	-2.2	-0.7	0.2
"Insufficient" quality and "Unclassified"	-2.1	-1.7	-0.5

\* For these variables the trend reflects the difference in percentage values in the periods indicated



Water is an indispensable condition for life on Earth and is essential to sustainable development. Through [Resolution 64/292](#), the United Nations General Assembly explicitly recognised the human right to water and sanitation, reaffirming that clean drinking water and sanitation are essential to the delivery of all human rights. The *UN-Water Policy Brief on Climate Change and Water* (July 2019) highlights the crucial nature of water in socio-economic development, food security and the health of ecosystems and the importance of reducing the global burden of disease and improving health, well-being and productivity in populations.

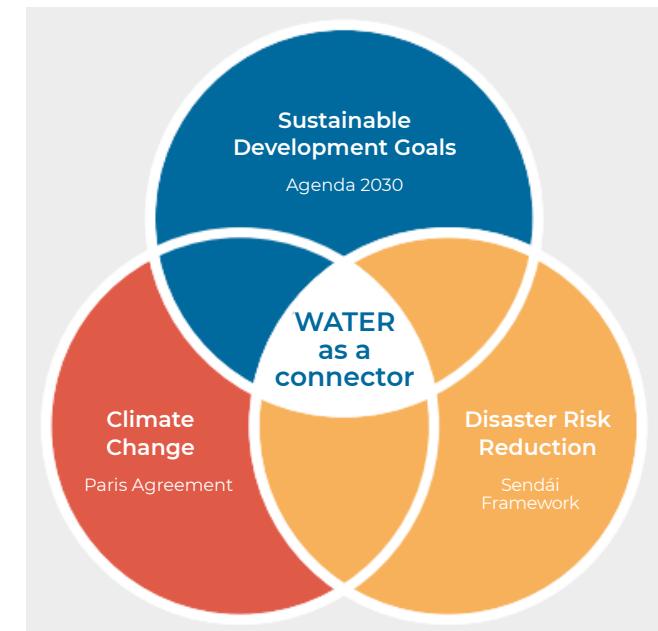
In 2015, the countries adopted the *2030 Agenda for Sustainable Development*. Its 17 Sustainable Development Goals (SDGs) are interrelated and intended to be mutually reinforcing. The 2030 Agenda places climate change (SDG 13) and water (SDG 6) as priority subjects that require immediate action given their key, transversal status. The importance of water and hygiene for health is recognised far and wide and is reflected in the targets of Sustainable Development Goal 6 but, unfortunately, almost 3 billion people in the world have no access to water for washing their hands against coronavirus (COVID-19) and many other infectious diseases. Achieving this goal is therefore essential to contributing to progress with other objectives, primarily those relating to health and the environment. In Spain, [Order SND/274/2020, of 22 March, adopting measures in relation to the supply of water for human consumption and waste water sanitation](#) has the purpose of laying down the measures necessary to ensure the correct functioning of services for the supply of water for human consumption and urban waste water sanitation, considered

essential services for society due to their close link with human health, in the development and application of the provisions of [Royal Decree 463/2020, of 14 March, declaring the State of Emergency for the management of the health crisis caused by the COVID-19 crisis](#).

Due to the effects of climate change, the variability of the water cycle increases, making it difficult to forecast the availability of water resources and reducing water quality. This further exacerbates water scarcity and constitutes a threat to sustainable development throughout the world. Climate change is a considerable emerging threat to public health and amends the manner in which to approach the protection of vulnerable population.

On 10 December 2019, the Group of Experts on Water and Climate of the United Nations organised the UN-Water side event, “*Climate-resilient Water Management Approaches*” on the margins of the twenty-fifth session of the Conference of the Parties (COP25) United Nations Framework Agreement on Climate Change (CMNUCC) in Madrid.

The participants recognised the crucial role of the integrated climate change approach and water management for the successful application of the 2030 Agenda, the Sendai Framework and the Paris Agreement. Therefore, climate-resilience water management approaches can serve as a coherent mechanism between these global frameworks. Adapting to the effects of climate change will protect health and save lives.



Water can reinforce commitments to mitigating climate change and adapting to it, reducing the risk of disasters, ending poverty and inequality and “*leaving no one behind*”. This was the slogan of World Water Day in 2019, which is celebrated on 22 March every year. To mark the day, the Ministry for Ecological Transition and the Demographic Challenge organised an open day on Nature-based Solutions (NBSs) to water management. NBSs are actions to



protect, sustainably manage and restore natural or modified ecosystems that tackle social challenges in an effective way with the aim of fostering human well-being and the benefits of biodiversity.

To strengthen the integration of water as part of the climate agenda, World Water Day 2020, around water and climate change, offered a much needed opportunity to ask the global community to participate jointly in the efforts around water and climate.

On 22 March 2020, UN-WATER expressed its full and lasting commitment to supporting countries and river basin authorities in their effort to better integrate water into plans and programmes relating to climate.



For its part, the European Commission has presented the *European Green Deal*, an ambitious package of measures that should allow European companies and citizens to benefit from a sustainable economic transition. The agreement will be fundamental for Europe to contribute to the goals at global level, including

those contained in the United Nations Sustainable Development Goals. In this context, climate change represents a major threat and an unprecedented opportunity to invest in water governance and water resource management systems.

On the basis of that opportunity, the Ministry for Ecological Transition and the Demographic Challenge has, over the course of 2019, organised territorial forums in different autonomous communities aimed at promoting the initiative of the *Green Book on Water Governance*.

Its aim is to achieve a governance model that serves to meet new objectives of hydrological transition, advance toward water security, facilitate adaptation to climate change and promote the protection of ecosystems and biodiversity.

The Ministry for Ecological Transition and the Demographic Challenge (MITERD) has undertaken a number of actions as part of the PIMA-Adapta-AGUA 2019: the fluvial restoration project for the Oro river and Farhana stream in Melilla; the fluvial restoration project for the Manzanares river between the Trofa stream and San Fernando bridge (Madrid); and actions for the maintenance of riverbank forest plantations and environmental improvement in the Natural Fluvial Reserves of the Segura basin and other sections of the rivers Segura, Mundo and Mula.

In accordance with the Water Framework Directive (WFD), the first quarter of 2019 saw the consolidation of the initial documents corresponding to third cycle hydrological plans in Spanish river basin authority demarcations. The provisional schemes of the Important Issues of the inter-community demarcations, corresponding to the review process of the third cycle of the hydrological plans were





made available to any interested party for a period of six months, from 25 January to 24 July 2020. In the monitoring of the second cycle plans, in 2018, there was positive evolution in the state of surface and underground waters, although remaining below the targets established for the 2021 horizon.

The Directorate General for Water of the MITERD also tackled the drafting of a *Plan Nacional de Depuración, Saneamiento, Eficiencia, Ahorro y Reutilización* (National Plan for Purification, Sanitation, Efficiency, Saving and Reuse), with aim of reviewing the intervention strategies defined in the current second cycle hydrological plans, and with a view towards the drafting of the third cycle plans. It is a question of ordering, clarifying and prioritising the measures that Spain is obliged to carry out in the areas indicated (purification, sanitation, efficiency, saving and reuse) and other related areas, to achieve alignment with the essential ecological transition required by our economy, and synergetically, attend to our legal obligations in the community sphere. The public information process for the *"Directives, working programmes, calendar and formulas for participation"* ended in January 2019. Work is currently being carried out on the drafting of the Plan.

The effects of climate change are visible most of all through water: in the form of drought, floods and storms. According to data from the State Meteorological Agency (AEMET), a total of 10 torrential rain episodes occurred in Spain during the 2019 season. Floods, such as those seen in 2019, are, year after year, the natural phenomenon that causes the most damage in Spain.

In this regard, it must be highlighted that on 4 May 2020, the draft *National Plan for Adaptation to Climate Change (PNACC) 2021-2030* was presented for public consultation. In chapter 1.3 (Impacts and risks arising from climate change) the document enumerates the following effects on ecological systems and sectors of the economy relating to water: reduction of water resources, deterioration of ecosystems, changes in production and energy consumption. It also considers "Water and water resources" as one of the 18 areas of work for which specific objectives are set.

The MITERD, in accordance with Article 21 of Royal Decree 903/2010, of 9 July, on the Evaluation and Management of Flood Risk, is finalising its review and update of the maps of the danger and risk of flood. The Flood Risk Management Plans (PGRI) currently in force (2016-2021) are also being reviewed and the plans for the second cycle (2022-2027) are already being drafted. What's more, an inventory is being prepared for all existing and planned flood protection works in our river basins and to assess the functionality of the different climate change scenarios.

In accordance with the Special Drought Plans (PES) approved in 2018, a double indicator system is used which differentiates prolonged situations of drought (understood as a natural phenomenon), scarcity (relating to overall problems in meeting demands). Throughout 2019 and to date, monthly drought and scarcity reports have been drafted.

As you can see, climate change forces us to plan and manage water resources in an integrated manner, taking not just standard but extreme scenarios into account. We must understand integrated water

resource management as considering the global use of underground, surface, desalinated and re-used water, to ensure the availability of those resources in terms of quantity and quality. It is important to point out that the health of our population is related to the success or failure of the development and integrated management of water resources.

The natural hydrological year 2018/2019 ended with the reservoir level below that of the previous year 2017/2018, below the 5-year average, the 10-year average and far below that recorded five years ago for the hydrological year 2014/2015. Meanwhile, the analysis of the evolution of underground water resource available over time, a number of variations appear.

As population grows, so too does the demand for water, which exhausts natural water resources and damages the environment in many places. The solutions include the desalination of marine and brackish waters and the safe reuse of waste waters. In Spain, close to 400 hm<sup>3</sup>, around 9 % of treated water is reused and 537 hm<sup>3</sup> is desalinated.

In December 2015, the European Commission presented its Action Plan for five years with the aim of advancing towards a circular economy in Europe. The reuse of water constitutes an essential element of the circular economy due to the fact that it allows for the use of waters discharged from treatment plants to be submitted to additional treatment to be regenerated and applied to other uses. This Action Plan has been updated in March 2020 with the name of [New Action Plan for the Circular Economy for a Cleaner and More Competitive Europe \(COM\(2020\) 98 final\)](#) and is seen as one of the principal elements of the *European Green Deal*. The plan places the reuse of water and



water efficiency as fundamental pillars of the circular economy and highlights the role that regulation will play in the reuse of water. In this regard, in June 2020, the Spanish Strategy for the Circular Economy (*España Circular 2030*) was approved, with the clear objective of reducing waste generation and improving the efficiency in the use of resources. Among the objectives for this decade are improving the efficiency of water use by 10 %. The new circular economy model incorporates water management as one of the key policies for advancing in the circular economy.

On 5 June 2020, the European Union published [Regulation \(EU\) 2020/741 of the European Union and the Council of 25 May 2020 relating to the minimum requirements for the reuse of water](#). The regulation establishes strict requirements with respect to regenerated water quality and supervision of this quality for the purposes of ensuring protection of the environment and public and animal health. Spain supports the regulation of the use of water through [Royal Decree 1620/2007, establishing the legal regime for the use of treated waters](#). This Royal Decree responds to the mandate of [Law 14/1986, of 25 April, the General Health Act](#), according to which the health authorities must participate in the drafting and execution of water legislation, in accordance with the importance for public health.

It must also be highlighted that since 2006 water distributed for public supplying in Spain has shown a downward trend, at -18 % in 2018. Between 2012 and 2018, this reduction was 6 %. In terms of the quality of resources supplied, the future European Water Consumption Directive (update envisaged for 2020) offers new measures that will reduce the possible risks to health of drinking water from 4 % to 1 %. Further-

more, it will allow for the reduction of consumption of bottled water, which can help European homes save more than six hundred million euros per year.

Finally, in relation to the obligations arising from [Directive 91/271/EEC – urban wastewater treatment](#), the 2016 data (sent to the European Commission in 2017 in accordance with Article 17 of the Directive) show that: 77.5 % of the pollutant load complied with the provision in relation to tertiary or more rigorous treatment; almost 87 % of the load complied with the provisions for secondary or biological treatment, and over 97 % of the equivalent population was connected to urban wastewater collection systems or suitable individual systems. The 2018 data, the subject of the next two-year report for the European Commission, will not be consolidated until late 2020.





## RESERVOIR WATER LEVELS

The indicator shows the water reserves in mainland reservoirs at the end of the 2018-2019 hydrological year. It also shows the trend for watersheds (Mediterranean and Atlantic).

*The Spanish hydrological regime is characterised by extraordinary volatility. Alternating periods of drought and floods, as a manifestation of this great variability, has led to hydraulic infrastructure that will guarantee the availability of a resource so essential for life and economic activity such as water.*

*The indicator allows for monitoring of Sustainable Development Goals 6 (Clean water and sanitation) and 12 (Responsible consumption and production).*

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). *Boletín hidrológico de 24 de septiembre de 2019*. Viewed 25 March 2020 <http://eportal.miteco.gob.es/BoleHWeb/bolehSRV>

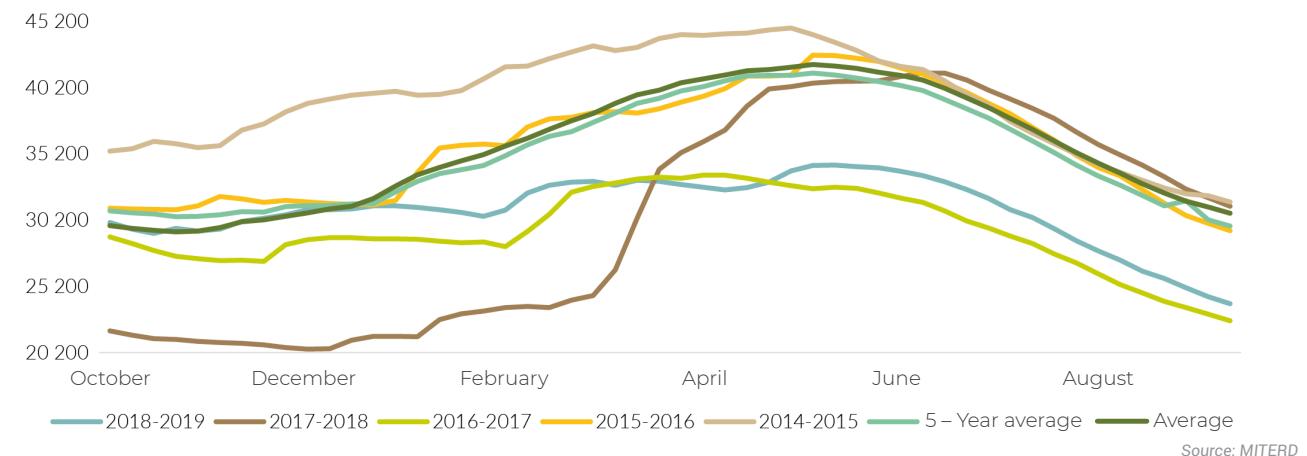
Over the course of the hydrological year 2018/2019 (22 October 2018 to 24 September 2019) reservoir levels have remained well below the level for the hydrological year of four years ago (2014/2015). The year 2018/2019 began with reservoir levels above those of the previous year 2017/2018, below the 5-year average and in and around the 10-year average. However, in mid-December the levels fell below the 10-year average and in the final week of March, below the reserve for the year 2017/2018.

It is worth pointing out that the “10-year average” is a series of averages of reservoir levels in the same month over the last 10 years. The 5-year average is obtained the same way, as an average of the values in the same month of the last 5 years.

The total peninsular hydraulic capacity of Spanish reservoirs at the end of the 2018/2019 hydrological year was 56 113 hm<sup>3</sup>, with 75 % (42 143 hm<sup>3</sup>) corresponding to the Atlantic watershed and the remaining 25 % (13 970 hm<sup>3</sup>) to the Mediterranean. The river basins with the highest reservoir capacity include the Tagus, with 11 056 hm<sup>3</sup>; the Guadiana, with 9 261 hm<sup>3</sup> and the Guadalquivir with 8 113 hm<sup>3</sup>, while the basins with the lowest reservoir capacity were the inland basins of the Basque Country (21 hm<sup>3</sup>) and Bay of Biscay East (73 hm<sup>3</sup>).

Faced with this capacity, at the end of the 2018/2019 hydrological year, total mainland water reserves stood at 23 038 hm<sup>3</sup>, equivalent to 41.1 % of reservoir capacity, a percentage below the 10-year average and the 5-year average, which stood at 52.2 % and 54.2 %, respectively; and only slightly above levels for the 2016/2017 period. 40.5 % of the total mainland water reserves indicated above (23 038 hm<sup>3</sup>), correspond to the Atlantic watershed and 42.6 % to the Mediterranean watershed.

### Peninsular hydrological reserves: Volume of water in reservoirs by water year (hm<sup>3</sup>)



Indicator/Variable	2014/2015 - 2018/2019	2017/2018 - 2018/2019	5-year average 2018/2019	10-year average 2018/2019
Average hm <sup>3</sup> in each monthly series	-21.1 %	1.9 %	-12.3 %	-13.1 %



## GROUNDWATER RESOURCES

The indicator shows the estimate of groundwater resources available, in application of the content and definitions established in the hydrological planning instruction. It provides information for each hydrological planning cycle.

*Groundwater bodies are a source of supply of special importance in the management of water resources and the maintenance of lakes, wetlands, currents and other associated ecosystems. The unique features of the aquifers mean they fulfil an especially important regulatory function during times of drought.*

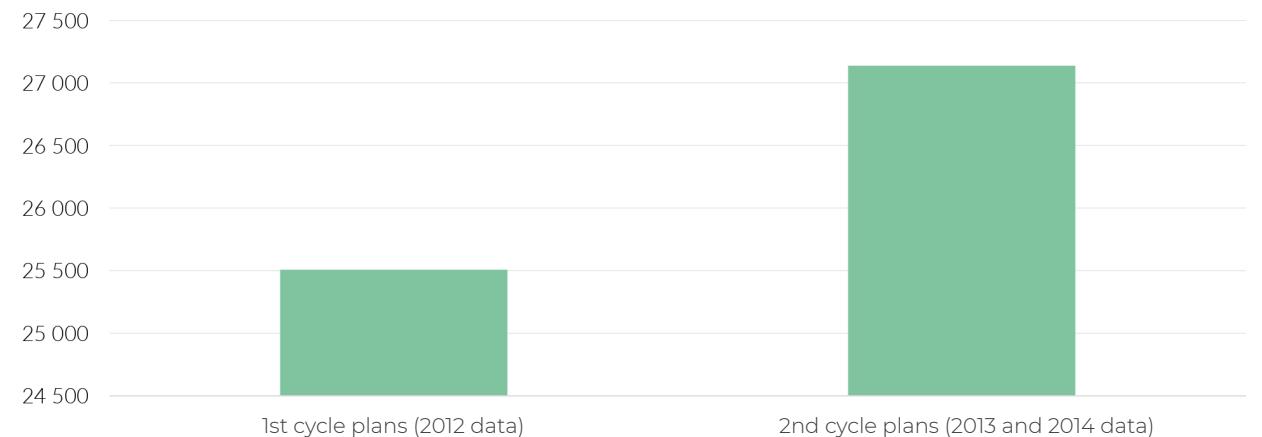
*The indicator allows for monitoring of Sustainable Development Goals 6 (Clean water and sanitation) and 12 (Responsible consumption and production).*

The assessment of availability of groundwater resources is completed for the drafting of hydrological plans of the first and second cycle and not annually. This is due to the fact that in the case of groundwater bodies the variations are less severe than in surface water bodies. It is logical if one takes into account the greater inertia in the groundwater dynamic.

The estimate at the time of drafting the hydrological plans of the first and second cycle was 25 508 hm<sup>3</sup>/year and 27 138 hm<sup>3</sup>/year respectively. The valuation of the third cycle of hydrological planning, as the sum of the resources of the 25 river basin districts will not be available until the drafts of the plans are prepared (forecast for December 2020).

The assessment conducted during the second cycle led to the adjustment, generally upwards, of the groundwater magnitudes offered in the first planning cycle. The variation observed (6.4 %) is generally small, except in the Tagus river basin district. In this particular case, the variation calculated results from adopting the common assessment criteria for resources established in the *Hydrological Planning Instruction*, rather than due to an actual variation in the underground run-off value.

### Evolution of available groundwater resources (hm<sup>3</sup>/year)



Source: MITERD

#### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). Data provided upon express request by the Sub-directorate General of Hydrological Planning. Directorate General for Water.

Indicator/Variable	1st cycle - 2nd cycle
Available groundwater resources (hm <sup>3</sup> /year)	6.4 %



## NON-CONVENTIONAL WATER RESOURCES

This indicator shows the annual volume of non-conventional water resources supplied, differentiating between resources from the reuse of regenerated waste water and desalinated brackish and marine waters.

*The use of non-conventional water resources is a fundamental strategy for the integrated management of water resources, allowing for the generation of additional resources with guarantees of supply above the conventional sources, and thus facilitating higher levels of self-sufficiency, efficiency and environmental protection.*

*The indicator allows for monitoring of Sustainable Development Goals 6 (Clean water and sanitation) and 12 (Responsible consumption and production).*

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). Data provided upon express request by the Sub-directorate General of Hydrological Planning. Directorate General for Water.

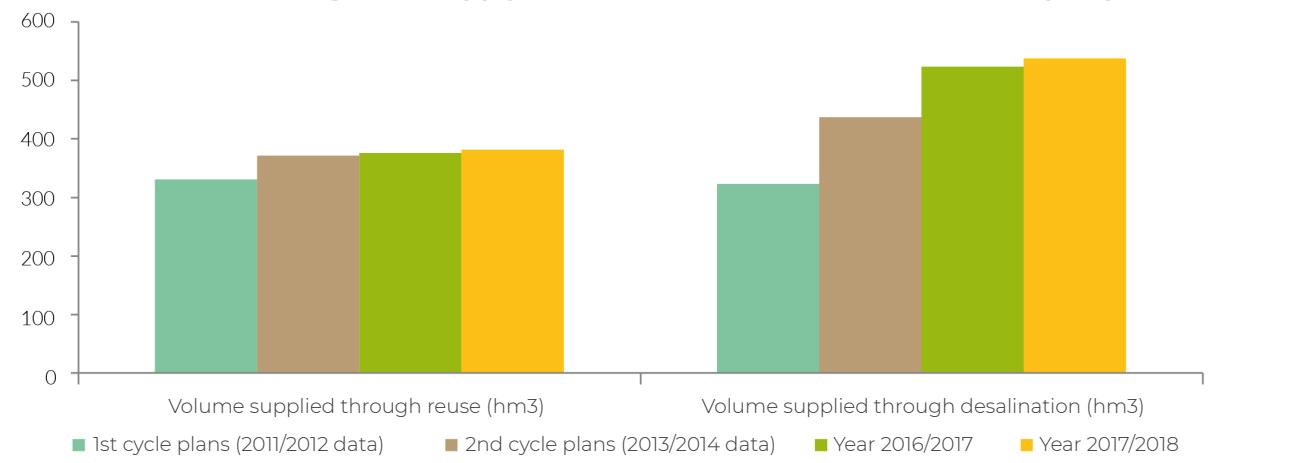
With a view to the data and information provided, it is worth saying that the degree of uncertainty around reuse values is high. It can be said that the volume of regenerated water supply in the year 2017/2018 was in the region of some 382 hm<sup>3</sup>. The volume supplied in the Júcar and Segura districts jointly account for more than half of the total volume, the sum of the values of all the river basin districts.

As can be observed in the table, the data appear to indicate that the volume of supply of reuse is increasing slightly: 1.6 % for the year 2017/2018 with respect to the previous year, 2.8 % with respect to the time of drafting of the hydrological plans of the second cycle and 15.4 % compared to the time the plans of the first cycle were drafted.

The value of the desalination volume supplied presents a degree of uncertainty. In the case of the data obtained for the year 2017/2018 (537.49 hm<sup>3</sup>) they do show a significant increase in the volume of water supplied from desalination: 2.7 % for the year 2017/2018 with respect to the previous year, 23 % with respect to the time of drafting of the hydrological plans of the second cycle and 66.1 % compared to the time of drafting of the first cycle plans. This is due to the inclusion of new resources in the river basin districts of Eastern Spain, principally the Segura, which accounts for 40 % of the resources from desalination supplied in Spain.

The river basin districts where the supply of non-conventional resources is most significant are the Segura, Júcar, Canary Islands and Balearic Islands.

**Evolution of degree of supply of non-conventional water resources (hm<sup>3</sup>)**



Indicator/Variable	1st cycle - 2017.2018	2nd cycle - 2017/2018	2016/2017-2017/2018
Volume supplied through reuse (hm <sup>3</sup> )	15.4 %	2.8 %	1.6 %
Volume supplied through desalination (hm <sup>3</sup> )	66.1 %	23 %	2.7 %



## STATUS OF SURFACE WATERS

The indicator shows the percentage of surface water in good status or ecological potential, the percentage of bodies with good chemical status and the percentage with good overall status for the total of river basin districts. The status of bodies of surface water will be determined by the worst value of their ecological status and their chemical status.

The Water Framework Directive (2000/60/CE) aims to achieve good status for water bodies in 2015. This involves reaching good chemical and ecological status in surface waters.

The status of a surface water body is the degree of alteration it presents with respect to natural conditions.

The indicator allows for monitoring of Sustainable Development Goals 6 (Clean water and sanitation) and 12 (Responsible consumption and production).

### Source:

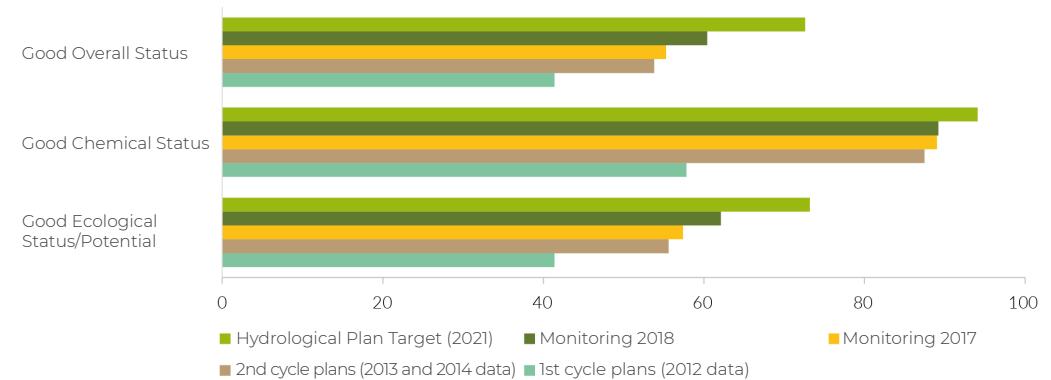
Ministry for Ecological Transition and the Demographic Challenge. (2020). Data provided upon express request by the Sub-directorate General of Hydrological Planning. Directorate General for Water.

For the assessment of the evolution of the status of surface waters, the existing information at the time of drafting of the first and second cycle hydrological plans, together with the monitoring data of the years 2017 and 2018. The valuation of the third cycle hydrological planning, as the sum of the resources of the 25 river basin districts will not be available until the drafts of the plans are prepared (no earlier than December 2020).

At the time of drafting of the second cycle hydrological plans, an assessment of the status of the surface water bodies was conducted and the objectives for the 2021 horizon were set. After this assessment, 2 775 water bodies (53.8 %) deemed to have good status. After analysing the data, it is observed that ecological status or potential is, on the whole, rather more limiting when it comes to reaching good status for surface waters: 2 869 water bodies had good ecological status or potential (55.6 %), and 4 516 water bodies reached good chemical status (87.5 %). Therefore, the percentage of water bodies with good status was around 19 % below the number of water bodies (3 747) for which it is expected to reach good status on the 2021 horizon.

The status of surface waters has evolved positively in 2017 and 2018, however, the advances achieved in 2018 show that there were 3 116 (60.40%) water bodies with good status, 12 % below the targets set for 2021. In 2018, 3 208 water bodies had good ecological status or potential (62.1 %), and 4 607 water bodies obtained good chemical status (89.2 %).

### Surface water bodies: percentage of total with good status or potential (%)



Source: MITERD

Indicator/Variable	1st cycle - 2018	2nd cycle - 2018	2017-2018
Percentage of surface water bodies with good ecological status or potential	20.7	6.5	4.7
Percentage of surface water bodies with good chemical status	31.4	1.7	0.2
Percentage of surface water bodies with good overall status	19	6.6	5.1

\* For these variables the trend reflects the difference in percentage values in the indicated periods



## STATUS OF GROUNDWATER BODIES

The indicator shows presents the percentage of groundwater bodies with good chemical status, the percentage of bodies with good quantitative status and the percentage with good overall status by river basin district. The status of a water body is determined by its worst chemical or quantitative status.

*The Water Framework Directive (2000/60/EC) aimed to prevent the deterioration of all groundwater bodies through the reduction of pollutants, achieving good status by the year 2015 and invert the significant, persistent trend of increasing concentration of pollutants.*

*The indicator allows for monitoring of Sustainable Development Goals 6 (Clean water and sanitation) and 12 (Responsible consumption and production).*

### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). Data provided upon express request by the Sub-directorate General of Hydrological Planning. Directorate General for Water.

Much like the case of surface waters, the existing information at the time of drafting of the first and second cycle was taken into account, together with the monitoring data for the years 2017 and 2018.

At the time of drafting of the second cycle hydrological plans, an assessment of the status of the surface water bodies was conducted and the objectives for the 2021 horizon were set. After this assessment, 425 water bodies (55.8 %) had good status. Of the data analysed it is observed that the chemical status is more limiting when it comes to achieving good status: the number of water bodies with good quantitative status was 577 (75.7 %), while the number with good chemical status was 494 (64.8 %). Therefore, the percentage of water bodies with good status was around 19.3 % below the number of water bodies (507) for which it is hoped to obtain good status by 2021.

The status of groundwater bodies had trended negatively up to 2017, however this trend was reversed in 2018, when the estimate showed 412 water bodies with good status (54.1 %) although still 23.1 % below the forecast for compliance with objectives in the year 2021. In 2018, 562 water bodies had good quantitative status (73.8 %) and 484 bodies had good chemical status (63.5 %), 9.8 % and 16.9 % respectively below the good status targets set for 2021.

**Groundwater bodies: percentage of total with good status (%)**



Source: MITERD

Indicator/Variable	1st cycle - 2018	2nd cycle - 2018	2017-2018
Percentage of groundwater bodies with good quantitative status	2.7	-1.9	2.3
Percentage of groundwater bodies with good chemical status	-1.9	-1.3	-0.8
Percentage of surface water bodies with good overall status	-2	-1.7	1.7

\* For these variables the trend reflects the difference in percentage values in the indicated periods



## QUALITY OF INLAND BATHING WATER.

The indicator shows a percentage of the total, of the sampling points in coastal bathing waters according to four categories of quality established by the legislation ("Insufficient"; "Sufficient"; "Good" and "Excellent"). There is also an "Unclassified" category.

The official census corresponding to the 2019 season in Spain is formed by a total of 1 962 bathing areas, of which 252 are inland areas.

*The health authority monitors the quality of bathing water in order to protect public health.*

*This indicator is based on the European bathing water directive and the research of the WHO, registering the incidence of gastrointestinal diseases after bathing at inland bathing waters.*

*The indicator allows for monitoring of Sustainable Development Goal 6 (Clean water and sanitation).*

### Source:

Ministry of Health. (2020). *Informe Técnico. Calidad de las Aguas de Baño en España (2019)*. Viewed 24 March 2020 [https://www.mscbs.gob.es/profesionales/saludPublica/saludAmbLaboral/calidadAguas/aguasBano/docs/INFORME\\_AB\\_2019\\_05\\_03\\_2020.pdf](https://www.mscbs.gob.es/profesionales/saludPublica/saludAmbLaboral/calidadAguas/aguasBano/docs/INFORME_AB_2019_05_03_2020.pdf)

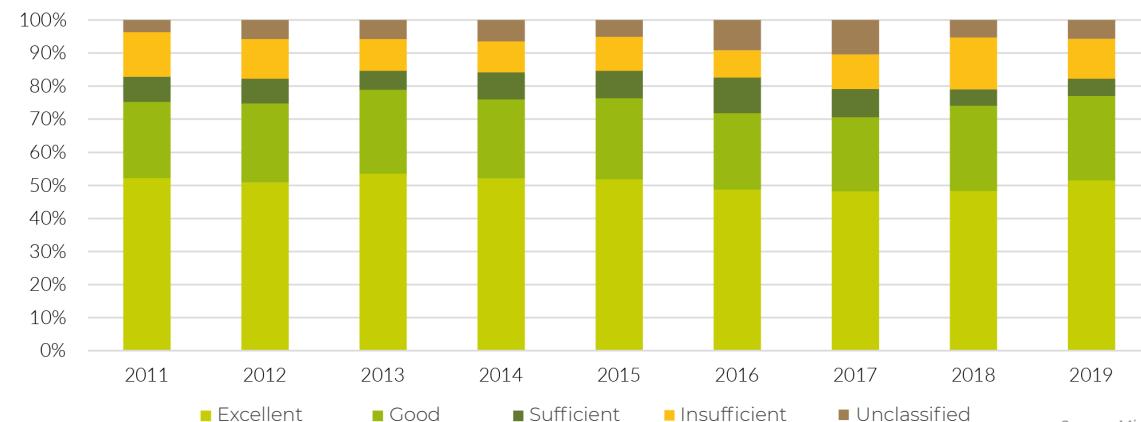
Bathing water control in 2019, in accordance with [Royal Decree 1341/2007, of 11 October, defining bathing water quality management](#), produced results showing an improvement in inland bathing water quality for the period in question.

The number of continental bathing waters was 252 in the year 2019. The autonomous communities with the highest number of bathing areas were: Galicia (67 areas), Castile La Mancha (37 areas), Castile and León (30 areas) and Extremadura (30 areas). The autonomous communities with no inland bathing waters are Asturias, the Canary Islands, Cantabria, Murcia, the Balearic Islands and the autonomous cities of Ceuta and Melilla.

Of the 266 inland bathing water sampling points in 2019 (each bathing area may have more than one sample), 51.5 % of the sampling points returned excellent quality (3.2 % more than in 2018), 25.6 % good quality (0.3 % less than in 2018), 5.3 % sufficient quality (0.35 % more than in 2018) and 12 % (3.6 % lower than in 2018) insufficient quality. The autonomous community with the highest number of excellent and good waters was Galicia (with 40 excellent for bathing and 21 with good quality) followed by Castile - La Mancha (26 and 2 respectively) and Castile - León with 16 excellent areas and 10 good areas.

In the trends table the quality categories have been grouped into three ranges. This grouping provides a clearer idea of the evolution of bathing water quality, due to the fact that the percentage waters with sufficient quality has changed over time, trending towards greater proportions in the higher quality categories.

### Quality of inland bathing water (percentage of sampling points according to their quality category)



Source: Ministry of Health.

Indicator/Variable	2011-2019	2015-2019	2018-2019
"Excellent" and "Good" quality	1.8	0.7	2.9
"Sufficient" quality	-2	-3	0.3
"Insufficient" and "Unclassified" quality	0.5	2.3	-3.2

\* For these variables the trend reflects the difference in percentage values in the indicated periods



## 2.3. ECONOMIC SECTORS

### 2.3.1. AGRICULTURE

- Fertiliser consumption
- Consumption of phytosanitary products
- Irrigated area
- Organic farming
- Organic livestock farming
- Number and area of holdings receiving the green payment

### 2.3.2. FISHING

- Number of vessels and fishing fleet capacity
- Fishing fleet catches
- Aquaculture production

### 2.3.3. INDUSTRY

- Final energy consumption in the industrial sector
- Emissions of atmospheric pollutants in the industrial sector
- Expenditure on environmental protection in the industrial sector
- Road and rail accidents causing possible environmental damage
- Industrial accidents involving hazardous substances

### 2.3.4. TRANSPORT

- Demand for inter-city passenger and freight transport
- Emissions of pollutants from transport
- Passenger vehicle fleet by fuel type
- Final energy consumption of transport

### 2.3.5. URBAN ENVIRONMENT

- Urban density by autonomous community/city
- Urban public transport
- Final energy consumption in households.

### 2.3.6. TOURISM

- International tourists per inhabitant
- International tourists per kilometre of coastline
- Equivalent Tourist Population in the main tourist areas
- Number of visitors to the national parks
- Rural tourism: accommodation, capacity, tourists and overnight stays
- Proportion of jobs in sustainable tourism with respect to total tourism jobs





## 2.3.1. AGRICULTURE

According to the Common Agricultural Policy (CAP), the functions of agriculture in society are the production of food and the development of rural communities with environmentally sustainable practices. In this regard, farmers have the responsibility of producing food while at the same time protecting nature and preserving biodiversity.

In June 2018, the European Commission put forward legislative proposals for the Common Agricultural Policy (CAP) from 2020 on, proposing the following nine objectives:

- Guarantee fair income for agricultural producers
- Increase competitiveness
- Re-balance power in the food chain
- Take action against climate change
- Protect the environment
- Preserve landscapes and biodiversity
- Maintain dynamic rural areas
- Support generational relevance
- Protect food and health quality

This approach considers the role of agriculture to be fundamental in the fight against climate change, the protection of the environment and the preservation of landscapes and biodiversity. There is also a need to regenerate rural areas from a social and economic perspective and to guarantee generational relief in these areas.

At the COP25 Climate Summit held in Madrid in 2019, the need to tackle climate change on a transversal basis was confirmed. All areas of sectoral action must incorporate it into their political agendas. During the summit there were a number of high level meetings in different areas, including agriculture.

In Spain, despite occupying an extensive surface area (48%), the sector provides low Gross Added Value to the economy as a whole (3%) with a low weight in terms of jobs (4%). However, during the COVID-19 crisis, the sector demonstrated that it is at the pinnacle of social responsibility, guaranteeing the production and supply of basic necessity food products and helping to satisfy the basic needs of the population.

Agriculture is one of the policies that the *European Green Deal* considers to be transformative for the economy of the EU to advance towards a sustainable future. Considered jointly with food, the European Green Deal starts from the basis that “Food production still results in air, water and soil pollution,

contributes to the loss of biodiversity and climate change and consumes excessive amounts of natural resources, while an important part of food is wasted. At the same time, low quality diets contribute to obesity and diseases such as cancer.

In May 2020 the *Farm to Fork Strategy – for a fair, healthy and environmentally-friendly food system (COM(2020) 381 final)* was adopted. This strategy should be considered a tool of the European Green Deal and an instrument to achieve the United Nations Sustainable Development Goals.

The CAP 2014-2020 defined its own monitoring and assessment of objectives. In late 2018, the *Report on the Implementation of the Common Monitoring and Evaluation Framework and first results on the performance of the Common Agricultural Policy (COM(2018) 790 final)* was published, with the next report for the final evaluation due in 2021.





### The Farm-to-Fork Strategy will help achieve a circular economy, from production to consumption:



The objectives include stimulating consumption of sustainable foods (reducing the environmental impact of the food processing sector) and fostering healthy food and contributing to a circular economy and improving the lives of farmers.

Both lines seek to have strategic plans for agriculture adopted by countries to guarantee environmental and climate behaviour that considers the management and storage of carbon in the soil, the management of nutrients, the reduction of atmospheric emissions and the reduction of the use of chemical

pesticides (and their risks), fertilisers and antibiotics, increasing the area dedicated to organic agriculture in Europe.

For its part the *New Action Plan for the Circular Economy for a Cleaner and More Competitive Europe* (COM(2020) 98 final) incorporates the reuse of water in agriculture as part of the optimisation of resources. In this regard, the purpose of *Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse* is "to guarantee that reclaimed

water is safe for agricultural irrigation, thereby ensuring a high level of protection of the environment and of human and animal health, promoting the circular economy, supporting adaptation to climate change, and contributing to the objectives of Directive 2000/60/EC by addressing water scarcity and the resulting pressure on water resources, in a coordinated way throughout the Union, thus also contributing to the efficient functioning of the internal market."

The 2019 FAO publication *The State of Food and Agriculture. Moving Forward on Food Loss and Waste Reduction*, highlights the need to reduce food loss and waste, reinforcing the positions set out in the European Green Deal. It includes a specific chapter linking environmental sustainability with food loss and waste and Target 12.3, to halve global per capita food waste and reduce food waste from here to 2030, within Sustainable Development Goal 12 (To ensure sustainable production and consumption).

The draft *National Plan for Adaptation to Climate Change (PNACC) 2021-2030* (presented for public consultation in May 2020) is primarily aimed at reducing the vulnerability of society and the economy to the impacts and risks of climate change. Agriculture is one of the 18 working areas for which specific targets are set, as one of the sectors that will be most impacted by climate change. It is taken together with livestock, fisheries and aquaculture and food and, specifically, 6 lines of action (3 specific to agriculture) are proposed of 81 in total.

In the case of agriculture, the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD) are the

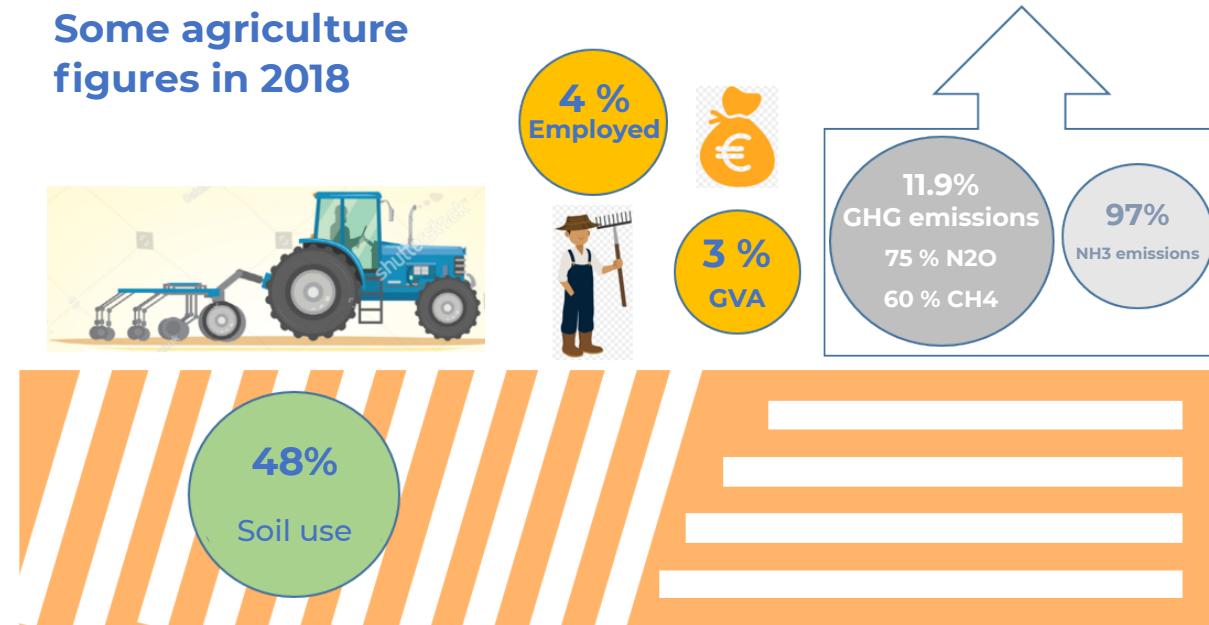


support instruments to strengthen the funding of adaptation policies and measures.

The *Climate Change and Energy Transition Bill* was put before Parliament by the Council of Ministers in May 2020, beginning the parliamentary process for its approval. Its objectives will be implemented through successive National Energy and Climate Plans, the first being for the period 2021-2030.

The Fair Transition Strategies make up one of the principal instruments to achieve the transition to a decarbonised economy. These five-year strategies must be approved by the Government on the basis of the joint proposal of several ministries, including the Ministry of Agriculture, Fisheries and Food and with the participation of the autonomous communities and social partners.

## Some agriculture figures in 2018



According to CLC 2018, agricultural land use accounts for 48 % of the total surface area. In some autonomous communities like Andalusia, Castile-Leon and Castile-La Mancha, the Balearic Islands and Murcia, that figure exceeds 50 %. In Extremadura it exceeds 60 %. The GVA of agriculture (including livestock, forestry and fisheries) represented close to 3 % of the total in 2018, a contribution below that of construction (6 %), industry (16 %) and services (75 %). In relation to employment potential, the percentage of people employed in the sector was 4 % of the total. Agriculture must adapt to climate change. Moreover, it contributes to climate change and in 2018 was responsible for 11.9 % of GHG emissions. The sector was responsible for over 60 % of CH<sub>4</sub> and over 75 % of all N<sub>2</sub>O emissions. Agricultural activities were also the cause of 97 % of atmospheric emissions of NH<sub>3</sub>, which together with nitrogen surpluses like fertilisers, are not assimilated by crops and were the source of nitrate contamination of soils and aquifers.



Agriculture, like most productive activities, can have negative effects on people's health. These are collateral effects of the necessary production of foods, and it is therefore necessary to assess it appropriately. SDG 2 (Zero hunger), is clear on this and establishes the need, by 2030, to “double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment” (Target 2.3). Nevertheless, this boosting of agricultural activity is conditional upon the development of sustainable practices. Target 2.4 identifies the need “by 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality”.

In general, the negative effects of agricultural activity are usually more serious when intensive agriculture is developed to improve economic performance. In addition to the global problems arising from its contribution to climate change and the deteriora-

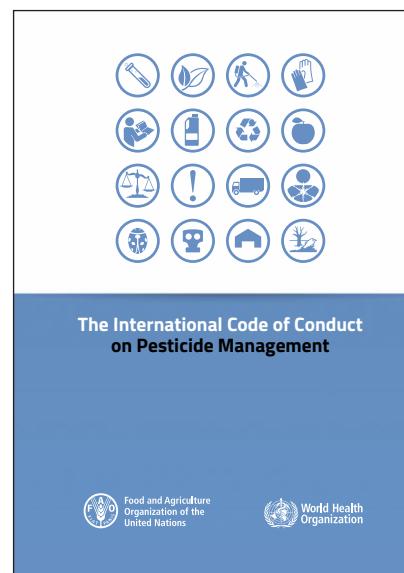
tion of air quality caused by pollutant gases, many agricultural practices damage health: emissions of particles during land works and movements using machinery; contamination of groundwater by nitrate from excessive use of fertiliser not assimilated by crops and effluent from intensive livestock farming; the incorporation into our organisms of chemical compounds from phytosanitary products whether by direct inhalation after dispersal or by ingesting them when we consume vegetables to which they have been applied; transmission of diseases related to intestinal worms and faecal bacteria arising from the use of waste water for irrigation.

