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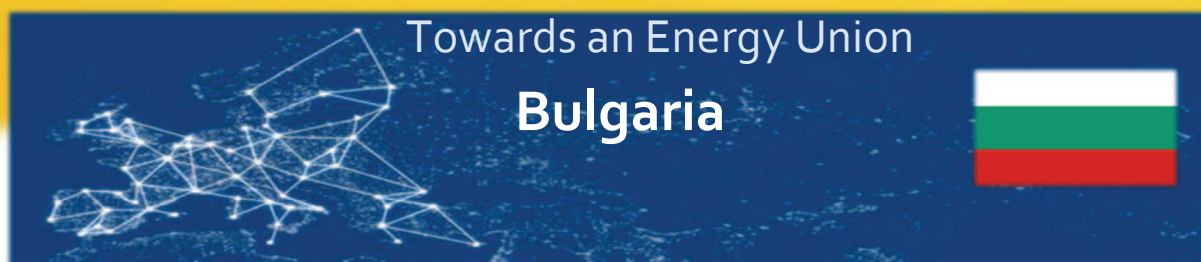
**Country Factsheet Bulgaria**

*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**

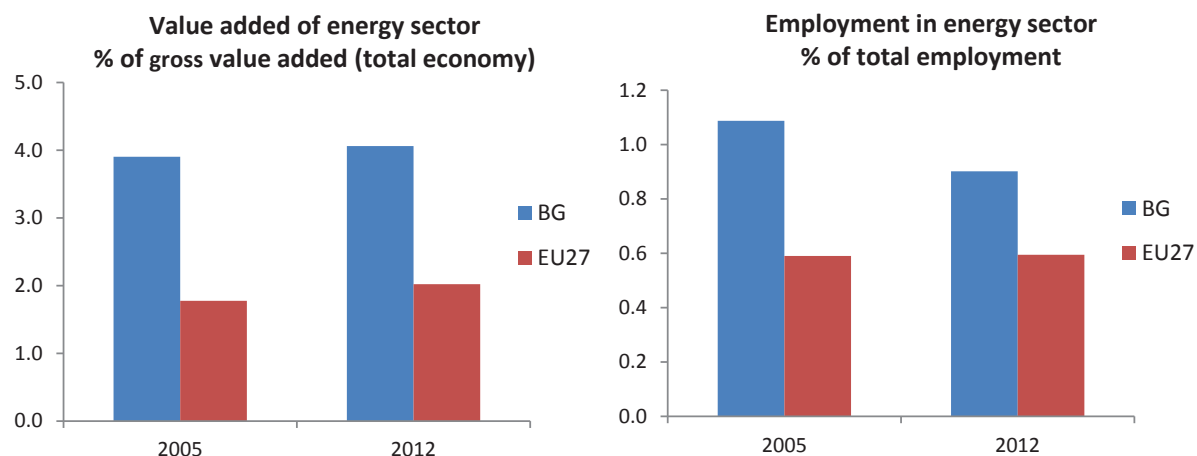
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## Macroeconomic relevance of energy

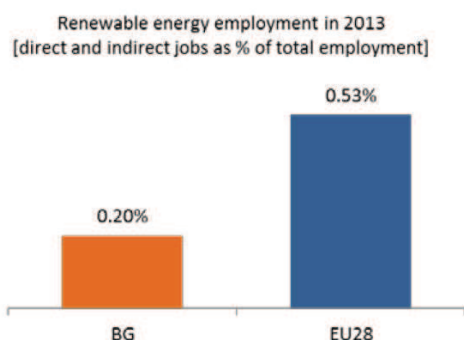
### IMPORTANCE OF THE ENERGY SECTOR

The energy sector showed a high importance in Bulgaria with a share of 4.1% of value added of the sector compared to the total economy in 2012, considerably higher than the EU average. The share of employment of the energy sector in total employment of 0.9% in 2012 was also higher than the EU average, even though the sector has seen its importance in employment decreasing somewhat since 2005.



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 Bulgaria was at about 0.2%, below the EU average of 0.53%.

