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## **COMMISSION STAFF WORKING DOCUMENT**

### **Country Factsheet Greece**

#### *Accompanying the document*

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN  
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL  
COMMITTEE, THE COMMITTEE OF THE REGIONS AND THE EUROPEAN  
INVESTMENT BANK**

### **State of the Energy Union**

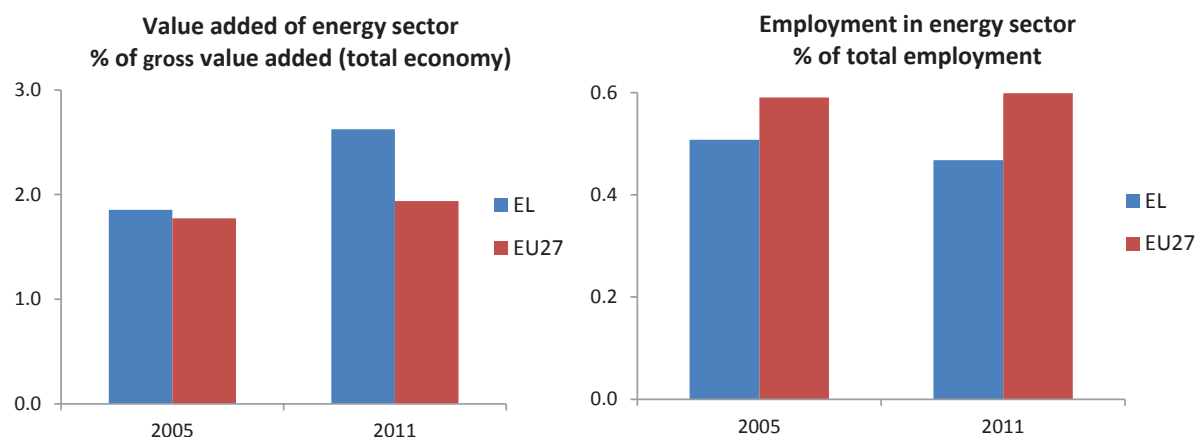
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## Macroeconomic relevance of energy

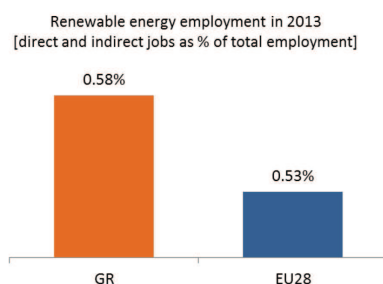
### IMPORTANCE OF THE ENERGY SECTOR

Compared to the EU average, the Greek energy sector's share in gross value added has become considerably larger, which for a part may reflect the severe economic downturn in Greece. The energy sector's share in total employment has not changed much and stayed a bit below the EU average. The two graphs combined suggest a higher labour productivity which may follow from the relatively high capital intensity of the Greek energy sector.



Source: EUROSTAT – National Accounts

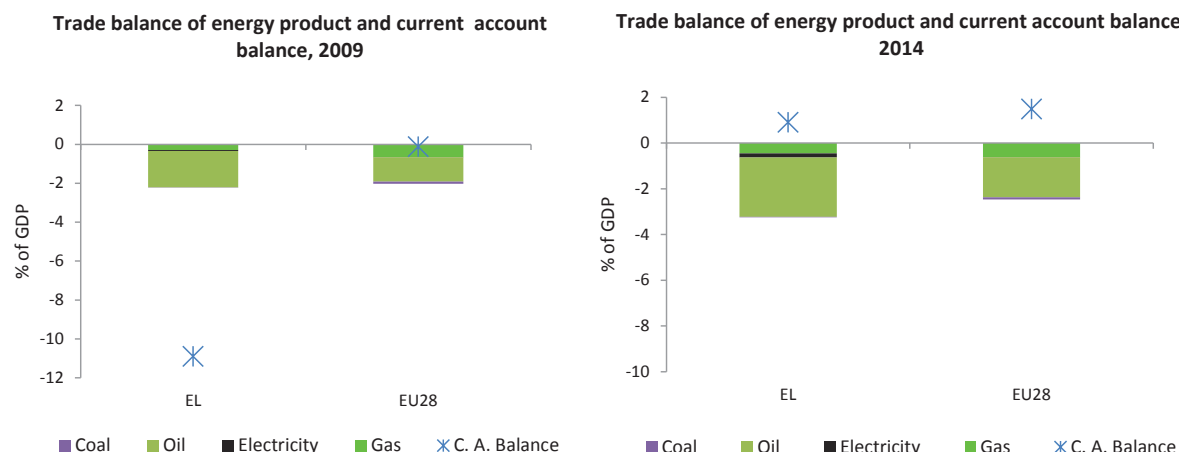
According to EurObserv'ER, in 2013, the share of direct and indirect renewable energy related employment in total employment of the economy in Greece was at about 0.58%, above the EU average of 0.53%.



