Council of the European Union

Brussels, 19 November 2015
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CLIMA 127
AGRI 607
COMPET 524
TRANS 370
ENV 718
ECOFIN 891
RELEX 947
TELECOM 217
CONSOM 197

COVER NOTE

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Delegations will find attached document SWD(2015) 232 final.

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COMMISSION STAFF WORKING DOCUMENT

Country Factsheet Luxembourg

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

{COM(2015) 572}
{SWD(2015) 208 à 209}
{SWD(2015) 217 à 231}
{SWD(2015) 233 à 243}

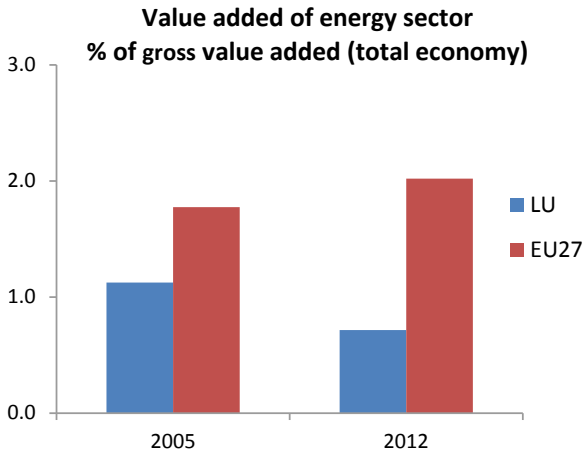
Towards an Energy Union

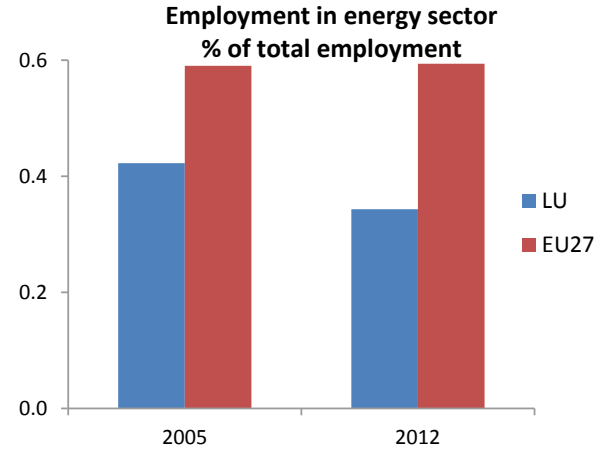
Luxembourg

Macroeconomic relevance of energy

IMPORTANCE OF THE ENERGY SECTOR

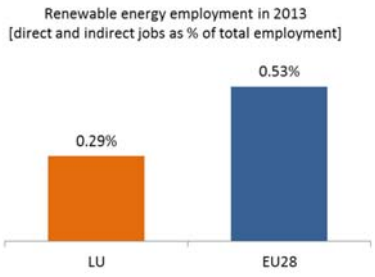
The macro-economic importance of the energy sector is very low in Luxembourg compared to the EU as a whole, as reflected by the sector's low shares in total value added and employment. Interestingly, the shares in value added and employment have decreased sharply between 2005 and 2012, whereas for the EU as a whole they have increased or remained constant during this period.





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 Luxembourg was at about 0.29%, below the EU average of 0.53%. However, in absolute terms, employment in the energy sector has increased by 29% from 2005 to 2013.[1]