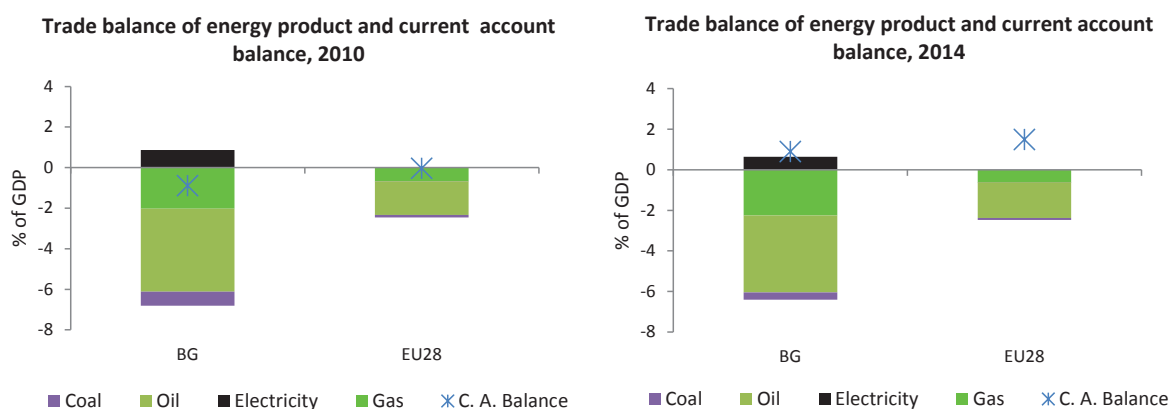


Source: European Commission, based on EurObserv'ER and EUROSTAT

### TRADE BALANCE OF ENERGY PRODUCTS

Bulgaria showed a trade deficit in energy products of 5.8% of GDP in 2014, considerably higher than the

EU average. This represents a modest improvement from 2010, when the country reported a deficit of 5.9%. The overall energy deficit is mainly driven by oil and gas, while the coal deficit is close to zero and trade in electricity shows a surplus. The overall energy trade deficit has to be seen in context of an overall current account balance that improved from a deficit of 0.9% in 2010 to a surplus of 0.9% of GDP in 2014.



Source: EUROSTAT

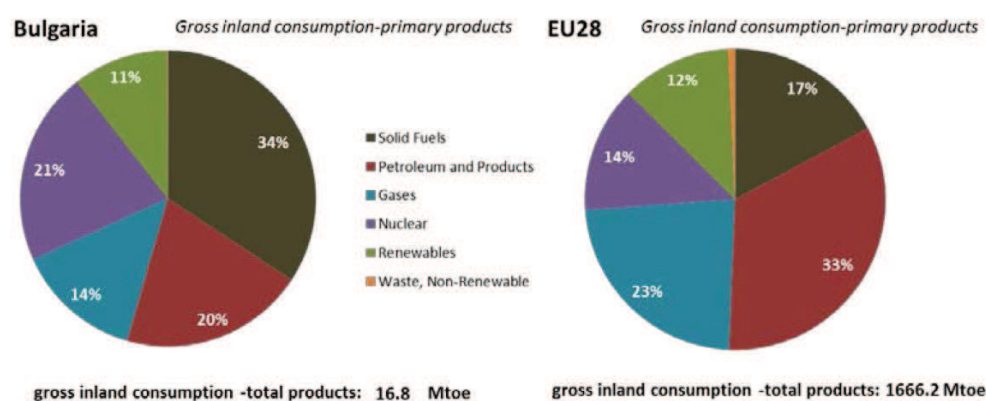
Note: Current account balance for EU28 from European Commission (AMECO)

## 1. Energy Security, solidarity and trust

### ENERGY MIX

The energy mix of Bulgaria shows a higher use of solid fuels and nuclear and lower share of petroleum and products and gases than on the EU28 average.