Source: European Commission, based on EurObserv'ER and EUROSTAT

## TRADE BALANCE OF ENERGY PRODUCTS

The relatively large energy trade deficit points to the relatively large dependence on imported energy sources, mainly oil and gas. This deficit has proved to be rather persistent over time, with an increase over the 2009 – 2014 period of both the gas trade and the oil trade deficit. The doubling of the gas trade deficit in GDP terms reflects a change in the country's energy mix. The energy trade deficit reduces the size of the current account surplus which is a vital counterweight for the country's debt deleveraging.



Source: EUROSTAT

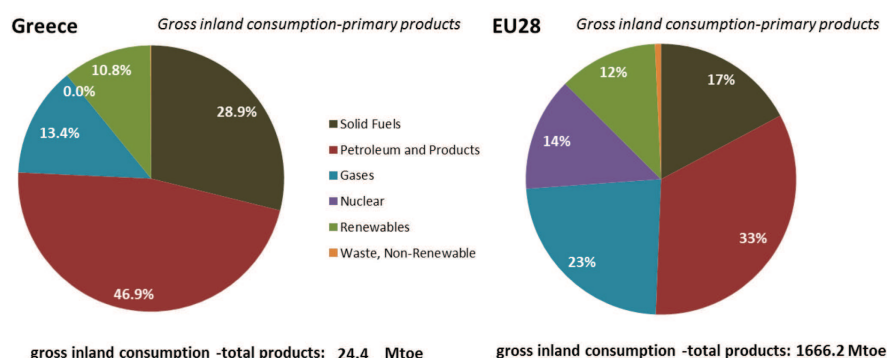
Note: Current account balance for EU28 from European Commission (AMECO)

## 1. Energy Security, solidarity and trust

### ENERGY MIX

The energy mix of Greece shows some differences compared to the EU28 average, i.e. by a higher use of petroleum and solid fuels, while a lower use of gas and no nuclear. Compared to 1995, the share of petroleum and products and solid fuels in gross inland energy consumption decreased (by 11 and 5 percentage points respectively), while the share of gases and – to a lesser extent – renewable energy increased (by 13 and 4 percentage points respectively).

#### Gross inland energy consumption in 2013

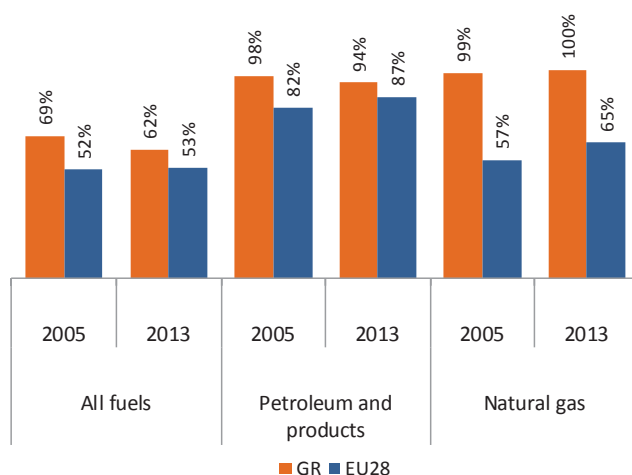


Source: European Commission, based on EUROSTAT

## IMPORT DEPENDENCY

Import dependency in Greece remains above EU average, in particular when it comes to petroleum and products and natural gas. In 2013, Greece imported 66% of its gas from Russia (85% in 2005) <sup>1</sup>. The country supplier concentration index is above EU average, but overall, the energy trade deficit (measured in terms of % of GDP) is slightly above EU average.

Import dependency 2013



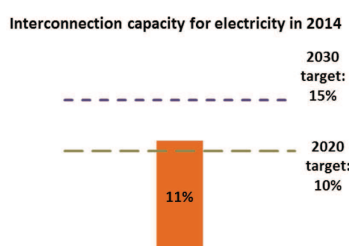
Top non-EU gas suppliers in 2013 (% in total imports)

Greece			European Union		
country		[%]	country		[%]
Russia		65.9	Russia		39.0
Turkey		17.4	Norway		29.5
Algeria		16.4	Algeria		9.7
			Qatar		6.7

Source: European Commission, based on EUROSTAT

## 2. A fully-integrated internal energy market

### INTERCONNECTIONS



Source: European Commission based on ENTSO-E scenario outlook and adequacy forecast 2014

Note: Reference to 2030 target is based on October 2014 European Council conclusions stating that "the Commission will also report regularly to the European Council with the objective of arriving at a 15% target by 2030"

The interconnection capacity for electricity was of 11% in 2014 for Greece. With new Projects of Common Interests, the level of 15% for 2030 can be reached. 3 electricity interconnections are labelled as PCIs: the interconnection between BG and EL and the two sections of the underwater interconnection between Israel, Cyprus and Greece. The Greek network has a central position in South-East Europe with the existing and future connections to Italy, Bulgaria, Turkey and the Western Balkans. Therefore, Greece could play the role of an electricity hub in the region.

