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#### COVER NOTE

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From: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 19 November 2015

To: Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of  
the European Union

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Subject: COMMISSION STAFF WORKING DOCUMENT  
Country Factsheet Denmark  
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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Delegations will find attached document SWD(2015) 221 final.

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**COMMISSION STAFF WORKING DOCUMENT**

**Country Factsheet Denmark**

*Accompanying the document*

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

**State of the Energy Union**

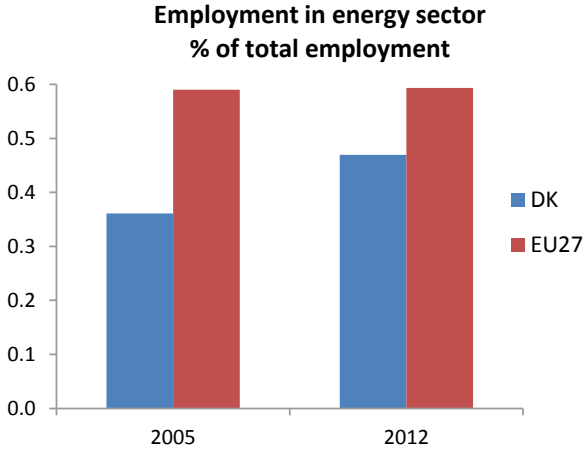
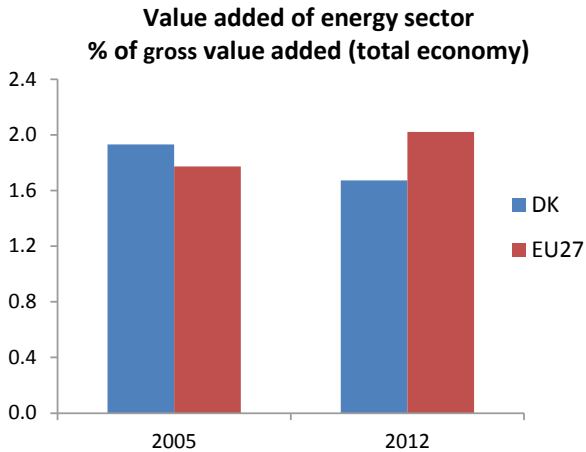
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## Macroeconomic relevance of energy

### IMPORTANCE OF THE ENERGY SECTOR

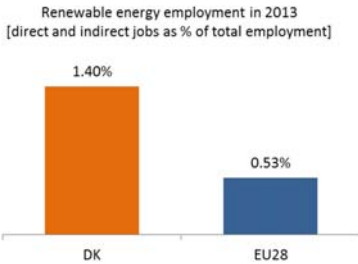
The value added of the energy sector amounted to slightly above 1.9% of GVA in Denmark in 2005, falling to close to 1.7% in 2012. As a result, the energy sector contribution to overall value added is now lower than the EU-average. The share of the energy sector in total employment is also lower than average, at slightly above 0.4%. It has increased somewhat since 2005, resulting in about 0.5% of total employment in 2012.



EUROSTAT – National Accounts

Source :

According to EurObserv'ER, in 2013, the share of direct and indirect renewable energy related employment in total employment of the economy in Denmark was at about 1.4%, above the EU average of 0.53%.

