

Residential energy supplier



Residential energy supplier

Quiz

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

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

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Introduction

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

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
Total		56,4

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
Total		39,8

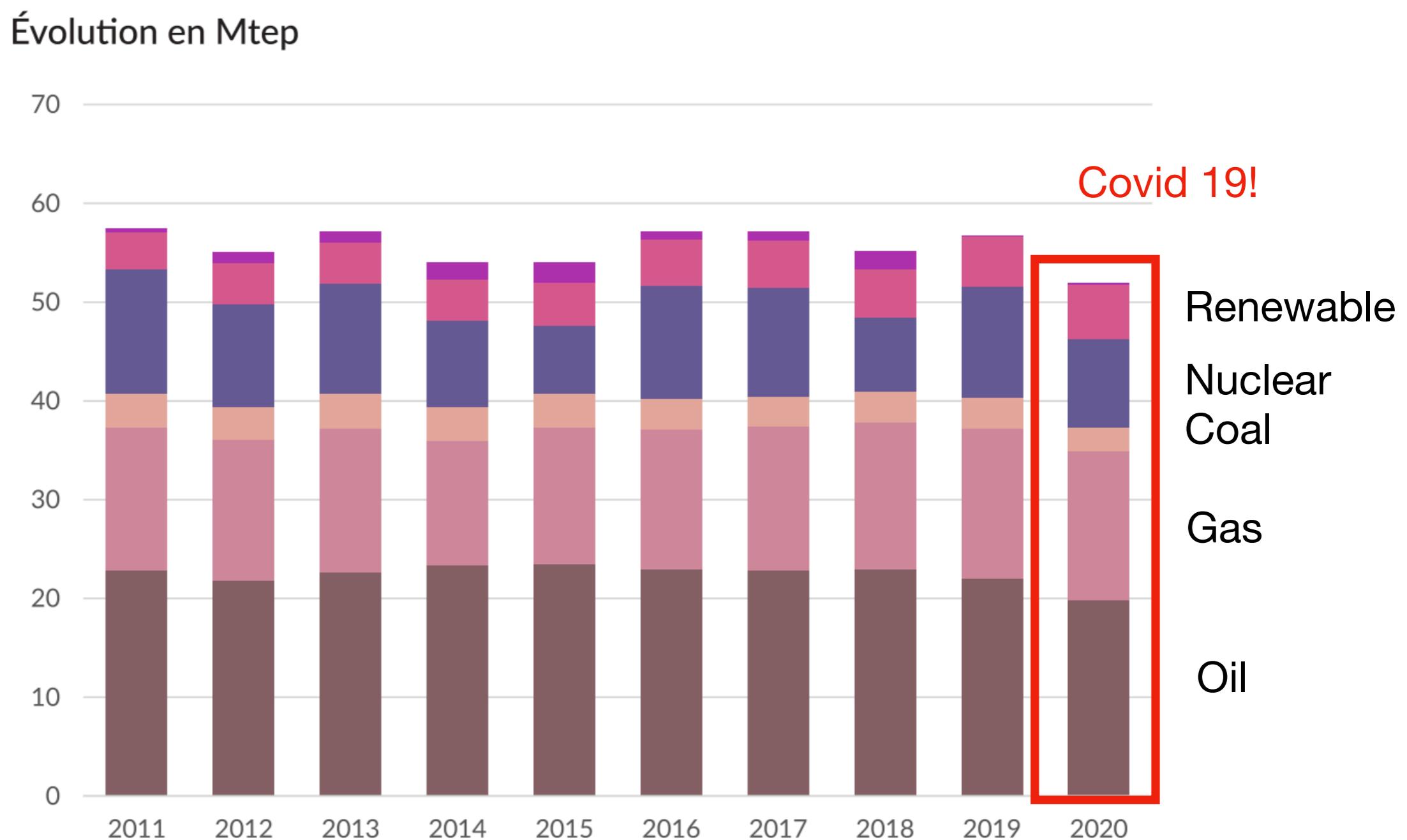
Primary -> Final:
Transport loss & efficiency

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>

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Quiz

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

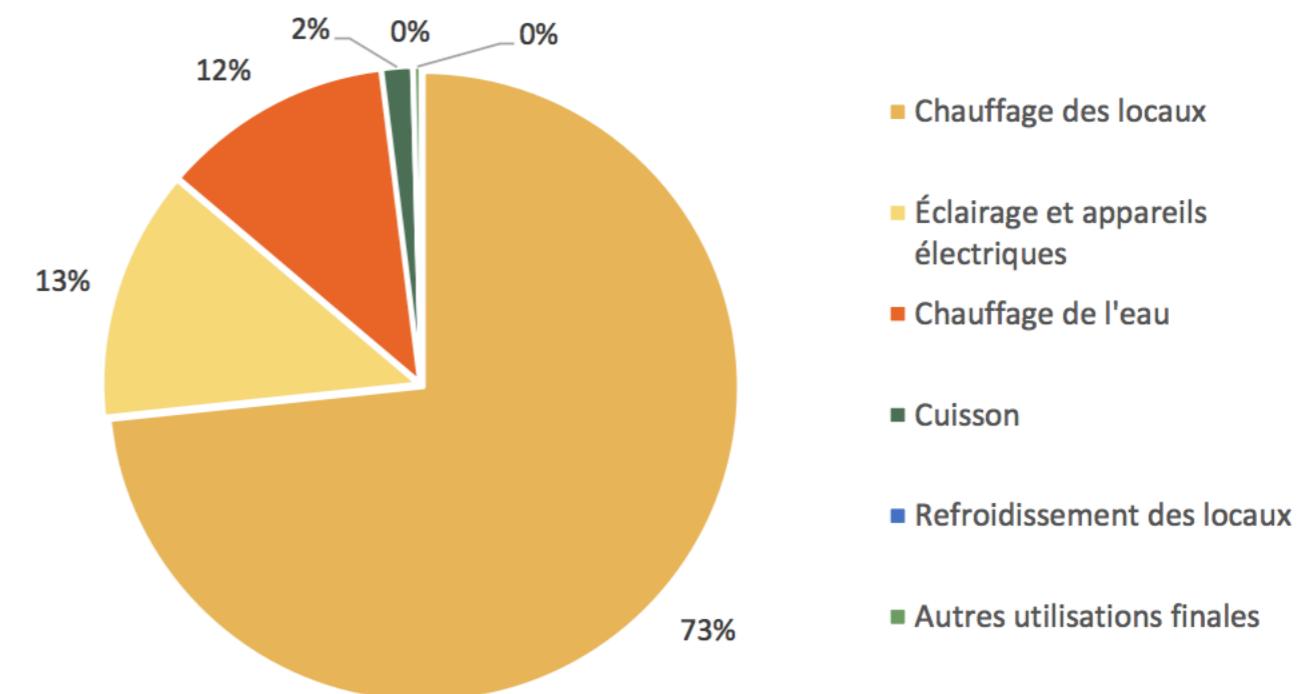
Shares of heat, domestic hot water and electricity in the residential energy consumption?

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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
Total	39,8



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

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

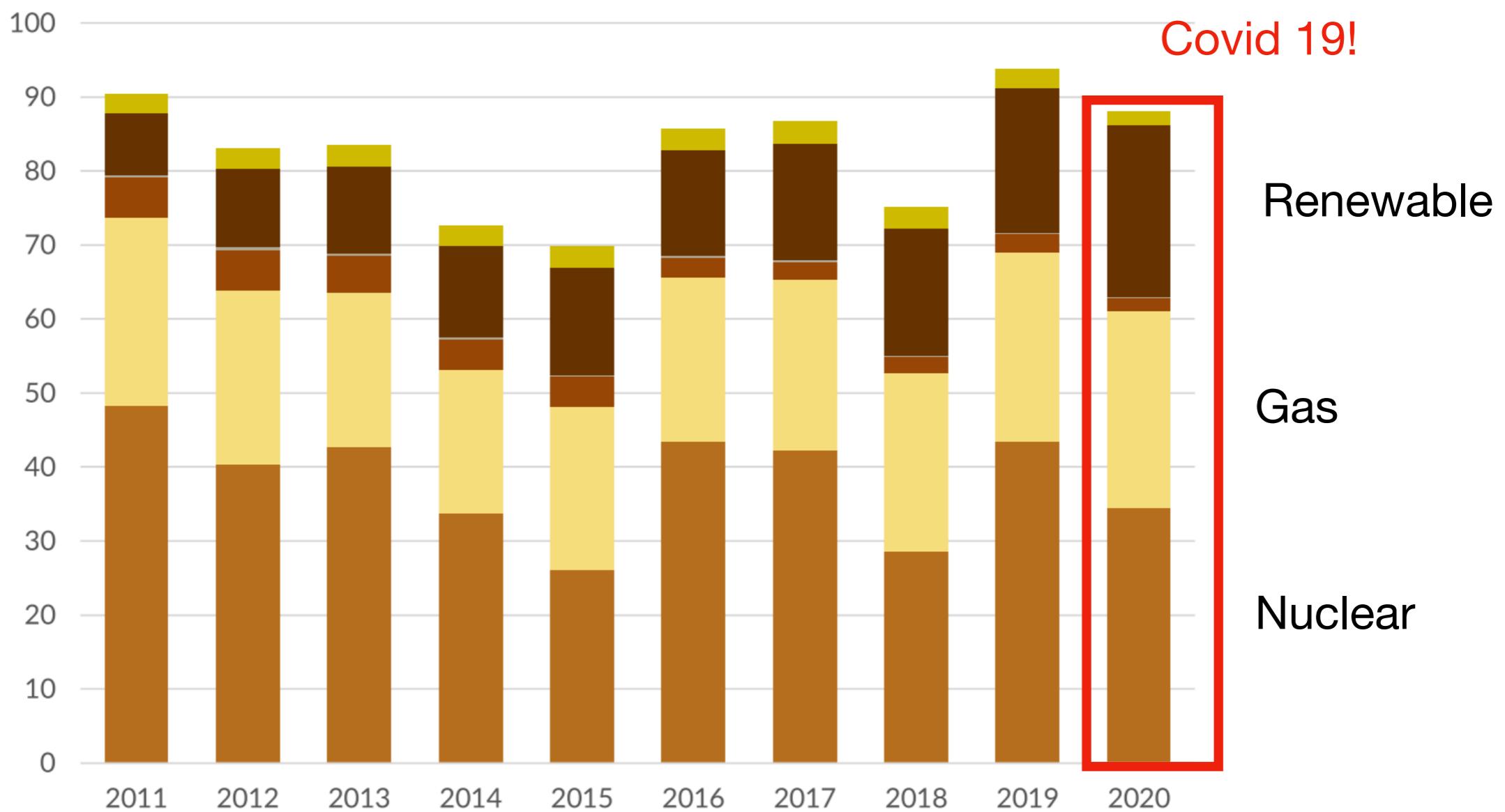
Électricité	TWh
Nucléaire	34,4
Gaz naturel	26,5
Combustibles fossiles solides et gaz sidérurgiques	1,8
Produits pétroliers	0,1
Énergies renouvelables	23,4
Autres sources*	1,8
Total	88,1

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>

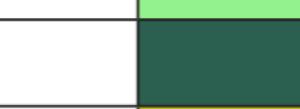
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Shares of wind, PV, hydro, biomass in the electricity production?

