



Country profile – Greece

The section 'Key climate- and energy-related data' was prepared by the EEA. It includes the latest data available as of 31 July 2014

The section 'Climate and energy policy framework' was prepared by eclareon and Ecologic Institute, Germany. It includes the latest information on national policies and measures available as of 31 May 2014.

For methodological details and other country profiles, see www.eea.europa.eu/themes/climate/country-profiles.

Key climate- and energy-related data — Greece

Key data on GHG emissions	2005	2011	2012	2013	EU 2012
Total GHG emissions (UNFCCC, Kyoto Protocol) (Mt CO ₂ -eq.)	135.3	114.7	111.0	107.8	4 544.2
GHG per capita (t CO ₂ -eq./cap.)	12.2	10.3	10.0	9.7	9.0
GHG per GDP (g CO ₂ -eq./PPS in EUR)	599	507	513	514	350
Share of GHG emissions in total EU-28 emissions (%)	2.6 %	2.5 %	2.4 %	2.4 %	100.0 %
EU ETS verified emissions (Mt CO ₂ -eq.)	71.3	58.8	61.4	58.6	1 848.6
Share of EU ETS emissions in total emissions (%)	52.7 %	51.3 %	55.4 %	54.4 %	40.7 %
ETS emissions vs allowances (free, auctioned, sold) (%)	+ 0.1 %	- 22.6 %	- 16.9 %	+ 14.0 %	- 14.1 %
Share of CERs & ERUs in surrendered allowances (%)	0.0 %	18.7 %	20.8 %	n.a.	26.4 %
Non-ETS (ESD) emissions, adjusted to 2013–2020 scope (Mt CO ₂ -eq.)	61.4	53.3	47.0	48.7	2 566.6
Key data on renewable energy	2005	2010	2011	2012	EU 2012
Share of renewable energy in gross FEC (%)			10.9 %	13.8 %	14.1 %
() = including all biofuels consumed in transport	(7.0 %)	(9.8 %)			
Share of renewable energy for electricity (%)	8.3 %	12.5 %	13.9 %	16.5 %	23.5 %
Share of renewable energy for heating and cooling (%)	12.8 %	17.8 %	19.4 %	24.4 %	15.6 %
Share of renewable energy for transport (%)			0.7 %	1.1 %	5.1 %
() = including all biofuels consumed (%)	(0.0 %)	(1.9 %)			
Key data on energy consumption	2005	2010	2011	2012	EU 2012
Primary energy consumption (Mtoe)	30.6	27.6	26.9	27.1	1 584.8
Primary energy consumption per capita (Mtoe/cap.)	2.8	2.5	2.4	2.4	3.1
Final energy consumption (Mtoe)	21.0	19.0	18.9	17.1	1 104.5
Final energy consumption per capita (Mtoe/cap.)	1.9	1.7	1.7	1.5	2.2
Efficiency of conventional thermal electricity and heat production (%)	37.5 %	37.3 %	39.2 %	38.6 %	50.0 %
Energy consumption per dwelling by end use	2005	2009	2010	2011	EU 2011
Total energy consumption per dwelling (toe/dwelling)	1.28	1.14	1.09	1.22	1.42
Space heating and cooling (toe/dwelling)	0.92	0.78	0.73	0.85	0.96
Water heating (toe/dwelling)	0.07	0.07	0.07	0.08	0.18
Cooking (toe/dwelling)	0.07	0.07	0.07	0.08	0.08
Electricity (lighting, appliances) (toe/dwelling)	0.21	0.22	0.22	0.21	0.20

Progress towards GHG targets (under the Effort Sharing Decision, i.e. non-ETS emissions)

2013 ESD target (% vs base year)	- 7.6 %	2020 ESD target (% vs base year)	- 4.0 %
2013 ESD emissions (% vs base year)	- 20.0 %	2020 ESD projections WEM (% vs base year)	- 5.0 %
		2020 ESD projections WAM (% vs base year)	- 8.2 %

Based on approximated emission estimates for 2013, emissions covered by the Effort Sharing Decision (ESD) (i.e. in the sectors which are not covered by the EU ETS) are expected to be below the annual ESD target in 2013. Projections also indicate that 2020 ESD emissions are expected to be below the 2020 ESD target, with the current existing measures.

