

STEAM3D Academy

IO1: Green Best Practice guide

BEGIN



National Desk Research
Greece

Contents

Background	3
Energy policies	6
Grants and subsidies	11
References (Use APA Style to list your references)	11

Background

Full name: Greece or Hellenic Republic

Area: 131 957 km²

Borders: Bulgaria (494 km), Albania (282 km), North Macedonia (246 km), Turkey (206 km)

Population: 10 603 810 inhabitants

Population density: 82 people/km²

Capital: Athens

Currency: Euro

In modern Greek, the country is known as Ellada. The corresponding form of the name in the ancient Greek and scholarly tongue is "Hellas". Hence the name Hellas, which in most European languages is used in archaic and poetic contexts today. The offensive form of the word is "Hellenic" or, "hellénique" and today it is used for more official purposes in Greece, mainly for names of state institutions and the Hellenic Republic.

The name of Greece in English and most European languages comes from the Latin terms Graecia and Graecus, from the name of the Grecos, who were among the first Greek tribes to colonize Magna Graecia in southern Italy. The term comes from the proto-Indo-European term *ǵerh-* (= grow up).

Greece, under the official constitutional name of the Hellenic Republic, is a country of southeastern Europe located at the southern tip of the Balkan peninsula. It is bordered on the northwest by Albania, on the north by Bulgaria and Northern Macedonia, and on the northeast by Turkey. It has coastlines in the eastern Mediterranean and is washed east by the Aegean Sea, west by the Ionian Sea and south by the Libyan Sea. It ranks 97th in the world in terms of size. According to official estimates by the European Statistical Office, the country's population on 1 January 2020 is estimated at 10,691,204. Its capital and largest city is Athens.

Greece holds the 9th place in the world in the countries with the longest coastline at 15,147 km, as it has an enormous number of islands estimated at 2,500 with 165 being habitable.



1(Lencer (map asset)derivative work: Yiyi (placenames and islands in Italian)derivative work: Gts-tg (translation to Greek + small updates) - File:Isole_della_Grecia.svg, CC BY-SA 3.0)

In the last decade, Greece may have supplied the world with negative news. But the standard of living of the Greeks is compared only to that of the inhabitants of the developed Western states. The Greek economy ranks 51st in the world for calendar year 2020. This is also the 55th purchasing power, at 280.11 billion euros in spite of its relatively small population, at only 10.7 million. The economy is developed with a high standard of living and a "very high" human development index. A large part of it is based on services, 79.1% of GDP, industry, 16.9% and agriculture, 4.1%.

Greece is a founder member of the Organisation for Economic Co-operation and Development (OECD) and the Organisation for Economic Cooperation of the Black Sea (ESBC). The country joined the EEC in 1981 and in 1999 the Economic and Monetary Union (EMU) adopting the euro as its currency in 2001. Greece is a member of the International Monetary Fund and the World Trade Organization.

Greece has the largest economy in the Balkans and is an important investor for the countries of the region.

The main sectors of the Greek economy are tourism, marine, industrial food production and tobacco processing, textiles, chemicals and metal products, mining and petroleum refining factories.

Tourism is a major contributor to Greece's economy and development. Greece is a popular destination worldwide mostly for summer holidays, where they are promoted much more than its winter and alternative destinations. In the period 2013-2019, tourist arrivals showed a significant increase and from about 18 million it exceeded to more than 31 million, with a value of more than 18 billion euros. Accommodation in Greece is recognized for its quality in terms of amenities and level of service to visitors.

