

# STEAM3D Academy

IO1: Green Best Practice guide

BEGIN



**National Desk Research**

**Spain**

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# Background

**Full name:** Spain

**Area:** 505 990 km<sup>2</sup>

**Borders:** France (656.3 km), Andorra (63.7 km), Morocco (19 km), Gibraltar (1.2 km)

**Population:** 47 450 795 inhabitants

**Population density:** 94 people/km<sup>2</sup>

**Capital:** Madrid

**Currency:** Euro

Most of Spain's national territory is located on the Iberian Peninsula (which it shares with Portugal and Andorra) situated in the southwest corner of Europe. However the Canary Islands, the Balearic Islands, a few smaller islands and the cities of Ceuta and Melilla in North Africa are also territories of Spain. Covering an area of 506,030 square kilometres, Spain is among the fifty largest countries in the world.

The geological history of the Iberian Peninsula has given rise to mountains forming large chains that surround a high inland plateau situated at over 600 metres above average sea level. As a result of this geography, the peninsula is characterised by a rich variety of unique enclaves and natural environments. Due to its geographic location, Spain is influenced by two very different bodies of water: the vast and open Atlantic Ocean; and the Mediterranean Sea, whose only physical connection to the former is a narrow channel called the Straits of Gibraltar, which permits the exchange of water between the two masses of very different salinity and temperature. The Spanish coastline is 5,755 kilometres long.

The surface of Spain is extremely varied and characterised by a relatively high average altitude; over 600 metres above sea level. The mountain ranges exert a tremendous influence on the continental climate by creating natural barriers against banks of moist air from the Atlantic Ocean, which would otherwise temper inland temperatures.

The natural fluvial regime of Spain's rivers mainly depends on the pattern of precipitation, where its waters originate and transform into surface water or groundwater runoff. However, this natural fluvial pattern is affected by human action in the form of infrastructures used to regulate and modify its temporal distribution, as well as other types of actions that remove volumes of water from rivers.

The climates in Spain are the following:

- Atlantic or Oceanic Climate

- Continental Climate
- Mediterranean Climate
- Mediterranean Mountain Climate

There are other smaller but nevertheless significant climate zones: Cold Steppe Climate, Hot Steppe Climate, and Subtropical Climates.

Spain's rich diversity in terms of climate, petrography and topography has given rise to the formation of several clearly defined ecological regions, which in turn have led to the development of a broad spectrum of vegetation types. Another influential factor is the intensity of human activity, which has gradually transformed its natural surroundings since the Neolithic period, often adding to the already diverse array of habitats. The vegetation cover in Spain resembles a type of mosaic in which the natural formations of trees, shrubs and herbaceous plants are distributed unevenly throughout the land alongside crop fields and reforested areas. This varied landscape is clearly reflected in the equally varied flora, which comprises approximately eight thousand species and includes plants from the whole of Europe and North Africa. Hence, the European beech co-exists with the Mediterranean holm oak, Aleppo pine, African palm and even the Australian eucalyptus<sup>1</sup>.

Spain is a constitutional monarchy, with a hereditary monarch and a bicameral parliament, the Cortes Generales (General Courts). The executive branch consists of a Council of Ministers presided over by the Prime Minister, who is nominated as candidate by the monarch after holding consultations with representatives from the different parliamentary groups, voted in by the members of the lower house during an investiture session and then formally appointed by the monarch.

As of 1 January 2020, Spain had a total population of 47,431,256, which represents a 0.9% increase since 2019. Spain's population peaked in 2019, surpassing for the first time in history 47 million inhabitants. As of January 2020, there were already 47,431,256 people living in Spain. Its population density, at 91.4 inhabitants per square kilometre (237/sq mi), is lower than other Western European countries yet, with the exception of microstates, it has the highest real density population in Europe, based on density of inhabited areas. With the exception of the capital Madrid, the most densely populated areas lie around the coast.<sup>2</sup>

## Energy policies

- **Evolution in the last 10 years**

Traditionally, Spain has been a two-party state in which governments used to rotate between the Socialist Party and the Popular Party, and it was originally them who came up with the little few green

