

ENERGY

Key Data

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Rue du Progrès 50 – 1210 Brussels

Enterprise no: 0314.595.348



○ 0800 120 33 (free number)



○ SPFEco



○ @spfeconomie



○ linkedin.com/company/fod-economie (bilingual page)



○ instagram.com/spfecoc



○ youtube.com/user/SPFEconomie



○ economie.fgov.be

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Introductory Page

This publication gives an overview of the latest available data about the energy market in Belgium.

Definitions

Primary energy consumption measures the total energy demand of a country. It covers consumption of the energy sector itself, losses during transformation (for example, from gas into electricity) and distribution of energy, and the final consumption by end users. It includes energy used for non-energy purposes (such as petroleum used for producing plastics). It excludes energy provided to international maritime bunkers (ships engaged in international navigation).

Final energy consumption is the total energy consumed by end users, such as households, industry and agriculture. It is the energy which reaches the final consumer's door and excludes that which is used by the energy sector itself. It includes energy used for non-energy purposes. It excludes energy provided to international aviation.

Primary energy production is any extraction of energy products in a useable form from natural sources. This occurs either when natural sources are exploited (for example, in coal mines, crude oil fields, hydropower plants, wind farms) or in the fabrication of biofuels.

Gross electricity production is the sum of the electrical energy production by all the generating sets concerned (including pumped storage) measured at the output terminals of the main generators..

Abbreviations

RES: Renewable energy sources

EE: Energy efficiency

NREAP: National renewable energy action plan

Targets

In accordance with the provisions of the European Energy 2020 strategy, Belgium is pursuing various renewable energy and energy efficiency targets.

RES

Directive 2009/28/EC on the promotion of the use of energy from renewable sources implies:

- A binding target of 13 % of RES in the final consumption of energy in 2020;
- A binding target of 10 % of RES in the final consumption of energy in transport in 2020.

EE

Directive 2012/27/EU on energy efficiency resulted in Belgium setting an indicative target of 18 % reduction in primary energy consumption in 2020 compared to projections performed by Primes 2007 (reference year 2005). This target corresponds to a primary energy consumption of 43.7 Mtoe in 2020. This translates into a final consumption of energy of 32.5 Mtoe in 2020.

CONSUMPTION

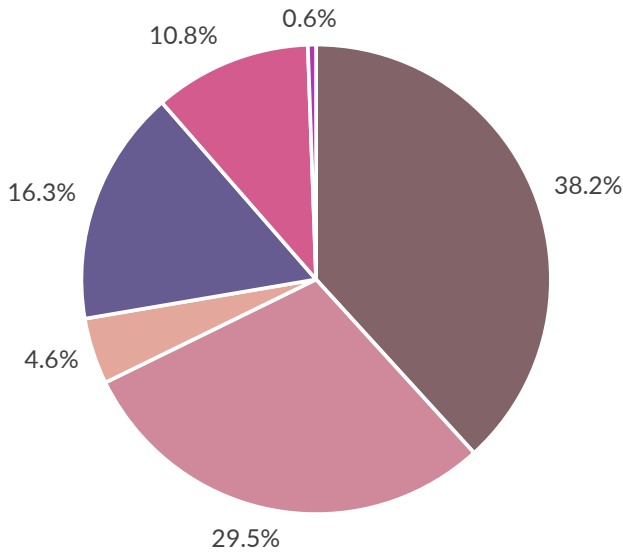
1. Consumption

1.1. Primary Energy Consumption in 2020

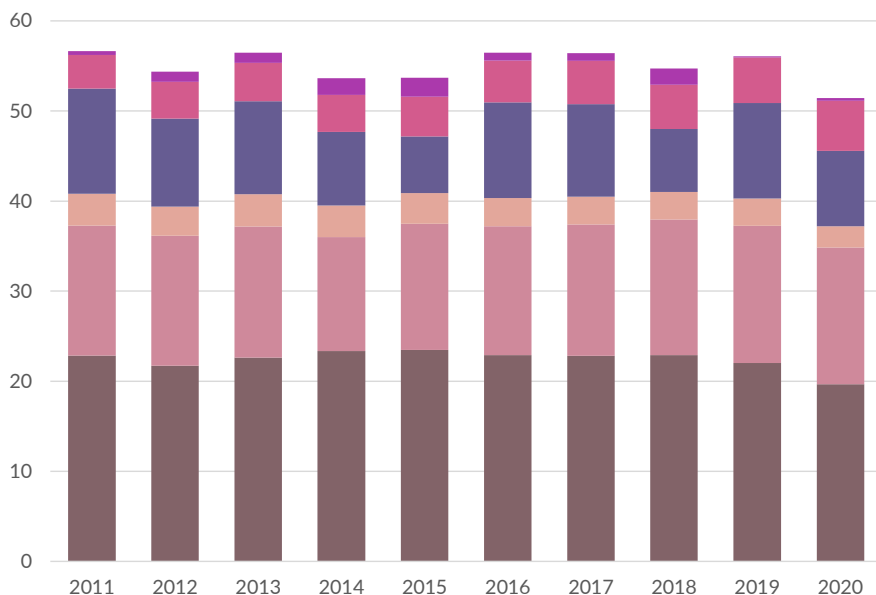
1.1.1. Per Energy Source

Energy source		Mtoe	TJ
Oil and oil products		19.7	823,580
Natural gas		15.2	635,507
Solid fossil fuels		2.4	98,474
Nuclear energy		8.4	350,393
Renewable energy and waste		5.6	233,413
Other*		0.3	12,281
Total		51.4	2,153,648

* Other includes net imports of electricity and heat, and the recovery of heat from chemical processes.



Evolution in Mtoe



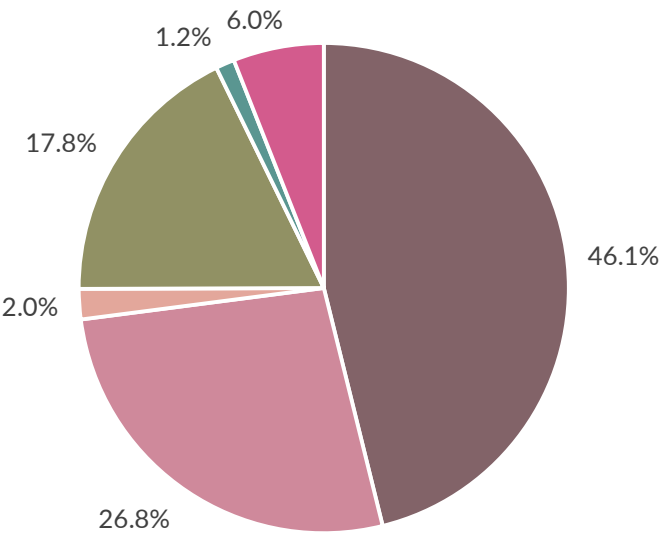
The total primary energy consumption in 2020 amounted to 51.4 Mtoe. This is a decrease of 8.3% compared to 2019. That is the lowest level of primary energy consumption since the early 1990s. This is mainly the result of the corona crisis, which caused a significant drop, primarily in the consumption of oil products. Planned maintenance in the blast furnace installations caused a decrease in the consumption of solid fossil fuels. The share of renewable energy and waste in the primary energy consumption amounted to 10.8% in 2020 compared to 6.6% in 2011. Negative net imports of electricity since 2019 have reduced the energy source "Other" compared to previous years, in which the net imports were positive.

