

ENERGY

Key Data

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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 the 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 for international maritime transport.

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

Targets

RES

Directive 2018/2001 on the promotion of the use of energy from renewable sources:

- A binding minimum share of RES of 13% in the final consumption of energy from 2021 onwards;
- A binding target of 32% of RES in the final consumption of energy in 2030 for the European Union, with a Belgian target of 17.5 % of RES in the final consumption of energy;
- A binding target of 14% of RES in the final consumption of energy in transport in 2030.

EE

Directive 2018/2002 amending Directive 2012/27/EU on energy efficiency: an indicative target in 2030 of 42.7 Mtoe primary energy consumption and a final energy consumption of 35.2 Mtoe.

CONSUMPTION

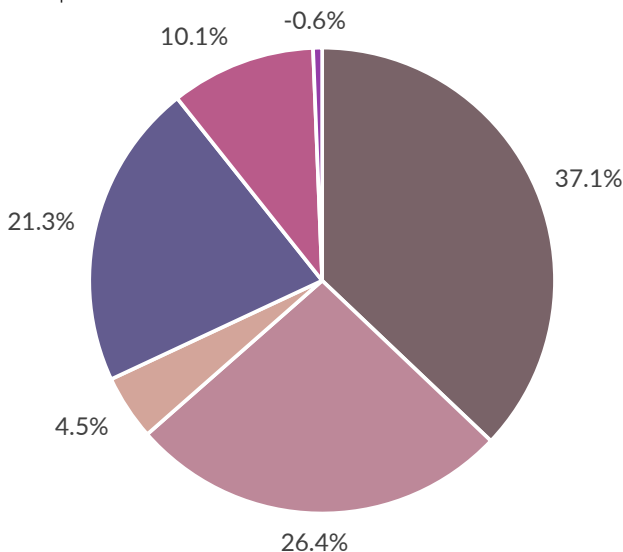
1. Consumption

1.1. Primary Energy Consumption in 2021

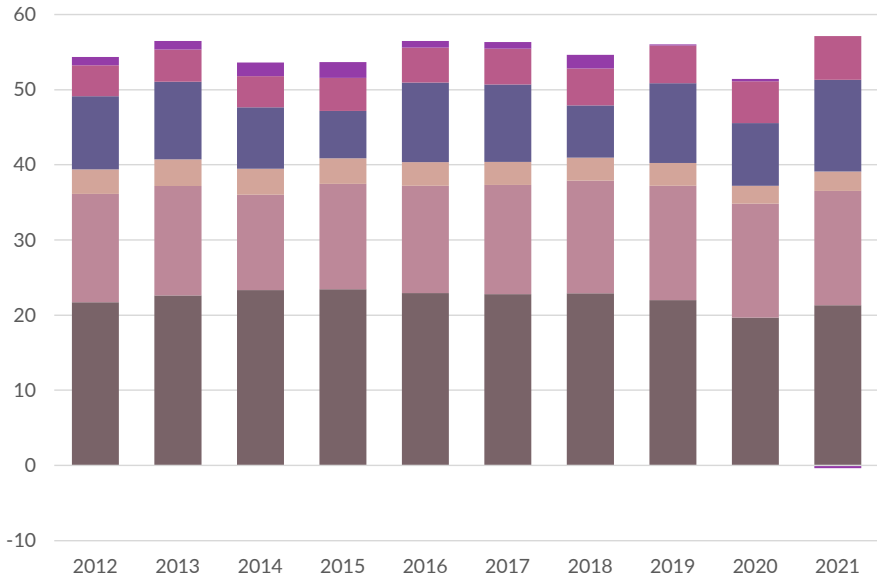
1.1.1. Per Energy Source

Energy source		Mtoe	TJ
Oil and oil products		21.3	892,532
Natural gas		15.2	636,248
Solid fossil fuels		2.6	108,745
Nuclear energy		12.2	511,753
Renewable energy and waste		5.8	242,180
Other*		-0.4	-15,093
Total		56.8	2,376,364

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



Evolution in Mtoe



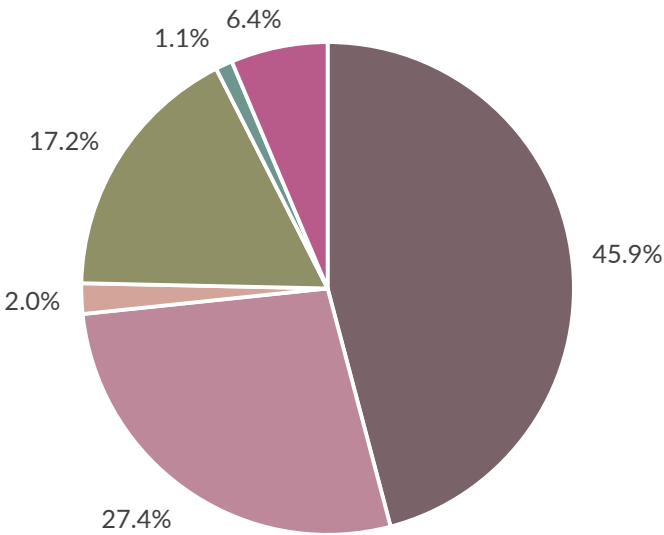
The total primary energy consumption in 2021 amounted to 56.8 Mtoe. This is an increase of 10.4% compared to 2020. That is the highest level of primary energy consumption since 2010. This is mainly the result of a long, lingering winter period and a strong increase in the consumption of nuclear energy due to the exceptionally high availability of the nuclear installations. The share of renewable energy and waste in primary energy consumption rises to 10.2% in 2021 compared to 7.5% in 2012. A negative net import of electricity since 2019 causes the energy source “Others” to fall, and even become negative in 2021, compared to previous years in which the net import of electricity was positive.

CONSUMPTION

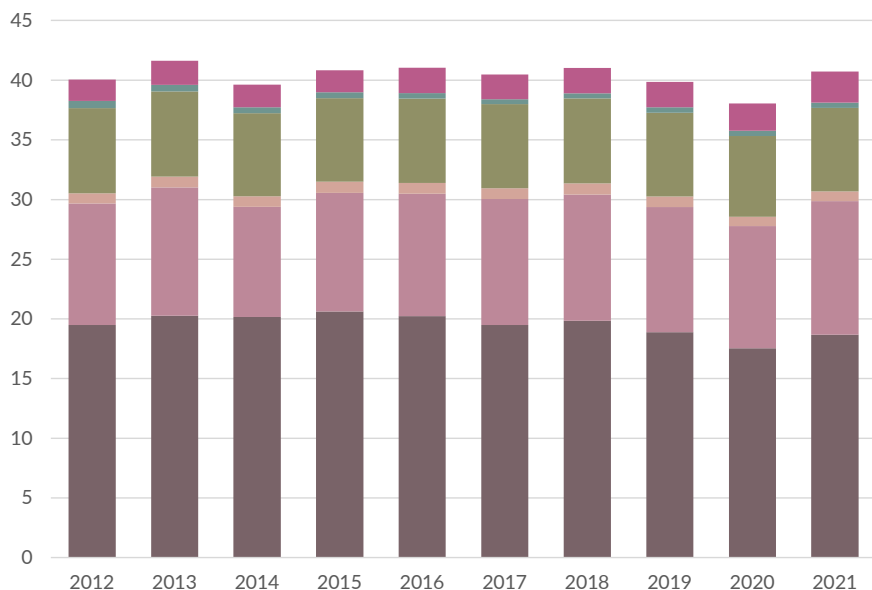
1.2. Final Energy Consumption in 2021

1.2.1. Per Energy Source

Energy source		Mtoe	TJ
Oil products		18.7	782,150
Natural gas		11.2	467,888
Solid fossil fuels		0.8	34,128
Electricity		7.0	292,904
Heat		0.5	19,090
Renewable energy and waste		2.6	108,405
Total		40.7	1,704,564