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<sup>1</sup> <https://www.lamoncloa.gob.es/lang/en/espana/Paginas/index-old.aspx>

<sup>2</sup> <https://en.wikipedia.org/wiki/Spain>

policies. Today, there is a ministry in charge of green policies called the Ministry of Ecological Transition and Demographic Challenge, but it was not of great importance until 1996, when the Popular Party established it as the Ministry of the Environment. Prior to its creation, decisions on ecological matters were taken by lower-ranking governmental bodies. This shows that concern for the environment did not emerge until the 1990s, following the global trend.<sup>3</sup>

Environmental issues account for only a tiny part of the topics dealt with in the Congress, despite being one of the most controversial issues at local and regional level, due to the growing importance that the population has been attributing over the last decade to issues related to environmental deterioration and sensitivity. It is worth mentioning that Spain lags far behind in terms of environmental policy, as there is no tradition of public environmental policies. However, the pressure exerted by the EU in this regard is forcing Spain to comply with European directives.<sup>4</sup>

These are some of the implemented laws over the last 10 years:

- Law 21/2013, of 9 December, on environmental assessment. This law establishes the exclusive competence of the State in matters of basic legislation on environmental protection.
  - It facilitates the incorporation of sustainability criteria in project evaluation.
  - Strategic decision-making, through the evaluation of plans and programmes.
- Law 30/2014 on National Parks. This law brings together measures such as reinforcement in emergency situations due to environmental catastrophe, intervention in cases of unfavourable conservation status, or the prohibition of incompatible activities such as sport fishing and hunting, logging for commercial purposes or the management of other of its resources, among others.
- Royal Decree 630/2013 on invasive alien species. Invasive species are the cause of biodiversity loss. For this reason, Royal Decree 630/2013, of 2 August, regulates the Spanish Catalogue of invasive alien species. With regard to the aquatic environment, at the national level, one law and two royal decrees are noteworthy.
- Royal Decree 876/2014, General Coastal Regulation. Royal Decree 876/2014, of 10 October, regulates coastal protection and occupation requirements.<sup>5</sup>
- Law 7/2021 of 20 May on climate change and energy transition. The law establishes a framework to facilitate equity in the transition to a decarbonised economy by providing mandatory learning and transparency tools to help identify and assess risks and opportunities and improve investment decisions.
- Royal Decree 390/2021, of 1 June, approving the basic procedure for the certification of the energy performance of buildings.

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<sup>3</sup> <https://repositorio.comillas.edu/xmlui/bitstream/handle/11531/37126/TFG-201502692.pdf?sequence=2&isAllowed=y>

<sup>4</sup> <https://blogs.upm.es/puma/>

<sup>5</sup> <https://www.gndiario.com/leyes-medio-ambiente-espana>

- **Current situation**

Within the Sustainable Development Goals<sup>6</sup>, there are several points that deal exclusively with environmental protection such as: "Point 6: Clean Water and Sanitation, 7: Affordable and Clean Energy, 11: Sustainable Cities and Communities, 13: Climate Action, 14: Underwater Life and 15: Terrestrial Ecosystem Life".<sup>7</sup> Despite the fact that Spain has been one of the countries with the worst compliance with environmental regulations in recent years, legal changes have been made in the area of pollution:

- "(...) reduction of national emissions of certain atmospheric pollutants, (...) establishes emission reduction commitments that will achieve levels of air quality that do not give rise to significant negative effects on, and risks to, human health and the environment. In particular, it establishes new national emission reduction commitments for 2020 and 2030 for sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), non-methane volatile organic compounds (NMVOCs), ammonia (NH<sub>3</sub>) and fine particulate matter PM<sub>2.5</sub>." (MITECO<sup>8</sup>, 2018)

- Spain has also taken action on point 7 on clean energy: The Renewable Energy Directive set a binding reviewable EU target of at least 32% of energy from renewable sources by 2030.

- Regarding point 6 and point 14, on February 2022, they established a criteria to better identify nitrate impaired waters and sets higher thresholds for designation as vulnerable zones. The application of the new regulations should increase the surface area of protected areas by 50%, which will require more rigorous action programmes and will include limitations on the use of fertilisers. This updates the transposition into Spanish law of the European Directive against pollution caused by nitrates of agricultural origin, originally approved more than 25 years ago.