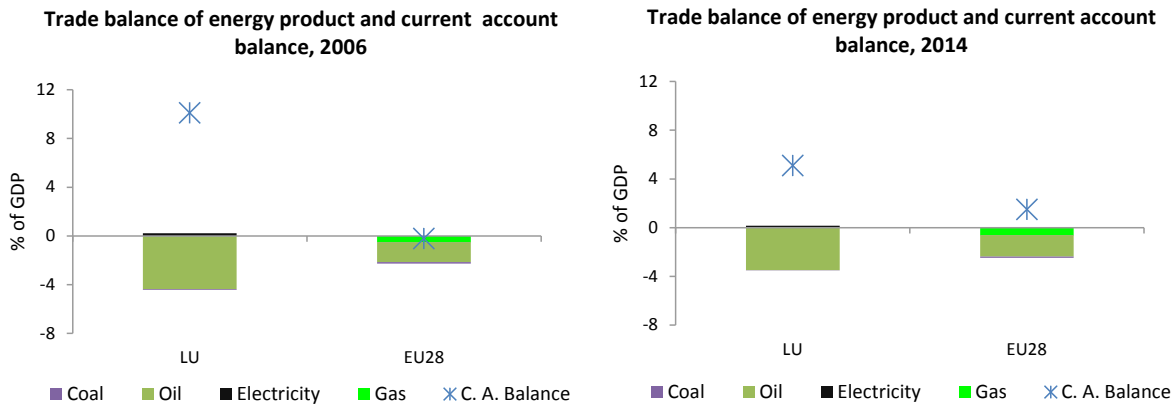


Source: European Commission, based on EurObserv'ER and EUROSTAT

TRADE BALANCE OF ENERGY PRODUCTS

The energy trade balance deficit of Luxembourg represents 3.3% of GDP in 2014, which is higher than the EU average, and is virtually fully driven by oil, which can be linked to the importance of the transport fuel market (i.e. cross-country fuel purchase) for Luxembourg's economy.

[1] Source: LU authorities



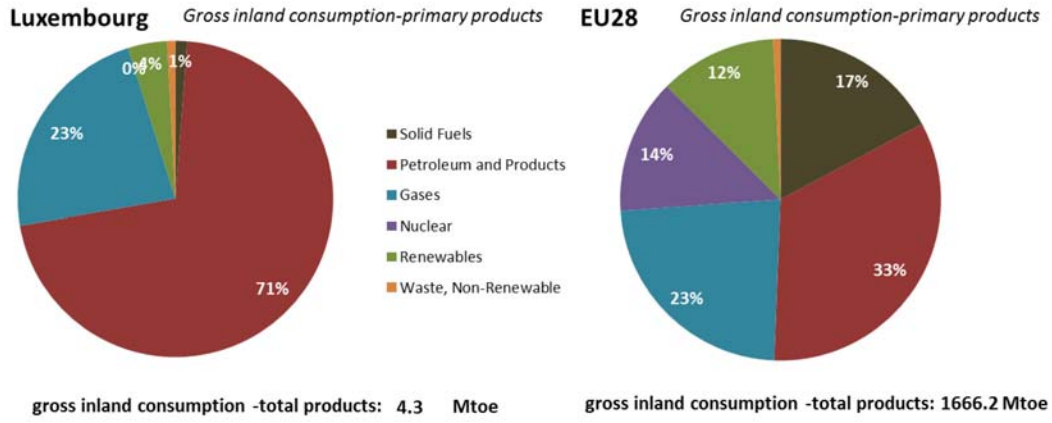
Source: EUROSTAT
Note: Current account balance for EU28 from European Commission (AMECO)

1. Energy Security, solidarity and trust

ENERGY MIX

The energy mix of Luxembourg differs broadly from the one of the EU-28, with the notable difference of a much higher share of petroleum and products. Compared to 1995, the share of petroleum and products sharply increased (from 55% to 71% of gross inland energy consumption), while the share of solid fuels decreased sharply as well (by 14 percentage points). The share of gases increased from 18 to 23% of the energy mix.

Gross inland energy consumption in 2013

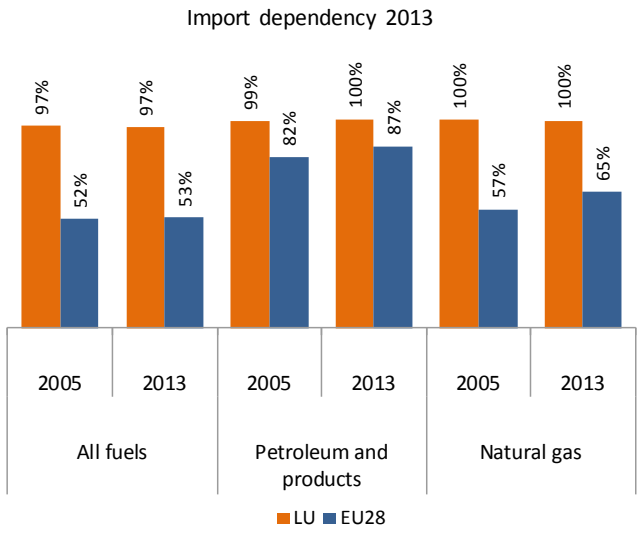


Source: European Commission, based on EUROSTAT

IMPORT DEPENDENCY

Luxembourg has a very high import dependency on fossil fuels, particularly on gas and petroleum and products. Luxembourg imports gas from Norway, Russia and other countries[2], which translates into a relatively balanced range of import sources. Luxembourg experiences a significant energy trade deficit, expressed in percentage of GDP.