Progress towards renewable energy targets

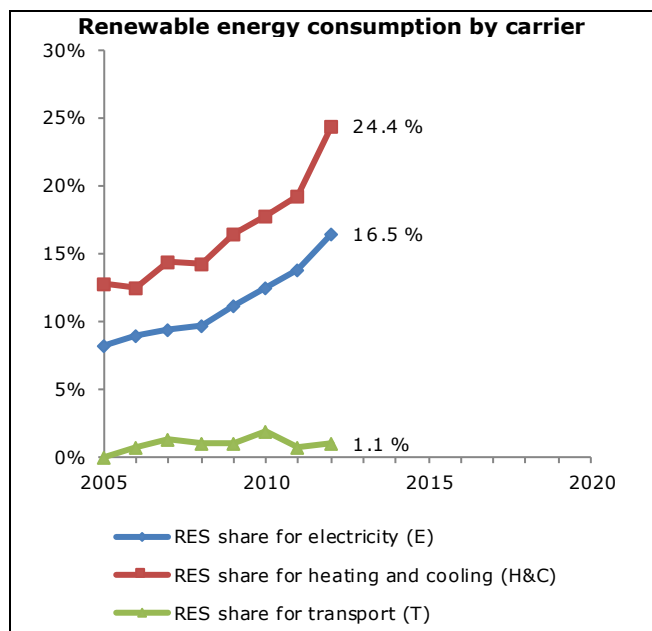
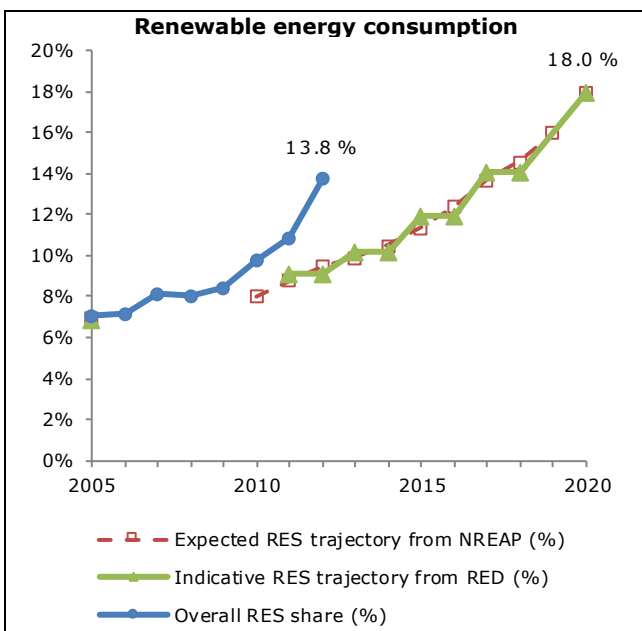
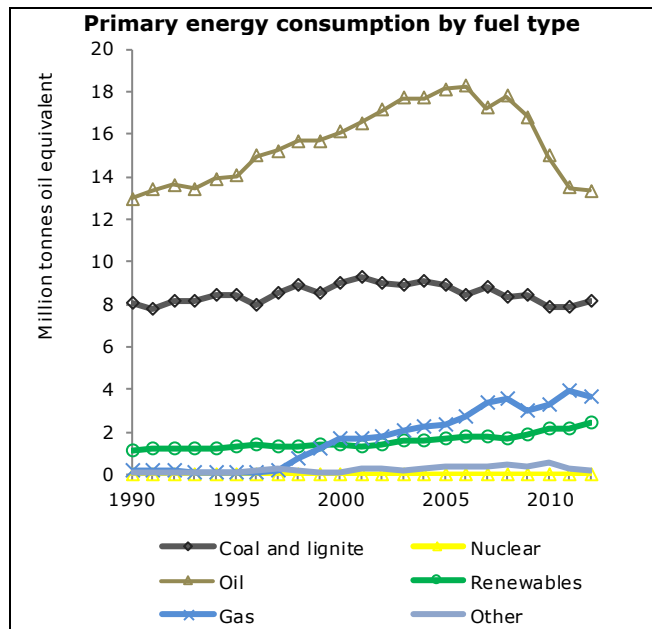
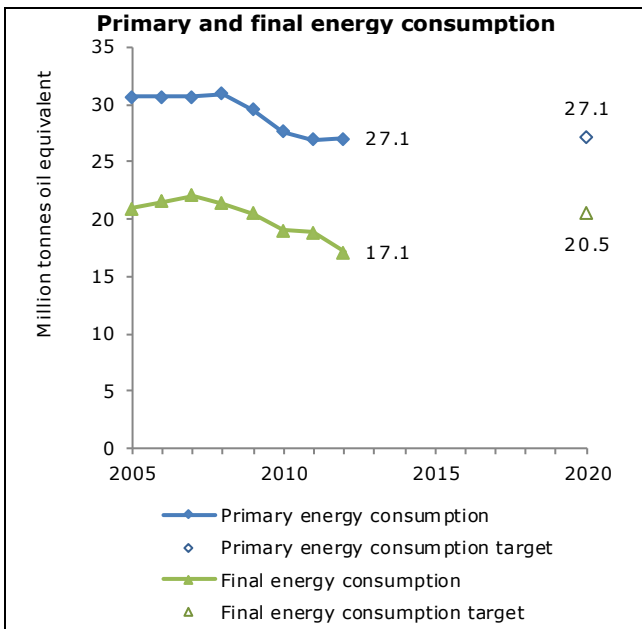
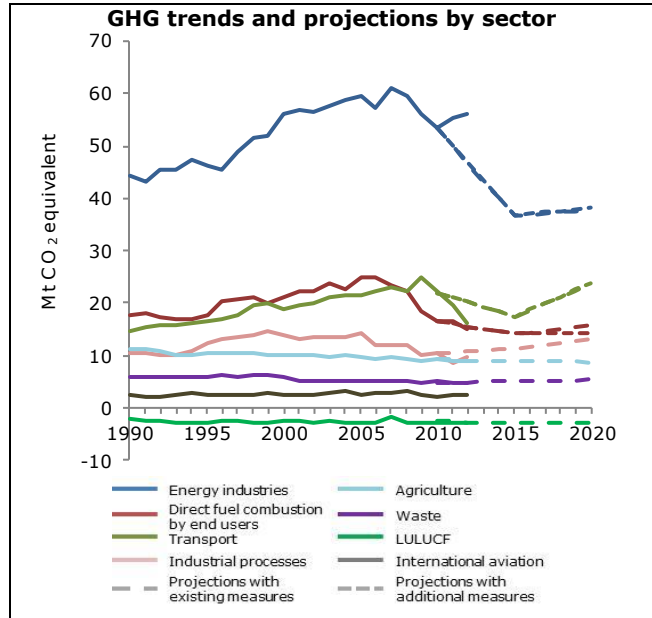