- The year 2018 was the eleventh season of the application of Royal Decree 1341/2007 of 11 October 2007 on the management of bathing water quality and, in general terms, the quality of marine bathing water has improved throughout this period.

- In June 2019, the Government amended the annex of Royal Decree 139/2011 that develops the List of Wild Species under Special Protection Regime and the Spanish Catalogue of Threatened Species, to include in these records 27 species of fauna and flora threatened in Spain, obliging the administrations to monitor their conservation status and the threats that affect them. For the species included in the catalogue, moreover, specific action plans must be implemented for their conservation or recovery. Among the species included, the populations of the Iberian wolf south of the Duero River in Castilla y León and the Community of Madrid are included in the List of Wild Species under Special Protection Regime.

Based on Spain's 2018 environmental profile, a clear evolution in some of the current ecological problems can be seen. In issues such as the conservation of the biosphere and terrestrial ecosystems, the evolution has been positive in the last 5 years, but in others such as emissions and air quality, we observe that the evolution has been negative, increasing the concentration of harmful gases.

Other laws that involve legislation regarding constructions, viability in sustainable cities, etc, are the following:

- Law 7/2021, of 1 December, on the promotion of territorial sustainability in Andalusia, of an integrating and transversal nature, including in the same regulatory text the planning of territory,

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<sup>6</sup> THE 17 GOALS - Sustainable Development Goals - the United Nations: <https://sdgs.un.org/goals>

<sup>7</sup> United Nations, 2015

<sup>8</sup> MITECO: Ministry for Ecological Transition and the Demographic Challenge

urban development, coastline and landscape, with the aim of providing the sectoral policies that intervene in the territory with a common and coherent strategy for the development of Andalusia and urban planning with a support based on the planning of interests of supralocal scope, in order to allow the economic and social cohesion of the territory and environmental sustainability.

- Law 3/2020, of 27 July, on the recovery and protection of the Mar Menor, establishes the control of discharges into the sea, containing in Article 21 the prohibition of discharges into the Mar Menor; in Article 22, the regulation on discharges of rainwater, and in Article 23, that of groundwater.

- Law 4/2021, of 16 September, amending Law 3/2020, of 27 July, on the Recovery and Protection of the Mar Menor: "The decomposition of tons of organic material, the high temperatures and the discharges that the lagoon receives put the ecosystem of this sea in a delicate situation, which is why it is necessary to boost protection measures even more. To this end, it is essential to continuously monitor the different types of discharges that reach the lagoon, increasing their control and surveillance."

- Order 6/2018, of 25 June, of the Regional Ministry of Housing, Public Works and Territorial Planning, which approves the regulatory bases for aid for the rehabilitation of housing located in collective residential buildings, within the Programme for the promotion of conservation, improvement of the safety of use and accessibility in housing of the State Housing Plan 2018-2021 (Valencian Community).

- Order TES/7/2020, of 17 January, approving the regulatory bases for subsidies to promote the acquisition of electric and low-emission vehicles intended for taxi service or commercial use, operating in areas of special protection of the atmospheric environment.

- **Future tendencies**

To be certain about the future in Spain is important to understand how the country has reacted in the past – regarding the raise of the sea level, the extreme temperatures, etc. all of them related to climate change.

Spain hasn't treated them as a priority, which has led the country to be the one with the highest number of environmental infringements in the European Union in 2017. This is a ranking that Spain usually tops, occupying either first or second place. This is probably due to the low political priority that environmental objectives occupy in the country and the correlative sensitivity in the population that such priorities manifest as well as to the governance system itself, characterised, for historical reasons, in the unilateral nature of the decision.