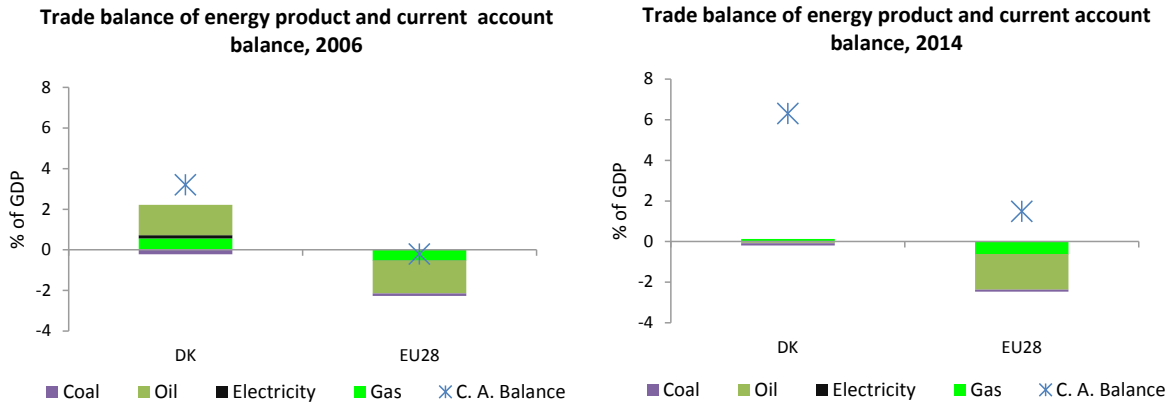


Source: European Commission, based on EurObserv'ER and EUROSTAT

### TRADE BALANCE OF ENERGY PRODUCTS

Denmark had until recently, as one of few countries in the EU, a positive trade balance for energy products. It amounted to 2% of GDP in 2006, mainly attributed to net export of oil and gas, but also electricity. By 2014, this surplus had turned into a slight deficit, reflecting mainly a structural decline

in oil and gas production. Denmark is recording a current account surplus amounting to 6.3% of GDP in 2014, which has grown over the period despite falling energy export.



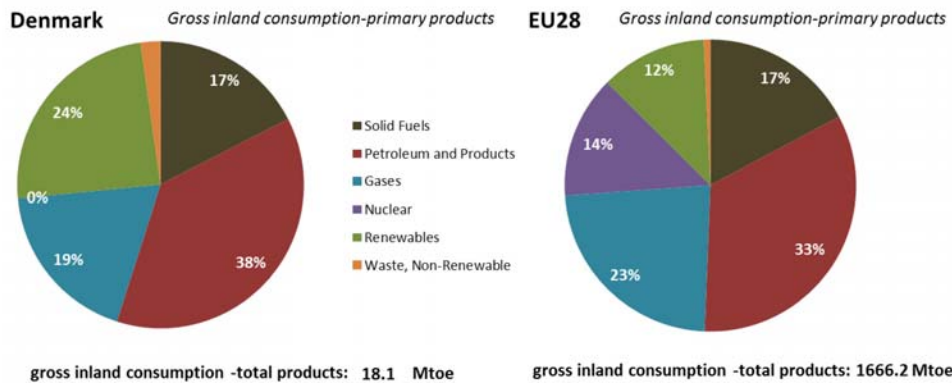
Source: EUROSTAT  
 Note: Current account balance for EU28 from European Commission (AMECO)

# 1. Energy Security, solidarity and trust

## ENERGY MIX

The energy mix of Denmark is broadly in line with the one of the EU-28, with the notable difference of a double share of renewables and no nuclear energy. Compared to 1995, the share of renewable energy sharply increased, more than EU average (from 6% to 24% of gross inland energy consumption, respectively), while the share of gases only slightly increased (by 3 percentage points). The main decrease concerns the use of solid fuels (by 18 percentage points).

Gross inland energy consumption in 2013

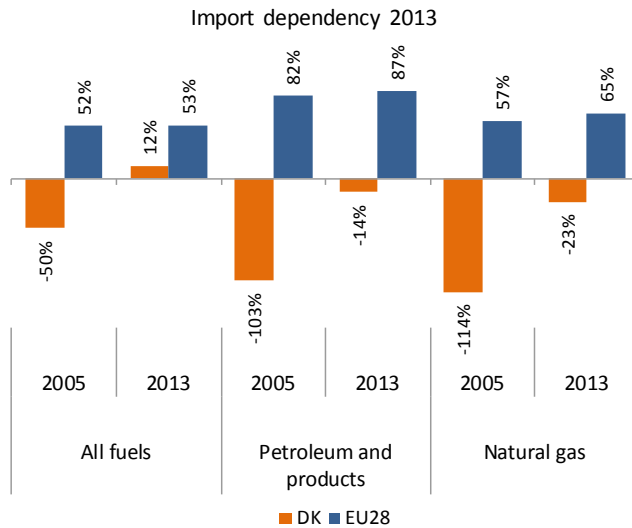


Source: European Commission, based on EUROSTAT

## IMPORT DEPENDENCY

Energy import dependency for all fuels is slightly positive in Denmark, and negative for gas and petroleum products, showing that Denmark is a net exporter of these fossil fuels<sup>1</sup>. In parallel, for fuels that need to be imported, the supplier concentration index for Denmark is low, showing well diversified fuel and country sources.

