

# Residential energy supplier

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# Residential energy supplier

## Quiz

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Any idea of the average household electricity and gas consumption (kWh) per year?

What can you do with 1 kWh?

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## Belgian household energy consumption

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Average **electricity** consumption: 3 000 to 5 000 KWh

Average **gas** (heat) consumption: 10 000 to 20 000 KWh

**1 kWh** = energy to carry **100 kg** from sea level (0m) to **3 600 m !!**

1 kWh = 13 km by foot, 2 km by car, 1 kg of TNT, ...

1 L of oil = 10 kWh



### Robert vs Iron Man (toaster)

1 Robert to toast a slice of bread  
180 Robert to power a car  
43 000 Robert to power an airplane



Toaster challenge: [https://www.youtube.com/watch?v=S4O5voOCqAQ&feature=emb\\_title&ab\\_channel=TheToasterChallenge](https://www.youtube.com/watch?v=S4O5voOCqAQ&feature=emb_title&ab_channel=TheToasterChallenge)

# Residential energy supplier

## Introduction

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**Key data** about **the Belgian** primary energy consumption, production, electricity ...

Increase of the gas price -> Why?

Increase of the electricity price -> Why?

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## Quiz

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Belgian energy primary consumption?

Share of fossil energies (gas, coal, oil)?

Share of renewable energies (wind, solar, hydro, ...)?

Share of nuclear?

Difference between primary energy and final energy consumption?

Share of electricity in the final energy consumption?

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## Belgian primary and final energy consumption 2019

Primary energy consumption

Source d'énergie		Mtep
Pétrole et produits pétroliers		21,9
Gaz naturel		15,1
Combustibles fossiles solides		3,1
Énergie nucléaire		11,3
Énergies renouvelables et déchets		5,0
Autres*		-0,2
<b>Total</b>		<b>56,4</b>

Final energy consumption

Source d'énergie		Mtep
Produits pétroliers		18,8
Gaz naturel		10,5
Combustibles fossiles solides		0,9
Électricité		7,1
Chaleur		0,4
Énergies renouvelables et déchets		2,1
<b>Total</b>		<b>39,8</b>

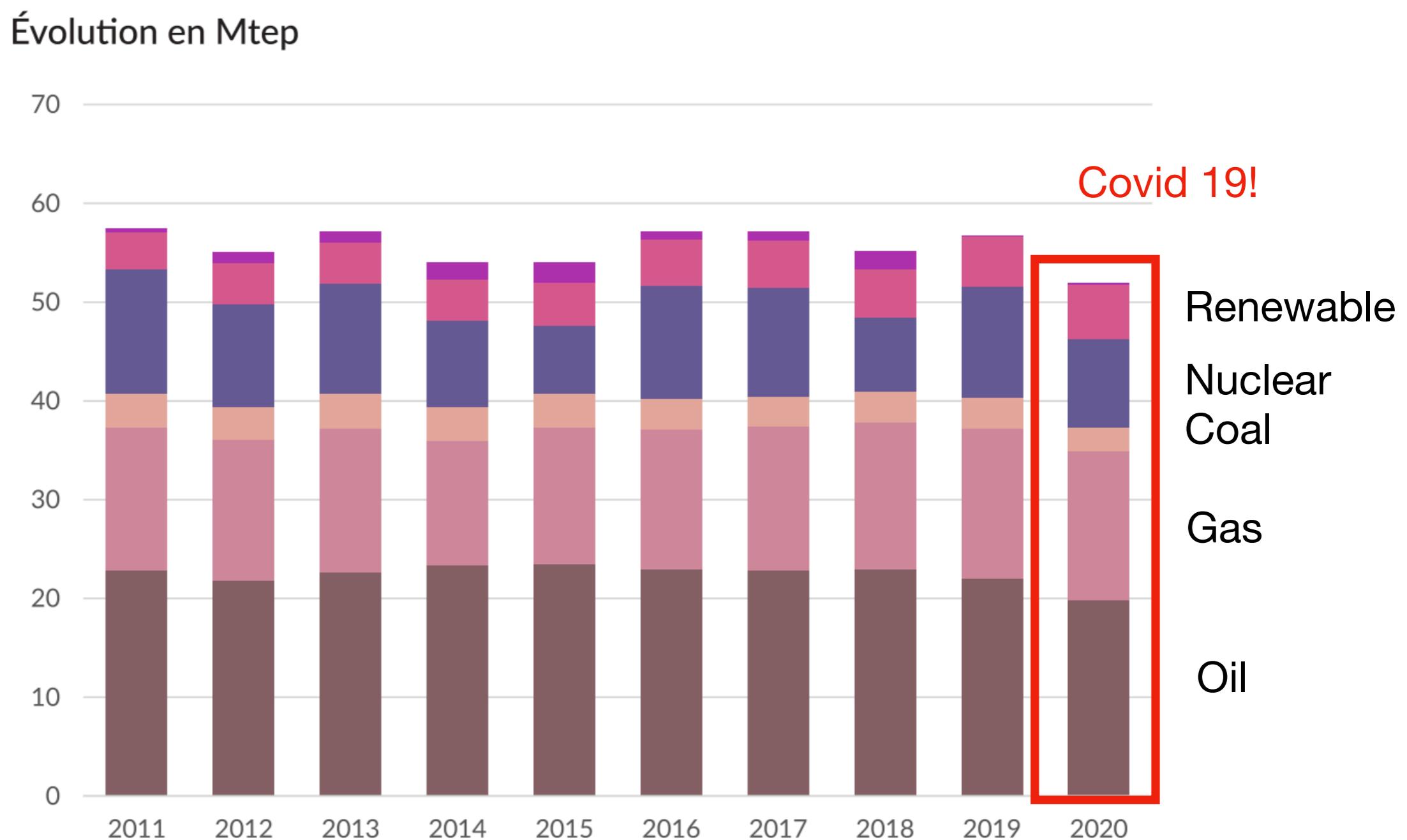
Primary -> Final:  
Transport loss & efficiency

Oil + gas +coal: -> **71 %** of the primary energy consumption  
Renewable: **8.9 %** of the primary energy consumption  
Electricity: **17.8 %** of the final energy consumption

Source: <https://economie.fgov.be/fr/publications/energy-key-data-aout-2020>

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## Belgian primary consumption 2011-2020



Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

# Residential energy supplier

## Quiz

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Shares of residential, transport, and industry in the final energy consumption?

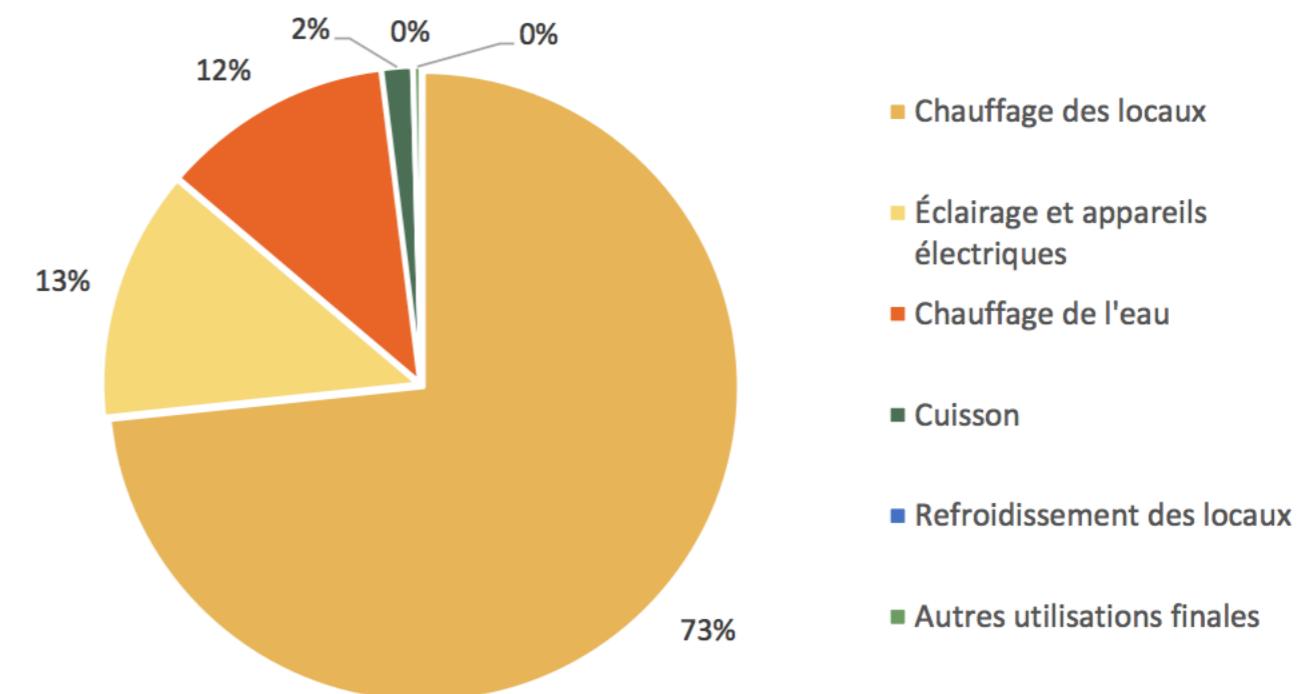
Shares of heat, domestic hot water and electricity in the residential energy consumption?

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## Belgian final energy consumption 2019 -> residential

### Final energy consumption per sector

Secteur	Mtep
Industrie	10,3
Transport	8,8
Résidentiel	8,0
Services et équivalent	5,4
Usages non énergétiques	7,3
<b>Total</b>	<b>39,8</b>



Residential: electricity + heat -> **20%**

**Heat 2/3 of the residential energy consumption !!**

Source: <https://economie.fgov.be/fr/publications/energy-key-data-aout-2020>

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## Quiz

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Shares of nuclear, gas, renewable in the electricity production?

The total amount of electricity production (TWh) in 2020?

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## Belgian electricity production 2020

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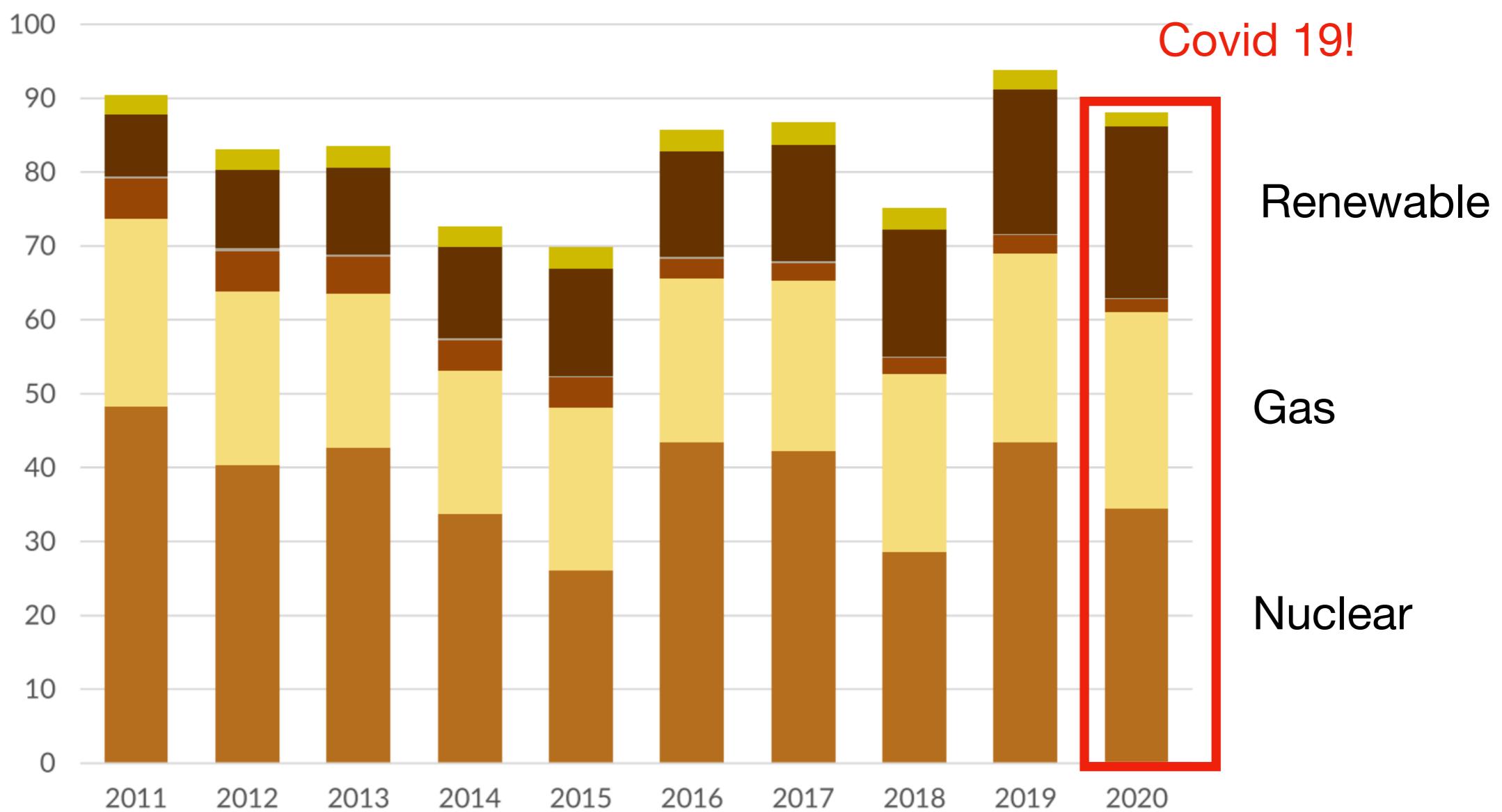
Électricité	TWh
Nucléaire	34,4
Gaz naturel	26,5
Combustibles fossiles solides et gaz sidérurgiques	1,8
Produits pétroliers	0,1
Énergies renouvelables	23,4
Autres sources*	1,8
<b>Total</b>	<b>88,1</b>

Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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## Belgian electricity production 2011-2020

Évolution en TWh



Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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## Quiz

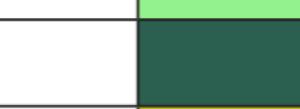
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Shares of wind, PV, hydro, biomass in the electricity production?