Evolution in Mtoe



Between 2012 and 2021, the final energy consumption varies between 38.0 and 41.6 Mtoe. There is a strong dependence on weather conditions; years with severe winters, such as 2013 and 2021, show a higher final consumption of heating fuels. This impact is mainly visible in the consumption of natural gas, which showed a record consumption in the year 2021. 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 coronavirus. In terms of final energy consumption, petroleum products were hit the hardest by these measures. In 2021, the consumption of petroleum products largely recovered.

CONSUMPTION

During the last years, the shares of the different energy sources in the final energy consumption remained rather stable. The decennial average share amounts to:

- 48% for oil products,
- 26% for natural gas,
- 17% for electricity,
- 5% for renewable energy and waste,
- 2% for solid fossil fuels, and
- 1% for heat.

Since 2012, the share of renewable energy and waste in the final energy consumption has increased from 4.5% to 6.4%. This share does not include the final consumption of green electricity.

The share of the oil products in the total final energy consumption decreases slightly but remains very dominant at 45.9% in 2021. This consumption can be split into energy consumption (66.3%) and non-energy consumption (33.7%) in 2021. The transport sector represents 60.6% of the energy consumption of oil products in 2021. That is about 3 percentage points higher than in 2020, where a very low consumption was observed due to measures against the coronavirus.

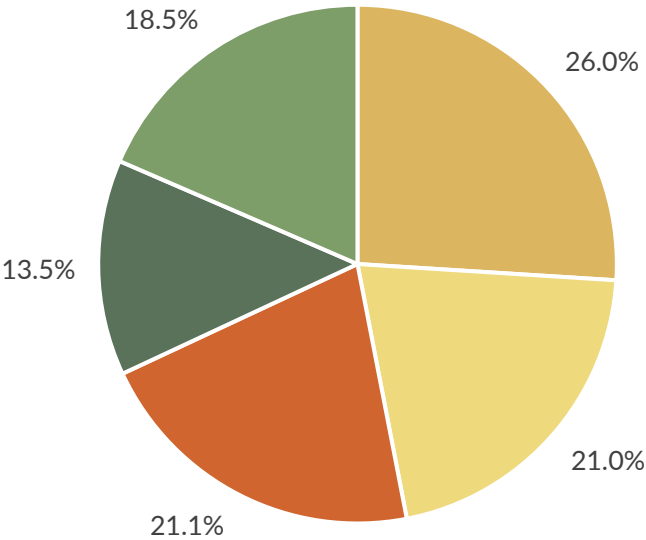
Natural gas covers 27.4% of the final energy consumption in 2021. 90.8% of this consumption is used for energy purposes, 35.5% of which is consumed in the domestic sector.



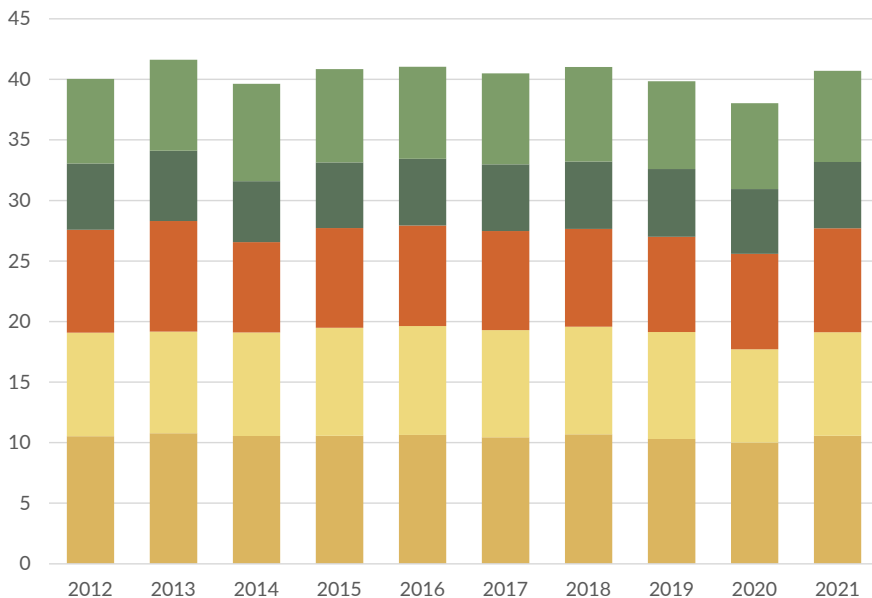
CONSUMPTION

1.2.2. Per Sector

Sector		Mtoe	TJ
Industry		10.6	443,116
Transport		8.5	357,191
Residential		8.6	359,626
Services and equivalent		5.5	229,316
Non-energy use		7.5	315,315
Total		40.7	1,704,564



Evolution in Mtoe

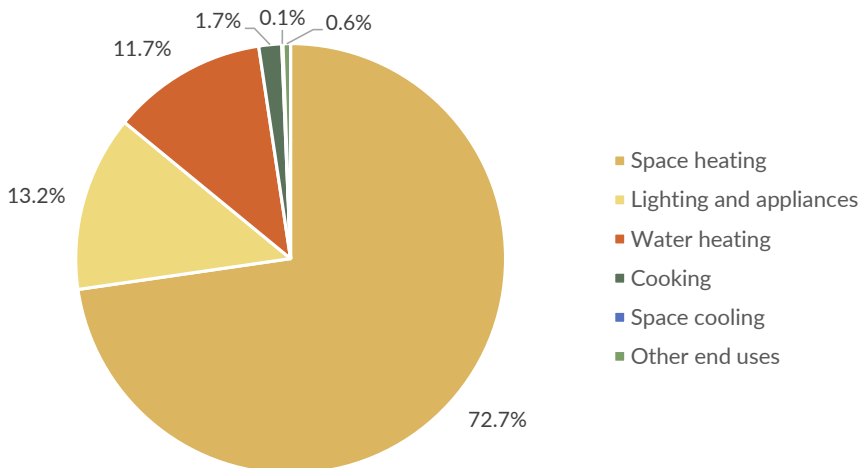


The sectorial distribution of the final energy consumption is fairly stable over the years. The year 2020 is an exception because of the major impact on the transport sector of the measures taken against the coronavirus. In 2020, consumption in the transport sector fell by 15.8% compared to 2019. In 2021, that consumption largely recovered.