<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).



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

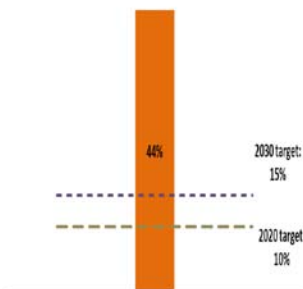
Denmark		European Union	
country	[%]	country	[%]
Norway	26.8	Russia	39.0
		Norway	29.5
		Algeria	9.7
		Qatar	6.7

Source: European Commission, based on EUROSTAT

## 2. A fully-integrated internal energy market

### INTERCONNECTIONS

Interconnection capacity for electricity in 2014



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"

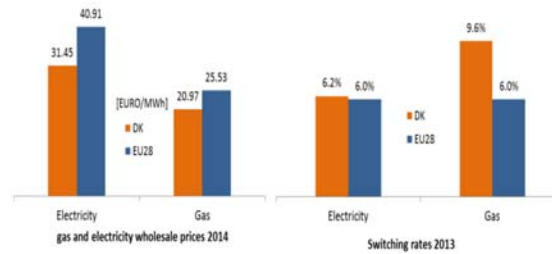
The interconnection capacity for electricity was 44% in 2014 for Denmark. The Project of Common Interest (PCI) implementation until 2020 will further increase this level.

The most important PCIs for Denmark in the electricity sector are those enhancing Denmark's electricity interconnections with Germany (3 onshore and offshore grid projects) and the Netherlands (1 offshore project). These are long-term projects with commissioning dates foreseen for years 2018 - 2022.

Following gradual depletion of gas fields, after 2020 Denmark will require access to new gas sources. The capacity expansion at the Danish/German border (PCI) came into operation in 2015. A new gas pipeline connecting Denmark and Poland ('Baltic Pipe') together with the tie-in to the Norwegian gas infrastructure in the North Sea is under consideration. Denmark closely cooperates with other Member States in its vicinity as well as with Norway to improve the security of gas supply through improved cross-border transmission capacity.

## ELECTRICITY AND GAS MARKETS

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



Sources: EC, based on ESTAT, CEER and Platts Power Vision

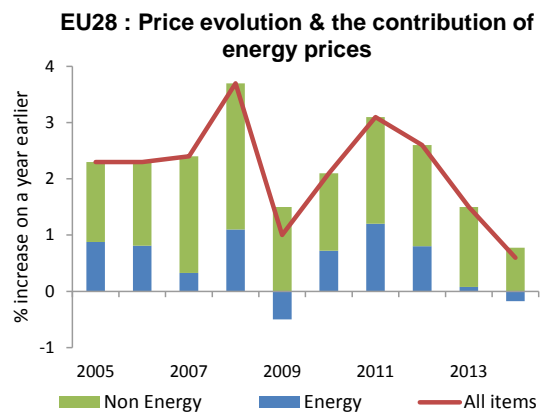
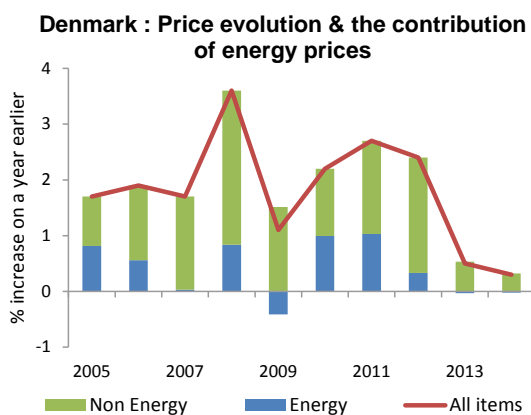
Sources: ESTAT and European Commission Calculations

Concentration in gas and electricity markets is low. The wholesale electricity and gas prices are lower than EU average. However, Danish household customers pay one of the highest electricity prices in EU, mainly due to a very high level of energy taxes. The Danish authorities intended to phase out the existing special supply obligation products in the electricity sector by October 2015, but this has been postponed until April 2016. The Danish authorities are also analyzing the gas sector and considering whether to abolish the current system of supply obligation licenses.