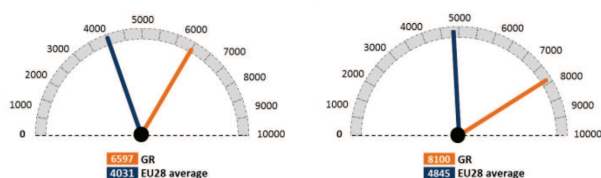
Greece has the potential to become a regional gas hub as it is located at the EU entry point of the Southern Gas Corridor, has access to LNG and gas supplies from Russia. Several gas projects are currently planned. The most relevant ones are: the interconnector Greece-Bulgaria, the Trans-Adriatic Pipeline and a new LNG terminal located in the Northern Aegean sea (Alexandroupolis or Kavala Bay).

<sup>1</sup> Top non-EU gas suppliers table is based on EUROSTAT data. The share of imports from non-EU countries is calculated as the ratio between volumes of imports from that specific non-EU supplier and total imports (from EU and non-EU countries).

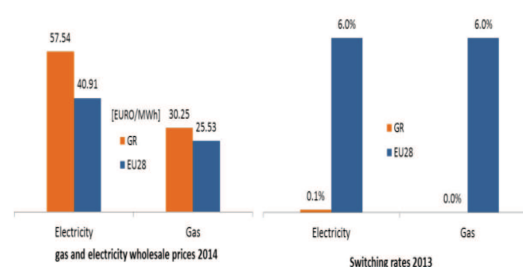
## ELECTRICITY AND GAS MARKETS

According to the selected indicators concentration of power generation and gas markets are high. Regarding electricity, there is no true level playing field with the incumbent (PPC) still having a dominant position. New legislation enhanced the independent role of the Regulator. To allow it to exert its role to the full and support the implementation of significant market reforms, the current staffing issues of the regulator should be swiftly addressed. Whereas the Greek government has now committed to lower the incumbent's market share with 25% in the short-run and to 50% by 2020, effective measures fostering competition on electricity retail and generation remain to be implemented. Similarly, progress will need to be made in order to converge the Greek electricity market towards the EU target model, such as by introducing forward, intra-day and balancing markets.

Market concentration index for power generation (left) and gas (right) (2013) (Herfindahl index – 10000 means monopoly)



Sources: European Commission based on ESTAT, CEER and Platts Power Vision<sup>2</sup>



Sources: ESTAT and European Commission Calculations

Regarding gas, since 2010 new gas suppliers have started importing natural gas. In 2012, 90% were imported by DEPA, the incumbent, and 10% by two other market players. However a sharp decline was observed in 2013 in the percentage share of gas imports by the other parties. Greece's gas retail markets are still legal monopolies and customers, with few exceptions, are not eligible. Nevertheless, a gas release process has been introduced aiming at market opening and effective competition, which recently has been improved further. Moreover, a new gas law was adopted with a view to fully liberalise by 2018 the gas retail markets. Once implemented fully, this will make it possible that for Greek end-consumers can to benefit from the increased gas-to-gas competition from LNG and the Trans-Adriatic Pipeline (TAP).

The wholesale electricity and gas prices are above EU average. Electricity prices were fully liberalised in July 2013 but no effective entry into the market has taken place. Electricity prices for household consumers, despite their upward trend, remained below the EU average both in 2013 and 2014. The increases were partly due to the introduction of non-recoverable tax rates but also to a gradual move towards cost recovery and removal of cross subsidies. On the other hand, gas prices for medium-sized households remained high in 2014. Supplier switching in electricity is largely absent and, with few exceptions, is still legally impossible in gas retail. Consumer satisfaction is low<sup>3</sup>, at least in the case of electricity.

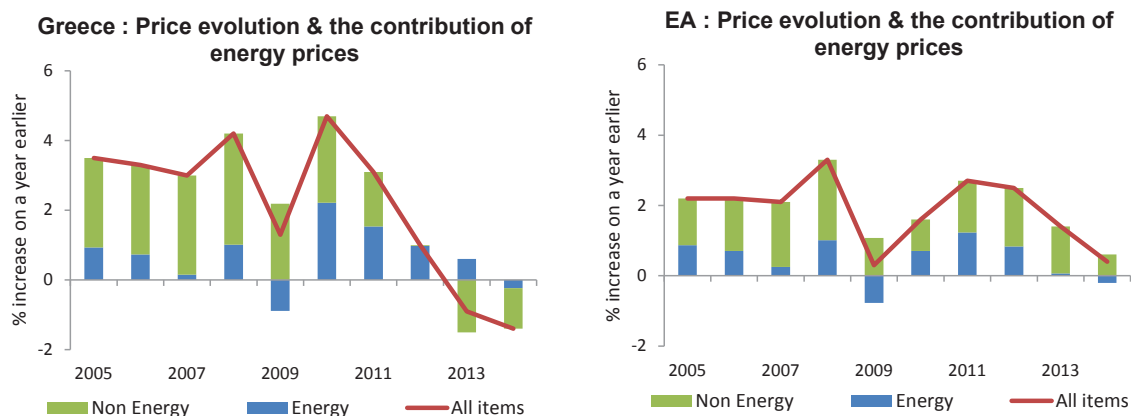
Regarding smart metering, Greece has mandated a large-scale roll-out targeting 80% of electricity consumers by 2020.