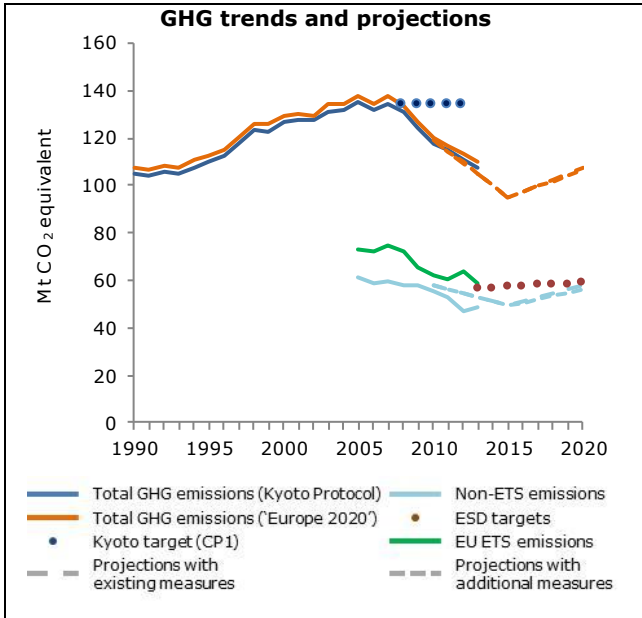
2012 RES share in gross final energy consumption (%)	13.8 %	2011–2012 indicative share from RES Directive (%)	9.1 %
2020 RES target	18.0 %	2012 expected share from NREAP (%)	9.5 %