[2] 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).



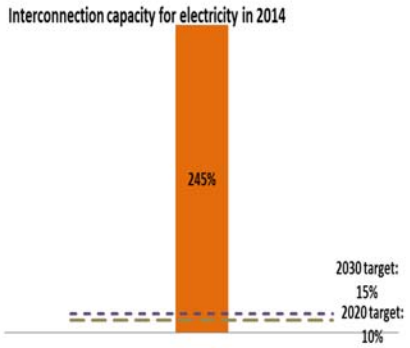
Top non-EU gas suppliers in 2013 (% in total imports)

Luxembourg			European Union		
country		[%]	country		[%]
Norway		63.9	Russia		39.0
Russia		25.2	Norway		29.5
Not specified		10.8	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"

Due to its location, the interconnection capacity of Luxembourg is the highest among the EU Member States. However, further developments are needed in certain areas given that Luxembourg is dependent on imports for almost all its energy needs.

For electricity, Projects of Common Interest (PCIs) have been identified in order to increase the capacity at the Belgian/Luxembourg border.

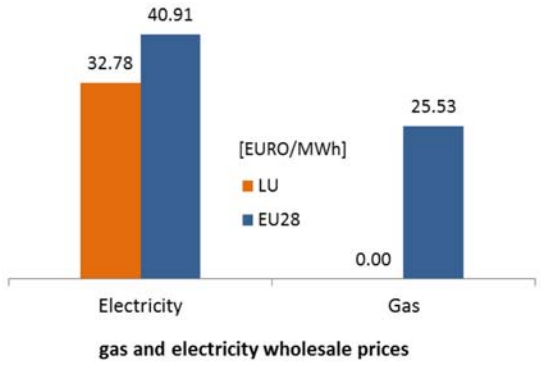
ELECTRICITY AND GAS MARKETS

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

The concentration of the power generation market is above EU average while it is below for gas. Regarding electricity markets, the relevant wholesale price zone encompasses Luxembourg, Germany and Austria. The absence of congestion on interconnectors means wholesale operators can participate on other power exchanges.

Regarding gas markets, the relevant wholesale prices applied in Luxembourg are those of the Zeebrugge Trading Point (ZTP) in Belgium.



gas and electricity wholesale prices

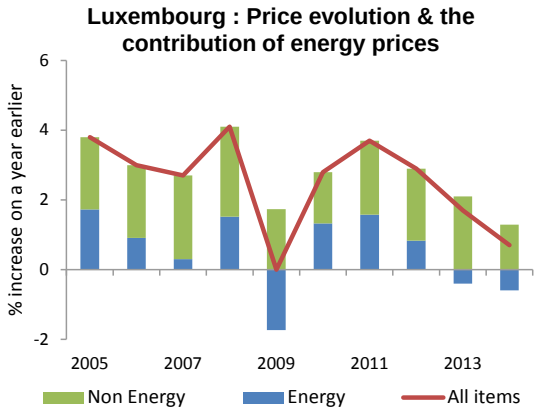
Sources:ESTAT and European Commission Calculations

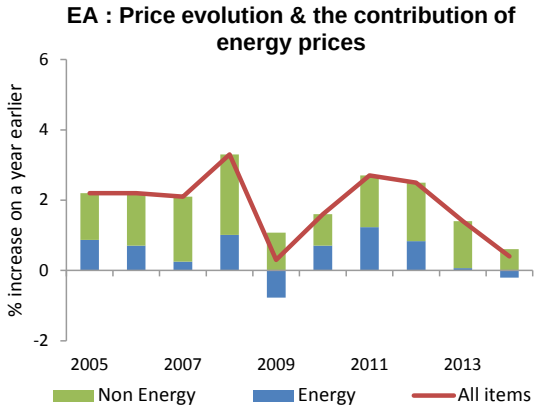
Furthermore, an initiative was launched in May 2014 by the Belgian and Luxembourg gas transmission system operators (TSO) to integrate the Belgian and the Luxembourg gas markets. The gas market integration, starting in October 2015, will offer new opportunities to market participants.