Spain has been slower than other countries to wake up to the imminent threat posed by climate change, but it has finally taken a step towards protecting the planet. The following measures were taken in 2021:

1. Cutting down CO2 emissions.
2. Stopping unnecessary energy consumption. The Senate expects that in just under 30 years, all electricity will be generated from renewable sources. By 2030, the origin of energy should be clean and Spain should be using 39% of this to achieve compliance with the law.
3. End the sale of petrol and diesel cars. Road transport releases 84 million tonnes of gases into the air in Spain alone. These figures have forced the country to take measures and set 2040 as the last year in which cars with petrol or diesel engines can be sold. However, after that year, vehicles already purchased will be able to continue to circulate. For its part, Greenpeace is already working on alternatives that are less costly for the environment while being

affordable for everyone. The environmental NGO does not rule out "opening the door to fossil gas", a solution that a priori was only seen as viable in the air sector.

4. Creating an efficiency plan for households. The government is obliged to approve a housing renovation plan. This is a series of guidelines that will help people make better use of energy in their homes. As well as consuming less, they will be contributing to improving their own savings.
5. Stop using oil, gas and uranium. The law hopes to gradually establish a habit that will lead to a shift away from dependence on oil. To this end, the search for fossil fuels within the territory will be banned. Congress has also decided to say goodbye to uranium mining.<sup>9</sup>
6. Spain will close its seven nuclear power plants between 2027 and 2035. The nuclear shutdown is scheduled to take place until 2035, as agreed between the companies that own the plants and the Ministry for Ecological Transition.

However, the implementation of these rules could have some side effects that do not fit in with the idea of respecting the environment. The construction of infrastructures that generate electricity from renewable energies implies the destruction of ecosystems wherever they are implemented. In order to avoid reaching this point, development must be carried out gradually and responsibly.

The European Investment Bank (BEI) publicaded in 2020 the 'Climate Survey 2021-2022', that announced that 81% of Spaniards are in favour of "stricter government measures that impose changes in people's behaviour to deal with the climate emergency" similar to those already adopted during the covid-19 pandemic. This is what the BEI reported in the first part of its study, which deals with relevant issues regarding climate change and its consequences, something that 82% of Spaniards consider to be "the greatest challenge facing society in the 21st century".

The European Union and the Spanish Government share a roadmap aimed at creating energy-efficient new buildings. New construction should include the use of renewable energy, sustainable materials and good thermal insulation.

- **Main threats and challenges**

Spain is the driest country in the European Union, the most fire-prone and one of the most energy-dependent. Since 1990 it has increased its CO2 emissions per person at four times the rate of France,

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<sup>9</sup> The amendment concerning uranium mining was particularly important as it could affect the plans of the Australian company Berkeley to build an open-pit uranium mine in Retortillo (Salamanca). Despite the fact that this amendment was considered to be one of the most controversial, the modification to the initial text to veto uranium did finally receive support by the majority of the parties. The modification read "as of the entry into force of this law, no new applications for exploration, research or direct concessions for the exploitation of mines of this type will be accepted. Nor will extensions to exploitation be allowed when the resources are extracted for their radioactive, fissile or fertile properties". At present, the dossier on the open-pit uranium mine in Retortillo is pending the opinion of the Nuclear Safety Council (CSN), which is mandatory for the Ministry for Ecological Transition and Demographic Challenge to authorise or not the mining concession. However, while parliamentary representatives understand that if the permit is not granted before the law enters into force, the project will be cancelled, Berkeley understands that the law will not mean the cancellation of any of its exploitation concessions or rights already acquired, as it explicitly refers to "new applications".

Italy and the United States, and at twice the rate of China. Energy consumption in all its forms (petrol, electricity, gas, etc.) is growing five times faster than the population, and the most polluting means of transport - the diesel-powered private car - is the one that has developed the most, leaving rail and public transport almost marginal. Renewable energies have increased significantly but their weight in overall energy expenditure has decreased. The consumption of pesticides and fertilisers, which damage land and water, has intensified, while organic farming, which has made significant progress, covers only 2% of cultivated land, half that of the EU-15.

Urbanisation and material consumption are increasing in Spain at a faster rate than in neighbouring countries, and waste recycling - despite the progress made - is not sufficient. A clear example is La Manga del Mar Menor, a town in Murcia. This urban development has resulted into critical environmental problems, such as the disappearance of dunes and natural beaches, the drying up of lagoons, continuous dredging, the elimination of landscape values and the loss of biodiversity. It has also altered the original environmental conditions of the Mar Menor, such as salinity.