CONSUMPTION

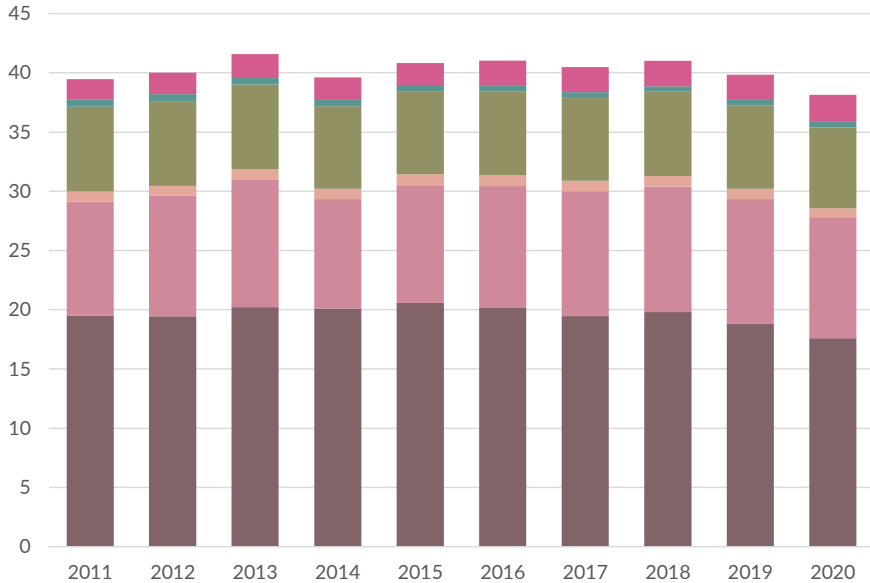
1.2. Final Energy Consumption in 2020

1.2.1. Per Energy Source

Energy source		Mtoe	TJ
Oil products		17.6	736,732
Natural gas		10.2	428,391
Solid fossil fuels		0.8	31,746
Electricity		6.8	284,746
Heat		0.5	19,742
Renewable energy and waste		2.3	95,624
Total		38.1	1,596,982



Evolution in Mtoe



Between 2011 and 2020, the final energy consumption varies between 38.1 and 41.6 Mtoe. There is a strong dependence on weather conditions; years with a severe winter, such as 2013, show a higher final consumption of fuels. This impact is mainly visible in the consumption of natural gas. The sharp decline observed in 2020 is primarily the result of a warm winter, but also of the measures taken in the fight against the corona virus. Just as was the case in the primary energy consumption, oil products are hit the hardest in the final energy consumption.

CONSUMPTION

These last years, the shares of the different energy sources in the final energy consumption remain rather stable: the decennial average share of oil products amounts to 49%, for natural gas 25%, for electricity 18%, for renewable energy and waste 5%, for solid fossil fuels 2% and for heat 1%.

Since 2011, the share of renewable energy and waste in the final energy consumption has increased from 4.4% to 6.0%. This share does not include the final consumption of green electricity.

Despite the fact that the measures taken in the fight against the coronavirus were mainly felt in the consumption of oil products, the share of the oil products in the total final energy consumption remains very dominant at 46.1% in 2020. This consumption can be split into energy consumption (67.5%) and non-energy consumption (32.5%). The transport sector represents 57.7% of the energy consumption of oil products in 2020. That is about 5 percentage points lower than in previous years, which highlights the greater impact of the measures in the fight against the coronavirus on the transport sector.

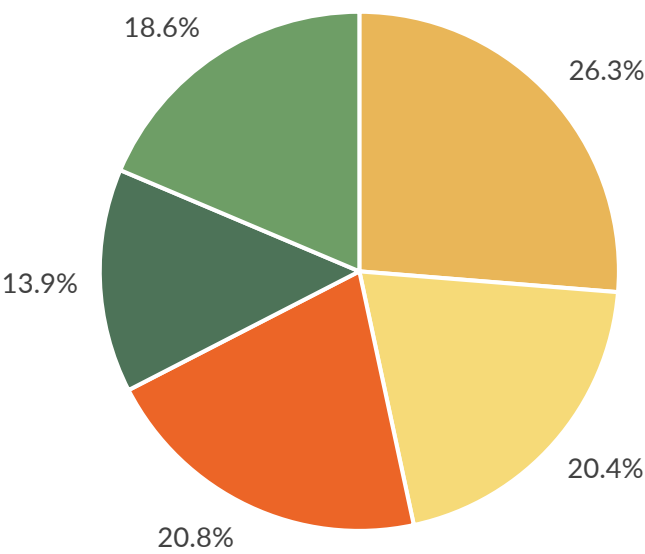
Natural gas covers 26.8% of the final energy consumption in 2020. 89.8% of this consumption is used for energy purposes, of which 33.8% is consumed in the domestic sector.



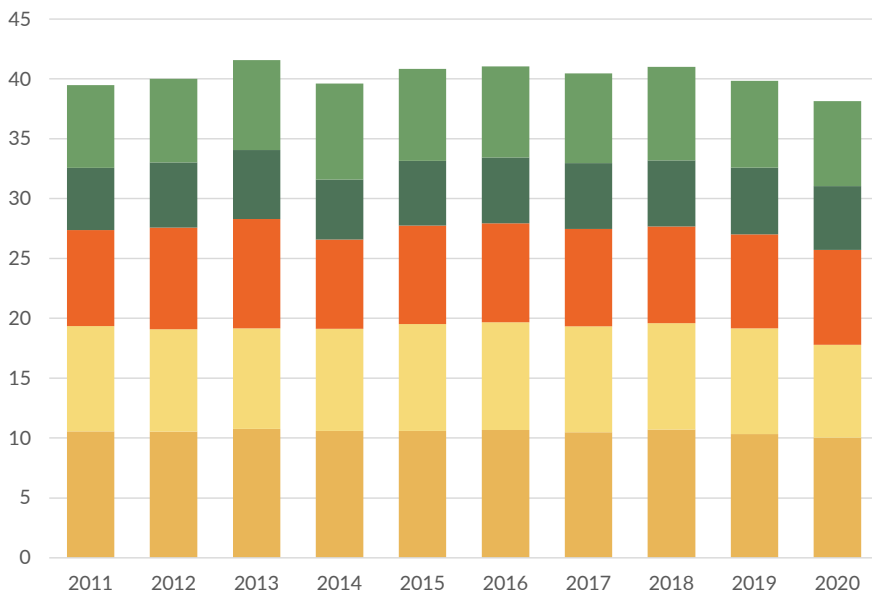
CONSUMPTION

1.2.2. Per Sector

Sector		Mtoe	TJ
Industry		10.0	419,653
Transport		7.8	325,095
Residential		7.9	332,203
Services and equivalent		5.3	222,598
Non-energy use		7.1	297,434
Total		38.1	1,596,982