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## Belgian electricity from renewable energies

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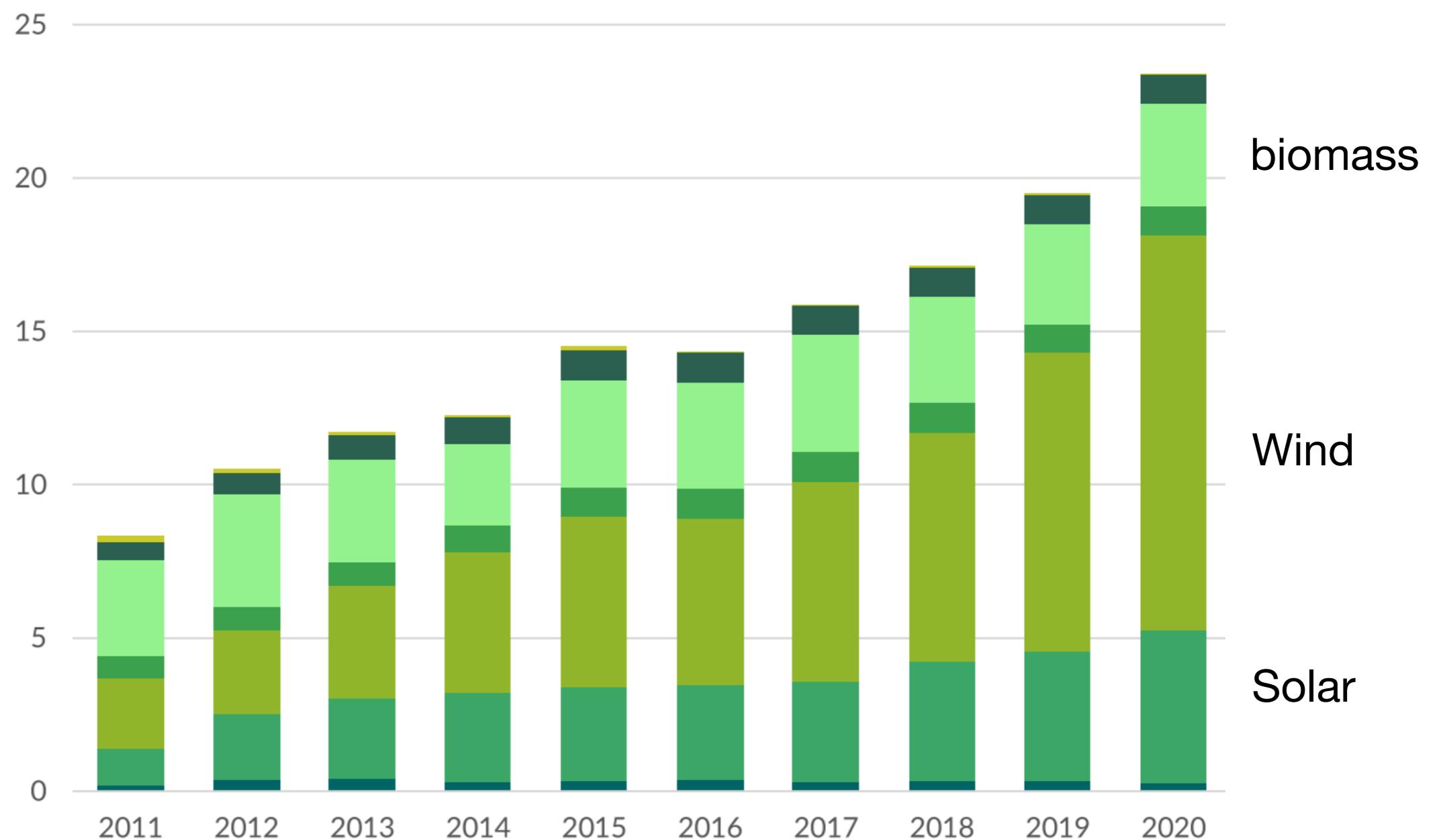
Électricité		TWh
Hydraulique hors pompage		0,3
Solaire		5,0
Éolien		12,9
Déchets urbains renouvelables		1,0
Biomasse solide		3,3
Biogaz		1,0
Biomasse liquide		0,0
<b>Total</b>		<b>23,4</b>

Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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## Belgian electricity from renewable energy 2011-2020

Évolution en TWh



Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

# Residential energy supplier

## Quiz

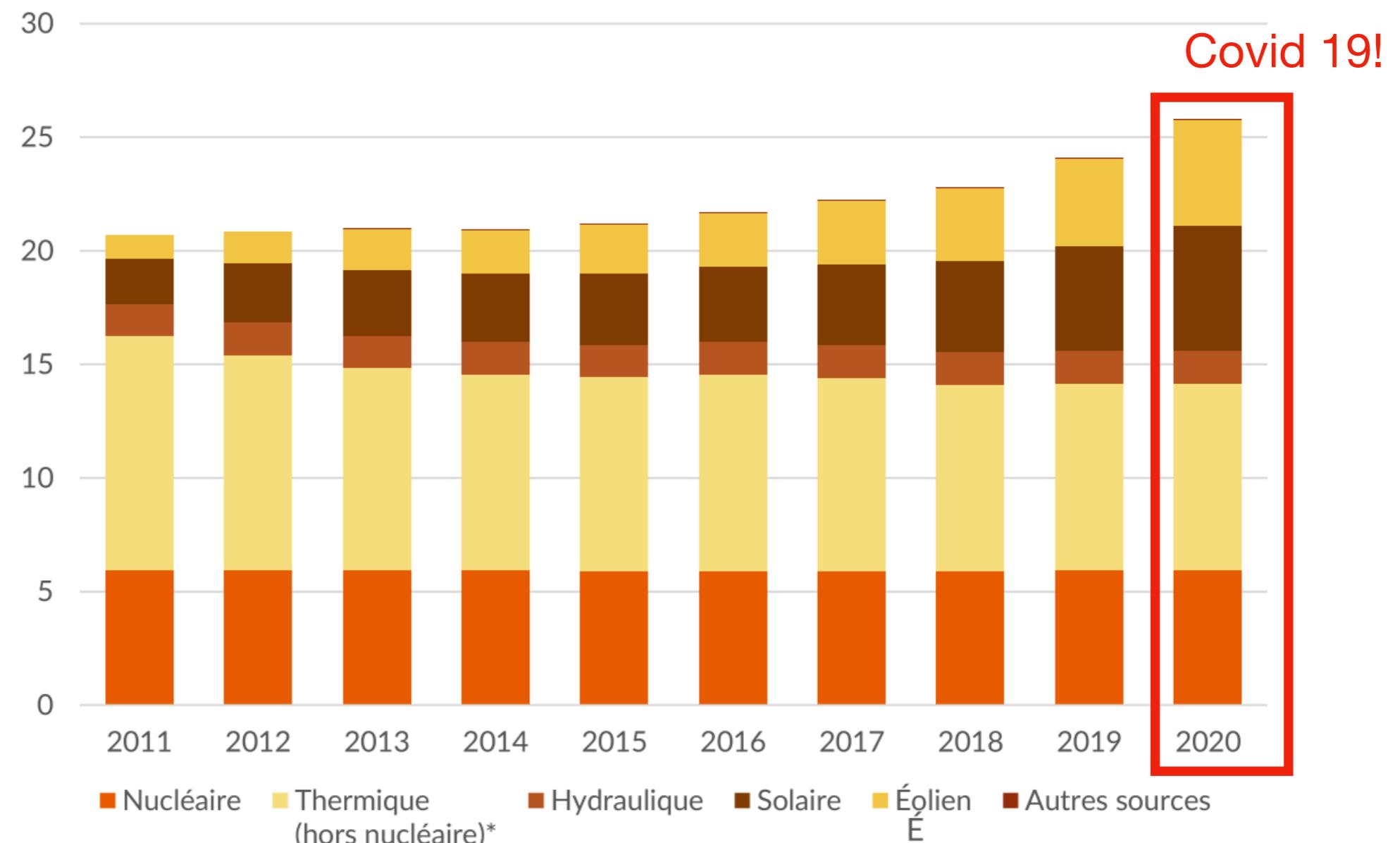
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Total installed capacity (GW) of nuclear, gas, renewable for electricity production?

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## Belgian installed electricity production capacities 2011-2020

Évolution en GW



Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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## Quiz

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Any idea of the Belgian energy dependency in terms of primary energy?

What are the types of energy imported?

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## Belgian net energy import 2020

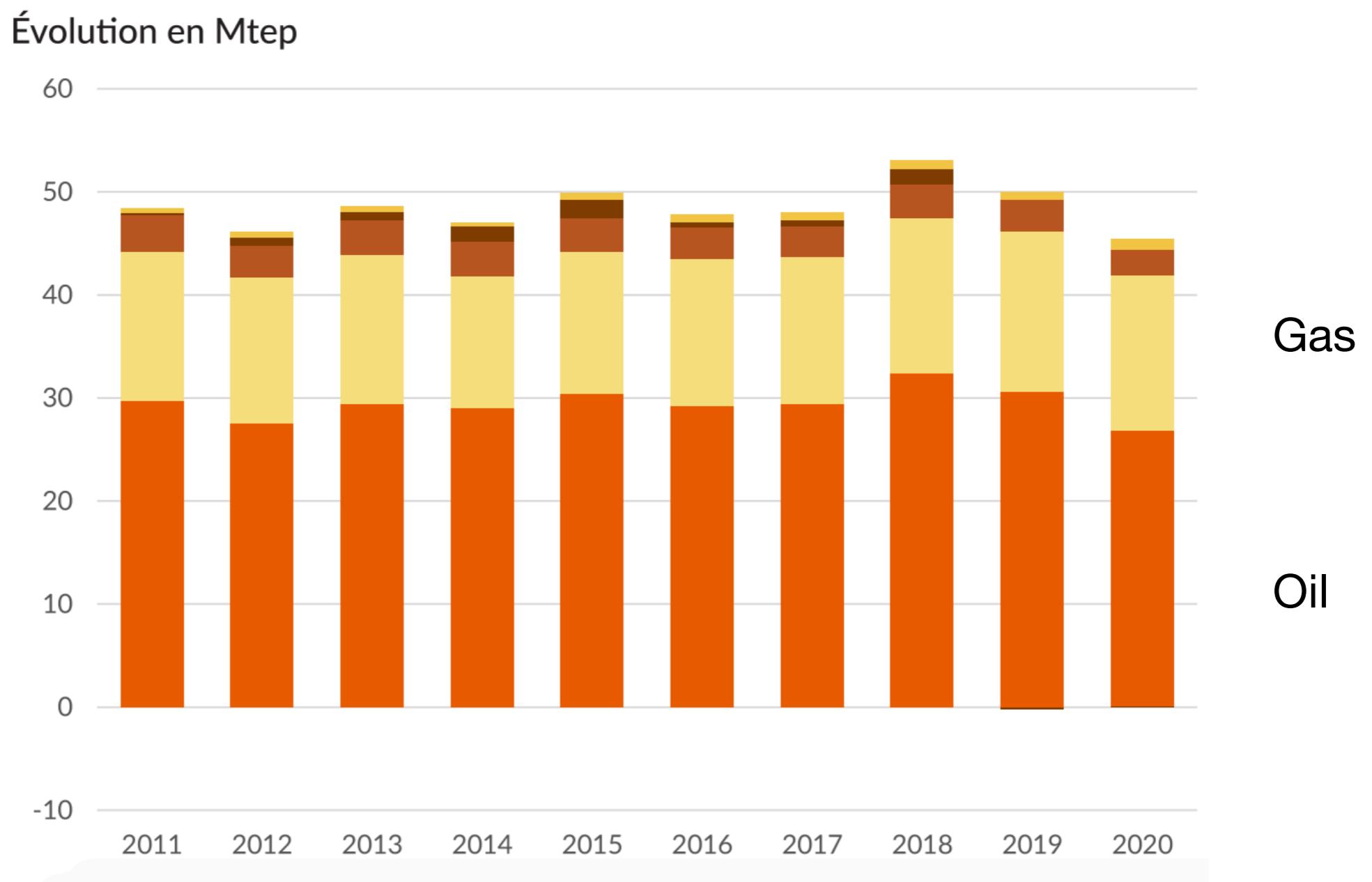
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Importations nettes	Mtep
Pétrole et produits pétroliers	26,9
Gaz naturel	15,0
Combustibles fossiles solides	2,5
Électricité	-0,1
Combustibles renouvelables et déchets	1,1
<b>Total</b>	<b>45,4</b>

Belgian energy dependency = **78%!** = net import/gross consumption

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## Belgian net energy import 2011-2020



Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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## **Quiz**

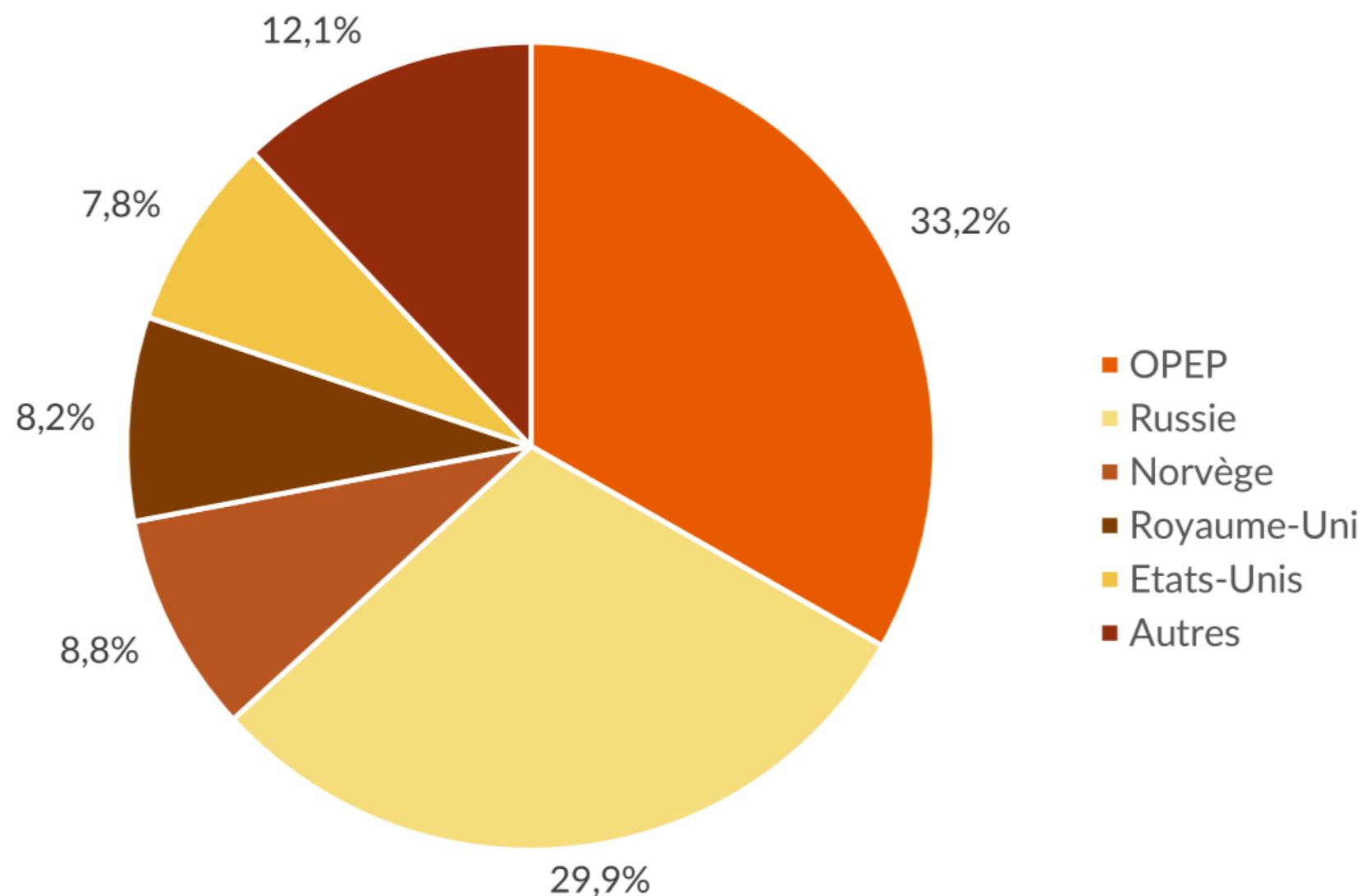
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What are the main origins of the oil imported?