The average share of renewable sources in gross final energy consumption for 2011–2012 was 12.3% (2.2 Mtoe), which is higher than the indicative RED target for 2011–2012 (9.1%). At the same time, the share of renewables in 2012 (13.8 %) is higher than the expected 2012 NREAP target (9.5 %). Over the period 2005–2012 the observed average annual growth rate in renewable energy consumption amounted to 6.5%. In order to reach its 2020 NREAP target, Greece needs an average annual growth rate of 9.5% in the run-up to 2020. In absolute terms, this is equivalent to 3.0 times its cumulative effort so far.

Progress towards energy efficiency targets

Primary energy consumption:		Final energy consumption:	
2005–2012 average annual change	- 1.8 %	2005–2012 average annual change	- 2.8 %
2012–2020 average annual change to target	+ 0.0 %	2012–2020 average annual change to target	+ 2.3 %

Over the period 2005–2012, primary and final energy consumption decreased at a much faster pace than is necessary to achieve the 2020 targets. The economic crisis had a significant impact on this development leading to large energy savings particularly in industry and transport sectors (a decrease by 30 % and 22 % respectively), while energy consumption in the residential sector changed much less. As the Greek economy slowly picks up, improvements in energy efficiency will be necessary. Particular attention could be necessary to limit energy consumption in the energy sector, where own consumption increased by 30 % between 2005 and 2012.



Climate and energy policy framework

Challenges and opportunities

Greece still receives direct financial aid through the European rescue facility and the associated second economic adjustment programme strongly influences policymaking. Green growth elements are only included to a limited extent in this programme and since the country remains in a state of financial stress, policy measures need to be designed in a very cost-efficient manner. The persistently high unemployment means that policymakers also need to be very aware of costs that are passed on to consumers. However, a specific opportunity presents itself in the form of clean technology investments, which can lead to economic development. Specifically, decentralised renewable energy deployment and energy efficiency measures in buildings can correlate with local economic activity and employment. In 2012, more than 33 000 jobs and more than EUR 2.7 billion of turnover were generated by the renewable energy sector alone, without considering supplying industries and energy efficiency (EurObserv'ER, 2012). Expanded energy efficiency measures could at the same time be the key to reduced energy poverty and reduced costs in industry. In addition, the successful implementation of measures listed in the National Renewable Energy and Energy Efficiency Action Plans is vital so that Greece can meet its greenhouse gas (GHG) emission target.

Climate and energy strategies

Greece has introduced climate policy instruments with a particular focus on energy and energy efficiency. Following the Energy Roadmap 2050, reducing dependence on imported energy, maximising the penetration of renewables, achieving a significant reduction in emissions of carbon dioxide (CO₂), reinforcing energy efficiency in building, industry and transport, and the protection of final consumers are the main pillars of long-term national energy planning. The introduction of natural gas into the energy mix, as well as the expansion of grid connections to the currently isolated islands and to neighbouring states are current major priorities of national energy policy. Greece has also been focusing on creating a sustainable financing structure for renewables, given the deficits in the funding mechanism. Further important reform targets include the privatisation of the electricity sector, adjustments in electricity pricing and the adoption of smart meter technology. However, civil society organisations caution that the economic downturn and the introduction of the economic adjustment programme have reduced policymakers' attention towards environmental topics (Ekathimerini, 2012).

Renewable energy

With the introduction of Law 3851/2010 the Greek government increased its national renewables target for 2020 of 18 % to 20 % participation of renewables in gross final energy consumption, composing of 40 % participation of renewable energy sources in electricity production, 20 % in heating and cooling, and 10 % in transport. However, the share of renewables in total energy consumption has been among the lowest in the EU. The main support system for renewable electricity is a feed-in tariff (FIT) scheme. Until recently, the FITs in Greece were among the most generous in the EU (MEEC, 2010). This led to a steep increase of installed capacity, especially in photovoltaics, which increased from 624 MW in 2011 to 2 579 MW in 2013 (HELAPCO, 2014). On the other hand, this caused a significant deficit in the Renewable Energy Special Account, the funding instrument basically fed by the Special Levy for the Reduction of GHGs paid by electricity consumers. Obligations under the economic adjustment programme have led the Greek government to reduce FIT rates and to increase the Special Levy to nullify the Special Account deficit. Renewables in heating and cooling are supported through tax reliefs granted on renewable boiler installation costs or replacement costs of old boilers with renewable boilers. The programme for energy savings in private buildings (Εξοικονομώ Κατ'οίκον) supports measures to increase the energy performance of buildings by providing financial means for installation costs of renewable heating facilities through subsidies and interest-free loans. The share of both instruments in total investment costs depends on family income.