Evolution in Mtoe

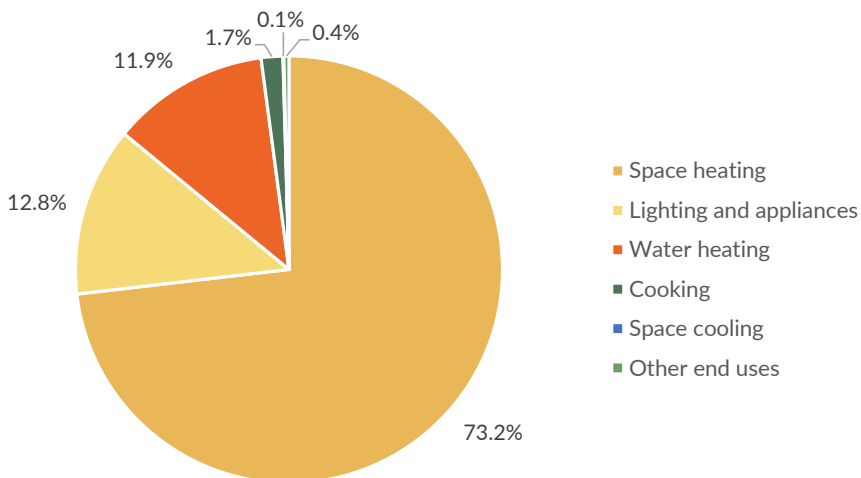


The sectorial distribution of the final energy consumption is fairly stable over the years. The year 2020 is an exception to this because of the major impact of the measures taken against the coronavirus on the transport sector. In 2020, consumption in the transport sector fell by 15.8% compared to 2019. A similar trend is not visible in the other sectors.

In 2020, the consumption in industry has been mainly covered by natural gas (38.6%), electricity (31.3%) and petroleum products (13.6%). These are also the main energy sources in the domestic sector (respectively 38.7%, 20.2% and 32.3%). The consumption in the transport sector is – as expected – dominated by petroleum products (88.3%). The remaining share is provided by biofuels (bioethanol and biodiesel), electricity (railway transport) and a very limited amount of natural gas. The non-energy consumption is also dominated by petroleum products (80.5%), completed by natural gas (16.1%) and solid fossil fuels (3.4%).

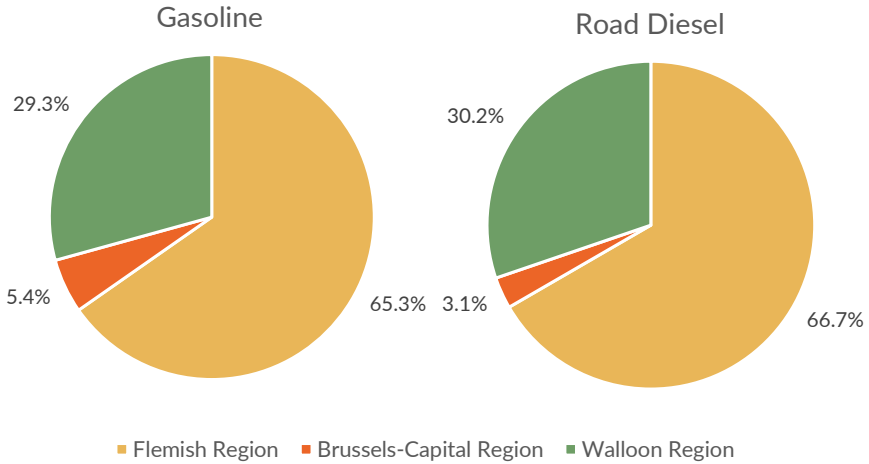
CONSUMPTION

1.2.3. Energy Consumption in Households per Type of End Use in 2019



In 2019, 73.2% of the energy consumed by households is used for heating. The main energy sources used for heating in households are natural gas (48.0%) and petroleum products (36.7%). The share of heating in household energy consumption varies with climatic conditions, between 70% and 77% since 2010. The remainder of the energy consumed in households is used for lighting and electrical appliances (12.8%), for water heating (11.9%) and for cooking (1.7%). As Belgium has a temperate climate, the use of energy for cooling is very low (0.1%).

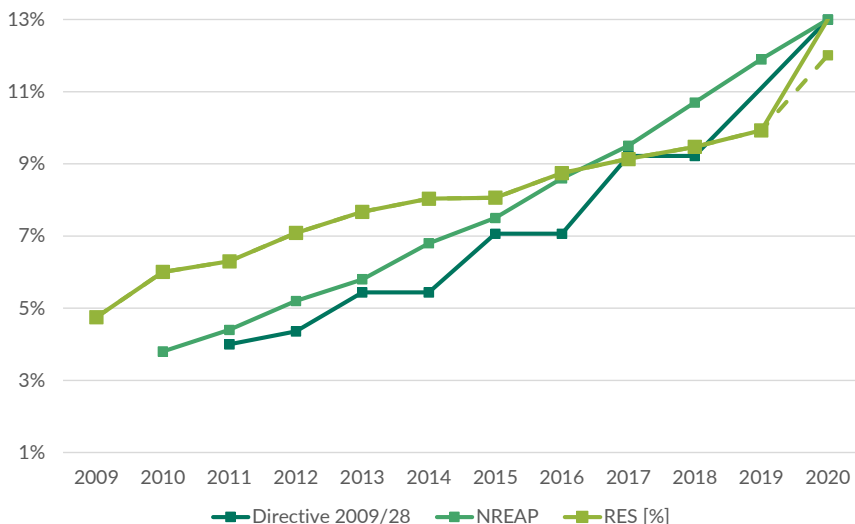
1.2.4. Regional Distribution of Sales of Motor Fuels in 2020



Surveys at public and private pumping stations make it possible to divide the quantities of motor fuels sold in Belgium between the three regions. The majority of motor fuels are sold in the Flemish Region: 65.3% or 1.4 million m³ of gasoline and 66.7% or 4.5 million m³ of road diesel. 29.3% or 0.6 million m³ of gasoline and 30.2% or 2.0 million m³ of road diesel are sold in the Walloon Region; whilst 5.4% or 0.1 million m³ of gasoline and 3.1% or 0.2 million m³ of road diesel are sold in the Brussels-Capital Region.

1.3. Follow-up on European Targets – 2020

1.3.1. Share of Renewable Energy Sources (RES) in the Final Consumption of Energy

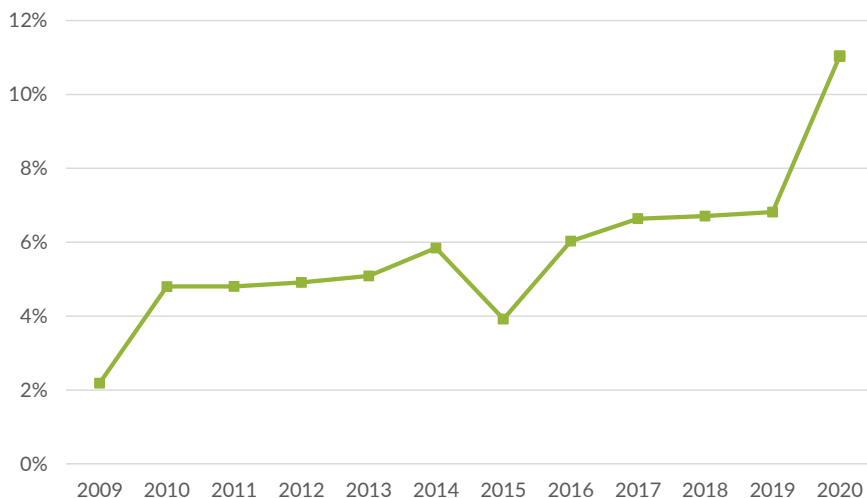


In 2020, the share of renewable energy in the final energy consumption amounted to 12.01% (dotted line). This is under the binding target of 13% as laid down in the Renewable Energy Directive 2009/28. In order to make up for this deficit, various purchases of quantities of energy from renewable sources from other Member States (Finland, Denmark and Lithuania) were carried out. These purchases lead to an increased share of 13.00% of renewable energy in the final energy consumption (full line), which therefore meets the binding target of the Renewable Energy Directive 2009/28.