In 2021, the consumption in industry was mainly covered by natural gas (38.6%), electricity (31.1%) and petroleum products (13.8%). These are also the main energy sources in the domestic sector (respectively 41.9%, 19.3% and 28.5%). The consumption in the transport sector is – as expected – dominated by petroleum products (88.0%). The remaining share is provided by biofuels (bioethanol and biodiesel), electricity (mainly used in railway transport) and a very limited amount of natural gas. The non-energy consumption is also dominated by petroleum products (83.6%), completed by natural gas (13.6%) and solid fossil fuels (2.8%).

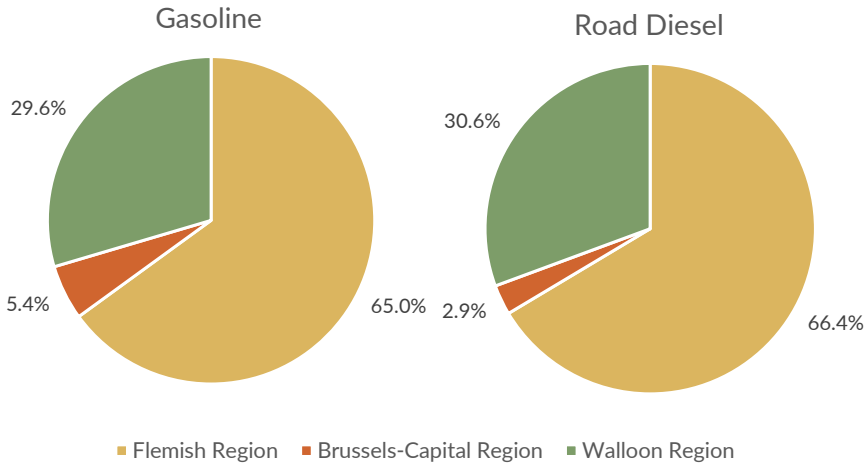
CONSUMPTION

1.2.3. Energy Consumption in Households per Type of End Use in 2020



In 2020, 72.7% of the energy consumed by households was used for heating. Natural gas (44.1%) and petroleum products (41.5%) accounted for the largest share in the consumption for heating in 2020. The share of petroleum products is slightly higher than before due to the large number of orders for heating oil made by households as a result of the very low prices in the spring of 2020 (tank effect). 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 (13.2%), for water heating (11.7%) 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 2021



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:

- 65.0% or 1.7 million m³ of gasoline,
- 66.4% or 4.8 million m³ of road diesel.

Followed by the Walloon Region:

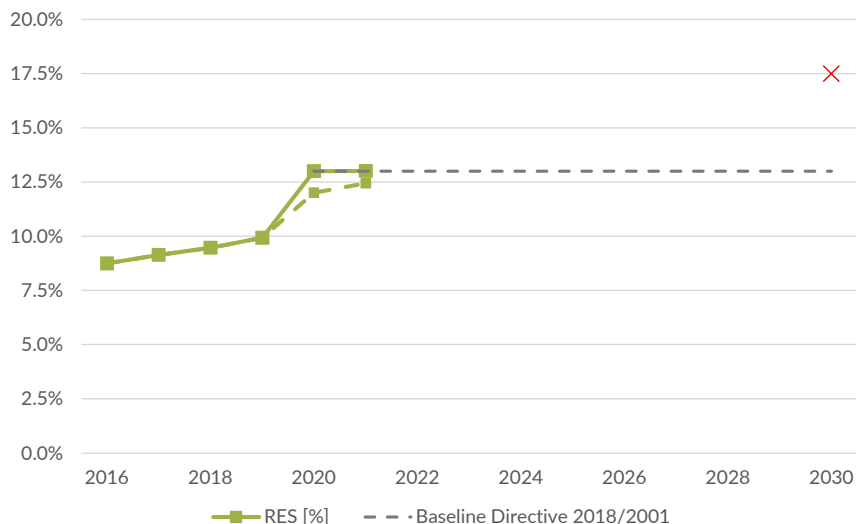
- 29.6% or 0.8 million m³ of gasoline,
- 30.6% or 2.2 million m³ of road diesel.

The Brussels-Capital Region closes the ranking with:

- 5.4% or 0.1 million m³ of gasoline,
- 2.9% or 0.2 million m³ of road diesel.

1.3. Monitoring of European Targets

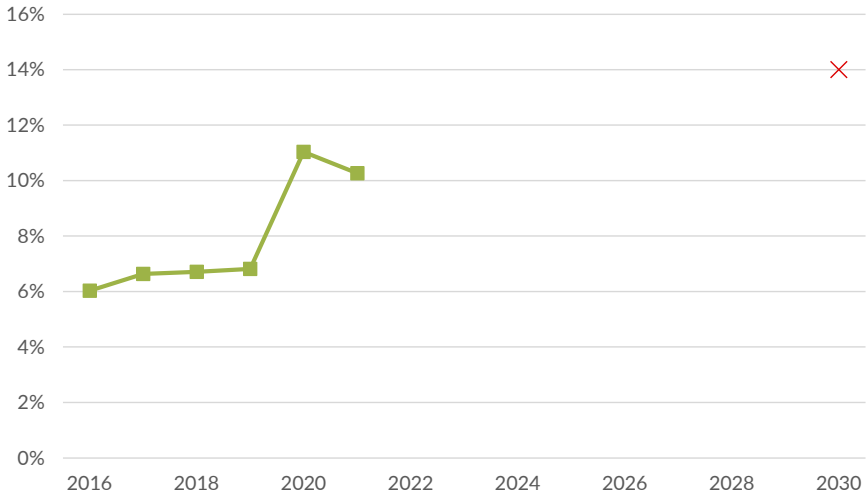
1.3.1. Share of Renewable Energy Sources (RES) in the Final Consumption of Energy



The RES share is determined up to and including 2020 in accordance with the calculation rules imposed by Directive 2009/28. From 2021, this will be done according to the calculation rules imposed in Directive 2018/2001.

In 2021, the share of renewable energy in final energy consumption was 12.44% (green dotted line). This is below the minimum value or baseline of 13% as defined in Directive 2018/2001. As in 2020, purchases of quantities of energy from renewable sources from other Member States were used to make up for this shortfall. These purchases bring the share of renewable energy in final energy consumption to 13.01% (full line).