Energy efficiency

Although the Energy Roadmap 2050 foresees significant energy efficiency improvements, Greece has no long-term energy efficiency strategy outlining specific targets. Energy **taxation** is rather high with the level of excise duties being above the EU average. There are exemptions in place for coal and coke used for chemical reduction and in electrolytic metallurgical processes. Greece has no CO₂ tax. A legislative framework is in force for the promotion of **cogeneration** and district heating in industry, residential buildings and the tertiary sector.

In the **building sector**, minimum performance standards and certification have been introduced for new or renovated buildings. The Building the Future programme aims to upgrade the energy performance of residential and industry buildings by implementing modern energy efficiency technologies. Within this framework, policy instruments, such as white certificates, voluntary agreements with the industrial and commercial sectors, and contracts of guaranteed performance are planned to be introduced. The programme for energy savings in residential buildings (Εξοικονομώ Κατ'οίκον) provides funding, granting interest-free loans and subsidies for the installation of renewables and energy-savings measures. The programme foresees a budget of EUR 396 million and due to its success it is expected to continue in the next programmatic period 2014–2020 with a substantially augmented budget.

Environmental organisations criticise a lack of coherence in the current policy framework. It is estimated that during the period 2012–2014 the Greek government will still spend almost EUR 1.20 in heating oil subsidies for each euro spent on energy efficiency (Greenpeace, 2013).

Transport

As the economic adjustment programme primarily encourages transport price reductions and growth of the tourism sector, including maritime transport and aviation (European Commission, 2012), Greece's transport policy is currently concerned with the liberalisation of the transport market. However, emissions from transport decreased in the last years and average emissions for newly registered cars are the fourth lowest in the EU (Eurostat, 2013). Measures to incentivise efficient driving and the purchase of efficient cars include a registration tax based on value, age and cylinder capacity, as well as an ownership tax based on CO₂ emissions for passenger cars and on weight for most commercial vehicles. Petrol is taxed well above EU average, while diesel is taxed well below EU average. The Greek government promotes the use of biofuels through a biofuels quota and an exemption from the excise tax. Modal shift is supported through different measures that are under development, including the expansion of metro

lines and bus lanes. Moreover, the bus fleet is being renewed and railways are being electrified, aiming at increasing energy efficiency.

Agriculture

The Rural Development Plan for Greece, co-funded by the EU, imposes the strategic objectives of maintaining and improving competitiveness, environmental protection and sustainable management, as well as improvement of quality of life in rural areas and the development of local possibilities for employment and diversification of rural economies. It includes measures to increase organic farming, reduce land use and decrease the use of synthetic fertilisers. Actions such as 'Crop rotation with rain-fed crops in tobacco producing regions' support former tobacco producers using irrigated farming to implement dryland farming and cultivate rain-fed crops as part of their cultivation switching to irrigated farming. The aim of the action is to reduce water consumption, restrict chemical compounds use and abate CO₂ emissions.

Waste

As a result of the National Waste Management Plan, nearly all municipal waste is disposed in sanitary landfills. The Plan's main objectives are the gradual closure of all uncontrolled waste disposal sites, the reduction of waste generation rates, the recovery and reuse of the wastes, including energy recovery, and the reduction of biodegradable wastes going to landfills. The share of recycled solid waste increased from 8 % in 2000 to 18 % in 2011. The four largest SWDS, managing some 90 % of waste disposed to SWDS, operate biogas recovery and flaring installations. Also, the number of wastewater treatment plants has been increased considerably, serving 91 % of the population living in agglomerations with more than 2 000 inhabitants in 2011 (MEEC, 2014).

Land use, land-use change and forestry

Rural development actions and further financing mechanisms aim at forest conservation, recovery of degraded forests and forest fire prevention.