The slight decrease in 2015 is a consequence of the (temporary) change in the national regulation applying on the blending of biofuels in motor fuels.

Determining the current share is done according to the calculation rules imposed by this directive.

1.3.2. Share of Renewable Energy Sources in the Final Consumption of Energy in Transport



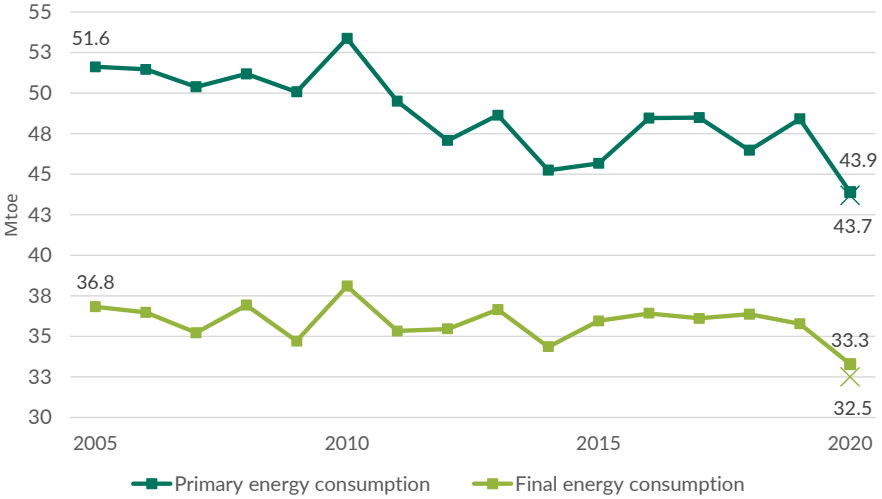
In 2020, the share of renewable energy in transport amounted to 11.03% of the final consumption of energy in transport; an increase of 4.2 percentage points compared to 2019, mainly due to the increased blending obligation of biofuels for the year 2020, as stipulated in the Royal Decree of 4 May 2018.

The renewable energy in transport originates mainly from blended biofuels in motor fuels (gasoline and road diesel). In addition, a small part of renewable electricity is used in transport (mainly railway). The 10% target in 2020 is imposed on all EU member states by the Renewable Energy Directive 2009/28. Belgium has also met this binding target.

2015 is characterized by the (temporary) change in the national regulation applying on the blending of biofuels in motor fuels

Determining the current share is done according to the calculation rules imposed by this directive.

1.3.3. Follow-up on the Energy Efficiency Indicative Objectives



Directive 2012/27/EU on energy efficiency resulted in Belgium setting an indicative target of 18% reduction in primary energy consumption in 2020 compared to projections performed by Primes 2007 (reference year 2005). This target corresponds to a primary energy consumption of 43.7 Mtoe in 2020. This translates into a final energy consumption of 32.5 Mtoe in 2020.

In EE Directive 2012/27/EU, primary energy consumption is defined as gross domestic consumption (which contains international aviation but not international marine bunkers) of which non-energy use is subtracted. Similarly, final energy consumption does not include non-energy use or international maritime bunkers but it does include international aviation. Due to deviating definitions (excluding non-energy use from both the primary and final energy consumption, and including international aviation in the final energy consumption), data presented here will differ from the ones presented in chapters 1.1 and 1.2.

The average decline in primary energy consumption, which is less noticeable in the final energy consumption, indicates that the main efficiency improvements are done in the energy sector (production of electricity, oil refineries, coking plants,...). The exceptionally low values of primary energy consumption in 2014, 2015 and 2018 are a consequence of the unavailability of several nuclear installations. Despite a recovering economy, the final energy consumption is relatively stable since 2015. This indicates that progress has been made in energy efficiency. By omitting non-energy consumption and including international aviation, the impact of the measures taken in the fight against the corona virus during 2020 becomes very clear. Despite this abrupt decline, the indicative targets are not met. An important note here is that this is only a temporary decrease, as the restrictive measures were gradually relaxed.

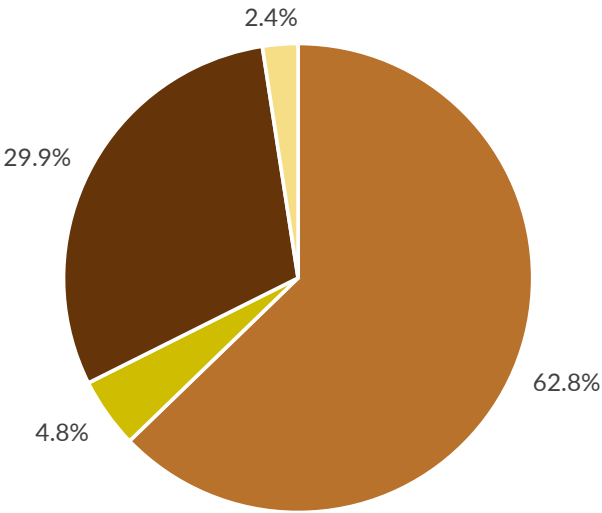
2. Production

2.1. Primary Energy Production in 2020

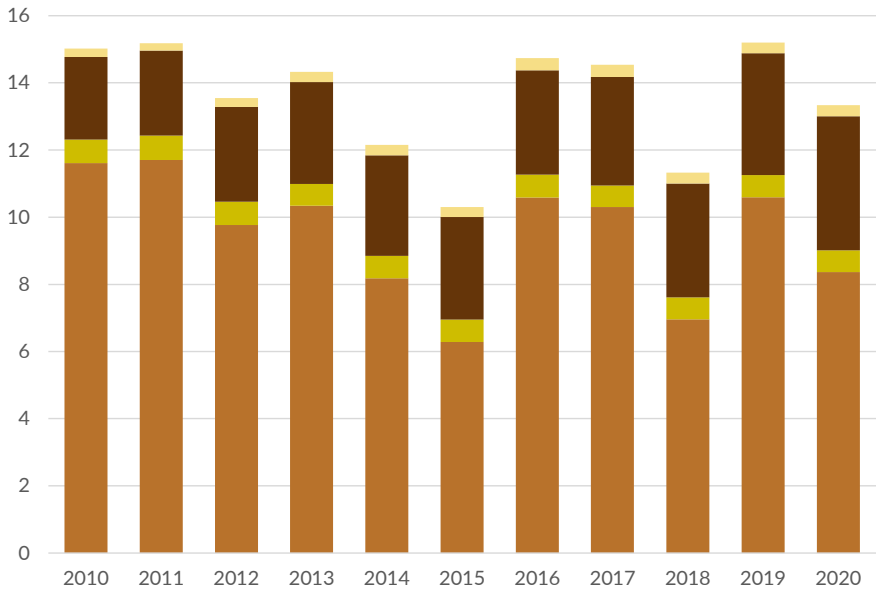
Energy source		Mtoe	TJ
Nuclear energy		8.4	350,393
Non-renewable waste		0.6	27,049
Renewables and biofuels*		4.0	167,105
Other**		0.3	13,670
Total		13.3	558,216

* Renewables and biofuels include natural hydro, wind, solar, geothermal, solid and liquid biomass, biogas, renewable waste and heat pumps.