Water consumption for public supply is growing at four times the rate of population growth and 66% of agricultural irrigation - the country's main water consumer - is still carried out using the more wasteful gravity method. According to the Ministry of Ecological Transition, in the last ten years the number of endangered species has doubled and those classified as 'vulnerable' have tripled. Although Spain is one of the European countries with the greatest wealth of flora and fauna, the International Union for the Conservation of Nature and Natural Resources classifies it as the country with the highest number of endangered species due to environmental deterioration.

- **Legislation and Regulations about green energies in cities infrastructures** (*Report the most relevant documents on the subject*)
  - In 2000, Barcelona adapted its building code to require solar thermal to cover at least 60% of hot water demand in new buildings and buildings undergoing major renovation. More than 50 Spanish towns and cities followed Barcelona's example, culminating in the implementation of national technical building regulations in 2007.
  - In Barcelona, the City Council renewed its housing renovation subsidy in 2020 to offer subsidies of up to 55% of the total cost of renovations to residential households installing solar thermal or solar photovoltaic.
  - HolaDomus is a PACE pilot programme launched in 2020, co-led by GNE Finance and Olot City Council; it finances renewable energy and other innovative home improvements.
  - In Madrid, only battery electric, fuel cell electric and certain plug-in hybrid vehicles can circulate and park in the ZLE (2018) without restrictions.
  - Barcelona approved an EZE in 2019 that came into force in 2020.
  - Scaling up renewables to address energy poverty is a major challenge in Spain: Martorell and other Spanish municipalities have collaborated with the cooperative Som Energia to cover the electricity bills of households in need.
  - Interest in hydrogen begins: the Port Authority of Santa Cruz de Tenerife partnered with Hyundai Canarias and Enagás to build a renewable hydrogen generation facility for transport.
  - Several Spanish cities have municipal energy infrastructures, including Barcelona. Barcelona Energia began supplying renewable electricity to city council buildings and facilities in 2018 and to the general public in 2019.

- Spanish citizens are involved in community energy projects through several regional cooperatives, including Som Energia (67,800 members) and GOIENER (> 10,000 members).
- City councils have spearheaded community energy projects in Spanish cities such as Barcelona, Cadiz, Girona, Madrid, Pamplona, San Sebastian, Valencia and Valladolid.
- The concept of collective self-consumption, introduced in 2019, allows citizens in densely populated areas to join together and become "external prosumers" by investing in solar PV installations near their homes and on neighbouring buildings.

## Grants and subsidies

- **29/06/2021: The Government approves 1,320 million euros for self-consumption, batteries and renewable air conditioning.** The programmes will have an initial budget of 660 million euros, which can be increased to 1,320 million euros as the autonomous communities exhaust their initial allocations. The aid will be divided into six programmes that will distribute a maximum of 900 million euros for self-consumption, 220 million for storage behind the meter and 200 million for air conditioning and hot water with renewables. These actions will allow the construction of 1,850 MW of renewable energy, including heating and cooling in more than 40,000 homes. More than 25,000 jobs will be created, GDP will grow by more than 1.7 million for every million of aid and CO2 emissions will fall by more than one million tonnes per year.
- **Subsidies for the improvement of energy efficiency and the use of renewable energies in companies and residential buildings**, co-financed with ERDF in the scope of the Operational Programme of the Canary Islands.

Target group: Citizens and SMEs and Large companies.

Amount: The subsidy rate will be 45% of the eligible expenditure, with a maximum subsidy of 60,000 euros per project. A maximum grant amount of EUR 90 000 per beneficiary is established, taking into account the provisions of base 25. For the business sector, projects with a subsidy of less than 15,000 euros will not be eligible. For the residential sector, projects whose subsidy is less than EUR 4,500 will not be eligible.

- **Direct grant subsidy dossiers - Subsidy dossiers intended for Geoparks. To meet needs considered to be of public or social interest, encouraging and promoting certain actions by natural or legal, public or private persons.**

Addressed to: Local Administration

Amount: 20,000 euros for Geoparks.

- **Direct grant subsidy dossiers - Subsidy dossiers to the Neotrópico Foundation** (The Neotrópico Foundation is the only exotic fauna Centre in the Canary Islands with a certified Biosecurity level 3 quarantine).