The WHO considers pesticides to be potentially toxic and to have damaging effects on human health, for

example causing cancer or consequences for the reproductive, immune or nervous systems. What's more, according to the FAO “Pesticides kill pests, but also pests' natural enemies, and their overuse can harm farmers, consumers and the environment. The first line of defence is a healthy agro-ecosystem.”

Article 2 of the International Code of Conduct on Pesticide Management, drafted jointly by the FAO and the WHO, defines pesticides as “any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth.”.

In May 2019, the EU drafted a new Regulation establishing provisions relating to the marketing of fertiliser products in the EU but it remains unsigned and unpublished. Among other aspects, it regulates the concentration of pollutants in order to reduce the risks to human, animal and plant health, safety and the environment.





## FERTILISER CONSUMPTION

The indicator shows consumption of fertiliser products per hectare in Spain, broken down by nutrients (N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O).

The indicator is the result of the ratio of consumption of fertilisers in the form of nutrients in absolute terms to the total fertilisable surface area, expressed in kg/ha.

Fertilisers increase agricultural production by providing soils with additional nutrients in a form assimilable for plants. Nevertheless, it is necessary to ensure that the products used in vegetable nutrition or in the improvement of soil characteristics to comply with agronomic efficacy and the absence of damaging effects for health and the environment.

The indicator allows for monitoring of Sustainable Development Goals 6 (Clean water and sanitation) and 12 (Responsible consumption and production).

### Source:

Ministry of Agriculture, Fisheries and Food. (2020). *Anuario de Estadística Agraria*. Year 2019. Viewed May 2020 <https://www.mapa.gob.es/estadistica/temas/publicaciones/anuario-de-estadistica/2018/default.aspx?parte=3&capitulo=09&grupo=2>

Fertilisation guarantees crop performance. It is another factor in agricultural exploitation (with soil, variation, rotation, water, etc.). Productive agriculture, which guarantees the supply of food, must be sustainable, with rational use of fertilisers. Inorganic fertilisers, which use stable chemical products, provide nutrients in an assimilable way and in the right dosage for each crop and existing agri-climate conditions.

In 2018, a total of 1874 129 t of fertilisers (as nutrients) was consumed in Spain. Of that, 55 % was nitrogen compound fertilisers, 23 % phosphate fertilisers and 22 % potassium fertilisers. By comparison with 2017, the former two fell (3.6 % and 2.3 % respectively) while potassium compounds rose (6.9 %). By fertilisable surface area, the variation from 2017 to 2018 showed different values from the absolute figures, while potassium fertilisers were the only ones to show an increase in application per hectare (8.8 %). The latter saw consumption of 69.4 kg/ha of nitrogen compounds, 28.6 kg/ha of phosphate compounds and 27.9 kg/ha of potassium compounds.

2009 recorded the biggest reduction in the application of fertilisers per hectare. This was particularly for potassium fertilisers, falling from 21.6 kg/ha in 2008 to 10.8 kg/ha in 2009, before rising again in 2010 to 24.4 kg/ha.

Consumption of fertilisers according to fertilisable surface area (kg/ha)



Indicator/Variable	2009-2018	2014-2018	2017-2018
Consumption of nitrogen fertiliser per ha	36.9 %	-2.3 %	-1.9 %
Consumption of phosphate fertiliser per ha	24.8 %	11.3 %	-0.6 %
Consumption of potassium fertiliser per ha	158.5 %	20.7 %	8.8 %



## CONSUMPTION OF PHYTOSANITARY PRODUCTS

The indicator presents phytosanitary products consumption (as active substance) in relation to the area of application. It is expressed in kg/ha and the classification of the phytosanitary products is as follows: fungicides and bactericides; herbicides; insecticides and acaricides and others (which include molluscicides and growth regulators).

*The use of controlled pesticides, when used well, can improve crop production and help protect human health. However, they are chemical products that can be toxic to human beings and have acute and chronic affects on health depending on the quantity and form of exposure.*

*The indicator allows for monitoring of Sustainable Development Goals 2 (Zero hunger), 3 (Good health and well-being), 6 (Clean water and sanitation) and 12 (Responsible consumption and production).*

### Source:

Ministry of Agriculture, Fisheries and Food. (2020). Encuesta de Comercialización de Productos Fitosanitarios. Viewed June 2020 <https://www.mapa.gob.es/es/estadistica/temas/estadisticas-agrarias/agricultura/estadisticas-medios-produccion/fitosanitarios.aspx>

Ministry of Agriculture, Fisheries and Food. (2020). Anuario de Estadística Agraria. Year 2018. Viewed May 2020 <https://www.mapa.gob.es/es/estadistica/temas/publicaciones/anuario-de-estadistica/2018/default.aspx?parte=3&capitulo=09&grupo=2>

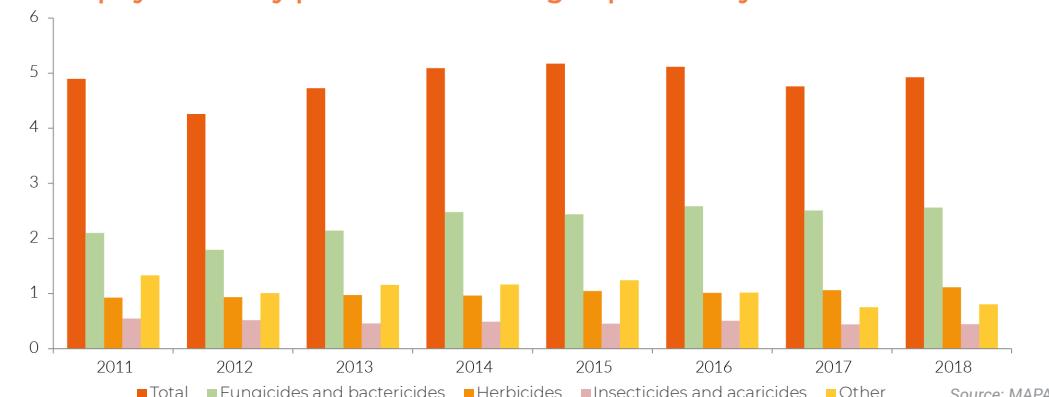
The use of phytosanitary products, measured as active substances, increased by 1.6 % in 2018 in comparison to 2017. Of the total of 73 283 tons of active substance of these products sold in Spain in 2018, 52 % were fungicides and bactericides, 22.6 % herbicides, 16.3 % molluscicides, growth regulators and other phytosanitaries and the remaining 9 % insecticides and acaricides.

Per hectare of treatable surface area, in 2018, 2.6 kg of fungicides and bactericides, 1.1 kg of herbicides, 0.8 kg molluscicides, growth regulators and others and 0.4 kg of insecticides and acaricides. These quantities are similar to those used the previous year when the total amounted to 4.9 kg/ha.

In 2018 (in the absence of total aggregate data), Spain was the second country in the EU-28 in sales of fungicides, bactericides and herbicides, behind only France. It was also second, this time behind Germany in sales of insecticides and acaricides.

In previous editions of the Environmental Profile of Spain, the surface area treated with phytosanitary products was calculated by subtracting fallow land each year, using information from the *Area and Crop Yield Survey* published annually by what is now the Ministry of Agriculture, Fisheries and Food. This time, the decision was taken to add the surface area of natural grasslands (both dry holdings and irrigated lands), as phytosanitaries can also be applied there.

**Consumption of phytosanitary products according to potentially treatable surface area (kg/ha)**



Indicator/Variable	2011-2018	2014-2018	2017-2018
Consumption of fungicides and bactericides (kg/ha)	22.1 %	3.3 %	2.1 %
Consumption of herbicides (kg/ha)	20.4 %	15.9 %	5.1 %
Consumption of insecticides and acaricides (kg/ha)	-18.3 %	-9.3 %	1.2 %
Consumption of other phytosanitary products (kg/ha)	-39.5 %	-30.8 %	7.1 %
Total consumption of phytosanitary products (kg/ha)	0.5 %	-3.3 %	3.5 %



## IRRIGATED AREA

The indicator shows the proportion of the irrigated agricultural area within the total national cultivated area, as a percentage.

*The inclusion of new irrigated areas can generate a water supply deficit in many territories, even more concerning in areas where this resource is limited, making it necessary to improve efficiency in use.*

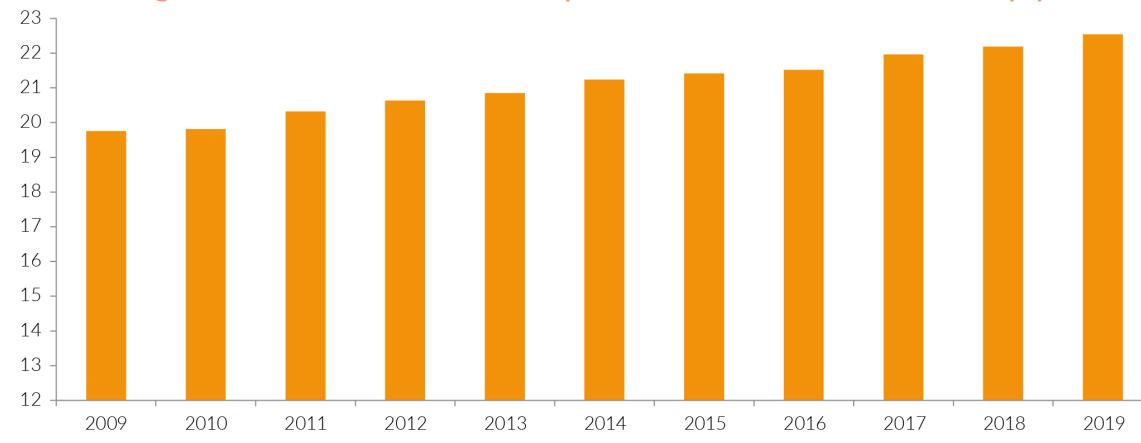
*The indicator allows for monitoring of Sustainable Development Goals 6 (Clean water and sanitation) and 12 (Responsible consumption and production).*

In 2019, the irrigated area represented 22.5 % of the total cultivated area (comprised of the dry area suitable for cultivation plus irrigated area), a percentage slightly above the 22.2 % for 2017. In the analysis of the series from 2009, a continuous annual increase in this percentage can be observed due to the increase in irrigated surface area to the detriment of total cultivated area as a consequence of the decrease in surface area used for dry cultivation area. Between 2010 and 2019, the dry surface area in Spain fell by 4.6 % while irrigated area increased by 12.3 %.

The Survey on Water Usage in the Agricultural Sector (2000-2008 series) prepared by the INE shows that the trickle irrigation technique has increased to come to account for 40.4 % of total water usage in agriculture in 2018 (in 2010 it accounted for 32.9 %) overtaking gravity irrigation in 2014. Agricultural holdings consumed 15 495 cubic hectometres in 2018, 3.7 % more than in 2016.

Concern with the improvement of the efficiency of irrigation systems has been constant in Spanish agricultural systems. Limited resources have forced the adaptation of irrigation methods that promote saving of water. The Spanish Strategy for Climate Change and Clean Energy, the latest with a 2020 horizon, established the objective of improving the energy efficiency of irrigation both in terms of the provisions of hydrological resources and in irrigation systems (gravity-pressure). In 2020, the Climate Change and Energy Transition Bill provides for the consideration of climate change in water planning and management (Article 17) to *“Identify and manage the risks arising from climate change in relation to their impact on crops and the agronomic needs for irrigation water...”*.

**Irrigated cultivated area with respect to the total cultivated area (%)**



Indicator/Variable	2010-2019	2015-2019	2018-2019
Irrigated cultivation area with respect to the total cultivated area (Only variation specified, without environmental evaluation)	2.7	1.1	0.3

In this variable the trend reflects the difference in percentage values in the indicated years.

**Source:**

Ministry of Agriculture, Fisheries and Food 2020. Encuesta sobre Superficies y Rendimientos Cultivos (ESYRCE) 2018. Viewed June 2020 <https://www.mapa.gob.es/es/estadistica/temas/estadisticas-agrarias/agricultura/esyrce/default.aspx>



## ORGANIC AGRICULTURE

This indicator describes the trend in area dedicated to organic agricultural production.

*Organic agriculture is presented as a production model that champions the sustainability of the territory by fostering agrifood production aimed at producing quality, environmentally friendly products. It has its own European regulation in place and is included within food quality policy and climate change adaptation policy.*

*The indicator allows for monitoring of Sustainable Development Goals 2 (Zero hunger) and 12 (Responsible consumption and production).*

### Source:

Ministry of Agriculture, Fisheries and Food (2019). *Agricultura Ecológica. Estadísticas 2018*. Sub-directorate General for Differentiated Quality and Organic Farming. Viewed June 2020 <https://www.mapa.gob.es/es/alimentacion/temas/produccion-ecologica/>

In 2018, the surface area of organic agriculture in Spain increased by 7.9 %, reaching 2.2 million hectares. This surface area contributed 16.7 % of the total surface area dedicated to organic agriculture in the EU-28 making Spain the biggest contributor, followed by France (15.1 %), Italy (14.6 %) and Germany (9.1 %). The remaining countries contributed less than 5 %. In global terms, Spain occupies fifth position behind Australia, Argentina, the United States and China, countries that have large geographic surface areas and, therefore, large agricultural areas too.

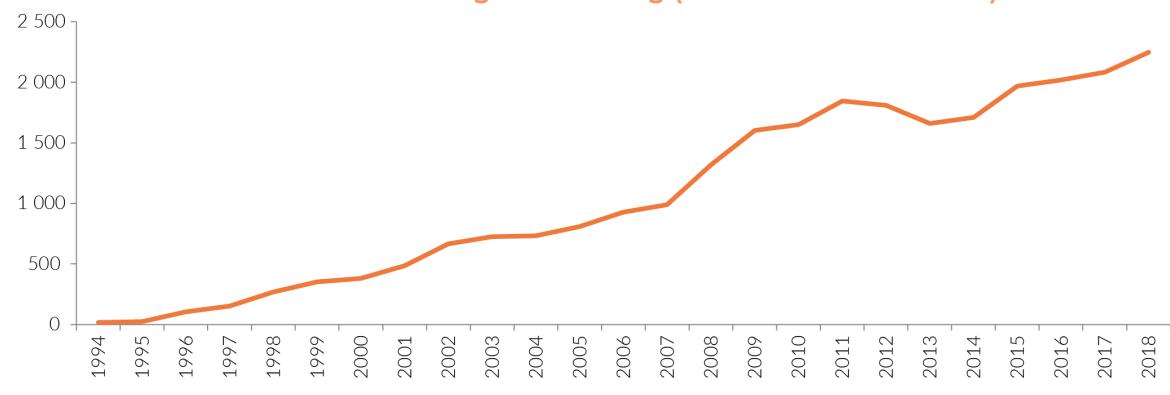
The evolution in the growth of surface area has been constant over the last 10 years, growing over 40 %. Nevertheless, the decrease in the agricultural surface area in the years 2012, 2013 and 2014 owes to the fact that, over these years, the total in section 6 (Other surface areas) were excluded, in order to standardise data with Eurostat (see explanatory note in appendix).

Based on the three categories into which the organic agriculture surface area is classified (in first year of practice, in conversion and organic), in 2018 three autonomous communities accounted for more than 73 % of total organic agriculture area. Andalusia was once again the autonomous community with the largest organic agriculture surface area, with over one million hectares (45.6 % of the total). It was followed by Castile-La Mancha, with 413 237 ha (18.4 %) and Catalonia, with 210 818 ha (9.4 %).

As in 2017, look at the type of crop, in 2018 permanent pastures and grasslands were once again the crops occupying the largest organic surface area (52.8 %), followed by the permanent crops (25.5 %) and crops on arable land (21.7 %).

With regard to the agriculture surface area used, organic agriculture in Spain represented 9.3 % in 2018, which placed us in 12th position in the EU-28. This percentage is above the European average which was 7.5 % and below Austria, Estonia and Sweden which exceeded 20 %.

**Area dedicated to organic farming (thousands of hectares)**



Source: MAPA

Indicator/Variable	2009-2018	2014-2018	2017-2018
Organic agriculture surface area (ha)	40.2 %	31.3 %	7.9 %



## ORGANIC LIVESTOCK FARMING

This indicator describes the number of organic livestock holdings.

*The indicator provides a reading similar to that for organic agriculture and allows for monitoring of the same objectives. It fosters livestock production aimed at obtaining quality products that respect the environment.*

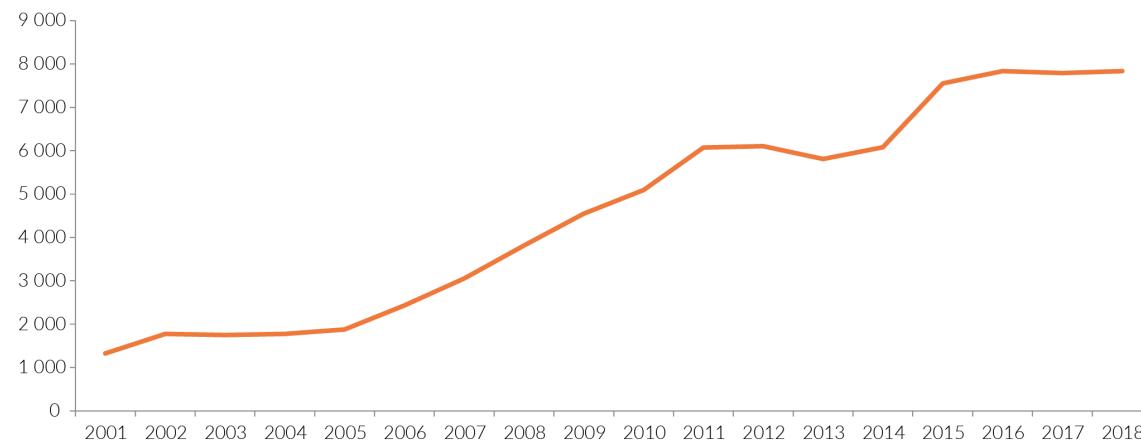
In 2018, the number of organic livestock holdings rose to 7 836, rising by 46 since 2017. By type of holding, cattle holdings represented 47.5 %, sheep 26.9 % and goats 9.1 %. They were followed by equine and poultry holdings, representing 5.7 % and 5.3 % respectively. Bee-keeping represented 3.5 % and pig farming 2 %.

The trend can be considered positive, with a slowdown in the increase in the number of organic holdings in the years 2012, 2014, 2016 and 2018 and isolated decreases in 2013 and 2017.

Over the last 10 years, organic cattle, sheep and goat holdings grew by over 75 %. Nevertheless, the biggest increase was for poultry holdings, which grew by more than 127 % in this period. Holdings dedicated to the production of honey have risen by close to 44 % and equine holdings by 42 %. At the other end of the extreme is pig holdings, which saw the lowest increase (just 7 %). Curiously, however, over the last year, these holdings have grown at fastest pace since 2017, at 11.5 %.

In 2018, six autonomous communities accounted for more than 90 % of organic livestock holdings: Andalusia (61.4 %), Catalonia (12.4 %), Extremadura (5.3 %), Balearic Islands (4 %), Asturias (4 %) and Galicia (3.5 %).

Number of organic livestock holdings



Source: MAPA

**Source:**

Ministry of Agriculture, Fisheries and Food (2019). *Organic agriculture. Statistics 2018*. Sub-directorate General for Differentiated Quality and Organic Farming. Viewed June 2020 <https://www.mapa.gob.es/es/alimentacion/temas/produccion-eco/>

Indicator/Variable	2009-2018	2014-2018	2017-2018
Number of organic livestock holdings	74.2 %	30.4 %	1.7 %



## NUMBER AND AREA OF HOLDINGS RECEIVING THE GREEN PAYMENT

This indicator shows the figure for holdings (number and area) that execute practices included in the "green payment regime" in Spain.

*The improvement in the environmental performance of agriculture is one of the objectives of the latest reform of the CAP, evaluating how to apply certain compulsory agricultural practices that are beneficial to climate and the environment.*

*The indicator contributes to the monitoring of the CAP (2014-2020), the National Rural Development Programme (2014-2020) and Sustainable Development Goal 12.*

### Source:

Ministry of Agriculture, Fisheries and Food. (2020). *Report on the application of payment for practices beneficial to the climate and environment ("green payment")*. 2018 campaign. Viewed June 2020 <https://www.fega.es/es/node/51170#>

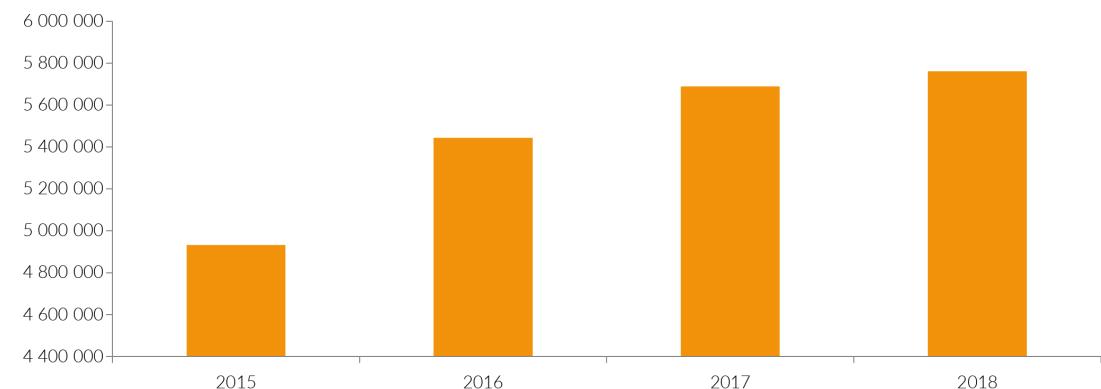
The payment is granted on an annual basis per eligible hectare, linked to a right to basic payment when certain environmental practices are respected. The average nominal sum of the rights is applied and, after any deductions for non-compliance or possible penalties, the sum for the "green payment" (GP) is finalised.

In terms of the diversification of crops (improvement in the structure and quality of soil and greater development of biodiversity is sought), looking at holdings of more than 10 ha, it can be observed that between 2015 and 2018, the number of holdings fell from 177 158 in 2015 to 165 490 in 2018. Holdings with a large number of different crops have increased to the detriment of those with a lower number of crops. The benefit of the green payment is clear in relation to crop diversification.

As for permanent pastures (with an important function when acting as carbon sequesters with benefits for health and combating climate change), the trend in surface area declared eligible shows continuous growth of 16.8 % between 2015 and 2018.

On the other hand, the Report on the application for payment for practices beneficial to the climate and environment ("green payment") for the 2018 campaign concludes that, in absolute terms, the organic surface area remained stable in Spain between 2015 and 2018.

### Evolution of surface area of permanent pastures applying for Green Payment (ha)



Source: FEGA (MAPA)

Indicator/Variable	2015-2018	2017-2018
Total number of holdings (from 1 to more than 8 types of crops)	-6.6 %	-2 %
- Number of holdings with just 1 type of crop	-21.3 %	-2.5 %
- Number of holdings with more than 8 types of crops	19.9 %	6.1 %
Surface area of permanent pasture lands declared eligible	16.8 %	1.3 %



The fishing sector is vital to the well-being and cultural heritage of most coastal communities around the world and, together with aquaculture, contributes greatly to the food security and nutrition of the world's population. The role of this industry in the fight against climate change will be fundamental as direct fishing and other aquaculture foods generate a lesser carbon footprint than animal production on land.

Fish populations are renewable resources provided they are exploited appropriately and sustainably. However, overfishing has historically existed in practically all of the world's seas, generating changes in trophic chains and in the composition and abundance of species; effects that are accentuated by the incidental catch of species that are not the target of fishing. Other impacts, such as damage to the marine environment are related to the method of fishing and the type of equipment used.



In 2019, the Spanish Fisheries Confederation, with the collaboration of the Spanish Oceanographic Institute, launched the [PesConect: Connecting science and fishing for sustainable management of marine resources](#) project. The principal goal is the creation of a state working network for the transfer of results and the improvement of fishing management through the analysis and generation of environmental, scientific and socio-economic information on the marine environment so as to facilitate the sustainable management of resources. The PesConect project has the collaboration of Fundación Biodiversidad and the Ministry for the Ecological Transition and Demographic Challenge within the framework of the [Pleamar Programme](#).

Fishing depends on healthy oceans more than any other economic activity as they are an indispensable requirement to establishing a broader blue economy. At the same time, a well-managed fishing sector generates a cascade of positive results, including increased earnings for fishers and the reduction of impacts on the environment.

For this to happen, there is a firm need to integrate the fishing industry in working frameworks with a broader governance and approach, which are grouped into multiple sectors and facilitate the establishment of management and assessment based on evidence using different sources of information that include the traditional experience and knowledge of local populations and foster their participation in stages of progress. The communication between fishers, scientists, managers, politicians and the general population should improve substantially to emphasize the fact that the fishing sector, developed sustainably, is fundamentally important to the food production system.

As part of the *European Green Deal* the European Commission announced the adoption of two strategies that directly affect the future of the fishing sector. The “Farm to Fork” Strategy and the *EU Strategy on Biodiversity for 2030*. Both, presented in May 2020, are mutually reinforcing, bringing together nature, resources, fishers, farmers, businesses and consumers to work jointly towards a sustainable future.

With the “Farm to Fork” Strategy, the Commission intends to streamline the transition towards sustainable production of fish and other marine foods. The future guidelines for the sustainable development of European aquaculture will map out the path to increasing the sustainability and competitiveness of the sector, with the measure to reduce the use of antimicrobial agents for farm animals and aquaculture by 50 %, a particular highlight. In relation to health, it specifically states that the resistance to antimicrobial agents arising from the use of antibiotics for the protection of human and animal health causes some 33 000 deaths in the EU every year.

The strategy reiterates the need for the correct and complete application the Common Fisheries Policy (CFP) and underlines the fact that specific efforts are required in the Mediterranean region. A number of measures, including financial instruments, will be available to European fishers and aquaculture producers to generate the necessary transition to sustainability and strengthen their position in the supply chain.



The *EU Biodiversity Strategy for 2030*, on the other hand, has the aim of strengthening the protection of marine ecosystems to restore them and ensure good environmental status through expansion of protected areas and the establishment of strictly protected areas for habitats and the recovery of fishing populations. The strategy highlights the need for an approach based on ecosystems for the management of human activities at sea. This involves bringing the overfishing of fish to the Maximum Sustainable Yield (MSY) levels, the levels that allow for a healthy future for fish species; eliminating incidental catch or at least reducing it to levels that do not pose a threat to the protection of sea mammals, turtles and birds, especially those species in danger of extinction; and finally to tackle practices that cause damage to the seabed.

On the other hand, within the framework of the long-term EU budget for the period 2021-2027, the European Commission has promised 6.14 billion euros for the marine and fishing economy in Europe. The new European Maritime and Fisheries Fund (EMFF) will focus specifically on support for small fishers with vessels of less than twelve metres, which represent half the fishing employment in Europe. At the same time, it will support the potential growth of the blue economy toward a more prosperous future for coastal communities and strengthen the area of impact of the EMFF, with a contribution of 30 % of its budget to the climate change mitigation and adaptation, in line with the aims of the Paris Agreement.

The year 2019 was a fundamental year for the fishing sector in Spain and in the EU in general due to the economic, political and environmental challenges it must tackle. Compliance with the CFP in terms of both the landing obligation and achieving the MSY, along with the uncertainty generated by Brexit, marked the starting point of a year of intense negotiations between Member States.

Turning to the Landing Obligation, *Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy*, set 1 January 2019 as the starting date

from which all species with Total Allowable Catches (TAC) and quotas in the Atlantic, and all species with a minimum reference sizes for conservation in the case of the Mediterranean would be included in the landing obligation. As a result, in Spain, the General Secretariat for Fisheries, proceeded to strengthen access to information on consumption of quotas for the purpose of facilitating management of fish stocks for all stakeholders. The *Gestcuotas network*, which can be accessed from the website of the Ministry of Agriculture, Fisheries and Food, with username and password, and provides access to aggregate quota





and consumption data by species and format for the principle fisheries subject to quotas and the information broken down by association and vessel for the quotas distributed on an individual basis.

On the other hand, in December 2019, after extensive negotiations, the Council of Ministers of the Ministries of Agriculture and Fisheries of the EU approved the agreement on TACs and fishing quotas for 2020 in the Atlantic and North Sea waters. Unlike other years, this agreement is particularly relevant as 2020 is the year forecast in the CFP to meet MSY targets. For Spain, there was a positive assessment of the result obtained for the national fleet. The agreement improves on the initial proposals of the European Commission and allows for the normal development of activity within Spain, ensuring the proposals can be delivered in good conditions in Spain in 2020 and even increasing the total volume of possible catches, maintaining the commitment to environmental, social and economic sustainability.

Within this agreement it was necessary to refer to the importance of Brexit and the future relationship between the United Kingdom and the European Union. The fishing sector is one of those most affected and, at the same time, one the most prominent supporters of the Brexit movement in the United Kingdom. Nevertheless, it was stipulated that both the access of the European fleet to British waters and the current distribution of quotas between the United Kingdom and Member States would be maintained during 2020. So, throughout 2020 it is expected that the negotiations will allow for the establishment of the future relationship between the United Kingdom and the European Union on fishing matters from the year 2021.

In relation to the conservation measures, in November 2019 the 26th annual meeting of the International Commission for the Conservation of Atlantic Tunas (ICCAT) adopted the new text of the Collective Agreement of this international body. The new text includes the regulation of migratory pelagic shark fisheries in the scope of the ICCAT, consolidating the ecosystem approach to fisheries management. Similarly, it was agreed to reinforce the management of tropical tuna and commitments were adopted for the conservation of the bigeye tuna, introducing measures for recovery and catch reduction.

As for aquaculture, at the 80th meeting of the National Advisory Board for Marine Aquaculture (JACUMAR) held on 3 December 2019, the General Secretariat for Fisheries presented a critical analysis of the current *Multi-Annual Strategic Plan for Spanish Aquaculture 2014-2020 (PEPAE)*. Based on the results of that analysis, it was agreed that it would be more convenient to work within the framework of a Spanish contribution to the European Commission's new strategic guidelines than to work on the basis of the PEPAE. This approach allows for the development of regional strategies provided they are coherent and in line with the new EMFF.



### 2.3.2. FISHING



Despite the global overfishing situation and the imminent need to reach sustainability to guarantee fish populations into the future, domestic fish consumption has been trending down for a number of years.

In accordance with the latest publication of the European Market Observatory for Fisheries and Aquaculture products (EUMOFA), *The EU Fish Market*, the data available up to June 2019 show that Spain has the highest fish and fresh fish product consumption in the home in the EU by some distance: in 2018, this was practically 70 000 tons higher than in Italy and France combined. Nevertheless, levels have been declining since 2014. Between 2017 and 2018, it fell

28 050 tons and 183 million euros. Among the most consumed species, salmon was the only one showing a positive trend, increasing 6 % in volume and 4 % in value with respect to 2017, reaching 47 747 tons and 501 million euros.

In relation to health, in November 2019 the Spanish Agency for Food Safety and Nutrition (AESAN) published a number of *new recommendations on consumption of certain fish with high mercury content*. In those recommendations, the exclusion of consumption of certain species of fish is extended up to the age of 10 (previously 3) and consumption for all other children is limited to 120g/month (previously 100g/week).

The quantity of mercury in fish is related to their diet, and large and long predatory fish (such as swordfish, luvar, shark, red tuna or northern pike) show the highest concentrations. Pregnant women and breastfeeding mothers and children under the age of 10 are the groups most vulnerable to mercury as it can affect the development of the central nervous system directly or through the placenta and breast milk.





## NUMBER OF VESSELS AND FISHING FLEET CAPACITY

This indicator provides a snapshot of the Spanish fishing fleet through the number of vessels and some of its characteristics: gross tonnage (GT) and power (expressed in kilowatts, kW).

Management of the fleet constitutes one of the main objectives of the Common Fisheries Policy to work on the line of sustainability. According to European legislation, the total capacity of the fishing fleet cannot be grown further and both the decommissioning of vessels and the reduction of fleets (financed with public aid) must be permanent. The indicator allows the monitoring of SDG 14 and the Common Fisheries Policy (2014-2020).

### Source:

Eurostat. (2020). Statistics on fisheries (fish\_fleet). Viewed 16 April 2020 <https://ec.europa.eu/eurostat/web/fisheries/data/database>

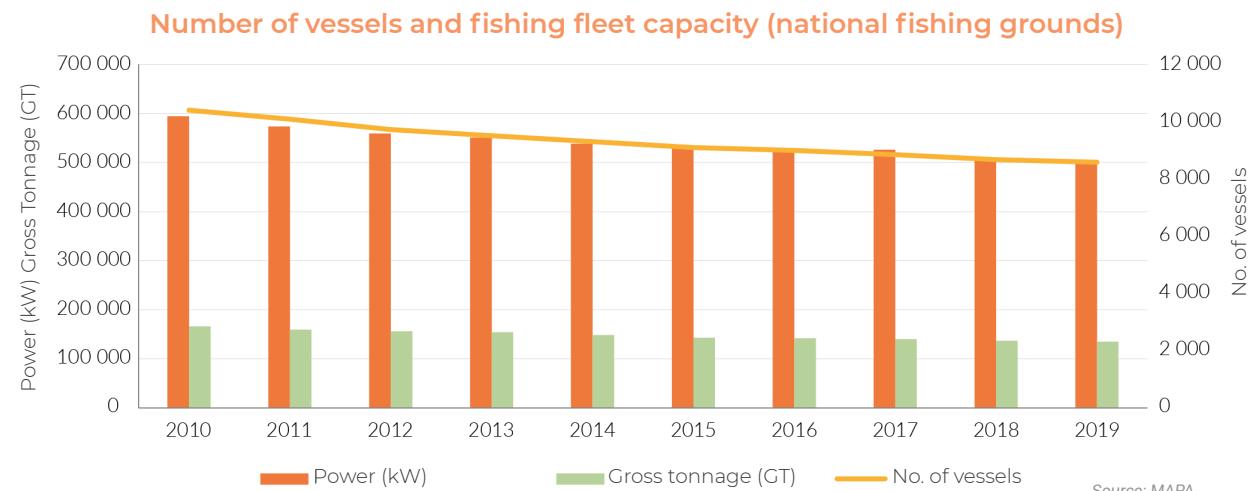
Ministry of Agriculture, Food and Environment. (2020). *Estadística de la flota pesquera. La flota española, Situación a 31 de diciembre 2019*. Viewed [https://www.mapa.gob.es/es/pesca/temas/registro-flota/la-flota-espanola-situacion-a-31-12-2019\\_tcm30-525563.pdf](https://www.mapa.gob.es/es/pesca/temas/registro-flota/la-flota-espanola-situacion-a-31-12-2019_tcm30-525563.pdf)

Ministry of Agriculture, Food and Environment. (2020). Data provided upon express request to the Sub-directorate General for Economic Sustainability and Social Affairs. (MAPA).

As of 31 December 2019, the fishing fleet statistics show 8 884 vessels with a gross tonnage of 332 444.6 GT and power of 777 321 kW. That implies a reduction of 88 vessels (1 %) on the previous year, and of 0.1 % in total power, while the gross tonnage increased slightly (0.3 %) due to the increase in international fishing grounds. It must be borne in mind that even though most of the Spanish fishing fleet (95.3 %) operates in the national fishing grounds, vessels that fish in international fishing grounds have higher average power and capacity, with 1 611 kW and 1 208.5 GT respectively. Nevertheless, for the purposes of this report, our interest lies primarily with the pressure that fishing exerts on our coasts and our focus therefore remains on the fleet that fishes in national fishing grounds. In this regard, the number of vessels, gross tonnage and power in national fishing grounds continue to fall. It can be stated therefore that the restructuring of the fleet is being carried out appropriately, contributing to a fleet more in line with the fishing opportunities available.

Looking at the autonomous communities, with regard to 2018, we should highlight the growth of the region of Murcia (7 more vessels and an increase of 3.4 % in gross tonnage and 4.1 % in power), the increase in gross tonnage and power in the Basque Country (3.4 % for both values) And Galicia (increases of 0.3 % in gross tonnage and 0.4 % in power). The rest of the communities have seen decreases in number of vessels, gross tonnage and power.

The latest data available in Eurostat show that in 2018 the Spanish fleet was, by some difference, the largest in the EU-28 in terms of gross tonnage, representing 21.4 %, while occupying third place in terms of both power and number of vessels.



Indicator/Variable	2010-2019	2015-2019	2018-2019
Number of vessels	-17.5 %	-5.6 %	-1 %
Power (kW)	-15 %	-4.4 %	-1 %
Gross tonnage (GT)	-18.8 %	-5.8 %	-2 %



## FISHING FLEET CATCHES

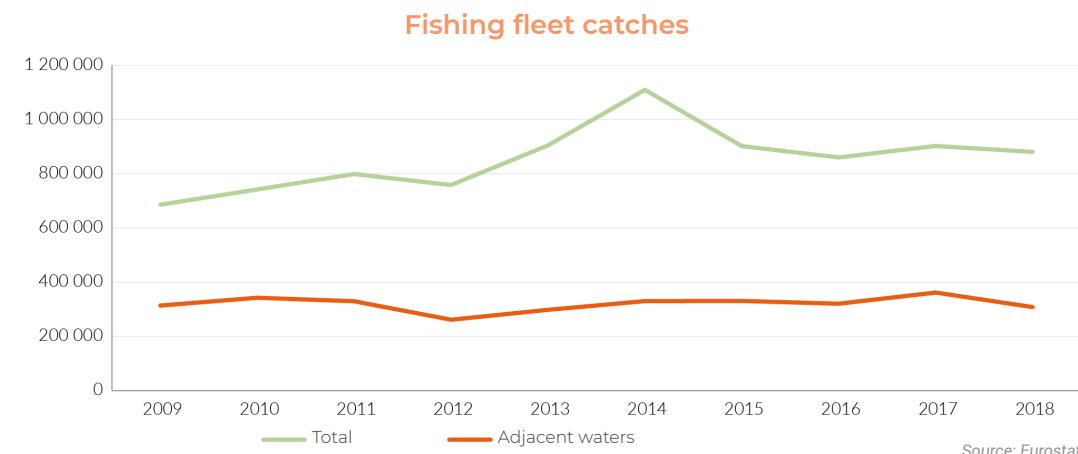
The indicator shows the total volume of catches by the Spanish fleet (expressed in tons of live weight) in the national fishing grounds (adjacent waters) and in the fishing grounds in the rest of the world, comparing them to catches in the European Union.

*The main objective of the management of fishing within the Common Fisheries Policy (CFP) 2014-2020 is to guarantee high yield over the long term for all populations, known as Maximum Sustainable Yield (MSY). Another fundamental objective is to reduce or avoid unintended catch and wasteful practices through the gradual introduction of the landing obligation, taking into account regionalisation and consultation with stakeholders. The indicator allows the monitoring of Agenda 2030 SDG 14 (Life below water) and the CFP (2014-2020).*

On the date of drafting of this report, the data available for total catches in the European Union in 2018 are based on estimates due to the fact that some Member States could not provide final figures. Those estimates show a total catch of 5.3 million tons of live weight, remaining at levels similar to 2017.

The fleets of Spain, Denmark, the United Kingdom, France and the Netherlands represented approximately two thirds of the total catch in the EU in 2018, and Spain and Portugal were the only Member states with catches in all seven areas covered by European statistics. Of the total catches, 75.5 % were made in the North-East Atlantic with Atlantic herring (21.8 % of live weight caught in the region), Atlantic mackerel (12.5 %), European sprat (11.2 %) and blue whiting (10.7 %) the most fished species.

Nationally, in 2018 Spanish vessels caught a total of 879, 961 tons of live weight implying a reduction of 2.5 % compared to 2017. 35% of these catches were made in adjacent waters (308 328 tons) where the reduction from the previous year is more acute than in the total (14.8 %). Within these waters, the highest volume of catches was reached in the North-West Cantabrian Sea (133 418 tons) followed by the Mediterranean and Black Sea (76 416 tons). In percentage terms, the Mediterranean and Black Sea area was the only area to show an increase in the volume of catches with respect to the previous year (0.7 %) while significant reductions were recorded in the Canary Islands (64 %), Gulf of Cádiz and Portugal (26.6 %) and the North-West Cantabrian Sea (3.9 %).



### Source:

Eurostat. (2020). *Agriculture, forestry and Fishery statistics, 2019 edition*. Viewed 22 April 2020 <https://ec.europa.eu/eurostat/web/products-statistical-books/-/KS-FK-19-001>

Eurostat. (2020). *Statistics on fisheries. (fish\_fleet)*. Viewed <https://ec.europa.eu/eurostat/web/fisheries/data/main-tables>

Indicator/Variable	2009-2018	2014-2018	2017-2018
Spanish fishing fleet catches	28.4 %	-20.6 %	-2.5 %



## AQUACULTURE PRODUCTION

This indicator shows aquaculture production in tonnes in Spain based on the statistics offered by the National Advisory Board for Marine Aquaculture (JACUMAR).

Aquaculture is the cultivation of aquatic organisms in both coastal and inland areas, which involves the intervention in the breeding process to increase production.

*In Europe aquaculture is a strategic economic activity and a key pillar of blue growth and the Common Fisheries Policy. This indicator, therefore, allows us to monitor the 2030 Agenda Sustainable Development Goals 2 and 14, the Common Fisheries Policy and the Spanish National Strategic Plan on Aquaculture (2014–2020).*

### Source:

Eurostat. (2020). Agriculture, forestry and Fishery statistics, 2019 edition. Viewed 22 April 2020 <https://ec.europa.eu/eurostat/web/products-statistical-books/-/KS-FK-19-001>

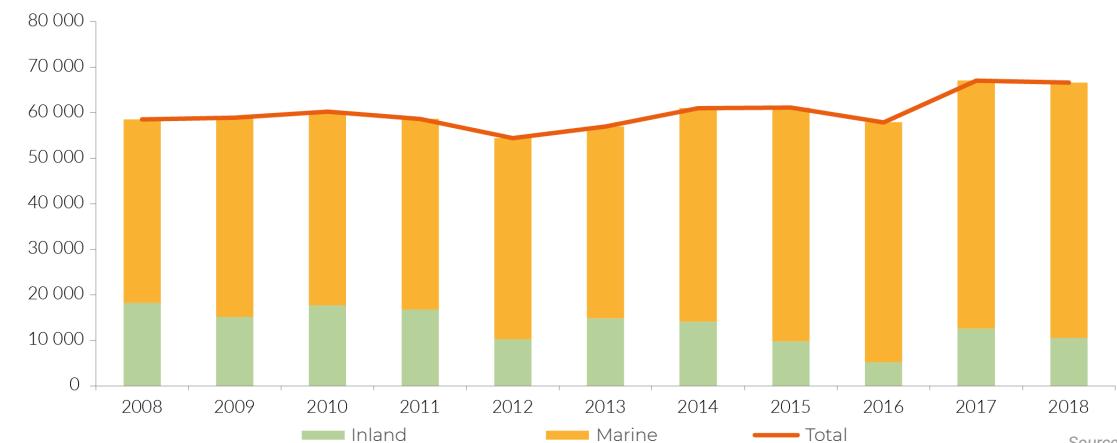
Ministry of Agriculture, Food and Environment. National Advisory Board for Marine Aquaculture (JACUMAR) . (2019). *Estadísticas pesqueras: Producción de acuicultura. 2018*. MAPA. Viewed [https://www.mapa.gob.es/app/jacumar/datos\\_produccion/datos\\_produccion.aspx](https://www.mapa.gob.es/app/jacumar/datos_produccion/datos_produccion.aspx)

The national data show that, in 2018, the Spanish aquaculture sector produced a total of 441 495.1 tons of live weight, of which 343 576.7 was marine aquaculture production (77.8 %) and 97 918.4 inland aquaculture production (22.2 %). Compared to 2017, total aquaculture production rose 25.8 %. By type of production, marine aquaculture rose 4.2 % and the increase of more of 360.5 % in inland aquaculture production stands out, due to the acute increase in breeding for restocking. 2018 saw a total increase of 87 300 tons of live weight for restocking, 78 975.6 more than in 2017, of which 53 800 tons correspond to restocking of the common trout.

By species, the breeding of mussels accounted for 64.3 % of total aquaculture production and it remains the most important at national level. Fish production fell slightly (0.7 %) on 2017, reaching a value of 66 600 tons of live weight and remained the second highest value of the ten-year period (2009–2018). After the significant increase in inland fish aquaculture in 2017, 2018 saw a fall-off of 16.1 % (2 028 tons). By species, bass (31.9 %), bream (20.7 %), rainbow trout (15.6 %), turbot (12 %) and red tuna (11.4 %) accounted for 91.7 % of the total volume of domestic fish aquaculture production.

Organic aquaculture production, estimated at 313.3 tons, fell by 13.9 % on 2017, due to scant inland production, which fell from 363 tons in 2017 to just 41.4 in 2018.

Marine and inland aquaculture: fish production (tons)



Source: Jacumar, MAPA

Indicator/Variable	2009-2018	2014-2018	2017-2018
Aquaculture production	51.3 %	43.7 %	25.8 %

### 2.3.3. INDUSTRY

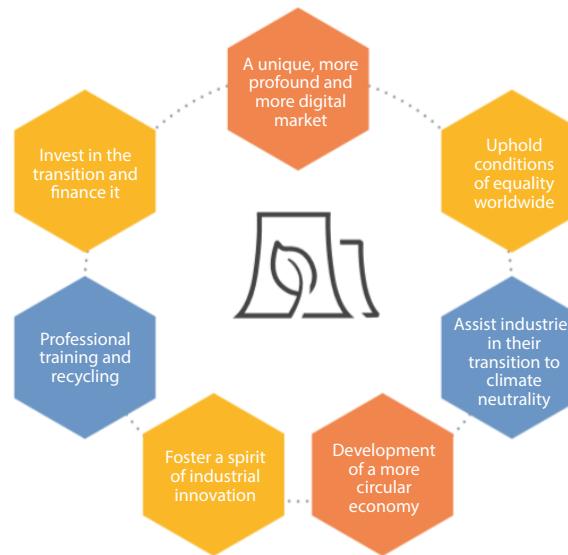


In late 2019, the European Commission announced its new strategy for growth, the *European Green Deal*, which has the principal aim of turning Europe into the first climate neutral continent by 2050. To achieve that it will be necessary to establish a new industrial policy based on the circular economy and energy transition.