** Other includes the recovery of heat from chemical processes and colliery gas (gas from coal mines).



Evolution in Mtoe

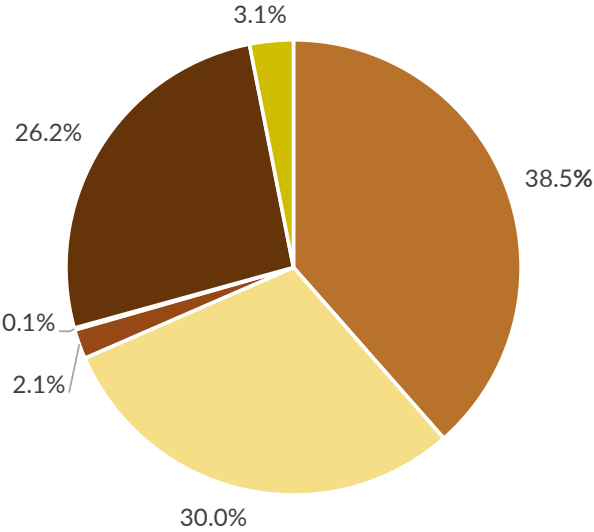


The primary energy production of renewables and biofuels has greatly increased from 2.5 Mtoe in 2011 (share of 16.7%) to 4.0 Mtoe in 2020 (share of 29.9%). This increase is mainly caused by new wind farms and solar panels. Between 2019 and 2020, wind production increased by 30.9% and solar production increased by 20.1%. Nuclear energy production decreased by 21.0% compared to 2019 due to a combination of technical problems and planned maintenance in the nuclear installations.

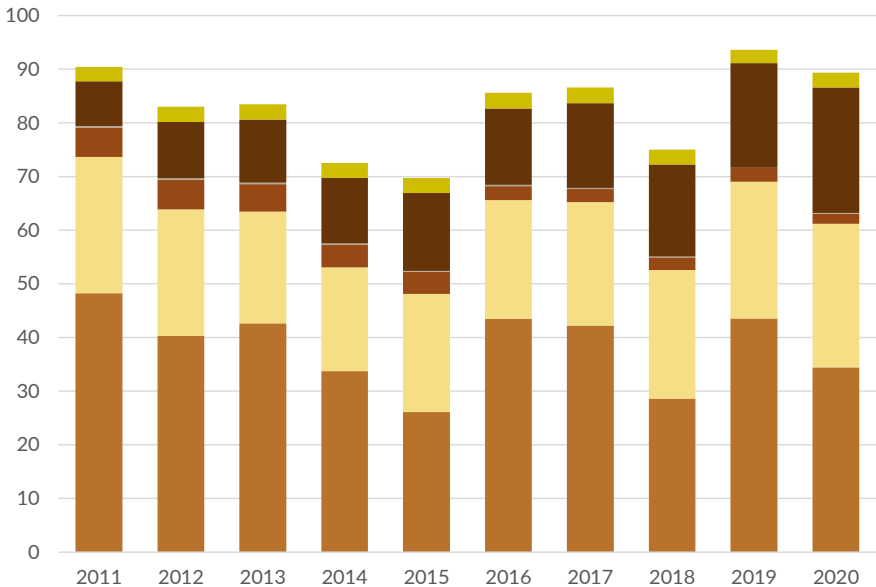
2.2. Gross Electricity Production in 2020

Electricity		TWh
Nuclear		34.4
Natural gas		26.8
Solid fossil fuels and manufactured gases		1.9
Oil products		0.1
Renewable energy		23.4
Other sources*		2.8
Total		89.4

* Other sources include pumped hydro, heat recovery, non-renewable waste and other.



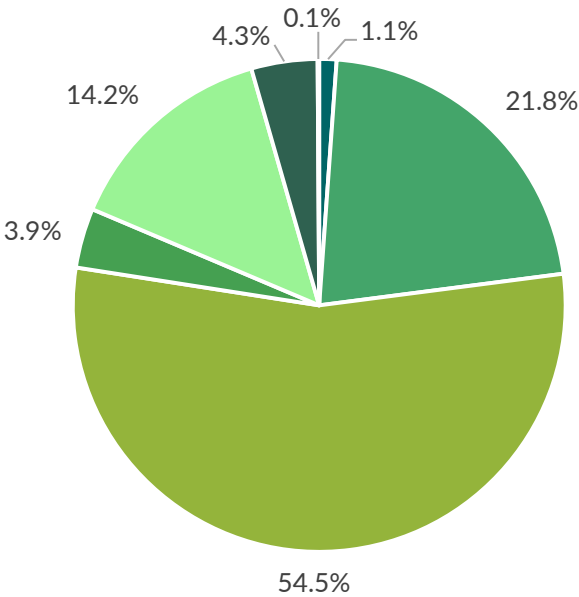
Evolution in TWh



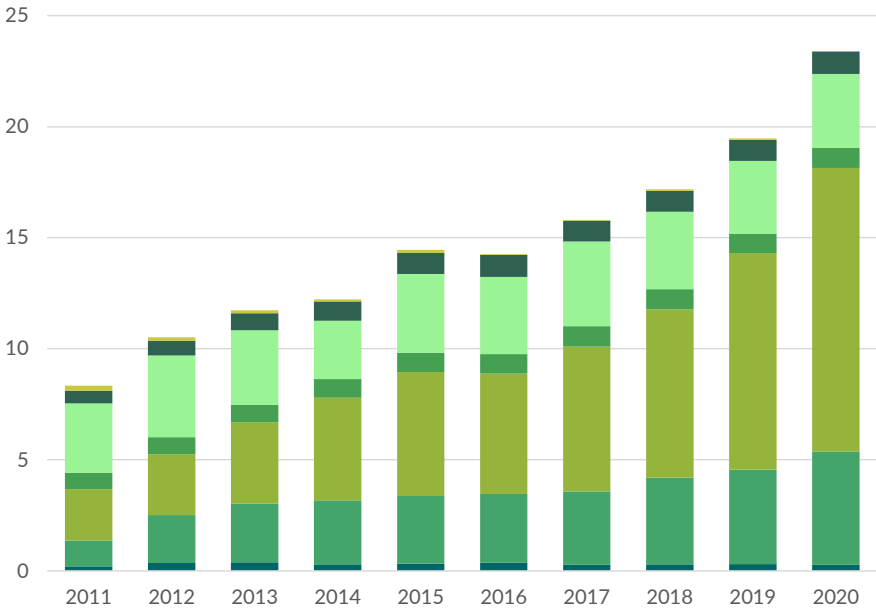
The gross electricity production in 2020 was 4.5% lower than in 2019, mainly due to a lower production from the nuclear installations (-20.9% or -9.1 TWh). However, the year 2020 remains the third highest year of the past decade in terms of gross electricity production. During the last decade, the largest increase can be found in renewable energy, where production increased by 180.9% or 15.1 TWh compared to 2011. From the graph, we can moreover deduct that the use of oil products and solid fossil fuels has decreased strongly (respectively -58.7% and -65.5% over the last decade) in favour of mainly renewable energy. The last power plant using solid fossil fuels closed in 2016. The remaining electricity production originating from this group of fuels originates from manufactured gases from the iron and steel industry and from small multi-fired CHP plants.