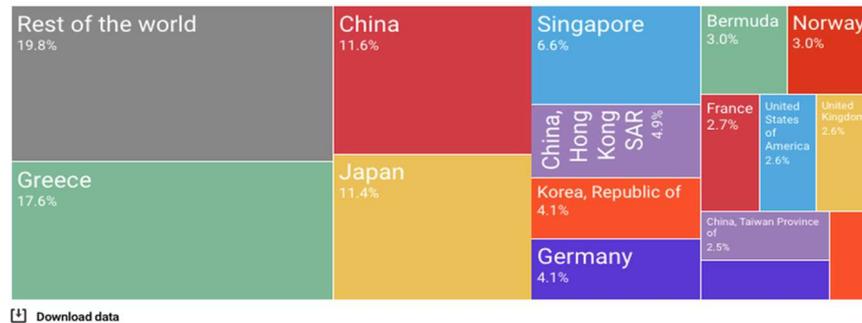


2The performance of Greek tourism in the period 2013-2019

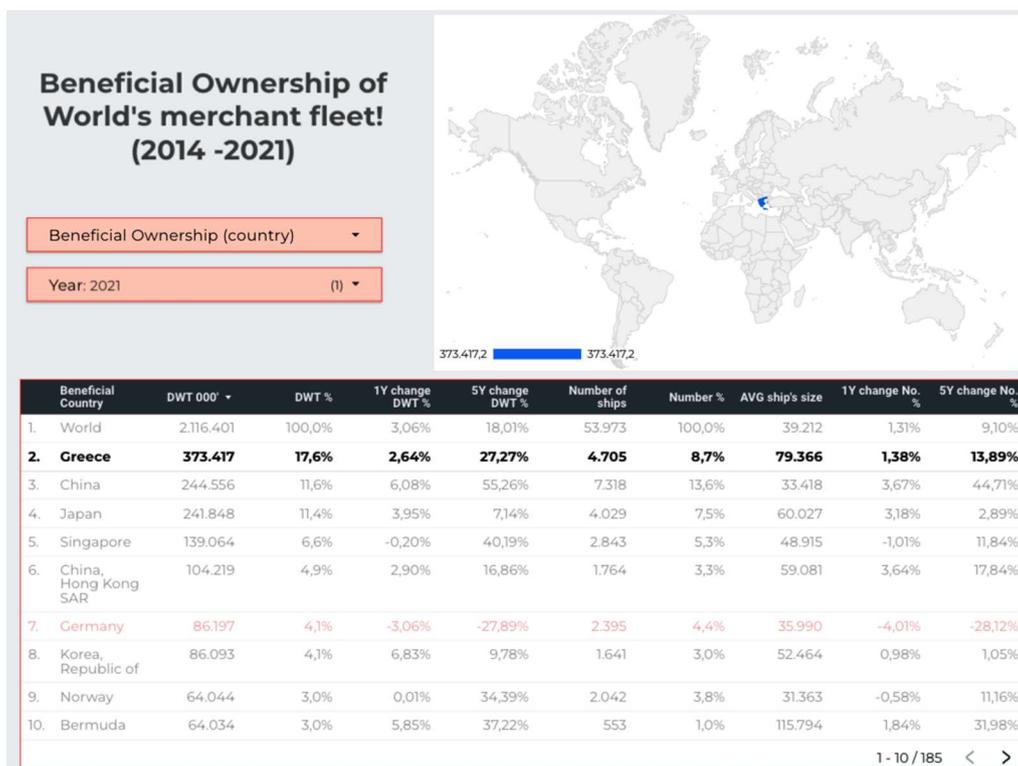
The maritime industry has been an important part of Greece's economic activity since antiquity. Today, the Greek merchant fleet is among the most important industries in the country. The Greek-owned merchant fleet is the largest in the world with significant growth rates both in absolute number of vessels and in total displacement. Greece ranks first in tankers and bulk carriers, fourth in container carrier ships, and also fourth in other types of ships. Today, the Greek merchant fleet, with a value of

more than 500 billion euros, is in the process of upgrading with the purchase of modern liquefied natural gas carriers, presenting the highest growth rate in the world.

Share of world fleet in % owned by top 15 countries in 2021



3The 15 countries with the largest share of the global merchant fleet

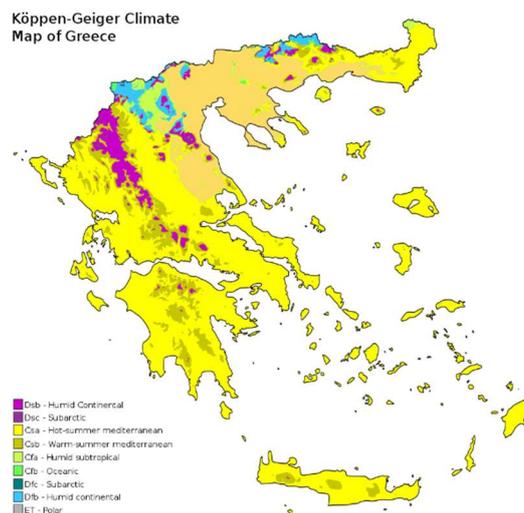


4Greece is the global leader as merchant fleet owner.