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Belgian electricity from renewable energies

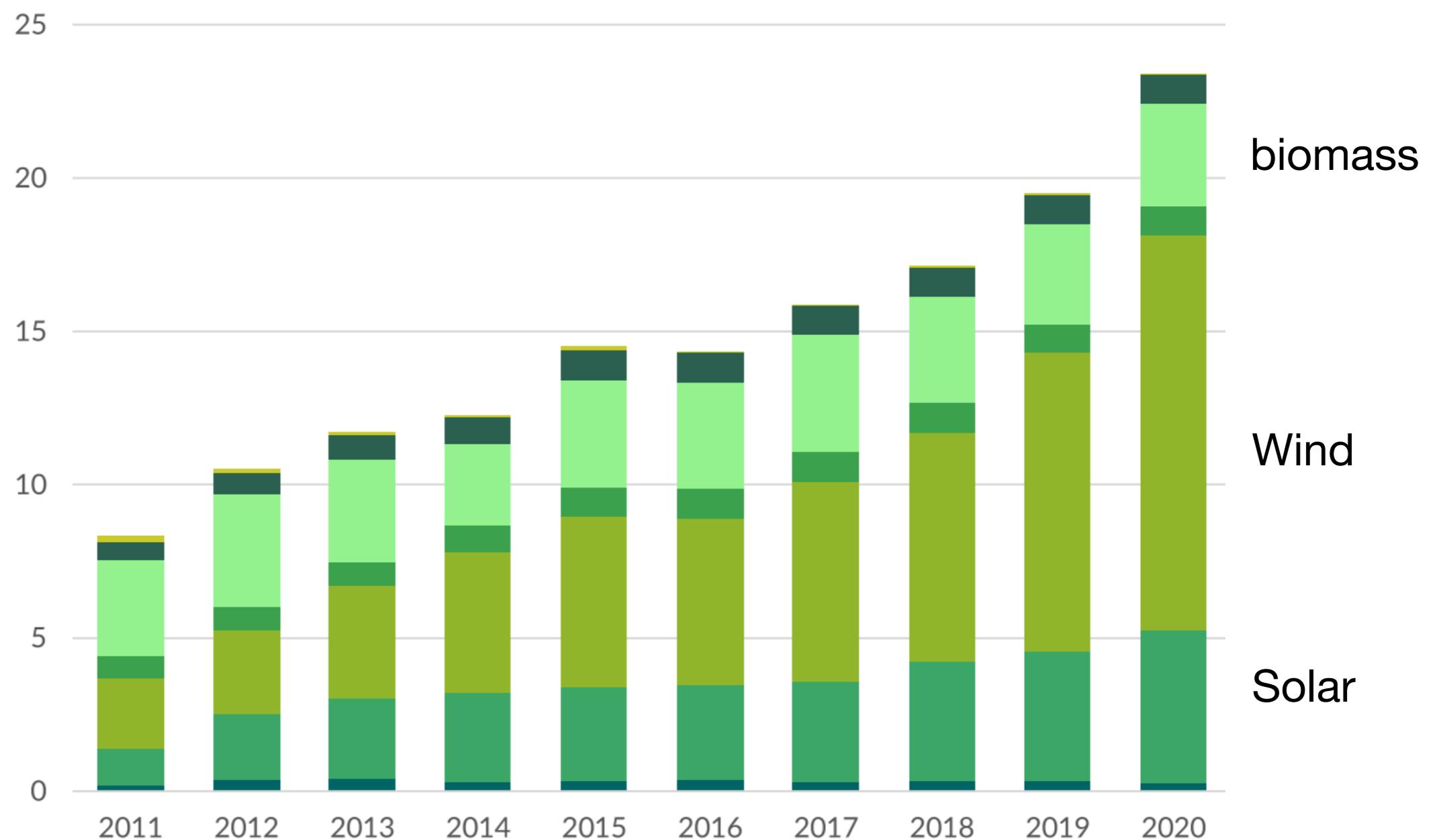
Électricité		TWh
Hydraulique hors pompage		0,3
Solaire		5,0
Éolien		12,9
Déchets urbains renouvelables		1,0
Biomasse solide		3,3
Biogaz		1,0
Biomasse liquide		0,0
Total		23,4

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>

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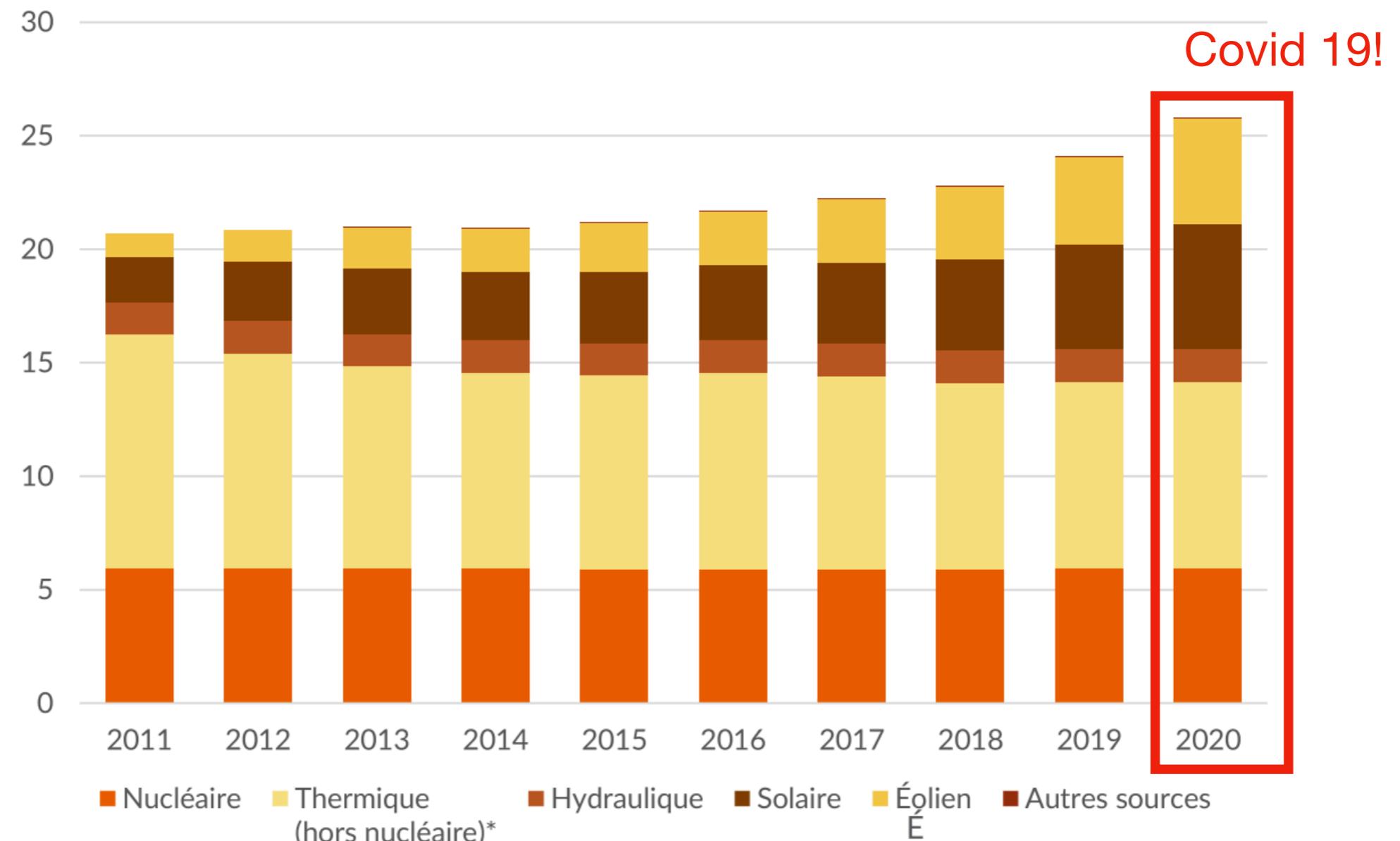
Quiz

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

What are the types of energy imported?