Gross inland energy consumption in 2013



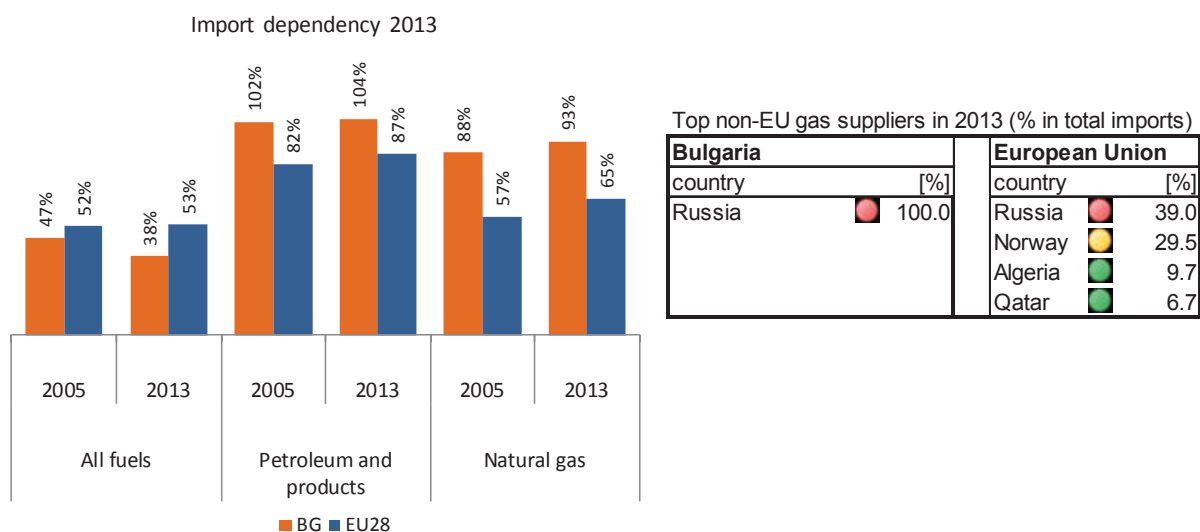
Source: European Commission, based on EUROSTAT

### IMPORT DEPENDENCY

Due to its domestic production of coal and nuclear electricity production, Bulgaria has a below EU average import dependency<sup>1</sup> when all energy products are considered together. However, Bulgaria imports all its nuclear fuel and nearly all its petroleum products and natural gas. In particular, Bulgaria

<sup>1</sup> Note: A dependency rate in excess of 100% indicates that energy products have been stocked.

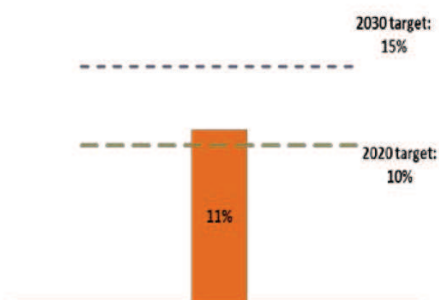
imports all its gas<sup>2</sup> and nuclear fuel from Russia. In addition to relying on a single supplier and a single route for its gas imports, Bulgaria has limited alternative supplies such as LNG and gas storage. Bulgaria is consequently vulnerable to gas disruptions. Overall, this translates into a high country supplier concentration index. Consequently, Bulgaria experiences a significant energy trade deficit, expressed in percentage of GDP.



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 Bulgaria, which is above the 2020 target. Implementing Projects of Common Interests (PCIs) would mean that the target of 15% for 2030 can be reached.

Regarding gas, several PCIs are to be developed with Greece and Romania to increase the cross-border capacity and open the North-South priority corridor. The construction of the critical infrastructure projects, which would modernize Bulgaria's gas network and reinforce the gas links with its neighbours (Greece, Romania, Serbia and Turkey), incurs delays mainly due to regulatory and financial difficulties.

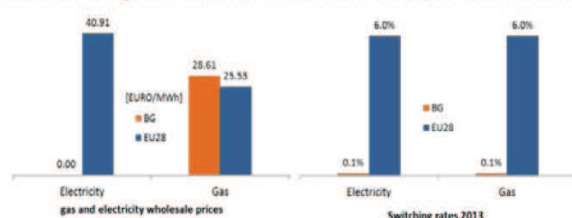
### ELECTRICITY AND GAS MARKETS

<sup>2</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).

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



Sources: European Commission based on ESTAT, CEER and Platts Power Vision



Sources: ESTAT and European Commission Calculations

A combination of complex problems (expansion of renewable energy power generation capacity based on generous subsidies for solar power and co-generation; long-term purchase power agreements; delays in phasing out power plants being non-compliant with the Large Combustion Plant Directive; weak and politically dependent energy regulator) and inaction in reforming the energy sector have exacerbated the problems in the energy sector and compromised the financial stability of public and private stakeholders. The revenues from the regulated end-consumer-tariffs are not sufficient to match the corresponding costs borne by electricity utilities.

The day-ahead market for electricity is not operational. There is no market for natural gas.