2.3. Gross Electricity Production from Renewable Energy Sources in 2020

Electricity		TWh
Natural hydro		0.3
Solar		5.1
Wind		12.8
Renewable municipal waste		0.9
Solid biofuels		3.3
Biogas		1.0
Liquid biofuels		0.0
Total		23.4



Evolution in TWh

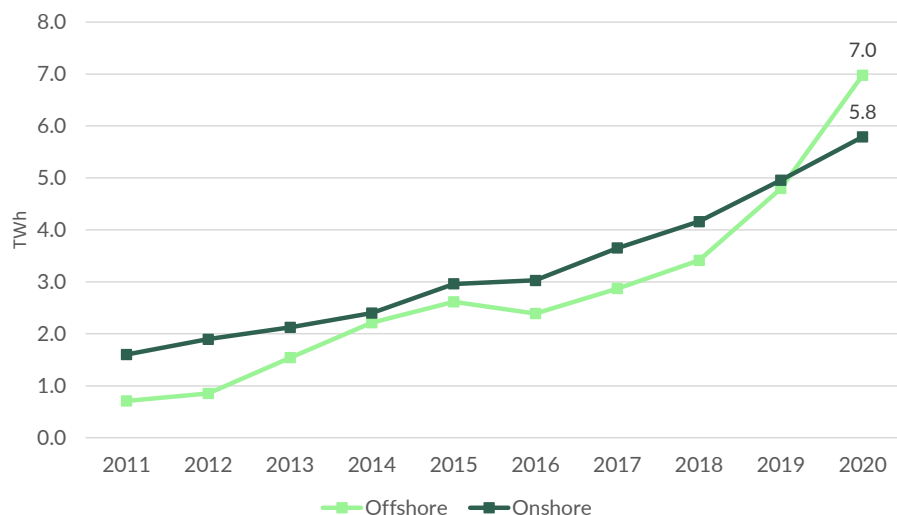


The production of renewable electricity grew strongly in the last decade. The production of electricity based on solar energy shows a strong increase (+20.1%) for the third year in a row after a few years of stagnation. Production on the basis of solid biofuels has recovered since its decrease in 2014 and reached a high in 2017 at 3.8 TWh. Between 2019 and 2020, wind production increased by 30.9%.

PRODUCTION

In part because of the offshore wind farms, wind energy is the main source of renewable electricity production. The offshore wind farms have produced 7.0 TWh of electricity in 2020 or the equivalent of the electricity consumption of around 1.990.000 households (considering that an average household annually consumes 3.500 kWh).

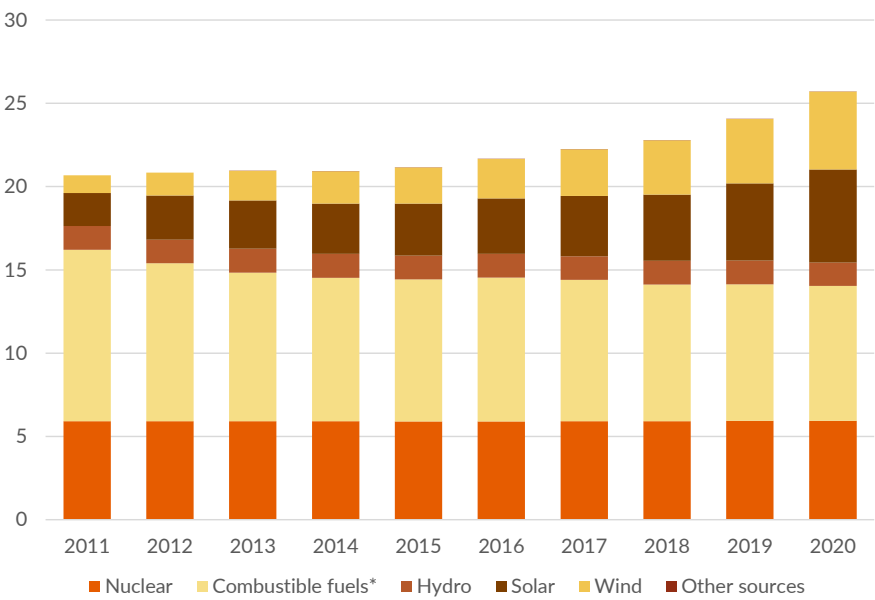
Evolution in TWh





2.4. Installed Electricity Generation Capacity in 2020

Evolution in GW



* Combustible fuels include solid fossil fuels, oil products, natural gas, renewable fuels and waste (solid and liquid biomass, biogas, and renewable and non-renewable waste).

The installed capacity in Belgium increased from 20.7 GW in 2011 to 25.7 GW in 2020, an increase of 5.0 GW. On the one hand, there is a decrease of 2.2 GW of conventional thermal installations (combustible fuels). On the other hand, there is a remarkable increase of renewable electricity generation capacity, mainly solar and wind. The installed capacity of these two renewable sources represents 10.3 GW or 39.9% of the total installed electricity generation capacity.

As shown in chapter 2.3. offshore wind farms represent 54.6% of the total wind production, although capacity wise, they only represent 48.3% of the total installed wind capacity. This results in a higher capacity factor of the offshore wind farms.

The first offshore wind energy zone in the Belgian North Sea was completely built. The last wind farm in this first zone has been fully operational since the end of December 2020. The total installed capacity at sea is 2,261.8 MW.

A second offshore wind energy zone, the Princess Elisabeth zone, has already been defined. The first commissioning of the first wind farm in this zone is planned for 2027-2028. In this second zone, a total installed capacity which can generate between 3,150 and 3,500 MW is envisaged.

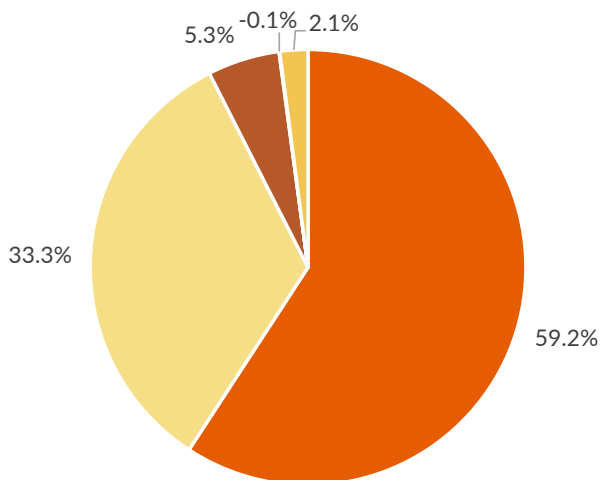
If we look closer at the solar capacity, we notice that around 64.6% are small solar photovoltaic installations under 20 kW. This type of installation is mainly located at households, showing its importance.

The increase in total installed electricity generation capacity does not necessarily result in an increase of electricity production, due to market and technical conditions, and due to the weather dependent character of wind and solar energy production.