Within this framework, in March 2020 the Commission published the *European Industrial Strategy: A new Industrial Strategy for a globally competitive, green and digital Europe*, which, along with the New Action Plan for the Circular Economy, aims to modernise industry, emphasising the importance of developing markets for climate-neutral products and digitalisation, decarbonisation and modernisation of resource and energy-intensive sectors such as textiles, construction, electronics and plastics.

Due to the variation in size, risks and needs of European industry, the strategy commits to supporting the initiatives known as the *industrial alliances*. The existing alliances in the fields of batteries, plastic and microelectronics will be used as the template and a new European alliance will be put in place for clean hydrogen, to be followed by alliances for hyper carbons, clouds and industrial platforms and raw materials. In Spain, in late 2019, the Industry and SME Sector Commission agreed the creation of a technical working group to boost participation in industrial projects in the area of sustainable mobility, batteries and hydrogen.

The fundamental factors named in the Strategy for the dual industrial transformation of Europe are presented in the following graphic.



In terms of national strategies, in February 2019 the Government presented the *General Guidelines for the New Spanish Industrial Policy 2030*, which are framed within the *Change Agenda* and are in line with the *Energy and Climate Strategic Framework*. These guidelines, aligned with European strategies, define the digitalisation of industry and the ecological transition as the principal future challenges.

In 2019, the Ministry of Industry, Trade and Tourism launched the *Active Industry 4.0 Programme*, which, with an allocated budget of three million euros, aims to encourage Spanish industries to apply technologies like big data, web analytics, cybersecurity and cloud computing, in order to increase competitiveness. Similarly, loans were approved for R&D&I projects within the scope of manufacturing industry, prioritising areas like the circular with loans allocated to the implementation of digital solutions in manufacturing industry.

These General Guidelines also make specific reference to Brexit. The impact of Brexit on Spanish industry will primarily depend on whether Britain's departure proceeds as established in the *(Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community)*, or if ultimately we are faced with an abrupt, "no-deal" Brexit. In the event of an orderly withdrawal, another fundamental variable to determine the impact on industry will be the scope of the future economic and trade relationship negotiated between the two parties.





Although there is still great uncertainty around the final scenario some of the principal consequences include the depreciation of sterling against the euro, the economic slowdown in the United Kingdom, which could affect demand for imports from Spain; increases in costs across all industries due to the tariffs, logistical costs and customs; and the adaptation of products to new approval requirement.

Both the EU and the Spanish Government have, for some time, been drawing attention to the need for Spanish and European companies to analyse their own situation in this regard and to draw up contingency plans to mitigate these impacts and identify potential new opportunities.

The Spanish Government is developing different measures to minimise the impact of Brexit. The most important of these measures in terms of the industrial sector are the following:

1. A temporary judicial framework is being drafted to guarantee the flows of British travellers to Spain and for the services associated with this travel and that adapts the customs process to intense commercial exchanges with the United Kingdom in its capacity as a third country.

2. The increase of personnel and material resources to tackle this situation. The teams responsible for custom controls will be expanded to conduct quality and safety inspections of products at borders, the personnel and material resources of the Institute of Foreign trade (ICEX) and the Economic and Trade Office in London will be reinforced to boost support for Spanish companies and increased personnel will be allocated to guarantee the exercise of citizenship rights.

3. Information actions are currently being carried out with a special focus on the companies and sectors most affected by Brexit.

4. Companies will be provided with services to assist with international expansion, and aid to export associations and federations for tasks relating to information and support for companies will be increased.

According to data from Eurostat, in 2019 Spanish industry represented 6.5 % of the GAV of Industry in the EU, providing 178.082 billion euros and growth of 3.2 % on 2018. In the period 2010-2019, the GAV of European industry grew 24.6 % while Spanish GAV grew 10.7 % in the same period.

In terms of employment in the national sphere, the data from the INE indicate that in 2019 the proportion of numbers employed per economic sector were similar to the previous year, with the services sector accounting for 75.5 % of jobs, followed by industry with 14 %, construction 6.5 % and agriculture with 4 %. With regard to 2018, the number employed in the industrial sector rose 2 %, maintaining the trend of reduced growth of previous years.

The latest data from the National Emissions Inventory of Spain refer to the year 2018, when Spanish industry was responsible for 19.9 % of total national emissions of GHGs, that is 66 559.8 kilotons of CO<sub>2</sub>- equivalent, an increase of 3.8 % on 2017. The increase in emissions from the sector runs counter to climate and environmental objectives and additional strategies have been but in place and efforts made to ensure compliance.



In 2020, in the context of the need for economic reactivation in light of the crisis caused by the COVID-19 pandemic, the Government put the *Climate Change and Energy Transition Bill* before Parliament on 19 May 2020, initiating the process for parliamentary approval. Its objectives will be implemented through the National Energy and Climate Plans. The first of those, the *National Integrated Energy and Climate Plan (PNIEC) 2021-2030* of 20 January 2020, was submitted to the European Commission by the Council of Ministers, at the proposal of the Ministry for the Ecological Transition and Demographic Challenge. The text sent coincides with that drafted to be submitted to the *public consultation phases of the Environmental Study Strategy from 23 January to 11 June 2020*. The PNIEC 2021-2030 provides for the drafting of the Industrial Development Plan, which attempts to lay the foundations to maximise the generation of economic development and industrial employment arising from the energy transition.

In its content, the PNIEC will respond to EU demands to tackle the climate change challenge and it is closely linked to the General Guidelines of the New Spanish Industrial Policy.

The objectives included in the commented version of the PNIEC 2021-2030 submitted to the European Commission that are significantly relevant to the industrial sector are the following:

- 23 % reduction in GHG emissions from 1990 levels: Specifically in the industrial sector, prioritising low-carbon technologies, innovation and energy competitiveness.
- 42 % renewables in final energy use.
- 39.5 % improvement in energy efficiency.
- 74 % of electricity production from renewable sources.

The emissions of the industrial sector to the environment, primarily the air, are also an important component of harm to health. PM2.5 emissions are the principal cause of premature deaths arising from pollution, causing respiratory system problems (lung cancer), cardiovascular and brain issues (ischemic attacks). For its part, ozone ( $O_3$ ) has significant effects on health relating to respiratory diseases.

In this regard, the measures presented in the aforementioned version of the PNIEC 2021-2030 submitted to the European Commission are aimed at reducing primary PM2.5 emissions, the most harmful to health,

by 33 % through the use of cleaner technologies. Sulphur dioxide ( $SO_2$ ) and nitrogen oxide ( $NO_x$ ), the principal pollutants for the formation of secondary PM2.5, will be reduced by 38 % and 35 % respectively. The reduction of  $SO_2$  is due primarily to the reduction in carbon consumption in the electricity sector, and in the case of  $NO_x$ , the improved efficiency of internal combustion engines and the electrification of transport.





## FINAL ENERGY CONSUMPTION IN THE INDUSTRIAL SECTOR

The indicator shows final energy consumption data corresponding to the industrial sector, including non-energy consumption, i.e. those products consumed by the industry as raw materials, the purpose of which is not the direct production of energy.

*The industrial sector is, after transport, the sector that consumes the most energy in Spain. To meet national and international objectives for renewable energies and energy efficiency, the industrial sector faces the challenge of orienting its growth towards a model based on a decarbonised, circular and more sustainable economy with increased use of renewable energies.*

*The indicator offers information useful for the monitoring of Sustainable Development Goals 9 (Industry, innovation and infrastructure) and 13 (Climate action).*

### Source:

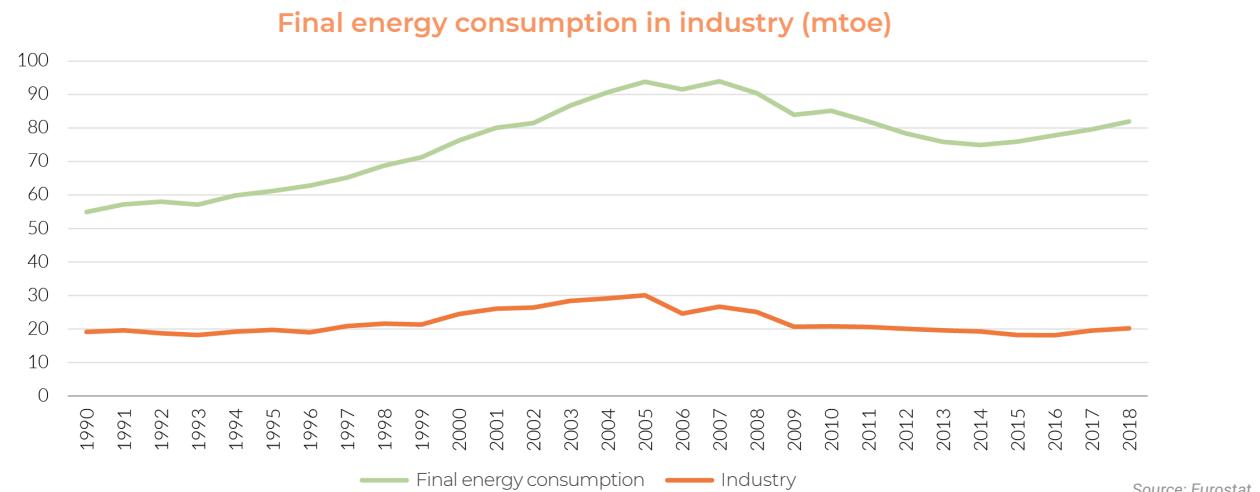
European Commission. (2020). DG Energy. EU energy in figures statistical pocketbook. Viewed 13 April 2020 [https://ec.europa.eu/energy/data-analysis/energy-statistical-pocketbook\\_en?redir=1](https://ec.europa.eu/energy/data-analysis/energy-statistical-pocketbook_en?redir=1)

In 2018, energy consumption in Spain was 82 mtoe, which was an increase of 2.9 % on the previous year. Spanish industry, with consumption of 20.2 mtoe, was responsible for almost a quarter of total energy consumption (24.6 %) and presented growth of 3.2 % on the year 2017. That growth, while it can be interpreted positively for the economy, is seen as a negative in environmental terms, due to greater consumption of energy resources.

With respect to the contribution by sector, non-metallic mineral industries (20.3 %), chemical and petrochemical industries (17.4 %), food and drink and tobacco (11.7 %) and metal and steel (11.1 %) were, respectively, the biggest contributors to energy consumption, representing 60.5 % of the total between them.

This year, Spain, with 7.7 % of EU total energy consumption was, again the fifth biggest consumer of energy, behind Germany, France, the United Kingdom and Italy. Together, these five countries represented 62.3 % of total EU energy consumption in 2018. Europe itself represented 24.4 % of total energy consumption worldwide.

Although the values for recent years indicate a growth trend in energy consumption in the industrial sector from the economic crisis of 2008 on, 2020 is expected to register a significant decrease due to the crisis caused by the COVID-19 pandemic.



Indicator/Variable	2009-2018	2014-2018	2017-2018
Total final energy consumption	-2.3 %	9.4 %	2.9 %
Final energy consumption by industry	-2.5 %	4.6 %	3.2 %



## EMISSIONS OF ATMOSPHERIC POLLUTANTS IN THE INDUSTRIAL SECTOR

The indicator shows the evolution of emissions of the following atmospheric pollutants from the industrial sector according to the data estimated by the Pollutant Release and Transfer Register (PRTR): sulphur dioxide (SO<sub>x</sub>), nitrogen oxide (NO<sub>x</sub>), non-methane Volatile Organic Compounds (NMVOCs), ammonia (NH<sub>3</sub>) and particulate matter with a diameter below 10 µm (PM10).

It is expressed as an index with reference to the base year 2007 (year 2007 = 100)

Spain's PRTR is an environmental information tool that provides us with information on emissions of polluting substances into the atmosphere, water and soil and data on waste transfers from the main industries and other specific and diffuse sources.

The indicator contributes to the monitoring of Sustainable Development Goals 11 (Sustainable cities and communities) and 13 (Climate actions).

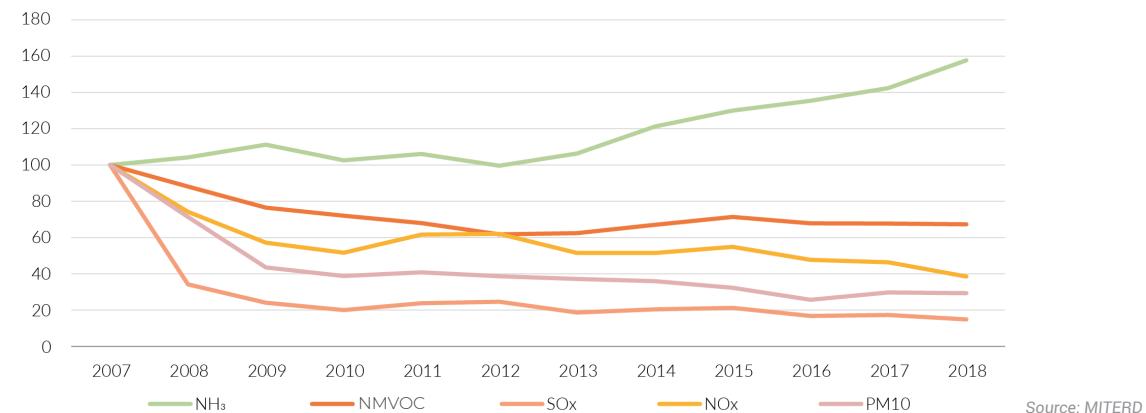
### Source:

Ministry for Ecological Transition and the Demographic Challenge. (2020). *Registro Estatal de Emisiones y Fuentes Contaminantes PRTR - España*. Data provided upon request by the Sub-directorate General for Air Quality and Industrial Sustainability of the Directorate General of Biodiversity and Environmental Quality (MITERD).

According to the PRTR, in 2018 the pollutant load emitted by the industrial sector fell compared to the previous years for all the pollutants analysed, with the exception of ammonia (NH<sub>3</sub>). The most notable decreases were 17 % in NO<sub>x</sub> emissions and 14 % in SO<sub>x</sub>. Both pollutants show the minimum for the whole data series, with values of 146.5 and 210.1 kilotons respectively. NMVOC emissions (55.8 kilotons) and PM10 (11.2 kilotons) fell by around 1 % in 2018. NH<sub>3</sub> emissions continue to show an upward trend, rising 11 %, reaching their maximum with a pollutant load of 67.6 kilotons emitted into the atmosphere.

Emissions caused by production processes in each of the industrial sectors depend on the raw materials and the specific conditions of the process. They therefore contribute with different proportions of pollutant loads emitted to the atmosphere or waters. The sources of SO<sub>x</sub>, NO<sub>x</sub>, NMVOC and PM10 emissions are primarily combustion and energy production facilities. With regard to ammonia emissions, livestock is the main contributor, responsible for 96 % of the emissions of NH<sub>3</sub>.

### Emissions of atmospheric pollutants in the industrial sector estimated by the Spanish Pollutant Release and Transfer Register PRTR (Index 2007=100)



Indicator/Variable	2009-2018	2014-2018	2017-2018
NH <sub>3</sub>	41.8 %	30 %	10.7 %
NMVOCs	-12 %	0.3 %	-0.6 %
SO <sub>x</sub>	-38.3 %	-27.6 %	-14.2 %
NO <sub>x</sub>	-32.6 %	-25.3 %	-17 %
PM10	-32.6 %	-18.3 %	-1.4 %



## EXPENDITURE ON ENVIRONMENTAL PROTECTION IN THE INDUSTRIAL SECTOR

The indicator shows the total investment in environmental protection made by the industrial sector. It is the sum of the investments made in integrated equipment and facilities that prevent pollution, as well as investments in equipment and facilities that operate independently of the production process to treat pollution.

The Survey on Industry Expenditure on Environmental Protection, drafted by the INE, allows for compliance with the environmental expenditure requirements in Regulation (EC) No 295/2008 of the European Parliament and of the Council, as well as establishing comparisons on the international scale. Similarly, it provides basic information for the development of the Environmental Protection Expenditure Account (EPEA) in the section pertaining to producers of ancillary services (own consumption) for environmental protection.

The indicator assists the monitoring of Sustainable Development Goal 12 (Responsible consumption and production).

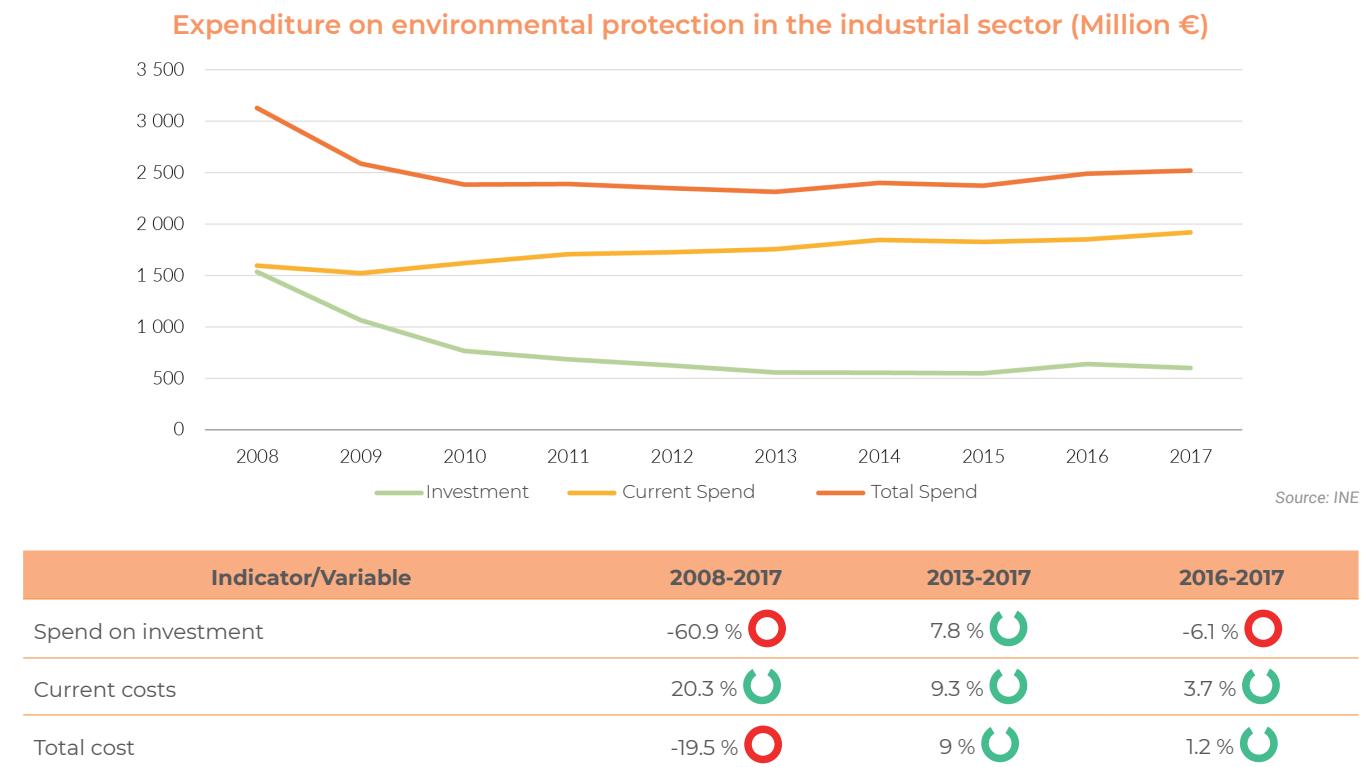
### Source:

Instituto Nacional de Estadística. (2020). Survey on Industry Expenditure on Environmental Protection. Series 2008-2017. Viewed 16 April 2020 <https://www.ine.es/jaxi/Tabla.htm?path=t26/p070/p01/serie/l0/&file=01001.px&L=0>

According to the available data on expenditure on environmental protection in the industrial sector, in 2017, the spend on investment reached 599.7 million euros. This figure represents 23.8 % of total spend, a reduction of 6.1 % compared to 2016, reversing the upward trend of previous years. Current expenditure, accounting for 76.2 % of total spend, reached a sum of 1.920 billion euros, a 3.7 % increase on the previous year and maintaining the positive trend, which is also replicated for total spend.

The progress in 2018 indicates that National Expenditure on Environmental Protection (NEEP) reached 18 729 million euros, registering an increase of 5.5 % with respect to the previous year and 1.56 % of GDP. These figures make 2018 the fourth consecutive year of growth. In accordance with this progress, the most significant services in terms of NEEP were waste management (61.7 %) and waste water management (19.3 %). That was followed by services for the protection of air, climate, soils, radiation and noise and vibration reduction (11 %), followed by environmental R&D and other activities (6.5 %) and finally biodiversity and landscape protection services (5.4 %).

The biggest increases in spending with respect to the previous year were in waste waster management services (6.9 %) and waste management and biodiversity and landscape protection services (both with an increase 5.5 %).





## ROAD AND RAIL ACCIDENTS CAUSING POSSIBLE ENVIRONMENTAL DAMAGE

The indicator shows the number of accidents during the transport of dangerous goods by means of transport (road and rail) causing possible environmental damage.

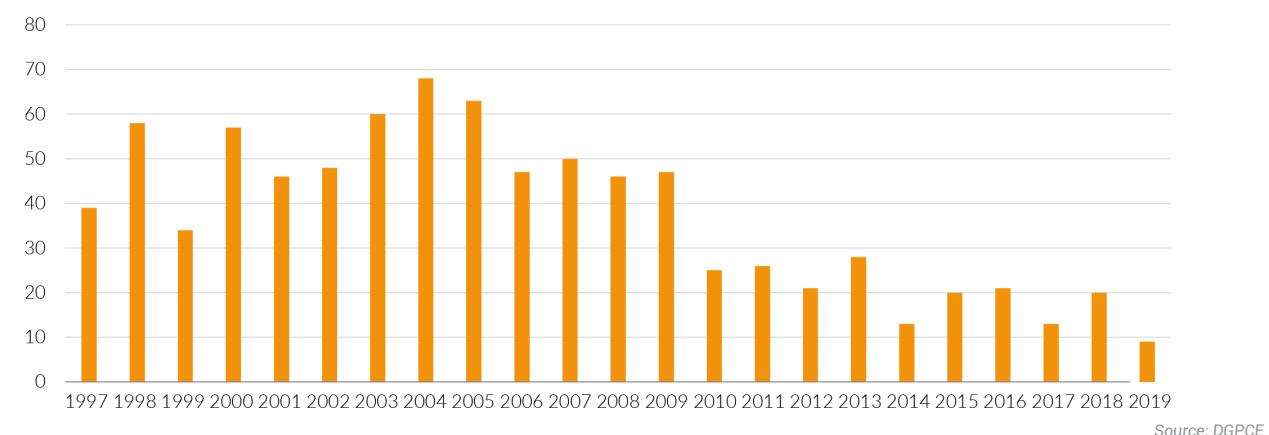
The State Secretariat for the Environment forms part of the State Coordination Committee created through the Basic Civil Protection and Planning Guideline in response to the risk of accidents during the transport of dangerous goods by road and rail, published through Royal Decree 387/1996, where one of the principal functions is to complete studies, reports and proposals for the drafting of the state plan and successive reviews thereof.

2019 saw nine road accidents with potential damage to the environment during the transport of dangerous goods and was the second consecutive year with no rail accidents. In total, for the period analysed, 1997-2019, 94.9 % of accidents occurred during road transport, with the remaining 5.1 % rail accidents.

The nine accidents that occurred in 2019 caused a total of ten impacts on the environment, five corresponding to soil pollution, three corresponding to water pollution and two to atmospheric pollution. The data of the series analysed confirm this proportion, with soil pollution accounting for 75.3 % of the impacts, followed by water pollution (13.3 %) and finally atmospheric pollution (11.4 %).

One positive that stands out from the data is that within the 1997-2019 period, 2019 was the year with the fewest accidents of this nature, both in road and rail transport, and was also the year with the fewest impacts on the environment.

**Number of accidents causing possible environmental damage during the transport of dangerous goods by road and rail. 1997-2019**



### Source:

Data provided by the Directorate-General for Civil Protection and Emergencies. (DGPC). Ministry of Home Affairs (2020). Viewed <http://www.proteccioncivil.es/riesgos/transportes/accidentes>

Indicator/Variable	2010-2019	2015-2019	2018-2019
Number of accidents causing possible environmental damage during the transport of dangerous goods by road and rail. 1997-2019	-99.6 %	-55 %	-55 %



## INDUSTRIAL ACCIDENTS INVOLVING HAZARDOUS SUBSTANCES

The indicator shows the number of industrial accidents involving activities included within the scope of the SEVESO-III-Directive. *Directive 2012/18/EU, on the control of major-accident hazards involving dangerous substances.*

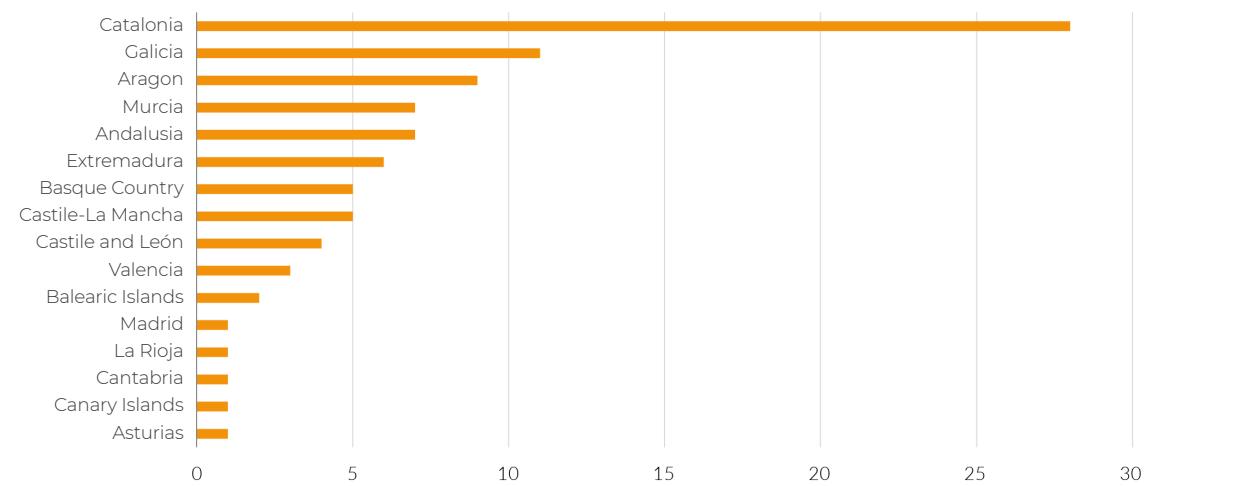
*The SEVESO Directive has helped achieve a low frequency of major accidents. This indicator is of interest in order to inform the public of the number of this type of events and their location at Autonomous Community level, as well as to monitor progress in complying with the Directive.*

2019 saw a total of nine accidents in the ambit of the SEVESO III Directive, equalling the figures for 2016 and 2018. Catalonia was the autonomous community with the most accidents of this kind, a total of three, followed by Andalusia with two and Aragon, Extremadura, the Balearic Islands and Galicia, with one accident each. With the exception of the Balearic Islands, all accidents were registered in autonomous communities where such accidents had also occurred in 2018.

It is important to note that since 2016 the lowest number of accidents recorded in a single year is nine, in contrast with the period prior to this year when 2010 had been the year with the highest number of accidents with seven.

In terms of the autonomous communities, Catalonia, with 28 accidents in total for the period (1987-2019) remained the most affected, followed by Galicia with eleven and Aragon with nine. At the other end were Asturias, the Canary Islands, Cantabria, La Rioja, and Madrid, recorded just a single accident for the period analysed. In 2019, the autonomous communities of the Canary Islands, Cantabria, Madrid, Castile and León and the Basque Country reached at least 10 years without a single accident of this kind.

**Number of accidents in industrial activities within the scope of the SEVESO Directive 1987-2019**



Source: DGPC

Indicator/Variable	2010-2019	2015-2019	2018-2019
Industrial accidents involving hazardous substances	28.6 %	200 %	0 %

\* Although the variation between 2018 and 2019 was 0 %, it is considered negative given that the same number of accidents occurred as in the previous year. The number of accidents must come down from the number recorded the previous year for the trend to be considered positive.

### Source:

Data provided by the Directorate-General for Civil Protection and Emergencies (DGPC). Ministry of Home Affairs. (2020). Viewed <http://www.proteccionsocial.es/riesgos/quimicos/presentacion>

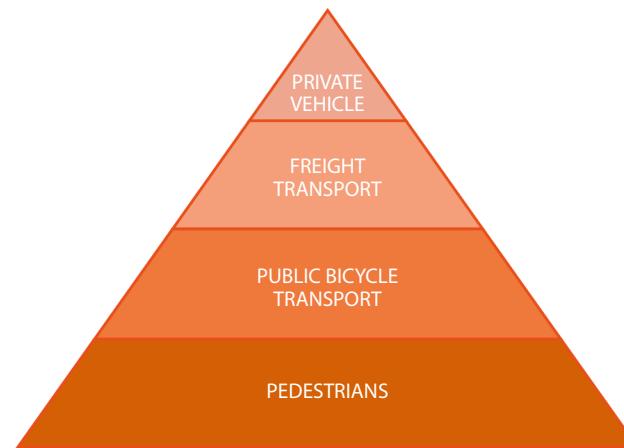


In the year 2018 the Spanish transport sector maintained the general trend observed since 2013, characterised by increasing in demand for journeys, for both people and goods, an increase in the final energy consumption of transport and in greenhouse gas emissions into the atmosphere. While all variables are on the rise, they are not rising to the same extent, as demand for journeys is increasing to a much faster pace than energy consumption and emissions.

The Spanish Transport and Logistics Observatory (OTLE) has published the seventh edition of its *Annual Report*, which includes an exhaustive analysis of transport and logistics. The aspects analysed in this report include *Section 5. Environmental sustainability* in which specific indicators are developed in relation to the principal transport variables. Based on those variables, the energy efficiency of the sector, defined as final energy consumed per unit of transport and GHG emissions to the atmosphere per unit of transport (km) respectively.

According to the European Environment Agency (EEA), transport is responsible for various health problems based on the atmospheric and acoustic pollution it causes. In 2018, it was the sector with the most greenhouse gas emissions, accounting for 27 % of the total.

Road transport represented 25 % of total GHG emissions and one third of those emissions are concentrated in urban areas. In general, the structure of mobility towards which all cities must strive is a pyramid with the base comprised of pedestrians. The bicycle and public transport should sit above that, then freight transport and finally, at the very top, the private vehicle.



In addition to the GHG emissions and nitrogen oxide, transport is also responsible for the emissions of a significant quantity of particulate matter with different harmful effects on health depending on the size of the particle. Larger size particulate matter, PM10, causes irritation, aggravates asthma and increases the risk of cardiovascular illness and lung cancer. PM2.5, smaller in size have a potentially even more harmful effect as they are capable of penetrating the alveoli and, finally, ultrafine particles can even penetrate the blood and cause toxicity beyond the respiratory system. According to the SOER 2020 report of the European Environment Agency, the repercussions for climate change and atmospheric and acoustic pollution in the environment and human health remain concerning. Exposure to fine particles, which disproportionately affect central and eastern European countries, is responsible for 400 000 premature deaths in Europe every year.

The EEA report *Environmental Noise in Europe – 2020* states that road traffic is the principle source of noise pollution in Europe and it is expected that over the next decade noise levels will increase in both rural and urban areas due to urban sprawl and increasing demand for mobility. In accordance with the information published by the World Health Organisation, the EEA estimates that noise exposure causes 12 000 premature deaths and contributes to 48 000 new cases of ischemic cardiopathologies (caused by constriction of the arteries) every year in Europe. It is also calculated that 22 million people suffer major chronic discomfort and that 6.5 million people suffer serious and chronic sleep alterations.

Another externality of transport relating to health is traffic accidents. In 2018, there were a total of 102 299 accidents with victims in Spain. Of those, 63 % occurred in urban streets while the remaining 37 % occurred on interurban roads. SDG 3 (Health and well-being) proposes to reduce by half the numbers of deaths and injuries caused by traffic accidents around the world. The fatality rate, defined as the ratio of the number of deaths to the number of victims has fallen since 1993. This is due not only to the reduction in the number of deaths but the increase in injuries not requiring hospitalisation, which in 2018 were 92 % of the victims registered, while they accounted for 65 % in 1993. In the past year, that trend observed in the fatality rate since 2013 continued, with a value of 1.3.

Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, which aims to reach air quality levels that do not have a significant negative effect on, or pose a risk to, human health and the environment, obliging Member States to prepare and apply national control programmes for atmospheric pollution.



Within this framework, the Ministry for Ecological Transition and the Demographic Challenge (MITERD) approved the *National Atmospheric Pollution Control Programme (PNCCA)* in September 2019. This programme has a total of 57 measures grouped by sector of activity.

*"The aim is to reduce private vehicle use in the urban environment by 35 % by 2030 and inter-city traffic in the order of 1.5 % annually, promote remote working, carsharing, the use of non-motorised transport and collective public transport to make it possible to reach these objectives."*

1st National Atmospheric Pollution Control Programme

It is forecast that the implementation of these measures will result in a very significant reduction in the levels of pollution harmful to health. Specifically, 92 % in sulphur dioxide ( $\text{SO}_2$ ), 66 % in nitrogen oxide ( $\text{NO}_x$ ), 30 % in Non-methane Volatile Organic Compounds (NMVOCs), 21 % in ammonia ( $\text{NH}_3$ ) and 50 % in fine particles (PM2.5).

On 11 December 2019, the *European Green Deal*, was presented, a new strategy that covers all sectors of the economy with the aim of achieving an efficient use of resources and an EU free of net emissions of greenhouse gases by 2050. In terms of transport it aims for a reduction of 90 % of emissions to 2050, as the sector represented a quarter of GHG emissions in the EU.

In line with the *European Green Deal* the future Climate Change and Energy Transition Law will be the legislative and institutional framework for the progressive compliance of Spain with requirements regulating climate action.

*"From here to 2025, approximately 1 million public charging stations for the 13 million zero emission and low emission vehicle that are expected to be on European roads."*

European Green Deal

This law will facilitate and oversee the decarbonisation of the Spanish economy up to 2050. The first legislative project is in the process of parliamentary approval, since the Council of Ministers, at the proposal of MITERD, submitted the bill to Parliament on 19 May.

For its part, the *National Integrated Energy and Climate Plan (PNIEC) 2021-2030* (the draft of 20 January 2020 employed in the public information phase was sent to the European Commission on 31 March) arose as a demand of the European Union of each Member State in order to serve the European Commission to determine the degree of compliance with the targets set to establish a prosperous, modern, competitive and climate neutral economy by 2050, and to establish the actions necessary to correct any possible deviations.

*"The road transport sector accounts for 25 % of greenhouse gas emissions in the country, and one of the principal barriers to decarbonisation is the insufficient roll-out of electric charging infrastructure."*

Climate Change and Energy Transition Bill

On 4 May 2020, MITERD submitted the draft of the *2nd National Climate Change Adaptation Plan (PNACC)* for public consultation.

One of 18 working areas on which this Plan is focussed is mobility and transport.

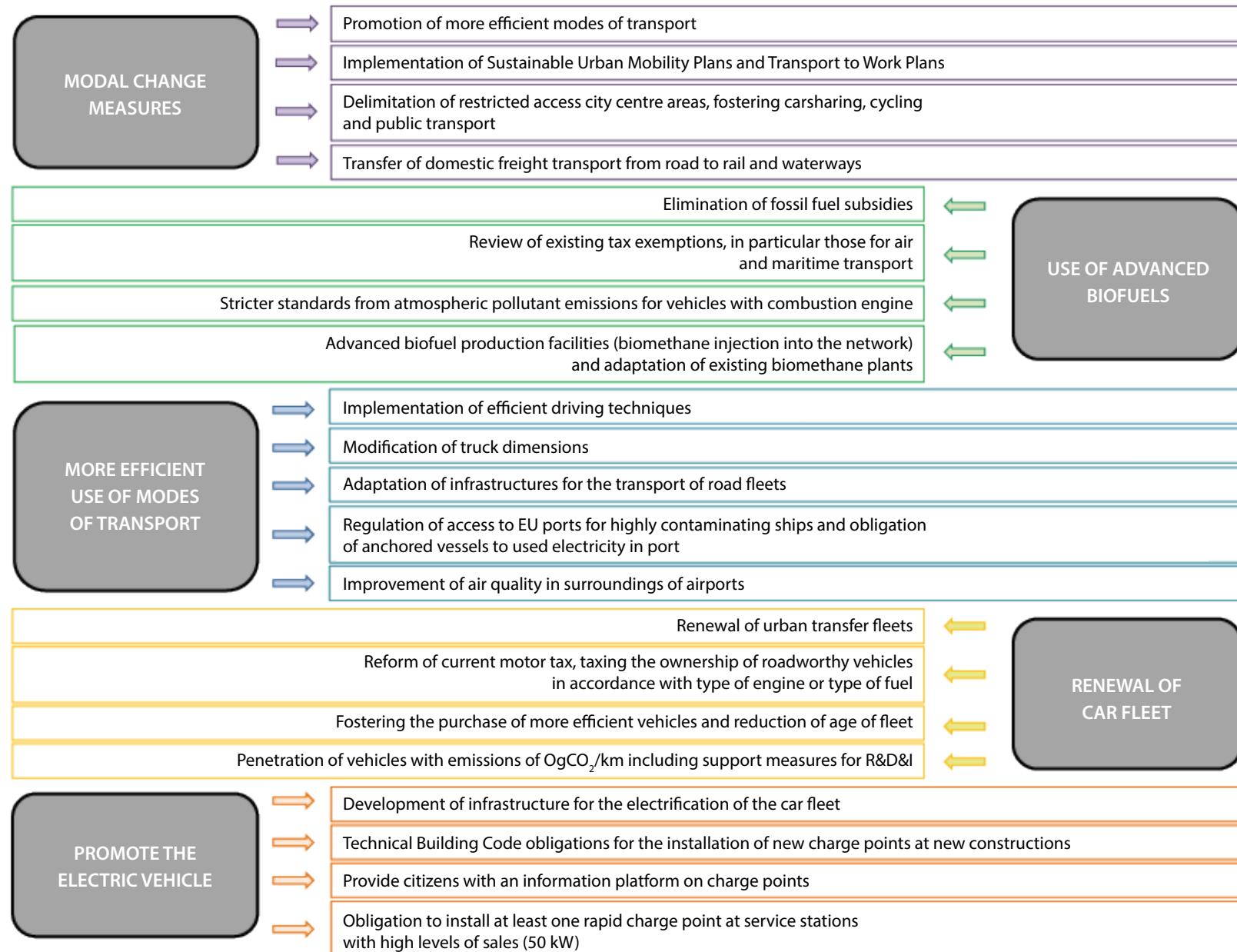
*"As a result of the measures adopted in this Plan, 28 % renewables was reached for transport through electrification and biofuels, above the 14 % target set by the European Union for 2030."*

National Integrated Energy and Climate Plan

All laws, plans and programmes mentioned in the above paragraphs have been developed jointly, so that between them the sectoral and transversal measures are established to strengthen national air quality, energy and climate policies. The measures proposed for the transport sector carry considerable weight in the development of different regulations. Some of the measures that have been proposed for the adaptation of the transport sector are presented schematically below.

*"Incorporate climate change adaptation criteria in the construction of new transport infrastructure (roads, railways, ports and airports), and in the exploitation and conservation phases."*

2nd National Plan for Adaptation to Climate Change





Over the course of 2019, the Council of Ministers, on the proposal of the Ministry for Ecological Transition and the Demographic Challenge, approved two economic programmes that allow for some of the measures geared towards the construction of efficient and sustainable mobility to be implemented. These are the *MOVES Programme* and the *MOVES Singular Projects Programme*. The first has been allocated 45 million euros to incentivise the purchase of alternative vehicles, to install electric vehicle installation infrastructures, to develop incentives to implement electrical bike sharing systems and implement the measures contained in the transport to work plans. The MOVES Singular Projects Programme has been allocated 15 million euros in funding and is geared towards the selection and granting of aid for singular integrated mobility management projects located in UNESCO World Heritage Site cities, municipal areas with high levels of pollution and experimental and innovative development projects across the country relating to electric vehicles.

The society in which we live, marked by continuous changes and technological evolution, provides tools that are useful for analysing mobility, especially in cities. Through the observation of traffic, both internal and incoming and outgoing it is possible to analyse the behaviour of cities and towns with the aim of understanding urban, provincial and inter-provincial mobility needs and serving as a starting point, based on the average number of journeys made by the population, for the analysis of progress as measures on urban mobility, modal transfer, etc. are implemented.

This information provides a great volume of data on mobility in Spain, useful when it comes to establishing measures for the planning and management of the transport system on the part of the public admin-

istrations, operators and different mobility stakeholders with a clear goal: to improve the quality of life of the entire population and improve the environment.

One example of the development of new technologies and their application to the transport sector is the use of big data technology to define and quantify mobility, put in place by the Ministry of Transport, Mobility and the Urban Agenda to provide a detailed description of mobility at national, autonomous community, provincial and local level. This technology was used in the *Study on the Inter-provincial Mobility of Travellers applying Big Data Technology*, a pilot project carried out in 2018 resulting in the definition of inter-provincial matrices of journeys and modal stages of more than 50 km for all Spanish provinces and islands, segmented by transport mode, time of day, distance travelled, residence and the reason for the journey.

The experience accumulated in this study has served as a basis for acting rapidly in the health crisis caused by COVID-19 in Spain and to analyse mobility behaviour during the State of Emergency and the imposition of restrictions on movement. The analysis is based on a comparison between daily mobility during the State of Emergency and a typical week prior to the crisis, where normal mobility was observed.

From 2 to 13 December 2019, the 25th Conference of the Parties (COP25) was held in Madrid. This Climate summit concluded with the adoption of the agreement *Chile-Madrid Time to Act*, which lays the foundations for countries to present more ambitious commitments for the reduction of emissions to respond to the climate emergency. The Minister of Transport, Mobility and the Urban Agenda, José Luis Ábalos stated that the ministry was “attempting to foster the use of rail, liberalising the sector and implementing low cost high speed rail”.

On 15 June 2020 the Government presented the *Plan to Boost the value chain of the auto industry: Towards sustainable and connected mobility*, drafted in collaboration with the trade unions and principal industry associations. The aim is to boost the value chain in the auto industry to ensure rapid recovery after the adverse effects of COVID-19. The plan articulates 21 economic, fiscal, regulatory, logistical, competitive, professional training and qualifications, sustainable public procurement and strategic planning measures. Among these are aid for renewal of the vehicle fleet (prioritising zero emission vehicles), development of electrical charging infrastructure, support for research and innovation and analysis of vehicle tax reform to introduce greater environmental focus.

<sup>7</sup> Address of the acting Minister of Development, José Luis Ábalos at COP 25: “*El transporte y la movilidad en la lucha contra el cambio climático*”, session focusing on the role of transport and mobility in the fight against climate change.

<https://www.miteco.gob.es/en/cop25/prensa-media/fomento-apuesta-por-una-estrategia-de-movilidad-sostenible-segura-y-conectada-ante-el-cambio-clim%C3%A1tico/tcm38-505624>



## DEMAND FOR INTER-CITY PASSENGER AND FREIGHT TRANSPORT

This indicator shows the annual pattern in the demand for domestic passenger transport, measured in passenger-kilometre (p-km) and freight, measured in tons-kilometre (t-km).

The distribution by mode of transport is also included (road, rail, sea and pipeline transport), relating to both the domestic passenger transport (p-km) and to domestic freight transport (t-km).

*Transport is one of the sectors that most impacts the environment, therefore reducing its demand and promoting less pollutant modes of transport is one of the priorities for sustainability.*

*The indicator allows for monitoring of Sustainable Development Goals 3 (Health and well-being) and 11 (Sustainable cities and communities) as well as the future Climate Change and Energy Transition Law and the National Integrated Energy and Climate Plan 2021-2030 (both in the process of approval at the time of completion of this report).*

### Source:

Ministry of Transport, Mobility and the Urban Agenda. (2020). *Los transportes y las Infraestructuras. Informe anual 2018*. Viewed 6 April 2020 <https://apps.fomento.gob.es/CVP/handlers/pdfhandler.ashx?idpub=BTW038>

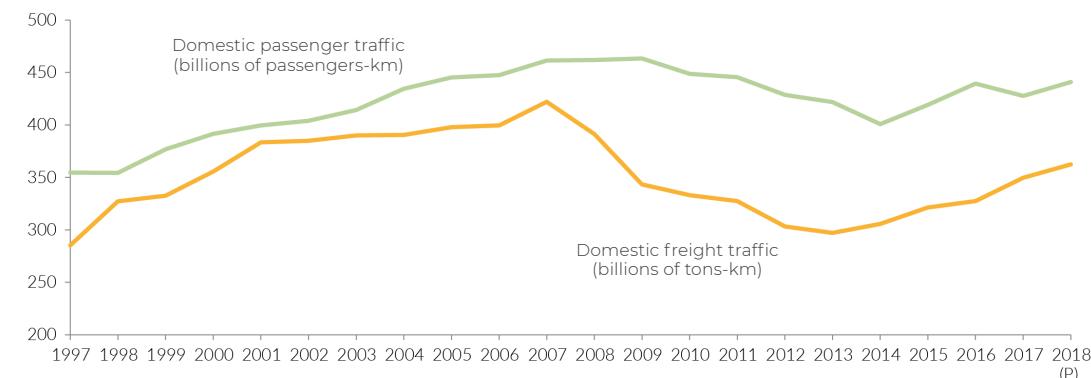
Ministry of Transport, Mobility and the Urban Agenda. (2020). *Anuario estadístico 2018. Capítulo 16. Viewed 6 April 2020. Transporte por tubería*. [https://www.mitma.gob.es/recursos\\_mfom/paginasbasicas/recursos/16transptuberia\\_18.pdf](https://www.mitma.gob.es/recursos_mfom/paginasbasicas/recursos/16transptuberia_18.pdf)

In 2018, road transport remained the main mode of transport in terms of domestic passenger transport, accounting for 86 % of passengers-km, followed by air transport and rail both accounting for 7 % of the total. Domestic freight transport is a very similar case, with road transport accounting for around 80 % of total tons-km transported, followed by maritime transport with 13 % of the total.