<sup>2</sup> Regarding HHI for power generation in Greece, see national information provided in: [http://www.ceer.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/NATIONAL\\_REPORTS/National%20Reporting%202014/NR\\_En/C14\\_NR\\_Greece-EN.pdf](http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20Reporting%202014/NR_En/C14_NR_Greece-EN.pdf). Regarding gas, preliminary calculations for Greece are based on information presented in [https://ec.europa.eu/energy/sites/ener/files/documents/2014\\_iem\\_communication\\_annex2.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/2014_iem_communication_annex2.pdf).

<sup>3</sup> 10th Consumer Markets Scoreboard (June 2014), [http://ec.europa.eu/consumers/consumer\\_evidence/consumer\\_scoreboards/10\\_edition/index\\_en.htm](http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/10_edition/index_en.htm)

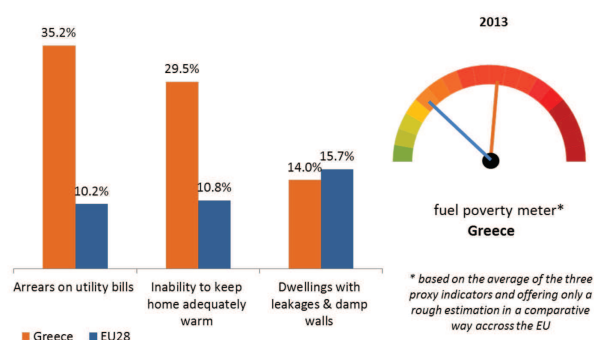
## CONTRIBUTION OF ENERGY TO CONSUMER PRICE EVOLUTION

The strong dependency on imported energy products also implies a bigger impact of the changes in the world oil prices on domestic inflation, as visible from the impact of the oil price volatility in the years 2008 – 2010. The severe economic depression has since cut off the knock-on effects of energy price changes in overall inflation.



Source: DG ECFIN based on Eurostat

## VULNERABLE CONSUMERS



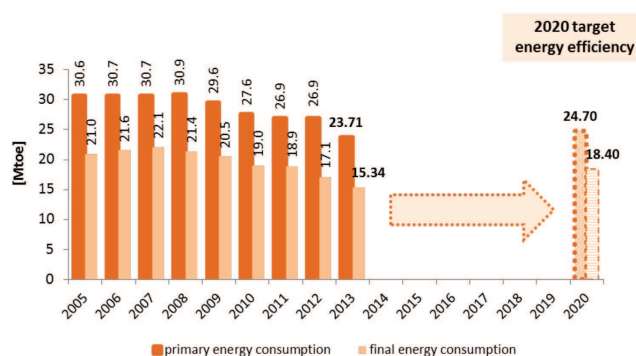
Source: European Commission, based on EUROSTAT SILC survey

Based on a EUROSTAT survey on income and living conditions, three proxy indicators are used to assess fuel poverty. They indicate serious issues in Greece, in particular as regards arrears on utility bills. This was one of the factors leading to liquidity constraints on power generation markets in 2013.

Greece has defined specific criteria and protective measures for vulnerable consumers. In February 2014, a total of 560,126 customers (9.8% of all residential customers) were benefiting from a social electricity tariff<sup>4</sup>. Moreover, a subsidy for heating oil and electricity for vulnerable households was launched in 2014. Furthermore, for 2015, a certain quantity of electricity is provided for free for residential consumers facing severe poverty. Further measures to tackle the problem are planned.

### 3. Energy Efficiency and moderation of energy demand

#### ENERGY EFFICIENCY TARGET 2020 (24.7 Mtoe primary energy and 18.4 Mtoe final energy)



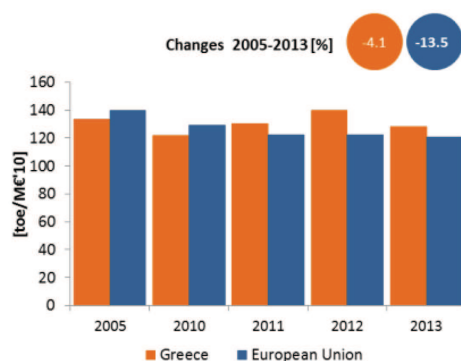
Source: European Commission, based on EUROSTAT and on national energy efficiency targets as declared by the MS under the Energy Efficiency Directive

Greece's 2020 energy efficiency target is 24.7 Mtoe expressed in primary energy consumption (18.4 Mtoe expressed in final energy consumption). Even if Greece's current primary energy consumption (23.7 Mtoe in 2013) is below its 2020 target, efforts remain needed to keep the primary energy consumption at this level or to minimise its increase when the GDP increases again during the next five year period.