At retail level, electricity and gas markets are highly concentrated. The supplier switching rate in 2012 was 0.22% by customer number and 9.7% by consumption volumes, demonstrating that industrial users were more active in switching suppliers. The opening of the gas sector remained very low with supplier switching rates less than 0.1% (customer numbers). Consumers report high level of satisfaction for both the electricity and gas retail markets[3]. Household electricity and gas prices are below EU average.[4]

CONTRIBUTION OF ENERGY TO CONSUMER PRICE EVOLUTION

The inflation of consumer prices has decreased more or less in line with the Euro Area average since 2011. In Luxembourg the contribution of the energy on the inflation rate has been negative since 2013, whereas for the Euro area the contribution was still positive in 2013.



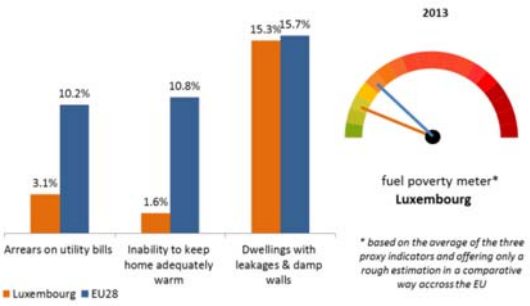


Source: DG ECFIN based on Eurostat

[3] 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

[4] Source: Eurostat (http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_price_statistics).

VULNERABLE CONSUMERS

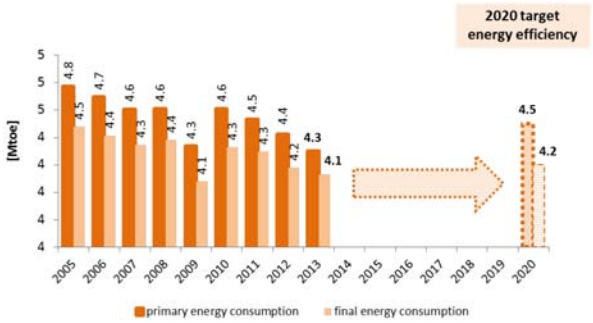


Source: European Commission, based on on EUROSTAT SILC survey

Based on a EUROSTAT survey on income and living conditions, three proxy indicators are used to assess fuel poverty. They indicate that while relevant, the problem is rather limited in Luxembourg. Social offices organised by the municipalities apply criteria established to define vulnerable consumers in Luxembourg. Both, the laws concerning the electricity market and the gas market, as well as the law concerning social welfare, have set a procedure to define the way how to treat vulnerable consumers.

3. Energy Efficiency and moderation of energy demand

ENERGY EFFICIENCY TARGET 2020 (4.5 Mtoe primary energy and 4.2 Mtoe final energy)



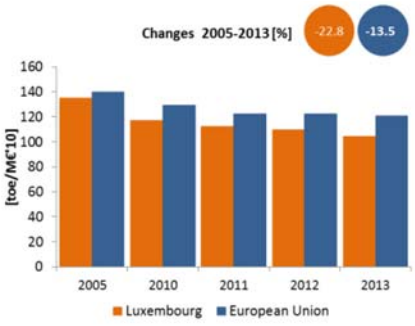
Source: European Commission, based on EUROSTAT and on national energy efficiency targets as declared by the MS under the EED

Luxembourg's 2020 energy efficiency target is 4.5 Mtoe expressed in primary energy consumption (4.2 Mtoe expressed in final energy consumption). When comparing the trend of primary energy consumption with the GDP development over the past decades, there is evidence of a decoupling of both since 2005. Even if Luxembourg's current primary energy consumption (4.3 Mtoe in 2013) is below its 2020 target, Luxembourg should continue its current efforts to keep the primary energy consumption at this level or increase it only slightly so that it will reach its 2020 target even if the economy continues to grow in the next five years.