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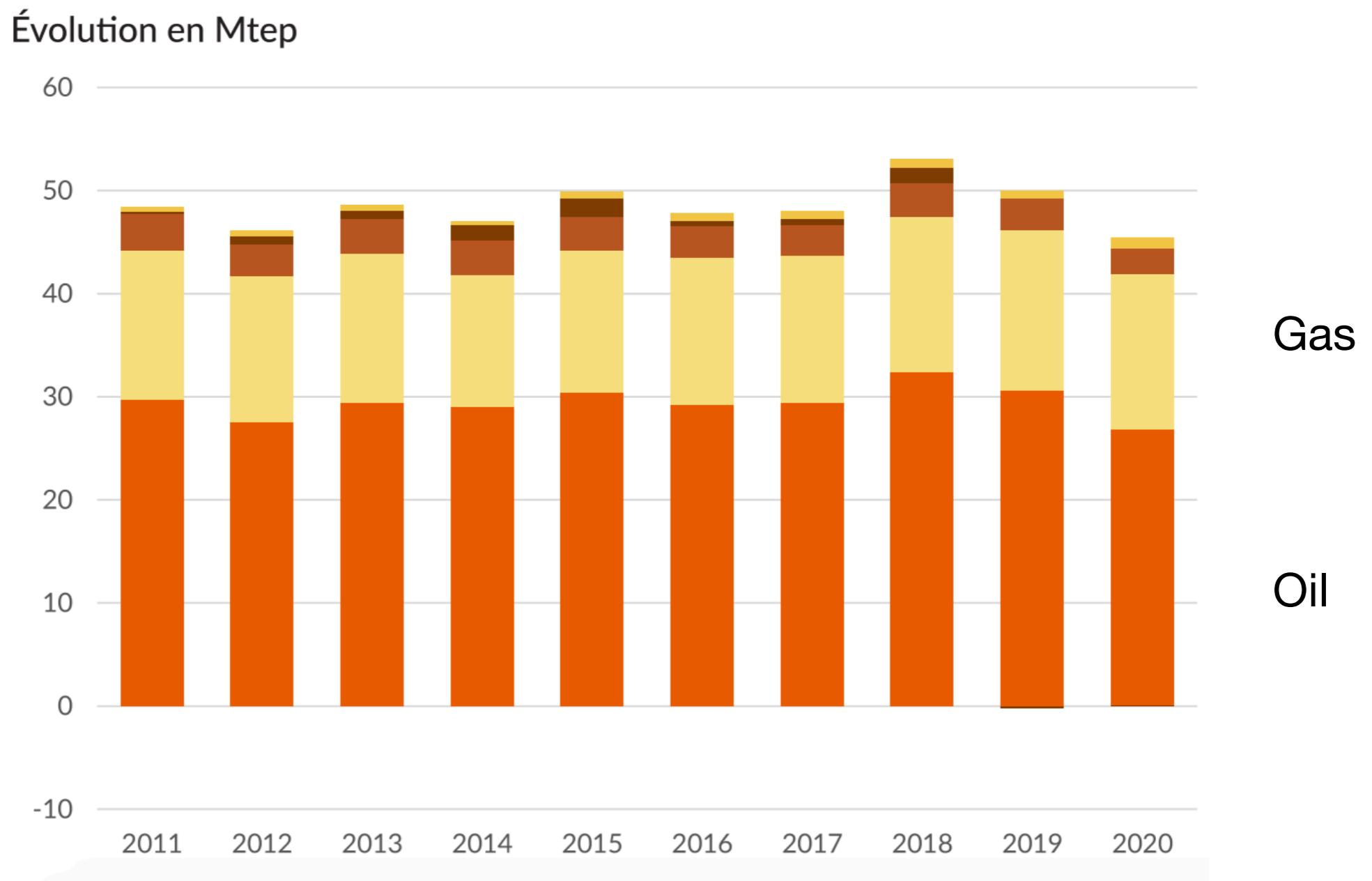
Belgian net energy import 2020

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
Total	45,4

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>

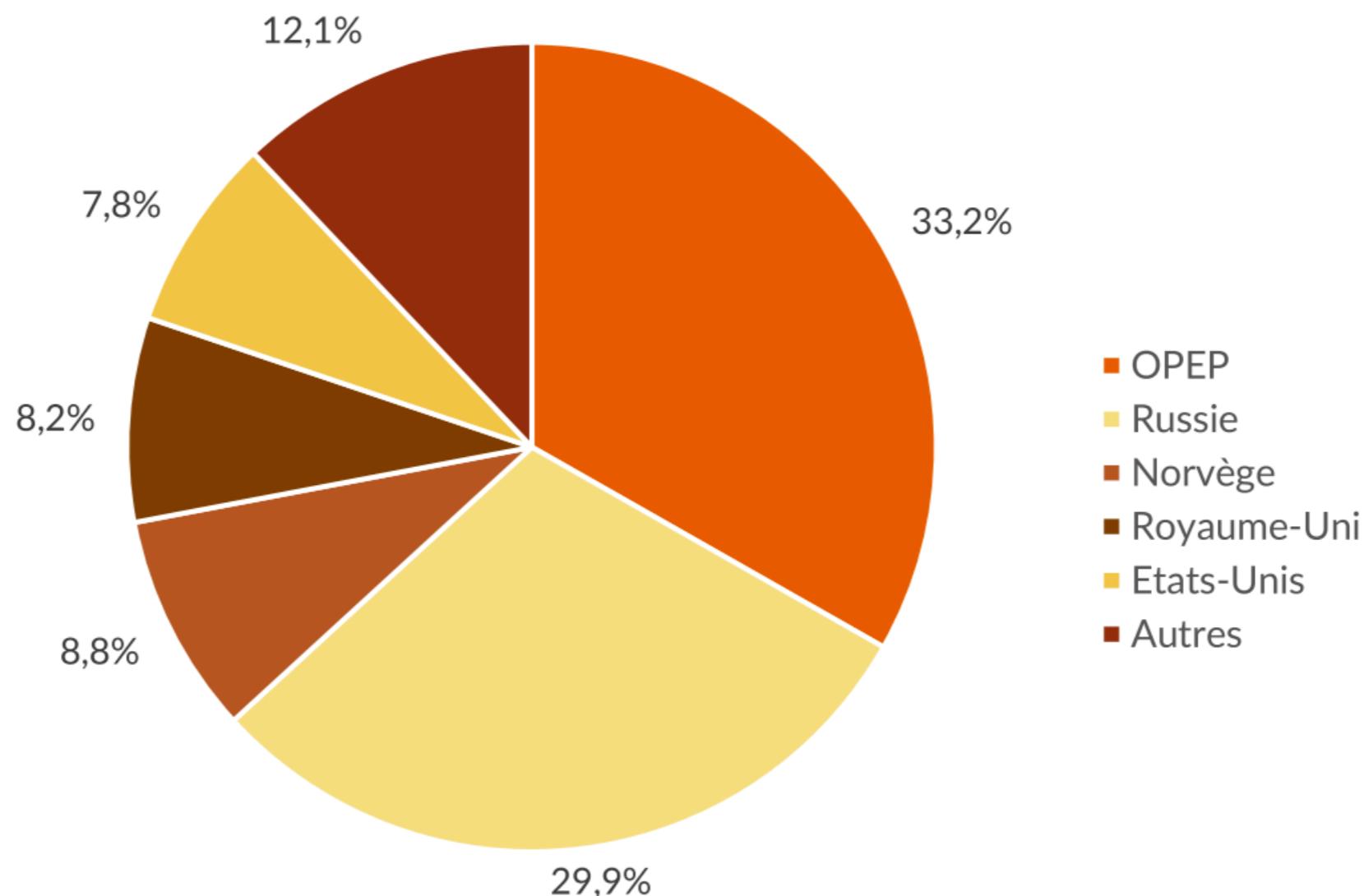
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Quiz

What are the main origins of the oil imported?

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Oil origin import 2020



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

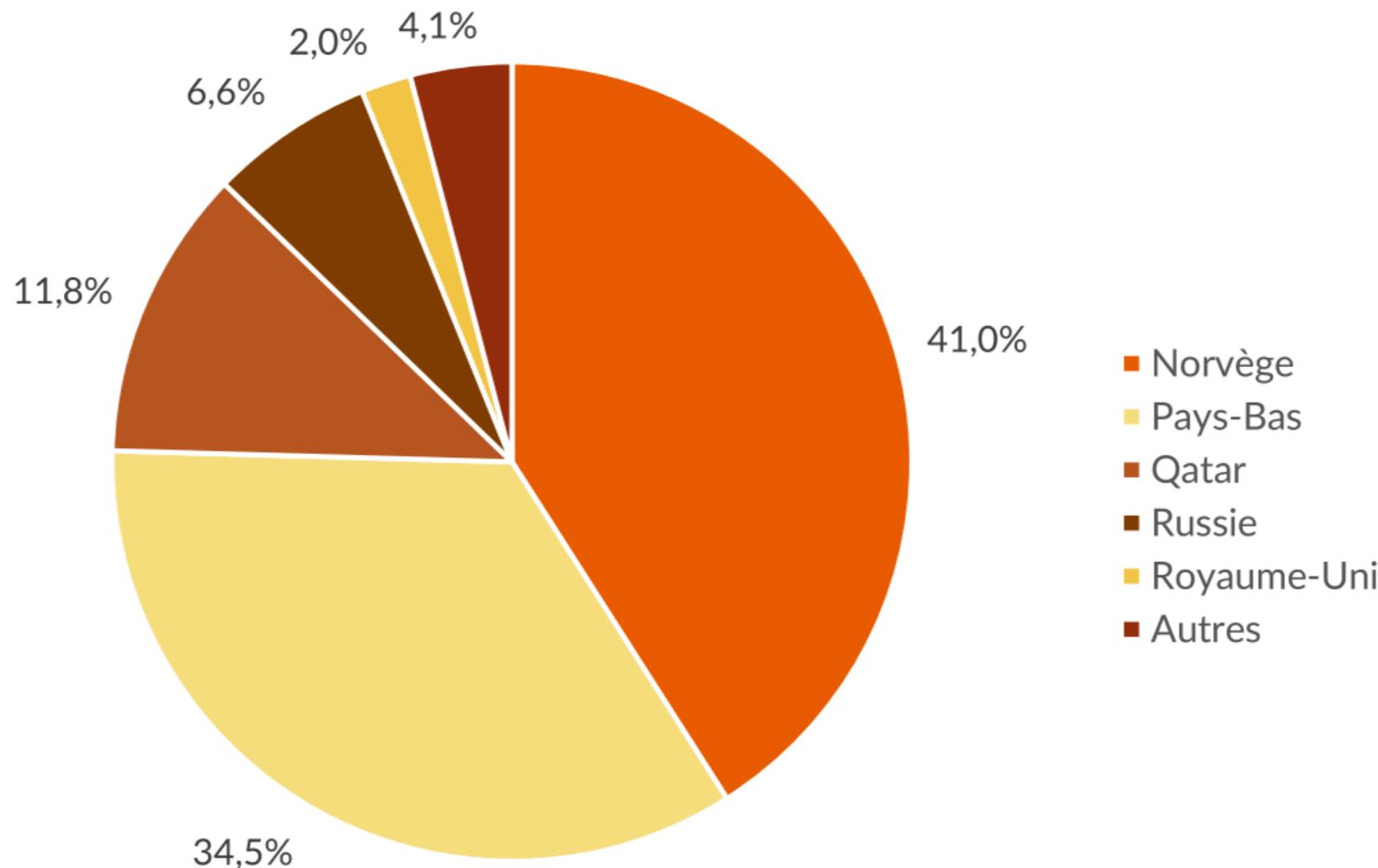
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Quiz

What are the main origins of the natural gas imported?