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Oil origin import 2020

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Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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## **Quiz**

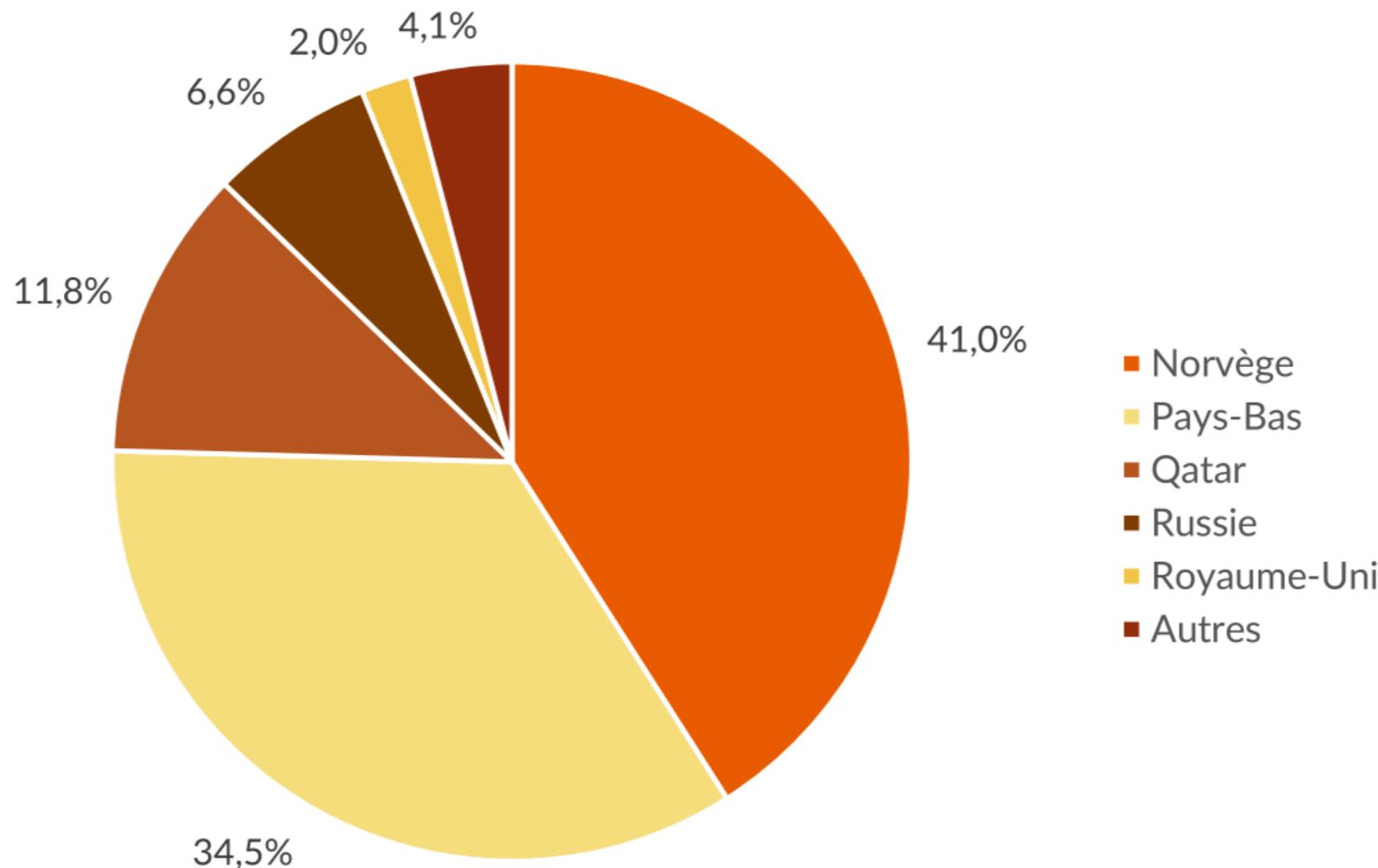
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What are the main origins of the natural gas imported?

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## Gas origin import 2020

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Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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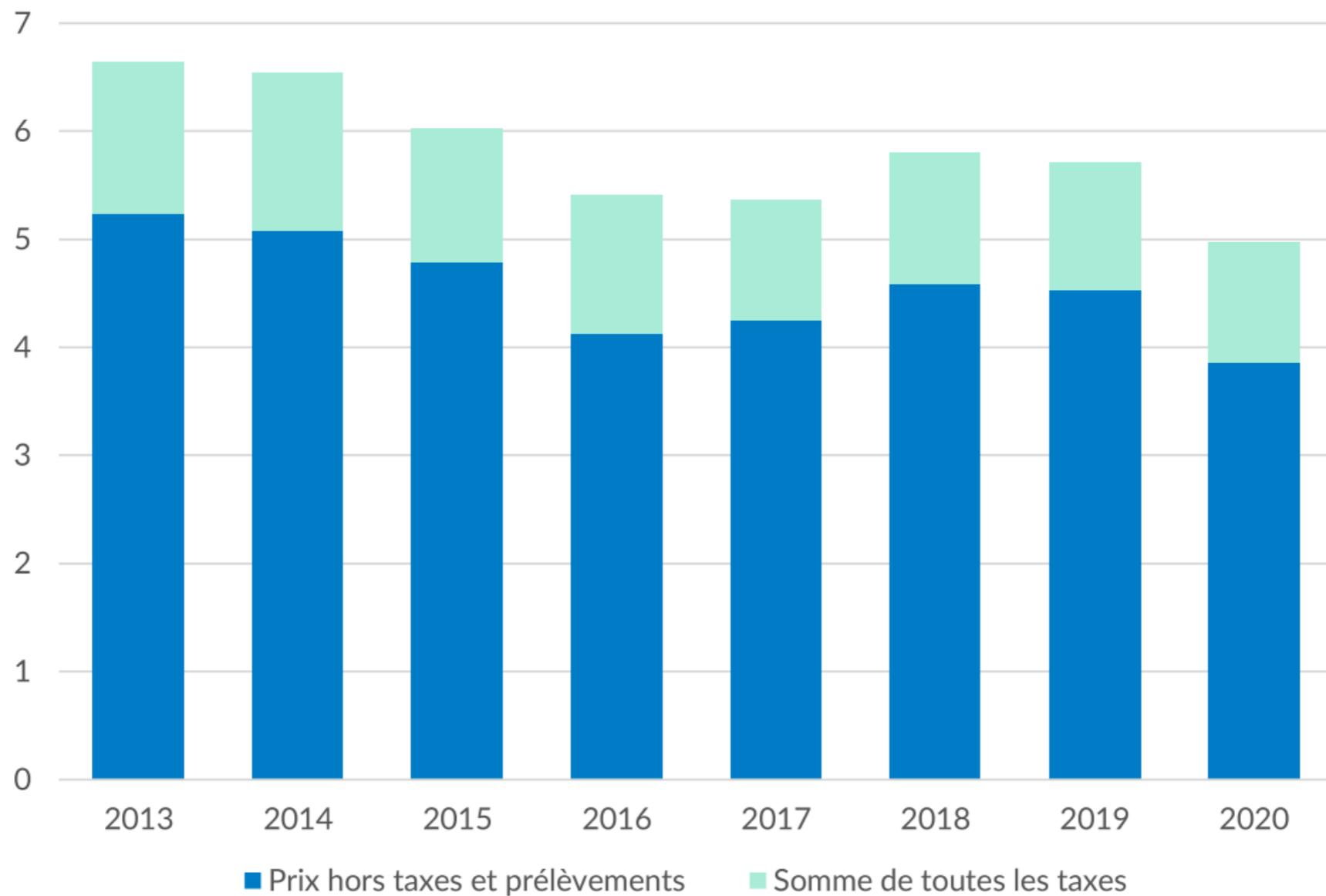
## Quiz

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Any idea of the residential gas price (cEUR/kWh)?

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Gas price 2013-2020 cEUR/kWh (consumption 5 000-50 000 kWh/y)



Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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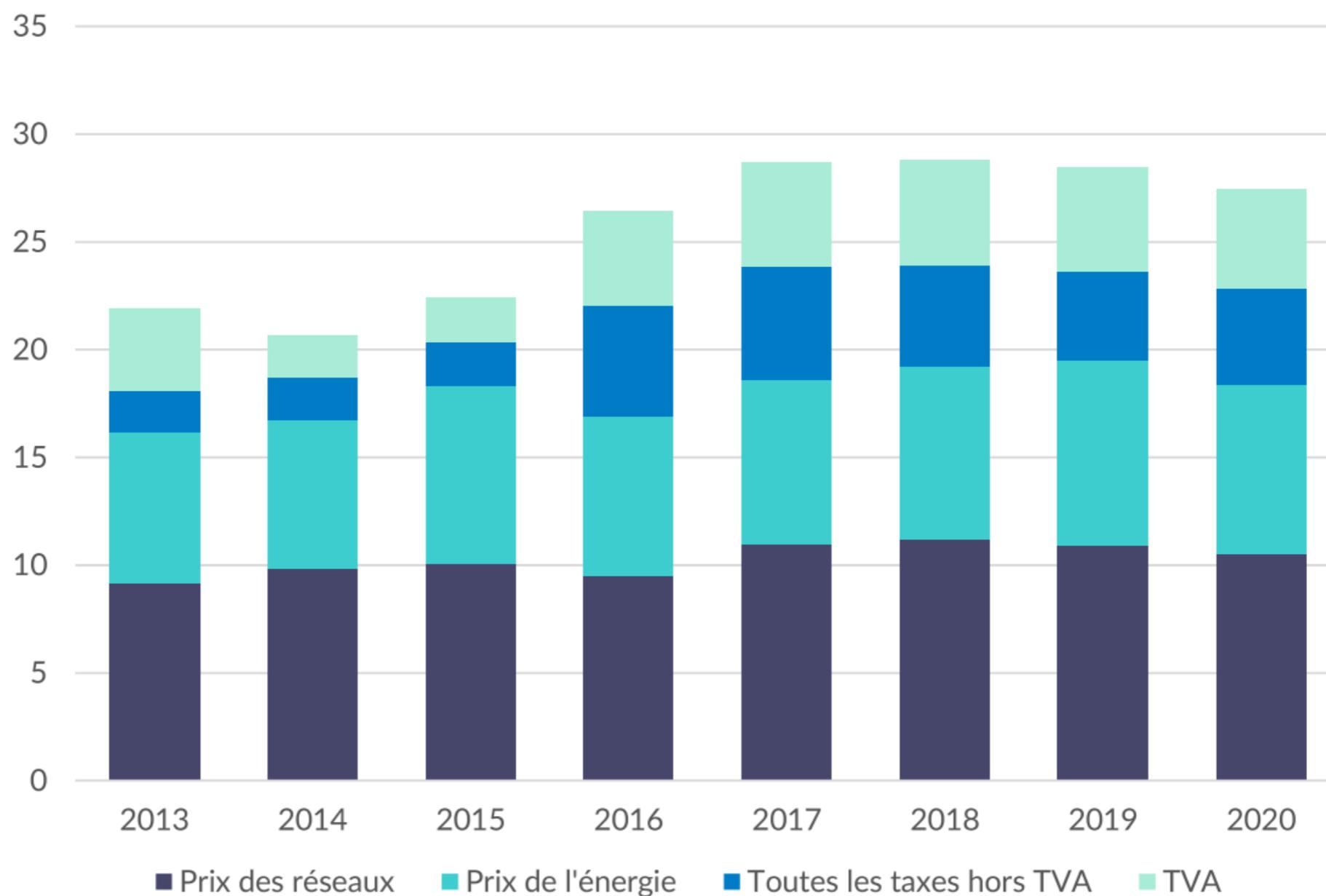
## Quiz

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Any idea of the residential electricity price (cEUR/kWh)?

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Electricity price 2013-2020 cEUR/kWh (consumption 2500-5000 kWh/y)



Source: <https://economie.fgov.be/fr/publications/energy-key-data-juillet-2021>

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## Quiz

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Any idea of the calendar gas price (EUR/MWh) on the energy market?