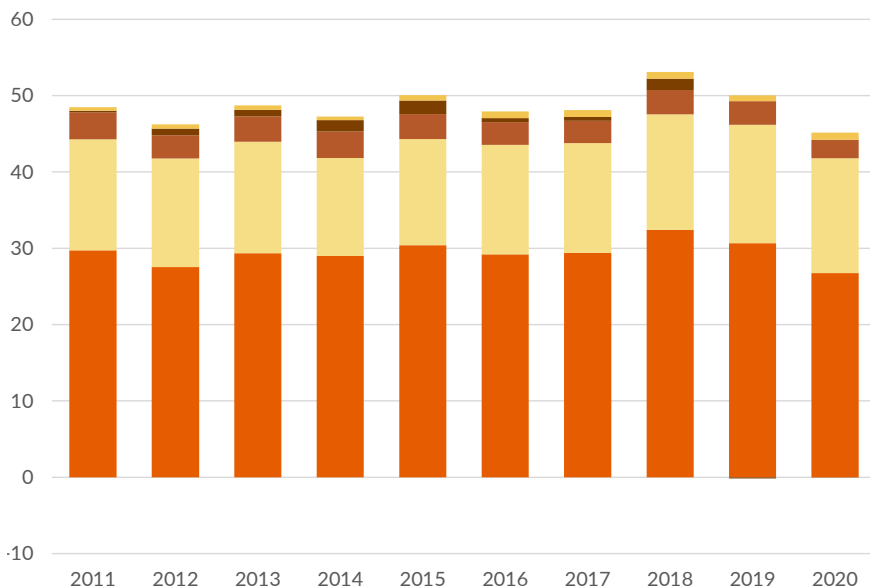
3. Import

3.1. Net Import of Energy in 2020

Net import		Mtoe	TJ
Oil and oil products		26.8	1,120,150
Natural gas		15.0	630,107
Solid fossil fuels		2.4	101,127
Electricity		-0.0	-1,198
Renewable fuels and waste		0.9	39,260
Total		45.1	1,889,446



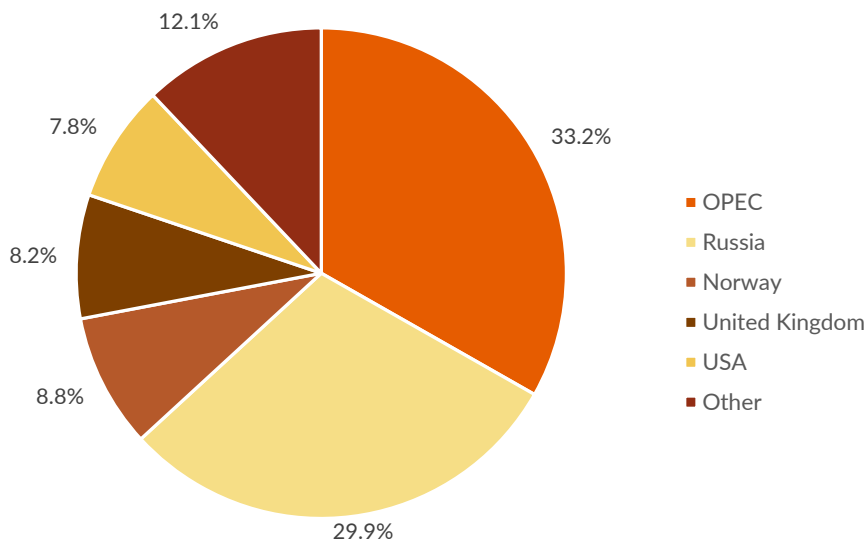
Evolution in Mtoe



The exploitation of the natural sources of fossil fuels, which can be found in Belgium, is insufficiently profitable. The last coal mine was closed in 1992. Only a small quantity of coal is still recovered from a slag heap. The dependency on fossil fuel imports to meet domestic demand is subsequently very high. In 2020, the energy dependency, which shows the extent to which an economy relies upon imports in order to meet its energy needs and is calculated as net imports divided by the sum of gross inland energy consumption plus maritime bunkers, was 78.1%. Diversification of the imports by country of origin and strategic stocks are the most important means to guarantee security of supply

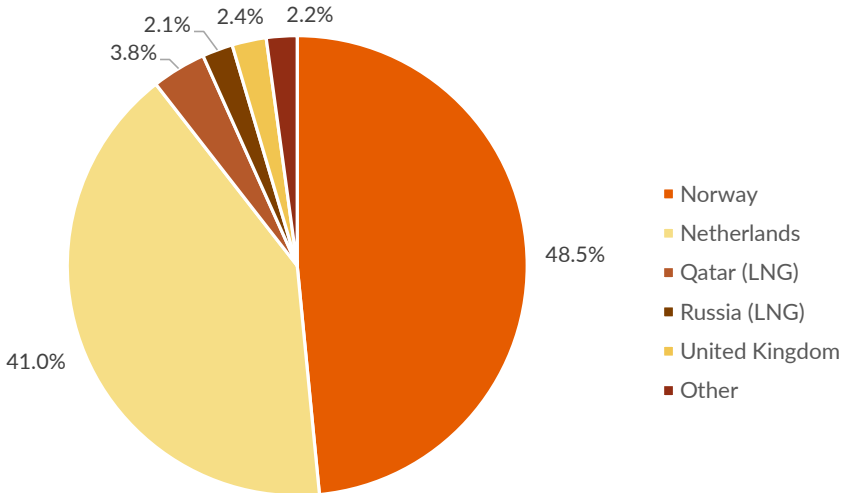
3.2. Origin of the Imports per Primary Energy Source in 2020

3.2.1. Origin of Crude Oil Imports



Almost 30% of the imported crude oil comes from Russia. Of the OPEC countries, Saudi Arabia and Nigeria are the countries with the highest import in Belgium (18.5% and 8.5% respectively). The “Other” countries include Canada, Colombia, Cuba, France, Gabon, Kazakhstan, Trinidad and Tobago and unspecified African countries.

3.2.2. Origin of Natural Gas Consumed in Belgium

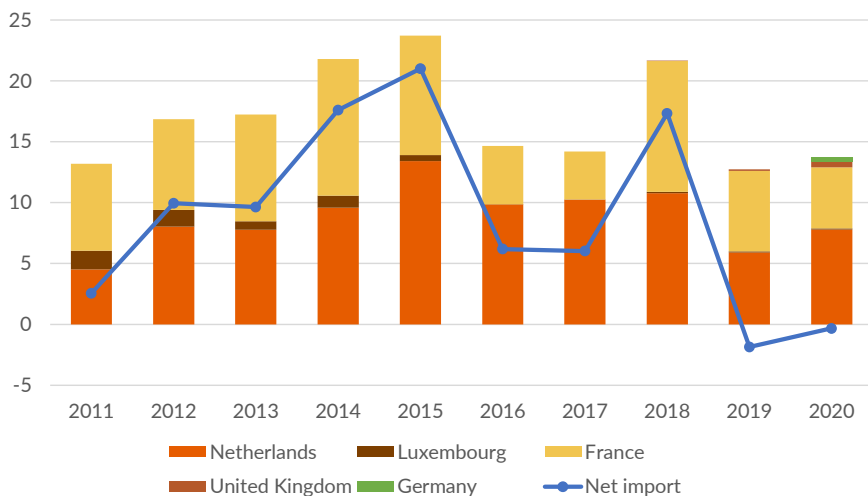


Due to Eurostat's reporting conventions for international trade, net imports are less representative in relation to the differentiated treatment of LNG. Indeed, net imports of LNG include not only LNG consumed or stored in Belgium, but also regasified and re-exported LNG. We have therefore decided to present the origin of the gas that was consumed or stocked in Belgium rather than net imports.

We see that 48.9% of the gas consumed in Belgium entered via a gas pipeline coming from Norway, 40.8% from the Netherlands and 2.4% from the United Kingdom. Furthermore, respectively 3.7% and 2.1% of consumed gas came by ship (LNG) from Qatar and Russia. In practice, only gas from Norway (and the imported LNG) actually comes entirely from the country of extraction. Gas entering via a pipeline from the Netherlands, the United Kingdom, Germany or France contains, at least in part, gas originating from other countries. The "Other" countries include Angola, Egypt, France, Germany and the USA.