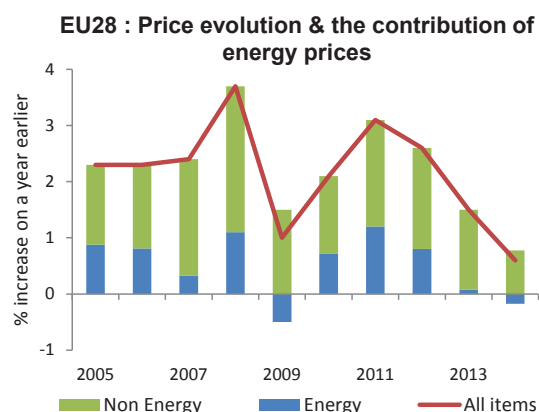
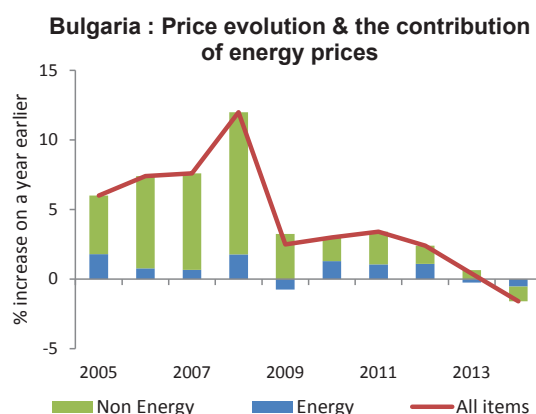
While market concentration in power generation is below EU average, the potential positive effects are hampered by a single buyer model with a quota system granting priority access to uncompetitive power plants. Market concentration is above EU average in gas supply markets.

Although electricity and gas consumers are allowed to switch, no actual switching is observed, due to the regulated prices in electricity and to DSOs operating exclusively in their licensed areas of operation for gas. The consumer satisfaction in electricity market is the lowest among the EU 28, while in gas is just below the EU average<sup>3</sup>.

## CONTRIBUTION OF ENERGY TO CONSUMER PRICE EVOLUTION

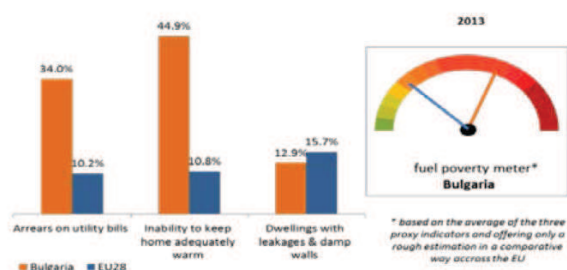
Consumer price inflation has decelerated rapidly in Bulgaria, from moderately high levels to below the EU average. In 2013 the country has experienced deflation. Energy prices have contributed to a limited extent to overall inflationary developments than in the EU.

<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)



Source: DG ECFIN based on Eurostat

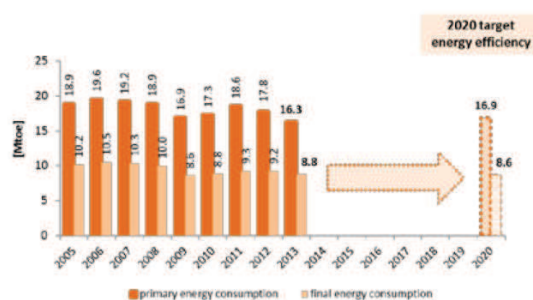
## VULNERABLE CONSUMERS



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. In this context, Bulgaria is considered the most vulnerable EU country in terms of fuel poverty. In particular, within the population at risk of poverty, a majority is unable to keep homes adequately warm. The other two proxy indicators are also above EU average. The measures to reduce fuel poverty and the social protection schemes supporting vulnerable customers should be improved.

## ENERGY EFFICIENCY TARGET 2020 (16.9 Mtoe primary energy and 8.6 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

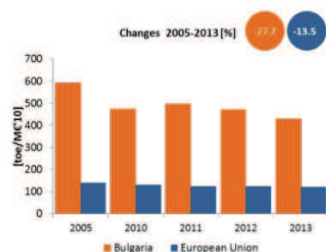
Bulgaria updated its 2020 energy efficiency target in 2014. The target is now 16.9 Mtoe expressed in primary energy consumption and 8.6 Mtoe expressed in final energy consumption. If the trend in primary and final energy consumption observed in the period 2005-2013 continues up to 2020, Bulgaria will meet its national target.