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



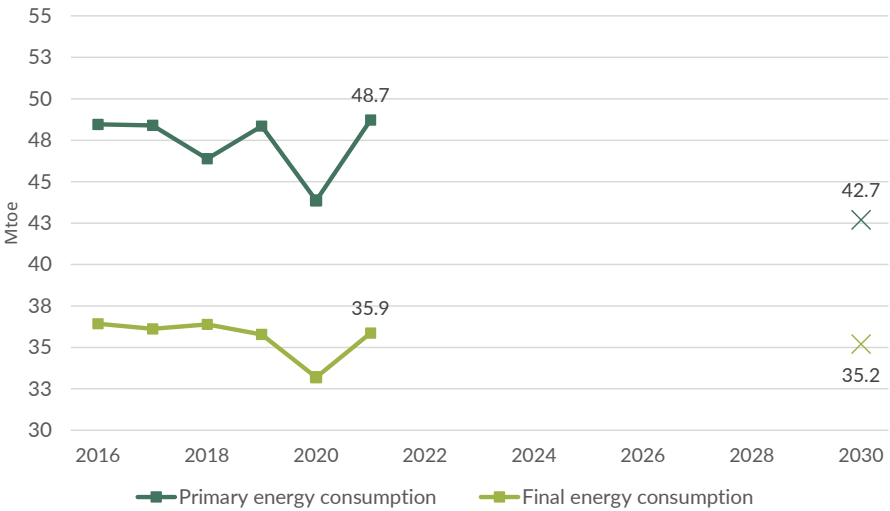
The determination of the share of RES in transport up to and including 2020 is done according to the calculation rules imposed by Directive 2009/28. From 2021, this will be done according to the calculation rules imposed in Directive 2018/2001, which also set the target of 14% for 2030.

In 2021, the share of renewable energy in final energy consumption in transport was 10.26%; a decrease of 0.77 percentage point compared to 2020, due to a change in the imposed calculation rules.

Renewable energy in transport mainly comes from the biofuels added to motor fuels (petrol and diesel). In addition, a limited part of renewable electricity is used in transport (mainly rail transport).

CONSUMPTION

1.3.3. Monitoring of the Energy Efficiency Indicative Objectives



Directive 2012/27/EU on energy efficiency amended by Directive 2018/2002 has resulted in Belgium having an indicative target of 42.7 Mtoe primary energy consumption and 35.2 Mtoe final energy consumption in 2030.

In EE Directive 2012/27/EU amended by Directive 2018/2002, primary energy consumption is defined as gross domestic consumption (which contains international aviation but not the energy provided for international maritime transport) of which non-energy use is subtracted. Similarly, final energy consumption does not include non-energy use 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 those presented in chapters 1.1 and 1.2.

The observed average decrease in primary energy consumption, which is less noticeable in final energy consumption, indicates that the main efficiency improvements have been achieved in the energy sector (electricity production, petroleum refineries, coking plants, etc.). The negative consumption peak in 2020 and the recovery in 2021 clearly demonstrate the impact of the measures taken in the fight against the coronavirus during 2020.

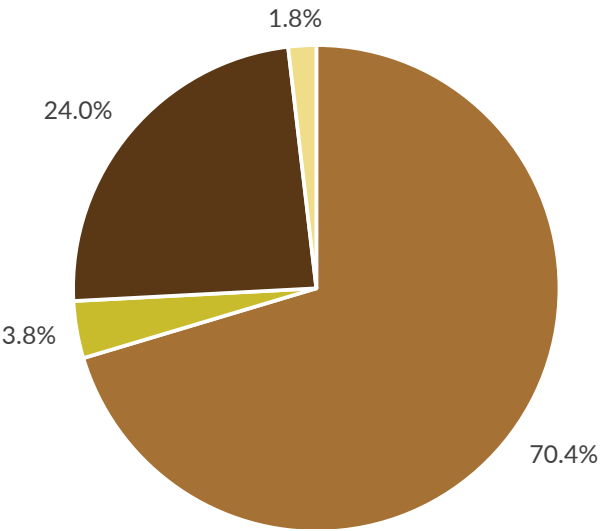
2. Production

2.1. Primary Energy Production in 2021

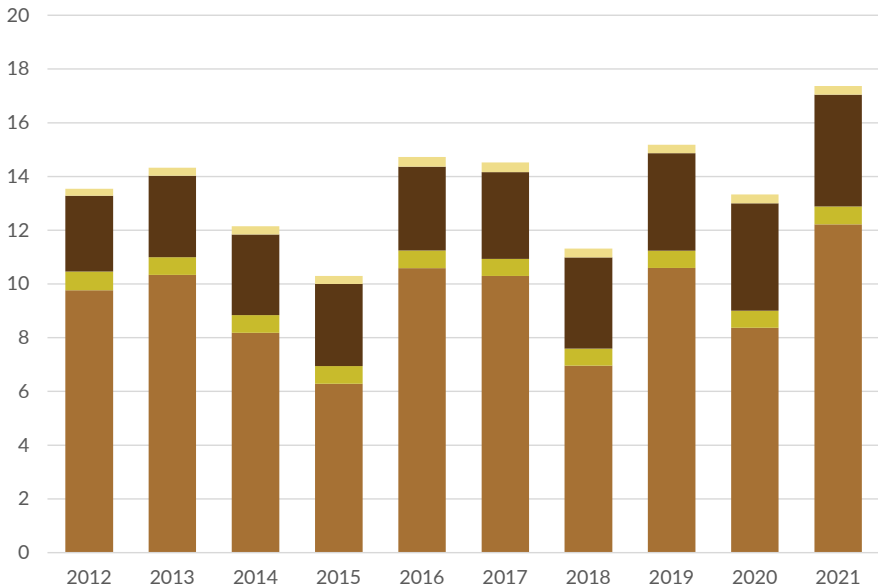
Energy source		Mtoe	TJ
Nuclear energy		12.2	511,753
Non-renewable waste		0.7	27,654
Renewables and biofuels*		4.2	174,396
Other**		0.3	13,430
Total		17.4	727,232

*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

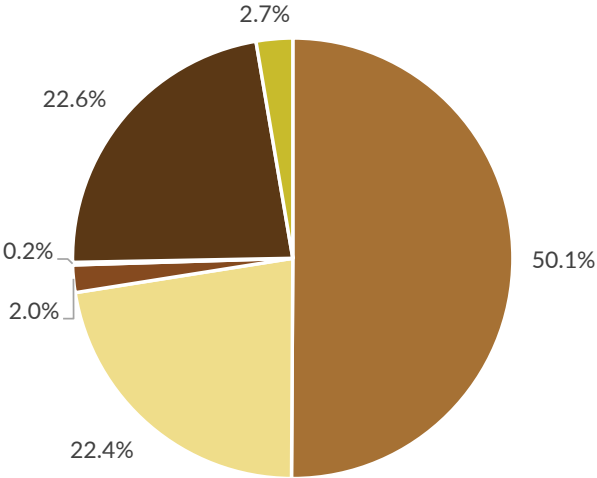


The primary energy production of renewables and biofuels has greatly increased from 2.8 Mtoe in 2012 (share of 20.8%) to 4.2 Mtoe in 2021 (share of 24.0%). This increase is mainly caused by new wind farms and solar panels. Between 2020 and 2021, wind production decreased by 6.4% as a result of low wind speeds. Solar production increased by 9.9%. Nuclear energy production increased strongly by 46.0% compared to 2020 due to the exceptionally high availability of the nuclear installations.