The switching rates for electricity and gas consumers are above the EU average, particularly for gas. The retail electricity and gas markets score highly with Danish customers in terms of trust in providers and overall satisfaction. In 2013, the Danish Energy Agency issued a new regulation securing the full roll-out of smart meters in Denmark by 2020. More than 50% of customers already have smart meters.

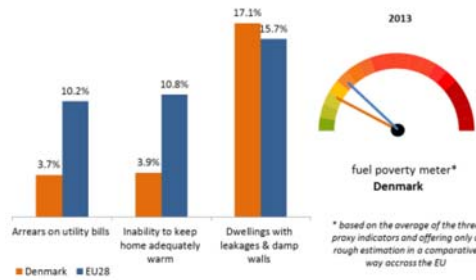
## CONTRIBUTION OF ENERGY TO CONSUMER PRICE EVOLUTION

The development of the overall consumer prices in Denmark has followed the EU-average closely over the period. The contribution of energy prices to price developments appears to be slightly less than for the EU-average. Inflation has been lower in Denmark than in the EU Since 2013. Falling energy prices have contributed to a very limited extent to this development.



Source: DG ECFIN based on Eurostat

### VULNERABLE CONSUMERS

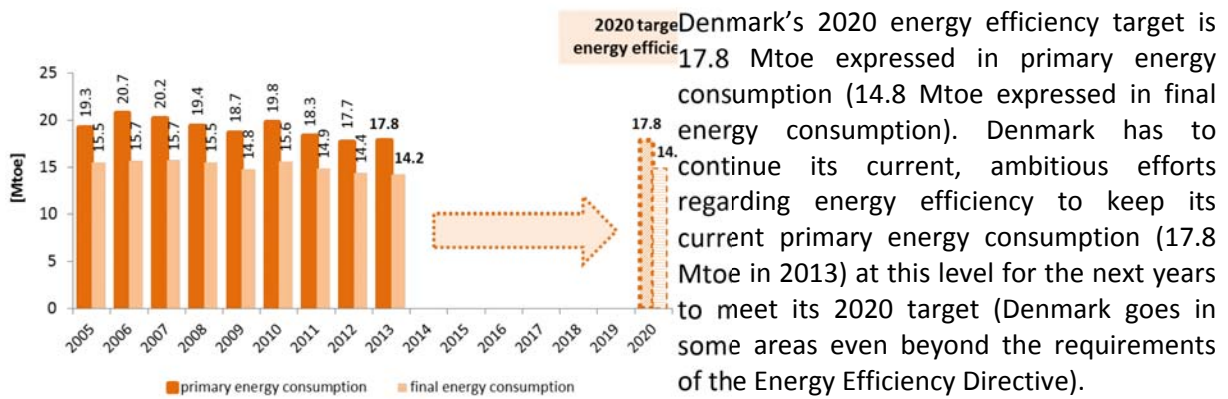


Source: European Commission, based on on EUROSTAT SILC survey

Based on a EUROSTAT survey on income and living conditions, three proxy indicators are used to assess fuel poverty. They indicate limited issues in Denmark, except a slightly higher share of houses with leakages than the EU average. There are no specific provisions regarding vulnerable consumers in the energy law; instead this issue is dealt with in social legislation.