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## Calendar gas prices: monthly average

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Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

# Residential energy supplier

## Quiz

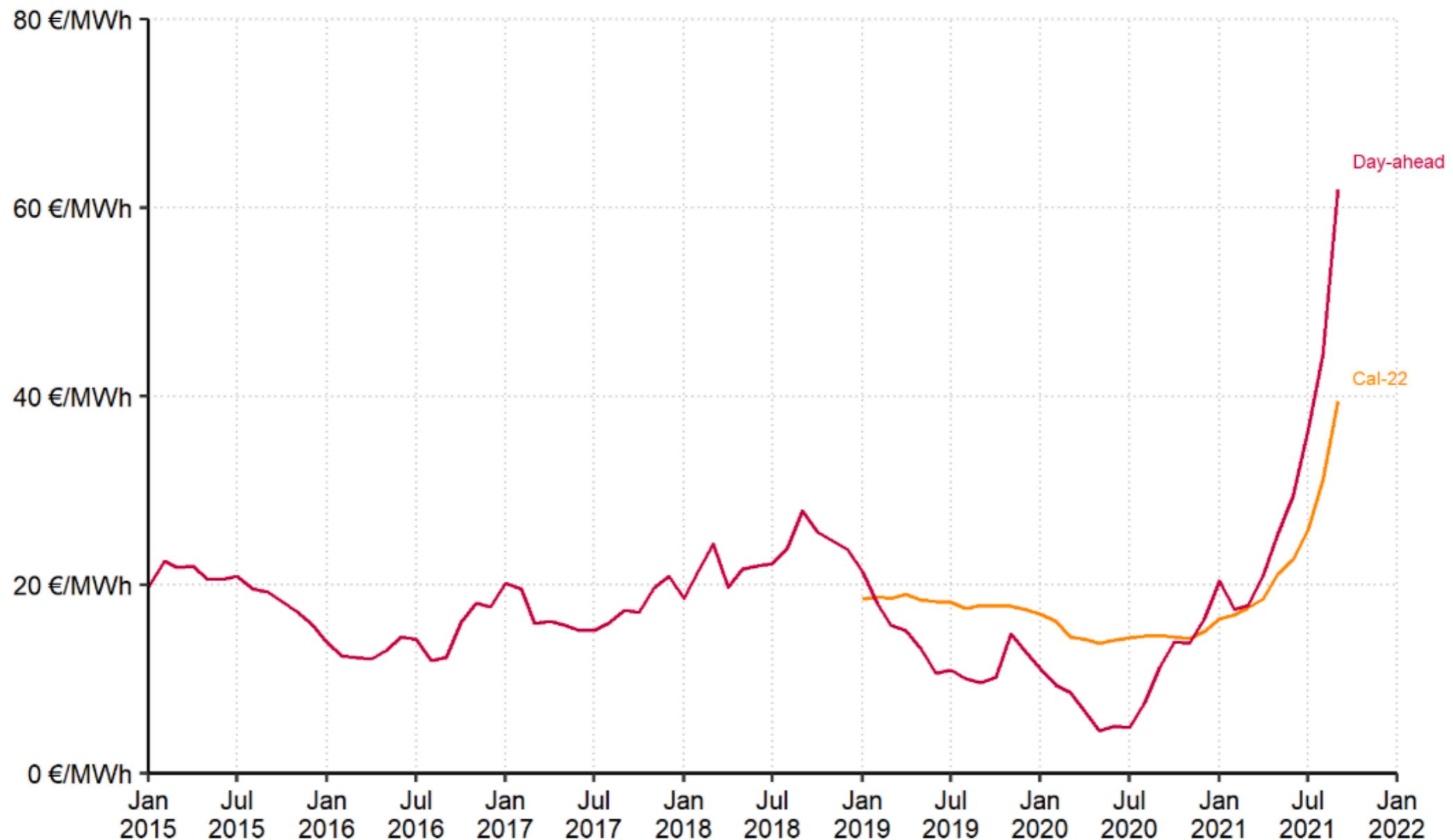
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Any idea of the day-ahead gas price (EUR/MWh) on the energy market?

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## Calendar vs day-ahead gas prices: monthly average

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Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

# Residential energy supplier

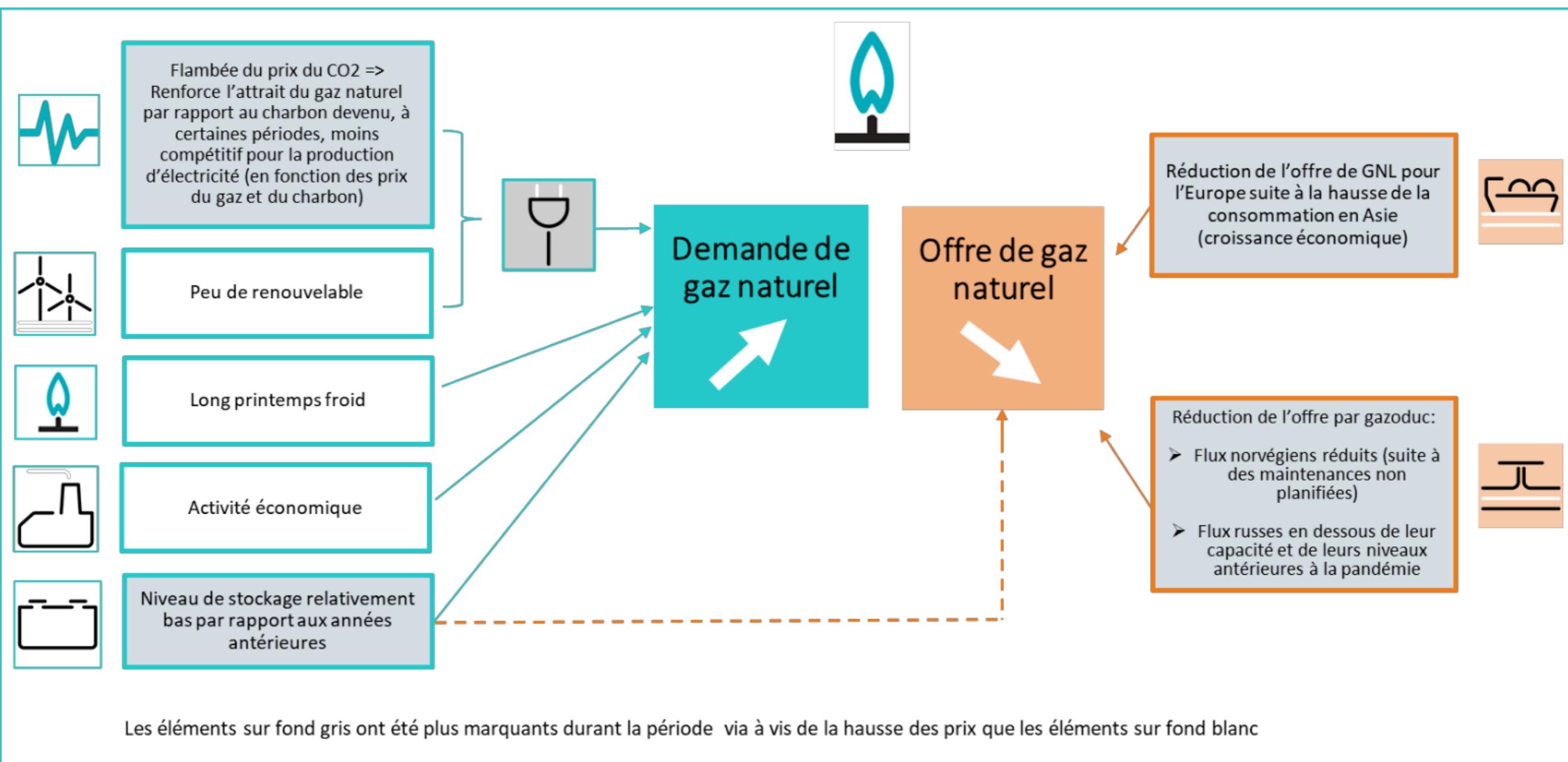
## Quiz

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Why is the gas price soaring?

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## Key factors of the increase of the gas price



Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

# Residential energy supplier

## Quiz

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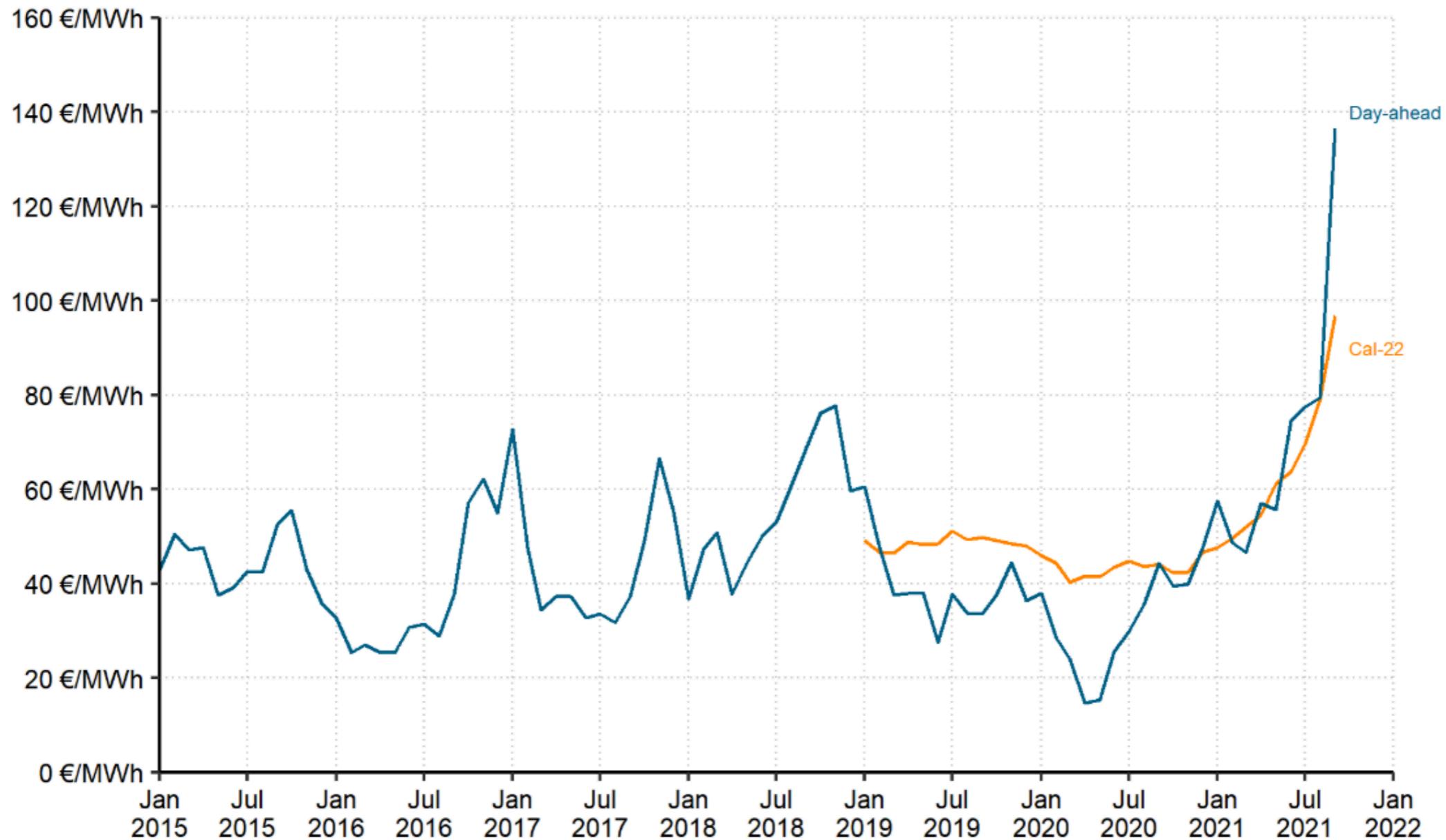
Are residential consumers (you and me) concerned by this increase?

What about the electricity price?

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## Day-ahead vs calendar electricity price

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Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

# **Residential energy supplier**

## **Quiz**

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Why is the electricity price soaring?

# Residential energy supplier

## Electricity, gas, C02, and coal calendar 22 prices



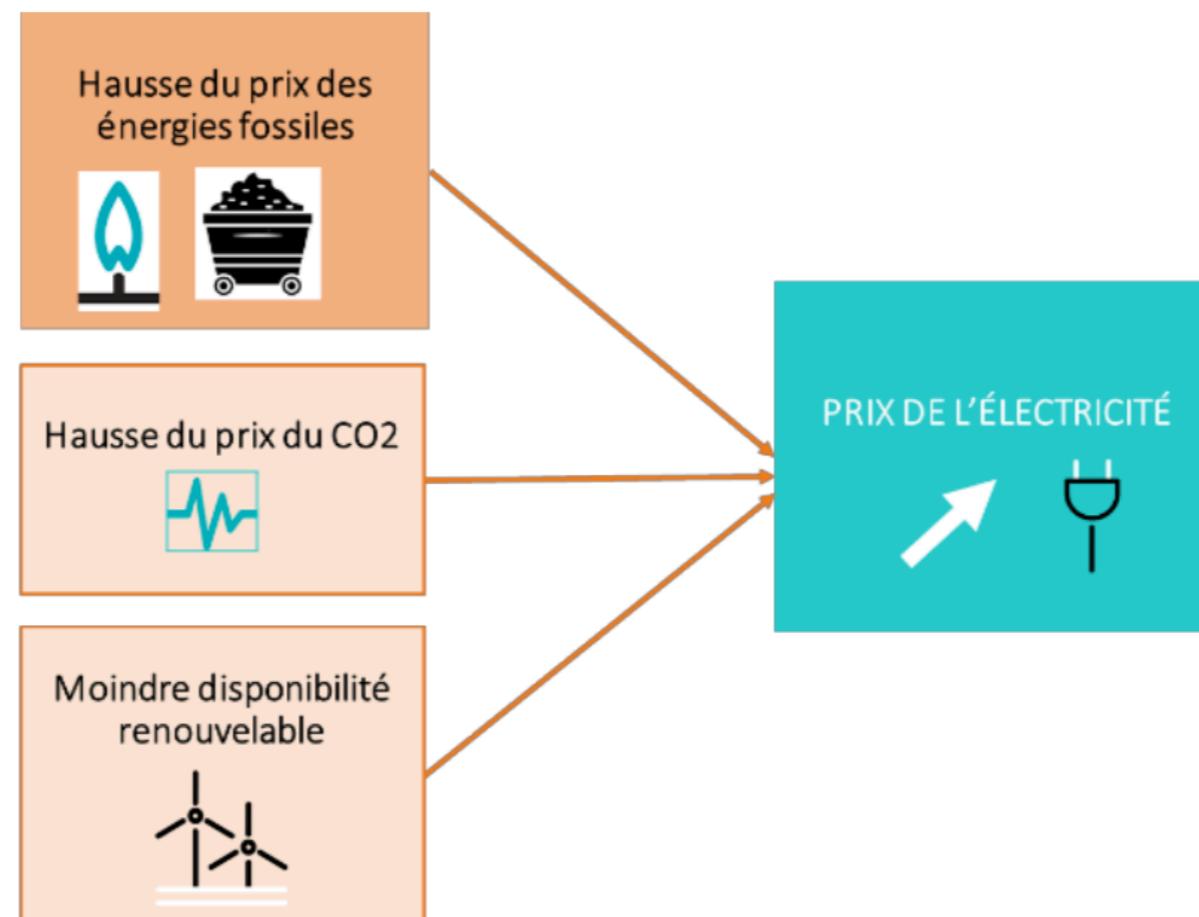
Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

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## Key factors of the increase of the electricity price

European electricity price: **merit of order** effect!

-> the clearing price is related to the **cost of the last kWh produced**, most of the time produced by a coal or a gas power plant....



Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

# **Residential energy supplier**

## **Quiz**

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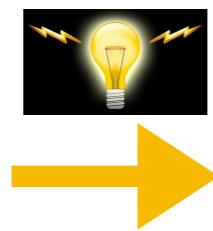
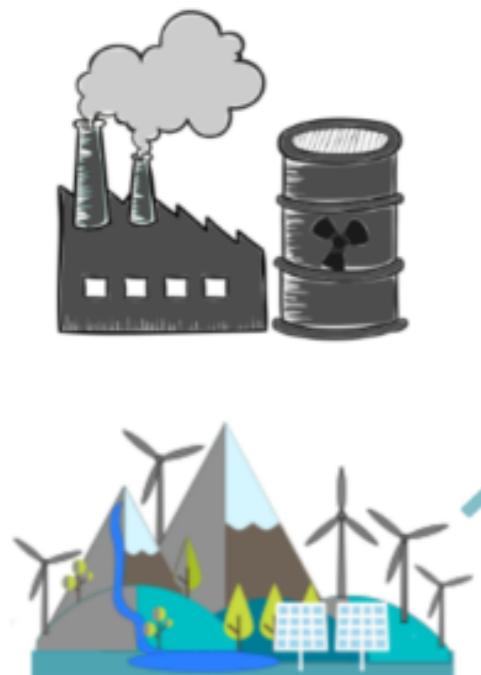
Do you know the energy key market players?

# Residential energy supplier

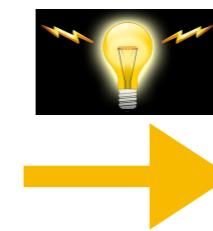
Context: What are the energy market players ?

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Energy producers



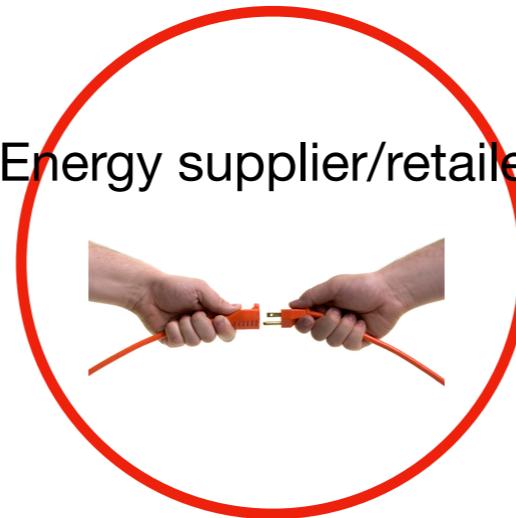
TSO / DSO



Residential customers (small)



Energy supplier/retailer



Industrial customers (large)



Regulator CREG

Commission for Electricity and Gas Regulation



**Politie Police**



Market operator: EEX, EPEXSPOT

# Residential energy supplier

## Context: What are the energy market players ?

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Source: CWaPE <https://youtu.be/buxP--5bWQk>

# Residential energy supplier

## Goals

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What **does** an energy supplier?

How does an **energy supplier build** a residential electricity/gas offer?

What is a **green** energy offer?

How to **compare** energy suppliers?

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## Summary

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1. Energy supplier perimeter
2. Building an energy offer
3. A « green » energy offer
4. Comparing energy suppliers

# **Residential energy supplier**

## **Quiz**

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What are the main missions of an energy supplier?

# Residential energy supplier

## Energy supplier perimeter

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Trusted third party

**Middleman** between the customers & Distribution System Operator (DSO)

**Customer** care

**Balancing** responsible party

**Buy/sell** energy

Additional services: insurance, PV installation, etc

What is your DSO ? : <http://www.synergrid.be/index.cfm?PageID=16823>

# Residential energy supplier

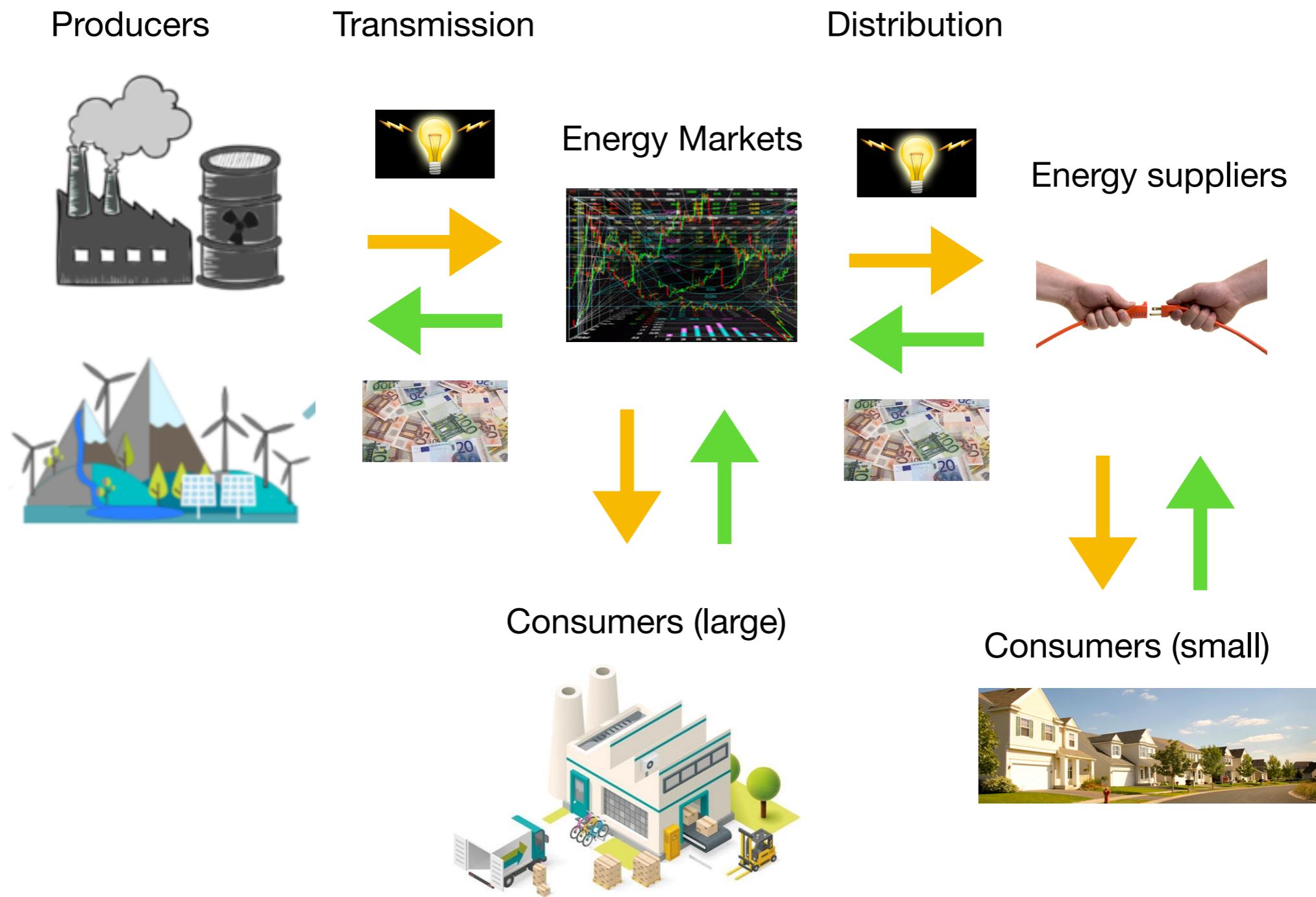
## Summary

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1. Energy supplier perimeter
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# Residential energy supplier

## Building a residential energy offer



# Residential energy supplier

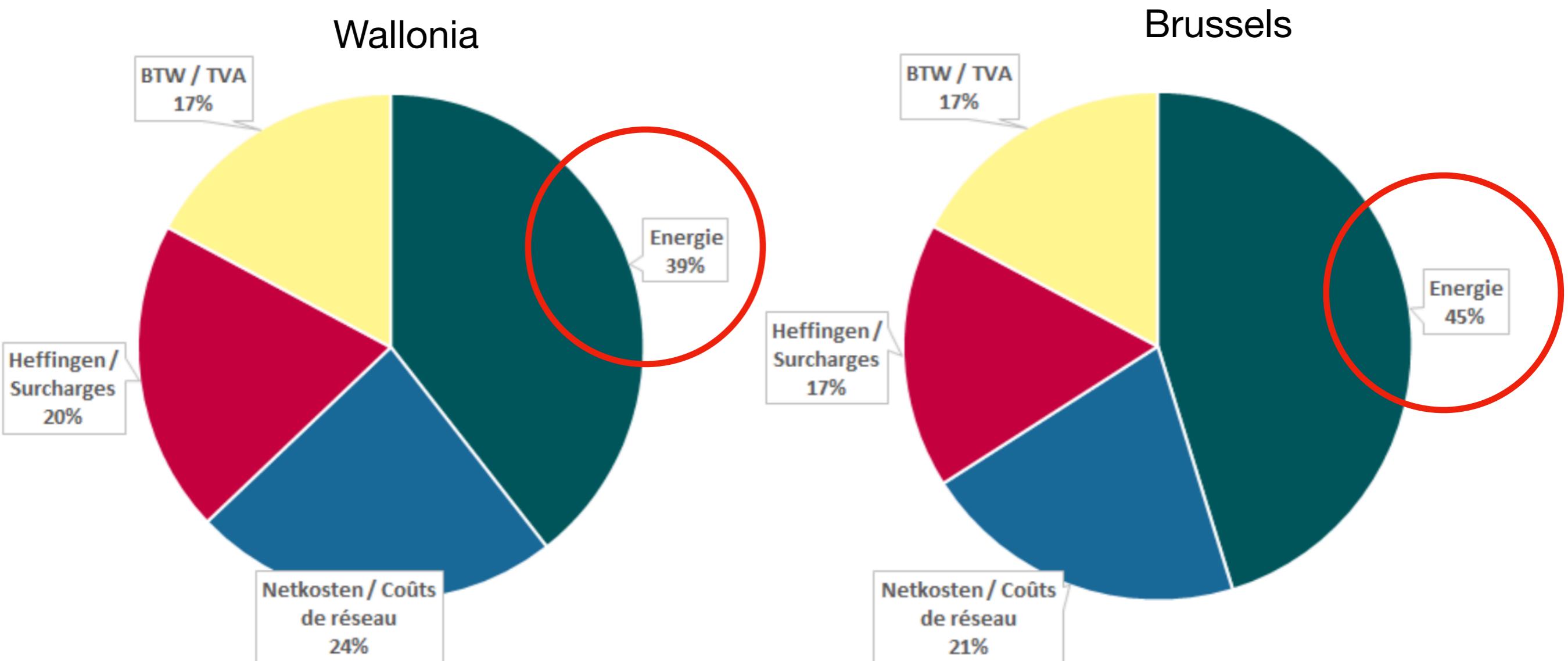
## Quiz

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What are the components of the electricity bill?

# Residential energy supplier

## The energy components of the electricity bill: 10/2021



Source: <https://www.creg.be/fr/consommateurs/prix-et-tarifs/comment-est-compose-le-prix-de-lenergie>

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## Quiz

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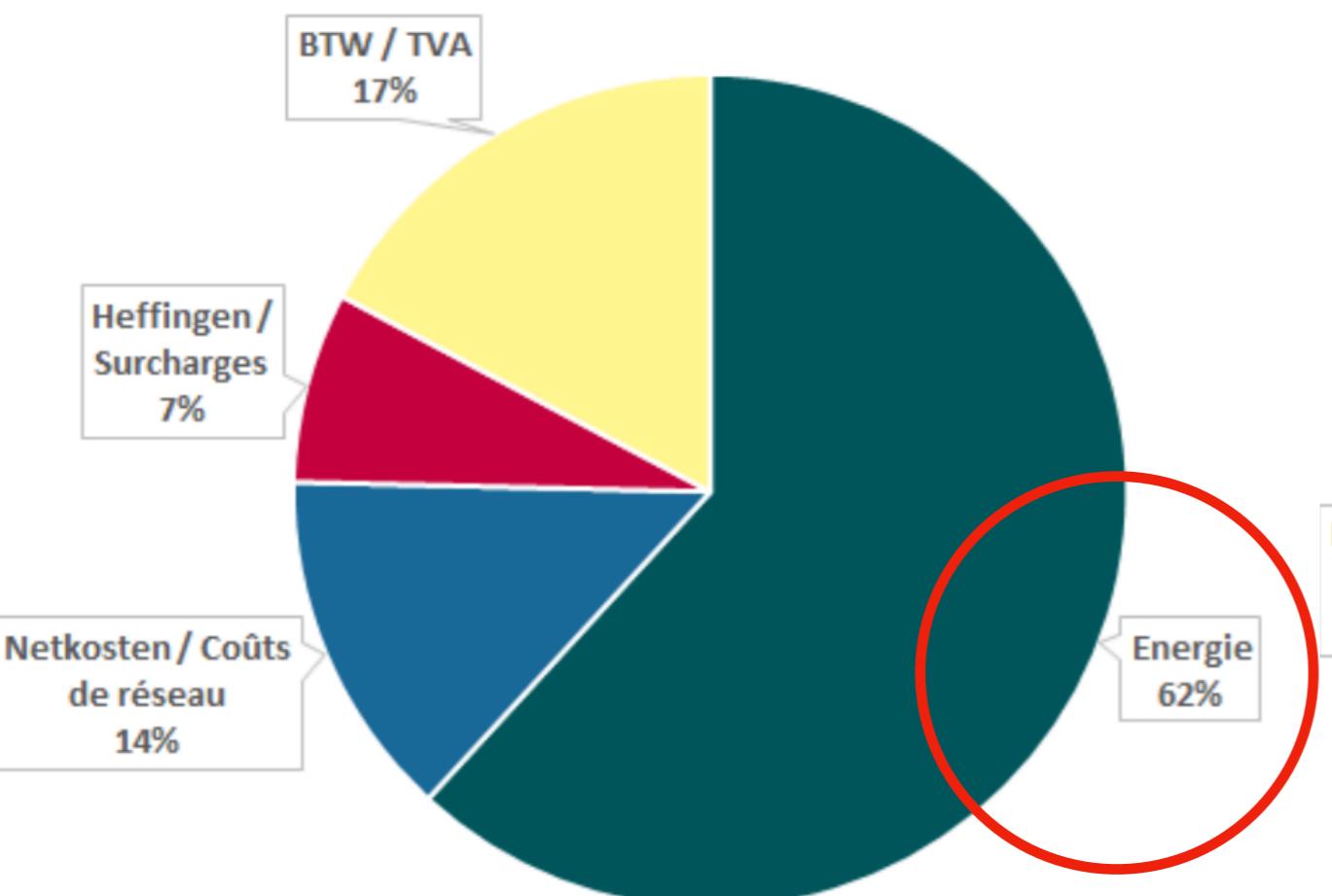
What are the components of the gas bill?