Both domestic passenger transport and domestic freight transport increased in the last year for all modes of transport although not equally. In 2018, air transport was the mode of domestic passenger transport that increased most, registering an increase of 9.3 % on 2017, with road transport registering the most modest increase, of just 2.5 % on the previous year. In domestic freight transport, maritime transport registered the biggest increase in 2018, with a 4.4 % rise on the previous year in tons-km transported.

Despite the fact that domestic passenger transport by road is growing every year, the increases have come at a slower rate since 2015, unlike domestic passenger transport by rail, which has seen increases grow each year. This trend of recent years would appear to be in line with the objective of transferring traffic to rail, both for passengers and freight, proposed in the National Integrated Energy and Climate Plan and the European Commission Objectives for 2050.

**Total volume of inter-city transport**



P. Provisional data.  
Source: MITMA

Indicator/Variable	2009-2018	2014-2018	2017-2018
Domestic passenger transport	-4.9 %	10 %	3.1 %
Domestic freight transport	5.6 %	18.6 %	3.6 %



## EMISSIONS OF POLLUTANTS FROM TRANSPORT

The indicator shows aggregated pollutant emissions into the atmosphere originating from domestic transport in Spain, presented as an index in which the value of year 1990 = 100. Aggregate emissions of greenhouse gases (GHG), acidifying and eutrophying substances and ozone precursors are presented.

The indicator allows for monitoring of Sustainable Development Goals 3 (Health and well-being), 7 (Affordable and clean energy) and 11 (Sustainable cities and communities). It also allows for monitoring of the National Integrated Energy and Climate Plan 2021-2030 and the future Climate Change and Energy Transition Law (both in the process of approval at the time of completion of this report), considering the need to adopt measures to achieve a fleet of cars and light commercial vehicles with zero CO<sub>2</sub> emissions by 2030.

### Source:

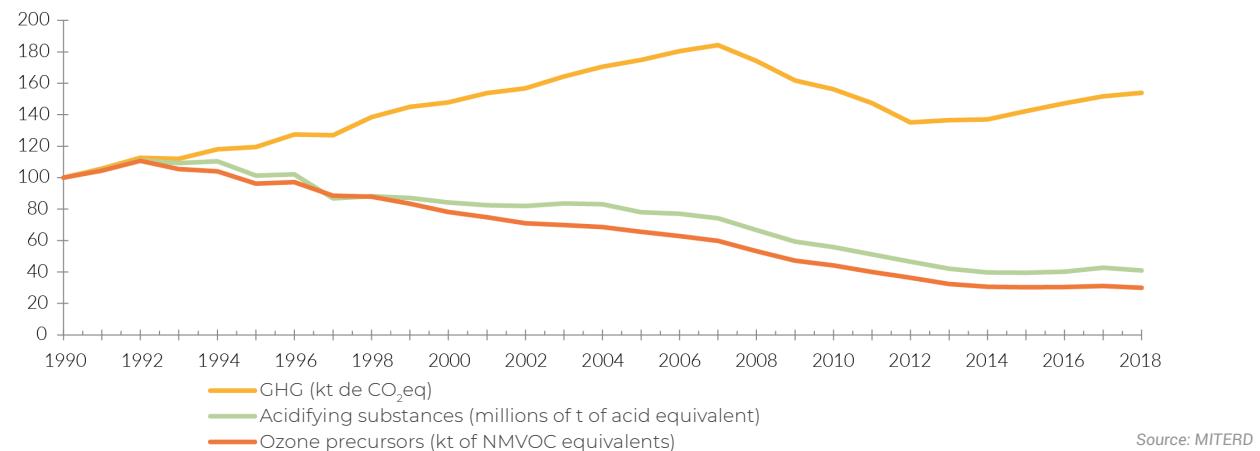
Ministry for Ecological Transition and the Demographic Challenge. (2020). *Inventario Nacional de Emisiones a la Atmósfera. Emisiones de Gases de Efecto Invernadero. Serie 1990-2018*. Data provided upon request by the Sub-directorate General of Air Quality and Industrial Environment of the Directorate General of Biodiversity and Environmental Quality (MITERD).

The transport sector, responsible for 27 % of total domestic GHG emissions to the atmosphere, reached a figure of 90 269 kt of CO<sub>2</sub> equivalent in 2018, 1.4 % more than the previous year. The same occurs with acidifying substances and ozone precursors, with both falling, registering a value of 7 531 million t of acid equivalents and 431 kt of NMVOC equivalents respectively in 2018.

There were slight decreases for almost all pollutants in the last year, except SO<sub>2</sub>, which confirms the upward trend since 2017 and CH<sub>4</sub>, which continued its trend of slight increases since 2016. According to the influence of each pollutant on the total, nitrogen oxide stands out, accounting for 90.9 % of total acidifying substances and 89 % of ozone precursors in 2018.

Both PM2.5 and PM10 associated with domestic transport continued their downward trend going back to the year 2000, with the most acute decrease between 2008 and 2015. In 2018, Spain registered 7.8 Gg of PM2.5 and 8.2 Gg of PM10, 7 % and 6.7 % lower than the previous year respectively. Over the last 10 years a decrease of around 50 % has been observed for both substances.

### Transport-related emissions of GHGs, acidifying substances and tropospheric ozone precursors.



Indicator/Variable	2009-2018	2014-2018	2017-2018
GHG	-4.9 %	12.3 %	1.4 %
Acidifying substances	-30.9 %	3.1 %	-3.9 %
Ozone precursors	-36.7 %	-2.4 %	-3.9 %



## PASSENGER VEHICLE FLEET BY FUEL TYPE

The indicator describes the number and proportion of passenger vehicles that make up the passenger vehicle fleet based on the fuel type used by the engine (diesel, petrol, gas), hybrid (combustion and electric) and electric engines.

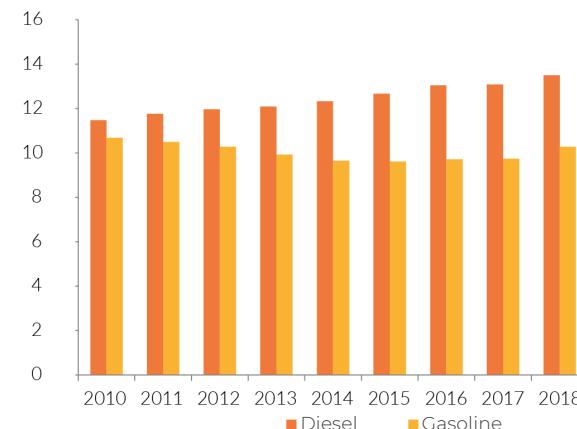
See justification of the indicator “Emissions of pollutants from transport”

Spain's car fleet grew in 2018 to reach a total of 24 074 151, accounting for 71.4 % of the total vehicle fleet. In the past year there has been an increase of 9.4 % in the number of cars on the previous year, with a total of 1 358 199 cars being registered in Spain. Of this total, 56.1 % of these cars were diesel and 42.7 % were petrol.

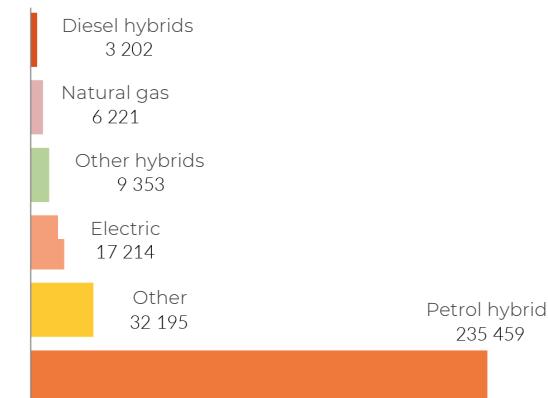
The remaining 1.2 % of the car fleet registered in 2018 was made up of alternative fuel vehicles, such as natural gas, rising from 902 cars in 2017 to 6 221 in 2018. Hybrid vehicles also more than doubled; both gasoil and petrol and electric cars saw a significant increase with a total of 17 214 electric cars registered in 2018, 10 831 more than the previous year. Despite the fact that cars with alternative fuels still represent only a small portion of the total, it is positive to note that the numbers are increasing.

In 2018, around 15 million vehicles had an environmental mark. Of those, 55.1 % held the B mark, followed by 42.8 % held the C mark while 1.9 % and 0.2 % held the ECO and CERO labels respectively.

**Diesel and petrol car fleet (millions of vehicles)**



**Fleet of alternative fuel cars. Year 2018**



Source: MITERD

Note: these data do not include hybrid vehicles

**Source:**

Ministry for Ecological Transition and the Demographic Challenge. (2020). *Inventario Nacional de Emisiones a la Atmósfera. Emisiones de Gases de Efecto Invernadero. Serie 1990-2018*. Data provided upon request by the Sub-directorate General of Air Quality and Industrial Environment of the Directorate General of Biodiversity and Environmental Quality (MITERD).

Directorate-General of Traffic (2020). *Parque de turismos por distintivo medioambiental: Seguridad vial/Estadísticas e indicadores/Parque de vehículos/Series históricas - Anuario 2018*. Viewed 24 March 2020 <http://www.dgt.es/es/seguridad-vial/estadisticas-e-indicadores/parque-vehiculos-series-historicas/>

Indicator/Variable	2014-2018	2017-2018
Gasoil	9.5 %	3.2 %
Petrol	6.6 %	5.5 %
Other fuels	384 %	135.3 %
Total vehicles	9.3 %	4.9 %



## FINAL ENERGY CONSUMPTION OF TRANSPORT

The indicator presents the final energy consumption of domestic transport. This data only include energy consumption and excludes non-energy consumption.

The indicator shows final energy consumption for the following modes of transport: road, rail, maritime, air (domestic air travel only) and other (including oil pipelines and other unspecified modes).

*The indicator allows for monitoring of Sustainable Development Goals 7 (Affordable and clean energy) and 11 (Sustainable cities and communities) as well as the future Climate Change and Energy Transition Law and the National Integrated Energy and Climate Plan 2021-2030 (both in the process of approval at the time of completion of this report).*

*The Climate Change and Energy Transition Bill sets national targets for the reduction of greenhouse gas emissions, renewable energies and energy efficiency for 2030 and for 2050.*

### Source:

Institute for Energy Diversification and Conservation (IDAE). (2020). *Balances de energía final (1990-2018)*. Consult online at: [Información y publicaciones/Estudios, informes y estadísticas/Balances de energía final \(1990-2018\). Viewed 7 April 2020 <http://sieeweb.idae.es/consumofinal/balasp?txt=Consumo%20de%20energ%EDa%20final&tipbal=f&rep=1>](http://informacion.y-publicaciones/estudios.informes.y.estadisticas/balances-de-energia-final-(1990-2018).Viewed-7-April-2020)

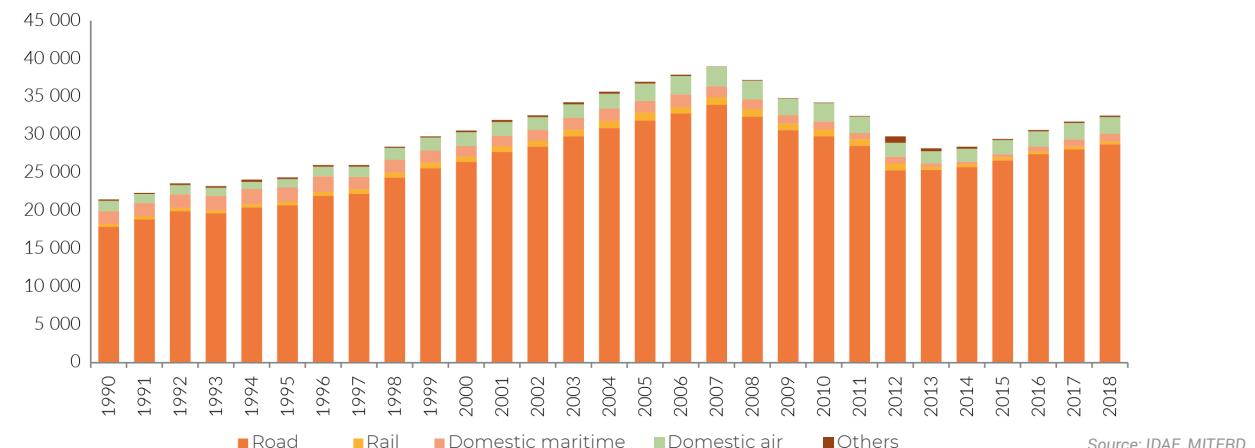
The domestic transport sector in Spain accounted for 37.2 % of total energy consumed in 2018, with a total of 32 531.18 ktoe. Breaking that down by mode of transport, road transport reached 28 735.46 ktoe, accounting for 88.3 % of final energy consumption of transport.

In the year 2018, 93.1 % of final energy consumption of transport was from fossil fuels, with gasoil the most used (around 74 % of the total).

Compared to the previous year, energy consumption from fossil fuels rose slightly by 1.2 % in 2018. There was an increase of 30.4 % in renewable energy consumption, specifically biofuels which, with a total of 1 681.32 ktoe, represented 5.2 % of final energy consumption from transport.

Natural gas consumption in transport also increased in comparison to 2017 by 23.9 % reaching 203.12 ktoe in 2018. On the other hand, despite scant representation (around 1 % of the total) consumption of electricity in road transport grew by 96.6 % on 2017.

Final energy consumption of transport (ktoe)



Source: IDAE, MITERD

Indicator/Variable	2009-2018	2014-2018	2017-2018
Road	-6.1 %	11.6 %	2.4 %
Rail	-54.2 %	0.8 %	0.4 %
Domestic maritime	-10.2 %	202.8 %	3.4 %
Domestic air	3.9 %	33.1 %	4 %
Other	180.7 %	-39.3 %	-2.9 %



According to the UN, urban areas are responsible for 70 % of global CO<sub>2</sub> emissions, with significant repercussions for sustainability and the environment. They are also responsible for emitting the lion's share of atmospheric pollutants, a source of harm to human health, all as a consequence of the concentration of activities and people. Thus, the world's urban population stood at around 55.3 % in 2018 and in Spain reached 80.3 % according to the World Bank. In 2050, the United Nations predicts that 68.4 % of the world population will be concentrated in cities. In Spain that figure will be 88 %.

In the Spanish case, the urban phenomenon is even more acute. If we take into account Eurostat's degree of urbanisation (DEGURBA), urban areas (densely populated and areas with intermediate density) account for 74.1 % of the Spanish population, more than a point above the EU-28 average. Moreover, this phenomenon is accelerating: according to data from EUROSTAT, between 2015 and 2019 the Spanish population living in regions considered predominantly urban had grown 0.6 points, reaching 63.3 % of inhabitants (compared to intermediate and predominantly urban regions with falls of 0.5 y 0.2 % respectively), aggravating urban-rural population imbalances. In addition to that, in 2019, 80 % of the Spanish population lived in municipalities of more than 10 000 inhabitants, with a surface area of just 19 % of the territory. Furthermore, 53 % of the population lived in 148 urban municipalities with more than 50 000 inhabitants and which represented 5.6 % of the Spanish territory. Six municipalities with more than 500 000 inhabitants concentrated more than 16.2 % of the population in just 0.5 % of the Spanish territory.

Urban concentration is more evident if we take into account functional urban areas (FUAs). Based on the European *Urban Audit*, project, which details concentrations in European urban areas linked to employment mobility, the INE defines 70 FUAs for all of Spain. In 2019, those with the biggest populations were Madrid (6.9 million), Barcelona (5 million) and Valencia (1.7 million).

The problems that threaten the sustainability of our cities and the health of our population are many. According to the WHO, aside from atmospheric pollution, the second biggest environmental risk to health is noise. Specifically, as indicated in the *Spanish Urban Agenda 2019*, close to 74 % of the Spanish urban population are affected by traffic noise and 23 % are subject to unhealthy noise levels. We find the environmental effects of climate change on cities: the Spanish State Meteorological Agency (AEMET), in 2019, singled out the big cities as environments especially vulnerable to climate change, amplified by the consequences of the "heat island" effect.

Also, within the current post-industrial context, the Mediterranean city, commonly considered safe and healthy, is being affected by new models of urbanisation (low density, based on the use of private vehicles, etc.). The Mediterranean city is bearing witness to processes of inequality and social exclusion; while the data from the *Survey of Living Conditions* (INE), show a positive trend in 2018 in terms of average annual income, with an increase of 3.1 % on 2017, reaching 11 412 euros per person, and a reduction in the proportion of persons living in homes with low intensity in employment (of 0 to 59 years), which reached 10.7 %, the territorial differences are evident. For example, taking into account municipalities with

more than 20 000 inhabitants, with data from the indicators of *Urban Audit* (INE), of 2017, there are significant contrasts in income per inhabitant ranging from 25 903 euros in the municipality of Pozuelo de Alarcón (Madrid), to 6 755 euros in Níjar (Almería). More acute are the differences between neighbourhoods, ranging from 43 319 euros in El Viso (municipality of Madrid), to 5 112 euros in the Polígono Sur neighbourhood in the southern district of Seville.

Added to that are the problems of an ageing population: in 2019, according to data from the *Continuous Household Surveys* (INE), people living alone aged 65 and over accounted for more than 2 million homes (11 % of the total). Finally other questions, such as increasing rent prices, touristification in central neighbourhoods, etc. have become evident in Spain's urban environments.

The health and care of the city deserve special mention and are particularly important in light of COVID-19, issues which are present in the UN 2030 Agenda, and specifically in SDG 11 (Sustainable cities and communities), which seeks more inclusive, safer, resilient and sustainable cities.

Various Urban Agendas have been put in pace, placing the focus on this issue. Thus, the *New Urban Agenda* of the United Nations (Quito Declaration) approved in 2016, identified the new challenges to contribute to sustainable urban development. It takes into account the sustainability of cities and human settlements and proposes, as one of the enormous challenges of sustainability, the health of the population. It promotes safe urban, healthy and inclusive urban environments with a clean environment, taking into account the guidelines on air qual-



ity, including those drafted by the WHO. It proposes to increase the resilience of cities in the face of issues like climate change. For its part, the *Urban Agenda of the European Union*, established under the *Pact of Amsterdam* (2016), proposes stimulating the growth, liveability and innovation of Europe's cities. It indicates a series of priority issues, some directly related to human health and sustainability, such as "air quality".

In Spain, the Council of Ministers presented the *Spanish Urban Agenda 2019*, a strategic document to guide urban policies. It contributes to compliance with the SDGs, through 10 objectives of primary order, some of them with important links between the environment and health. For example, strategic objective 1, to "order the territory and provide the rational use of soil, conserve it and protect it.", seeks to increase the presence of nature in cities (green infrastructure with vegetation and blue infrastructure with water). Furthermore, objective 2, "to prevent urban dispersal and regenerate the existing city", with lines of action such as the fostering of interventions in public spaces, and buildings that reduce and/or eliminate the negative impacts on the health of citizens, or the control and reduction of air and light pollution and pollution of thermal conditions and minimising visual pollution. Objective 3 proposes "preventing and reducing the impacts of climate change and improving resilience", whether heatwaves have an added effect when combined with the increase in temperatures and, in extreme cases, can increase illnesses and deaths due to high temperatures. The combination of heatwaves with the heat island effect of cities increases the impact on health of the population. Finally, objective 5 is to "encourage proximity

*and sustainable mobility*", with sustainable transport systems that foster an efficient economy, a healthy environment, and good air quality for inhabitants: the city for the pedestrian.

Many initiatives in relation to health and the city were undertaken during the pandemic. In 2020, in the midst of the COVID-19 crisis, and the need for safe distancing in cities, as part of the debate to "place health at the heart of urban planning", the WHO and UN-Habitat published the guide *Integrating health in urban and territorial planning*. The guide serves to make decisions on public health, urban and territorial planning and the development of planned cities with a focus on human and environmental health.

The number of large cities in the world committed to climate neutrality by 2050 continues to grow, from 100 at the New York Summit (September 2019) to 398 at COP25 (December 2019) conference, laying foundations for countries to commit to combating the climate emergency.

In the European ambit, the commitment to sustainability is focussed through the *European Green Deal* (2019), roadmap to provide the EU with a sustainable ecosystem with multiple references to cities. Among other aspects, it proposes to make the urban dimension of cohesion policy more robust and offer cities strategic, sustainable urban development opportunities through the *Urban initiative*, taking advantage of strategic opportunities for sustainable develop-

ment. It commits to an increasingly greater role for automated and connected multi-modal mobility and states that the Commission will adopt a sustainable smart mobility strategy in 2020.

Its approach focuses on the transition towards clean energy that must involve and benefit consumers: "*the rapid reduction in the cost of renewable energies, combined with a better configuration of support policies, has already mitigated the effects of the roll-out of renewable energies in home energy bills*". In Spain, for example, with data from the IDAE, total final renewable energy consumption for residential/domestic use in Spain stood at 2 816 kilotons of oil equivalent (ktoe) in 2018, constituting 19 % of energy





consumption in homes, with biomass the renewable energy most consumed, accounting for 90.3 % and, finally, geothermal energy with just 0.4 %. In terms of use, renewable energy is mostly used in households for home heating, with 89.1 %, while 88.4 % is used for domestic hot water. Finally, the Green Deal mentions the Biodiversity Strategy, with proposals to make cities more ecological, increasing biodiversity in urban spaces.

For its part, the *New Action Plan for the Circular Economy for a cleaner and more competitive Europe* COM(2020) 98 final (2020), under the section “The circular economy at the service of citizens, the regions and cities” explains the potential of a series of initiatives and instruments with an important effect on the urban environment, such as the case of the *Intelligent Cities Challenge*» and «*Circular Cities and Regions*» initiatives, which, according to the document, will provide cities with key assistance. The circular economy will be one of the priority areas of «*Green City Agreement*»». Finally, the document also covers aspects linked to mobility, underlining the role of the next *Global European Strategy for Sustainable Mobility*.

In Spain, the *Agreement of the Council of Ministers approving the Government Declaration of the Climate and Environmental Emergency in Spain* (January 2020), highlights the unprecedented impact that fossil fuels, change in land use, urbanisation and other processes have on our development model, with the increase of the concentration of greenhouse gases. The road is that of climate neutrality, a transition that includes the strengthening of the industrial and technological fabric, in particular in the area of energies, mobility and the urban environment. Point

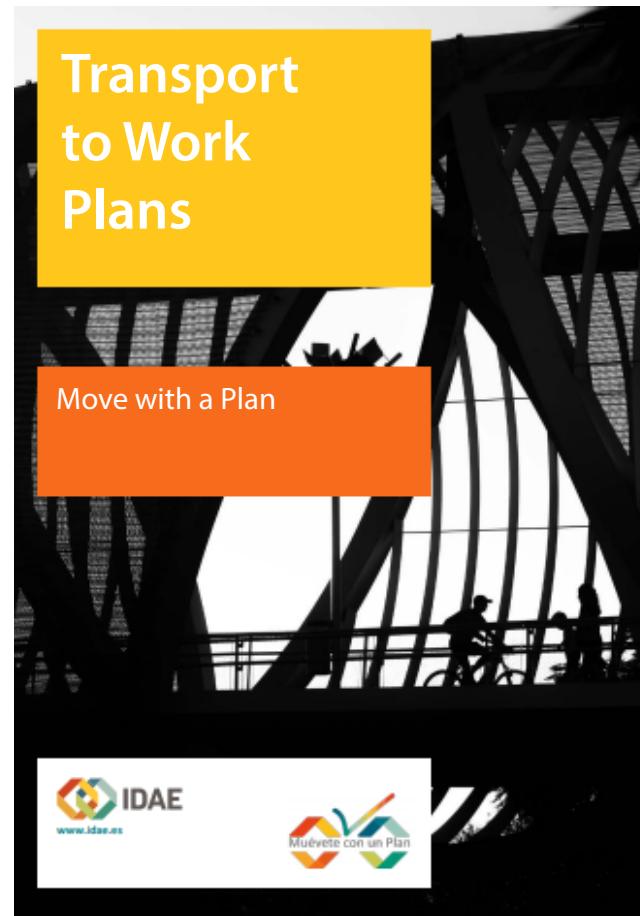
17 indicates, as a priority line of action, very much directly linked to the urban environment, “*fostering measures to achieve sustainable, inter-modal and connected mobility that improves the air quality of our cities and the health of our citizens*”. For that reason, the Law on Sustainable Mobility and Financing Public Transport will be passed, along with measures in municipalities with more than 50 000 inhabitants, to urgently establish low-emission zones.

The *General Guidelines of the National Strategy to Combat the Demographic Challenge* (2019) point to a problem of accumulation of population in major cities resulting in major consequences in the form of congestion. The agreement also highlights the importance of connecting the urban environment with the rural environment, as sustainable cities cannot be achieved with sustainable rural areas, in line with the 2030 Agenda, that is, the diverse territorial system. As lines of action, it proposes that the strategy contributes “*to the improvement of the competitiveness of the territory, both for small nuclei and for functional centres, given that the seats of regional governments, medium-sized cities and small provincial capitals are all essential for achieving the dynamic growth of spaces in demographic risk*”, as also indicated in the Spanish Urban Agenda.

The biggest change contained in the *first Climate Change and Energy Transition Bill (PLCCTE)*, of May 2020, is the provision for municipalities with more than 50 000 inhabitants and island territories to introduce urban planning mitigation measures to reduce transport emissions, such as “*the creation of low emission zones no later than 2023*”; but also measures to facilitate pedestrian mobility, bicycle use and other forms of active mobility (healthy life habits),

for the improvement of the use of public transport, electrification of the public transport network and other non-GHG emitting fuels, to foster the use of private electric modes of transport and to foster shared electric mobility.

For its part, the April 2020 draft the *National Plan for Adaptation to Climate Change 2021-2030 (PNACC)*, defines 18 working areas with objectives for each of them. Many are linked to the urban environment especially vulnerable to climate change. Among these areas are climate and climate scenarios and health. They also include the city, urban development and housing, cultural heritage, energy, mobility and transport. Specifically, in regard to the “*City urban development and housing*” a series of objectives are defined, such as reinforcing the link between the new Spanish Urban Agenda and the new PNACC, as frameworks of governance for the management of democratic risk; to integrate adaptation to climate change in territorial and urban planning, developing governance for the management of democratic risk, with the implication of all stakeholders in planning and management; and to integrate the adaptation to climate change in the construction sector. In terms of mobility and transport, among the objectives proposed is that of incorporating climate change adaptation criteria to strategic planning of the transport sector.



In 2019, the IDAE published the guide *Transport to Work Plans. Move with a Plan*, in which a review of the negative impact of current mobility to work, the direct economic costs of car use, or the need to reverse the current mobility to work trends, for which there is an opportunity in the context of COVID-19. It highlights the distinctive character of mobility to work in relation to general urban mobility as an integral part thereof. The large-scale centres of employment are magnets for travel and they depend fundamentally on their location in urban areas. For this reason “these basic characteristics of mobility to work must be present in a transport to work plan”.



## URBAN DENSITY BY AUTONOMOUS COMMUNITY/CITY

This indicator represents data on urban population density, both in Spain and in the autonomous territories.

It is calculated as the ratio between the population living in towns and cities with more than 10 000 inhabitants and the land area (both for Spain as a whole and the autonomous communities).

It also includes estimated population density using the ratio of inhabitants to the surface area of each territorial unit.

*The indicator makes it possible to measure urban pressure in the territory and helps analyse appropriate urban densities for sustainability.*

*The indicator is related to the D06 descriptive data. Population density on urban land, in the Strategic Objectives 1, 2, 4, 5, 6, 7, 8, and 9 of the Spanish Urban Agenda.*

*It also links in with SDG 11 (Sustainable cities and communities) and target 11.3 "By 2030, enhance inclusive and sustainable urbanization."*

### Source:

National Institute of Statistics (INE) (2020). *Official figures from the review of the Municipal Register as of 1 January. Summary by autonomous community. Population per autonomous community and city, and size of municipalities.* Viewed 28 April 2020 <http://www.ine.es/jaxiT3/Datos.htm?t=2854>

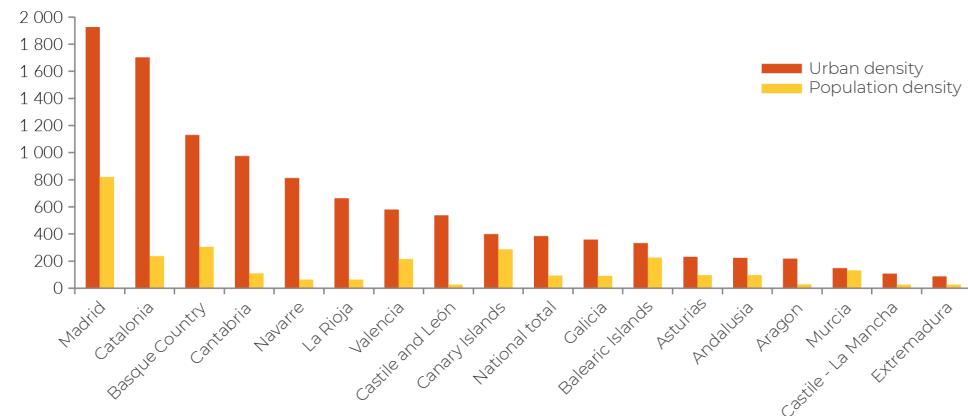
National Geographic Institute (IGN). Ministry of Public Works. (2020). *Nomenclátor Geográfico de Municipios y Entidades de Población.* Viewed 28 April 2020 <http://centredescargas.cnig.es/CentroDescargas/catalogo.do?Serie=NGMEN>

Of the 47 026 208 inhabitants in Spain in 2019, 79.7 % were living in municipalities with more than 10 000 inhabitants (defined as urban for the purpose of this indicator). This phenomenon is reinforced if compared to other European countries, taking the Eurostat indicator on the degree of urbanisation (DEGURBA9) as a benchmark. In 2018, 50.7 % of the Spanish population were concentrated in cities (densely populated areas), almost 10 points above the EU-28 average (41.8 %).

These urban municipalities with more than 10 000 inhabitants cover just 19.1 % of the surface area of the country, with an average urban density of around 388.6 inhab/km<sup>2</sup>, far and above the average of 92.9 inhab/km<sup>2</sup> for Spain. Not all urban territories had the same behaviour: the autonomous cities of Ceuta and Melilla were, once again, bearing an extremely compact population pressure in their territories with a population density in excess of 5 000 inhab/km<sup>2</sup>. In terms of autonomous communities, those with the highest population density were Madrid, with 1 949.2 inhab/km<sup>2</sup>, Catalonia with 1 720.2 inhab/km<sup>2</sup> and the Basque Country with 1 133.9 inhab/km<sup>2</sup>, while Murcia, Castile - La Mancha and Extremadura recorded the lowest values, with 149.5, 110.8 y 86.3 inhab/km<sup>2</sup>, respectively.

Finally, there is a series of problems common to these densely populated areas, such as congestion, which is having an important effect on public health. Thus, the management of COVID-19, especially in urban areas, and particularly those that are most densely populated, has revealed the importance of secure social distancing in cities.

**Population density, urban (municipalities>10 000 inhabitants) and general Data by autonomous community in inhab/km<sup>2</sup>. Year 2019**



Note: the Cities of Ceuta and Melilla do not appear in the graph due to problems of scale. Source: INE and IGN

Indicator/Variable	2010-2019	2015-2019	2018-2019
Urban density	4.2 %	3.3 %	1.3 %
Population density	0 % --	0.9 % --	0.7 % --



## URBAN PUBLIC TRANSPORT

This indicator represents data regarding urban passenger transport exclusively, defined as routes running entirely over urban ground or that connect different urban areas within the same municipality. To calculate the indicator, no data are included on inter-city transport or special or discretionary transport.

*The indicator measures the evolution in the use of the public transport network in our cities to contribute to sustainable urban mobility.*

*The indicator supports Strategic Objective no. 5 of the Spanish Urban Agenda 2030: "Encourage proximity and sustainable mobility." It is linked in with monitoring and evaluation indicator 5.2.3. Number of journeys on public transport.*

*Public transport is considered in Sustainable Development Goal 11 (Sustainable cities and communities).*

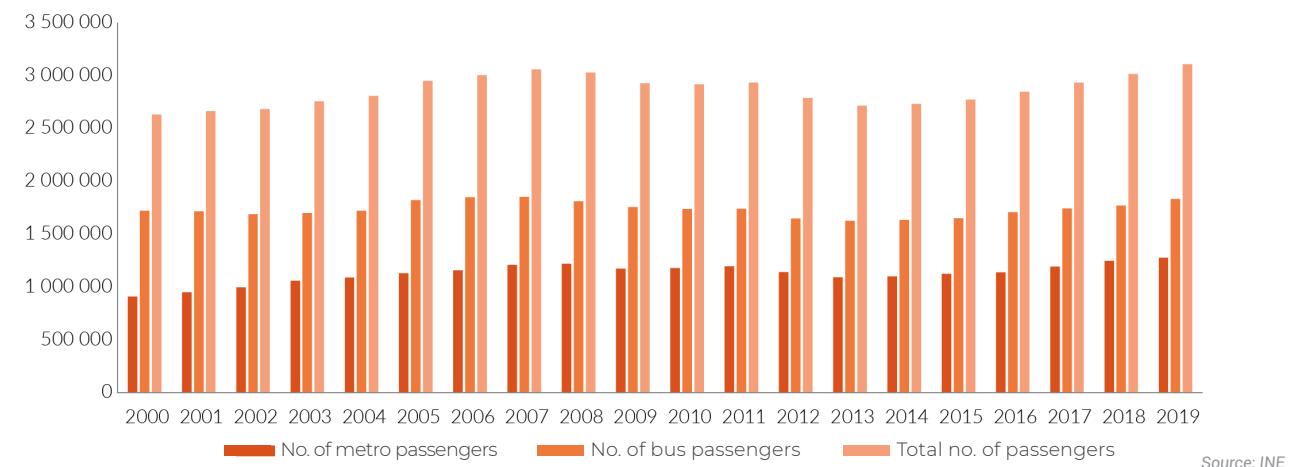
### Source:

National Institute of Statistics (INE) (2020). *Estadística de Transporte de Viajeros*. Viewed 28 April 2020 [https://www.ine.es/dyngs/INEbase/operacion.htm?c=Estadistica\\_C&cid=1254736176906&menu=resultado&secc=1254736195091&idp=1254735576820](https://www.ine.es/dyngs/INEbase/operacion.htm?c=Estadistica_C&cid=1254736176906&menu=resultado&secc=1254736195091&idp=1254735576820)

In Spain, in 2019 a total of 4 906 million passengers (INE) used public transport in all its forms, including urban transport (metro and bus), inter-city and special and discretionary services, which helped urban and urban-rural connectivity and accessibility. Of this total, 63 % of passengers used urban transport for their urban journeys, a total of 3.106 billion passengers, of whom 58.9 % chose the bus while 41.1 % chose metro. With the growth in the use of public transport from 3.1 % in respect of 2018, the increase was greater for the number of bus passengers (3.6 %), and lower for the metro (2.4 %).

Unlike the previous year, the increase in the use of urban public transport was seen across all autonomous communities: those that saw the greatest relative increase in urban bus passengers were the Canary Islands, Madrid and Catalonia, with growth of 7.8 %, 5 % and 4.5 %, respectively. Furthermore, of the seven cities with metro systems (Barcelona, Bilbao, Madrid, Málaga, Palma, Seville and Valencia) the biggest annual increases in passenger numbers were seen in Palma and Málaga, with growth of 24.9 % and 9.1 % respectively. In any case, this trend cannot be maintained in 2020, due to obvious effect that COVID-19 has had since the month of March and the reduction of daily urban journeys in order to control the pandemic, with a significant reduction in the number of public transport passengers.

**Urban public transport 2000-2019 (in thousands of travellers)**



Indicator/Variable	2010-2019	2015-2019	2018-2019
No. of metro passengers	8.2 %	13.5 %	2.4 %
No. of bus passengers	5.4 %	11 %	3.6 %
Total No. of passengers	6.5 %	12 %	3.1 %



## FINAL ENERGY CONSUMPTION IN HOUSEHOLDS

This indicator shows the final energy consumption of the residential sector in Spain.

*This indicator is used to measure the sustainability of energy used by households.*

*The indicator helps monitor Strategic Objective no. 1 of the Spanish Urban Agenda 2030: "To implement sustainable management of resources and promote the circular economy." Specifically, it is related to monitoring and assessment indicator 4.1.2. "Energy consumption by construction, infrastructure and services".*

*It links in with SDG 7 (Affordable and clean energy), and specifically target 7.2 to "increase substantially the share of renewable energy in the global energy mix by 2030", and Indicator 7.2.1 "Proportion of renewable energy in total final energy consumption".*

### Source:

Institute for Energy Diversification and Conservation (IDAE). Ministry for Ecological Transition and the Demographic Challenge. (2020). *Consumo de Energía final. Balance del consumo de energía final*. Viewed 5 May <http://sieeweb.idae.es/consumofinal/bal.asp?txt=2018&tipbal=t>

Institute for Energy Diversification and Conservation (IDAE). Ministry for Ecological Transition and the Demographic Challenge. (2020). *Estudios, informes y estadísticas. Consumo para usos y energías del sector residencial (2010-2018)*. Viewed <https://www.idae.es/estudios-informes-y-estadisticas>

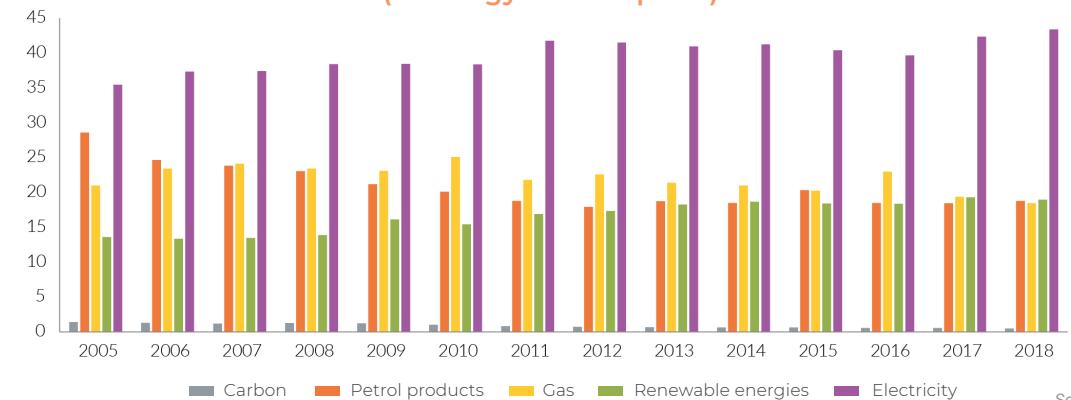
Final energy consumption in Spain in 2018 was 86 883 kilotons of oil equivalent (ktoe), 2.3% above the previous year, according to data from the Institute for Energy Diversification and Conservation (IDAE).

Spanish households also increased their use of final energy by 2.6 %, compared to the previous year, which is equivalent to 17.1 % of the final total energy use. This growth is especially due to the contribution of electricity consumed, which rose 1 % on average and, to a lesser extent oil products (0.3 % of growth). On the contrary, gas consumption (-0.9 %) and renewable energy consumption (-0.3 %) saw negative growth. Carbon consumption continues on its downward trend (-0.1 %).

Total final energy consumed in the residential sector in Spain was 14 867 ktoe, and it was sourced primarily from electricity (43.4 %), followed by renewable energies (18.9 %), petrol products (18.8 %) and natural gas (18.4 %). Only 0.5 % consumed carbon. Once again that year, in terms of renewable energies, biomass was used the most used (especially for heating) and gasoil and liquid gas were the most used in terms of petrol products.

Finally, in 2018, according to the *Annual Energy Consumption Report (2010-2018)* of the IDAE, 42.2 % of the final energy used in households was for home heating, followed by use of lighting and domestic appliances (32 %) and of hot sanitary water (17.3 %). The kitchen accounted for 7.5 %, while the refrigeration accounted for 1 %.

**Final energy consumption in the residential sector by source of energy (% energy consumption)**



Source: IDAE

Indicator/Variable	2009-2018	2014-2018	2017-2018
Carbon	-0.7	-0.2	-0.1
Petroleum products	-2.4	0.3	0.3
Gases	-4.7 --	-2.6 --	-0.9 --
Renewable energies	2.8	0.3	-0.3
Electricity	4.9 --	2.1 --	1 --

\* For these variables the trend reflects the difference in percentage values in the indicated periods.



Within a pre-COVID-19 scenario and according to the National Institute of Statistics (INE), in 2019, 83.7 million tourists visited Spain, 1.1% more than the previous year; maintaining growth, albeit at a slower pace, and the positive dating back to 2009, a year which saw a significant drop in visitor numbers, which was not compensated until 2012, the first year when the numbers of international visitors exceeded pre-financial crisis figures. The total spend of international tourists in 2019 was in excess of 92.2 billion euros, an increase of 2.8 % on the previous year. Nevertheless, the difficulties caused by Brexit and the bankruptcy of British tour operator Thomas Cook, one of the largest in the world, in September 2019, brought turmoil to the sector. The result was a reduction in the volume of tourists from Spain's primary international tourist market, the United Kingdom, with a reduction of 2.4 % in these travellers, with significant effects in the autonomous communities where this group operated, especially the Canary Islands, where the number of foreign tourists fell by 4.4 %, and the Balearic Islands, where numbers fell 1.2 %. The result of all that was to reduce connectivity with these territories and in tourist flows, the lack of liquidity in tourist companies and freelancers and the impact on employment.

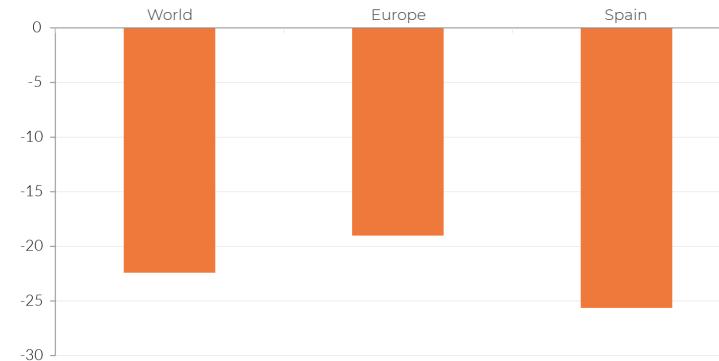
According to the latest data from the World Tourism Organization, Spain remained in second place as a global tourism destination, by arrivals of international tourists and by revenue. What's more, according to the INE, tourism provided 12.3 % of GDP and accounted for 12.7 % of employment in Spain, extending its influence in the weight of the economy.

As we all know, the global outbreak of SARS-CoV-2 (COVID-19) brought much of the world to a standstill in March 2020, with a massive impact on tourism, possibly one of the economic sectors most damaged by

this crisis. In Spain, as a consequence of the entry into force of *Royal Decree 463/2020, of 14 March declaring the State of Emergency for the management of the health crisis situation caused by COVID-19* and the subsequent provisions (*Order INT/248/2000* and *Order INT/270/2020*), the movement of people, the very basis of tourism, was restricted and tourist establishments and services were closed. Along with that, the lower demand for tourist services over the short and medium term, both in the source markets and receiving markets, due to the uncertainty and

the effects of caution on the part of tourists after the end of the State of Emergency have had important repercussions on Spain, which are evident both in the volume of tourism in terms of GDP and employment, as well as the effect on the country's image and brand and, consequently, on the entire value chain of the Spanish tourist industry.

**Comparison of % fall in arrival of international tourists 2019-2020.  
First quarter. Effects of COVID-19.**



Source: UNWTO/OMT and INE

In May 2020 global tourism remained paralysed while 100 % of countries imposed travel restrictions (217), and 72 % had completely closed their borders to international tourism (156) due to COVID-19, according to data from the UNWTO. The figures for Spain are telling: in April 2020 the flow of international visitors was zero due to the closure of borders under the State of Emergency. That month, tourism, along with its revenues, disappeared. The forecasts of the UNWTO in May 2020 were very pessimistic: the international tourist figures could fall between 58 and 78 % in comparison to 2019, depending on both the degree of gradual opening of international borders and the relaxation of travel restrictions (July, September or December). In any case, the forecasts indicated important international losses, in international tourism, revenue and employment in the worst crisis tourism has faced since records began (1950). Despite everything, the UNWTO began to call for responsible reopening to bolster the recovery of tourism on a timely basis.



The new outlook for international travel, in the post-crisis scenario, forces all strategies to respond to an even more secure tourism, with less massification, an opportunity for quality and sustainability. There are a number different initiatives that have been launched along these lines in times of COVID-19. The UNWTO (2020), in its document *Supporting Jobs and Economies through Travel & Tourism. A Call for Action to Mitigate the Socio-Economic Impact of COVID-19 and Accelerate Recovery*, makes a series of significant recommendations in relation to the environment and sustainability. Specifically, the chapter “Providing stimulus and accelerating recovery”, proposes to “mainstream environmental sustainability in stimulus and recovery packages”, and the chapter “Preparing for Tomorrow”, proposes to “place sustainable tourism firmly on the national agenda” and to “transition to the circular economy and embrace the SDGs”.

From the very earliest moments of this crisis, Spain has taken this route, through its repositioning as a safe and sustainable tourist destination. The relaunching of the tourist sector, through, for example, the *Impulse Plan for the Tourism sector: towards a secure and sustainable tourism sector post-COVID-19* (June 2020) to strengthen one of the strategic activities of the Spanish production model, the design of different COVID-19 protocols for the tourism sector and specifications (UNE 0066 Measures for the reduction of contagion of the coronavirus SARS-CoV-2) designed by the Spanish Institute for Tourism Quality (ICTE), best practices and the *ad hoc* assistance for the sector, such as the *ICO Line for the Tourist Sector and activities related to Covid19/Thomas Cook*, were some of the initiatives undertaken.