3.3. Origin of the Imports of Electricity in 2020

Evolution in TWh



To meet the inland demand of electricity, Belgium must rely on imports from neighbouring countries. There is an inversely proportional relationship with the electricity production figures, as presented in chapter 2.2. Years with low production (2014, 2015 and 2018 for example) have high electricity net imports.

At the end of 2020, work on the ALEGrO interconnector between Belgium and Germany was completed, allowing electricity to be exchanged between the two countries. This interconnector has been available for commercial activities since November 2020.

In 2020, net electricity imports were negative for the second year in a row after many years of positive net imports. This points to a surplus of electricity produced relative to domestic demand. Net imports were positive for France, the Netherlands and Germany (0.8, 4.0 and 0.2 TWh, respectively). With Luxembourg and the United Kingdom, net imports were negative (-0.3 and -5.0 TWh, respectively). This will result in net exports of 0.3 TWh in 2020. The high exports to the United Kingdom are mainly driven by the higher price at peak times in the United Kingdom compared to the mainland.

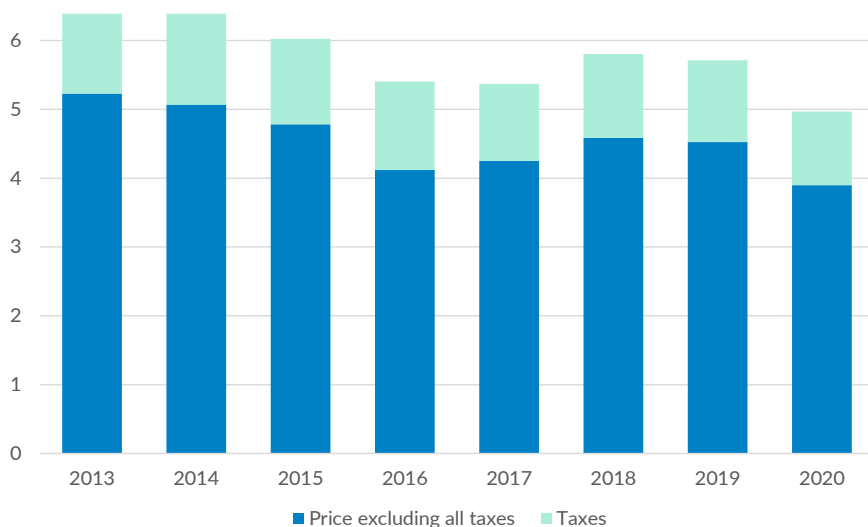
With ALEGrO (1.000 MW), the maximum commercial import capacity of Belgium was 6.500 MW in 2020.

4. Prices

4.1. Natural Gas Market in 2020

Evolution in eurocent/kWh

Consumption band D2 (20 - 200 GJ/year)

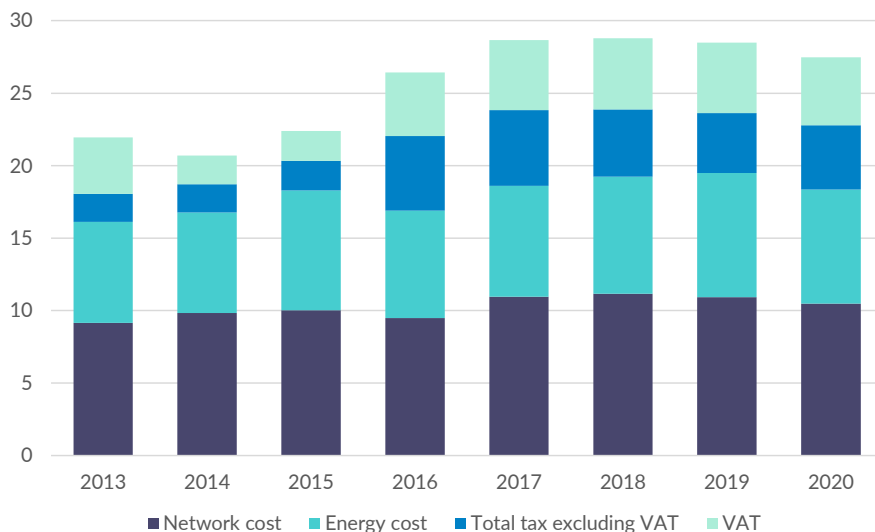


An average Belgian household paid 5.0 eurocent/kWh for its natural gas in 2020, a decrease of 13 % compared to 2019. The price excluding all taxes includes the energy, supply and network cost and represents 77.5%. The share of VAT and other taxes is 22.5%. The decline in prices, which started slowly in 2019, accelerated in 2020, partly due to the fall in wholesale prices as a result of the corona crisis.

4.2. Electricity Market in 2020

Evolution in eurocent/kWh

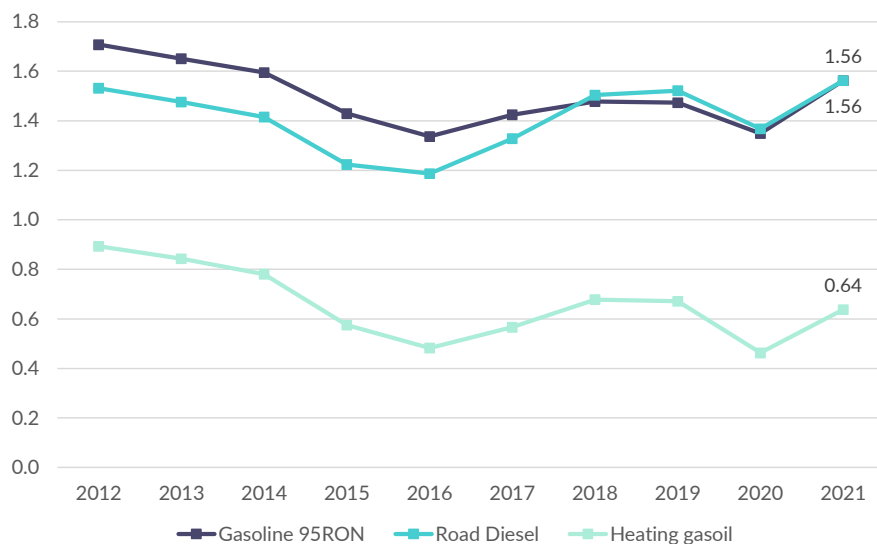
Consumption band DC (2.500 - 5.000 kWh/year)



An average Belgian household paid 27.5 eurocent/kWh for its electricity in 2020, which is slightly lower than in 2019 (-3.6%). The energy cost represented 28.6% of the total electricity bill in 2020. The network rates have decreased slightly, constituting 38.2%. The share of taxes constitutes 33.2% of the total bill.

4.3. Oil Market in 2021

Evolution in euro/litre



After a sharp fall in the average annual maximum prices in 2020, prices recovered during 2021 and are back to pre-corona levels. Partly due to a change in the applied fiscal policy for motor fuels, a higher average annual diesel price is observed for the first time in 2018 compared to the average annual petrol price. The sharp decline recorded in 2020 is the result of the fall in prices on international markets as a result of the corona crisis.



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Rue du Progrès 50
1210 Brussels
Enterprise no.: 0314.595.348
<https://economie.fgov.be>