The climate of a geographic area is mainly affected by the following 3 factors:

- o Latitude: Greece lies between the geographical widths of the 34th (Libyan Sea, southern Crete) and 42nd (borders of Greece-Bulgaria-Turkey, in Thrace). This zone is located in the Temperate Zone, which is defined between 23:27' (Tropic of Cancer) and 66:33' (Arctic Circle) northern latitude.

- The land/sea ratio: Greece is a multifaceted peninsula with a rich horizontal (coastal) and vertical (relief) dismemberment. Its area (land) amounts to 132,000 km², while the total surface of the seas in which the island complexes are scattered, amounts to 300,000 km² (in total, the wider area of The Greek area amounts to 432,000 km²). Of the aforementioned area, almost 2/3 of Greece consists of the sea. As a peninsula exposed in the south, Greece has a great open sea in the south. On the contrary, in the north, Greece is connected to the compact landmass of the Balkans peninsula.
- The relief (altitude): The country has an extremely vertical dismemberment. Although a sea country, it is at the same time mountainous and is classified in the most mountainous countries of Europe. From the surface of the sea, to the highest point of the country (Olympus), there is an altitude difference of 2,918 meters and the average altitude of the country is about 585 meters. The shape of the land has a decisive influence on the weather. Under stable atmosphere conditions, the air temperature drops by 6°C per 1000 meters in height or 0.6°C per 100 meters. Together, the above three factors shape the climate of our country, which varies considerably from region to region.



5Figure 7: (<https://www.wikiwand.com/el>) Climate classification of Greece based on the Köppen methodology

Energy policies

- **Evolution in the last 10 years**

According to the national and European reports over the last 10 years, as elaborated by the European Commission, the main challenges identified for Greece in the implementation of EU environmental policy and legislation were the following:

- tackling problems in the field of waste management and, in particular, the closure of illegal landfills and the treatment of hazardous waste;

- improving the protection of the natural environment through the establishment of an effective national protection system, improving information and providing appropriate incentives for sustainable investment; and.
- completion of the implementation of the Urban Waste Water Management Directive.

The complexity of Greek administrative structures and procedures, which can lead to significant delays and bottlenecks, is sometimes the main obstacle to the implementation of environmental legislation. Since the 2019 OECD – Environmental Performance Review, however, some progress has been recognized in the field of the waste management, as the strategic waste management framework is now in place and national and regional waste management plans have been adopted. In addition, the number of illegal landfills remaining in operation or requiring remediation has declined over the years. However, it will be especially difficult to shut down the remaining landfill sites if new facilities are not built. With regard to the protection of the natural environment, Greece has recently considerably enlarged the coastal section of the Greek Natura 2000 network. It developed legislation for the establishment of the management bodies of sites that have been included in the Natura 2000 network. In parallel, a fully integrated LIFE project for nature conservation was launched. In the area of urban wastewater treatment, positive steps have been taken, such as the systematic assessment and strategic reorganisation of the country's investment needs. These efforts should lead to the rapid establishment of the necessary infrastructure, particularly in urban areas (i.e. community centres or places of economic activity).

- **Current situation**

Greek legislation is fully harmonized with European law. Consequently, all European Union policies are subject to national legislation. For their full and efficient implementation, the relevant Ministry of Energy and Environment Affairs cooperates with Greek universities, professional and scientific associations and with local authorities for the creation and implementation of plans that meet the requirements and objectives EU has set. The main pillars of the effort of the Greek authorities are as follows:

- Energy
- Environment
- Forests
- Spatial planning
- Waste management

These 5 sectors are analyzed as follows:

Energy

- a. Renewable energy sources
 - i. Wind energy
 - ii. Solar energy
 - iii. Biomass
 - iv. Hydroelectric plants
 - v. Geothermal energy
 - vi. Co-generation systems based on renewable energy sources.

- b. Electrical energy
- c. Hydrocarbons
- d. Energy efficiency plans.
- e. Green transport
- f. Energy Research & Innovation.
- g. Mineral resources.