Regardless of the economic and social repercussions of tourism, especially as a consequence of COVID-19, tourism, in a scenario of normalisation, also has significant environmental and sustainability implication. The tourist sector, with its significant weight, contributes to the progress made on the 2030 Agenda Sustainable Development Goals, whether directly or indirectly. Aspects linked to environmental sustainability such as the efficiency of resources, the protection of the environment, and mitigation of climate change, are contained in Sustainable Development Goals 6 to 8 and 11 to 15. More specifically, tourism is included in the targets of Goals 8 (Decent work and economic growth), 12 (Responsible consumption and production) and 14 (Life below water).

The reference for compliance with the SDGs in the European sphere is detailed in the *European Green Deal* (2019), the roadmap for a sustainable EU economy, and the tourist sector is not beyond its scope in energy consumption, water, in the transport sector and impacts on biodiversity and the natural and cultural heritage and the effects of climate change. The document, while it does not contain direct references to the tourism sector, is the basis for promoting the efficient use of resources through the shift to a clean and circular economy, restoring biodiversity and reducing pollution, with important effects on tourism. At the same time, the allusions to tourism are very limited, and only refer to resources and waste in ultra-peripheral and island regions in the *New Action Plan for the Circular Economy for a cleaner and more competitive Europe* COM(2020) 98 final (2020), while the sector will be conditioned by the guidelines established in this new plan.

In Spain, the link between tourism and the environment is covered both implicitly and explicitly in the Government initiatives of 2019 and the first half of 2020. The *Agreement of the Council of Ministers approving the Government Declaration of the Climate and Environmental Emergency in Spain* (January 2020) highlights, under point 25, as a priority line in relation tourism, “tackling the link between climate change and the tourism sector, to increase the resilience of the sector to the impacts of climate change and minimising its own contribution”. It also proposes to “present, before 2021, a Sustainable Tourism Strategy for Spain 2030 in which climate change the protection of the natural and cultural heritage of the country is tackled as one of the principal challenges faced by the tourist sector”.

In this regard, one year earlier (January 2019), the *General Guidelines of the Sustainable Tourism Strategy for Spain 2030* were presented, proposing the transformation of Spanish tourism towards a sustained and sustainable growth model, retaining its position of global leadership based on three elements: the competitiveness and profitability of the industry, differential natural and cultural values of destinations, and equal distribution of benefits and costs of tourism. One of the five axes proposed in the future strategy is based on sustainable growth, so that tourism could be an economic and social engine and a lever for the sustainable development of the territory, to contain the depopulation of the rural environment, redistribute prosperity and wealth, protect and promote heritage and the natural environment, and improve the quality of life of citizens.

Another important reference to take into account is the *first draft bill of the Climate Change and Energy*



*Transition Law (PLCCTE).* Submitted by the Council of Ministers to the Parliament on 19 May 2020, and although the document does not contain specific references to the tourist sector, the scope of the measures in relation to tourism is evident by virtue of its importance in the Spanish economy and the consequences of greenhouse gases emissions and energy consumption. Among other objectives it proposes to “reduce greenhouse gas emissions across the Spanish economy as a whole by at least 20 % from 1990 levels”, and others linked to renewable energy and energy efficiency with the same year as a reference. The impact of the content of the Bill for the tourist sector is evident, as a result of emission-free mobility and the effects on transport, the efficient use of energy and renewable energy, for example, in the field of construction. Questions relating to the energy transition and the use of alternative sustainable fuels in the air travel sector may also have a major impact on the tourist sector. Finally, the measures for adaptation to the effects of climate change have a great impact on this industry.

The April 2020 draft of the *National Plan for Adaptation to Climate Change 2021-2030 (PNACC)*, makes clear the consequences of climate change for tourism. The document points to a series of impacts and risks in resources, infrastructures and tourist demand arising from climate change and possible changes in the demand for destinations. It proposes four objectives in relation to tourism: integration of the adaptation to climate change in plans, programmes and strategies in the ambit of tourism, including *Spanish Sustainable Tourism Strategy 2030*; to protect destinations and tourist resources and foster the resilience of infrastructures used in tourism; to define tourism models that are sustaina-

ble and take into account the capacities of environmental burden and conditioning climate factors of destinations; and to stimulate supply and demand for the creation of a tourist offering that adjusts the new climate conditions and a low carbon footprint. Finally, and in conjunction with these objectives, from the cultural heritage perspective, it proposes the promotion of a cultural tourism adapted to climate change and low in carbon.

There is an important link between the environment and sustainability, health tourism and quality of life that is vitally important in a post-COVID-19 environment, due to its enormous repercussions. In its report *International Tourism Panorama* (2019 edition), the UNWTO highlighted, among the six travel trends, two closely related to sustainability and a healthy life. These were greater awareness of sustainability (eradication of plastic and climate change) and the search for a healthy life (walking tourism, health and sports). In relation to the latter, health tourism would be comprised of what is referred to as healing tourism, linked to medical services including rehabilitation and healing; and what is referred to as a sub-segment of wellness tourism, related to health and prevention, upon which the following analysis will focus. It is worth highlighting work of the Spanish Health Tourism Cluster (Spaincares), which is defined as a strategic alliance between private sector entities with the support of public institutions that work jointly in this area.

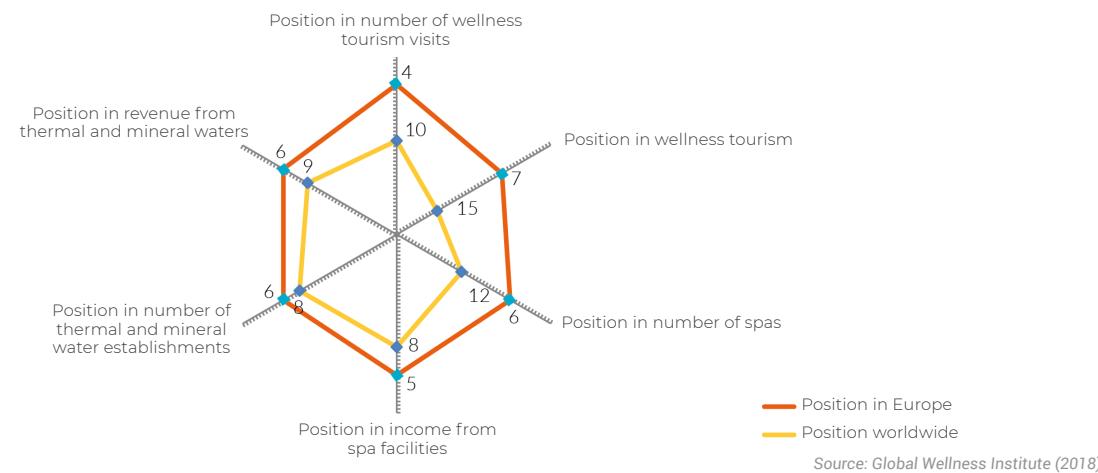
As the UNWTO indicates in its report *Exploring Health Tourism (2018)*, wellness tourism is defined as “a type of tourist activity that has the aim of improving and balancing all the principal domains of human life including the physical, mental,

*emotional, occupational, intellectual and spiritual*”. The tourist seeks to “participate in preventive and proactive activities that improve lifestyle, such as physical exercise, healthy diet, relaxation, care and curative treatments”.

The variety of activities in Spain is broad, as indicated by the EOI and the State Secretariat of Tourism in the study *Health Tourism (2013)*: integrated services (thermal springs, Thalassotherapy, SPA, sporting activities, water and a series of associated wellness services), thermal medicine (treatment and prevention of pain), beauty and wellness treatments, health resorts and alternative therapies. It is a form of tourism that is not dependent on seasonality and highly profitable in average daily spend per number of overnight stays.



### Position of Spain in the world and in Europe for tourism and wellness activities. Top 20 destinations 2017 data:



Spain holds a consolidated position among the major wellness tourism destinations, within the upward global trend in this type of tourism. According to the *Global Wellness Economy Monitor 2018*, wellness tourism accounted for 639 billion dollars in 2017 (15 % of the wellness economy), to which the spa sector can be added (119 billion dollars and 3 % of this economy), and springs and medicinal waters (48 billion dollars and 1 % of the wellness economy).

In the year 2017, Spain was among the top 20 wellness tourism destinations in the world, with 18.8 million visits, direct employment of 0.10 million and a spend of 9.9 billion dollars. It was also among the top 20 spa destinations, with revenue at spa facilities of 2.46 million dollars. Finally, it was among the top ten destinations in the world for thermal and mineral waters (683.1 million dollars in revenue).

In general, Spanish spa resorts offer close to a dozen types of medicinal waters, from bicarbonated to sulphurous; many types of treatments from circulatory issues to rheumatics; and the use of many techniques, with aerosols, healing hydroponics, mud vaporarium, etc. Through [spain.info](http://spain.info) Spain also offers a broad range of health and beauty tourism options to care for body and mind, and well-being,

with all manner of spa resorts and thermal centres and other tourism offerings.

In terms of spa resorts or *balnearios*, the [Turespaña website](http://Turespana.es) includes a total of 50 certified establishments that comprise the Club Balnearios de España group, created by the Asociación Nacional de Balnearios. At the member centres of the club, visitors can find waters beneficial to health, beauty treatments and

cutting edge techniques. There are also 32 certified spa resorts in Spain that hold the Q Tourist Quality Mark awarded by the Institute of Tourist Quality. Finally, visitors to the Turespaña website can also find the great variety of experiences and tourism and health and beauty products offered in Spain, which complement the spa resorts: massages and a range of treatments, experiences encompassing meditation (*mindfulness*, yoga, etc.), or relaxing sports such as golf, etc. Other forms of wellness experiences include wine and gastronomy tourism, hiking and other special forms of nature tourism, relaxing experiences and romantic getaways, etc.





## INTERNATIONAL TOURISTS PER INHABITANT

Ratio of international tourists to resident population in Spain. It also analyses the situation by autonomous community.

*The indicator determines the tourist pressure on destinations, one of the negative externalities of tourist activities that affect the well-being of the resident population (urban and coastal areas, by tourist pressure).*

*The indicator supports the monitoring of the Specific Objectives No. 7.2 "Fostering sustainable tourism and quality and key sectors of the local economy" (Spanish Urban Agenda 2030). It is also linked with Sustainable Development Goal 11 (Sustainable cities and communities) and specifically target 11.3 to enhance inclusive and sustainable urbanization.*

### Source:

National Institute of Statistics (INE) (2020). *Cifras oficiales de población resultantes de la revisión del Padrón municipal a 1 de enero*. Viewed 7 April 2020 <http://www.ine.es/jaxiT3/Tabla.htm?t=2852>

National Statistics Institute. (2020). *Movimientos Turísticos en Fronteras. Número de turistas según comunidad autónoma de destino principal*. Viewed 6 April 2020 <http://www.ine.es/jaxiT3/Tabla.htm?t=23988>

TURESPAÑA. (2020). *FRONTUR Tourist Movement on Borders Número de turistas según vía de acceso*. State Secretariat for Tourism. Ministry of Industry, Commerce and Tourism. Viewed <http://estadisticas.tourspain.es/es-ES/estadisticas/frontur/informesdinamicos/paginas/anual.aspx>

In 2019, Spain received more than 83.1 million international tourists, an increase of 1.1 % on 2018, according to the *Tourist Movement on Borders Survey* (INE). As in previous years, air travel was the mode most used to arrive in Spain (68.7 million tourists, 82.1 % of the total).

In Spain the ratio of international tourists per inhabitant stands at around 1.78, a value that could increase and accentuate the phenomena of tourist pressure if we consider, moreover, international visitors coming to Spain without an overnight stay (daytrippers), who represent 33.6 % of all visitors, which would exacerbate the problems in cities such as congestion due to touristification processes.

By autonomous communities, Catalonia took first position in arrival of international tourists with more than 19.3 million (23.1 %), followed by the Balearic Islands with 13.7 million (16.3 % of the total) while Castile - La Mancha and La Rioja received the lowest number of non-resident visitors, with 264 thousand (0.3 % of the total) and 142 thousand (0.2 % of the total) respectively.

The territorial distribution of this ratio by destination was very heterogeneous. In general terms, there was a significant contrast between the coastal autonomous communities, especially those linked to "sun, sea and sand" tourism and those inland. The autonomous communities with the highest incidence of international tourism were, in order, the Balearic Islands, followed by the Canary Islands, and, on the mainland, Catalonia, with tourist per inhabitant ratios in these three autonomous communities of 11.9, 6.1 and 2.5 respectively, which in some cases has led to significant issues of tourist saturation, affecting the quality of life of the resident population. This being a floating population, it makes the presentation of equipment and management services difficult. At the other extreme, Aragon, Asturias and Castile - La Mancha had the lowest ratios, with 0.42, 0.32 and 0.13 tourists per inhabitant.

**Number of international tourists per inhabitant.**



Indicator/Variable	2010-2019	2015-2019	2018-2019
International tourists per inhabitant.	58.9 %	21.7 %	0.4 %



## INTERNATIONAL TOURISTS PER KILOMETRE OF COASTLINE

The indicator is the ratio between the number of international tourists whose final destinations are the autonomous communities with coastlines and the length of same.

*The analysis of the tourist congestion of destinations, linked, especially, to the “sun, sand and sea” product is important to estimate the pressure exerted by the sector on resources.*

*This links in with SDG 6 (Clean water and sanitation). It also contributes to SDG 8 (Decent work and economic growth) and specifically target 8.9 (promote sustainable tourism that create jobs and promote local culture and products). It also links in with SDG 11 (Sustainable cities and communities) and target 11.3 (enhance inclusive and sustainable urbanization). It is also relevant to SDG 14 (Life below water), due to the concentration of tourism in Spain in the principal tourist areas on the coast, with the resulting impact on the population and the generation of waste and land and marine environments.*

### Source:

National Institute of Statistics (INE) (2020). *Movimientos Turísticos en Fronteras. Número de turistas según comunidad autónoma de destino principal*. Viewed 20 April 2020 <http://www.ine.es/jaxi3/Tabla.htm?t=23988>

TURESPAÑA. (2020). *FRONTUR Tourist Movement on Borders Número de turistas según vía de acceso*. State Secretariat for Tourism. Ministry of Industry, Commerce and Tourism. Viewed <http://estadisticas.tourspain.es/es-ES/estadisticas/frontur/informesdinamicos/paginas/anual.aspx>

Ministry for Ecological Transition (2014). *Informe 2014 sobre el estado del Patrimonio Natural y de la Biodiversidad en España*. Viewed [https://www.miteco.gob.es/es/biodiversidad/temas/inventarios-nacionales/lepnbi\\_2014\\_tcm30-196687.pdf](https://www.miteco.gob.es/es/biodiversidad/temas/inventarios-nacionales/lepnbi_2014_tcm30-196687.pdf)

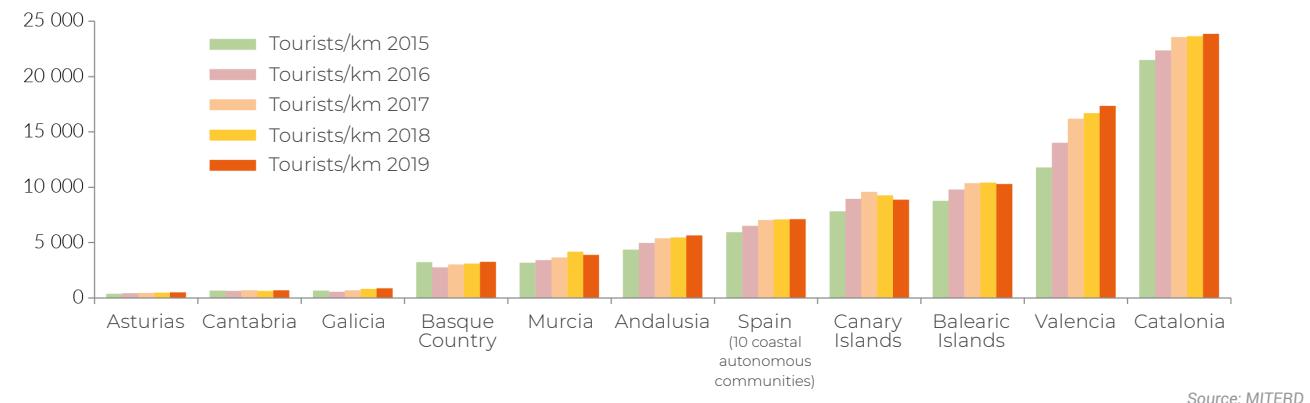
In 2019, a total of 72.9 international tourists visited one of Spain's coastal autonomous communities, that is, 87.1 % of foreign overnight visitors. This amounts to a ratio of 7 112 tourists per km of coastline with an increase of 0.5 % in the last year. This ratio would increase further if we consider that a total of 33.6 % of international travellers who enter Spain without an overnight stay are not included in these figures.

The Spanish coast continued to receive massified “sun, sand and sea” tourism. The great dependence of the tourism sector on this product, which continues to perform well, is therefore maintained. At the same time, these coastal territories bear the most intense tourist pressure, and an overload of resources, although this tourist congestion was unequal across the different coasts in 2019.

- The largest number of international tourists was concentrated on the Mediterranean coasts and the southern peninsula, receiving 55.7 million (76.5 % of the total), with a ratio of 10 921 tourists per km of coastline, with Catalonia to the fore (23 843 tourists/km).
- The Canary Islands experienced a reduction from 2018 levels. The Canaries received 13.1 million international tourists, 18 % of the total, with 8 853 tourists per km of coastline (-4.4 % on 2018).
- Finally, the Cantabrian Coast was the destination with the lowest pressure of visits, although it did increase its ratios slightly compared to 2018 with 1 095 tourists/km. It received 4 million visitors (5.5 % of the total), with the Basque Country recording the highest ratio (3 259 tourists/km).

Despite this massification, in 2019 a total of 272 Spanish beaches had obtained the Q tourist quality certification and 566 were awarded blue flags. That is evidence of Spain's commitment to sustainability and assistance to position itself for quality tourism, in line with the *General Guidelines of the Sustainable Tourism Strategy for Spain 2030*, and which will add value in the context of post-COVID-19 tourism.

**International tourists per kilometre of coastline**



Indicator/Variable	2010-2019	2015-2019	2018-2019
International tourists per km of coastline	57.9 %	19.8 %	0.5 %



## EQUIVALENT TOURIST POPULATION IN THE MAIN TOURIST AREAS

Ratio of annual overnight stays in hotels of a certain area to the number of days of the year. This allows the daily number of people that, as tourists, would be equal to the population living in that area to be estimated. The 10 areas with the highest presence of tourists contained in the *Hotel Occupancy Survey* are published annually by the INE.

The indicator detects the pressure arising from the increase of the seasonal population in areas that receive high number of tourists, relating to the phenomenon of touristification.

It is related to SDG 6 (Clean water and sanitation); SDG 8 (Decent work and economic growth); target 8.9 (sustainable tourism that creates jobs and promotes local culture and products); SDG 11 (Sustainable cities and communities); target 11.3 (enhance inclusive and sustainable urbanization); and SDG 14 (Life below water).

### Source:

National Institute of Statistics (INE) (2020). *Encuesta de ocupación hotelera. Establecimientos hoteleros. Viajeros y pernoctaciones por zonas turísticas*. Viewed 3 April 2020 <http://www.ine.es/iaxiT3/Tabla.htm?t=2039&L=0>

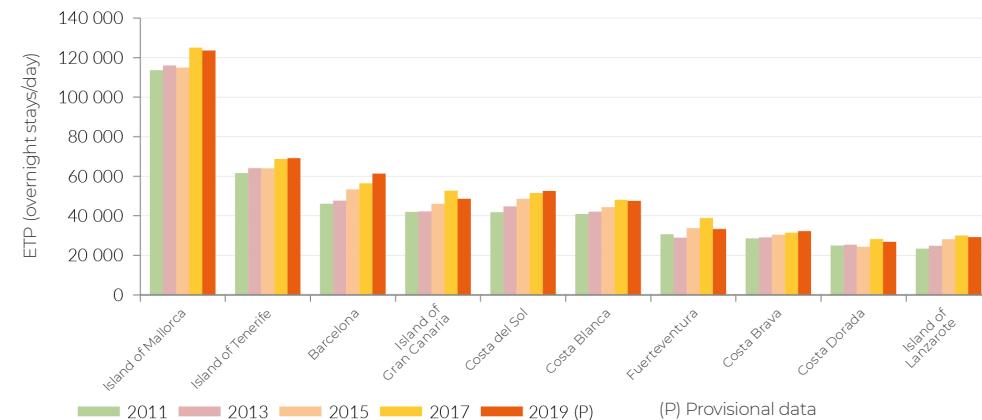
The 10 areas with the largest influx of tourists, once again, were the coastal destination associated with the "sun, sea and sand" product. With a total of 191.2 million overnight stays in 2019, the average Equivalent Tourist Population (ETP) was around 524 thousand persons per day. This translates into significant tourist pressure on the destination, even though it fell 0.3 % from 2018. Again, Barcelona and the Costa Brava were the areas that experienced the biggest year-on-year increase in ETP (5.8 % and 2.5 % respectively) while three of the Canary coasts considered recorded negative values, as was the case of Fuerteventura, Gran Canaria and Lanzarote, with -8.4 %, -4.6 % and -2.5 % respectively, largely due to the bankruptcy of British tour operator Thomas Cook in September 2019.

In 2019, once again, the Mediterranean remained at the top in terms of overnight stays. The island of Mallorca was the principal destination, with 45.1 million overnight stays in hotels (123.6 persons/day), although this indicator was down 0.8 % on ETP in 2018. Next was Tenerife with 25.2 million overnight stays, around 69 000 persons/day.

Finally, the Pyrenees, an inland and nature tourism destination linked to the health and wellness tourism offering, was the only non-coastal tourist area included in the *Hotel Occupation Survey* by the INE, and, in contrast with the coast, shows some positive dynamics. In 2019, the Pyrenees received 3.9 million overnight stays (more than 10,000 persons/day), and of 2.5 % compared to the previous year. The numbers of visitors grew in all the territories of the Pyrenees, with the Navarre Pyrenees, for another year, recording a significant increase: 16.1 %, more than doubling the previous year's growth.

This type of inland tourism helps diversify the offering on the market and fosters the balanced development of tourism, in line with the *General Guidelines of the Sustainable Tourism Strategy for Spain 2030* (2019).

### Equivalent Tourist Population (ETP) in the main tourist areas, 2011-2019 (Overnight stays/day).



Source: INE

Indicator/Variable	2011-2019	2015-2019	2018-2019
Equivalent Tourist Population in the principal Spanish tourist areas	27.5 %	7.5 %	-0.3 %



## NUMBER OF VISITORS TO THE NATIONAL PARKS

This indicator analyses the annual evolution in absolute and relative terms of the number of visitors to the different areas comprising the National Park Network, with respect to their surface area. It is calculated as the ratio of number of visitors to the surface area of the natural space itself.

*This indicator is often used to analyse the pressure exerted on protected natural spaces as a result of tourism.*

*It links in with SDG 14 (Life below water) and SDG 15 (Life of terrestrial ecosystems), as ecotourism depends on the natural environment, for its role in the conservation of biodiversity and the protection of the environment and to prevent tourism degrading delicate ecosystems and resources.*

### Source:

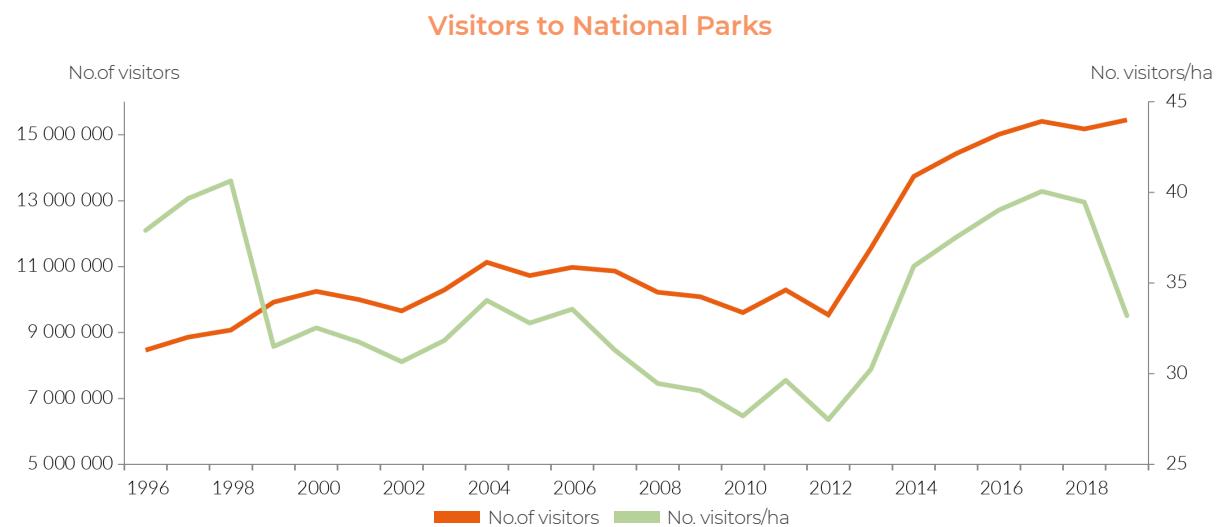
Ministry for Ecological Transition and the Demographic Challenge. (2020). Data provided by express request by the Autonomous Authority for National Parks.

Total visits to the 15 national parks in 2019 were 15 451 483, an increase of 1.8 % on 2018. The Sierra Nevada stands out with an increase of 20.7 % and the Sierra de Guadarrama, with 4.8 %. In the case of Monfragüe, the increase was considerable, 78.7 %, although this was largely due to a change in the counting methodology.

Spanish national parks reached a rate of 33.2 visitors per hectare. The fall in number of visitors per hectare from the previous year is due to the expansion of the surface area of the Archipiélago de la Cabrera National Park, thus reducing the ratio by 16 %. The national parks of the Canary Islands, with a surface area of 7 % of the total, received more than 50 % of visits, equivalent to a ratio of 234 visitors per hectare.

One of the strengths indicated in the *General Guidelines of the Sustainable Tourism Strategy for Spain 2030* (2019), is European leadership in protected natural spaces as part of Spain's European Charter of Sustainable Tourism. Up to 2019, twenty seven protected natural spaces were accredited and six of them were national parks. There were also 25 protected natural spaces that received the "Q mark for Quality Tourism in Protected Natural Spaces", granted by the Spanish Institute of Quality Tourism, two of which are also National Parks.

In these protected spaces, the link between nature and health is a direct one, thus resulting in the role of the product clubs. Many companies provide ecotourism services in national parks like the Tablas de Daimiel, Cabañeros, Doñana, Garajonay and Sierra Nevada, or play an important role in creating ecotourism products and fostering sustainability as a value of the Spanish tourism brand, especially important in a post-COVID-19 context.



Indicator/Variable	2010-2019	2015-2019	2018-2019
Number of visitors	60.8 % --	7.1 % --	1.8 % --
Number of visitors/ha	20 % --	-11.5 %;	-15.9 %;



## RURAL TOURISM: ACCOMMODATION, CAPACITY, TOURISTS AND OVERNIGHT STAYS

The indicator analyses the progress of the main rural tourism variables: number of accommodation establishments, tourist seats, travellers and overnight stays in rural accommodation establishments by means of the Survey on the occupation at non-hotel tourist accommodation establishments.

*This indicator allows us to analyse the inland tourism trend, on the basis of the level of tourism diversification, both from the point of view of the territory and that of the demand of rural tourism products. From this perspective, it contributes to SDG 8 (Decent work and economic growth) and target 8.9 (By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products). It also links in with SDG 10 (Reduce urban-rural inequality) as tourism contributes to the rural development of territories.*

### Source:

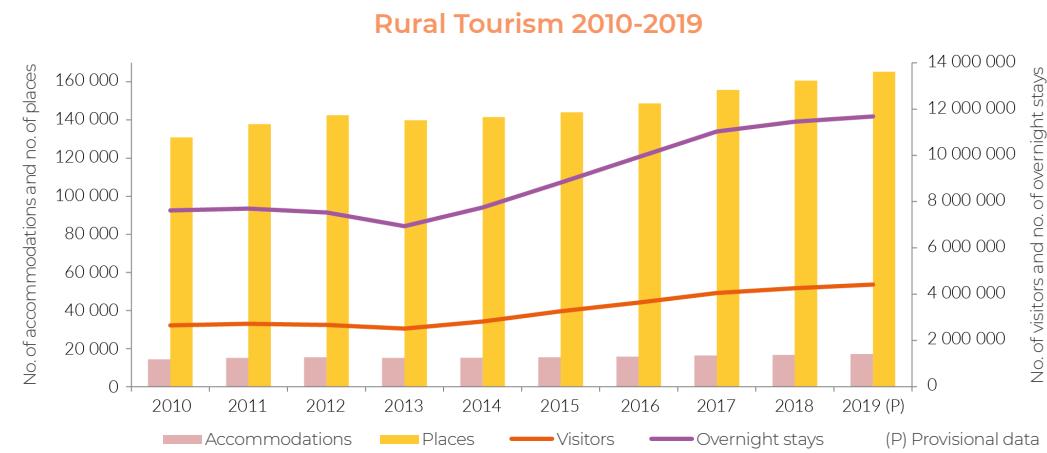
National Institute of Statistics (INE) (2020). Encuesta de ocupación en alojamientos de turismo rural. Alojamientos de turismo rural: encuesta de ocupación e índice de precios. Viewed 31 March and 1 and 2 April 2020 [http://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736176963&menu=resultados&secc=1254736195429&idp=1254735576863](http://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176963&menu=resultados&secc=1254736195429&idp=1254735576863)

In 2019, rural tourism indicators improved, making it an economic alternative that connects the urban and rural environment while at the same time it constitutes an equitable distribution of the benefits of tourism.

According to the INE, the number of visitors stands at 4 414 029 and overnight stays at 11 678 579, with respective increases of 3.6 % and 1.9 % on 2018, and employment grew at around 4.5 %, with 25 530 people employed in 2018. The places offered continue to grow (165 335, a year-on-year increase of 2.9 %), and the number of accommodation establishments (17 156, growth of 3 %).

Despite the potential of tourism for the socio-economic development of the territory, rural tourism still has limited weight as it represents, for example, only 6 % of the tourist accommodation places in Spain. Occupation of places was 19.2 %, well below the rate of occupation for hotel places (60.2 %) or for other tourist accommodation establishments. In addition, a slight decrease is noted in respect of 2018, making it necessary to take advantage of this resource to diversify the tourist market offering.

Much like the other tourist activities, it is also highly seasonal, especially strong in the summer months which represent over 50 % of overnight stays in 2019, with special intensity in July and August as well as Easter Week and weekends, the latter with 32.7 % occupation.



Source: INE

Indicator/Variable	2010-2019	2015-2019	2018-2019
Accommodation establishments	19.8 %	11.5 %	3 %
Beds	26.3 %	14.8 %	2.9 %
Travellers	66.7 %	35.2 %	3.6 %
Overnight stays	53.3 %	32.3 %	1.9 %



## PROPORTION OF JOBS IN SUSTAINABLE TOURISM WITH RESPECT TO TOTAL TOURISM JOBS

Sustainable tourism jobs as a percentage of total jobs in the tourism sector.

*The indicator allows for measuring progress on SDG 8. "To promote sustainable, inclusive and stable economic growth, full, productive employment and decent jobs for everyone". Target 8.9 of the Sustainable Development Goals. Included by the INE as Indicator 8.9.2. "Sustainable tourism jobs as a percentage of total jobs in the tourism sector."*

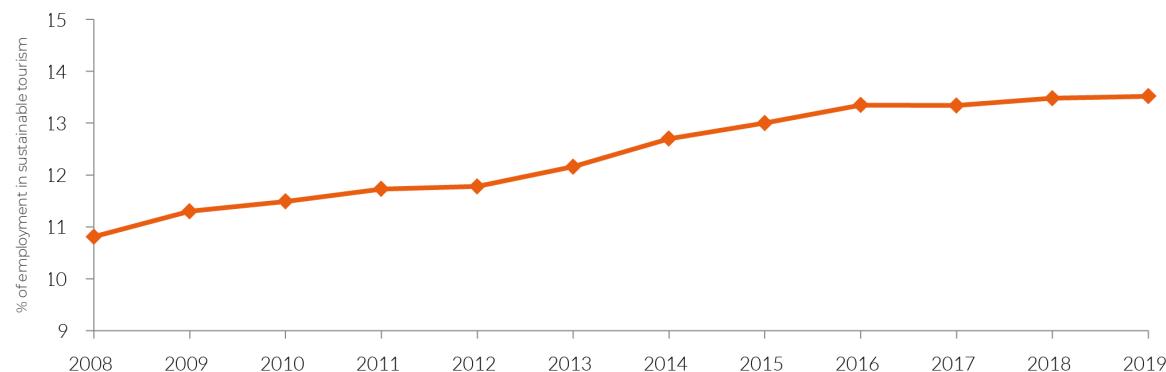
The *Encuesta de Población Activa* (Spanish Labour Force Survey), indicates an increase of two percentage points in the proportion of jobs in the sustainable tourism sector in respect of the total tourism jobs with the year 2010 taken as a reference. With the exception of the year 2017, which saw a slight reduction, the trend has always been positive, albeit with more moderate increases over recent years. The indicator currently stands at 13.5 %.

The INE uses the indicator *"8.9.2. Proportion of jobs in the sustainable tourism sector with respect to total jobs in tourism"* as the base date for analysing progress in target 8.9 of the Sustainable Development Goals: *"By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products"*. Since 2015, this indicator has seen progress of 0.5 points.

The tourist sector will need workers with profiles specialised in quality and sustainability and specialists in management, planning and development of tourist destinations. All progress made in this indicator ultimately involves a higher quality of tourist employment, which is key for the success of tourist destinations as they shift towards sustainability.

The consequences in terms of quality and seasonality in employment in the tourism sector from March 2020 on, due to the influence of the COVID-19 health crisis, remain to be analysed. In any case, tourism should be a vector for transformation in employment and, specifically, sustainable tourism, given the current situation, together with technological innovation, can offer an alternative to the concept of overtourism, compatible with the Sustainable Development Goals.

**Sustainable tourism jobs as a percentage of total jobs in the tourism sector (%)**



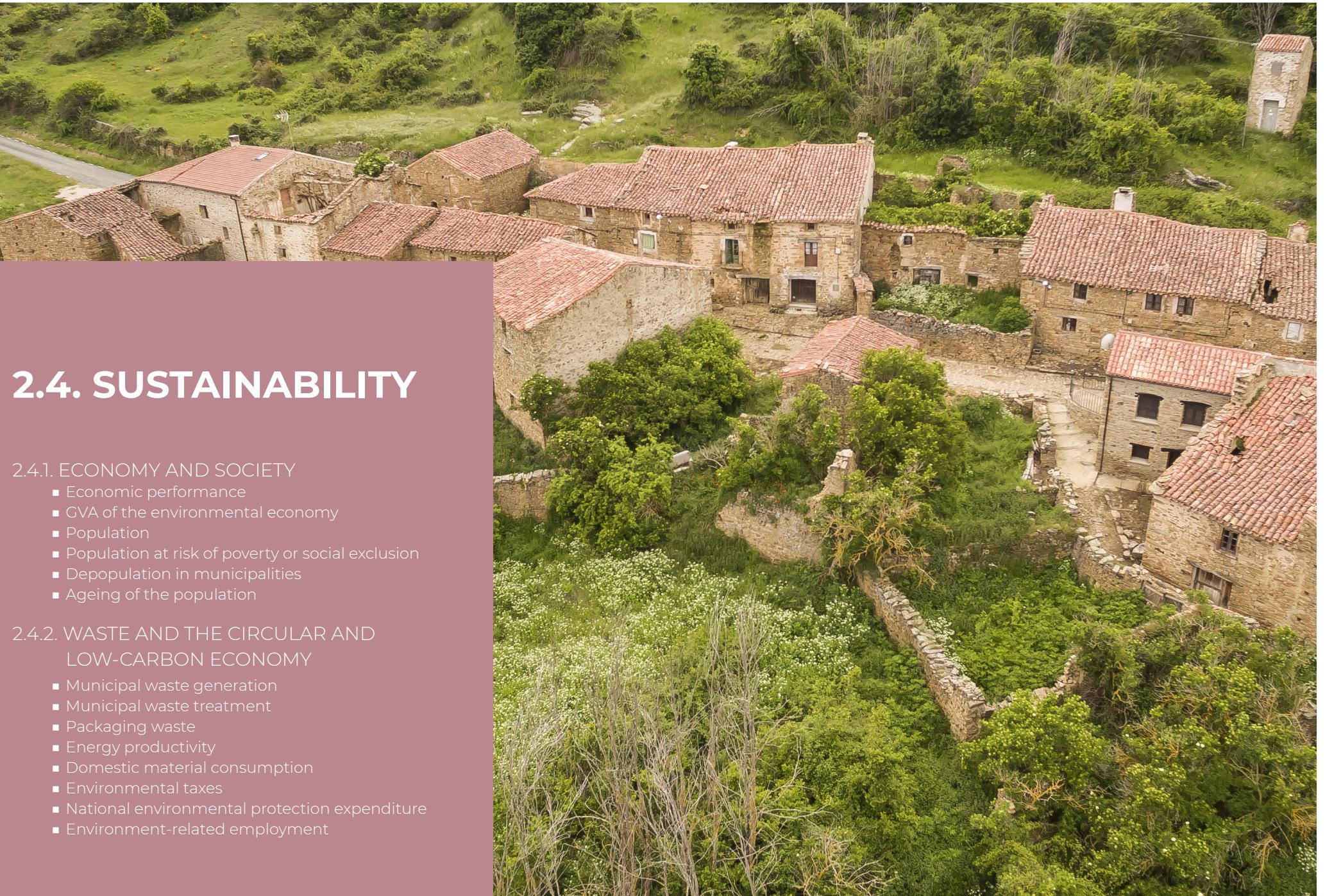
Source: INE

### Source:

National Institute of Statistics (INE) (2020). *Encuesta de Población Activa (EPA). Banco de series temporales. Serie EPA366495*. Viewed 6 July 2020 <https://www.ine.es/consulta/serie.do?d=true&s=EPA366495&nult=15>

Indicator/Variable	2010-2019	2015-2019	2018-2019
Sustainable tourism jobs as a percentage of total jobs in the tourism sector.	2	0.5	0

In this variable the trend reflects the difference in percentage values in the indicated years.



## 2.4. SUSTAINABILITY

### 2.4.1. ECONOMY AND SOCIETY

- Economic performance
- GVA of the environmental economy
- Population
- Population at risk of poverty or social exclusion
- Depopulation in municipalities
- Ageing of the population

### 2.4.2. WASTE AND THE CIRCULAR AND LOW-CARBON ECONOMY

- Municipal waste generation
- Municipal waste treatment
- Packaging waste
- Energy productivity
- Domestic material consumption
- Environmental taxes
- National environmental protection expenditure
- Environment-related employment

The creation of the Ministry for Ecological Transition and the Demographic Challenge was one of the new Spanish Government's commitments for the general elections of 10 November 2019. Royal Decree 2/2020, of 12 January, restructuring the ministerial departments, establishes this ministry's competency for the "proposal and execution of policy to combat depopulation and the drafting and development of a national strategy to combat the demographic challenge". To do that, it creates, as a superior body, the General Secretariat for the Demographic Challenge, upon which the Directorate General of Policy to Combat Depopulation shall depend.

The establishment of this competency defines the impulse of the National Strategy against the Demographic Challenge, the general guidelines of which were approved in March 2019 by the Council of Ministers.

In fact, in January 2020 the Government approved the agreement of the *Declaration of the Climate and Environmental Emergency in Spain*, in which it commits to adopting 30 priority lines of action. This initiative arises from the approval by the majority of the Congress of Deputies at the session of 11 September 2019.

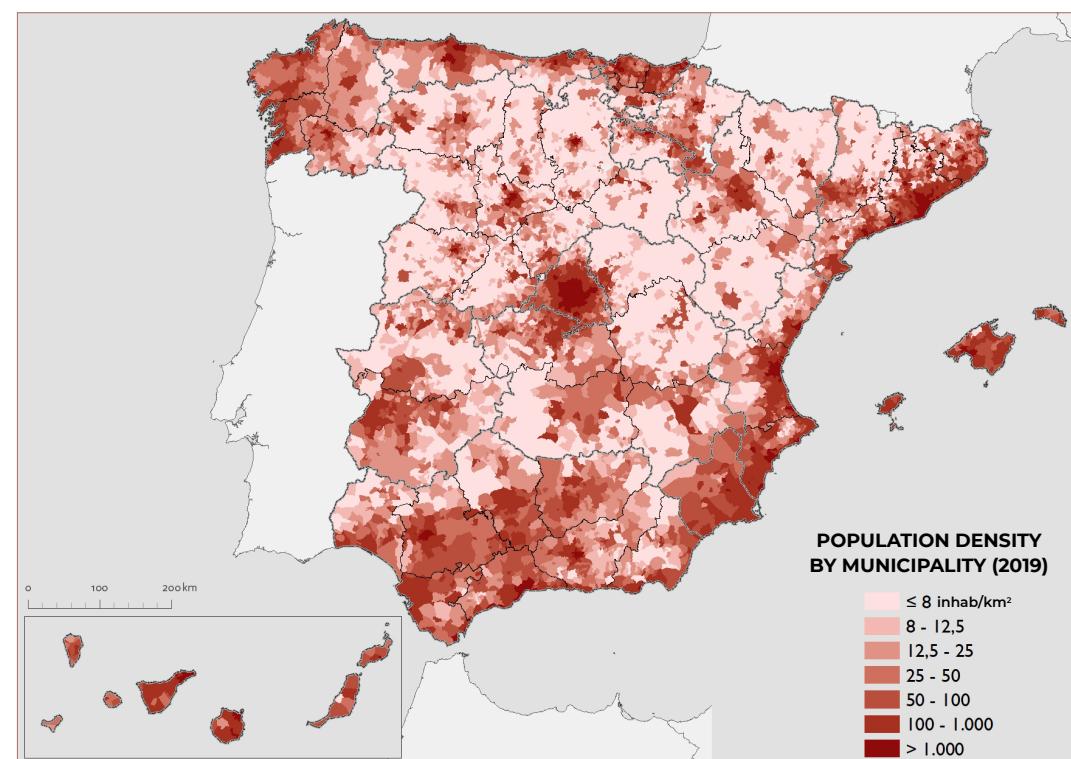
The commitment of priority no. 21 is "to boost synergies with policies on rural development, biodiversity protection and recognition of environmental services, fostering energy transition opportunities and renewable energies to generate new green jobs, and actions designed within the framework of the strategy to tackle depopulation and the demographic challenge. In this context, the Government will draft the Strategy to Combat Desertification

and the National Forestry Strategy and will present the Strategy to tackle the Demographic Challenge before the Conference of Presidents 2020 to facilitate better coordination between administrations".

The objective, in tackling the demographic challenge, is to lay the foundations of a national project that guarantees equality of opportunity and free exercise of the rights of citizens across the territory, through the coordination and cooperation of all Public Administrations, the sustainable use of endogenous resources and close public-private collaboration.

In Spain, we have seen a process of depopulation in a general context of the demographic growth of the country. From 2001 to 2019, the Spanish population increased. However, in this same period, 62.7 % of the municipalities lost population. Furthermore, since the year 2010, depopulation became a more widespread issue, and not only a question for the smallest municipalities, affecting county seats, small cities and more than half of the provincial capitals.

Population density by municipality 2019



One of the effects of the process of depopulation in the territory was low demographic density in numerous areas. The evolution of population density is also an indicator of existing territorial vulnerability. Spanish cities concentrated 54 % of the population in just 5 % of the territory with a density of almost 1 000 inhabitants per km<sup>2</sup>, intermediate density areas accounted for 32.8 % of the population across 22 % of the territory with a density of 139 inhabitants per km<sup>2</sup>, while rural areas are home to 13.2 % of the population, occupying 73 % of the territory with a density of 16.8 inhabitants per km<sup>2</sup>.

Close to half of the national territory has a population density below 12.5 inhabitants per square kilometre, the threshold identified by the EU for territories at risk of depopulation. What's more, most of the territory below 12.5 does not even reach 8 inhabitants per km<sup>2</sup>, the threshold set by the EU as risk of severe depopulation. In Spain, 38 % of municipalities are in this situation.

To understand the different factors associated with the phenomenon of depopulation, according to the latest data from the Residential Variation Statistics for 2019, almost half of the municipalities have a negative balance of female residents. What's more, 95 % of the municipalities with a negative balance of female residents have fewer than 5 000 inhabitants. The same occurs if we look at residential variations in age cohorts between 16 and 44. A total of 4 144 municipalities show negative balances of young people. Territories at demographic risk are losing their young adult population and, to an even greater extent, women.

The number of people aged 65 or more has risen 28.7 % from the year 2001, placing the number of over-65s at 9 057 193, or 19.3 % of the population. We can link it with the fact that Spain has the highest life expectancy in the EU (83.6 years), which is considered a social success for the country. Now, the progressive ageing of the population places the ageing index for the year 2019 at close to 1.23 over-65s for every under-16. Moreover, the territories most affected by depopulation are not only the oldest but, above all, over-aged with the proportion of over-80s exceeding 37 % of the over- 65s cohort.

The migratory balance has turned positive for the third consecutive year since the year 2016. In Spain, there were 5 036 878 foreign nationals registered on the Continuous Registry of Inhabitants in 2019, representing 10.7 % of the population. In the most populated areas and intermediate density areas, this percentage of foreign nationals is very similar to the

national total, however, in rural areas, only 7.7 % of the residents are foreign nationals.