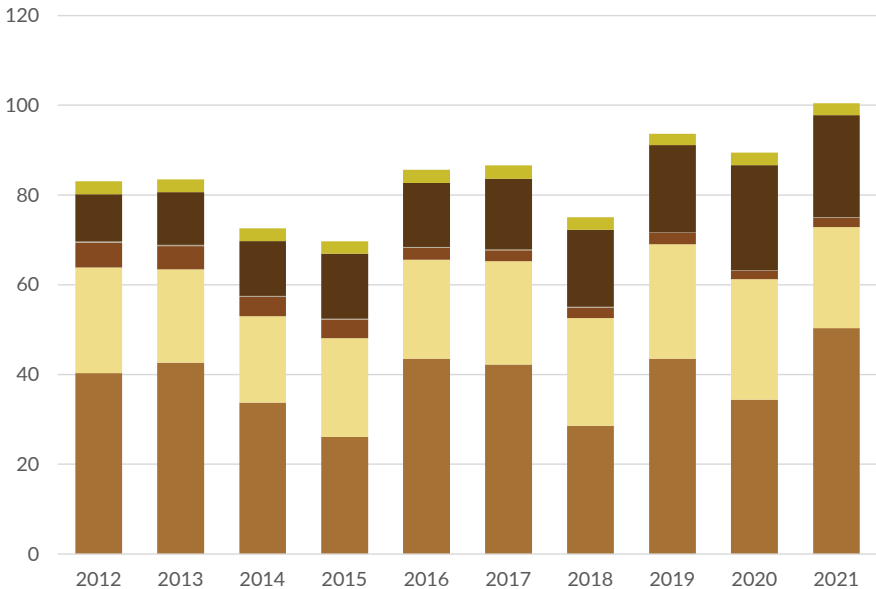
2.2. Gross Electricity Production in 2021

Electricity		TWh
Nuclear		50.3
Natural gas		22.5
Solid fossil fuels and manufactured gases		2.0
Oil products		0.2
Renewable energy		22.7
Other sources*		2.7
Total		100.5

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



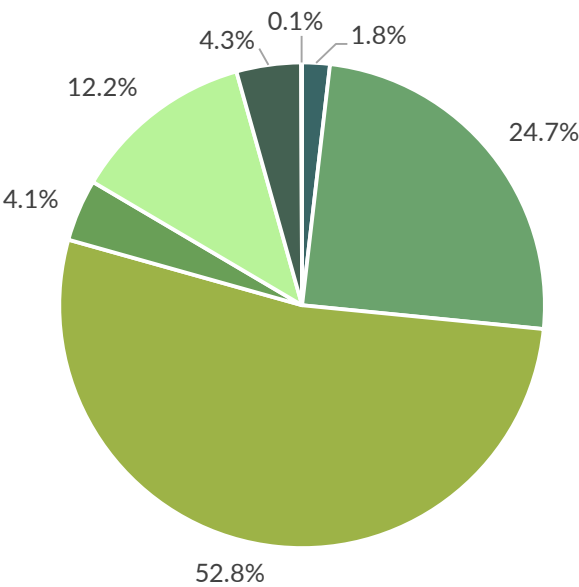
Evolution in TWh



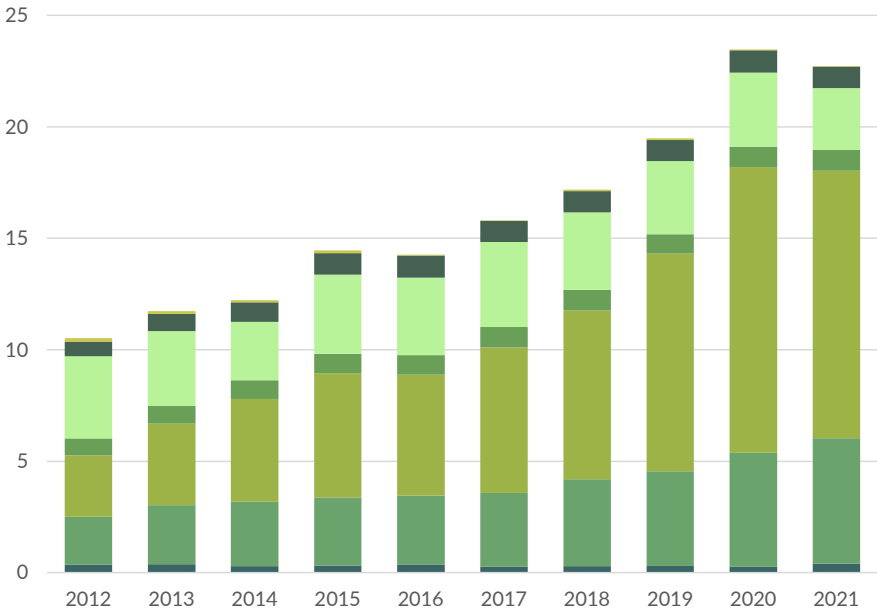
The gross electricity production in 2021 was 12.3% higher than in 2020, mainly due to a higher production from the nuclear installations (+46.0% or +15.9 TWh), but also due to unavailability of capacities in neighbouring countries. The year 2021 is the highest year ever in terms of gross electricity production. During the last decade, the largest increase can be found in renewable energy, where production increased by 116.0% or 12.2 TWh compared to 2012. The use of oil products and solid fossil fuels strongly decreased (respectively -45.8% and -62.9% over the last decade), mainly in favour of renewable energy. The last power plant using solid fossil fuels closed in 2016. The remaining electricity production originating from this group of fuels derives 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 2021

Electricity		TWh
Natural hydro		0.4
Solar		5.6
Wind		12.0
Renewable municipal waste		0.9
Solid biomass		2.8
Biogas		1.0
Liquid biofuels		0.0
Total		22.7



Evolution in TWh

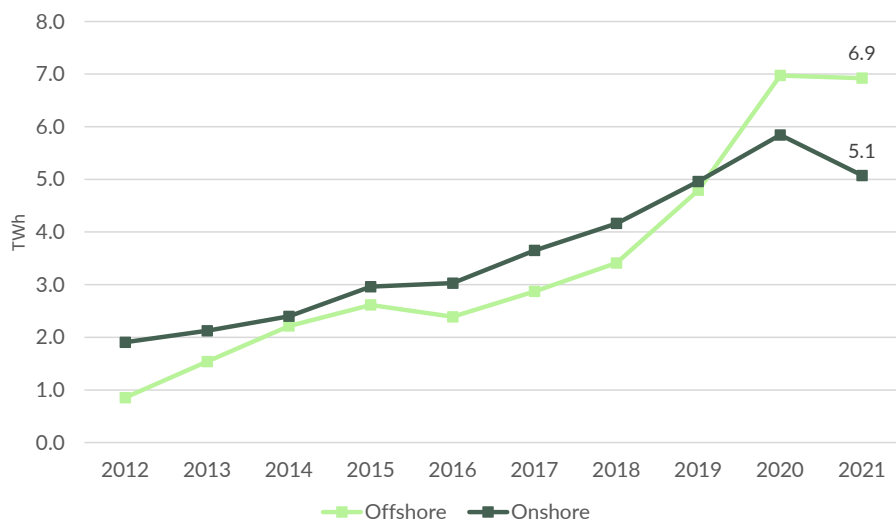


The production of renewable electricity grew strongly in the last decade. The production of electricity from solar energy shows a strong increase (+9.9%) for the fourth year in a row, after a few years of stagnation. Solid biomass production has recovered since the decline in 2014 and peaked in 2017 at 3.8 TWh. Between 2020 and 2021, wind-based production decreased by 6.4% despite additional wind farm installations. The year 2021 showed exceptionally low wind speeds resulting in decreased production.