## ENERGY INTENSITY

Primary energy intensity in Bulgaria has decreased at a fast pace (-27.7% between 2005 and 2013), although it remains among the highest in the EU. Across all sectors, the highest energy intensity

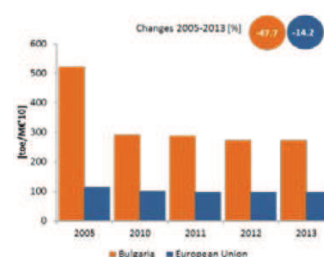
reduction is recorded in the industrial sector, i.e. almost 48% reduction. However, the energy intensity of the industrial sectors is still more than three times higher than the EU average.

## 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 but it has decreased at a higher pace than the EU average between 2005 and 2013 (i.e. by about 14% as comparing to 12%). Nevertheless, the specific energy consumption by households remains well below the EU average and this can be partially explained by the amplitude of fuel poverty in the country as well as by a lower welfare level than the EU average, which has limited investments in buildings renovation.

The specific energy intensity of passengers cars has decreased between 2005 and 2010 by more than 11% (almost three times more than the EU average) which reflects a more efficient cars stock and usage (i.e. higher stock, maybe more efficient cars and/or more passengers per car). The specific energy intensity for freight transport also decreased between 2005-2010 (by more than 11% as comparing to 1.7% on the EU average) reflecting a higher efficiency of transport (i.e. from the same unit of energy more tonnes of goods are transported and/or on shorter distances and/or the filling factor of goods in freight vehicles are lower).

## Final energy consumption per m2 in residential sector, climate corrected



Source: European Commission based on Odyssee database

## Specific energy intensity for passenger cars and freight transport<sup>4</sup>

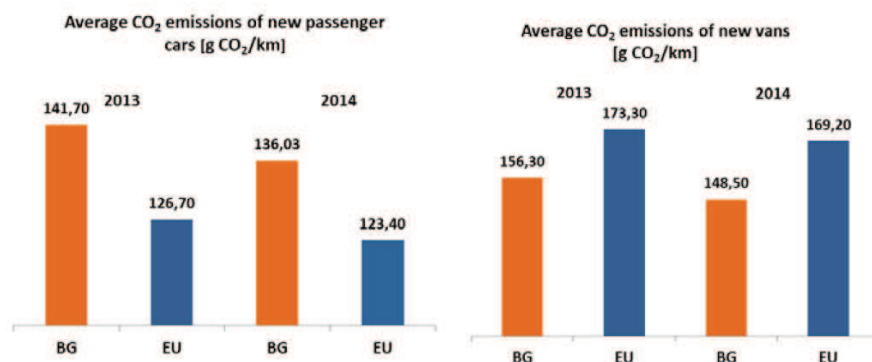


Source: PRIMES model background data and estimations based on EU Commission and EU MS inputs

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.

<sup>4</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.

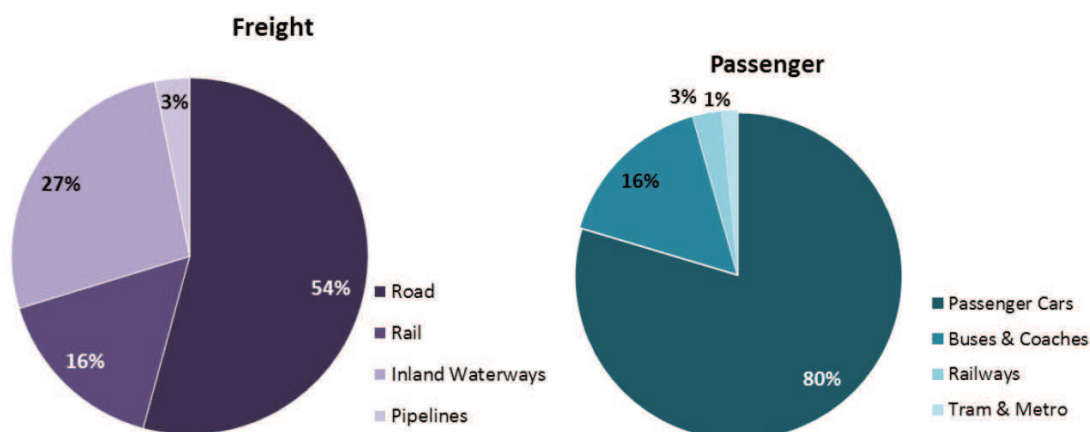




Source: European Environmental Agency. 2014 values are provisional. 2013 EU average refers to EU-27.