ENERGY INTENSITY

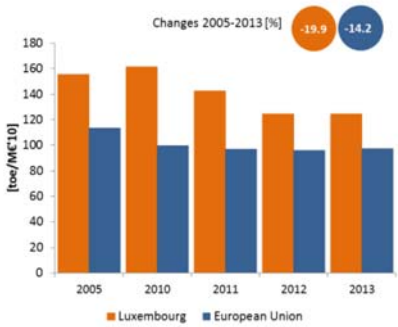
Primary energy intensity in Luxembourg has decreased since 2005, and remains below EU average, even though the country has substantial 'heavy industry' and a sizeable amount of transport fuel sales, also due to a high level of fuel exports. Regarding industry, energy intensity is above EU average, but decreasing at a faster pace. The energy consumption of the industry decreased by 36% between 2010 and 2013.

Primary energy intensity of the economy



Source: European Commission based on EUROSTAT

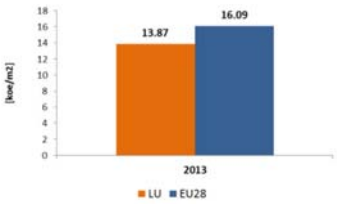
Final energy intensity in industry



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

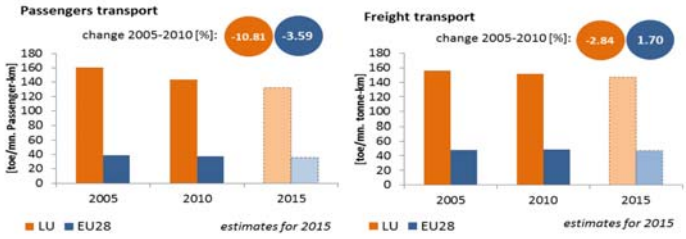
Specific energy consumption by households is slightly below EU average. Luxembourg has an ambitious policy regarding energy efficiency of new buildings. The specific energy intensity of passengers cars is extremely high, which could be biased by the cross-country fuel purchase. The specific energy intensity for freight transport is also very high, which could be explained by the nature of Luxembourg as a transit country.

Final energy consumption per m2 in residential sector, climate corrected



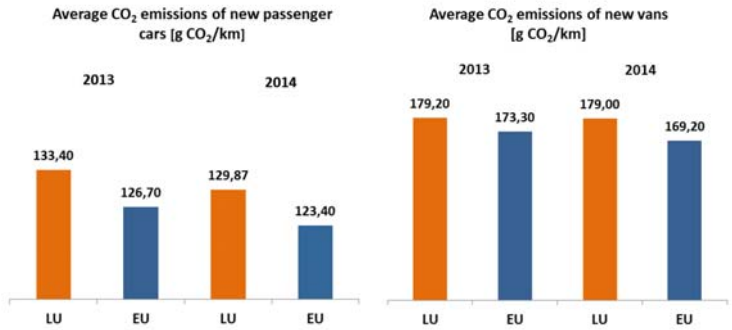
Source: European Commission based on Odyssee database

Specific energy intensity for passenger cars and freight transport[5]



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

EU legislation sets mandatory CO_2 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_2 per kilometre. For new vans, the fleet average is set at 147 g/km by 2020.

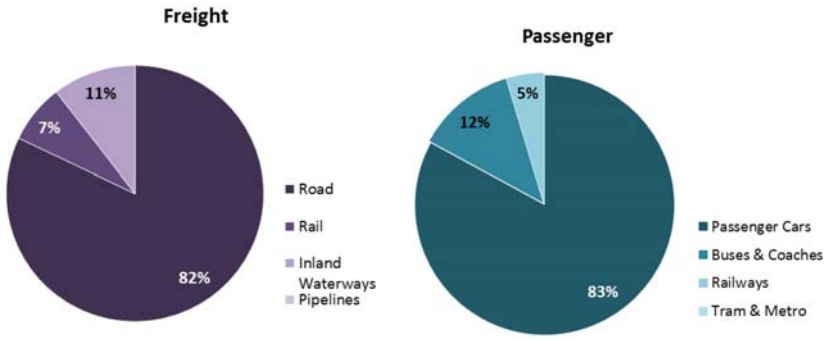


Source: European Environmental Agency. 2014 values are provisional. 2013 EU average refers to EU-27.