Environment

- a. Circular economy
- b. Climate change
 - i. Policies for fighting climate change.
 - ii. Emissions trading system.
 - iii. Flexible Procedures of the Kyoto Protocol Protection of the ozone layer.
 - iv. Fluoridated greenhouse gases.
 - v. F-GASES & ODS Monitoring Information System to carry out the above tasks.
- c. Biodiversity
 - i. NATURA 2000 network
 - ii. "Nature 2000" Committee, which is the central scientific advisory body of the State for the coordination, monitoring and evaluation of policies and measures for the protection of Greek biodiversity.
 - iii. Protected Areas (national parks, wildlife refuges, protected landscapes and natural formations)
- d. Waters Protection
 - i. Management of water resources
 - ii. Nitrates
 - iii. Floods
 - iv. Swimming shores
 - v. INTERREG programmes:
 1. WATenERgy CYCLE: Urban water-energy cycle
 2. Plastic Busters MPAs
 3. AQUARES: Promotion of water recycling policies for resource-efficient European regions.
 4. LOODGUARD: Integrated actions for joint coordination and reaction to flood risks in the transboundary area/ flood guard.
- e. Air quality
- f. Noise and radiation

Forest

- a. Forest's Protection
- b. Forest's management
- c. Implementation of the CITES Convention, to protect flora and fauna and control their trade.

Spatial planning

- a. Spatial planning
- b. Urban planning

- c. Urban design
 - i. Sustainable mobility
 - ii. Accessibility
 - iii. Development of an electric vehicle recharging network.
- d. Buildings
 - i. Traditional architecture
 - ii. Preserved buildings
- e. Monitoring of the built environment
- f. Development of geo-spatial data

Waste management

- a. Solid waste
 - i. Recycling
 - ii. Non-hazardous waste
 - iii. Hazardous waste
 - iv. Extractive waste
- b. Urban wastewater
 - i. Nationwide installation database.
 - ii. Wastewater treatment
 - iii. Wastewater reuse
- c. European programmes
- d. Life programs aimed at contributing to the implementation of the National Waste Management Plan, the National Strategic Waste Prevention Plan and the National Circular Economy Strategy.

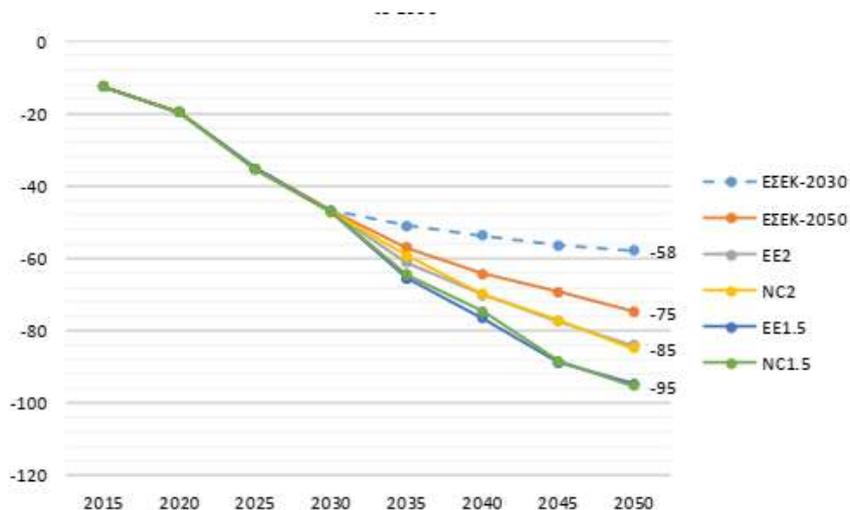
- **Future tendencies**

Greece's energy objectives have been identified and described in the National Energy and Climate Plan (NECP). This is a detailed road map for achieving the specific energy and climate objectives by 2030. The long-term strategy considers the range of options available and the different scenarios. The development of the energy system and the need for an energy transition in the most economically competitive manner are the objectives of the plan.

Long-term strategy scenarios that have been developed and reviewed include:

- Scenario EE2 (Energy Efficiency and Electrification for 2oC)
- Scenario NC2 (New energy carriers for 2oC)
- Scenario EU1.5 (Energy and Efficiency electrification for 1.5oC)
- Scenario NC1.5 (New energy carriers for 1.5oC)

These scenarios present different possibilities for achievement (low ambitious – very ambitious) according to international conditions of economic and geopolitical stability. The reduction in greenhouse gas emissions in percent from 1990 is projected to reach 60 percent by 2030 and 95 percent by 2050.



6 Total greenhouse gas emissions total reduction target in % compared to 1990 in Greece

Energy saving procedures in buildings and residences are among the main policies with undeniable benefits, and the sector with the greatest potential to reduce energy consumption in a cost-effective manner. Long-term strategy scenarios, as well as NECP-2050, include particularly ambitious targets and similar policies to drastically reduce energy use, especially for thermal uses.