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. Bulgaria reports a high use of inland waterways in freight transport.

#### Modal shares Bulgaria



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.

## 4. Decarbonisation of the economy

**NON-ETS GHG EMISSION REDUCTION TARGET 2020**  
 (+20% by 2020 as compared to 2005 in the non-ETS sector)





Source: DG CLIMA based on EEA. Based on preliminary inventory data.

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

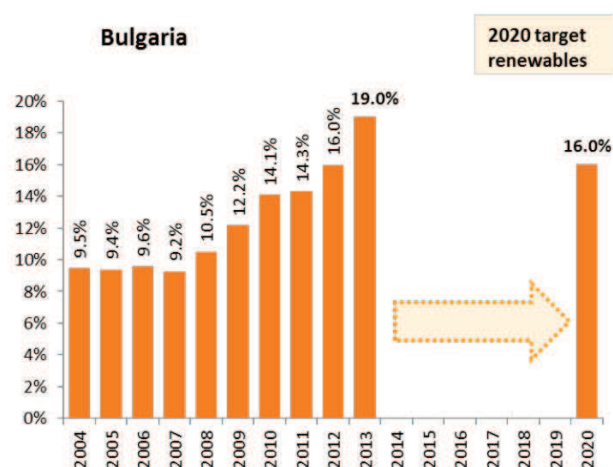
In Bulgaria emissions in 2014 are 1% higher than the 2005 ESD base year emissions.<sup>5</sup>

According to its 2015 projections, Bulgaria is expected to reach its 2020 target with a 25% margin as compared to 2005.

Non-ETS Emissions (vs. 2005)	Projections/proxy	target
Projections with existing measures 2020	-5%	+20%
Proxy 2014	+1%	+13%

<sup>5</sup> The estimated historic non-ETS emissions in 2005, as displayed in the graph, are different from the 2005 base year used to calculate the target under the Effort Sharing Decision (ESD).

## RENEWABLE ENERGY SHARE TARGET 2020 (16%)



With a renewable energy share of 19% in 2013, Bulgaria is already above its 2020 renewable energy target.

Source: European Commission based on EUROSTAT

## GREENHOUSE GAS EMISSION INDICATORS

- Due to the large proportion of coal/lignite in the electricity mix, more than half of Bulgaria's emissions are in the ETS sector.
- Bulgaria has the highest carbon intensity of the economy in the EU.
- In 2014, Bulgaria's revenues from the auctioning of ETS allowances amounted to EUR 36.4 million. This amount was used to partially cover the deficit arising from the renewable surcharge.

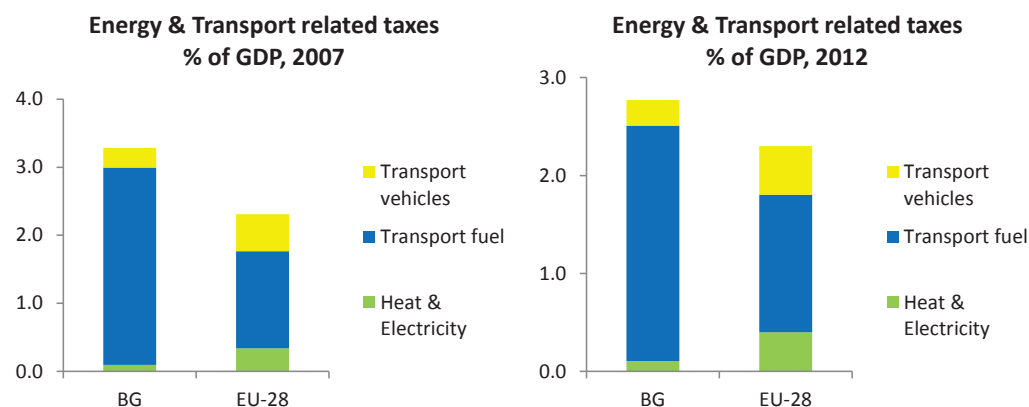
Largest Sectors of GHG Emissions in 2012(*)	Bulgaria	EU Average
Energy/power industry sector	54%	33%
Transport	14%	20%
Industry (incl. industrial processes)	12%	19%
Agriculture (incl. forestry & fishery)	11%	12%
Residential & Commercial	3%	13%
Waste & others	6%	3%