# Residential energy supplier

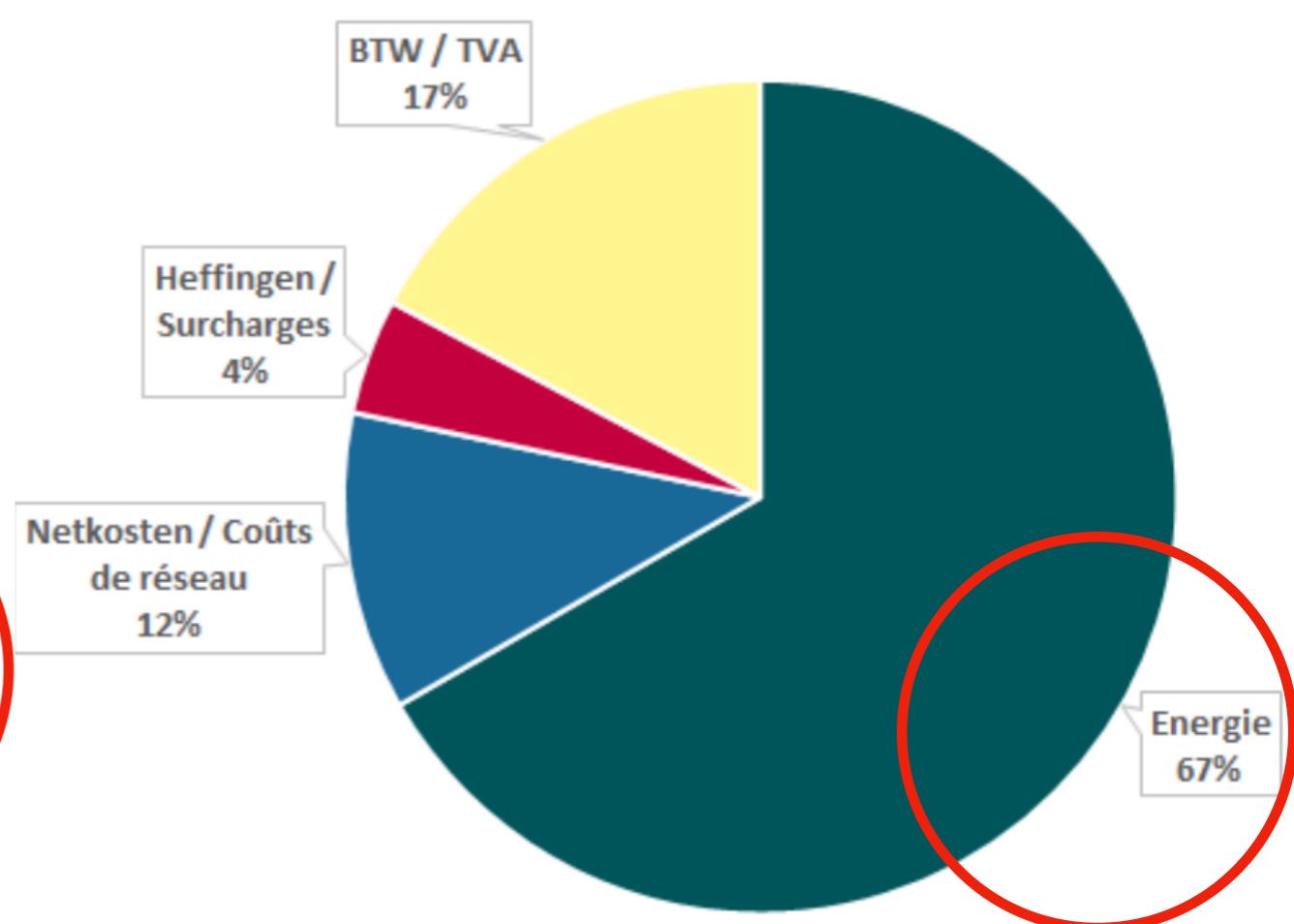
The energy components of the gas bill: 10/2021

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Wallonia



Brussels



Source: <https://www.creg.be/fr/consommateurs/prix-et-tarifs/comment-est-compose-le-prix-de-lenergie>

# **Residential energy supplier**

## **Quiz**

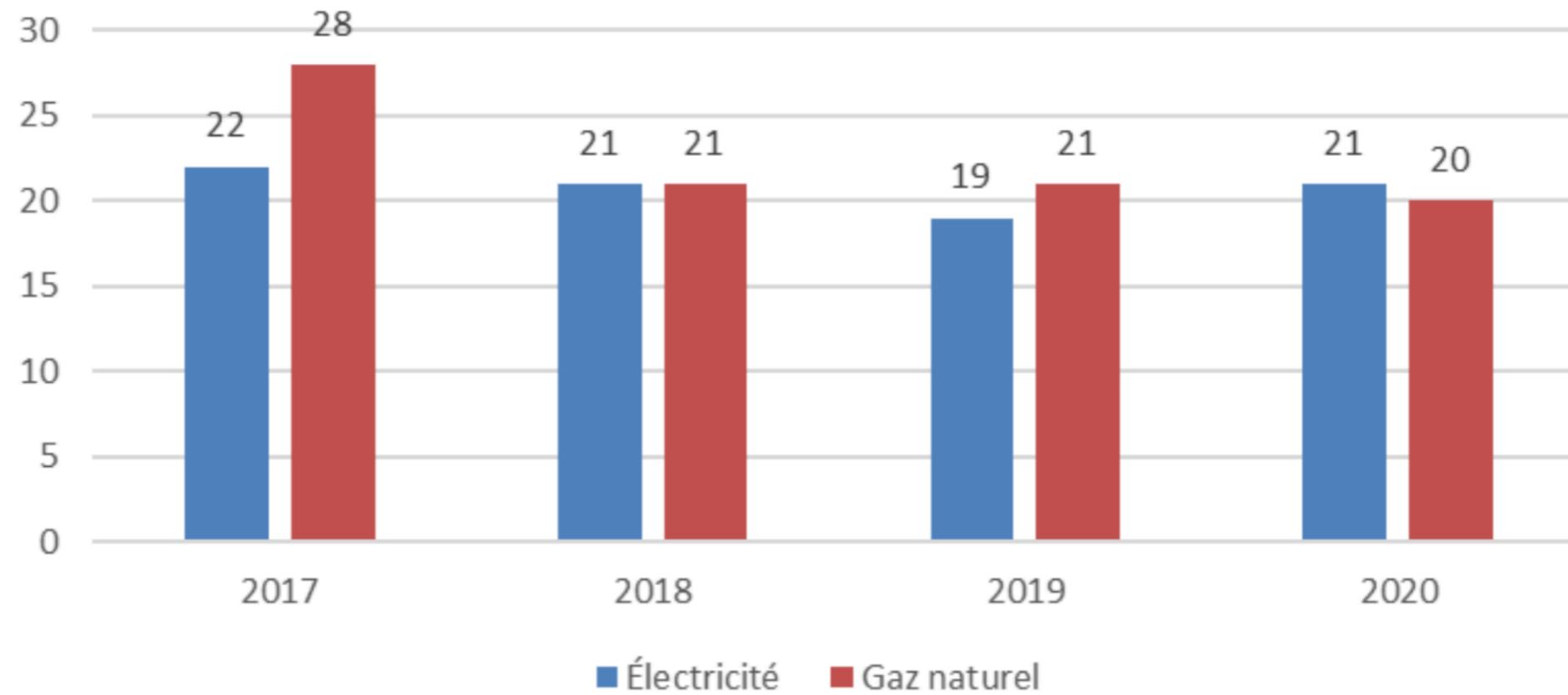
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How many energy suppliers are in Belgium?

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## Belgian energy suppliers 2017-2020

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Source: rapport commun des régulateurs belges sur l'année 2020 <https://www.cwape.be/sites/default/files/cwape-documents/2021.07.02-Rapport%20commun%202020%20Fr.pdf>

# Residential energy supplier

## 2020 Wallon fuel mix

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Source: <https://www.cwape.be/node/165#fuel-mix-2020-des-fournisseurs-en-wallonie>

# Residential energy supplier

## Quiz

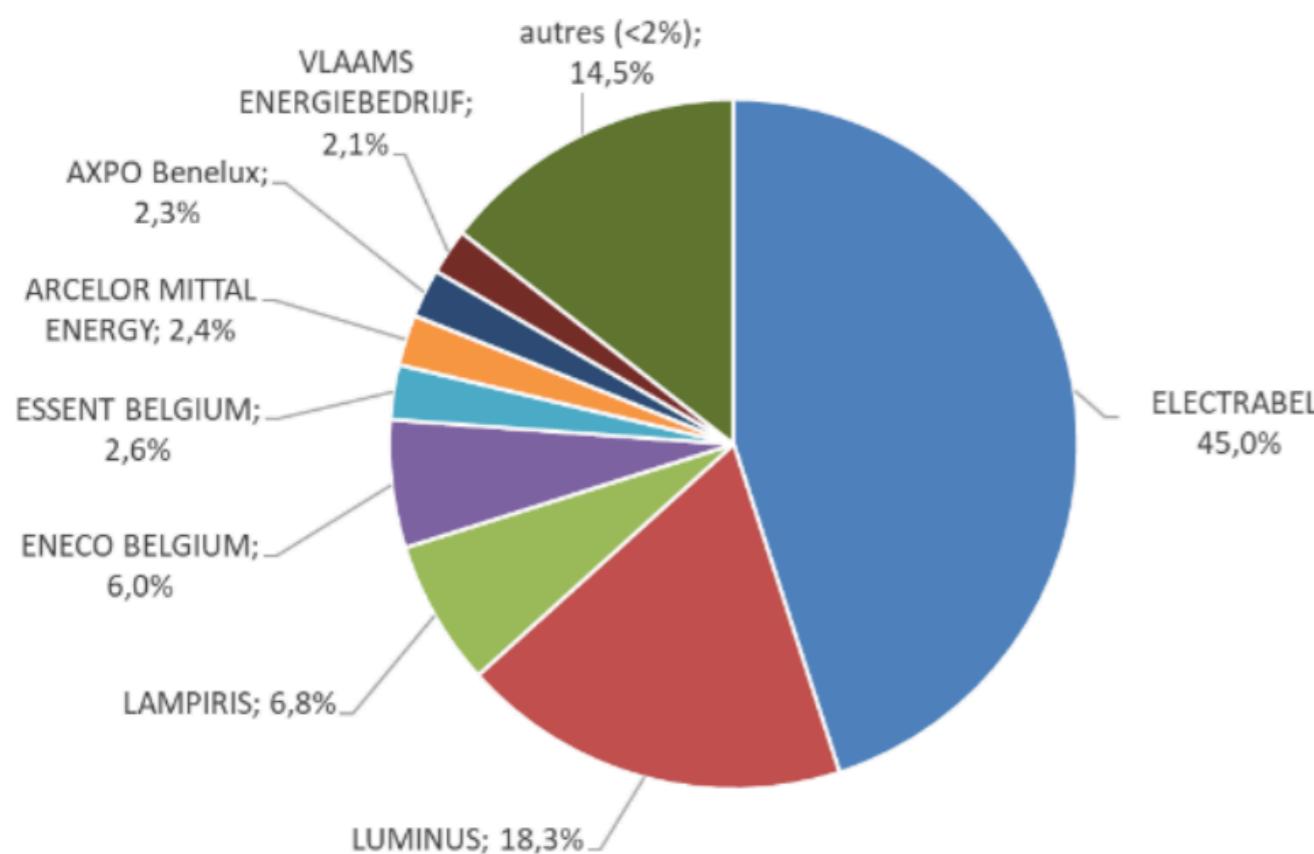
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Which energy supplier delivers most of the electricity and gas in Belgium?

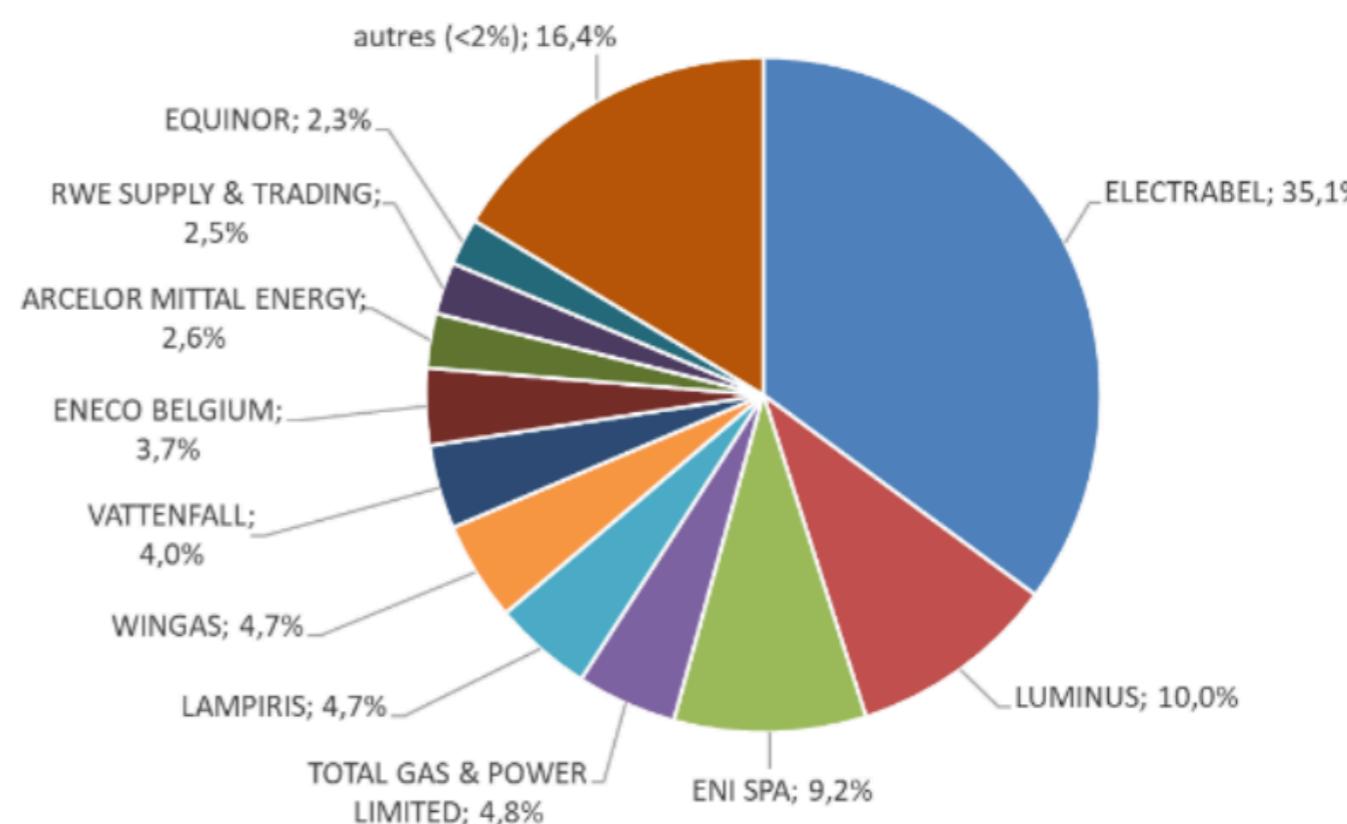
# Residential energy supplier

Energy share per supplier (%TWh): Wallonia 30/06/2021

Electricity (63 TWh)