Addressed to: Fundación Neotrópico

Amount: 130.000 euros

- **Grants for Renewable Energies and Biofuels, for the financial year 2021** (Comunidad Valenciana).

Target group: Any entity or legal person, of a public or private nature, including groups without legal personality and communities of property, as well as businesswomen or individual entrepreneurs.

Amount: Up to 45% of the eligible cost of the project, with a maximum of 200,000 euros per project.

- **Aid programme for energy efficiency actions in SMEs and large companies in the industrial sector.**

Aimed at: SMEs, self-employed, large companies and public companies in the water cycle.

Amount: Incentive of 30% of the incentive investment, subject to state aid limit. The maximum incentive is €15 M per project and/or beneficiary.

- **Aid for investments for singular local clean energy projects in municipalities with demographic challenges.**

Target group: Everyone.

Amount: Initial allocation for the whole of Spain of 75 million euros.

- **Programme of aid for the energy rehabilitation of buildings.**

Target group: Natural or legal persons of a private or public nature who are owners of existing buildings intended for any use; communities of owners or groups of communities of owners of residential buildings for residential use; owners who as a group are owners of buildings; building operators, lessees or concessionaires (by means of a long-term contract in force with the property), which gives them express authority to undertake the refurbishment works that are the object of the action; energy services companies (ESCOs). They must act in accordance with the contract with the property and carry out the investments; town councils, provincial councils, the institutional public sector of any public administration or equivalent local bodies, and the Mancomunidades or groupings of Spanish municipalities; renewable energy communities and citizen energy communities.

Amount: The budget for Catalonia €5,574,330.

- **Electrical energy storage systems with batteries associated with self-consumption photovoltaic installations.**

Target group: Natural persons who do not carry out an economic activity; communities of owners.

Amount: The amount of the subsidy will be 60% of the total cost of the eligible expenses of the storage system with lithium-ion technology batteries, with a limit of 5,000 euros per system.

- **Grants for local authority projects favouring the shift to a low-carbon economy.**

Aimed at: Municipalities or groupings of municipalities with no limit on the number of inhabitants.

Amount: 50% of the eligible expenditure, with a maximum of 5 million Euros per municipality.

- **Aid for the generation of renewable thermal and electrical energy.**

Target group: Natural or legal persons, public or private, who can carry out the projects or activities that motivate the granting of this aid may obtain the status of beneficiaries.

Amount: EUR 10 million.

- **R&D activities in Circular Economy projects in companies, specifically in the field of waste.**

Target group: Profit-making companies that have an operational establishment in Catalonia and that have been in existence for at least one year at the date of the application for aid, counted from the date of registration of the company in the Companies Register (or similar register).

Amount: Maximum intensities, in accordance with Community state aid rules, may be up to:

- Small enterprise Industrial research activities 50%.
  - Experimental development activities 45%.
- Medium-sized enterprise Industrial research activities 50% Experimental development activities 35
  - Experimental development activities 35% Large enterprise
- Large enterprise Industrial research activities 50% Experimental development activities
  - Experimental development activities 25%.

The maximum grant per project will be 125,000 euros for individual projects and 300,000 euros for collaborative projects.

The minimum project budget will be 200,000 euros for individual projects and 500,000 euros for collaborative projects.

## References

La Moncloa. Official website of the Government of Spain and the Presidency of the Spanish Government – <https://www.lamoncloa.gob.es/lang/en/espana/Paginas/index-old.aspx>

Description of environmental policies: analysis of concrete cases and their impact on the economy. Faculty of Economics and Business – Comillas Universidad Pontificia

Official state journal. Ministerio para la transición ecológica y el reto demográfico – EcVerde

Environmental Law Update. Eva Blasco Hedo (Coord.) – Special Issue 102/2, Dedicated to the Homage to Ramón Martín Mateo Congress Mateo "VIII National Congress on Environmental Law (Environmental Vulnerability)".

Riesgos Y Amenazas Del Cambio Climático - Elena Conde Pérez

España contra el cambio climático: las 5 medidas clave para frenarlo - Diana Torres para We Life Sustainable Living