PRODUCTION

In part because of offshore wind farms, wind energy is the main source of renewable electricity production. Offshore wind farms produced 6.9 TWh of electricity in 2021 or the equivalent of the electricity consumption of around 1,975,000 households (considering that an average household annually consumes 3,500 kWh).

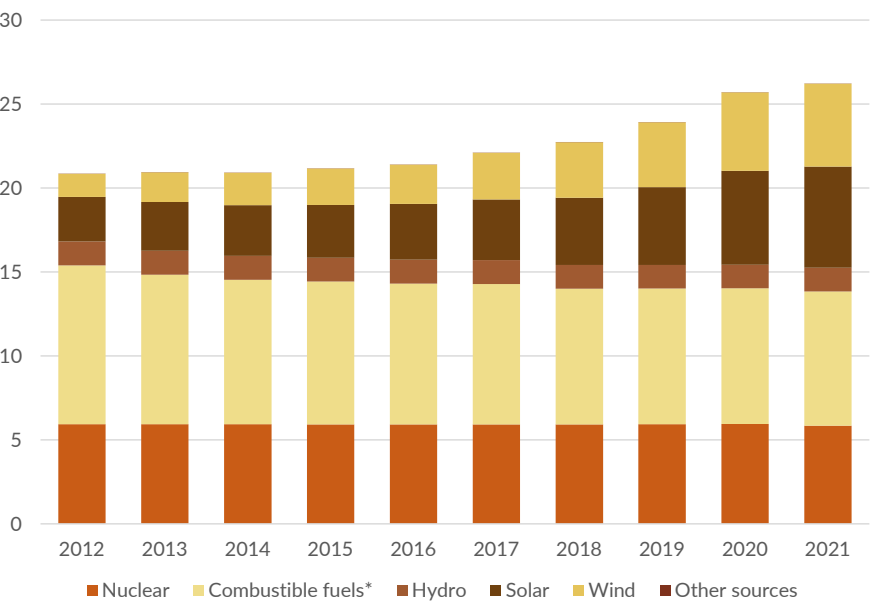
Evolution in TWh





2.4. Installed Electricity Generation Capacity in 2021

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 grew from 20.8 GW in 2012 to 26.2 GW in 2021, an increase of 5.4 GW. On the one hand, there is a decrease of 1.5 GW in conventional thermal installations (combustible fuels). On the other hand, there is a remarkable increase of renewable electricity generation capacity, mainly solar and wind energy. The installed capacity of these two renewable sources represents 11.0 GW or 41.8% of the total installed electricity generation capacity.

As shown in chapter 2.3. offshore wind farms represent 57.7% of the total wind production, although capacity wise, they only represent 45.7% of the total installed wind capacity. This results in a higher capacity factor for offshore wind farms.

The first offshore wind energy zone in the Belgian North Sea has been 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 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.

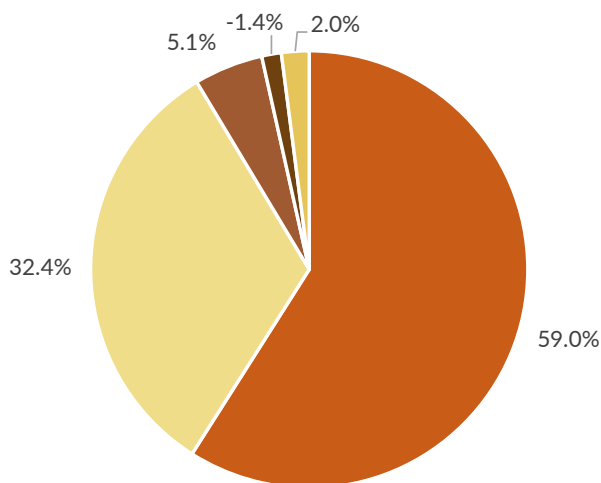
If we look closer at the solar capacity, we notice that around 64.0% are small solar photovoltaic installations under 20 kW. This type of installation is mainly located in households, showing its importance.

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

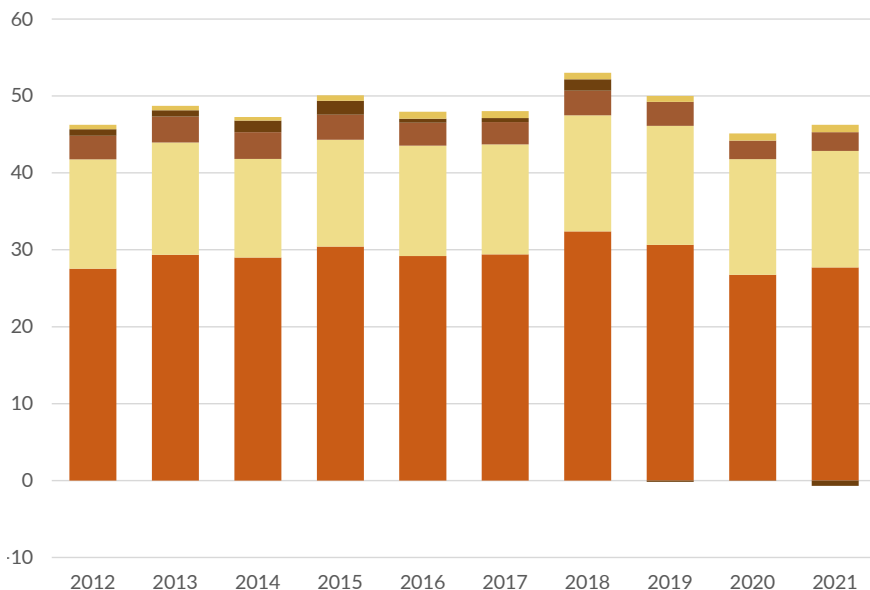
3. Import

3.1. Net Import of Energy in 2021

Net import		Mtoe	TJ
Oil and oil products		27.7	1,158,950
Natural gas		15.2	635,815
Solid fossil fuels		2.4	100,509
Electricity		-0.7	-28,355
Renewable fuels and waste		1.0	40,130
Total		45.5	1,907,050



Evolution in Mtoe

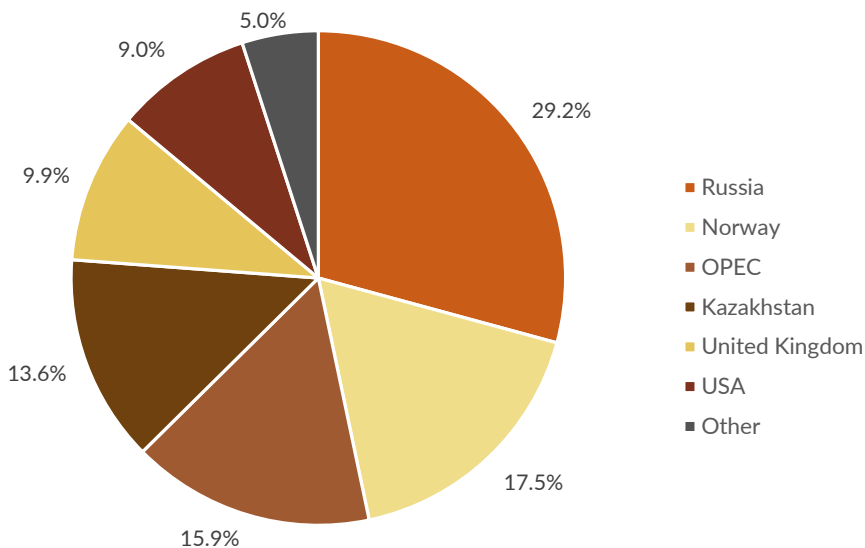


The exploitation of the natural sources of fossil fuels which can be found in Belgium, is insufficiently profitable. The last coal mine was closed in 1992. Only a small quantity of coal is still recovered from slag heaps, as well as the extraction of colliery gas for the production of electricity and heat. The dependency on fossil fuel imports to meet domestic demand is subsequently very high.