## 3. Energy Efficiency and moderation of energy demand

### ENERGY EFFICIENCY TARGET 2020 (17.8 Mtoe primary energy and 14.8 Mtoe final energy)

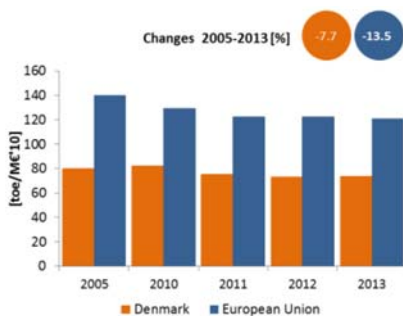


Source: European Commission, based on EUROSTAT and on national energy efficiency targets as declared by the MS under the Energy Efficiency Directive

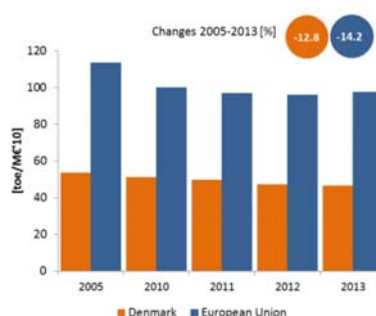
### ENERGY INTENSITY

Primary energy intensity in Denmark has decreased from 2005 onwards, and remains much below EU average. A slower energy intensity reduction is recorded in the industrial sector compared to the EU28 reduction, but again it remains much below EU average.

#### Primary energy intensity of the economy



#### Final energy intensity in industry

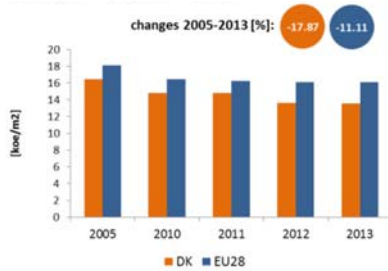


Source: European Commission based on EUROSTAT and European Commission/AMECO

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

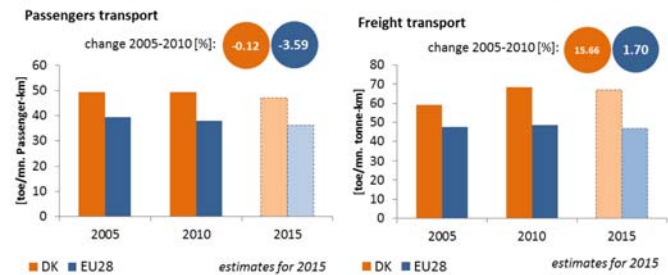
Specific energy consumption by households is slightly below EU average and decreased at a higher pace than the EU average between 2005 and 2013. The specific energy intensity of passenger cars remains above EU average, which reflects a less efficient usage of cars. The specific energy intensity for freight transport increased between 2005-2010 (by up to 16%), i.e. from the same unit of energy fewer tonnes of good are transported and/or on shorter distances.

Final energy consumption per m2 in residential sector, climate corrected



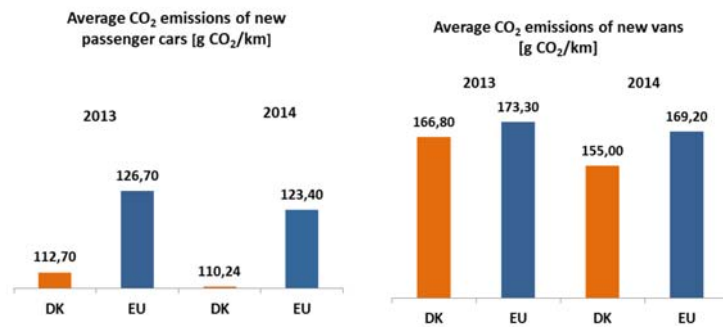
Source: European Commission based on Odyssee database