GHG Emissions	Bulgaria	EU
EU ETS auctioning revenues in 2014 (EUR millions)	36.4	3205
Share of ETS emissions in 2013	59%	42%
GHG emissions/capita in 2013 (tCO <sub>2</sub> equivalent)	7.7	8.5
Carbon intensity of the economy in 2013 (tCO <sub>2</sub> equivalent/(EUR millions))	1466	328

Source: European Commission, based on EEA  
 (\*) Sectoral breakdown of 2013 not yet available.

## ENERGY &amp; TRANSPORT TAXATION

Energy and transport related taxes as a share of GDP reached 2.8% in 2012, which is higher than the EU average. This is largely due to a very high share of transport fuel taxation reaching 2.4% of GDP. Since 2007 the share of energy and transport taxes have declined in Bulgaria, though the relative importance of the different components has remained stable.

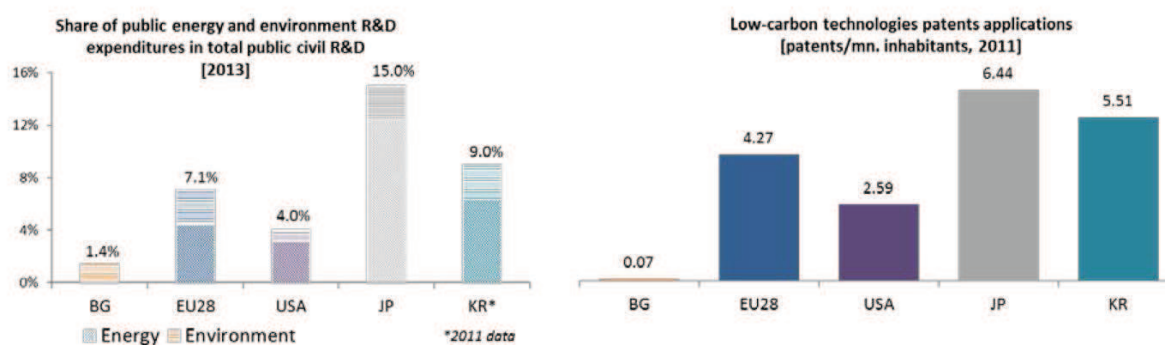


Source: Eurostat

## 5. Research, innovation and competitiveness

### RESEARCH AND INNOVATION

Bulgaria lags behind EU average and main trading partners on indicators related to research and innovation in the field of sustainable energy and low-carbon developments. Overall, the EU fares well when compared to the US but does not perform as well as Japan. One can also notice the absence of Bulgarian energy firms among the top EU firms according to investment levels in R&D<sup>6</sup>.



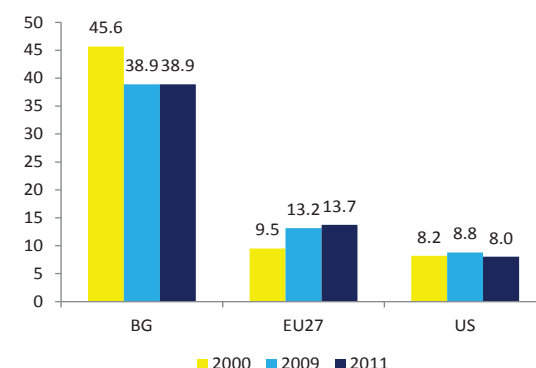
Source: European Commission based on EUROSTAT

### COMPETITIVENESS

The real unit energy costs in Bulgaria, which measures the amount of money spent on energy sources needed to obtain one unit of value added, are considerably higher than the average in both the EU and the US. This is mostly due to very high energy intensity<sup>7</sup> of the manufacturing sector in Bulgaria.

Observing energy prices, Bulgaria has among the lowest electricity and gas prices for industrial users. When considering large industrial users, electricity prices are comparable to US prices.