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Gas origin import 2020



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

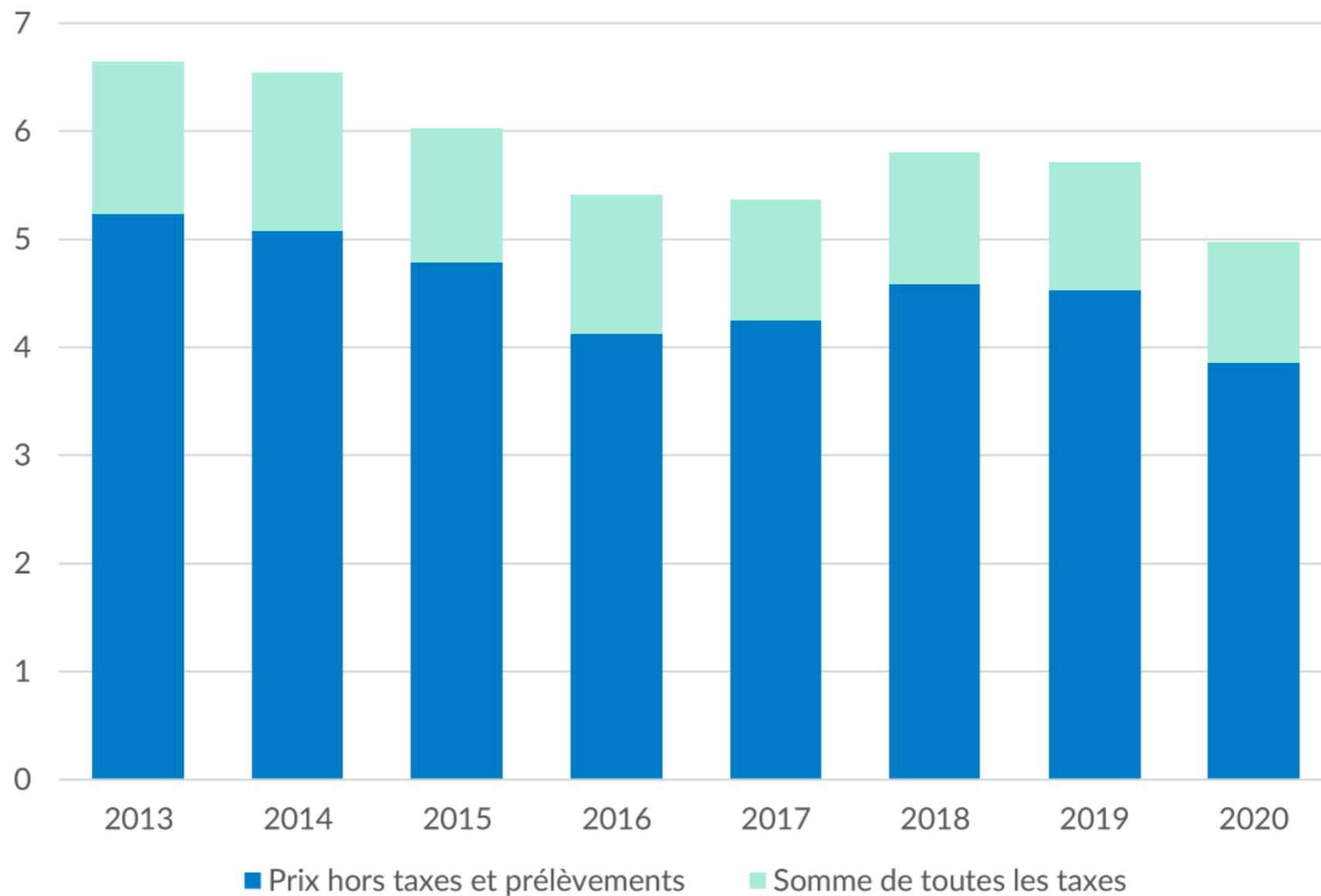
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Quiz

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>

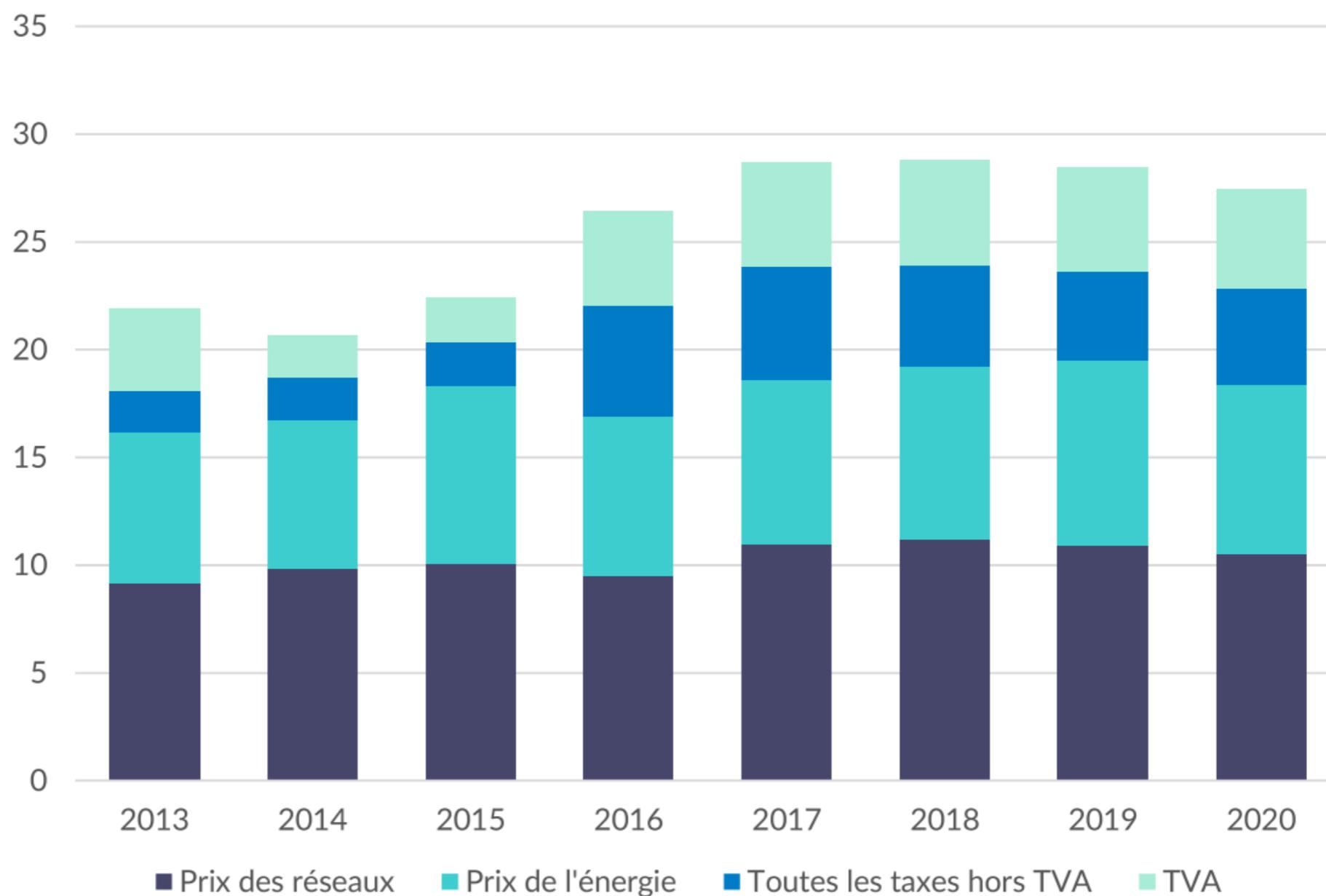
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Quiz

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: calendar gas price

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

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Calendar gas prices: monthly average