Specific energy intensity for passenger cars and freight transport<sup>2</sup>



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

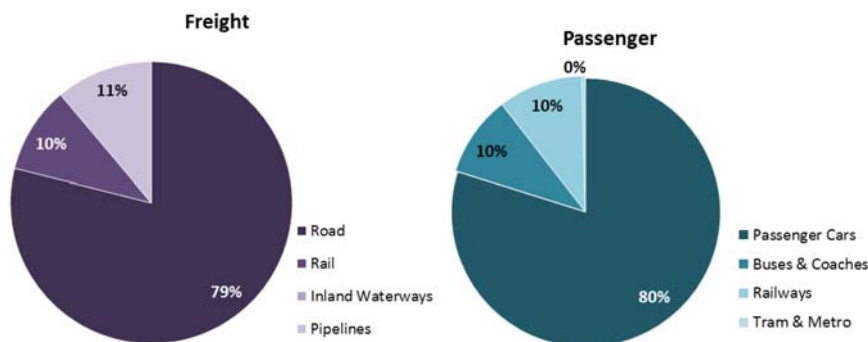
EU legislation sets mandatory CO2 emission reduction targets for new cars and vans. By 2021, the fleet average to be achieved by all new cars is 95 grams of CO2 per kilometre. For new vans, the fleet average is set at 147 g/km by 2020.



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.

Modal share Denmark



<sup>2</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: 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)



Denmark has decreased its emissions by 15 % between 2005 and 2014. According to its 2015 projections, Denmark is expected to reach its 2020 target.

Non-ETS Emissions (vs. 2005)	Projections/proxy	target
Projections with existing measures 2020	-20%	-20%
Proxy 2014	-15%	-6%

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

### RENEWABLE ENERGY SHARE TARGET 2020 (30%)



Source: European Commission based on EUROSTAT

With a renewable energy share of 27.2% in 2013, Denmark is on track to reach its 30% target in 2020.

### GREENHOUSE GAS EMISSION INDICATORS

- Per capita road transport emissions in Denmark are among the highest in the EU.
- Denmark carbon intensity of the economy is one of the lowest in the EU, and it is about 40% lower than the EU average.
- In 2014, the revenues from the auctioning of ETS allowances amounted to EUR 48.1 million, entirely used or planned to be used for energy and climate related purposes.

Largest Sectors of GHG Emissions in 2012 (*)	Denmark	EU Average
Energy/power industry	33%	33%
Transport	24%	20%
Industry	12%	19%
Agriculture (incl. forestry & fishery)	23%	12%
Residential & Commercial	6%	13%
Waste & others	2%	3%

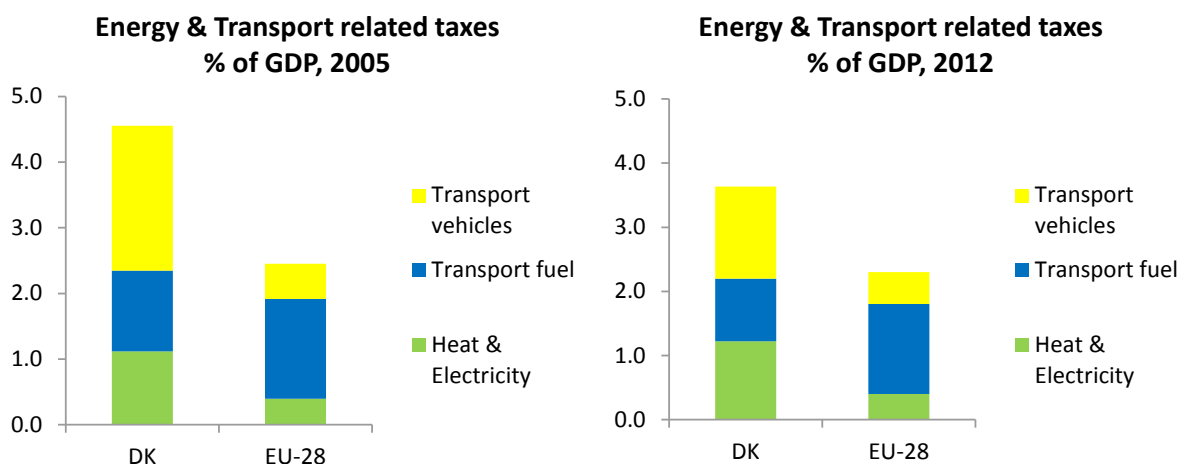
GHG Emissions	Denmark	EU
EU ETS auctioning revenues in 2014 (EUR millions)	48.1	3205
Share of ETS emissions in 2013	39%	42%
GHG emissions/capita in 2013 (tCO <sub>2</sub> equivalent)	9.8	8.5
Carbon intensity of the economy in 2013 (tCO <sub>2</sub> equivalent/(EUR millions))	228	328