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.

[5] 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.

Modal shares Luxembourg



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)

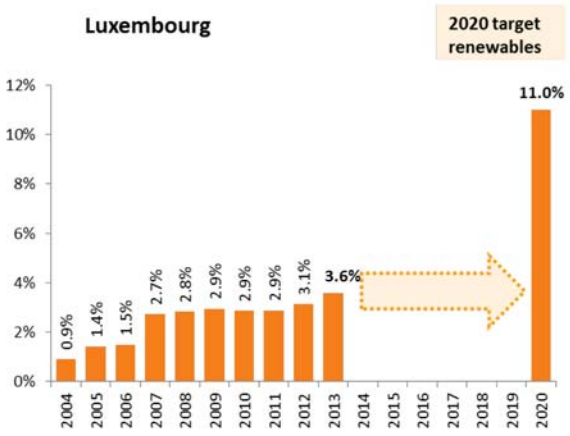
Source: European Commission based on EEA. Based on preliminary inventory data.

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

According to the most recent data (preliminary figures for 2014), ESD emissions in Luxembourg have decreased by 10% between 2014 and 2005. According to the latest projections, Luxembourg is going to exceed by a wide margin its greenhouse gas emission reduction target for 2020, with approximately a 21% gap as compared to 2005. However, these projections do not take into consideration new measures, such as the increase of the standard VAT rate which will narrow the price gap of fuel with neighbouring countries and the construction of a tramway in Luxembourg City. The impact of these measures on projected emissions remains to be quantified.

Non-ETS Emissions (vs. 2005)	Projections/proxy	target
Projections with existing measures 2020	1%	-20%
Proxy 2014	-10%	-8%

RENEWABLE ENERGY SHARE TARGET 2020 (11%)



Source: European Commission based on EUROSTAT

The estimated renewable energy share in 2013 was 3.6%, which is below the indicative trajectory of 3.9% for 2013-2014; interim figures for 2014 are indicating an increase to 4.54%. The target trajectory will become steeper in the coming years.

Given the limited national capabilities and the geographical constraints, the achievement of the 2020 target solely by domestic measures seems challenging. Negotiations to make use of the cooperation mechanisms available under the Renewables Directive to achieve its 2020 renewable energy target are ongoing.

GREENHOUSE GAS EMISSION INDICATORS

- Overall GHG emissions decreased by 5% in 2013 compared to 2012 in Luxembourg and are currently at their lowest level since 2002.
- Although this downward trend can be observed across all sectors, the transport sector still accounts for more than half of the total greenhouse gas emissions, due to the intense transit and commuting traffic performed within the country.
- Emissions per capita are the highest in Europe due to the very high share of road fuel sales to non-residents.

Largest Sectors of GHG Emissions in 2012 (*)	Luxembourg	EU Average
Energy/power industry	9%	33%
Transport	55%	20%
Industry	16%	19%
Agriculture (incl. forestry & fishery)	6%	12%
Residential & Commercial	13%	13%
Waste & others	1%	3%

(*)Sectoral breakdown for 2013 data not available

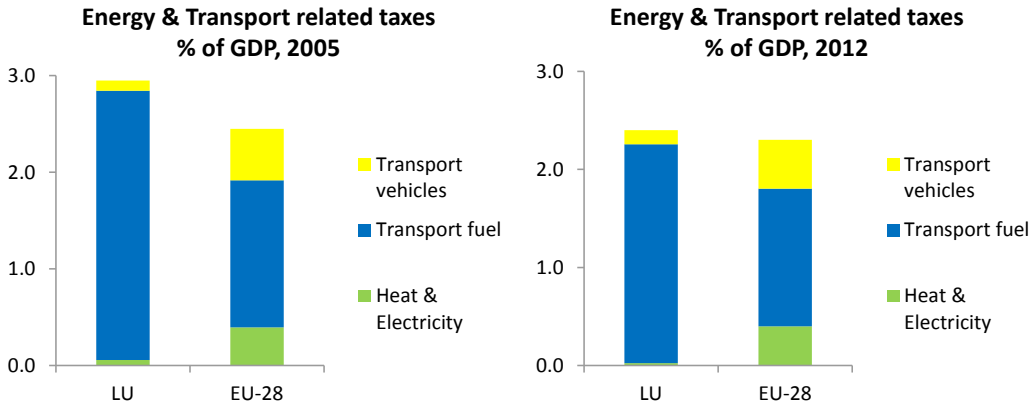
GHG Emissions	Luxembourg	EU
EU ETS auctioning revenues in 2014(EUR millions)	5.155	3205
Share of ETS emissions in 2013	16%	42%
GHG emissions/capita in 2013 (tCO_2equivalent)	21.2	8.9
Carbon intensity of economy in 2013 (tCO_2equivalent/EUR millions)	277	346