The objectives of the long-term strategy scenarios are based on the objective of the building fleet to approach near-zero energy consumption standards by 2050.

In order for the building stock to approach zero energy consumption, Greece must:

- to apply strict specifications for new buildings regarding the energy performance of its thermal shell and
- large-scale energy retrofitting of older buildings so that almost all of the remaining stock of older buildings in 2050 will be retrofitted.

- **Main threats and challenges**

Compared with the 2030 target, the 2050 targets are significantly more ambitious and therefore policy instruments must be broader in scope. Given that the construction rate for new buildings is relatively low and is expected to remain so in the future, energy retrofits for older buildings are important. The long-term strategy scenarios, for analysis and economic evaluation purposes, slightly differentiate the scope of implementation from the above policy. The ambitious energy improvement programme calls for major investments, which have, on average, increased the cost per unit of building surface, as they are applied to almost the entire building stock.

Also important is the penetration of geothermal heat pumps, whose number is expected to be multiplied in relation to 2030 data, particularly in scenarios with improved energy efficiency.

The climate neutral roadmap includes eliminating the use of solid and liquid fossil fuels in buildings.

- **Legislation and Regulations about green energies in cities infrastructures**
 - Regulation of Energy Performance of Buildings (KENAK). It includes, in addition to the thermal insulation, characteristics of the structural elements of the external surface of the building (shell). Other factors such as heating / air conditioning and hot water production installations, the use of renewable energy sources, passive heating and cooling elements, shading, indoor air quality, adequate natural lighting and the architectural design of the building, are getting into consideration. The methodology for calculating energy performance covers the annual energy performance of the building and has been developed according to the applicable European standards.
 - Each building in Greece must have an energy efficiency certificate after a study according to KENAK.
 - All new public buildings must be in the "Almost Zero Energy Consumption" category.
 - Law on Sustainable Housing Development (Law 2508/97). Residential organization should be governed by the principle of the maximum possible economy of residential subdivisions. Urban planning must be in line with the protection of the natural and built environment and the preservation of highly productive farmland.

Grants and subsidies

- "ELECTRA": Funding Programme for the Energy Upgrade of Public Buildings.
- "I move electrically": Subsidy program for the purchase or long-term rental of an electric vehicle and the purchase of an electric motorcycle or bicycle. It is possible to subsidize for the installation of a smart home charger in the main residence or the withdrawal of the old vehicle.
- "Energy Saving at home": The design of the program takes into account the integrated energy saving intervention in the residential building sector. Its main objective is to reduce the energy needs of buildings and the polluting emissions which contribute to the greenhouse effect.
- "Replacement and Recycling of Energy-Intensive Electrical Devices": The program includes the replacement and recycling of air conditioners, refrigerators and freezers, as these devices create the largest loads of electricity.

References

Hellenic Government, Ministry of Energy and Environment Affairs, 2018. National Energy and Climate Action Plan. Available at http://www.opengov.gr/minenv/wp-content/uploads/downloads/2018/11/NECP_131118_final.pdf

Weather forecast: <http://www.meteoclub.gr/images/stories/weerman/klimatiki-katataksi-elladas.pdf>

Hellenic Government, Ministry of Energy and Environment Affairs, 2017. General Secretariat for Energy and Mineral Raw Materials, Technical Chamber of Greece. Detailed National Standards for the Buildings Energy Performance Calculation. Available at: http://portal.tee.gr/portal/page/portal/SCIENTIFIC_WORK/GR_ENERGEIAS/kenak/files/TOTEE_20701-1_2017_TEE_1st_Edition.pdf

HELLENIC STATISTICAL AUTHORITY, THE GREEK ECONOMY, December 2021. Available at: https://www.statistics.gr/documents/20181/17120175/greek_economy_30-12-2021.pdf/622c60c2-eb1e-cbc8-b73e-bfc492ce4f61

ECONOMIST INTELLIGENCE, The Global Livability Index 2021, Available at: <https://www.eiu.com/n/campaigns/the-global-liveability-index-2021-download-success>

INFOMARITIME.EU. World merchant fleet and top 15 ship owning countries. 2021. Available at: <http://infomaritime.eu/index.php/2021/08/22/top-15-shipowning-countries/>

European Commission. Overview of the implementation of EU environmental policy 2019. Brussels, 4.4.2019. Available at: https://ec.europa.eu/environment/eir/pdf/report_el_el.pdf