Source: European Commission based on EEA

(\*)Sectoral breakdown for 2013 data not available

### ENERGY & TRANSPORT TAXATION

Energy and transport related taxes as a share of GDP amount to 3.9%, which is significantly higher than the EU-average. This is mainly due to high taxation of transport vehicles (1.4%). Moreover, the taxation of electricity and heating fuels is also very high in relative terms, while the share of taxation of transport fuels to GDP is below the EU-average. The overall tax burden on transport and energy has fallen since 2005, possibly reflecting both the growth of GDP and the pursued climate and energy policy.

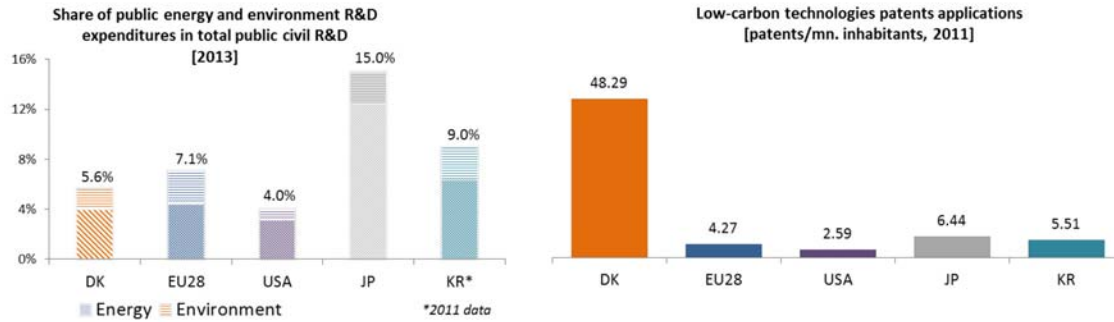


Source: Eurostat

## 5. Research, innovation and competitiveness

### RESEARCH AND INNOVATION

Denmark is slightly below the EU average, above the US and below Japan and South Korea in terms of public support share allocated to research and innovation in the field of energy and environment. In terms of intensity of low-carbon technologies patents, Denmark shows a much better performance than EU average and main worldwide partners.

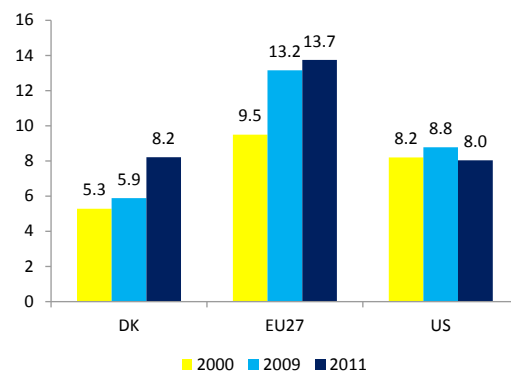


Source: European Commission based on EUROSTAT

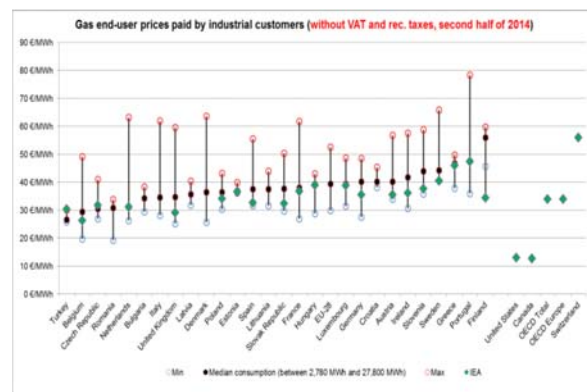
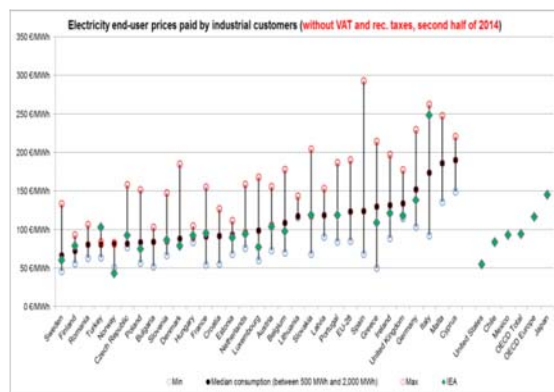
COMPETITIVENESS

The real unit energy costs<sup>3</sup>, that is the amount of money spent on energy sources needed to obtain one unit of value added, has been lower in Denmark than in the EU27 and the US in the past. However, real energy prices have increased over time and is now at about the same level as in the US, while remain below the EU average.