Source: European Commission based on EEA

ENERGY & TRANSPORT TAXATION

Energy and transport related taxes as a share of GDP amount to 2.4%, which is slightly higher than the EU-average. More than 90% of these tax revenues in Luxembourg still come from transport fuel taxes, despite a decrease in the period 2005-2012, which reflects the remaining importance of the transport fuel market for the economy. By contrast, the revenues from taxes on transport vehicles and heat and electricity are very low compared to the EU average.

In the framework of the on-going tax reform, Luxembourg is currently analysing the impact of increasing tax rates on road fuels. Another considered option is to increase taxes on company cars which account for almost half of the cars registered in Luxembourg.

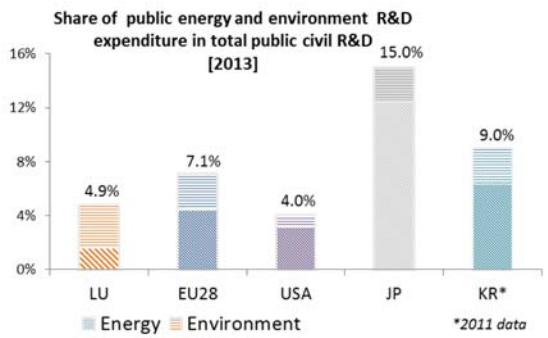


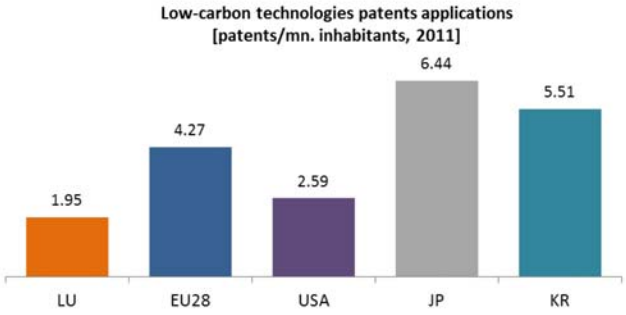
Source: Eurostat

5. Research, innovation and competitiveness

RESEARCH AND INNOVATION

Luxembourg is 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. Luxembourg has set priorities for research towards sustainable buildings and bioenergy with the emphasis on nearly zero-energy buildings. In terms of intensity of low-carbon technologies patents, Luxembourg lags behind the EU average and main worldwide partners.





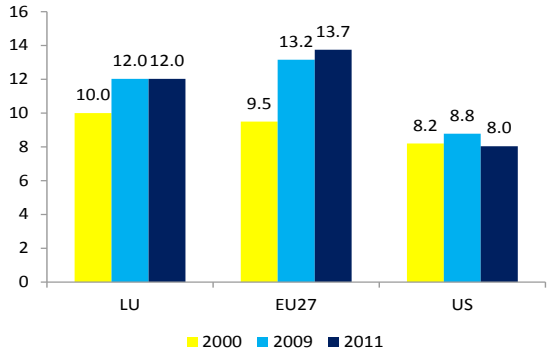
Source: European Commission based on EUROSTAT

COMPETITIVENESS

The real unit energy costs [6] in Luxembourg increased since 2000, but remains slightly below the EU average, while above the US. This can be explained by the level of energy intensity[7] in the manufacturing sector, as well as lower real energy prices in Luxembourg.