In 2021, 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 the energy provided for international maritime transport, was 70.8%. Diversification of the imports by country of origin and strategic stocks are the most important means to guarantee security of supply.

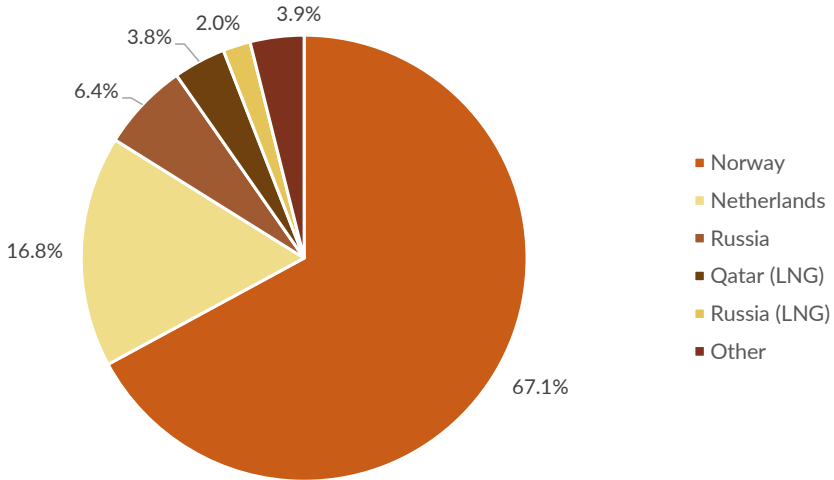
3.2. Origin of the Imports per Primary Energy Source in 2021

3.2.1. Origin of Crude Oil Imports



In 2021, almost 30% of the imported crude oil came from Russia. Of the Organization of the Petroleum Exporting Countries (OPEC), Saudi Arabia and Iraq are the countries with the highest imports into Belgium (8.1% and 4.2% respectively). The "Other" countries include Canada, Cuba, France and Guyana.

3.2.2. Origin of Natural Gas Consumed in Belgium



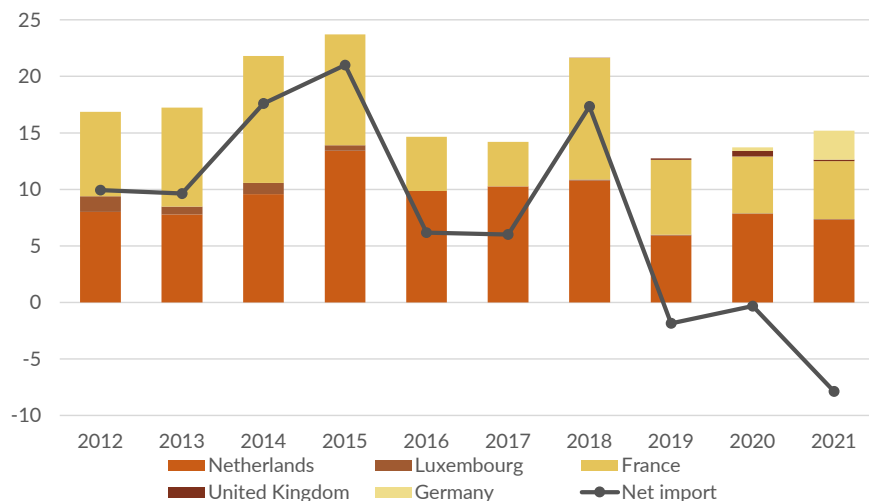
Belgium is located at an international crossroads for natural gas, with inter-connection points with several countries, as well as the port of Zeebrugge through which liquified natural gas (LNG) is imported. In 2021, 50% of the gas entering Belgium went to a neighbouring country.

Due to Eurostat's reporting conventions for international trade, net imports are less representative in view of 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.

In 2021, 93.7% of the gas consumed in Belgium came in via a pipeline. Of this, 67.1%, 16.8% and 6.4% of the gas consumed in Belgium comes from Norway, the Netherlands and Russia respectively. On the other hand, 3.8% and 2.0% of the gas consumed in Belgium arrived by ship from Qatar and Russia, in the form of LNG, respectively. The "Other" category includes the United Kingdom, France (regasified LNG), Denmark, the United States, Algeria and Egypt.

3.3. Origin of the Imports of Electricity in 2021

Evolution in TWh



To meet the inland demand of electricity, Belgium can 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 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. With ALEGrO (1,000 MW), the maximum commercial import capacity of Belgium reached 6,500 MW from 2020.

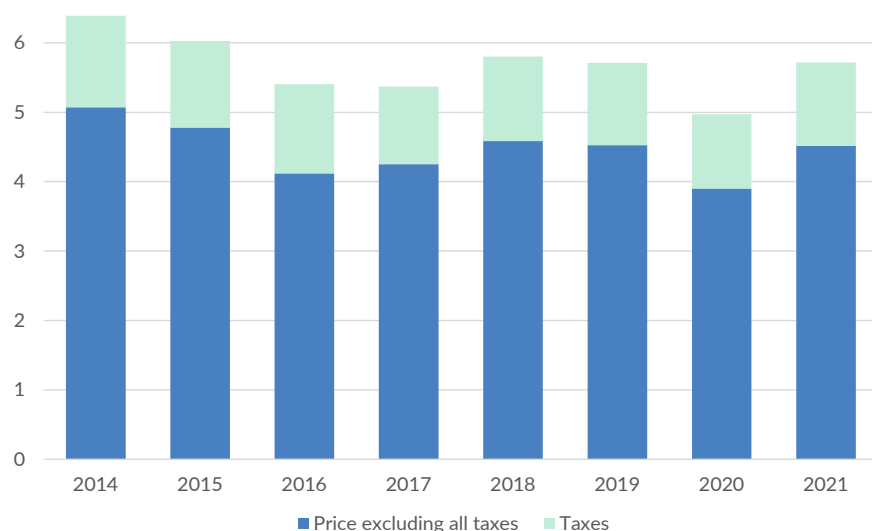
In 2021, net electricity imports were negative for the third year in a row after many years of positive net imports. This points to a surplus of electricity produced relative to domestic demand. Net imports were positive for the Netherlands and Germany (2.1 and 0.7 TWh, respectively). With France, Luxembourg and the United Kingdom, net imports were negative (-2.6, -1.1 and -7.0 TWh, respectively). This results in net exports of 7.9 TWh in 2021. 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. Due to a low availability of the French nuclear installations, a higher export to France is observed.