Real unit energy costs (% of value added)



Source: European Commission



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

- Denmark has a long-term vision (post 2020) for energy. This has, however, not been translated into concrete policy as regards the post-2020 perspective.
- Denmark has according to its EU commitments a 20 % greenhouse gas emission target for

<sup>3</sup> This indicator measures the amount of money spent on energy sources needed to obtain one unit of value added.

2020 (compared to 1990). No further targets have been set in relation to 2030.

- Energy plan: The Government has a long term vision for the energy system to be independent of fossil fuels in 2050. The *Energy Agreement* (2012) is supported by a large majority of parties in the Parliament. The agreement covers several aspects of the energy sector, such as support for renewable energy (wind, biomass and biogas) and initiatives to phase out fossil fuels. The initiatives set in the Agreement are intended to develop the energy sector towards 2020. It is incorporated in the agreement, that the parties before the end of 2018 are obliged to discuss initiatives for the period after 2020.

### NATIONAL TARGETS, especially for 2030

Objectives, 2030-2050	Targets	Comments
GHG reduction	No	No specific GHG target for 2030
Renewable energy	Yes	Independency of fossil fuels in 2050 means that the national production of renewable energy in 2050 in general should cover the Danish energy consumption
Energy Efficiency / savings	Yes (2050)	<i>“Strategy for Energy Renovation of Buildings”</i> → 35% reduction in energy consumption for heating in existing buildings by 2050

## 7. Regional cooperation

Regional cooperation on infrastructure development is necessary to optimise the identification of regional infrastructure priorities and to coordinate cross-border investments. Denmark is a member of 3 Regional groups: Electricity Northern Seas Offshore Grid (NSOG), Electricity Baltic Energy Market Interconnection Plan (BEMIP) and Gas Baltic Energy Market Interconnection Plan. Denmark also plans to be part of the regional initiative on the promotion of the North Sea Offshore Grid, which aims to deliver cost-reduction to the offshore energy system. The close regional cooperation between Denmark and Poland, Netherlands, Sweden, Germany allows the improvement of the gas and electricity interconnections.

Denmark is part of the Nordic wholesale electricity markets, which includes the Nord Pool spot market, and cooperates with its Nordic neighbours on the advanced integration of energy markets of Finland, Sweden, Denmark and Norway.

## 8. Cohesion policy contribution

The EU Cohesion policy provides for investment possibilities to implement energy policy objectives in Denmark 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 macro-regional strategy for the Baltic Sea Region in which Denmark takes part.

*Energy efficiency:* Over 2014-2020, EU Cohesion Policy will invest some EUR 41 million in energy efficiency improvements in SMEs in Denmark.

*Decarbonisation:* Overall, the EU Cohesion Policy investments in Denmark over 2014-2020 are

expected to contribute to an estimated annual decrease of GHG of around 49 000 tonnes of CO<sub>2</sub>eq. No EU Cohesion Policy investments in renewable energy infrastructure envisaged in Denmark over 2014-2020; research and innovation in the area of renewable energy may be supported.

*Research, Innovation and Competitiveness:* Over 2014-2020, EU Cohesion Policy will invest in R&I and in SME competitiveness in Denmark. This will be based on the national strategy for smart specialisation. For Denmark, the Strategy includes a focus on assisting SMEs in developing resource efficient business plans, production methods and operations. At this stage, at least EUR 11 million is foreseen for investments in R&I and adoption of low-carbon technologies in Denmark, but this might increase further in line with the evolving content of the smart specialisation strategy.