#### ENERGY INTENSITY

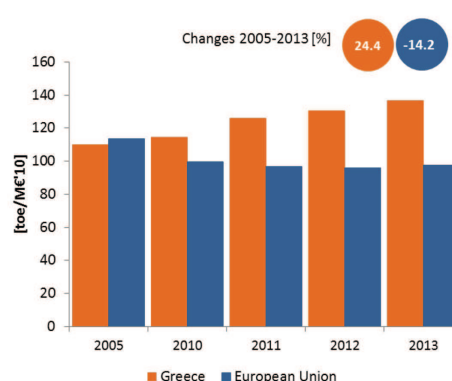
Primary energy intensity in Greece is now slightly above EU average, as this indicator decreased more slowly than for the EU average between 2005 and 2013. This could be explained by a more significant decline of GDP as compared to primary energy consumption. Energy intensity in industry remains above EU average, and actually has shown deterioration over the last 5 years, most probably due to the same negative impact of the economic crisis.

##### Primary energy intensity of the economy



Source: European Commission based on EUROSTAT and European Commission/AMECO

##### Final energy intensity in industry

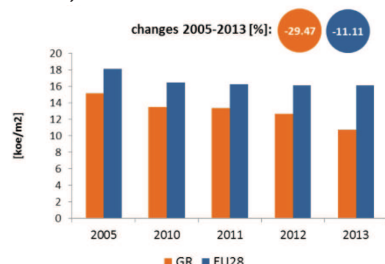


Source: European Commission based on EUROSTAT and European Commission/AMECO

Specific energy consumption by households is below EU average and decreased at a higher pace than the EU average over the period 2005-2013. One of the main determinants of this trend may have been the economic crisis, leading to lower energy demand for households. The specific energy intensity of passenger cars is in line with EU average. The specific energy intensity for freight transport increased faster than for the EU.

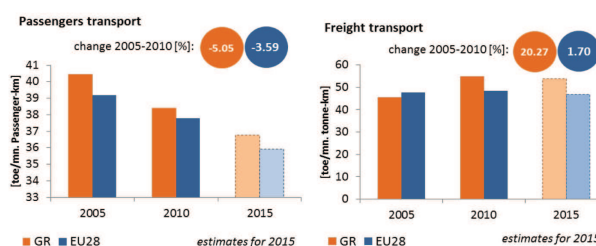


### Final energy consumption per m<sup>2</sup> in residential sector, climate corrected



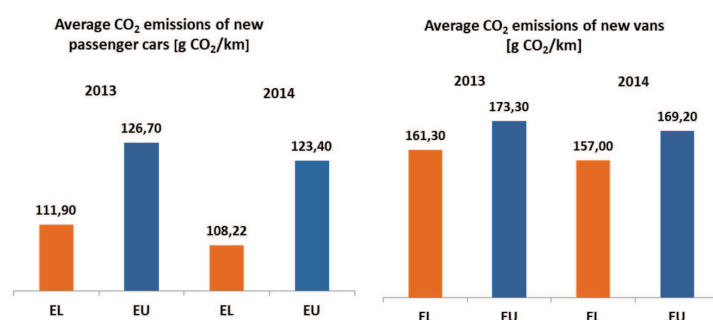
Source: European Commission based on Odyssee database

### Specific energy intensity for passenger cars and freight transport<sup>5</sup>



Source: PRIMES model background data and estimations based on EU Commission and EU MS inputs

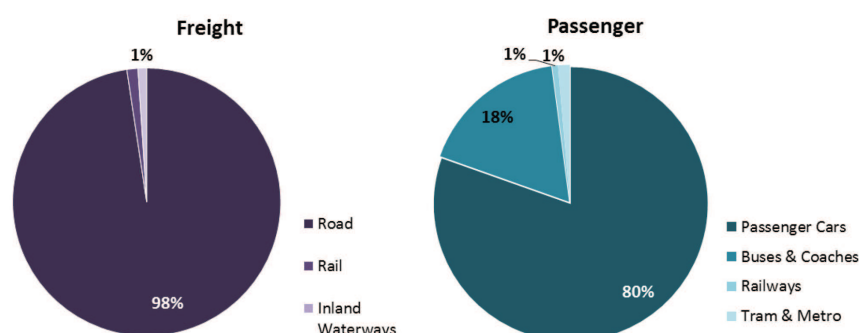
EU legislation sets mandatory CO<sub>2</sub> emission reduction targets for new cars and vans. By 2021, the fleet average to be achieved by all new cars is 95 grams of CO<sub>2</sub> per kilometre. For new vans, the fleet average is set at 147 g/km by 2020.



Source: European Environmental Agency. 2014 values are provisional. 2013 EU average refers to EU-27.

Regarding transport performance, in EU-28 the inland freight modal shares are 71% by road, 17% by rail, 7% by inland waterways and 5% by pipelines. The respective inland passenger modal shares are 82% by private car, 9% by buses and coaches, 7% by railways and 2% by tram and metro. In Greece, freight and passenger transport is almost exclusively performed by road transport.