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

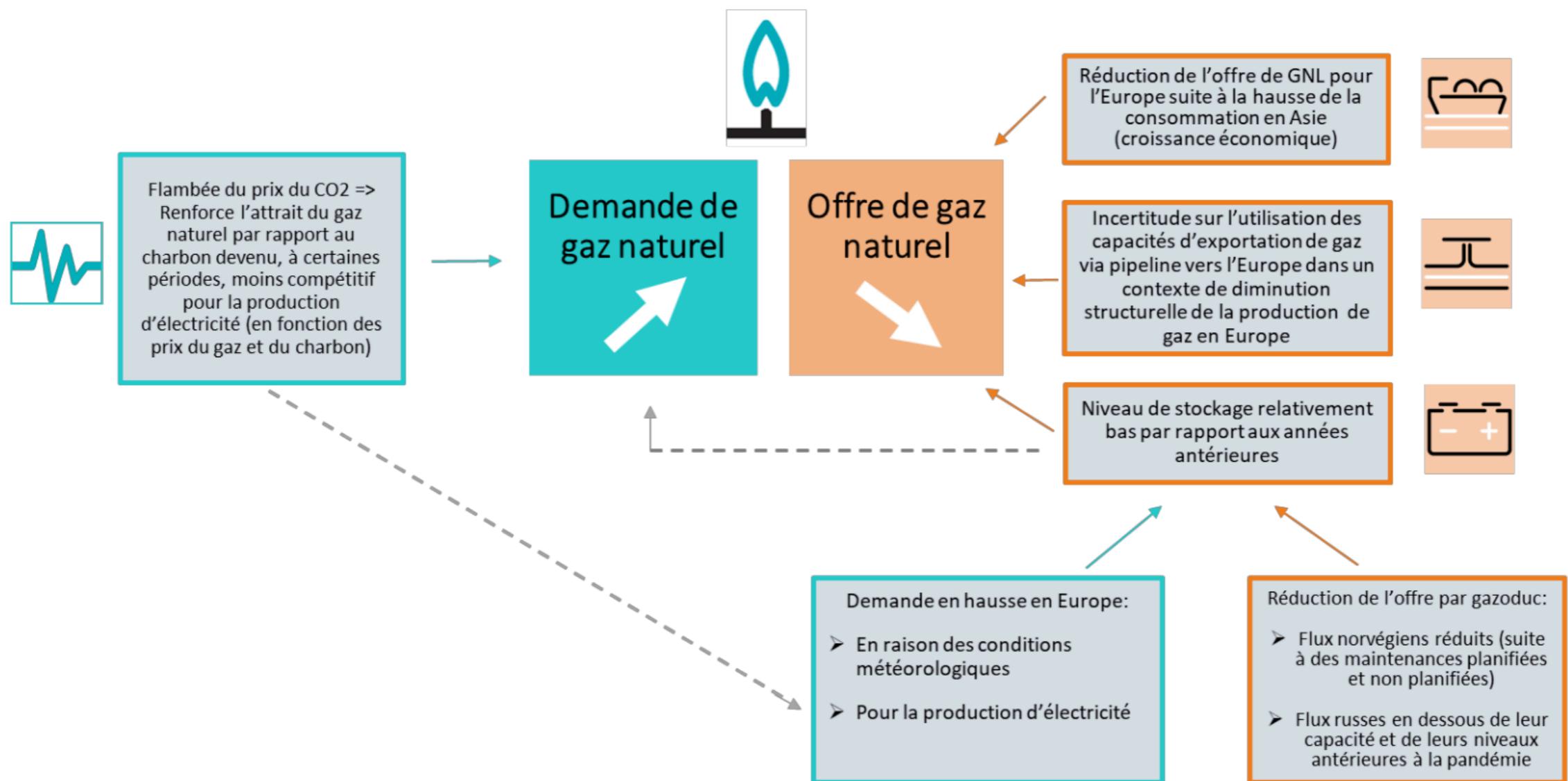
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Quiz

Why is the future gas price soaring?

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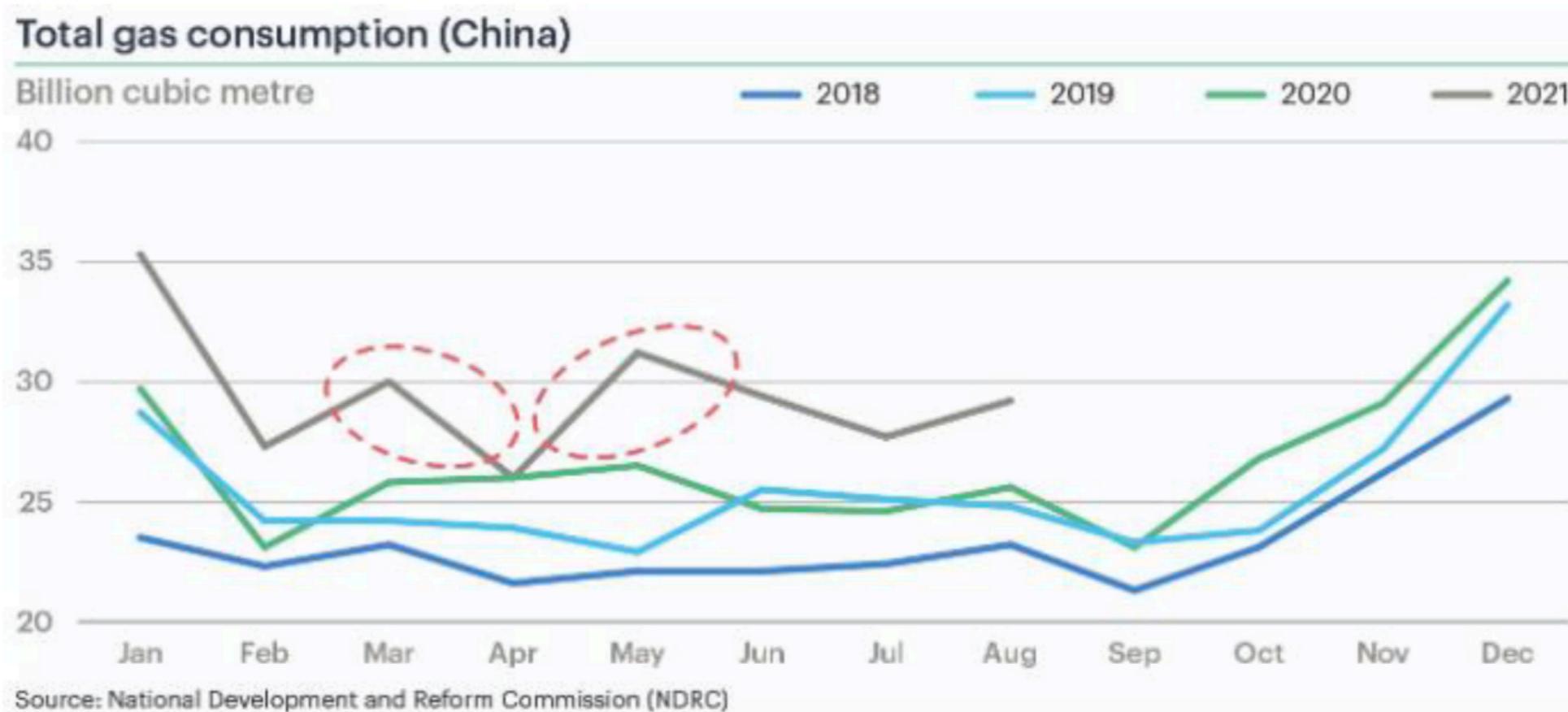
Key factors of the increase of the gas price on the future market



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

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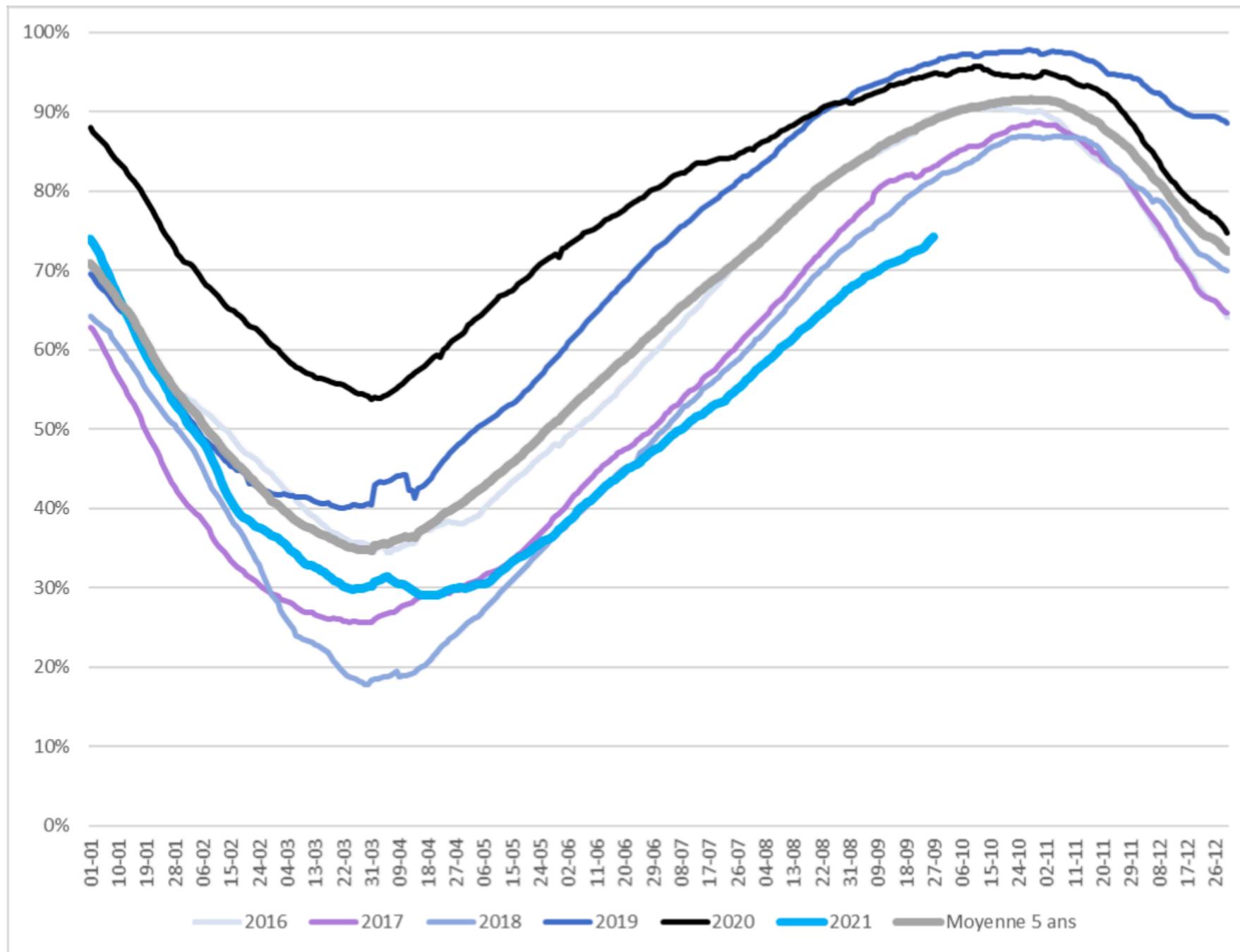
Increase of the China gas consumption