In this population context, one must also highlight the growth in the number of Spaniards who emigrate overseas. During 2019, the population with Spanish nationality resident abroad rose by 72 863 (2.9 %), to a figure of 2 618 592 on 1 January 2020. Continental distribution reveals that 60.2 % of the persons registered on the Registry of Spanish Nationals Resident Abroad resided in America, 36.1 % in Europe and 3.7 % in the rest of the world. In terms of countries, Argentina (473 519), France (273 290), the United States of America (167 426), Germany (167 151) and the United Kingdom (152 291) were the countries in which most Spanish nationals overseas were resident on 1 January 2020.



In terms of the increases over the last year, the United Kingdom (13 055), France (10 842) and the United States (9 868) were the countries with the largest increase in their population of Spanish nationals. Ireland also stands out, which although home to fewer Spanish nationals in absolute terms (just 10 681), saw an increase of 1 028, some 10.6 % of the Spanish community registered there in 2019. In the opposite direction, a decrease of 9 613 Spanish nationals (6.3 % of those resident on 1 January 2019) was recorded in Venezuela.

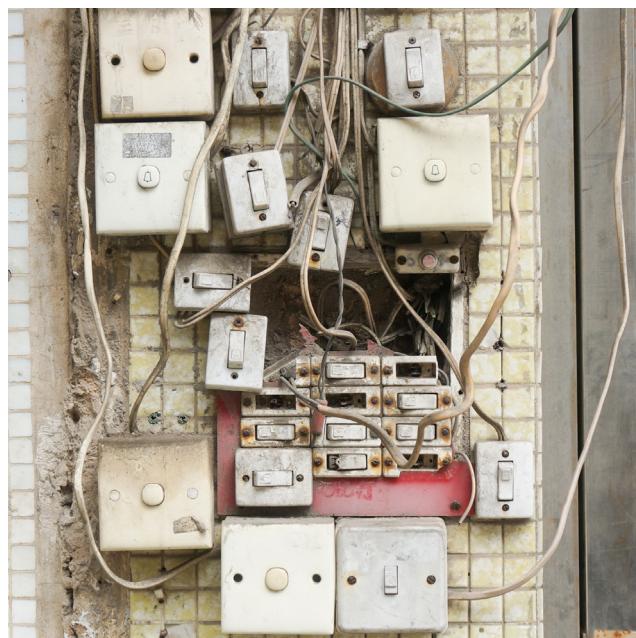
In 2014, with a value of 29.2 %, it was the country presenting the highest risk of poverty and social exclusion (At Risk of Poverty and/or Exclusion

(AROPE) indicator). From that year on, that decrease has been continuous, having reached 26.1 % in 2018.

In the EU-28 the rate of risk of poverty or social exclusion (AROPE indicator) was 21.9 %, lower than Spain's, which was the seventh highest in the EU.

The *National Strategy to combat Energy Poverty 2019-2024* was approved by the Council of Ministers in April 2019. It names the Institute for Diversification and Energy Saving responsible for its execution, a body that must update the data on the reality of energy poverty in Spain annually.

This monitoring was carried out using data from the *Encuesta de Condiciones de Vida* (Living Conditions Survey) and the *Encuesta de Presupuestos Familiares* (Family Budgets Survey) drafted by the INE. The principal indicators established by the European Observatory are reviewed (an initiative that brings together research groups, universities and other organisations to find solutions to energy poverty throughout all of Europe, created in June 2018) to allow for the monitoring of energy poverty. On 15 October 2019, the report *Update of Indicators of the National Strategy to Combat Energy Poverty* was published, which included the monitoring of the four principal indicators with the following result:



National Strategy to fight Energy Poverty 2019-2024. Monitoring indicators	2015	2016	2017	2018	2025 minimum objective	2025 goal
<b>Disproportionate expenditure:</b> percentage of households whose energy spend in relation to their income is more than double the national median.	16.6	16.7	17.3	16.9	12.9	8.6
<b>Hidden energy poverty:</b> percentage of households whose absolute energy expense is lower than half of the national median	10.8	11.3	10.7	11	8.6	5.7
<b>Inadequate temperature:</b> percentage of the population who cannot heat their homes to an adequate temperature	10.6	10.1	8	9.1	6	4
<b>Delay in payment of invoices:</b> percentage of the population with delays in the payment of invoices for household supplies	8.8	7.8	7.4	7.2	5.5	3.7

Source: Informe de Actualización de indicadores de la Estrategia Nacional contra la Pobreza Energética. MITERD.



In the trends observed in the indicators, one observes an improvement in the “Delayed payment of bills” while “disproportionate spending” fell slightly and remains close to the 17 % recorded in 2018. “Inadequate temperature” saw an isolated increase in 2018, although its value is still lower than for the first two years. “Hidden energy poverty” has performed irregularly, with an increase in 2018.

In comparison to Europe, in 2018 Spain occupied eighth place of the EU-28 with the highest percentage of the population incapable of maintaining adequate home heating (“Inadequate temperature”). Its value of 9.1 % places it above the EU average of 7.3 %.

The declaration of the Climate Emergency in our country comes with financial muscle that, in principle, should continue to contribute to compliance with environmental and socio-economic commitments. The European Council, on 12 December 2019, backed the announcement of the European Investment Bank to support investments for a sum of 1 billion euros in climate and environmental sustainability actions between 2021 and 2030.

Through the *InvestEU Programme* (instrument to incentivise investment, growth and employment in the EU) the Commission will facilitate investments through the Fair Transition Mechanism aimed at the regions and sectors most affected by the transition.

Nonetheless, any analysis of the economic situation of the country in 2019, beyond that commented in the indicators, will remain conditional upon the evolution of policy and economic decisions adopted in Spain and the European Union in 2020 as a consequence of the pandemic caused by COVID-19.

This introduction, therefore, only presents the figures on GDP and employment for 2019 with the aim of serving as a starting point for a future analysis of the socio-economic situation from 2020 on.

- The trend in GDP at current prices has continued since the year 2013 when, with a value of 1 020.348 billion euros, the lowest value since 2009 was recorded as a result of the financial and economic crisis that began in 2007. That year, 2009, GDP saw a reduction of 3.8 %. At current prices, GDP reached a total of 1 245 331 million euros, with an increase of 3.6 % compared to 2018. Growth in terms of volume of GDP across the whole year 2019 (estimated by the aggregate of the four quarters of the year) was 2 % in respect of 2018, maintaining the slowdown in the rate of increase observed since 2015.
- Referring to the percentage of active population, in 2019 Spain was the country with the second highest rate of unemployment behind Greece. Nevertheless, the rate of 14.1 % shows a downward trend from the maximum value of 26.1 % reached in 2013. The EU-28 average in 2019 was 6.3 %.

The start of 2020 was dominated by the COVID-19 health crisis, which emerged in China in late 2019, leading to the collapse of the global economy. The evolution of the spread of the disease, declared a pandemic, caused real panic on the financial markets resulting in a global recession.

The scenario described for Spain in the year 2019 has changed radically and it is not possible, at the time of collating the information for this publication, to estimate the effects of COVID-19 on our economic structure. The public health challenge of the first order arising from the spread of the disease led to the declaration of the State of Emergency and the adoption of extraordinary measures of confinement of the population in their homes and the cessation of most productive activity.

At the time of publication of this Profile there persists a high degree of uncertainty regarding the impact and duration of disruption of the economy, the consequences of which will depend on the real fall in production and consumption. The economic and social consequences will have to be evaluated over the medium to long term, where sufficient and accurate data is available for that.

The economic recovery will depend on the economic policy measures that are put in place. These are global measures that must be adopted jointly in economic space like the EU geared towards entrepreneurial impetus and the increase of employment.

## ECONOMIC PERFORMANCE

Economic evolution measured as Gross Domestic Product (GDP) at market prices, both in absolute figures and per capita.

GDP is one of the main aggregates of the national economy (along with national income and employment) in the system of national accounts.

The population figure used by the INE to make the per capita estimate refers to the population resident on 1 July of each year.

*GDP is one of the variables used to analyse and evaluate the structure and evolution of regional economies and serves as the statistical basis for the design, implementation and monitoring of economic policy.*

*The indicator allows for monitoring of Sustainable Development Goals 8 (Decent work and economic growth) and 10 (Reduce inequality).*

### Source:

National Institute of Statistics. (2020). Annual Spanish National Accounts: main aggregates. Viewed 5 March 2020 [https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736177057&menu=resultados&idp=1254735576581](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736177057&menu=resultados&idp=1254735576581).

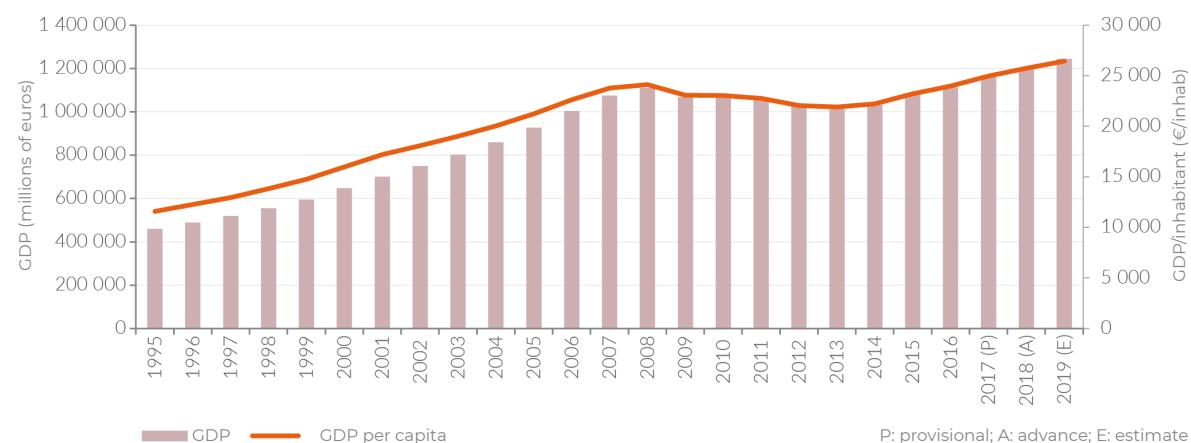
2019 was the sixth consecutive year of GDP growth at current prices. The rising trend interrupted in the years 2009 to 2013 as a consequence of the crisis has therefore been recovered. The same trend is observed for GDP per capita. The value of GDP rose in 2019 to 1 245 331 billion euros, some 3.6 % above that of 2018 (provisional data estimated in January 2020) while GDP per capita stood at €26 438, with growth of 2.8 % in respect of 2018.

Spain presented a structural change in its economy over recent years. Up to 2007, it could be characterised by the relatively constant contribution, around 60 % of GDP, of the services sector, a reduction in the weight of the industrial and agricultural sectors (including livestock, forestry and fisheries) and an increase in that of construction. From that year on, a second phase begins with sustained growth of the services sector to reach almost 70 % of GDP and the stabilisation of the agricultural sector. For its part, the contribution of construction falls, much like that of industry, albeit more moderately.

The data from Eurostat show us that the rate of unemployment in 2019 was 14.1 % of the active population. It fell for the sixth consecutive year, approaching pre-2009 levels and drifting further from the maximum of 26.1 % recorded in 2013. In 2019, Spain had the second highest rate of unemployment in the EU-28, behind Greece. That year, the EU-28 average was 6.3 %.

Nevertheless, the effects of the COVID-19 pandemic have seen major changes to this trend in our economy that began to become apparent in the early months of 2020.

**Gross Domestic Product (GDP) at total market prices and per capita**



Indicator/Variable	2010-2019	2015-2019	2018-2019
GDP	16.1 %	15.6 %	3.6 %
GDP per capita	14.8 %	13.9 %	2.8 %

## GROSS VALUE ADDED OF THE ENVIRONMENTAL ECONOMY

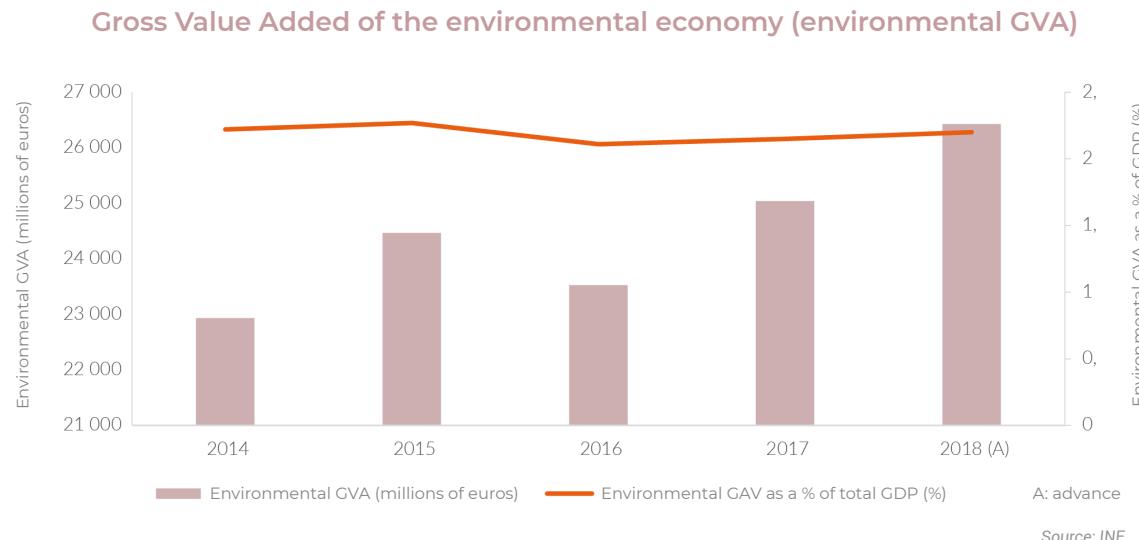
The indicator shows the evolution of Gross Value Added (GVA) of the production of environmental goods and services from activities associated with the environment and the management of natural resources (hereinafter environmental GVA).

*The Environmental Goods and Services Account shows data on the principal variables associated with the production of goods and services whose main objective is the protection of the environment and/or the efficient management of natural resources classified by economic activities and environmental domains.*

The Gross Value Added (GVA) of the production of environmental goods and services, which we can measure using environmental GVA, as it corresponds to activities associated with the protection of the environment and the management of natural resources, reached 26.424 billion euros. This is a provisional figure presented by the INE as and advance in the framework of the Environmental Goods and Services Account. For 2017, GVA increased by 5.5 % while in comparison to 2014 (first year of the series) the total increase was 13.2 %, showing an upward trend only interrupted by a reduction in 2016.

The contribution of environmental GVA to total GDP remains slightly above 2 % over the course of the period and was 2.2 % in 2018.

The biggest contributions to GVA were from the D (supply of electricity, gas, steam and air conditioning) and E (supply of water, sewerage activities, waste management and decontamination) sectors of the National Classification of Economic Activities (CNAE2009). At the opposite end of the spectrum were the F (construction) and A (agriculture, livestock, forestry and fisheries) with a weight of 3.8 % and 5.4 % respectively.



### Source:

National Institute of Statistics. (2020). *Environmental goods and services account. National results Series 2014-2017 and Advance 2018*. Viewed 11 March 2020  
[https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736177053&menu=resultados&idp=1254735976603](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736177053&menu=resultados&idp=1254735976603).

Indicator/Variable	2014-2018	2017-2018
Environmental GVA	13.2 %	5.5 %
* Environmental GVA as a % of GDP	-0.02	0.5

In this variable the trend reflects the difference in percentage values in the indicated years.

## POPULATION

The indicator considers the official population figures for Spain obtained from the review of the Municipal Register (administrative register of all residents in each municipality of Spain as of the first January of each year and declared official by royal decree). It also includes the performance of resident population figures (both as of 1 January each year).

*The population figures constitute fundamental statistical information to describe the evolution of society. They are an essential element of the statistical system by allowing for the preparation of other indicators.*

*Regulation (EU) 1260/2013, of 20 November 2013, on European demographic statistics, establishes a common legal framework for the development, production and dissemination of European statistics on population and vital events.*

According to the review of the Municipal Register, in 2019 the Spanish population grew for the third consecutive year after the decreases experienced in the years 2013 to 2016. On 1 January, the population was comprised of a total of 47 026 208 inhabitants, of whom 89.3 % were Spanish and the remaining 10.7 % were foreign nationals. This was the first year the population exceeded the 47 million mark.

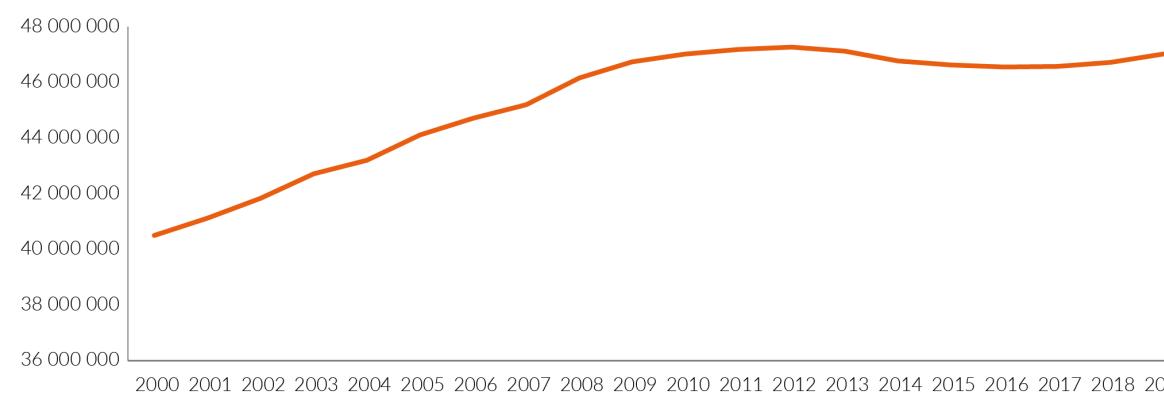
It is worth pointing out that the convergence over recent years between the figures of the municipal register and those of the estimate of the resident population (all the people who have their habitual residence within a certain geographic area on a certain reference date), from 1 January 2019, was 46 937 060 inhabitants as of 1 July 47 100 396 inhabitants (still a provisional figure in March 2020).

In the period 2012-2017, the foreign population experienced consecutive annual decreases as a result of the economic crisis, with the year 2018 being the first to record growth (3.5 %) that almost doubled in 2019.

Leaving the autonomous cities of Ceuta and Melilla aside, with population densities of 4 461.9 inhab/km<sup>2</sup> and 6 652.8 inhab/km<sup>2</sup> respectively in 2019, Madrid recorded the highest population density with 830.6 inhab/km<sup>2</sup>, followed by the Basque Country, with 311.4 inhab/km<sup>2</sup>. At the other end are Extremadura, Castile - La Mancha and Castile and León with 25.6 inhab/km<sup>2</sup> in 2019.

In the period 2010-2019, several autonomous communities have experienced a reduction of population density, caused by the decrease in inhabitants. They include Castile and León (-6.2 %), Asturias (-5.7 %), Extremadura (-3.6 %), Galicia (-3.5 %) and Castile - La Mancha (-3.1 %). The other autonomous communities that recorded a reduction in population density in this period are Aragon, Valencia, Cantabria and La Rioja with values in and around -2 %.

### Population in Spain (inhabitants according to Municipal Register as of 1 January)



Source: INE

#### Source:

National Institute of Statistics. (2020). *Continuous Register Statistics*. Viewed 5 March 2020 <https://www.ine.es/jaxi/Tabla.htm?path=/t20/e245/p08/l0/&file=01001.px&l=0>

Indicator/Variable	2010-2019	2015-2019	2018-2019
Population	- 0.6 % 	0.54 % 	0.65 % 

## POPULATION AT RISK OF POVERTY OR SOCIAL EXCLUSION

This indicator shows the percentage of the population resident in Spain that is in a situation of risk of poverty or social exclusion. Information of the European Union is provided, too.

People at Risk of Poverty or Exclusion are identified in the Europe 2020 Strategy (strategy for smart, sustainable and inclusive growth) by the acronym AROPE (At Risk of Poverty and/or Exclusion).

The indicator allows for monitoring of Sustainable Development Goals 8 (Decent work and economic growth) and 10 (Reduce inequality).

### Source:

Eurostat. (2020). People at risk of poverty or social exclusion by age and sex [ilc\_peps01]. Viewed 25 February 2020 de [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc\\_peps01&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_peps01&lang=en)

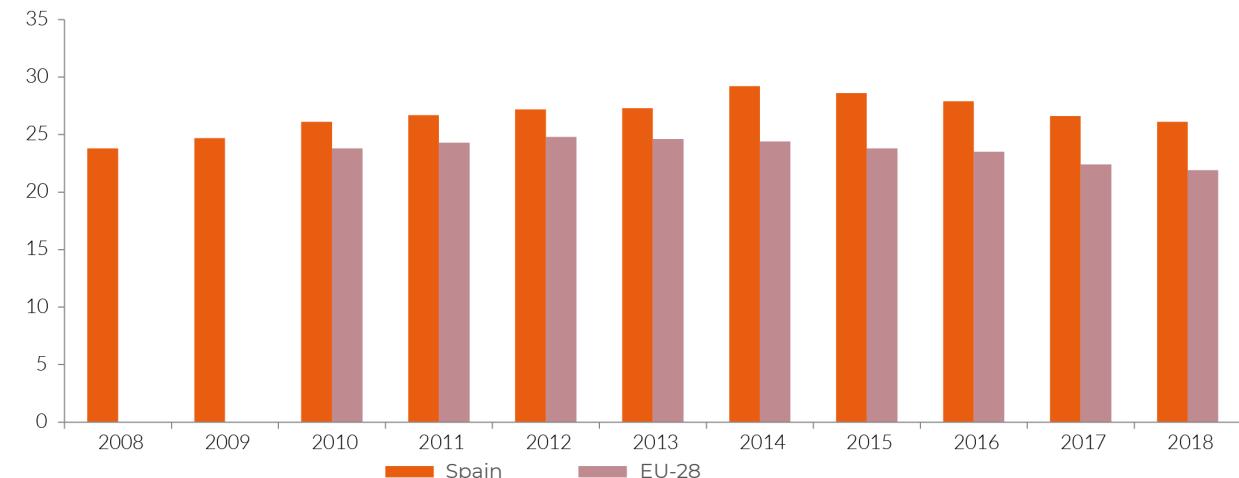
Since the year 2014, the year in which the poverty or social exclusion rate (AROPE indicator) reached 29.2 %, a continued decrease has been observed, standing at 26.1 % in 2018.

The analysis of the three situations used to evaluate social exclusion shows us that 21.5 % of the total population was at risk of poverty, with 10.7 % of the population belonging to homes without employment or with low intensity in employment (homes in which the members of the household of working age worked less than 20 % of the potential working period of the reference year) and 5.4 % of inhabitants experienced a severe material deprivation (lack of at least 4 items of a list of 9).

In Europe, in 2018 Spain presented a rate of poverty in excess of the average for the EU-28, which was 21.9 %. Much like what occurred in 2017, six countries recorded rates in excess of Spain's in 2018.

The Basque Country and Navarre were the autonomous communities with the lowest percentages of population at risk of poverty or social exclusion with values generally less than half of the average for Spain. Seven autonomous communities recorded rates above the average in 2018.

Population at risk of poverty or social exclusion (%) (AROPE indicator)



Indicator/Variable	2009-2018	2014-2018	2017-2018
Change in rate of Population at risk of poverty or social exclusion (AROPE indicator) in Spain	1.4	-3.1	-0.5

In this variable the trend reflects the difference in percentage values in the indicated years.

## DEPOPULATION IN MUNICIPALITIES

The indicator shows the percentage of municipalities that lost population over a period of time.

With reference dates of 2001, 2010 and 2019, the calculation was made through rates of variation in population for the 21st century (2001-2019) and for the last decade (2010-2019) for each of the 8 131 municipalities in Spain.

*The population figures constitute fundamental statistical information to describe the evolution of society. They are an essential element of the statistical system by allowing for the measuring of other indicators.*

### Source:

National Institute of Statistics. (2020). *Continuous Register Statistics*. Information prepared by the General Secretariat for the Demographic Challenge, using official population figures from the review of the municipal register as of 1 January every year.  
[https://www.ine.es/jaxi/Tabla.htm?path=/t20/e245/p08/\\_0/&file=01001.px&l=0](https://www.ine.es/jaxi/Tabla.htm?path=/t20/e245/p08/_0/&file=01001.px&l=0)

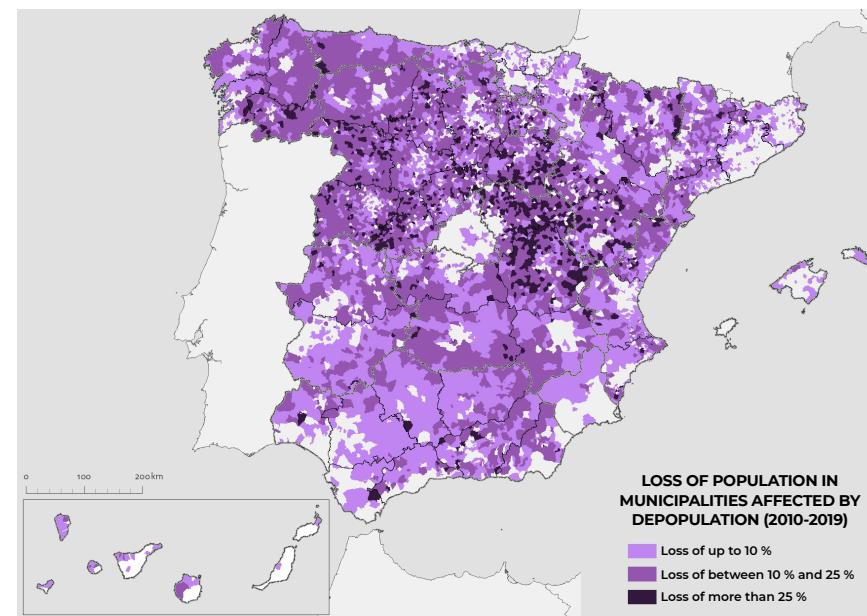
From the year 2001 to 2019, the Spanish population increased by 14.4 %, from 41 116 842 inhabitants to 47 026 208. However, during this period, 62.7 % of the municipalities in the country lost population. If we look at the last decade, 77.2 % of municipalities have lost population, that is 6 280 municipalities, in a context of population growth at national level.

In terms of the intensity of the variation in population rates 2010-2019 by municipalities, 9.9 % of municipalities lost more than 25 % of their population and 29.7 % lost less than 10 %. In rural areas, 11.8 % of municipalities lost more than a quarter of their population, 44.2 % lost between 10 % and 25 % and 27.4 % lost less than 10 %.

According to the degree of urbanisation of municipalities, the population of rural areas fell 6.2 % from the year 2010, while the population of medium-sized cities grew by 1.7 % and cities by 0.6 %.

Over the last decade, 85.6 % of the municipalities of less than 1 000 inhabitants, 73.7 % of the municipalities of 1 000 to 5 000 inhabitants and 51.2 % of the municipalities of 5 000 to 20 000 inhabitants lost population.

Depopulation is a general phenomenon that most affects small municipalities and less populated areas but also county seats, medium-sized cities and more than half the provincial capitals.



Indicator/Variable	2001-2019	2010-2019
Municipalities that lose population	62.7 % 	76.6 % 

## AGEING OF THE POPULATION

The indicator shows the ageing index of the population calculated as the ratio between the population aged 65 or over and the population aged under 16, two of the most dynamic population groups that influence the structure and evolution of population figures.

*The Basic Demographic Indicators constitute statistical operation comprised of a series of indicators that allow for an analysis of how the basic demographic indicators impact on Spain.*

*They are calculated based on the results of the reference Natural Movement of the Population and the Resident Population figures in Spain.*

*This indicator covers those population groups that will need the most social assistance, and it is useful to analyse the size of the older population for every 100 minors, that is, to try to measure the weight of a sector to be supported by another sector of the population.*

### Source:

National Institute of Statistics. (2020). *Continuous Register Statistics. Principal population series since 1998*. Information prepared by the General Secretariat for the Demographic Challenge. MITERD. <https://www.ine.es/jaxi/Tabla.htm?path=t20/e245/p08/10/&file=01001.px&L=0>

The ageing index stands at 123 %, which is 15.4 points higher than in 2010.

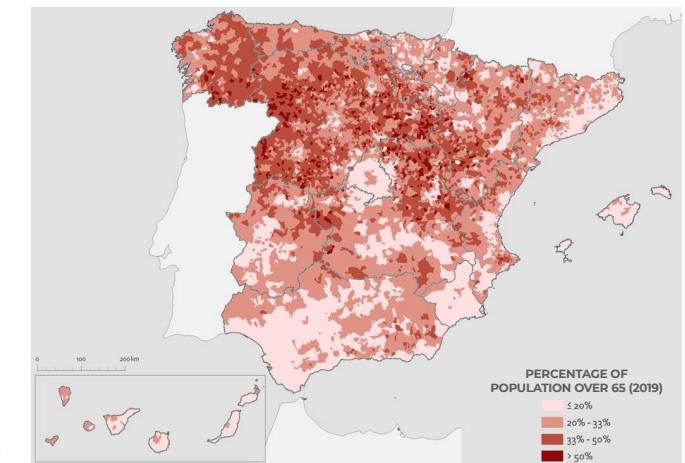
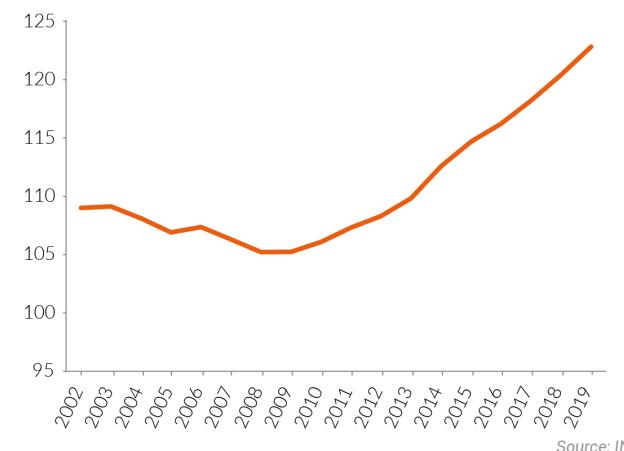
In 2019, there were 9 057 193 people aged over 64 (65 and older) in Spain, 19.3 % of the population. What's more, there was over-ageing of the population, that is, the fact that almost a third of those over 65 are over 80. In the rural areas, 24.8 % (1 538 496) of the population are over that age, meaning one in four inhabitants is over 65. In the 5 000 municipalities with less than 1 000 inhabitants, the percentage of those over 64 reaches 31 %.

The average age of the Spanish population in 2019 was 43.6, almost four years more than that recorded in the year 2001. The variation in median age is even greater, rising from 37.6 % in the year 2001, to 44.3 % in 2019. For women, those ages are even higher, due to the longer life expectancy.

Ageing has repercussions for the rate of dependency, reaching 54.2 % by the end of 2019, which means more of the population is potentially inactive than in active age. This indicator has risen 6 points from the year 2001.

At the same time, progressive ageing of the population is aggravated by low birth rates. The number of children per woman in Spain is 1.26, the lowest figure after Malta on the list of EU countries. What's more, this figure is accompanied by a gradual increase in average maternity age, from 30.7 years in 2001 to 32.2 in 2019.

### Ageing index of the population



Indicator/Variable	2010-2019	2015-2019	2018-2019
Ageing index of the population	15.4	8.1	2.5

In this variable the trend reflects the difference in percentage values in the indicated years.



There is a global consensus on the need to change the economic development model of recent years, based on a linear economy. Air, soil and water pollution (inland and marine), waste generation, the abusive exploitation of renewable and non-renewable natural resources (the former at a rate far and above their rate of renewal), and the loss of biodiversity due to the destruction and fragmentation of habitats, are all examples of the high price of reaching the state of well-being to which society aspires with this system of production.

The circular economy optimises the use of resources and fosters efficiency in the production system, minimising negative externalities. This improves the quality of the environment and its diversity, preserving and improving our natural capital. At the same time, the fostering of economic activity is the basis of improving the well-being of society, contributing to the development of areas suffering from population loss, who find, in activities associated with the circular economy, alternative forms of employment.

One of the bases of the circular economy is the reduction of the waste generated by productive and social activity. The market economy and globalisation has made it possible to provide companies and citizens with a wealth of materials and products, to which we must add their packaging for storage and distribution. By incorporating waste as materials in the production cycle, we avoid consumption of new materials and also the need for their management (including possible elimination). This circular economy model goes beyond a reduction in the generation of waste. The proposal is to reduce the use of raw materials, their transport from site of extraction or production and energy consumption for transfor-

mation processes. It is a model that makes for a more sustainable, low-carbon economy that is efficient in the use of resources.

The *European Green Deal*, presented on 11 December 2019, offers a new growth strategy that seeks the development of a competitive economy that is efficient in the use of resources, climate-neutral by the year 2050 and in which economic growth is generated with lower consumption of resources. It includes a roadmap with actions focussed on fostering efficient use of resources, restoring biodiversity and reducing pollution.

The *New Circular Economy Action Plan* for a cleaner and more competitive Europe (March 2020) is one of the instruments that will help achieve the objectives of the Green Deal. It focuses on sustainable use of resources and places special focus on the life cycle of products to make them more lasting and avoid the generation of waste. It therefore embraces one of the principal concerns of citizens who demand a change in production and consumption patterns.

To contribute to the principles of the *European Green Deal*, the approach of the Action Plan is very inclusive, in encompassing all economic stakeholders, consumers and citizens and encompassing the circular economy actions implemented since 2015. The success of the Action Plan requires Member States to incorporate it into their own circular economy strategies or plans.

In December 2015, the EU adopted its first circular economy action plan to support and manage the transition to a circular economy. With 54 actions, its aim is to serve as the basis for “*fostering employment, growth, investment in and development of an economy with zero carbon emissions, efficient in the use of resources and competitive*”.





## 2.4.2. WASTE AND THE CIRCULAR AND LOW-CARBON ECONOMY

The plan defined the circular economy as one with the aim that “*the value of products, materials and resources (water, energy, etc.) is maintained in the economy for as long as possible and that to minimize waste generation*”.

In 2017 and 2019, the Commission completed the interim evaluations established in the plan. One of the principles was the configuration of a circular economy monitoring framework with the European Environment Agency to measure the progress made.

Among the different initiatives carried out in the EU to advance towards a circular economy, and framed with the *European Strategy for Plastics* (Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee Of The

Regions. A European Strategy for Plastics in a circular economy) we find *Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment*. Its objectives are to “*prevent and reduce the impact of certain plastic products on the environment, in particular the aquatic environment, and on human health, as well as to promote the transition to a circular economy with innovative and sustainable business models, products and materials, thus also contributing to the efficient functioning of the internal market*”. It must be transposed into Spanish legislation by 3 July 2021.

Along this line, we must also consider that the International Resource Panel of the United Nations Environment Programme recommends that countries incorporate the value-retention processes (remanufacturing, refurbishment, repair and arranging direct reuse) into in their circular economy strategies. They are processes complementary to recycling that “*enable the retention of the inherent value of the product, whereas recycling retains just the value of the material or resource that is recycled*.”.

Another important element to consider is the *European Industrial Strategy* of March 2020. It offers a plan for the transformation of industry and support for small and medium-sized enterprises making Europe more sustainable and competitive. Among other aspects it is based on the ecological transition, finding in the *European Green Deal* the new European growth strategy.

The Framework Directive on Waste (Directive 2008/98/EC, amended extensively by *Directive (EU) 2018/851*) is the principal European regulation on waste. In its day, it set a landmark in waste management by establishing the principle of hierarchy and focusing its management approach on prevention and preparation for reuse and recycling, forcing countries to adopt waste management plan and prevention programmes.

It was transposed into Spanish law through *Law 22/2011, of 28 July, on waste and polluted soils*. In late 2013, the *State Programme for Waste Prevention 2014-2020* was approved and two years later (upon the expiry of the previous National Integrated Waste Management Plan (PNIR)), the *State Framework Plan for Waste Management (PEMAR) 2016-2022*





was approved as an instrument to guide waste policy in Spain with the one final objective: to make Spain a society efficient in the use of resources, advancing towards a circular economy.

There are many regulatory initiatives and corporate actions that arose from the state policy on waste management in the PEMAR. *Royal Decree 293/2018, of 18 May, on the reduction of consumption of plastic bags and creating the Register of Manufacturers*, for example, regulates the consumption of light plastic bags in Spain, transposing the EU directive. It includes the prohibition of light and very light plastic bags from the year 2021 (with the exception of compostable bags). It is one of the first initiatives along these lines that most recently led to Spain signing up to the *European Plastics Pact* in March 2020. 12 European countries initially signed up to this pact along with 90 multinationals and associations, with the aim of promoting the transition towards a circular economy in the plastic sector, eliminating plastic waste from the environment, reducing the unnecessary use of plastic and committing to innovation in the reuse and recycling of plastic.

During the drafting of this Profile, the Ministry was in the process of finalising the introduction, after the completion of the public consultation process, of a proposed royal decree on deposits to landfill, and in June 2020 the draft Bill on waste and contaminated soils was introduced, containing regulation of certain single-use plastic products. The future will establish new, more ambitious objectives for preparation for reuse and recycling of municipal waste and will include aspects relating the separate collection of bio-waste, textile waste, and domestic hazardous waste, among other new elements.

In this regard, priority number 22 of the Government's Declaration of the Climate and Environmental Emergency in Spain is to "Advance towards the circularity of the economy in economic and industrial sectors and processes and to adopt the Circular Economy Strategy and a Waste Management Law that tackles, among other issues, the problem of single-use plastics to achieve "zero waste" by 2050". It is a commitment that reaffirms the criteria for abandoning linear aspects of the economy towards greater environmental sustainability in the productive system.

Since 2 July 2020, Spain has a Circular Economy Strategy in place to advance in the transition to a sustainable model of low-carbon production that, while creating jobs, reduces the consumption of resources and the generation of waste.

Under the title "*Circular Spain 2030*", the strategy establishes objectives for 2030 to reduce domestic consumption of materials by 30 % and reduce the generation of waste by 15 % on 2010, which will also contribute to the reduction of GHG emissions. It will also reduce waste from the food chain (50 % reduction per capita at domestic level and retail consumption and 20 % in production and supply chains) from the year 2020, promote reuse and preparation for reuse of waste up 10 % of municipal waste generated and improve efficiency in the use of water of up to 10 %.





## 2.4.2. WASTE AND THE CIRCULAR AND LOW-CARBON ECONOMY

The strategy considers the provisions of the *European Circular Economy Action Plan*, which incorporates the global challenges established in the Sustainable Development Goals of the UN 2030 Agenda. It is based on a series of reviewable three-year action plans that set out the specific measures to be developed and that will, in line with their evaluations, enable the execution of the adjustments necessary to achieve the goals set for 2030. The first of those will be established for the period 2021-2023 and will be presented in late 2020.

The Spanish strategy is conceived as an integrative strategy that will include different existing initiatives (regulatory framework, plans, strategies, etc.) that contribute to achieving the complete circularity of the economy.

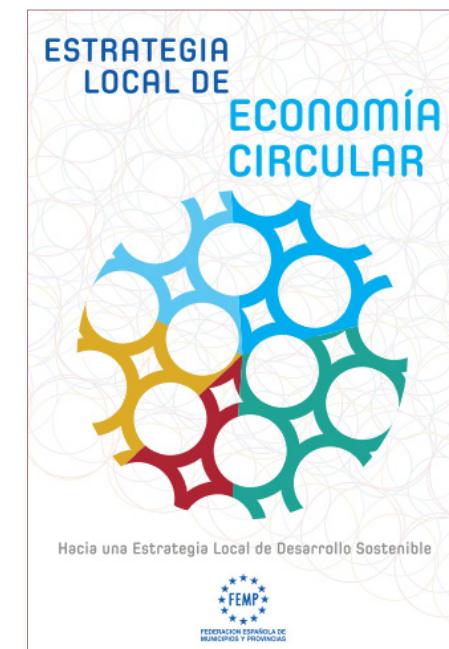
We can find one example of these components of the strategy in the *Ecological Public Procurement Plan of the General State Administration 2018-2025* (published in February 2019), which specifically establishes considerations for same. In fact, one of the objectives is, expressly, “*to serve as an instrument to drive the Spanish Strategy for the Circular Economy*”. One of the general criteria of action is to promote the contracting of companies with a management system in place that adheres to the *Community Eco-Management and Audit scheme (EMAS)*. Meeting the requirements established to register on this system improves the environmental performance of companies by contributing to the reduction of energy consumption ensuring they are more efficient in the consumption of resources. Spain has one of the highest number of companies that have adopted this commitment. In

October 2019, the number of organisations accredited with EMAS was 834, which represented 22.6 % of the 3 694 organisations registered throughout the EU-28. Only Germany and Italy registered more organisations than Spain (1 164 and 985 respectively), with the three countries accounting for 80.8 % of the total between them.

The ecological transition being driven by this Ministry considers the principles of the circular economy at all times and requires involving the public at large. Their participation is indispensable and can only be fully achieved within the framework of a fair transition process. That requires accompanying stimulus and support measures targeting the sector of the population most affected by the ecological transition. In this regard, there are plans for the creation of the Fair Transition Institute, and the signing of the Transition Agreements for application in geographic areas where social and economic development might be affected by the transition.

In addition to governments and companies, consumers are a fundamental part of the development of a circular economy. Citizens are one of the principal units of consumption, so their involvement and inclusion in the process is indispensable. The *New EU Circular Economy Action Plan* highlights the fact that the decisions of consumers can have repercussions for its success. In 2019, the Spanish Federation of Municipalities and Provinces published the *Local Circular Economy Strategy*, a document that includes practical recommendations based around five strategic axes: minimise the use of natural resources; management of water consumption; sustainability of urban spaces, healthy

spaces and habits and mainstreaming policies. Moreover, in line with the provisions established by the European Commission, the document proposes that municipalities should monitor their progress in the transition to the circular economy model and proposes indicators for that monitoring. It also includes an appendix with a series of measures for the initial evaluation of the degree of implementation of the circular economy in the municipality.





Its origins were forged in March 2017 in light of the approval of the *Seville Declaration: Cities' Commitment to the Circular Economy*. That saw more than 230 signatory cities commit to drafting their own local strategies focussed on two fundamental principles: guarantee that products remain in the system as long as possible and value the waste generated by recycling them as raw materials to be used in productive processes or as a source of energy that is integrated into the production cycle.

The new configuration of the Ministry of Ecological Transition and the Demographic Challenge establishes an important conceptual path for the configuration of its structure of competencies. *Royal Decree 500/2020, of 28 April, developing the basic organic structure of the Ministry for Ecological Transition and the Demographic Challenge., and amending Royal Decree 139/2020, of 28 January, establishing the basic organic structure of the ministerial departments*, creates the Sub-directorate General of the Circular Economy, which takes the place of the Sub-directorate General of Waste Management, assuming, among other competencies those relating to waste prevention and waste management and sustainable production and consumption and the circular economy. This structure clearly fosters the development of a circular model as opposed to the linear production system.



The World Health Organization considers the change from a linear economy to a circular economy to be an instrument that contributes to achieving the Sustainable Development Goals (SDGs), specifically SDG 12 (Responsible consumption and production). It can also provide an impetus for certain aspects of SDG 3 (Good health and well-being).

In 2019, the WHO published the report *Assessing the health impacts of a circular economy*, using its own 2018 report *Circular economy and health: opportunities and risks* as starting point. This report analyses the positive and negative health impacts that might be caused by the transition to a circular economy and highlights the gaps in knowledge, primarily in the nature of the negative impacts (for example in the case of dangerous chemical products).

There are positive effects in the reduction in the use of primary resources by ensuring longer use of materials and materials products and improving process requirements. But there are also negative effects in the recycling and reuse processes of products, components and hazardous materials that primarily affect vulnerable groups.

*"The transition to a circular economy is an opportunity to obtain benefits for health and help achieve the SDGs".*



## 2.4.2. WASTE AND THE CIRCULAR AND LOW-CARBON ECONOMY

### MUNICIPAL WASTE GENERATION

The indicator expresses the amount of municipal waste produced per inhabitant expressed in kg.

Municipal waste means waste produced by households, including other waste from similar sources (shops, offices and public institutions) and collected by or on behalf of municipal authorities and disposed of through the waste management system.

*Waste prevention is the first step in the waste hierarchy, as the preferred option prior to any management operation. This approach of the Framework Directive and Law 22/2011, on waste and contaminated soils, is reinforced by the 2020 Strategy, which is aimed at changing the current resource-intensive economy to a new growth model based on its efficient use preceded by its lesser generation.*

*The Indicator helps monitor Sustainable Development Goal 12 (Responsible consumption and production).*

#### Source:

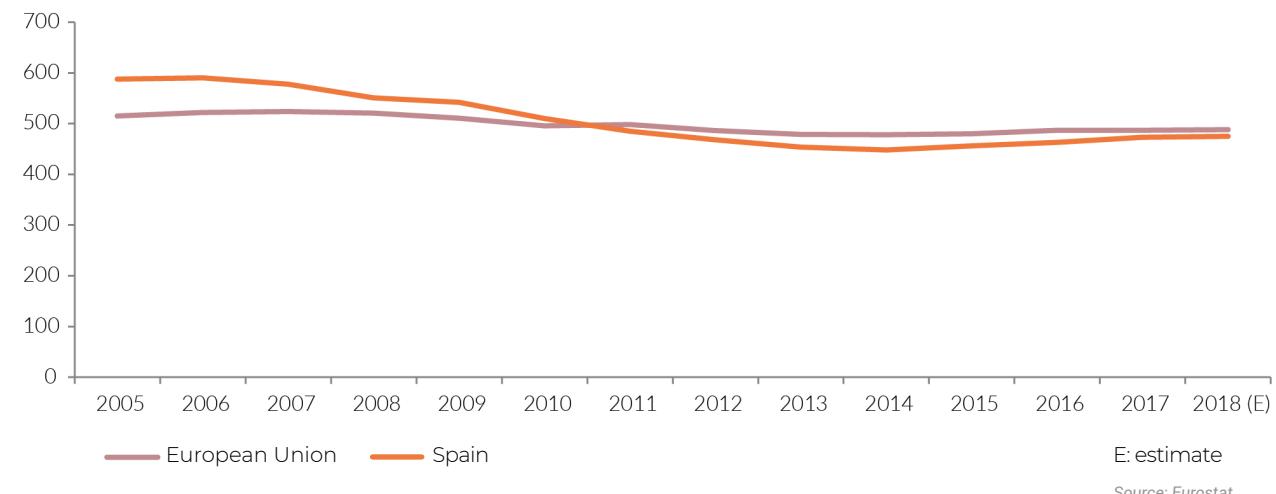
Eurostat (2020). Municipal waste by waste management operations [env\_wasmun]. Viewed [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env\\_wasmun](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wasmun)

According to the estimate based on the data from Eurostat, excluding data from Ireland, Greece and Cyprus, which were unavailable as of 8 May 2020, Spain, with 22.2 million tons of municipal waste, contributed 8.9 % of the total municipal waste in the EU-28 in 2018, and as in previous years was the fifth contributor by volume behind Germany, France, the United Kingdom and Italy.