Gas (190 TWh)



Source: rapport commun des régulateurs belges sur l'année 2020 <https://www.cwape.be/sites/default/files/cwape-documents/2021.07.02-Rapport%20commun%202020%20Fr.pdf>

# Residential energy supplier

## Summary

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1. Energy supplier perimeter
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3. A « green » energy offer
4. Comparing energy suppliers

# **Residential energy supplier**

## **Quiz**

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**Do you know what is a Guarantee of Origin?**

## Residential energy supplier

« Green » energy ? -> Guarantees of Origin (GO)

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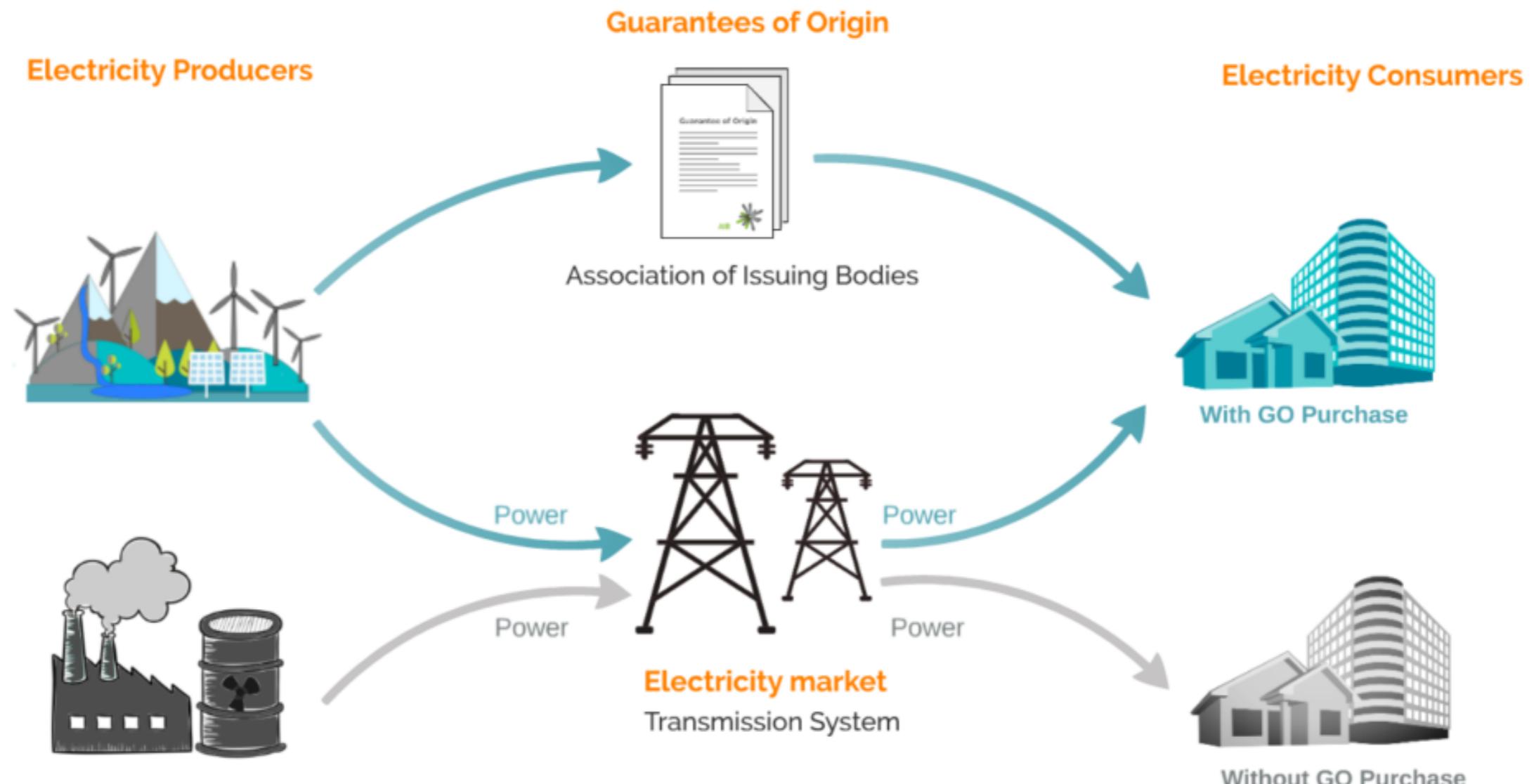
**VIDEO : Les dessous de l'électricité verte.**

# Residential energy supplier

« Green » energy ? -> Guarantees of Origin (GO)

A Guarantee of Origin (GO or GoO) is a **tracking instrument** defined in article 15 of the **European Directive 2009/28/EC**

Source: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0028>



# **Residential energy supplier**

## **Quiz**

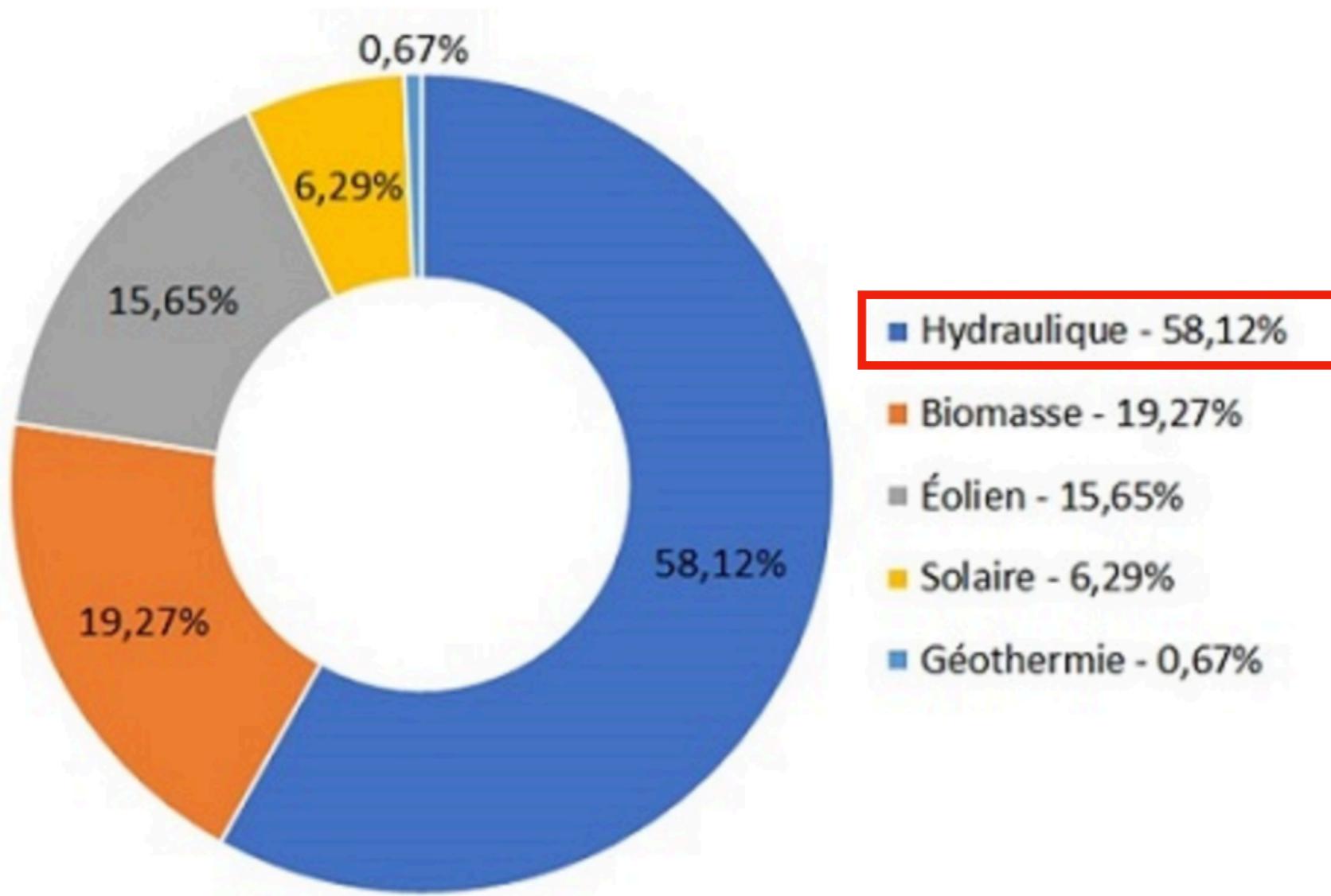
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From which energy sources do come from the GOs in Wallonia?

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## 2020 Walloon GO mix per renewable energy source

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Source: <https://www.cwape.be/node/165#schemas-filières-et-sources-des-go>

# Residential energy supplier

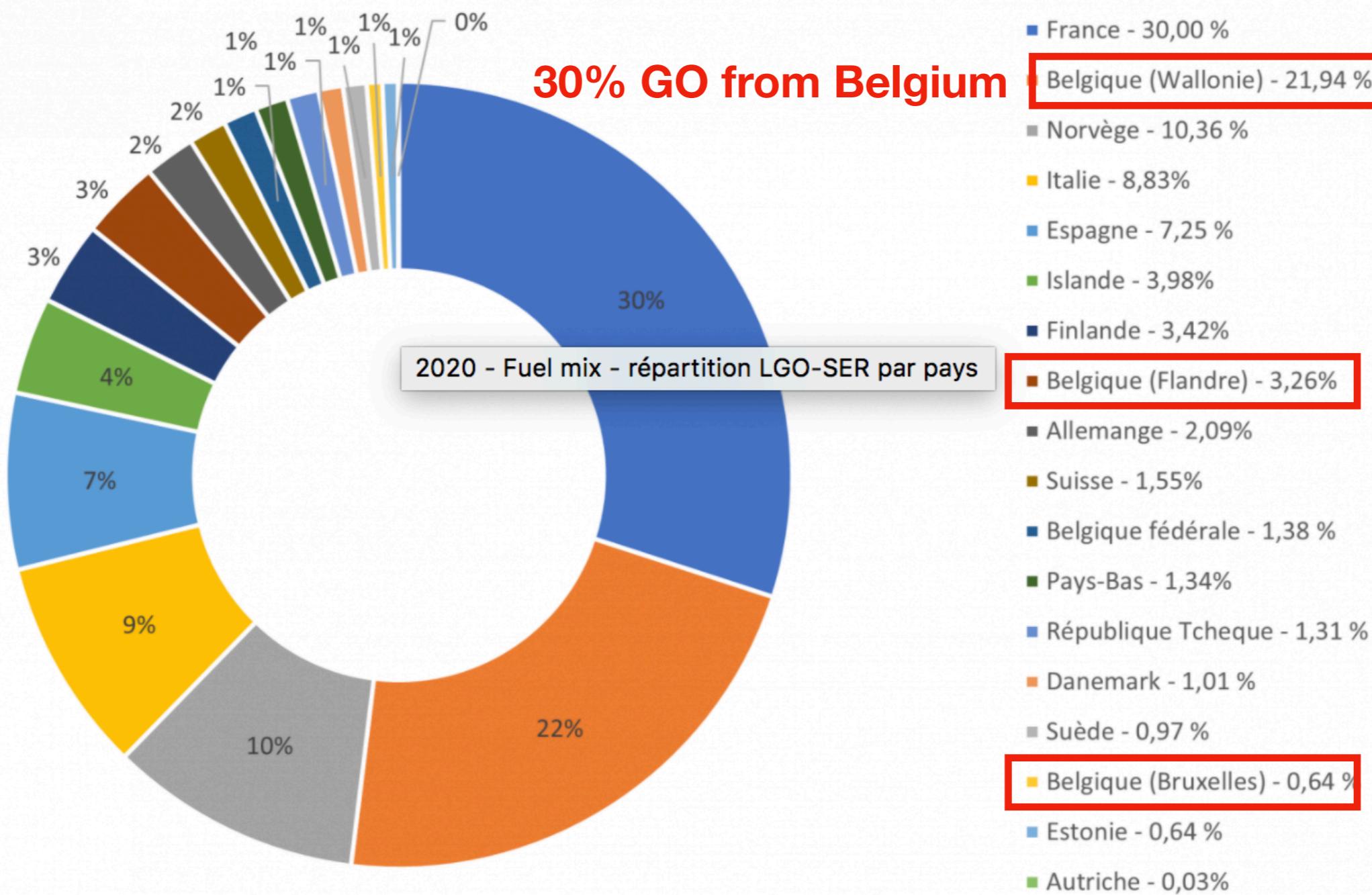
## Quiz

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All the GOs do come from Belgium?