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

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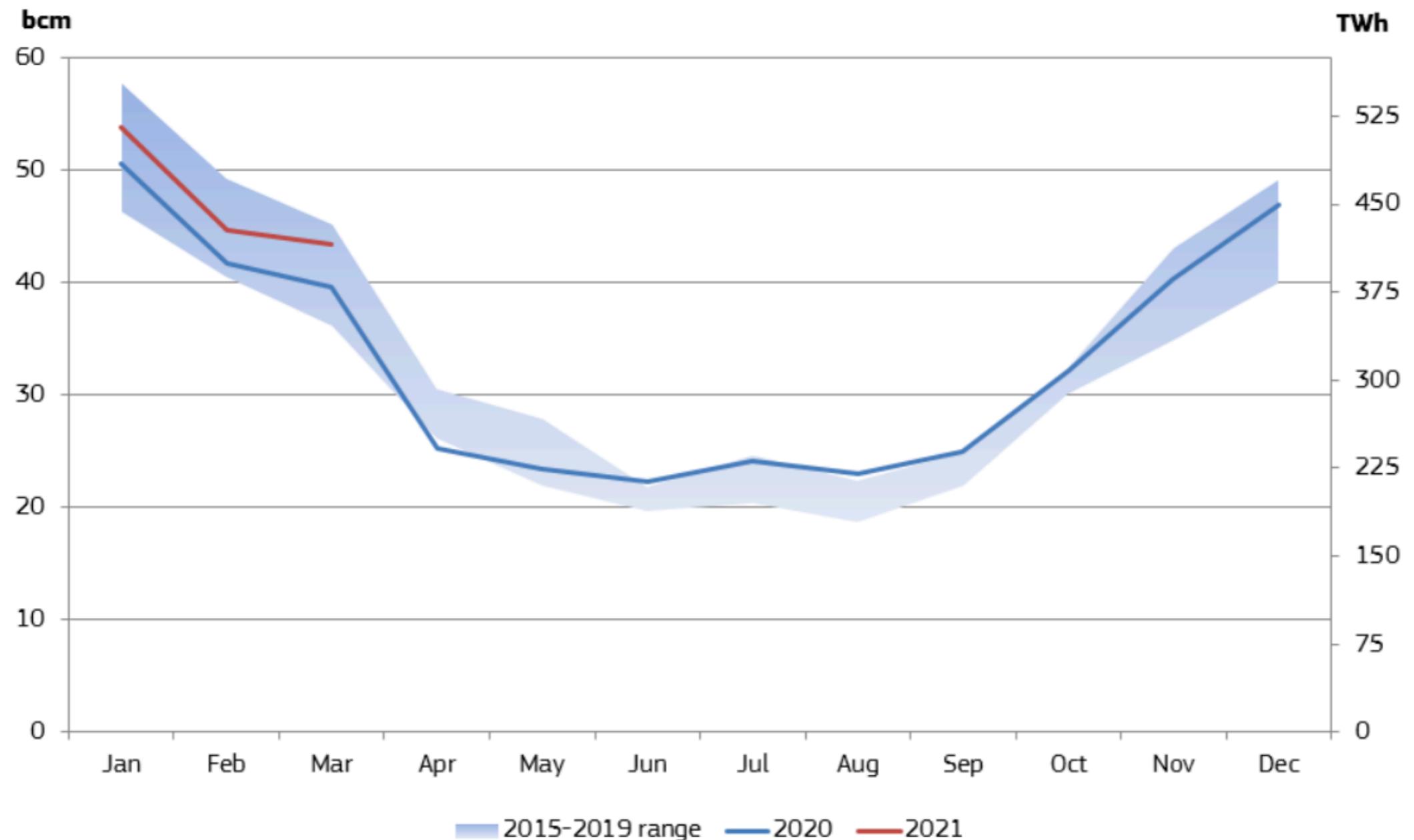
Evolution of the filling rate of the storage facilities in UE



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

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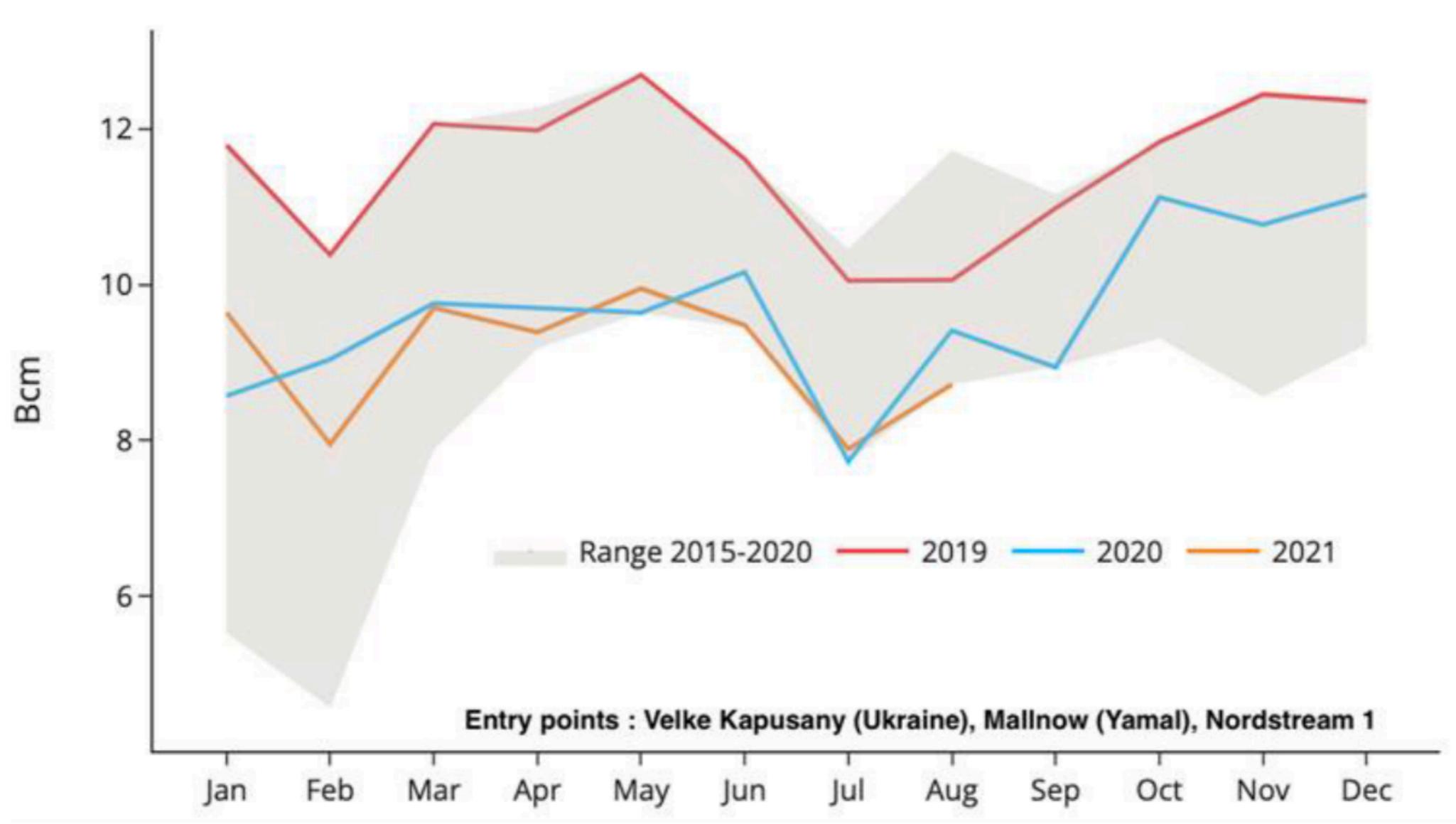
UE gas consumption



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

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Russian gas exports to western europe



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

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Medium and long term perspectives

Medium-term (5-10y):

- gas price should reach a normalized level in summer 2022
 - Gas demand should remain consequent in the coming decade and even increase
 - Gas European reserves are decreasing
 - Russian exports are uncertain (political issues)
 - UE is dependent on the Asia demand
- > these factors should drive the gas price to a high level

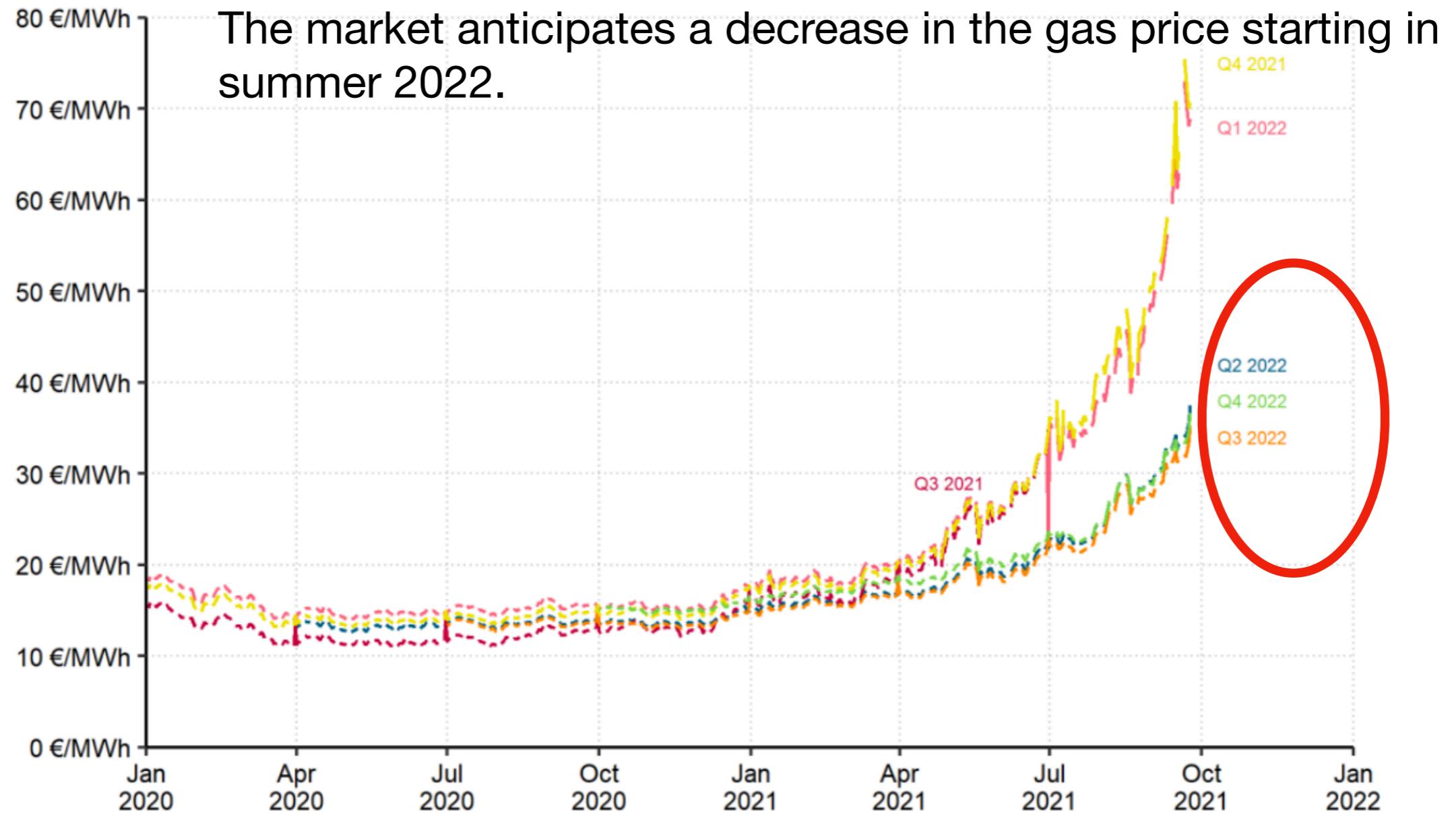
Long term (30y):