### Modal share Greece



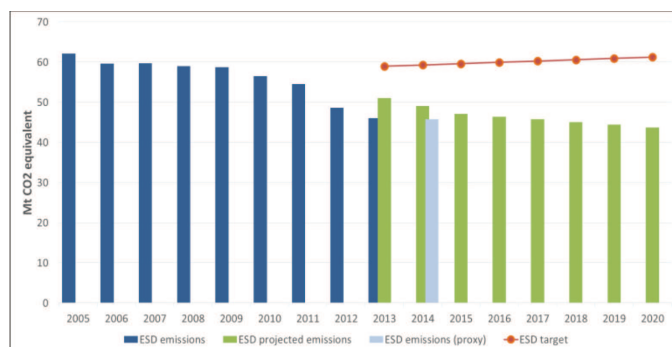
Source: Eurostat and EU transport in figures 2015. Data refers to 2013. Modal shares based on tonne-kilometres for freight sector and passenger-kilometres for passenger sector, freight data based on activity within country territory. Estimates are made when data is missing.

<sup>5</sup> Statistics on energy demand for passengers and freight transport are not available and model estimates have been used instead. These issues should be borne in mind when comparing energy intensity in freight or passenger transport between Member States, which should be regarded as merely indicative.



## 4. Decarbonisation of the economy

### NON-ETS GHG EMISSION REDUCTION TARGET 2020 (-4% by 2020 as compared to 2005 in the non-ETS sector)



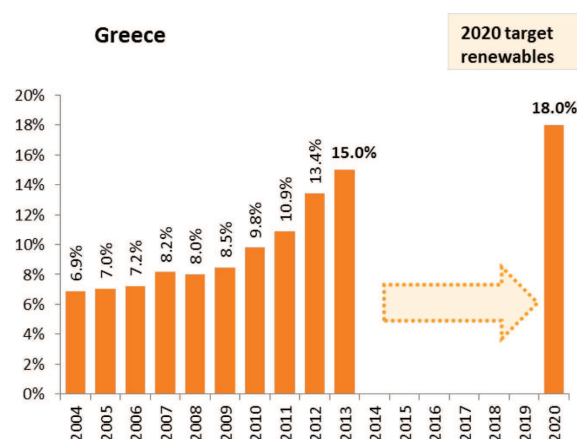
Source: European Commission based on EEA. Based on preliminary inventory data.

ESD (Effort Sharing Decision) emissions are the emissions from sectors not covered by the EU ETS.

Greece has decreased its emissions by 28% between 2005 and 2014 (based on approximated data). According to the latest projections, Greece is on track to reach its greenhouse gas emission reduction target for 2020, with approximately a 27% margin as compared to 2005. Behind this significant share of the decrease in GHG emissions is, besides the economic crisis, a significant shift in Greece's energy mix from lignite towards gas and renewable energy.

Non-ETS Emissions (vs. 2005)	Projections/proxy	target
Projections with existing measures 2020	-31%	-4%
Proxy 2014	-28%	-7%

### RENEWABLE ENERGY SHARE TARGET 2020 (18%)



Source: European Commission based on EUROSTAT

With a renewable energy share of 15% in 2013, Greece is on track to reach its 18% target in 2020, but efforts should be strengthened ahead of 2020. The lack of predictability and transparency of renewable support schemes might jeopardise the development of this important sector for energy security and growth.

### GREENHOUSE GAS EMISSION INDICATORS

- As a result of the energy mix that also relies on locally available lignite resources, the carbon intensity of the Greek economy is about 70% higher than the EU average.
- In Greece, the energy sector contributes to half of the total emissions, a share that is well above the EU average. In addition, the carbon intensity of energy use is one of the highest in the EU (3.2 compared to 2.1 EU average 1,000 tonnes/ 1,000 TOE).
- In 2014 the revenues from the auctioning of ETS allowances amounted to EUR 131.1 million, all of which are used or planned to be used for energy and climate-related purposes (mainly in the

renewables sector).

Largest Sectors of GHG Emissions in 2012 (*)	Greece	EU Average
Energy/power industry	51%	33%
Transport	14%	20%
Industry	14%	19%
Agriculture (incl. forestry & fishery)	9%	12%
Residential & Commercial	8%	13%
Waste & others	4%	3%

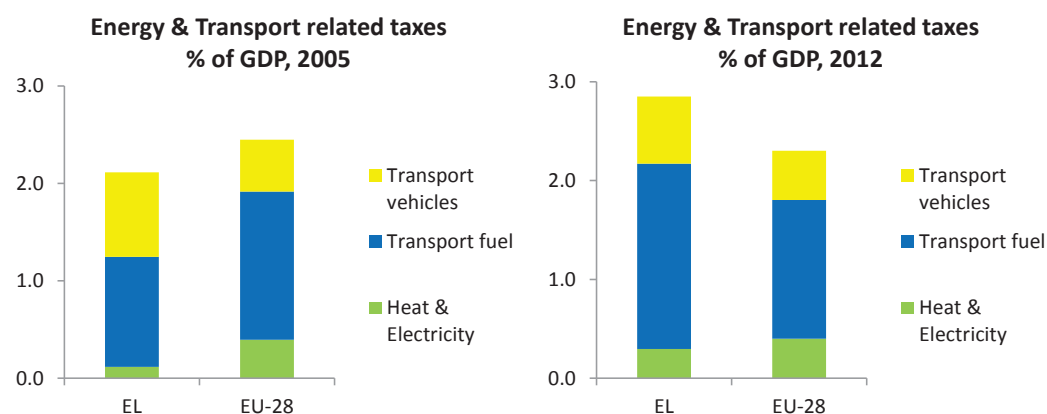
GHG Emissions	Greece	EU
EU ETS auctioning revenues in 2014(EUR millions)	131.1	3205
Share of ETS emissions in 2013	56%	42%
GHG emissions/capita in 2013 (tCO <sub>2</sub> equivalent)	9,6	8.5
Carbon intensity of economy in 2013 (tCO <sub>2</sub> equivalent/EUR millions)	568	328

Source: European Commission based on EEA

(\*) Sectoral breakdown for 2013 data not yet available.