References

Econews, 2014, 'Το "Εξοικονομώ κατ' οίκον" στο νέο ΕΣΠΑ με €700 εκ. — Ακόμα €250 εκ. στις ΑΠΕ' (Econonews, 2014, "Exsoikonomo kat' oikon" included in the new National Strategic Reference Framework with €700 million — Additional €250 million to RES) (<http://www.econews.gr/2014/04/10/exoikonomo-esp-114044/>) accessed 8 October 2014.

Ekahtimerini, 2012, 'In debt-hit Greece, much-craved development is no longer green' (http://www.ekathimerini.com/4dcgi/w_articles_wsite1_1_22/10/2012_466697) accessed 8 October 2014.

EurObserv'ER, 2012, *The State of Renewable Energies in Europe: 12th EurObserv'ER Report* (http://www.energies-renouvelables.org/observ-er/stat_baro/barobilan/barobilan12.pdf) accessed 8 October 2014.

European Commission, 2012, *The Second Economic Adjustment Programme for Greece First Review - December 2012* (http://ec.europa.eu/economy_finance/publications/occasional_paper/2012/pdf/ocp123_en.pdf) accessed 8 October 2014.

Eurostat, 2013, Data sources: 'Implicit tax rate on energy (tsdcc360)', 'Energy intensity of the economy (tsdec360)', 'Final energy consumption (ten00095)', 'Share of renewable energy in gross final energy consumption (t2020_31)', 'Average carbon dioxide emissions per km from new passenger cars (tsdtr450)', 'Final energy consumption by sector (tsdpc320)', 'Greenhouse gas emissions by sector (tsdcc210)', 'Environmental tax revenues - % of total revenues from taxes and social contributions (ten00064)', 'Total environmental tax revenues as a share of GDP (ten00065)'.

Greenpeace, 2013, 'Μισο «Εξοικονομώ κατ' οίκον» θυσιάζεται κάθε χρόνο στο πετρέλαιο' ('Half of "Exsoikonomo kat' oikon" Programme is sacrificed on heating oil') (<http://www.greenpeace.org/greece/el/news/118508/118517/2013/oktovrios/oil-subsidies/>) accessed 8 October 2014.

HELAPCO, 2014, *Greek PV Market Statistics 2013*, Hellenic Association of Photovoltaic Companies (http://helapco.gr/wp-content/uploads/pv-stats_greece_enq-2013.pdf) accessed 8 October 2014.

MEEC, 2010, Law No.3851/2010, 'Accelerating the development of Renewable Energy Sources to deal with climate change and other regulations addressing issues under the authority of the Ministry of Environment, Energy and Climate Change', Ministry of Environment, Energy and Climate Change (<http://www.ypeka.gr/LinkClick.aspx?fileticket=qtIW90JJLYs%3d&tabid=37>) accessed 8 October 2014.

MEEC, 2014, *6th National Communication and 1st Biennial Report under the United Nations Framework Convention on Climate Change*, Ministry of Environment, Energy and Climate Change (http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_greece%5B1%5D.pdf) accessed 8 October 2014.

References

BMLFUW, 2014, '6th National Communication under the United Nations Framework Convention on Climate Change', Federal Ministry of Agriculture, Forestry, Environment and Water Management (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft) (http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/aut_nc6.pdf) accessed 3 October 2014.

BMWFJ, 2012, 'Neuer Boom bei Ökostrom', Austrian Federal Ministry of Economy, Family and Youth (Bundesministerium für Wirtschaft, Familie und Jugend) (<http://www.bmwfj.gv.at/ENERGIEUNDBERGBAU/ENERGIEVERSORGUNG/Seiten/Oekostrom.aspx>) accessed 3 October 2014.

EEA, 2013, *Trends and projections in Europe 2013, Tracking progress towards Europe's climate and energy targets*

until 2020, EEA Report No 10/2013, European Environment Agency (<http://www.eea.europa.eu/publications/trends-and-projections-2013>) accessed 3 October 2014.
Lebensministerium, 2012, 'Green jobs in Österreich' (<http://www.lebensministerium.at/umwelt/green-jobs/greenjobs.html>) accessed 3 October 2014.