- UE should phase out from fossil energies (2050 neutral carbon target)
 - UE gas demand should decrease
- > the UE gas price should decrease

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

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Calendar gas prices: monthly average



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

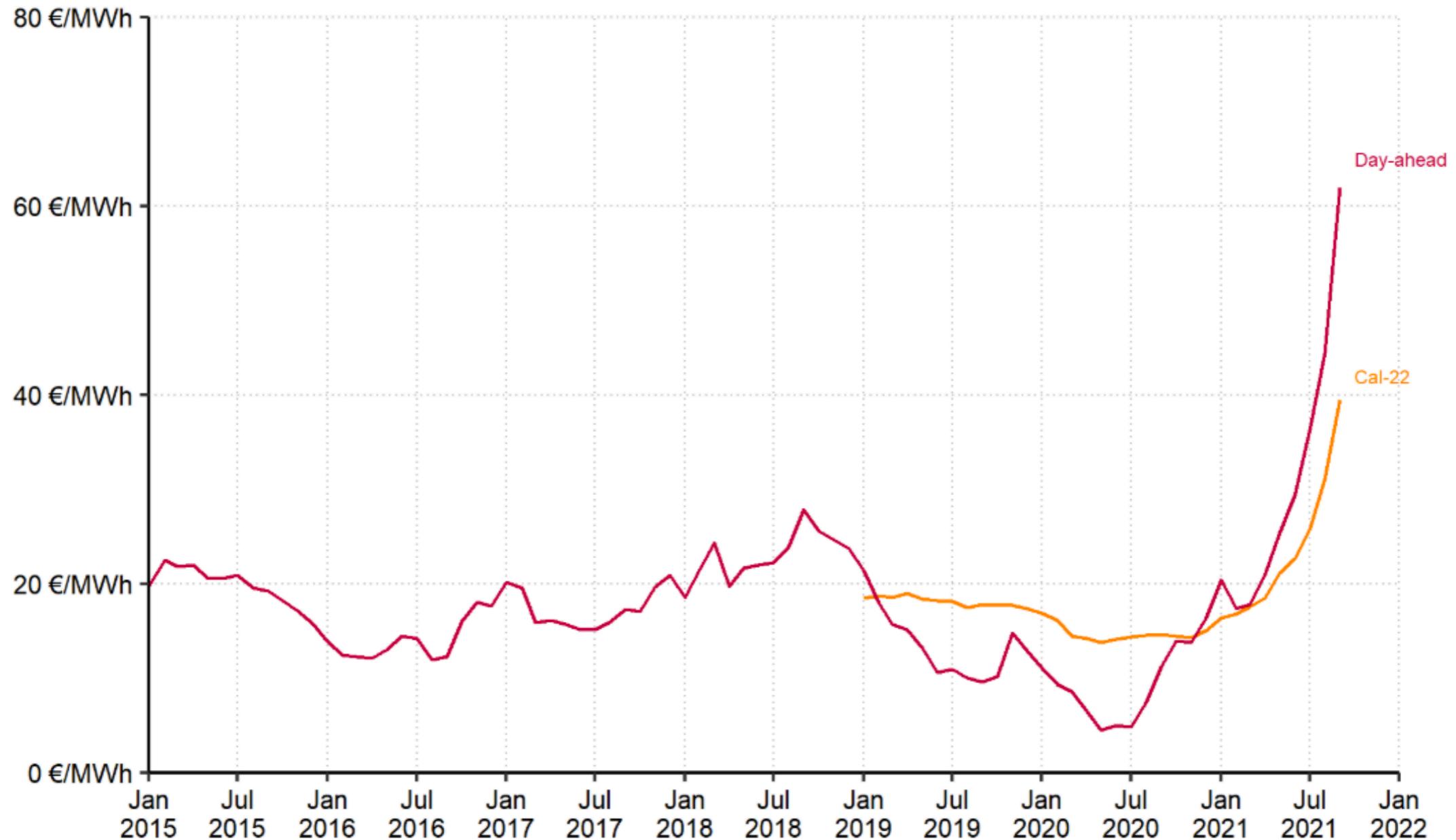
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Quiz: day-ahead gas price

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



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

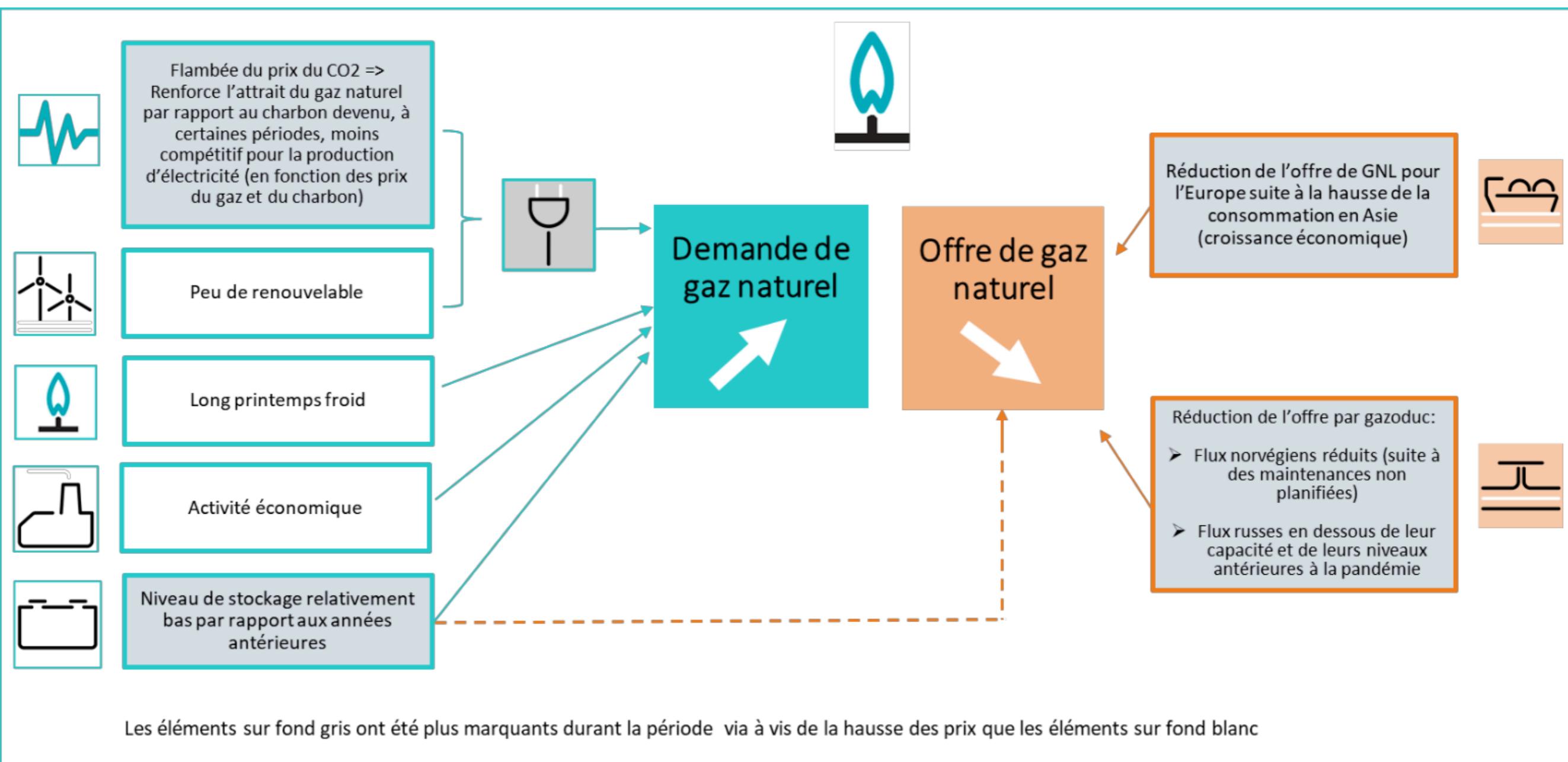
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Quiz

Why is the day-ahead gas price soaring?

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Key factors of the increase of the day-ahead gas price



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

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Quiz

What about the calendar electricity price?