## ENERGY & TRANSPORT TAXATION

Greece's GDP share of energy and transport taxes has risen over the period from below to well over the EU average, in particular due to marked increases in the GDP share of taxes on transport fuels and also on heat and electricity (while the latter remains under the EU average level). The GDP share of transport vehicle taxes has fallen in absolute terms and also vis-à-vis the EU average GDP share level. This seems for a part due to the severe economic downturn impacting the demand for vehicles.

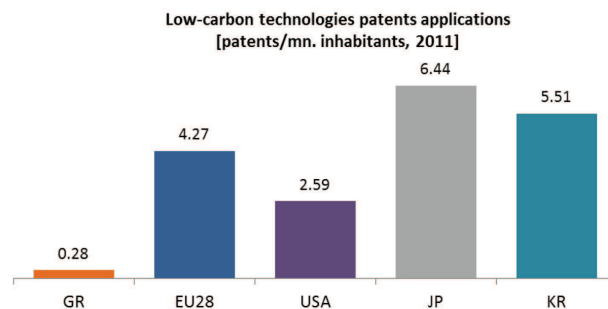
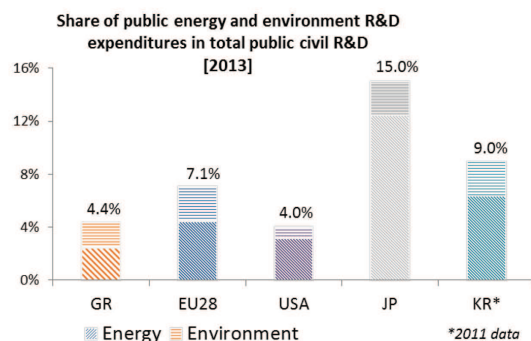


Source: Eurostat

## 5. Research, innovation and competitiveness

### RESEARCH AND INNOVATION

Greece is close to the EU average, above the US and below Japan and South Korea in terms of the public support share allocated to research and innovation in the field of energy and environment. In terms of intensity of low-carbon technologies patents, Greece is much behind the EU average and main worldwide partners.



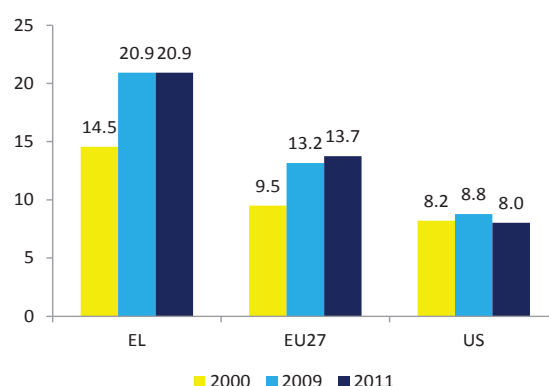
Source: European Commission based on EUROSTAT

## COMPETITIVENESS

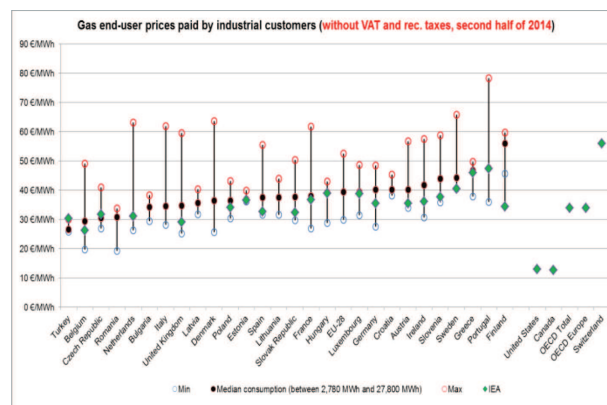
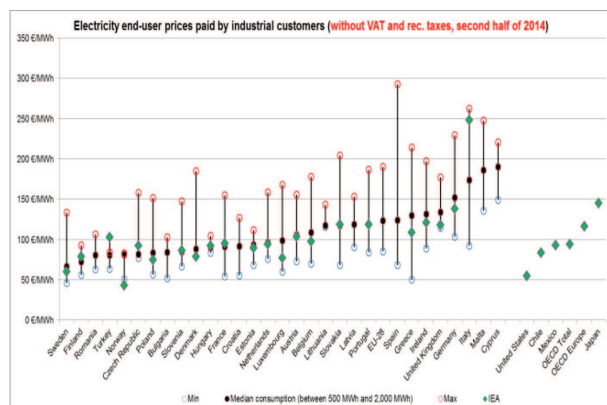
The real unit energy costs<sup>6</sup> are considerably higher in Greece than in the EU or in the US and its increase since 2000 has also exceeded that in the EU as a whole. The energy intensity of the Greek manufacturing sector is higher than the EU's and also higher than of the US.