# Residential energy supplier

## Walloon 2020 GO distribution per country

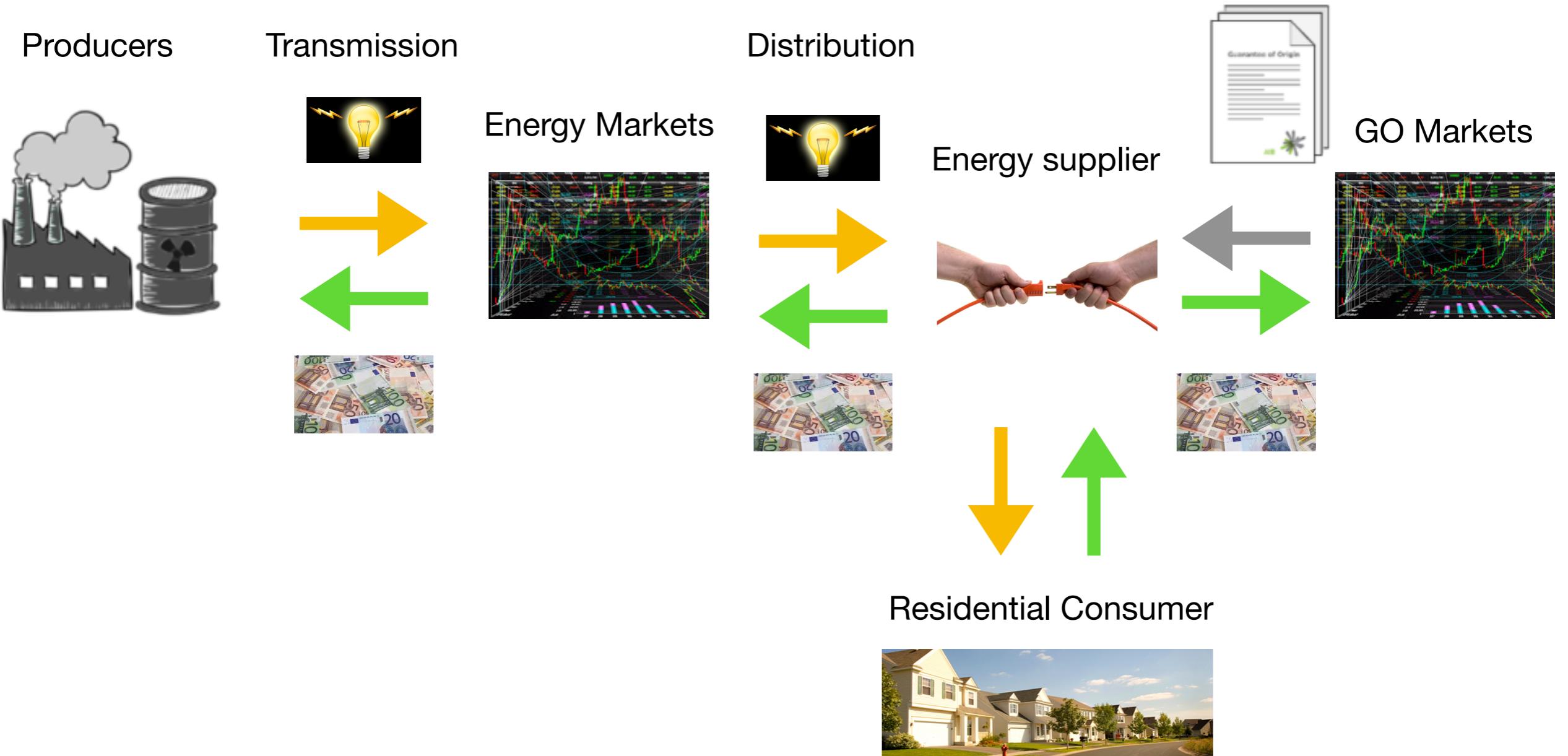


Source: <https://www.cwape.be/node/165#schmas-filières-et-sources-des-go>

# Residential energy supplier

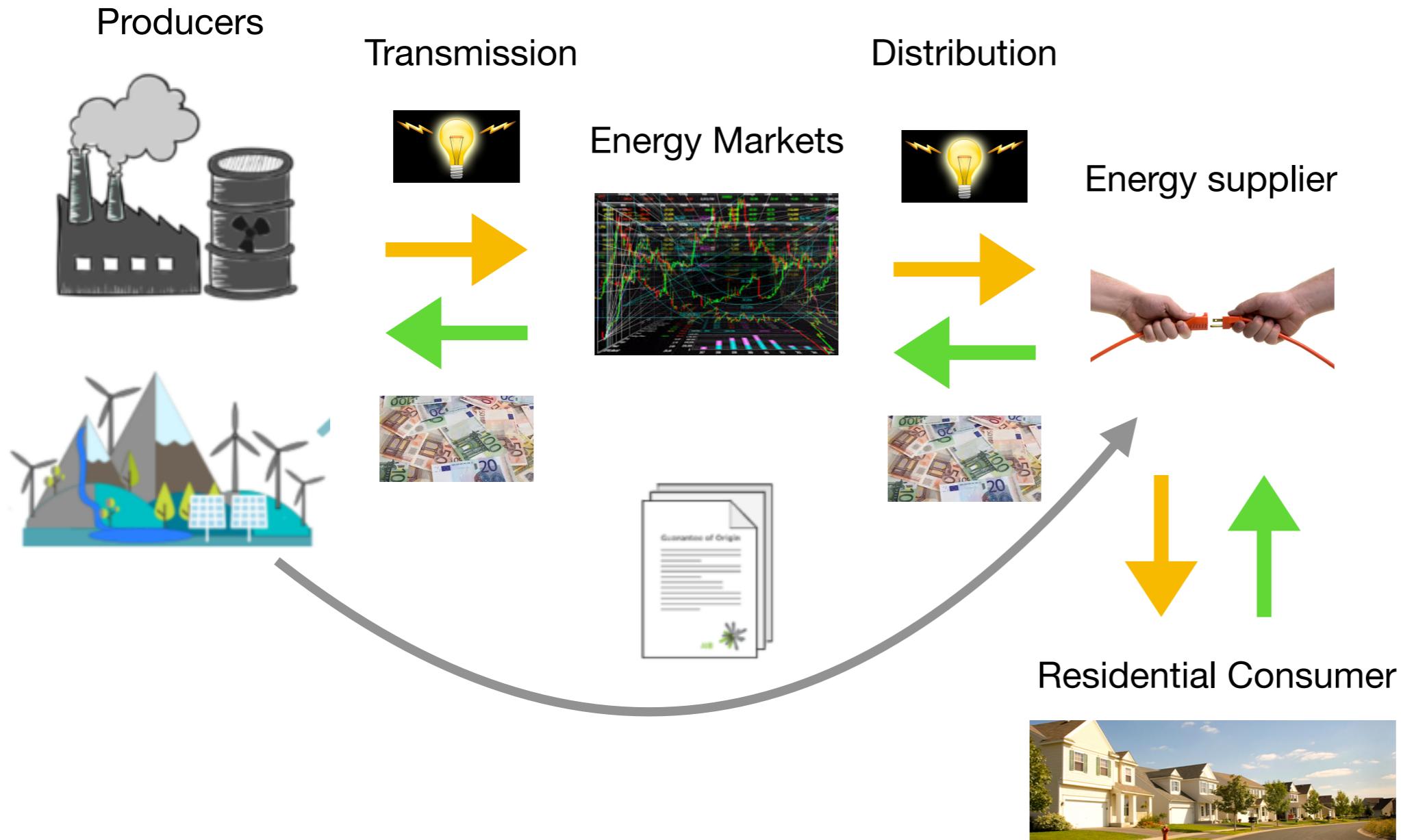
Non-« green » to « green » market offer

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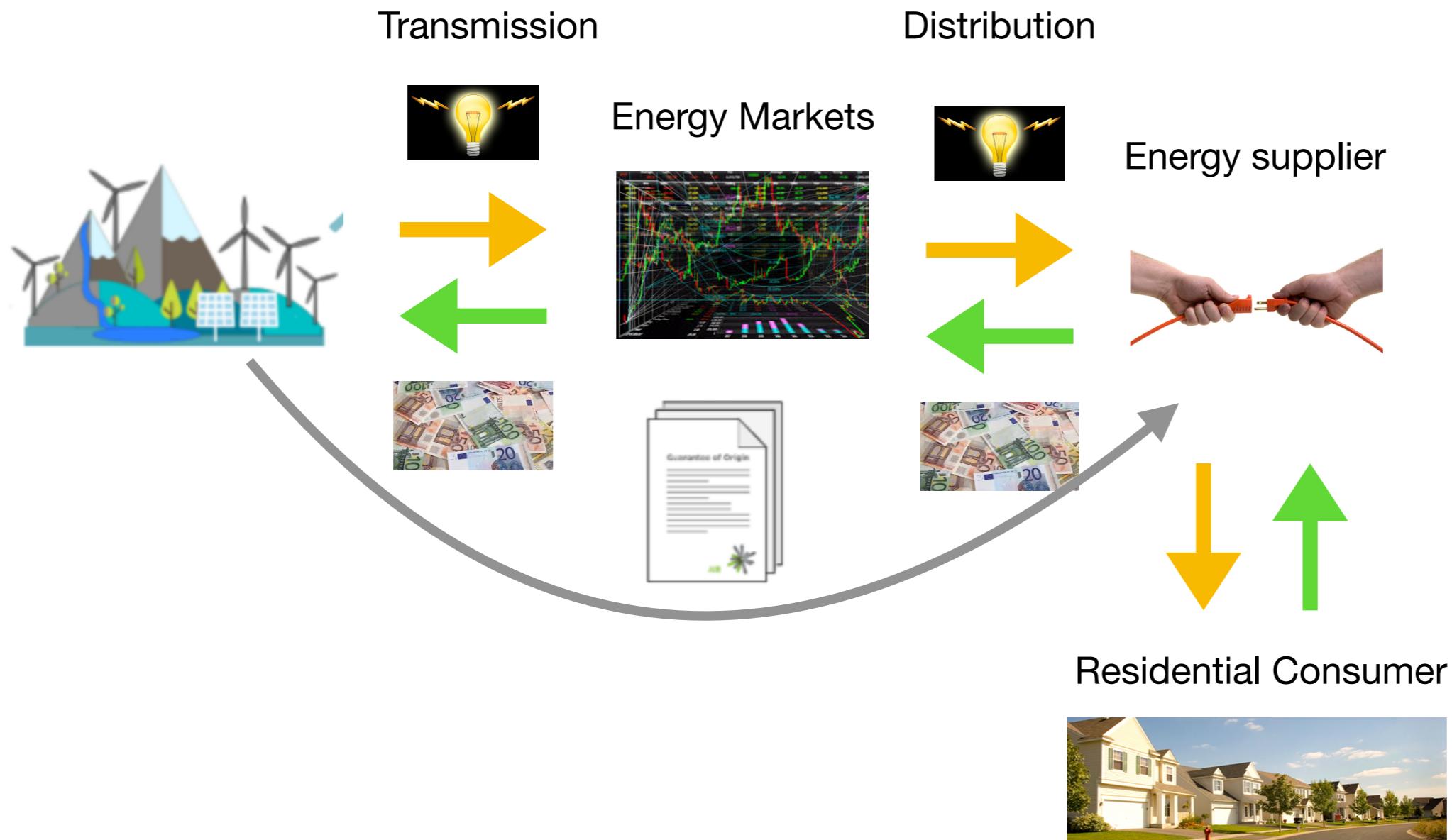
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**Mix « green » to « green » market offer**



# Residential energy supplier

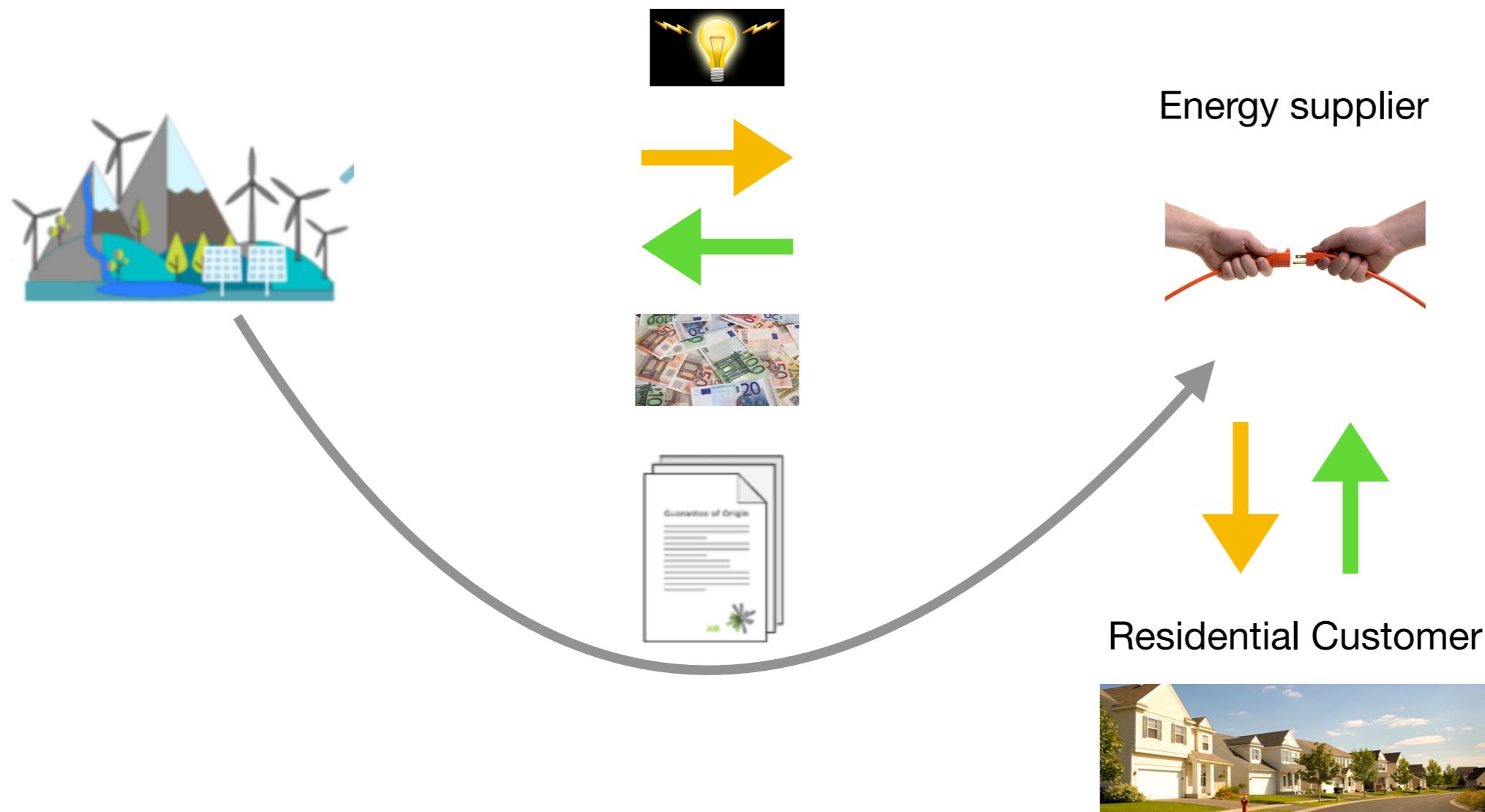
« Green » market offer



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Direct « green » offer

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# Residential energy supplier

## Video summary

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**VIDEO : Les dessous de l'électricité verte.**

# Residential energy supplier

## Small recap

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How an **energy supplier** **builds** a residential electricity offer?

- **direct** to the producer -> money into the pockets of the producer
- **market-based** offer -> money to many market players
- **mix direct - market-based** offer

What is a « **green** » energy offer?

- **Guarantees of Origin (GO)**



**« green » does not mean low carbon footprint !!!**

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To dig the topic on green electricity offer

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References:

- VIDEO : Les dessous de l'électricité verte.
- <https://www.lereveilleur.com/les-dessous-de-lelectricite-verte/>
- <https://www.carbone4.com/wp-content/uploads/2018/12/Publication-Electricite-verte.pdf>

# Residential energy supplier

## Summary

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1. Energy supplier perimeter
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# Residential energy supplier

## Conclusion

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**It is impossible to compare energy suppliers on GOs ...**

Some possible criteria:

- energy mix
- **carbon footprint** of the energy mix
- financial **transparency**
- **Belgian GO** vs GO from other countries, etc
- direct, market-based offer ?
- Etc



**« green » does not mean low carbon footprint !!!**