4. Prices

4.1. Natural Gas Price in 2021

Evolution in euro cent/kWh

Consumption band D2 (20 - 200 GJ/year)

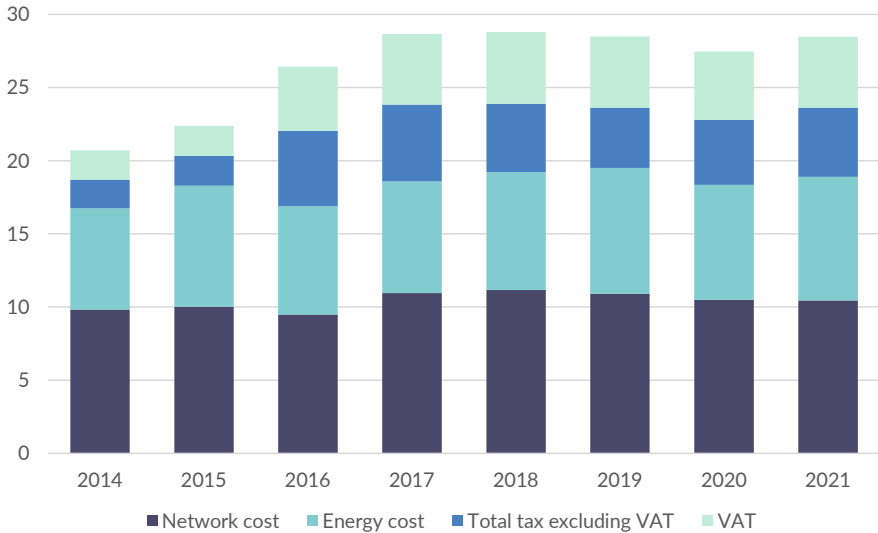


An average Belgian household paid 5.7 euro cent/kWh for its natural gas in 2021, an increase of 15 % compared to 2020. The price excluding all taxes includes the energy, supply and network cost and represents 78.9% of the total price. The share of VAT and other taxes is 21.1%. Wholesale prices increase from the second half of 2021, which is gradually reflected in the price households pay. The increase in the average price paid by households is however dampened by the extension of the social tariff from February 2021.

4.2. Electricity Price in 2021

Evolution in euro cent/kWh

Consumption band DC (2,500 - 5,000 kWh/year)

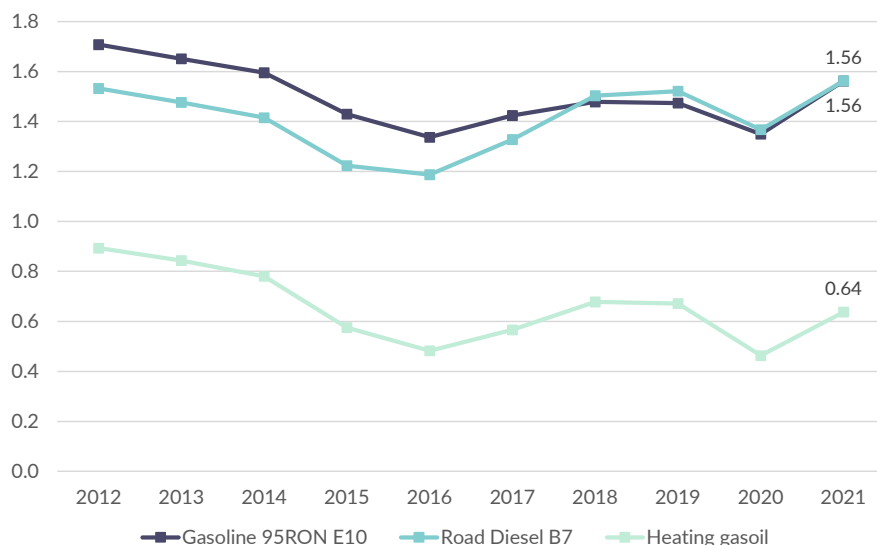


An average Belgian household paid 28.5 euro cent/kWh for its electricity in 2021, which is slightly higher than in 2020 (+3.7%). The energy cost represented 29.6% of the total electricity bill in 2021. The network rates represent 36.7%. The share of taxes constitutes 33.6% of the total bill.

Driven by a rising wholesale price of natural gas, the wholesale price of electricity is also rising. From the second half of 2021, this is reflected in the rising price paid by households. The increase in the average price paid by households is however dampened by the extension of the social tariff from February 2021.

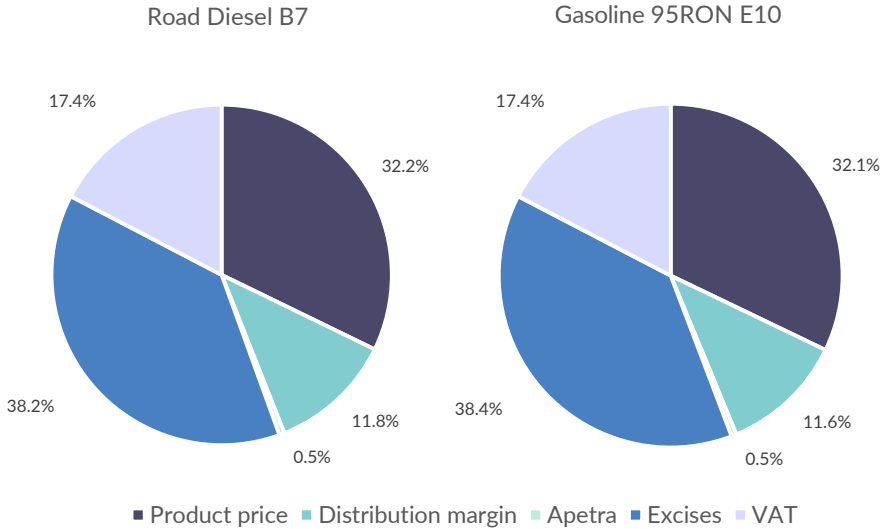
4.3. Oil Prices in 2021

Evolution in euro/litre



After a sharp drop 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, an average annual diesel price higher than that of the average annual petrol price is observed for the first time in 2018. The sharp decline recorded in 2020 is the result of the fall in prices on international markets as a result of the corona crisis.

4.4. Compositions of Oil Prices in 2021



The composition of the maximum prices of diesel B7 and gasoline 95RON E10 is very similar. The product price is around 32% of the total price. This is supplemented by the distribution margin, around 11.5 to 12%. This parameter covers the distribution costs and the logistics costs for bringing the product to the end user. The Apetra contribution is added to this, representing a share of 0.5% of the total price. Apetra is the company responsible for maintaining the strategic stocks of crude oil and petroleum products. Finally, legal charges and taxes are added, in the form of excise duties (38%) and finally VAT (17.4%).



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