In relative terms, based on inhabitants, in 2018, Spain generated 475 kg/inhab (estimated data) compared to 488 kg/inhab generated on average for the same year in the EU-28. Since 2011, Spain has generated less waste per inhabitant than the EU-28.

In one comparison of countries, just 13 countries generated less waste per inhabitant than Spain in 2018. The data for Ireland, Greece and Malta are not included, although in previous years the quantity of waste for these countries has always been higher than Spain's.

**Municipal waste generation (kg/inhab)**



Indicator/Variable	2009-2018	2014-2018	2017-2018
Municipal waste generation (kg/inhab)	-12.4 %	6 %	0.4 %



## MUNICIPAL WASTE TREATMENT

Quantity of urban municipal waste treated through recycling of materials, composting (includes anaerobic digestion of biodegradable waste), incineration with energy recovery and landfill.

The definition of municipal waste can be seen in the previous indicator or in the appendix on clarification notes.

*The deposit of waste in landfill constitutes a loss of resources and generates pressures on the environment arising from leachate, atmospheric emissions and land occupation. An efficient economy in the use of resources minimizes the dumping of waste in favour of their recovery, hence the importance of providing information to monitor their management.*

*The Indicator assists the monitoring of Sustainable Development Goal 12 (Responsible consumption and production).*

### Source:

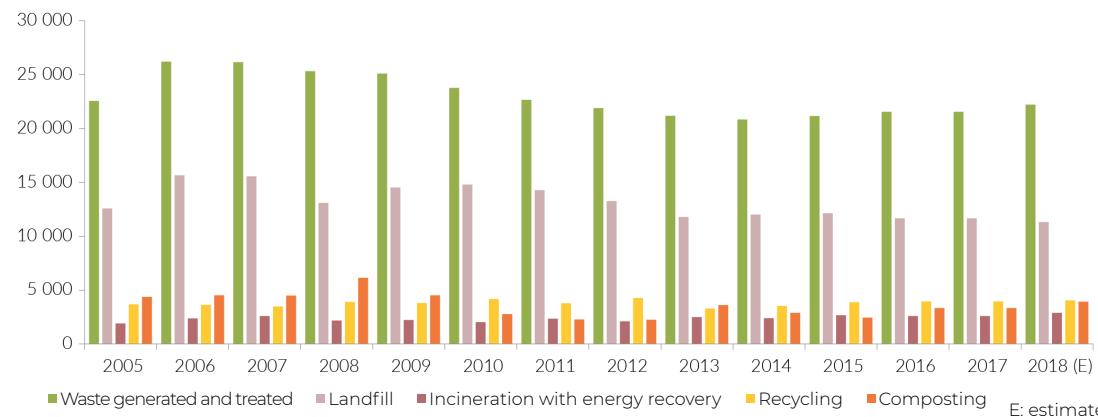
Eurostat (2020). Municipal waste by waste management operations [env\_wasmun]. Viewed [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env\\_wasmun](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wasmun)

Spain contributed close to 9 % of the total municipal waste generated in the EU-28, the fifth contributor by volume behind Germany, France, the United Kingdom and Italy.

Looking at treatment operations, in 2018 (estimated data) Spain deposited 51 % of waste generated in landfill. A figure higher than that for the EU-28, which was 22.5 %. However, the trend is positive with a reduction over recent years as demonstrated by the figures: 57.7 % in 2014, 57.3 % in 2015, 54.1 % in 2016 and 52.9 % in 2017. Nevertheless, it is necessary to continue to reduce these percentages to meet the objective of the State Waste Framework Plan 2016-2022, which is to not exceed 35 % in 2020.

Except for composting of waste (including anaerobic digestion), a management alternative that slightly exceeded the EU-28 level in Spain in 2018 (17.7 % compared 17 % for Europe), in the rest of the operations, differences were detected compared to Europe. Spain incinerated (using incineration with energy recovery) 13 % of waste, compared to 28.1 % for the EU-28 and materially recycled 18.3 % of waste, with Europe's figure for same 30.1 %. The aim of energy recovery established in the PEMAR is to reach up to 15 % in 2020, just a two -percentage-point difference with respect to 2018.

**Municipal waste treatment (1000 t)**



Source: Eurostat

Indicator/Variable	2009-2018	2014-2018	2017-2018
Waste generated and treated	-11.5 %	6.7 %	0.9 %
Landfill	-22.1 %	-5.8 %	-2.9 %
Incineration with energy recovery.	29.3 %	21.1 %	11.9 %
Recycling of material goods	6.5 %	15.1 %	2.8 %
Composting (includes anaerobic digestion)	-12.7 %	36.2 %	17.7 %



## 2.4.2. WASTE AND THE CIRCULAR AND LOW-CARBON ECONOMY

### PACKAGING WASTE

The indicator shows the recycling and recovery rates for packaging. They are calculated as a percentage of the packaging waste recycled and recovered (including recovery and incineration at waste incineration facilities with energy recovery) with respect to the quantity of waste generated (both quantities in tons).

*The Waste Framework Directive establishes the principle of hierarchy in waste management options. After the prevention, the best option is preparation for reuse, followed by recycling and other forms of recovery (including energy). The last option should be elimination, which includes deposit in landfill.*

*The indicator allows for monitoring of Sustainable Development Goals 11 (Sustainable cities and communities) and 12 (Responsible consumption and production).*

#### Source:

Sub-directorate General for the Circular Economy. (2020). Data provided by means of express request. General Secretariat for Environmental Assessment and Quality. Ministry for Ecological Transition and the Demographic Challenge (MITERD).

In 2018, with 7.5 million tons of waste generated, a quantity very similar to 2017's figure (increasing only 0.13 %), the global packaging waste recycling and recovery rates reached 68.8 % and 74.5 % respectively, increasing slightly on 2017 values. For each type of material considered, these rates were the following:

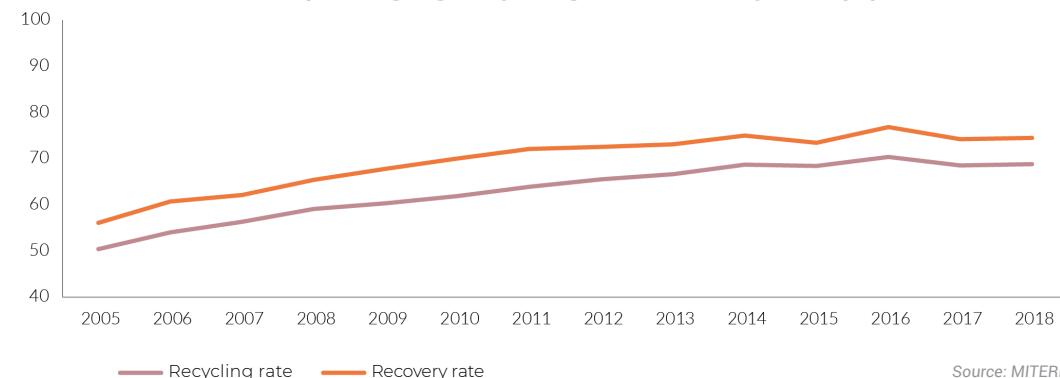
	Glass	Plastic	Paper and cardboard	Metals	Wood	Other	Total
Recycling rate (%)	76.8	50.7	72.5	84	67	0	68.8
Recovery rate (%)	76.8	66.1	76.1	84.4	80.5	4.1	74.5

In recent years, an upward trend has been maintained for both rates, although isolated decreases were detected in 2015 and 2017. The aim of recycling, as provided for in the State Waste Framework Plan (PEMAR) 2016-2022 is to reach 70 % of total recycling in 2020. The 2018 data continue to bring us closer to that target.

In terms of materials, in 2018 the recycling objectives set out in the PEMAR for 2020 for glass (75 %), plastic (40 %) metals (70 %) and wood (60 %) have already been met, with those for paper and cardboard remaining pending (set at 85 %). Nevertheless the future of the waste and contaminated soil, as we have seen in the draft bill of 2 June 2020 submitted for parliamentary approval, new criteria will be established for management of packing and waste, including plastic bottles for example.

In relation to the EU-28, in 2017 Spain reached a higher recycling rate for packaging than the EU average (which was 67 %), the country with the ninth highest rate. For energy recovery, however, Spain was positioned in the mid-table, some six percentage points below the average rate for EU-28, which was 80.2 %.

Global packaging recycling and recovery rate (%)



Source: MITERD

Indicator/Variable	2009-2018	2014-2018	2017-2018
Recycling rate	8.5	0.1	0.3
Recovery rate	6.7	-0.5	0.3

In these variables, the trend reflects the difference in percentage values in the indicated years.



## ENERGY PRODUCTIVITY

This indicator shows the economic wealth produced (measured as GDP) per unit of gross domestic energy consumption. The gross internal consumption of energy is the consumption of primary energy plus the oil used for non-energy purposes. This ratio is provided for the average of the EU-28 countries and for Spain.

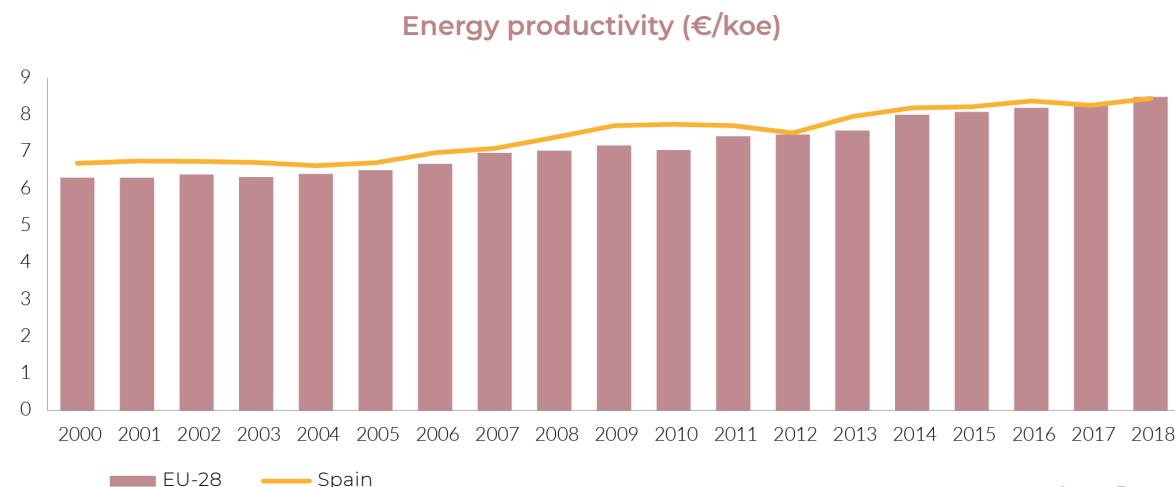
*The amount of economic wealth produced per each unit of energy consumed is a key variable for monitoring the environmental efficiency of the economic system.*

*The indicator allows for monitoring of Sustainable Development Goal 7 (Affordable and clean energy). It also contributes to the monitoring of the Europe 2020 Strategy and the Clean Energy package for all Europeans.*

Energy productivity allows us to measure how efficient a country is in relation to the economic wealth generated with the energy available to it. If we compare two years, greater productivity implies more wealth generated with the same energy consumption; that the growth in wealth has been greater than that of energy used or the same wealth achieved consuming less energy. The ability to analyse how much energy is consumed to maintain economic development is important for monitoring the “*Clean Energy for all Europeans*” package which in 2019 incorporated the *Revised Energy Efficiency Directive* (Directive (EU) 2018/2002, of 11 December 2018, amending Directive 2012/27/EU on energy efficiency). In that directive, the EU establishes new standards for energy efficiency, including the aim of reaching 32.5 % for 2030, more ambitious than the 20 % set for 2020 by the *Europe 2020 Strategy*.

Spain shows a positive evolution in energy productivity, with annual increases since 2005 (with the exception of the years 2011, 2012 and 2017). It also presents slightly higher values than the EU-28 average, while in 2018 those values met at 8.5 €/kgoe.

In the European environment, in relation to energy productivity, in order to make comparisons between countries, the measure used is purchasing power parity (PPP) and Spain stood in tenth position in the EU-28 in 2018. The €9.4 (in purchasing power parity)/kgoe in 2018 represented growth of 2.6 % on 2017.



### Source:

Eurostat (2020). Energy productivity (sdg\_07\_30). Viewed May 2020  
[https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=sdg\\_07\\_30](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=sdg_07_30)

Indicator/Variable	2009-2018	2014-2018	2017-2018
Energy productivity	9.6 %	3.2 %	2.3 %



## 2.4.2. WASTE AND THE CIRCULAR AND LOW-CARBON ECONOMY

### DOMESTIC MATERIAL CONSUMPTION

Total annual quantity of solid, liquid and gaseous materials (not including air or water) used directly by the economy consumed in Spain. In addition to the variable National Consumption of Materials (NCM), the indicator includes two of the main ratios derived from it: Intensity per inhabitant and Productivity. The indicator is shown as an index (2008=100).

*Domestic Material Consumption (DMC) allows the resource productivity to be estimated, one of the main indicators of the total established, to assess "resource efficiency". In this sense, the consumption of resources is more efficient insofar as the increase in economic wealth is produced with an increasingly lower consumption of resources. When this happens, we say that there is a disengagement between the use of materials and economic growth.*

*The Indicator allows us to monitor Sustainable Development Goal 12 (Responsible consumption and production) and the Europe 2020 strategy.*

#### Source:

National Institute of Statistics (INE) (2020). *Environmental accounts: Material flow account.* Viewed May 2020, INEbase/Agricultura y medio ambiente/Cuentas ambientales/Cuenta de flujo de materiales/Principales indicadores de flujos de materiales. [https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736176943&menu=resultados&idp=1254735976603](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176943&menu=resultados&idp=1254735976603)

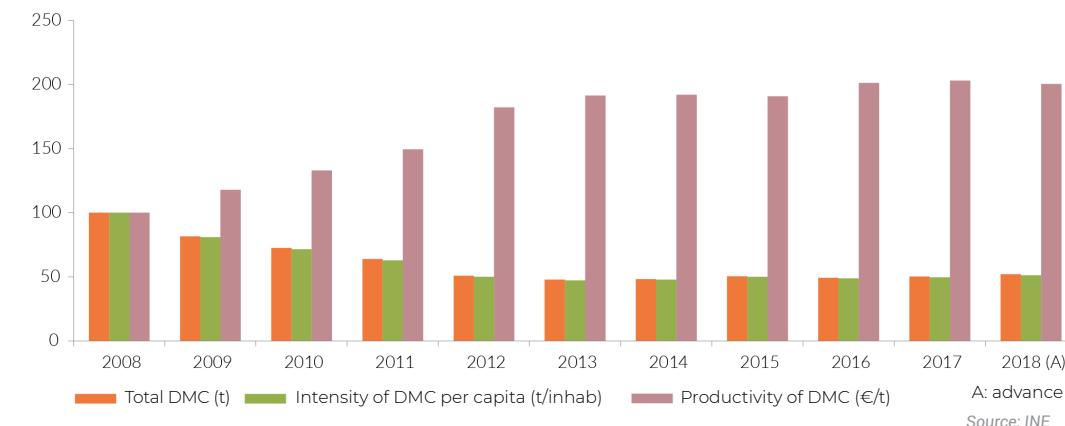
In the year 2018, material consumption (annual quantity of solid, liquid and gaseous materials not including air or water) used directly by the economy grew again. The 422.97 million tons consumed represented 6 % of the material consumption of the EU-28 (seventh among the countries with the highest consumption). The increase of 3.7 % was superior to the 2 % recorded in 2017. In the series, the year 2014 ushered in a period of growth in demand for materials (interrupted only in 2016) and broke the negative trend going back to 2008.

Of the total consumed in 2018, 82.8 % was sourced from domestic extraction (5.9 % higher than in 2018), with non-metallic minerals accounting for 54.6 %, biomass for 39.1 %, metallic minerals for 5.5 % and fossil fuels for 0.8 %.

In relative terms, annual material consumption per capita also reversed the downward trend observed since 2008 with a turnaround in 2014, ushering in a period of growth from 8.4 t/inhab that year to 9.1 t/inhab in 2018 (an increase of 3.2 %). In the European sphere, Spain stood out as the country with the third lowest material consumption per capita in 2018, bettered only by Italy and the United Kingdom. The EU-28 average was 13.6 t/inhab.

Material productivity represents the quantity of GDP generated per unit of material consumption. In 2018, that was 2 764.3 euros per ton of material consumed. If it's compared to the 2017 value, we detect a decrease of 1.3 %.

Domestic Material Consumption. Index; 2008=100



Indicator/Variable	2009-2018	2014-2018	2017-2018
Domestic Material Consumption (tons)	-36.2 %	7.9 %	3.7 %
Intensity of DMC per capita (t/inhab)	-36.7 %	7.2 %	3.2 %
Productivity of materials (euros/t)	70.1 %	4.4 %	-1.3 %



## ENVIRONMENTAL TAXES

The indicator shows the annual value, expressed in millions of euros as a percentage of total GDP, of the sum collected as environmental taxes.

Calculation includes taxes which have a tax base that consists of a physical unit (or similar) of a certain material that has a negative impact –verified and specific– on the environment. They are distributed in taxes on energy, transport and pollution and resources.

*The monitoring of environmental taxes is an indispensable tool for analysing the interrelationships between the environment and the economy in general and, in particular, for assessing sustainable development and for monitoring environmental policy actions at national and international level.*

*The Indicator helps monitor Sustainable Development Goal 12 (Responsible consumption and production).*

### Source:

Eurostat (2020). Environmental tax revenues [env\_ac\_tax]. Viewed May 2020 [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env\\_ac\\_tax&lang=en](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_tax&lang=en)

Total environmental taxes reached the figure of 22.066 billion euros in 2018, experiencing a rise of 3.3 % in comparison to 2017. The upward trend, which returned in 2013 after a period of decreases between 2008 and 2012, therefore continues to grow.

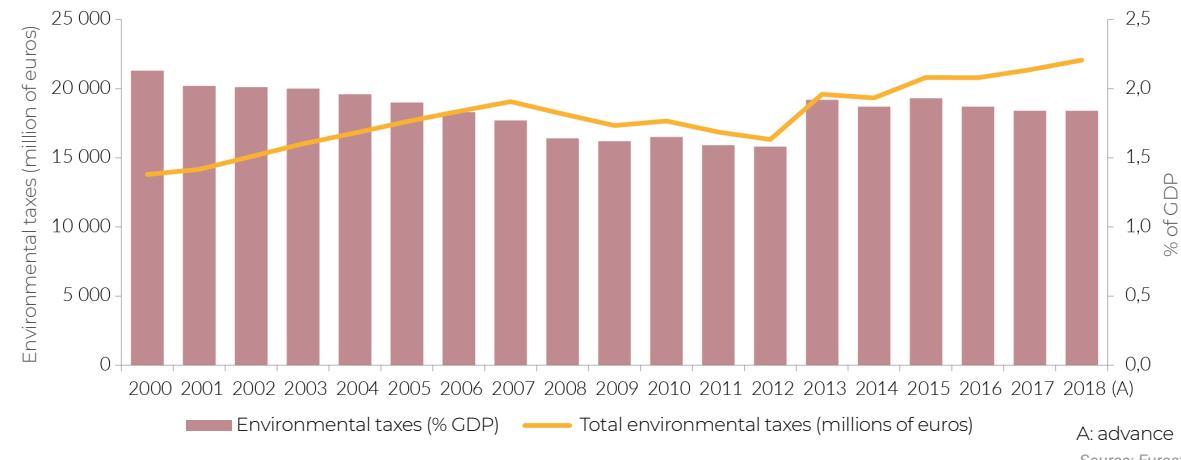
Spain was the country with the sixth biggest contribution to total environmental taxes in the EU-28 in 2018, contributing 5.8 % of the total. The growth in environmental taxes in Spain this year was 2.2 %.

However, in relation to GDP, Spain had the fourth lowest proportion, with environmental taxes representing 1.84 % of GDP, a value that has varied very little over recent years. In relation to total taxes raised in Spain, in 2018 environmental taxes represented 8.1 % of the total.

In 2018, the contribution to environmental taxes of the three categories into which they are classified was the following. Energy taxes accounted for 82.7 %, transport taxes for 13 % and pollution and resources taxes for the remaining 4.3 %. Compared to the previous years, energy taxes rose 3.2 %, transport taxes 3.2 %, those pertaining to pollution 4.9 % and resources 0.3 %.

Analysis of this contribution in general terms demonstrates that, over the last 4 years, the contribution in three categories has remained similar (energy taxes 82.9 %, transport taxes 12.7 % and taxes on pollution and resources 4.4 %). However, in comparison to previous years, the growth in the contribution of energy and pollution and resources to the detriment of contribution of transport taxes, can be observed.

**Environmental taxes in Spain. Total and as a % of GDP**



Indicator/Variable	2009-2018	2014-2018	2017-2018
Total environmental taxes	27.3 %	14.1 %	3.3 %
* Environmental taxes as a % of GDP	0.2	0	0

In this variable the trend reflects the difference in percentage values in the indicated years.



## 2.4.2. WASTE AND THE CIRCULAR AND LOW-CARBON ECONOMY

### NATIONAL ENVIRONMENTAL PROTECTION EXPENDITURE

The indicator sets out the total amount of economic resources used in Spain for the protection of the environment.

*The prevention, reduction and disposal of pollution and any other degradation of the environment together with measures to restore it after its degradation are the basis for sustainable development. Investing in these activities is a way to quantify the level of involvement of the administrative, political, economic and social systems.*

*The indicator can contribute to the monitoring of a number of the Sustainable Development Goals (6, 7, 12, 13, 14 and 15, for example).*

#### Source:

National Institute of Statistics (INE) (2020). *Environmental protection expenditure account*. Viewed May 2020, INEbase/Agricultura y medio ambiente/Cuentas ambientales/Cuenta de gasto en protección ambiental/Resultados nacionales. Serie 2010-2017 y avance 2018/Gasto nacional en protección ambiental/1.1 Gasto nacional en protección ambiental por ámbito de protección ambiental, estructura porcentual y tasas de variación interanuales. [https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736177048&menu=resultados&idp=1254735976603](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736177048&menu=resultados&idp=1254735976603)

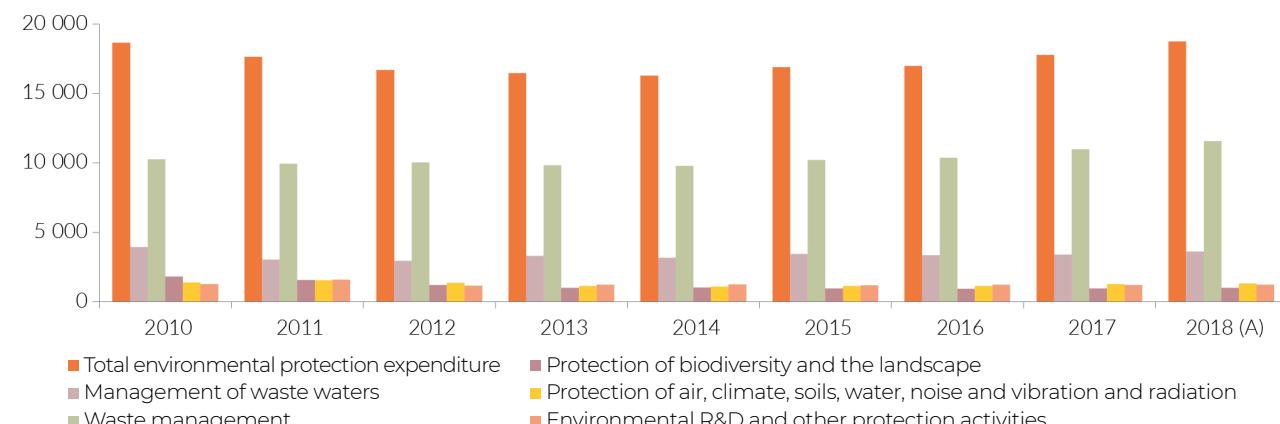
In 2018, environmental protection expenditure was 18 729 million euros, a figure of 5.5 % higher than 2017, thus maintaining the growth trend observed in recent years.

By categories, waste management is responsible for the greater share of environmental protection expenditure (61.8 %) and, moreover, presents an upward trend. That's followed by waste water management with a spend of 19.3 % which has maintained a stable proportion over recent years. In third place was the protection expenditure on air, climate, soils, water, noise and vibrations and radiation (7.1 %) and in fourth was environmental R&D and other environmental protection activities (6.5 %). Both have maintained proportions similar to recent years above 7 % and 6.5 % respectively. However, the protection of biodiversity and the landscape have recorded continuous reduction in their contribution to the total expenditure, falling from 9.7 % in 2010 to 5.3 % in 2018.

Nevertheless, environmental protection expenditure has increased across the five categories to a greater or lesser extent in the last year.

In terms of environmental protection expenditure as a percentage of GDP, the figure remains stable and between 1.5 % and 1.6 % across the series, recorded at 1.6 % in 2018.

**Environmental protection expenditure (millions of euros)**



Source: INE

Indicator/Variable	2010-2018	2014-2018	2017-2018
Environmental protection expenditure	0.5 %	15 %	5.5 %



## ENVIRONMENT-RELATED EMPLOYMENT

The indicator shows the number of full-time jobs in environmental protection and natural resource management activities.

*Environmental employment relates economic and social welfare aspects to the environment. It is one of the basic tools for achieving an ecological transition according to the principles of sustainable development (included in the Europe 2020 Strategy and other initiatives), as well as for moving towards a resource-efficient and low-emission economy.*

*The indicator allows for monitoring of Sustainable Development Goals 8 (Decent work and economic growth) and 12 (Responsible consumption and production).*

### Source:

National Institute of Statistics (INE) (2020). *Environmental goods and services account*. Viewed May 2020, INEbase/Agricultura y medio ambiente/Cuentas ambientales/Cuenta de bienes y servicios ambientales/Resultados/Resultados nacionales. Serie 2014-2017 y avance 2018/Principales resultados/I.4 Empleo equivalente a tiempo completo por sectores de actividad (CNAE 2009) y ámbitos y 3.1 Indicadores del sector de bienes y servicios ambientales por actividades económicas (CNAE 2009). [https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736177053&menu=resultado&idp=1254735976603](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736177053&menu=resultado&idp=1254735976603)

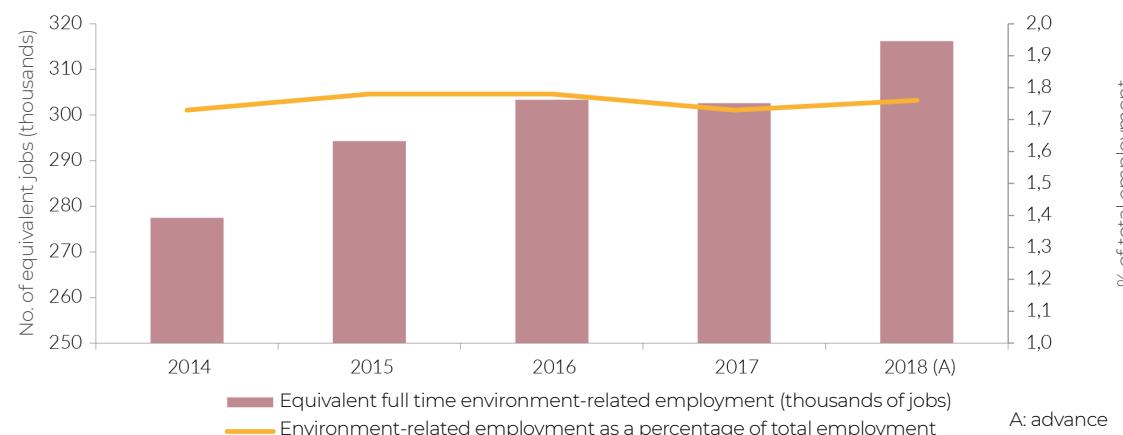
Environment-related employment is a principal element of recent EU initiatives. The *Clean energy for all Europeans* package drafted by the Commission in March 2019 indicates that the transition towards clean energy, in addition to reducing emissions, offers growth and employment opportunities in Europe. According to the *New Circular Economy Action Plan for a cleaner and more competitive Europe* (COM (2020) 98 final) “Between 2012 and 2018 the number of jobs linked to the circular economy in the EU grew by 5 % to reach around 4 million”.

In Spain, in 2018, the environment-related economy employed 316 200 full time workers, representing 1.76 % of total employment. In comparison to the previous year, that figure is up 4.5 % and up 14 % on 2014 (the first year of records).

By sectors of activity, water supply, sanitation activities, waste management and decontamination (40.5 %), the services sector (23.5 %) and extraction and manufacturing industries (13.5 %) represented over 75 % of environment-related employment. The agriculture, livestock, forestry and fisheries sector also made an important contribution of 12.1 % to environment-related employment, while the contribution of construction and the sector led energy supply fell to 5.9 % and 4.5 % respectively.

In terms of economic accounting, the gross value added of the environmental economy stood at 26.424 billion euros in 2018, 5.5 % higher than in 2017, representing close to 2.2 % of GDP.

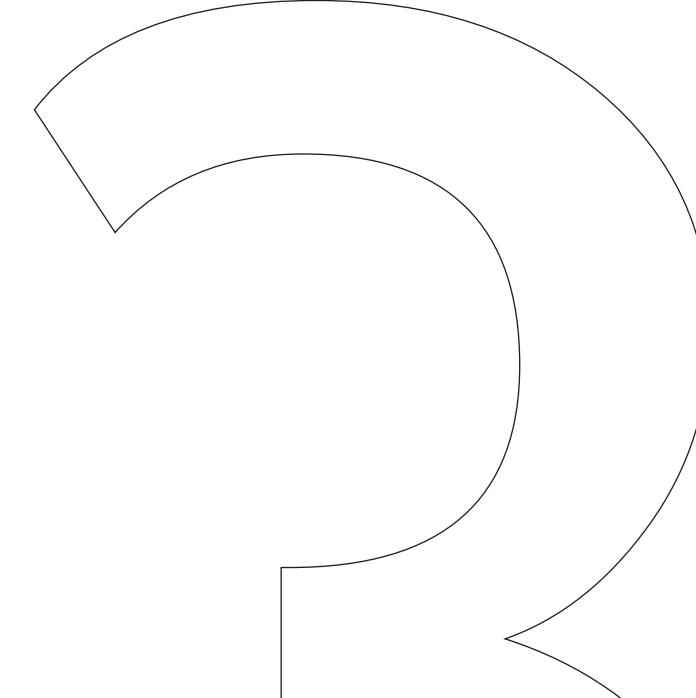
**Environmental Employment: No. of jobs and % of total jobs**



A: advance

Source: INE

Indicator/Variable	2014-2018	2017-2018
Equivalent full time environmental employment	14 %	4.5 %



## **INFORMATION BY AUTONOMOUS COMMUNITY: BASIC DATA**

### 3.1. Introduction

In this new edition of the Environmental Profile of Spain for 2019, the section dealing specifically with the autonomous communities has seen a structural change from previous years. Rather than publish 19 different files, one for each autonomous community and the two autonomous cities of Ceuta and Melilla, graphic information is provided with references to six selected environmental indicators in which the situation for each of the autonomous territories is analysed.

This format is based around a map of Spain with a basic interactive function. By moving the cursor over the different autonomous communities they are highlighted in the corresponding information graphs for each autonomous community.

The aim pursued is, once again, to offer a lighter, more compact final document as was done last year, and take a step forward in offering interactive information that simplifies the standard publishing and reference processes.

The features of the new format, both in terms of structure and content are the following:

- Each indicator occupies one single page.
- The environmental information is presented thematically and refers to surface area under protection, distribution of land use, average air quality, renewable electricity consumption and the circular economy.
- The basic socio-economic information centres on the following variables: demographics, GDP per capita, GAV by sector, sectoral structure of employment and unemployment rate.

### 3.2 Links to websites relating to the environment of autonomous communities and the autonomous cities of Ceuta y Melilla

The links to the websites of the autonomous communities and autonomous cities are the following:

Autonomous Community and Autonomous Cities	Links to websites on the environment
Andalusia	<a href="http://www.juntadeandalucia.es/medioambiente/site/portalweb">http://www.juntadeandalucia.es/medioambiente/site/portalweb</a>
Aragon	<a href="https://www.aragon.es/temas/medio-ambiente">https://www.aragon.es/temas/medio-ambiente</a>
Canary Islands	<a href="http://www.gobiernodecanarias.org/transparencia/destacados/medioambiente/">http://www.gobiernodecanarias.org/transparencia/destacados/medioambiente/</a>
Cantabria	<a href="https://www.cantabria.es/web/consejeria-de-desarrollo-rural-ganaderia-pesca-y-biodiversidad">https://www.cantabria.es/web/consejeria-de-desarrollo-rural-ganaderia-pesca-y-biodiversidad</a> <a href="https://cima.cantabria.es/">https://cima.cantabria.es/</a>
Castile and León	<a href="https://medioambiente.jcyl.es/web/jcyl/MedioAmbiente/es/Plantilla100/1246988359553//_/">https://medioambiente.jcyl.es/web/jcyl/MedioAmbiente/es/Plantilla100/1246988359553//_/_</a>
Castile - La Mancha	<a href="https://www.castillalamancha.es/tema/medio-ambiente/calidad-ambiental">https://www.castillalamancha.es/tema/medio-ambiente/calidad-ambiental</a>
Catalonia	<a href="http://mediambient.gencat.cat/es/05_ambits_dactuacio/index.html">http://mediambient.gencat.cat/es/05_ambits_dactuacio/index.html</a>
Ceuta	<a href="http://www.lineaverdeceutatrace.com/">http://www.lineaverdeceutatrace.com/</a>
Melilla	<a href="https://medioambientemelilla.es/">https://medioambientemelilla.es/</a>
Madrid	<a href="https://www.comunidad.madrid/servicios/urbanismo-medio-ambiente">https://www.comunidad.madrid/servicios/urbanismo-medio-ambiente</a>
Navarre	<a href="http://www.navarra.es/home_es/Temas/Medio+Ambiente/">http://www.navarra.es/home_es/Temas/Medio+Ambiente/</a>
Valencia	<a href="http://www.agroambient.gva.es/es">http://www.agroambient.gva.es/es</a>
Extremadura	<a href="http://extremambiente.juntaex.es/index.php">http://extremambiente.juntaex.es/index.php</a>
Galicia	<a href="https://cmatv.xunta.gal/medio-ambiente-e-sustibilidade">https://cmatv.xunta.gal/medio-ambiente-e-sustibilidade</a>
Balearic Islands	<a href="http://www.caib.es/govern/organigrama/area.do?lang=es&amp;coduo=2390691">http://www.caib.es/govern/organigrama/area.do?lang=es&amp;coduo=2390691</a>
La Rioja	<a href="https://www.larioja.org/medio-ambiente/es">https://www.larioja.org/medio-ambiente/es</a>
Basque Country	<a href="https://www.euskadi.eus/gobierno-vasco/medio-ambiente/">https://www.euskadi.eus/gobierno-vasco/medio-ambiente/</a>
Asturias	<a href="https://www.asturias.es/portal/site/medioambiente/menu-item.902b26b36a5e1f63e7cc2a20a6108a0c/?vgnextoid=3cfda5c7be-9fa110VgnVCM1000006a01a8c0RCRD&amp;i18n.http.lang=es">https://www.asturias.es/portal/site/medioambiente/menu-item.902b26b36a5e1f63e7cc2a20a6108a0c/?vgnextoid=3cfda5c7be-9fa110VgnVCM1000006a01a8c0RCRD&amp;i18n.http.lang=es</a>
Murcia	<a href="https://www.carm.es/web/pagina?IDCONTENIDO=64&amp;IDTIPO=140&amp;RASTRO=c\$m22679">https://www.carm.es/web/pagina?IDCONTENIDO=64&amp;IDTIPO=140&amp;RASTRO=c\$m22679</a>

### 3.3 Source of information and clarification notes

The sources of information and clarifying notes necessary to interpret each of the indications are the following:

#### Socio-economic Information

National Institute of Statistics (INE) (2020). *Spanish Regional Accounting. 2000-2019 series by autonomous communities and autonomous cities*. Viewed [https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica\\_C&cid=1254736167628&menu=resultados&idp=1254735576581#!tabs-1254736158133](https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736167628&menu=resultados&idp=1254735576581#!tabs-1254736158133) First data estimates 2019.

National Institute of Statistics (INE) (2020). *No. of people employed by economic sector, sex and autonomous community. Percentages with respects to the total of each community Average across the four quarters of the year*. Viewed <https://www.ine.es/jaxiT3/Tabla.htm?t=4949&L=0>

National Institute of Statistics (INE) (2020). *Unemployment rates by different age groups, sex and autonomous community Annual average for the four quarters*. Viewed <https://www.ine.es/jaxiT3/Tabla.htm?t=4966&L=0>

National Institute of Statistics (INE) (2020). *Population by community, age, Spanish nationals/foreign nationals, sex and year. Principal population series since 1998*. Viewed <https://www.ine.es/jaxi/Datos.htm?path=/t20/e245/p08/l0/&file=02001.px#!tabs-tabla>

#### Terrestrial surface area under protection:

Ministry for Ecological Transition and the Demographic Challenge. (2020). *Banco de Datos de la Naturaleza*. Directorate General of Biodiversity, Forests and Desertification. Data provided upon express request by the Sub-directorate General for Land and Marine Biodiversity

Regionalised national data as of 31/12/2019.

#### Land use distribution:

Ministry for Ecological Transition and the Demographic Challenge. (2020). *Banco de Datos de la Naturaleza*. Directorate General of Biodiversity, Forests and Desertification. Data provided upon express request by the Sub-directorate General for Land and Marine Biodiversity

Information obtained from the European Commission. National Geographic Institute (2020). Map of land occupation in Spain corresponding to the European CORINE Land Cover (CLC) project. 2012 and 2018 version. European Environment Agency, European Commission. Viewed May 2020, from <http://centrodedescargas.cnig.es/CentroDescargas/catalogo.do?Serie=SIOSE>

#### Air quality in relation to the protection of human health:

Ministry for Ecological Transition and the Demographic Challenge. (2020). *Air Quality Database*. General Secretariat for Environmental Assessment and Quality. Data provided upon express request to the Sub-directorate General for Clean Air and Industrial Sustainability.

For each of the contaminants, the number of stations used in the evaluation of air quality for 2018 in each of the ranges in which average annual concentration is classified (average  $\mu\text{g}/\text{m}^3$ ), classification based on ranges of the following legislated values:

- $\text{NO}_2$ : Referred to the Lower Evaluation Threshold (LET), Upper Evaluation Threshold (UET) and Annual Limit Value (ALV). These ranges are:
  - Concentrations below or equal to the LET/2 ( $13 \mu\text{g}/\text{m}^3$ )
  - Concentrations between the LET/2 and the UET ( $13-26 \mu\text{g}/\text{m}^3$ )
  - Concentrations between the LET and the UET ( $26-32 \mu\text{g}/\text{m}^3$ )
  - Concentrations between the UET and the ALV ( $32-40 \mu\text{g}/\text{m}^3$ )
  - Concentrations exceeding the ALV ( $> 40 \mu\text{g}/\text{m}^3$ )
- $\text{PM10}$ : Referred to the Lower Evaluation Threshold (LET), Upper Evaluation Threshold (UET) and Annual Limit Value (ALV). These ranges are:
  - Concentrations below or equal to the LET/2 ( $10 \mu\text{g}/\text{m}^3$ )
  - Concentrations between the LET/2 and LET ( $10-20 \mu\text{g}/\text{m}^3$ )
  - Concentrations between the LET and the UET ( $20-28 \mu\text{g}/\text{m}^3$ )
  - Concentrations between the UET and the ALV ( $28-40 \mu\text{g}/\text{m}^3$ )
  - Concentrations exceeding the ALV ( $> 40 \mu\text{g}/\text{m}^3$ )

### 3. INFORMATION BY AUTONOMOUS COMMUNITY: BASIC DATA

- PM2.5: Referred to the Lower Evaluation Threshold (LET), Upper Evaluation Threshold (UET) and Annual Limit Value (ALV). These ranges are:
  - Concentrations below or equal to the LET/2 (6  $\mu\text{g}/\text{m}^3$ )
  - Concentrations below or equal to the LET/2 and LET (6-12  $\mu\text{g}/\text{m}^3$ )
  - Concentrations between the LET and the UET (12-17  $\mu\text{g}/\text{m}^3$ )
  - Concentrations between the UET and the ALV (17-25  $\mu\text{g}/\text{m}^3$ )
  - Concentrations exceeding the ALV (> 25  $\mu\text{g}/\text{m}^3$ )
- Regarding ozone ( $\text{O}_3$ ), the percentage of stations with sufficient data volume included in each one of the three reference ranges into which the maximum daily values of eight-hour running averages are divided is shown. For the protection of human health, they must not exceed the average values more than 25 times within a term of three years (corresponding to the Target Value, TV) or within a term of one calendar year (corresponding to the Long Term Target, LTT) These ranges are:
  - Concentrations below or equal to the LTT (120  $\mu\text{g}/\text{m}^3$ )
  - Concentrations between the LTT and the TV
  - Concentrations above the TV (120  $\mu\text{g}/\text{m}^3$  and 25 exceedances in 3 years)

#### **Production of electricity from renewable sources as % of total electricity production**

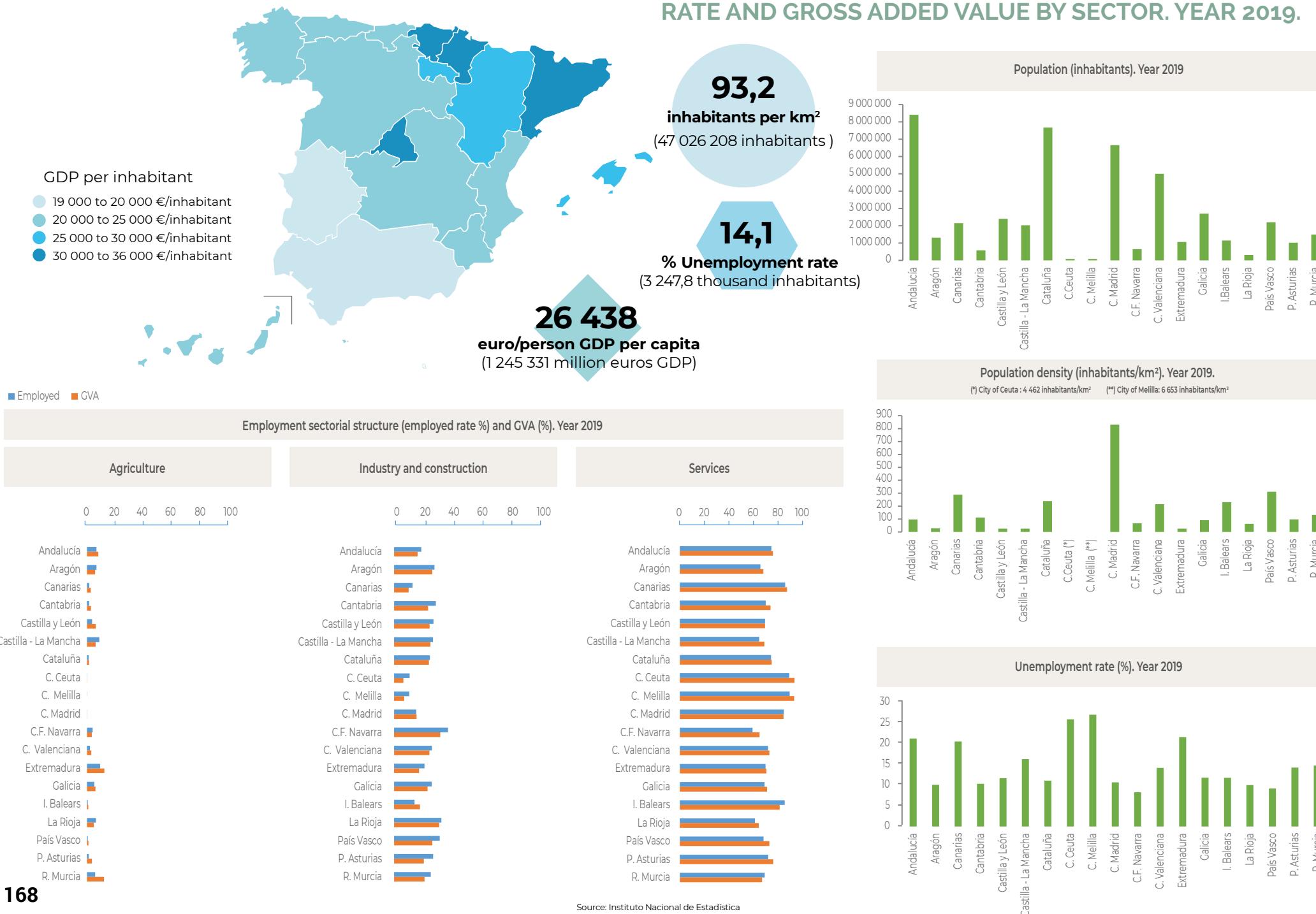
Red Eléctrica de España. (2020). Department of Access to Electronic Data System Information provided upon express request.

Indicator prepared using the ratio of electricity produced from renewable sources and the total generated in each autonomous community (both in GWh).