Regarding energy prices paid by industrial customers, both electricity and gas prices are significantly above EU average. Gas prices in particular are among the highest, also above OECD average and those of most the EU trading partners.<sup>7</sup>

Real unit energy costs (% of value added)



Source: European Commission



Source: European Commission based on EUROSTAT and IEA

<sup>6</sup> This indicator measures the amount of money spent on energy sources needed to obtain one unit of value added.

<sup>7</sup> The assessment is based on energy prices from the second half of 2014 as indicated in the graphs. Moreover, the EC quarterly report on gas markets for the first quarter of 2015 indicates that Greece has the highest retail gas prices for industrial consumers in the EU (for the I4 consumption band, Map3 from the report available here: [https://ec.europa.eu/energy/sites/ener/files/documents/quarterly\\_report\\_on\\_european\\_gas\\_markets\\_q1\\_2015.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_gas_markets_q1_2015.pdf)). Similarly, the EC quarterly report on electricity markets for the first quarter 2015 indicates that Greece has the fifth highest electricity prices for industrial consumers in the EU (prices without VAT and recoverable taxes, figure 34 in the report available here: [https://ec.europa.eu/energy/sites/ener/files/documents/quarterly\\_report\\_on\\_european\\_electricity\\_markets\\_q1\\_2015.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_electricity_markets_q1_2015.pdf)).

## 6. Post-2020 Energy and Climate policy Strategy

### COMPREHENSIVE MEDIUM TO LONG-TERM STRATEGY (post-2020) FOR CLIMATE AND ENERGY

- Greece has not yet established a comprehensive post-2020 climate and energy strategy.
- In April 2012, the Ministry of Energy, Environment and Climate Change proposed an Energy Roadmap for 2050. According to the scenarios outlined in the roadmap, further efforts would be needed to reduce emissions up to 80%, as agreed at the EU level.

### NATIONAL TARGETS, especially for 2030

Objective, 2030-2050	Targets	Comments
GHG reduction	No	
Renewable energy share	No	
Energy Efficiency / savings	No	Indicative energy efficiency target of approximately 19 Mtoe of final energy consumption in 2030.

## 7. Regional cooperation

Greece is a member of the High Level Group on Central East South Europe Connectivity (CESEC) together with Austria, Bulgaria, Croatia, Hungary, Italy, Romania, Slovak Republic and Slovenia. The objective of the High Level Group is to establish a regional priority infrastructure roadmap and advance its implementation in order to develop missing infrastructure and improve security of gas supplies.

## 8. Cohesion policy contribution

The EU Cohesion policy provides for important investment possibilities to implement energy policy objectives in Greece which will be complemented by national public and private co-financing, aiming at optimal leverage. It also ensures integrated territorial solutions to challenges by supporting capacity building, technical assistance and territorial cooperation, including the Adriatic and Ionian Region macro-regional strategy in which Greece takes part.

*Internal Energy Market:* Over 2014-2020, EU Cohesion Policy will invest some EUR 285 million in smart energy storage and transmission systems, as well as some EUR 46 million in smart electricity distribution grids in Greece. These investments are expected to contribute to around 197 000 additional users connected to smart grids.

*Energy efficiency:* Over 2014-2020, EU Cohesion Policy will invest some EUR 493 million in energy efficiency improvements in public and residential buildings and in SMEs, as well as in high-efficiency cogeneration and district heating in Greece. A further estimated EUR 1 935 million will be invested in supporting the move towards an energy-efficient, decarbonised transport sector. These investments are expected to contribute to around 26 000 households with improved energy consumption classification and a decrease of around 97 047 000 kWh per year of decreased primary energy consumption of public buildings, as well as to around 100 km of new railway lines, 150 km of reconstructed or upgraded railway lines and 40 km of new or improved tram and metro lines.

*Decarbonisation:* Overall, the EU Cohesion Policy investments in Greece over 2014-2020 are expected to contribute to an estimated annual decrease of GHG of around 103 000 tonnes of CO<sub>2</sub>eq. Over 2014-2020, EU Cohesion Policy will invest some EUR 94 million in renewable energy in Greece. These investments are expected to contribute to around 170 MW of additional capacity of renewable energy production.

*Research, Innovation and Competitiveness:* Over 2014-2020, EU Cohesion Policy will invest significantly in R&I and in SME competitiveness in Greece. This will be based on the national strategy for smart specialisation. For Greece, the strategy includes a focus on sustainable energy and low-carbon economy. At this stage, at least EUR 102 million is foreseen for investments in R&I and adoption of low-carbon technologies in Greece, but this might increase further in line with the evolving content of the smart specialisation strategy, and further specification is expected with the finalisation of the content of the national and regional smart specialisation strategies.