Regarding electricity prices paid by industrial customers, these stand below EU average. They are also lower than OECD average prices. Gas prices stand slightly above EU and OECD averages..

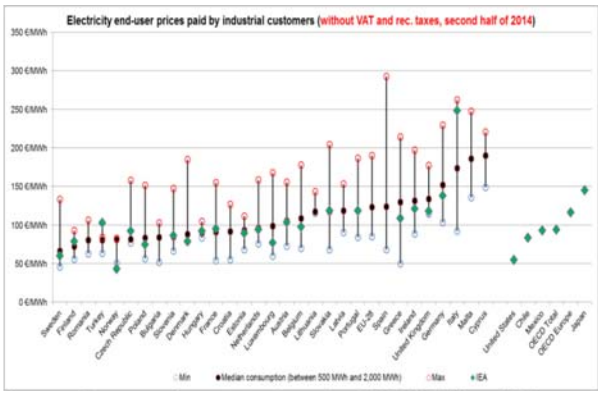
Real unit energy costs (% of value added)

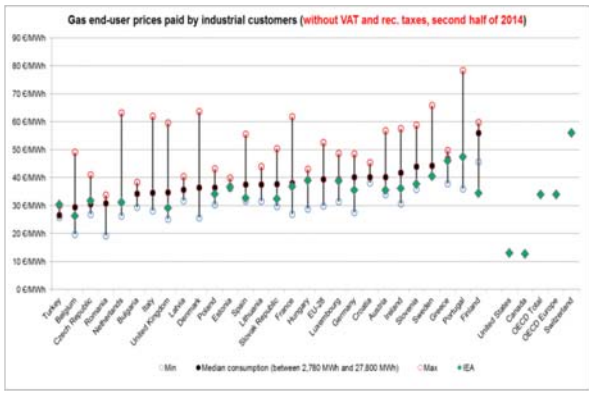


Source: European Commission

[6] This indicator measures the amount of money spent on energy sources needed to obtain one unit of value added.

[7] 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

- Luxembourg has not yet established a medium to long-term climate and energy strategy for the period post-2020. The current climate targets, covering the period until 2020, are outlined in the 2013 "*Action Plan for reducing CO2 emissions*".
- A white book process has been launched in 2009 to prepare a new national post-2020 energy strategy, covering higher energy efficiency, the replacement of imported fossil fuels with alternative sources and increase of renewables in the transport sector. Luxembourg announced it would actually start working on its "low carbon development strategy" in 2016.

NATIONAL TARGETS, especially for 2030

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

7. Regional cooperation

Luxembourg is a member of the Pentalateral Energy Forum. It was created in 2005 by Energy Ministers from Benelux, Germany and France in order to promote collaboration on cross-border exchange of electricity. It is an inter-governmental initiative, assisted by an independent secretariat, whose mission consists of improving control of the cross-border network and harmonising allocation methods using information exchange between regulators and network operators in participating countries. Luxembourg also participates in the German-led round-table on electricity market design.

8. Cohesion policy contribution

The EU Cohesion policy provides for investment possibilities to implement energy policy objectives in Luxembourg 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.

Energy efficiency: Over 2014-2020, EU Cohesion Policy will invest some EUR 4 million in energy efficiency improvements in public and residential buildings. A further estimated EUR 4 million will be invested in supporting the move towards an energy-efficient, decarbonised transport sector. These investments are expected to contribute to around 60 households with improved energy consumption classification and a decrease of around 150 000 kWh per year of decreased primary energy consumption of public buildings.

Decarbonisation: Overall, the EU Cohesion Policy investments in Luxembourg over 2014-2020 are expected to contribute to an estimated annual decrease of GHG of around 15 000 tonnes of CO2eq. Over 2014-2020, EU Cohesion Policy will invest some EUR 2 million in renewable energy in Luxembourg. These investments are expected to contribute to 5 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 Luxembourg. This will be based on the national strategy for smart specialisation. For Luxembourg, the strategy includes a focus on ecotechnologies and key enabling technologies. At this stage, at least EUR 360 000 are foreseen for investments in R&I and adoption of low-carbon technologies in Luxembourg, but this might increase further in line with the evolving content of the smart specialisation strategy.