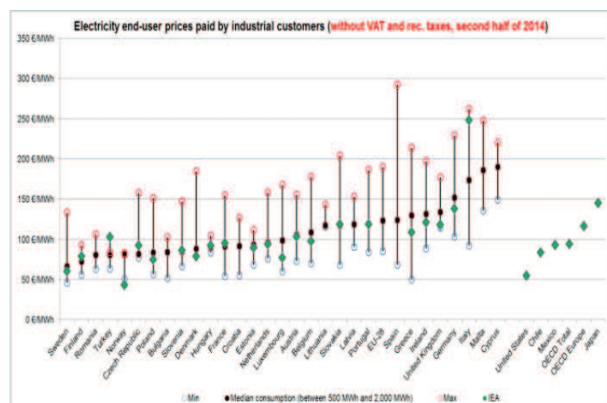
Real unit energy costs (% of value added)



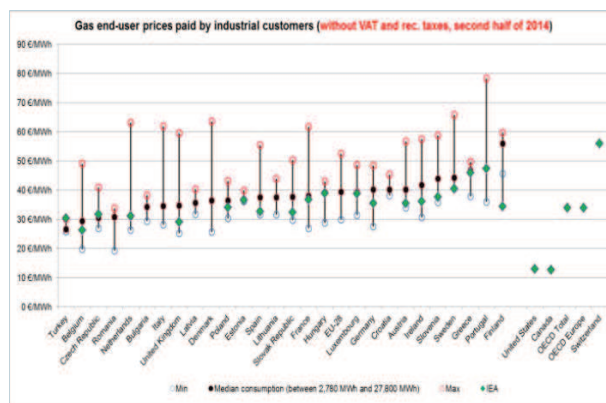
Source: European Commission

<sup>6</sup> Source: EU R&D innovation scoreboard: <http://iri.jrc.ec.europa.eu/scoreboard.html>

<sup>7</sup> The energy intensity presented here is derived from Use Tables of WIOD, see "Energy Economic Developments in Europe SWD(2014)19".



Source: European Commission based on EUROSTAT and IEA



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

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

- No comprehensive medium to long term strategy post 2020.
- Bulgaria has an Energy Strategy until 2020. There are on-going discussions on a new energy strategy for 1) immediate term- next three years; 2) medium to long term – until 2030; and 3) long term – for 2050.
- Publication in 2012 of a Third National Action Plan on Climate Change for the period 2013-2020. Bulgaria intends to develop a national low-carbon development strategy after finalizing its new Energy Strategy.

### NATIONAL TARGETS, especially for 2030

Objective, 2030-2050	Targets	Comments
GHG reduction	No	
Renewable energy	No	
Energy Efficiency / savings	No	

## 7. Regional cooperation

Bulgaria is a member of the High Level Group on Central East South Europe Connectivity (CESEC) together with Austria, Croatia, Greece, Hungary, Italy, Romania, Slovakia 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 Bulgaria 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 Danube Region macro-regional strategy in which Bulgaria takes part.

*Internal energy market:* Over 2014-2020, EU Cohesion Policy will invest some EUR 38 million in smart energy storage and transmission systems in Bulgaria.

*Energy efficiency:* Over 2014-2020, EU Cohesion Policy will invest some EUR 471 million in energy efficiency improvements in public and residential buildings and in SMEs in Bulgaria. A further estimated EUR 1 174 million will be invested in supporting the move towards an energy-efficient, decarbonised transport sector. These investments are expected to contribute to around 12 900 households with improved energy consumption classification and a decrease of around 140 645 000 kWh per year of decreased primary energy consumption of public buildings, as well as to around 190 km of reconstructed or upgraded railway lines.

*Decarbonisation:* Overall, the EU Cohesion Policy investments in Bulgaria over 2014-2020 are expected to contribute to an estimated annual decrease of GHG of around 198 000 tonnes of CO<sub>2</sub>eq. No EU Cohesion Policy investments in renewable energy infrastructure envisaged in Bulgaria over 2014-2020; research and innovation in the area of renewable energy might be supported.

*Research, Innovation and Competitiveness:* Over 2014-2020, EU Cohesion Policy will invest significantly in R&I and in SME competitiveness in Bulgaria. This will be based on the national strategy for smart specialisation. For Bulgaria, the Strategy includes a focus on assisting clean technologies, including energy preservation and ecomobility. At this stage, at least EUR 58 million is foreseen for investments in R&I and adoption of low-carbon technologies in Bulgaria, but this might increase further in line with the evolving content of the smart specialisation strategy.