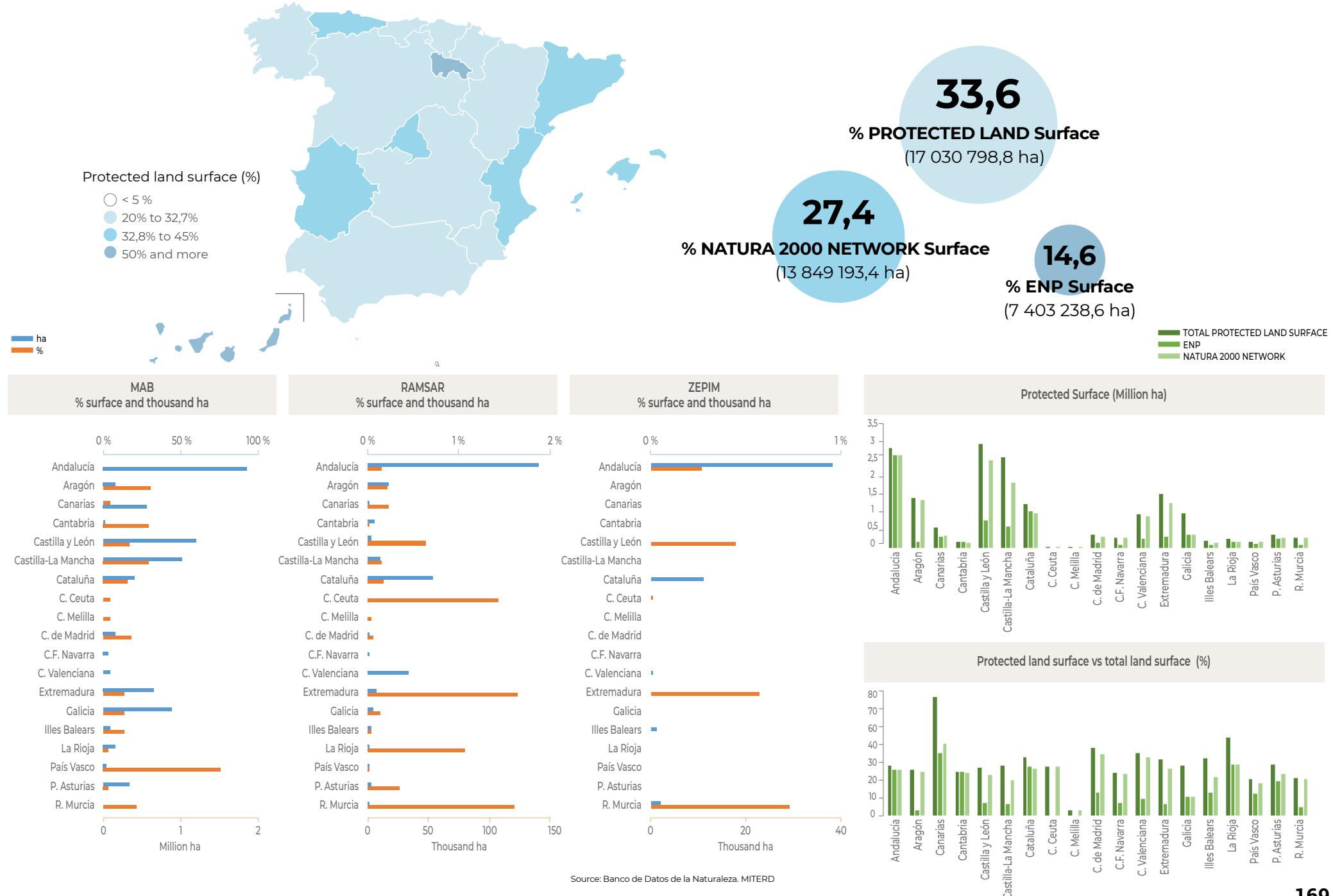
#### **Instruments (strategies, regulations and campaigns) on the circular economy**

Ministry for Ecological Transition and the Demographic Challenge. (2020). Directorate General for Environmental Quality and Assessment. Prepared by the authors using the National Focal Point of the European Environment Agency with data provided by the Sub-directorate General for the Circular Economy.

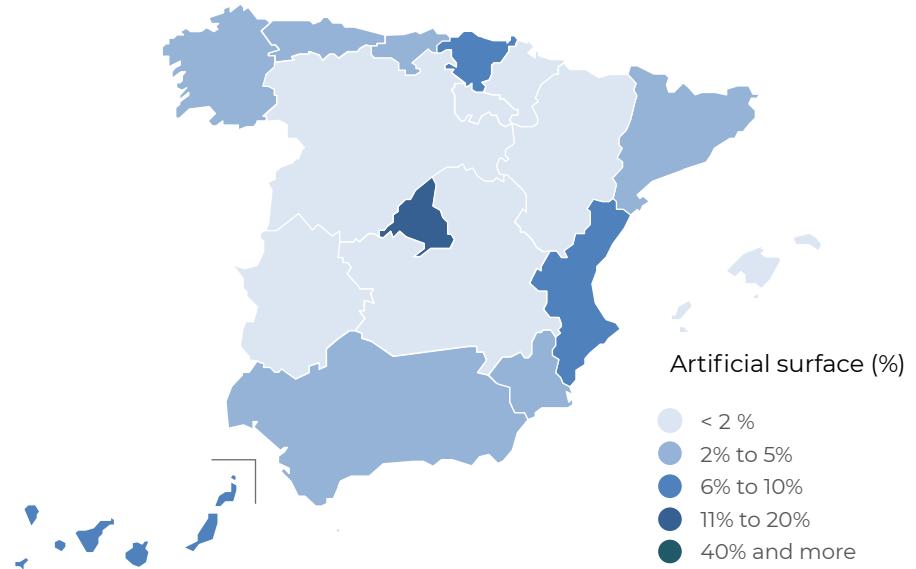
### 3. DATA BY AUTONOMOUS COMMUNITY: CORE DATA SOCIOECONOMIC ASPECTS: DEMOGRAPHY, GDP PER CAPITA, UNEMPLOYMENT RATE AND GROSS ADDED VALUE BY SECTOR. YEAR 2019.



### 3. DATA BY AUTONOMOUS COMMUNITY: CORE DATA NATURE: PROTECTED LAND SURFACE. YEAR 2019



### 3. DATA BY AUTONOMOUS COMMUNITY: CORE DATA LAND: LAND USE DISTRIBUTION. YEAR 2018



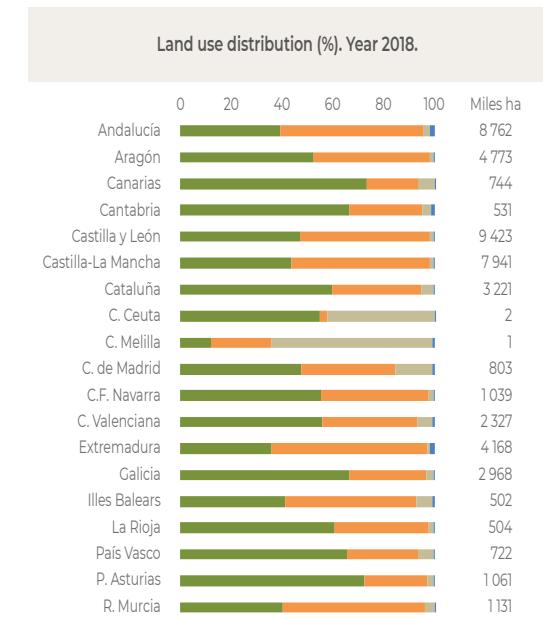
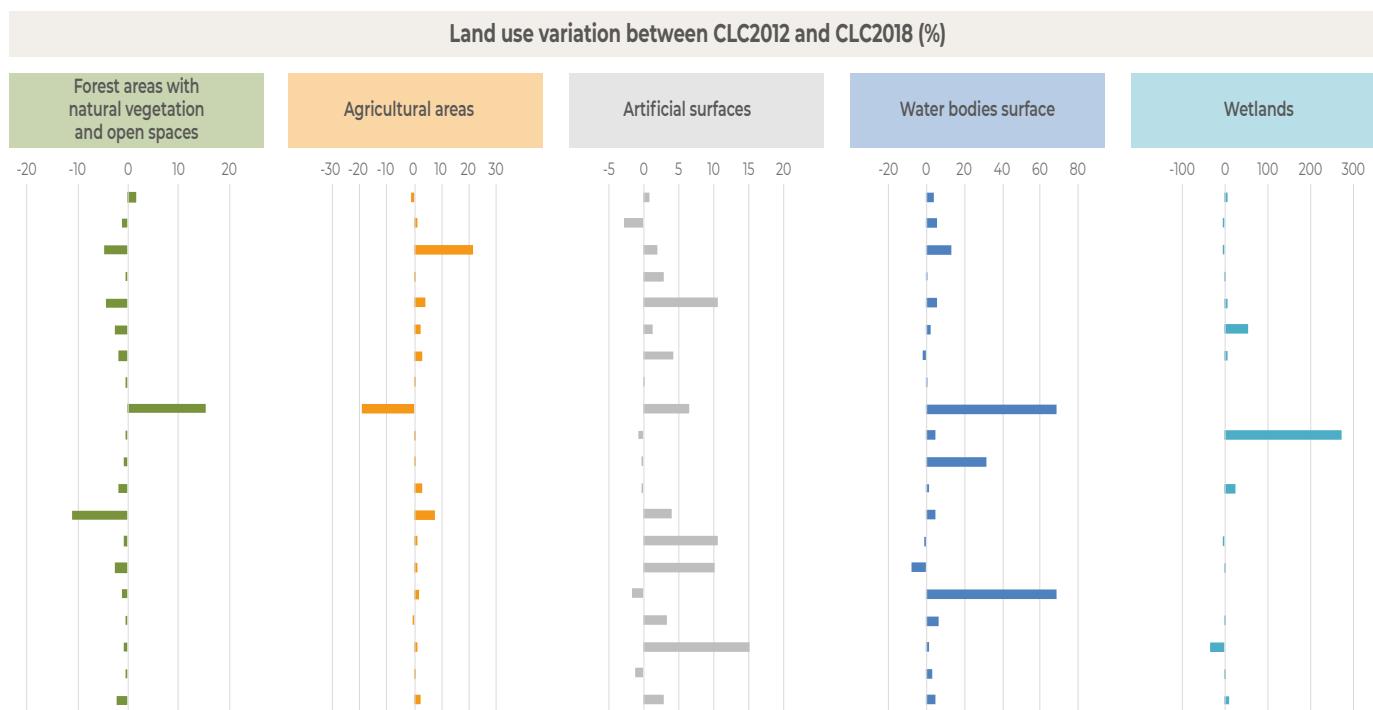
**2,6**  
% Artificial surface  
(1 295 667 ha)

**0,7**  
% Water bodies surface  
(339 457,8 ha)

**0,2**  
% Wetlands  
(106 065,2 ha)

**48,6**  
% Forest areas with  
natural vegetation and  
open spaces  
(24 600 900,1 ha)

**48**  
% Agricultural areas  
(24 280 277,5 ha)



Source: European Commission. Corine Land Cover Project. Information provided by IGN

3. DATA BY AUTONOMOUS COMMUNITY: CORE DATA  
AIR: AIR QUALITY REGARDING HUMAN HEALTH PROTECTION. YEAR 2018.

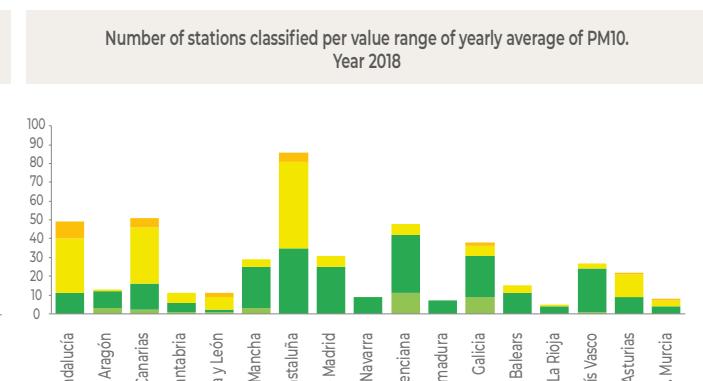
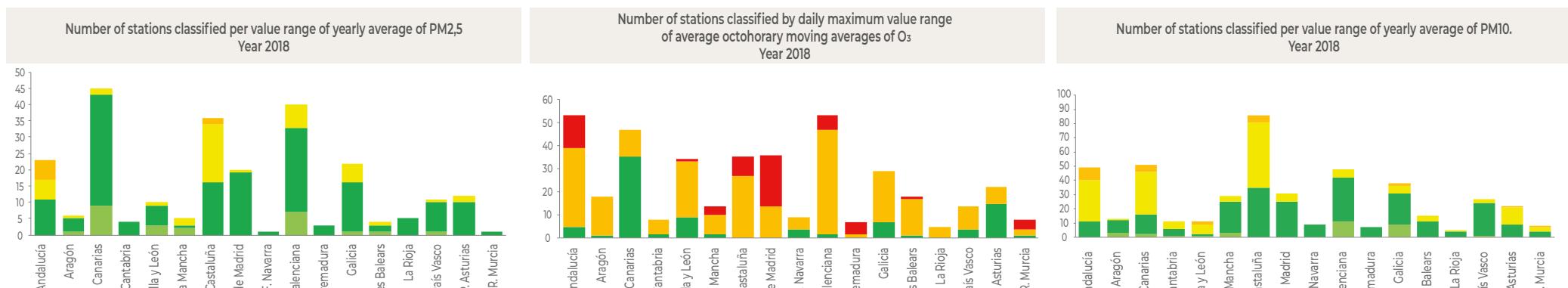
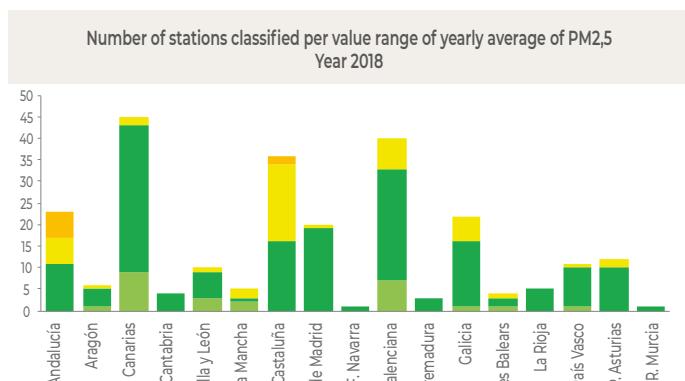
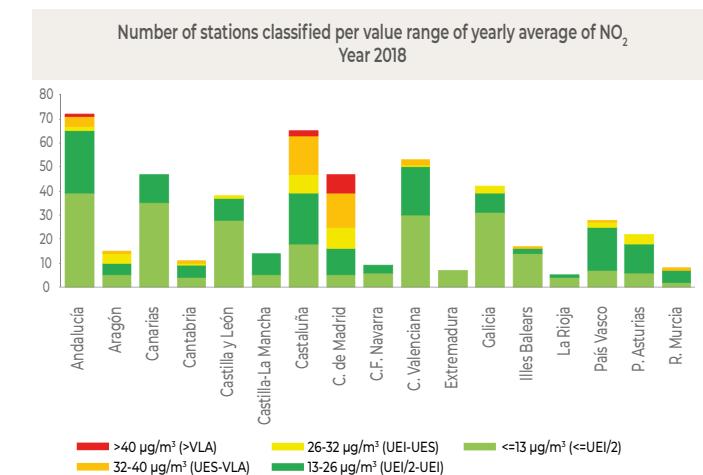


**O<sub>3</sub>**  
62,7  
% stations obtained  
between OLP-VO  
(257 stations of 410)

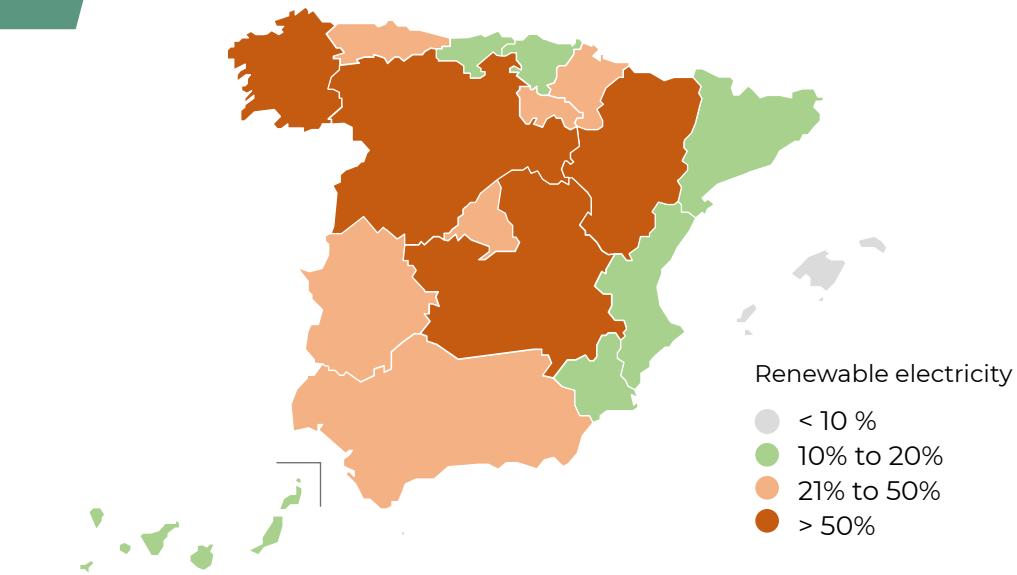
**PM10**  
52,6  
% stations presenting  
between 6-12 µg/m<sup>3</sup>  
(242 stations of 460)

**NO<sub>2</sub>**  
49,2  
% stations presenting  
<13 µg/m<sup>3</sup>  
(246 stations of 500)

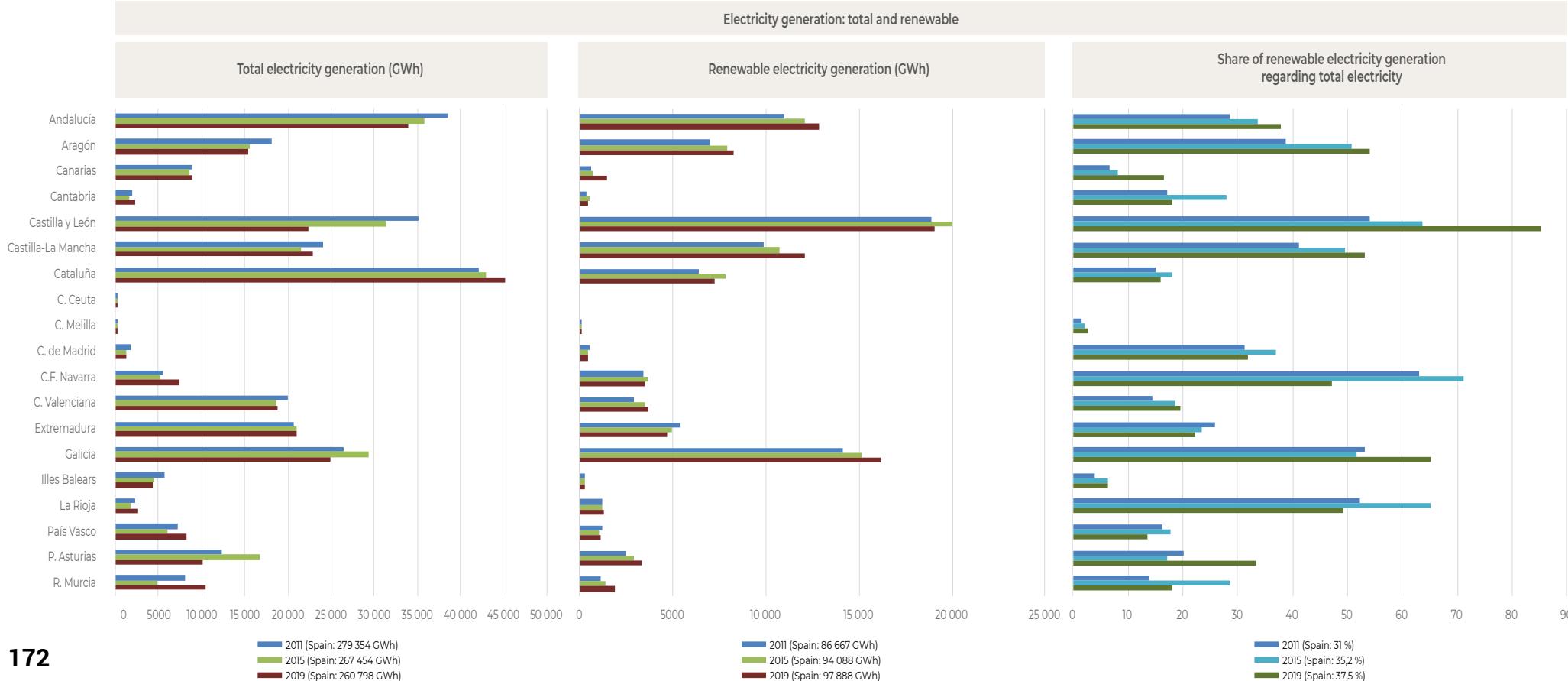
**PM2,5**  
67,3  
% stations presenting  
between 6-12 µg/m<sup>3</sup>  
(167 stations of 248)



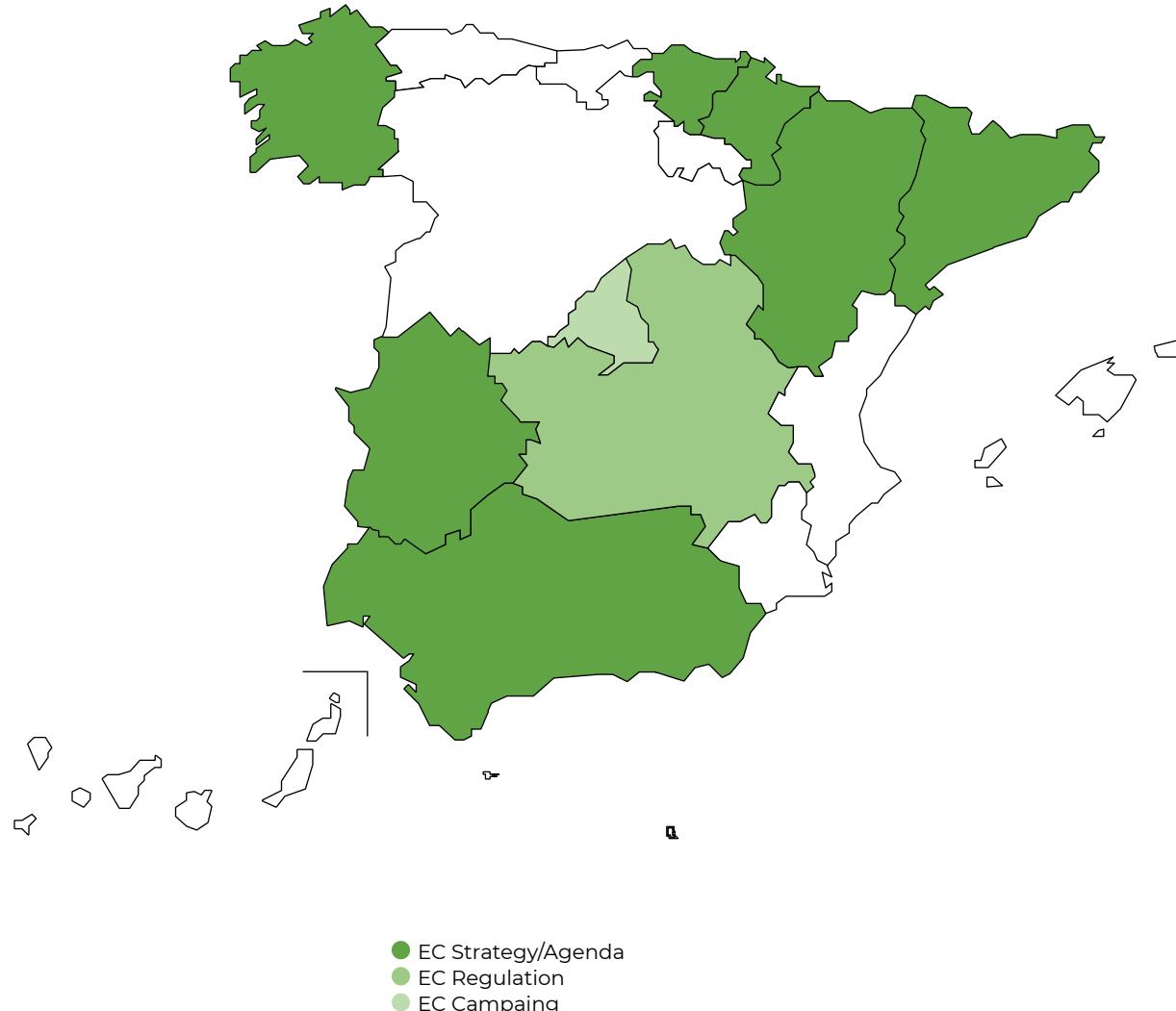
### 3. DATA BY AUTONOMOUS COMMUNITY: CORE DATA ENERGY: RENEWABLE ELECTRICITY. YEAR 2019



**37,5**  
% Renewable electricity  
regarding  
total electricity  
(97 887,7 GWh renewable)



3. DATA BY AUTONOMOUS COMMUNITY: CORE DATA  
CIRCULAR ECONOMY: INSTRUMENTS (STRATEGIES, REGULATIONS AND CAMPAIGNS)  
ON CIRCULAR ECONOMY



Source: Own elaboration Punto Focal Nacional. MITERD



## APPENDICES



## Methodological notes on the indicators

For the purpose of making the publication of the Environmental Profile of Spain 2019 more manageable, and continuing with the structure of the previous edition, the "Methodological Notes" have been published in a separate document. In order of publication, they describe complementary information for those indicators where considered necessary to facilitate their correct interpretation.

It can be consulted on the website of the Ministry for Ecological Transition and the Demographic Challenge via this [link](#).

## Acronyms, abbreviations, units and clarifications

### Index of acronyms, abbreviations, units and clarifications

<b>EEA</b>	European Environment Agency
<b>AEMET</b>	Spanish State Meteorological Agency
<b>AESAN</b>	Agencia Española de Consumo, Seguridad Alimentaria y Nutrición (Spanish Agency for Food Safety and Nutrition)
<b>AROPE</b>	At Risk of Poverty and/or Exclusion
<b>BOE</b>	Boletín Oficial del Estado (Official State Gazette)
<b>EC</b>	European Commission
<b>CDB</b>	Convention on Biological Diversity
<b>EEC</b>	European Economic Community
<b>ECST</b>	European Charter for Sustainable Tourism
<b>EPEA</b>	Environmental Protection Expenditure Account
<b>CITES</b>	Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>CLC</b>	Corine Land Cover
<b>CLRTAP</b>	Convention on Long-range Transboundary Air Pollution
<b>CNAE</b>	Clasificación Nacional de Actividades Económicas (National Classification of Economic Activities)
<b>CNE</b>	Contabilidad Nacional de España (Spanish National Accounts)

## APPENDIX II. ACRONYMS, ABBREVIATIONS, UNITS AND CLARIFICATIONS

<b>DMC</b>	Domestic Material Consumption
<b>CNMC</b>	Comisión Nacional de los Mercados y la Competencia (National Commission on Markets and Competition)
<b>NRC</b>	National Reference Centre
<b>ETC</b>	European Topic Centre
<b>COM</b>	Abbreviation for European Commission documents referring to legislative proposals., green books, white books, communications, reports, etc.
<b>COP</b>	Conference of the Parties on the United Nations Framework Convention on Climate Change
<b>DG</b>	Directorate-General
<b>DGPCE</b>	Dirección General de Protección Civil y Emergencias (Directorate-General for Civil Protection and Emergencies)
<b>DEGURBA</b>	Degree of Urbanisation
<b>WFD</b>	Water Framework Directive
<b>EEEC</b>	Estrategia Española de Economía Circular (Spanish Strategy for the Circular Economy)
<b>EIONET</b>	Environment Information and Observation Network
<b>EMAS</b>	Eco-Management and Audit Scheme
<b>EMEP/GAW/CAMP</b>	European Monitoring and Evaluation of Pollutants/Global Atmospheric Watch/Comprehensive Atmospheric Monitoring Programme
<b>PNS</b>	Protected Natural Space
<b>EOH</b>	Encuesta de Ocupación Hotelera (Hotel Occupancy Survey)
<b>EPA</b>	Encuesta de Población Activa (Active Population Survey)
<b>ESYRCE</b>	Encuesta sobre Superficies y Rendimientos de Cultivos (Crop Area and Yield Survey)
<b>Eurostat</b>	Statistical Office of the European Union
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>EMFF</b>	European Maritime and Fisheries Fund
<b>FLEGT</b>	Forest Law Enforcement, Governance and Trade
<b>GoO</b>	Guarantee of Origin
<b>GHG</b>	Greenhouse Gases
<b>LFF</b>	Large Forest Fire
<b>NEPE</b>	National Environmental Protection Expenditure

<b>ICEX</b>	Instituto de Comercio Exterior (Institute of Foreign Trade)
<b>ICTE</b>	Instituto para la Calidad Turística de España (Spanish Institute of Tourism Quality)
<b>IDAE</b>	Instituto para la Diversificación y Ahorro de la Energía (Institute for Diversification and Energy Saving)
<b>IEHEM</b>	Inventario Español de Hábitat y Especies Marinas (Spanish Inventory of Marine Habitats and Species)
<b>IEPNB</b>	Inventario Español del Patrimonio Natural y de la Biodiversidad (Spanish Inventory of Natural Heritage and Biodiversity )
<b>IGN</b>	National Geographic Institute (Instituto Geográfico Nacional)
<b>INE</b>	Spanish National Institute of Statistics (Instituto Nacional de Estadística)
<b>INES</b>	Inventario Nacional de Erosión de Suelos (National Soil Erosion Inventory)
<b>IPBES</b>	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IPPC</b>	Integrated Pollution Prevention and Control
<b>JACUMAR / JACUCON</b>	Juntas Nacionales Asesoras de Cultivos Marinos y Continentales (National Advisory Board for Marine Aquaculture)
<b>JRC</b>	Joint Research Centre
<b>SCIs</b>	Sites of Community interest
<b>LUCAS</b>	Land Use Cover Area Statistical Survey
<b>LULUCF</b>	Land Use, Land Use Change and Forestry
<b>MaB</b>	Man and Biosphere
<b>MAPA</b>	Ministerio de Agricultura, Pesca y Alimentación (Ministry of Agriculture, Fisheries and Food)
<b>MITERD</b>	Ministerio para la Transición Ecológica y el Reto Demográfico (Ministry for Ecological Transition and the Demographic Challenge).
<b>MITMA</b>	Ministerio de Transportes, Movilidad y Agenda Urbana (Ministry of Transport, Mobility and the Urban Agenda).
<b>MSCBS</b>	Ministerio de Sanidad, Consumo y Bienestar Social (Ministry of Health, Consumer Affairs and Social Well-being)
<b>NECD</b>	National Emission Ceilings Directive
<b>UN</b>	United Nations
<b>OECC</b>	Oficina Española de Cambio Climático (Spanish Office for Climate Change)
<b>SDG</b>	Sustainable Development Goal
<b>LT</b>	Long Term Target

## APPENDIX II. ACRONYMS, ABBREVIATIONS, UNITS AND CLARIFICATIONS

<b>WMO</b>	World Meteorological Organization
<b>WHO</b>	World Health Organization
<b>UNWTO</b>	United Nations World Tourism Organization
<b>OSPAR</b>	Oslo and Paris Convention on the Protection of the Northeast Atlantic
<b>OTLE</b>	Observatorio del Transporte y la Logística en España (Spanish Transport and Logistics Observatory)
<b>CAP</b>	Common Agricultural Policy
<b>PNDSEAR</b>	Plan Nacional de Depuración, Saneamiento, Eficiencia, Ahorro y Reutilización (National Plan for Sanitation, Efficiency, Saving and Reuse)
<b>PEMAR</b>	Plan Estatal Marco de Gestión de Residuos 2016-2022 (State Waste Management Framework Plan 2016-2022)
<b>PEPAE</b>	Plan Estratégico Plurianual de la Acuicultura Española 2014-2020 (Multiannual Strategic Plan for Spanish Aquaculture 2014-2020)
<b>PEPR</b>	Programa Estatal de Prevención de Residuos 2014-2020 (National Programme on Waste Prevention 2014-2020)
<b>GDP</b>	Gross Domestic Product
<b>PIMA</b>	Plan de Impulso al Medio Ambiente (Plan for the Promotion of the Environment)
<b>PIMA Adapta</b>	Plan de Impulso al Medio Ambiente para la Adaptación al Cambio Climático (Plan for the Promotion of Adaptation to Climate Change)
<b>PLCCTE</b>	Proyecto de Ley de Cambio Climático y Transición Energética (Draft Climate Change and Energy Transition Bill)
<b>PNIEC</b>	Plan Nacional Integrado de Energía y Clima 2021-2030 (National Integrated Energy and Climate Plan 2021-2030)
<b>PM</b>	Particulate matter in the air
<b>NP</b>	National Park
<b>PNACC</b>	Plan Nacional de Adaptación al Cambio Climático (National Plan for Adaptation to Climate Change)
<b>PNCCA</b>	Programa Nacional de Control de la Contaminación Atmosférica (National Atmospheric Pollution Control Plan)
<b>PNIR</b>	Plan Nacional Integrado de Residuos (2008-2015) (National Integrated Waste Management Plan (2008-2015))
<b>UNEP</b>	United Nations Environment Programme
<b>CFP</b>	Common Fisheries Policy
<b>NP</b>	National Park
<b>PRTR</b>	Pollutant Release and Transfer Register
<b>ETP</b>	Equivalent Tourist Population
<b>GP</b>	Green payment

<b>EGD</b>	European Green Deal
<b>RAMPE</b>	Red de Áreas Marinas Protegidas de España (Spanish Network of Marine Protected Areas)
<b>RAMSAR</b>	City in Iran where the Convention on Wetlands of International Importance was signed in 1971. The wetlands declared by countries are included in the RAMSAR List
<b>REE</b>	Red Eléctrica de España [Spanish electricity grid operator].
<b>RMIP</b>	Reservas Marinas de Interés Pesquero (Marine Reserves of Fishing Interest)
<b>MSY</b>	Maximum Sustainable Yield
<b>DRR</b>	Disaster Risk Reduction
<b>RUSLE</b>	<i>Revised Universal Soil Loss Equation</i>
<b>SEPRONA</b>	Servicio de Protección de la Naturaleza de la Guardia Civil (Nature Protection Service of the Spanish Guardia Civil)
<b>GIS</b>	Geographic Information System
<b>SIOSE</b>	Sistema de Información sobre Ocupación del Suelo de España (Spanish Land Use Information System)
<b>SOER 2020</b>	The European environment — state and outlook 2020
<b>TAC</b>	Total Allowable Catch
<b>TURESPAÑA</b>	Public body within the Ministry of Industry, Commerce and Tourism through the State Secretariat for Tourism, responsible for marketing Spain as a tourist destination around the world.
<b>EU</b>	European Union
<b>ET</b>	Evaluation Threshold
<b>EU-15</b>	Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, The Netherlands, Austria, Portugal, Finland, Sweden, United Kingdom
<b>EU-25</b>	Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, The Netherlands, Austria, Portugal, Finland, Sweden, United Kingdom, Hungary, Poland, Cyprus, Czech Republic, Estonia, Malta, Latvia, Lithuania, Slovenia, Slovakia.
<b>EU-27</b>	EU 25+ Bulgaria and Romania
<b>EU-28</b>	EU 27 + Croatia
<b>LET</b>	Lower Evaluation Threshold
<b>UET</b>	Upper Evaluation Threshold

## APPENDIX II. ACRONYMS, ABBREVIATIONS, UNITS AND CLARIFICATIONS

<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>GVA</b>	Gross Value Added
<b>GAW</b>	Global Atmospheric Watch
<b>LV</b>	Limit Value
<b>ALV</b>	Annual Limit Value
<b>TV</b>	Target Value
<b>SAC</b>	Special Area of Conservation
<b>SPABs</b>	Special Protection Areas for Wild Birds
<b>SPAMI</b>	Special Protection Areas of Importance for the Mediterranean Sea

### Symbols, units and chemical compounds

<b>€</b>	Euro
<b>CFC</b>	Chlorofluorocarbon
<b>NH<sub>4</sub></b>	Methane
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>POP</b>	Persistent Organic Compounds
<b>VOC</b>	Volatile Organic Compounds
<b>NMVOCs</b>	Non-methane Volatile Organic Compounds
<b>dB(A)</b>	Weighted decibels (A-scale)
<b>GT</b>	<i>Gross Tonnage: Measure of tonnage of fishing vessels. In use since 1998 when it replaced Gross Registered Tonnage (GRT)</i>
<b>GWh</b>	Gigawatt-hour
<b>h</b>	Hour

<b>ha</b>	Hectare
<b>inhab</b>	Inhabitant
<b>hm<sup>3</sup></b>	Cubic hectometre
<b>H<sub>2</sub>SO<sub>3</sub></b>	Sulphurous acid
<b>H<sub>2</sub>SO<sub>4</sub></b>	Sulphuric acid
<b>K<sub>2</sub>O</b>	Potassium oxide
<b>koe</b>	Kilogram of oil equivalent
<b>kg</b>	Kilogram
<b>km</b>	Kilometre
<b>km<sup>2</sup></b>	Square kilometre
<b>ktoe</b>	Kilotons of oil equivalent
<b>kW</b>	Kilowatt

<b>kWh</b>	Kilowatt-hour
<b>l</b>	Litre
<b>mg</b>	Milligram
<b>Tt</b>	Thousand tonnes
<b>Mtoe</b>	Million tons of oil equivalent
<b>MW</b>	Megawatts
<b>m<sup>2</sup></b>	Square metre
<b>m<sup>3</sup></b>	Cubic metre
<b>Cloudy</b>	Nitrogen
<b>NH<sub>3</sub></b>	Ammonia
<b>N<sub>2</sub>O</b>	Nitrous Oxide
<b>NO<sub>x</sub></b>	Nitrogen Oxide
<b>O<sub>3</sub></b>	Ozone
<b>P</b>	Phosphorus
<b>P<sub>2</sub>O<sub>5</sub></b>	Orthophosphates

<b>PM10</b>	Particulate matter with a diameter of 10 microns or less
<b>PM2.5</b>	Particulate matter with a diameter of 2.5 microns or less
<b>SO<sub>x</sub></b>	Sulphur oxide
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>t</b>	Ton
<b>toe</b>	Ton of oil equivalent
<b>t-km</b>	Tonne-kilometre. Unit of measurement of freight transport. It is calculated by multiplying the number of tonnes transported by the number of kilometres travelled
<b>v-km</b>	tourist-kilometre. Unit of measurement used for passenger traffic. It is calculated by multiplying the annual number of passengers by the number of kilometres travelled
<b>µg</b>	Micrograms
<b>&gt;</b>	More than
<b>&lt;</b>	Less than
<b>[CH<sub>3</sub>Hg]<sup>+</sup></b>	Methylmercury

## CLARIFICATIONS

### Clarification 1.

The Spanish Official State Gazette (BOE) of Friday, 29 July 2005 publishes the *Resolution of 28 July 2005 of the Undersecretariat, which gives publicity to the Agreement of the Council of Ministers from 22 July 2005, approving the guidelines of technical regulations*. Said resolution defines the official names of the Spanish Autonomous Communities and Cities under a Statute of Autonomy. The above mentioned official names are as per below, appearing in order of approval of the appropriate Statutes

of Autonomy thereof:

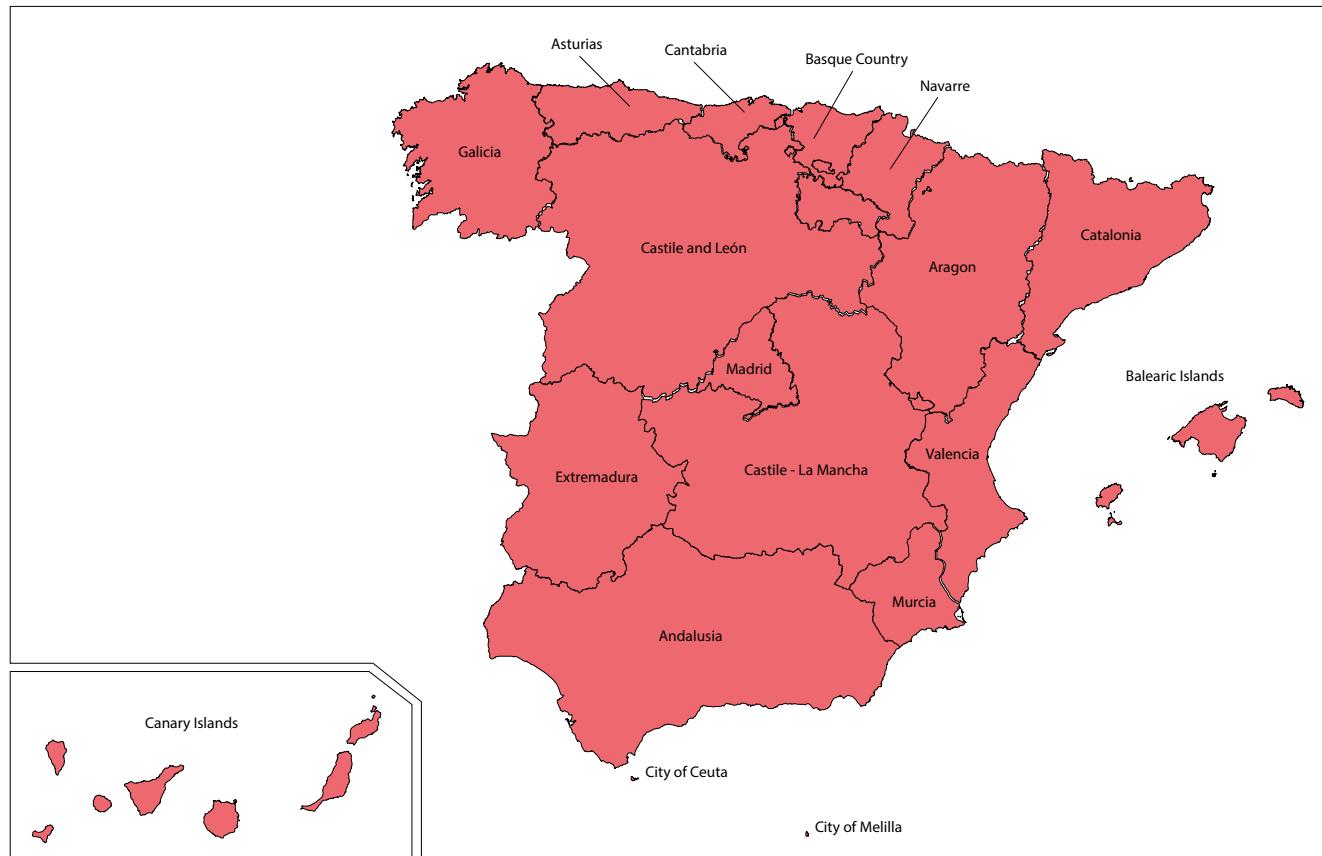
- Autonomous Community of the Basque Country or Euskadi
- Autonomous Community of Catalonia
- Autonomous Community of Galicia
- Autonomous Community of Andalusia
- Autonomous Community of Asturias
- Autonomous Community of Cantabria
- Autonomous Community of La Rioja
- Autonomous Community of Murcia
- Autonomous Community of Valencia
- Autonomous Community of Aragon
- Autonomous Community of Castile-La Mancha
- Autonomous Community of the Canary Islands
- Autonomous Community of Navarre
- Autonomous Community of Extremadura
- Autonomous Community of the Balearic Islands
- Autonomous Community of Madrid
- Autonomous Community of Castile and León
- Autonomous City of Ceuta
- Autonomous City of Melilla

Notwithstanding this resolution, throughout the Environmental Profile of Spain abbreviated references to the autonomous communities are used in the text, charts and tables since using their full official names would be cumbersome.

## Clarification 2.

The location of the various autonomous communities across Spain is shown in the administrative map below.

MAP IDENTIFYING THE AUTONOMOUS COMMUNITIES AND AUTONOMOUS CITIES OF SPAIN



### Clarification 3.

The links below provide access to the statutes of autonomy of all Spain's autonomous communities and cities. All versions of the statutes are available, from the original text through to the one currently in force.

1. [Organic Law of the Statute of Autonomy of the Basque Country](#)
2. [Organic Law reforming the Statute of Autonomy of Catalonia](#)
3. [Organic Law on the Statute of Autonomy of Galicia](#)
4. [Organic Law reforming the Statute of Autonomy of Andalusia](#)
5. [Organic Law on the Statute of Autonomy of Asturias](#)
6. [Organic Law on the Statute of Autonomy of Cantabria](#)
7. [Organic Law on the Statute of Autonomy of Rioja](#)
8. [Organic Law on the Statute of Autonomy of Murcia](#)
9. [Organic Law 1/2006, of 10 April, on the Reform of Organic Law 5/1982, of 1 July, on the Statute of Autonomy of the Autonomous Community of Valencia](#)
10. [Organic Law reforming the Statute of Autonomy of Aragon](#)
11. [Organic Law on the Statute of Autonomy of Castile-La Mancha](#)
12. [Organic Law reforming the Statute of Autonomy of the Canary Islands](#)
13. [Organic Act on the reintegration and improvement of the Navarre Legal System](#)
14. [Organic Law reforming the Statute of Autonomy of Extremadura](#)
15. [Organic Law reforming the Statute of Autonomy of the Balearic Islands](#)
16. [Organic Law on the Statute of Autonomy of Madrid](#)
17. [Organic Law reforming the Statute of Autonomy of Castile and León](#)
18. [Organic Law on the Statute of Autonomy of Ceuta](#)
19. [Organic Law on the Statute of Autonomy of Melilla](#)

More information at:

<https://www.boe.es/legislacion/codigos/codigo.php?id=17&modo=1&nota=0&tab=2>.

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