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Evolution of the calendar electricity price



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

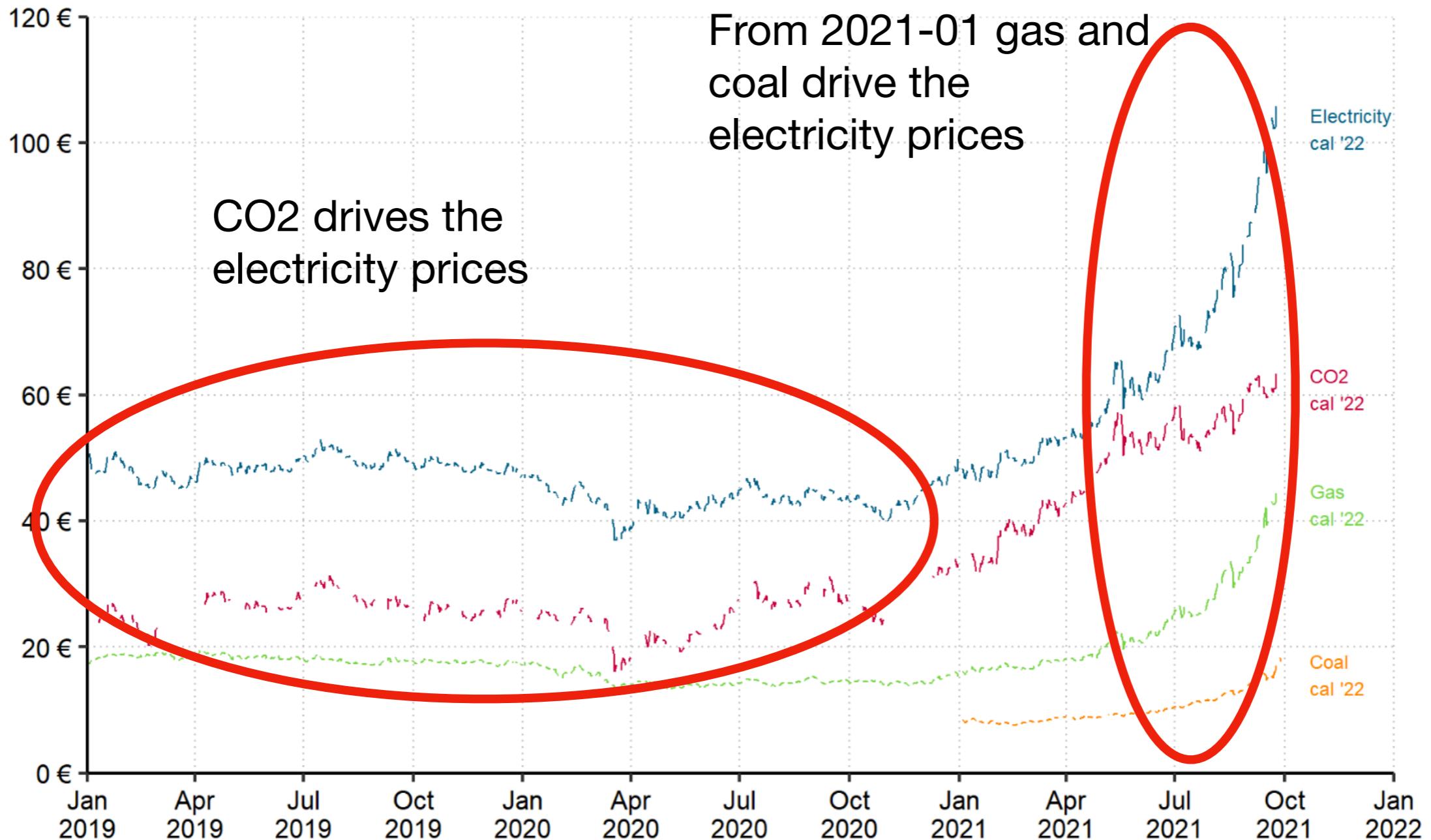
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Quiz

Why are the electricity future prices soaring?

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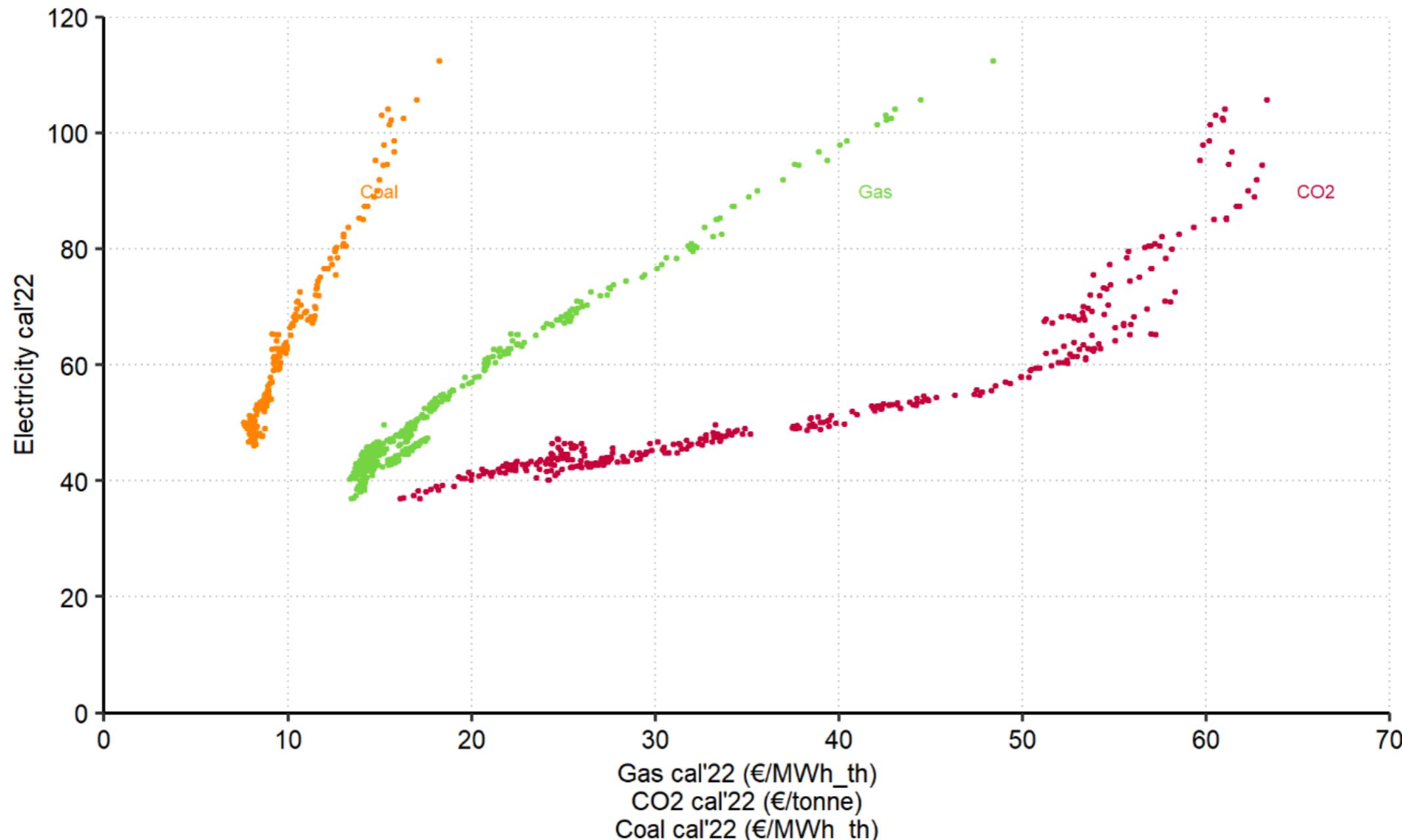
Electricity, gas, CO2, and coal calendar 22 prices



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

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Correlations between electricity, gas, CO2, and coal calendar 2022 prices



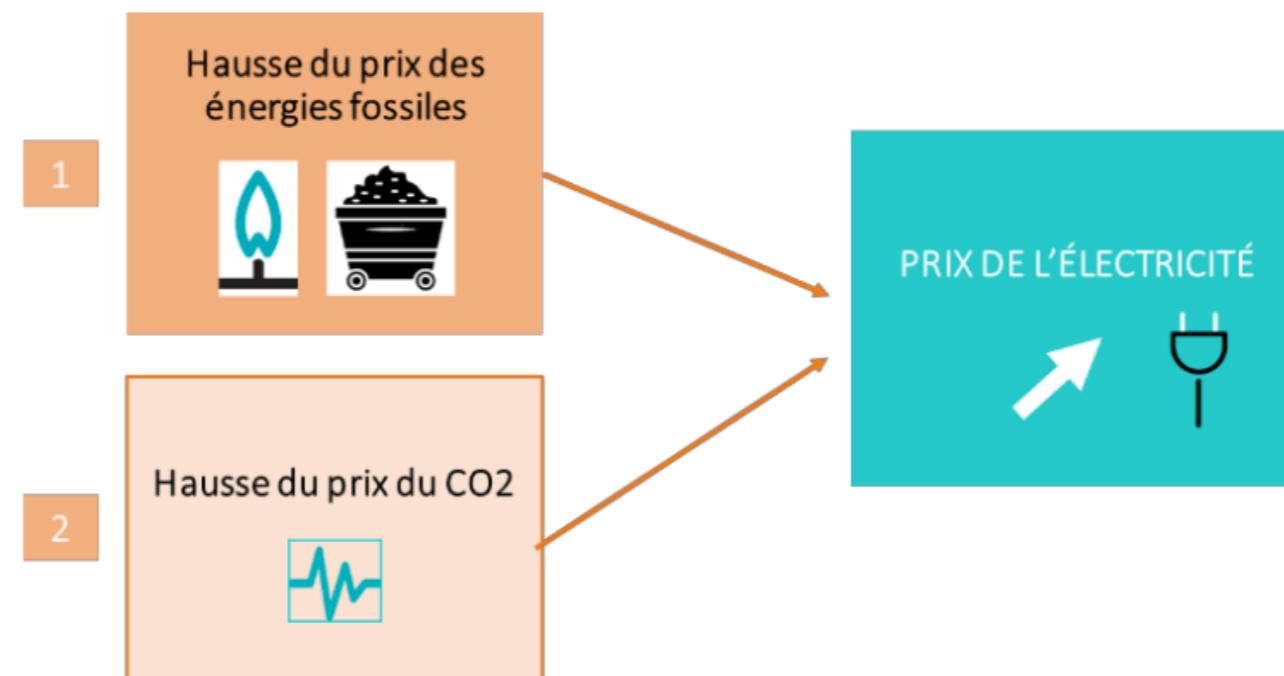
Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

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Key factors of the increase of the future electricity price

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

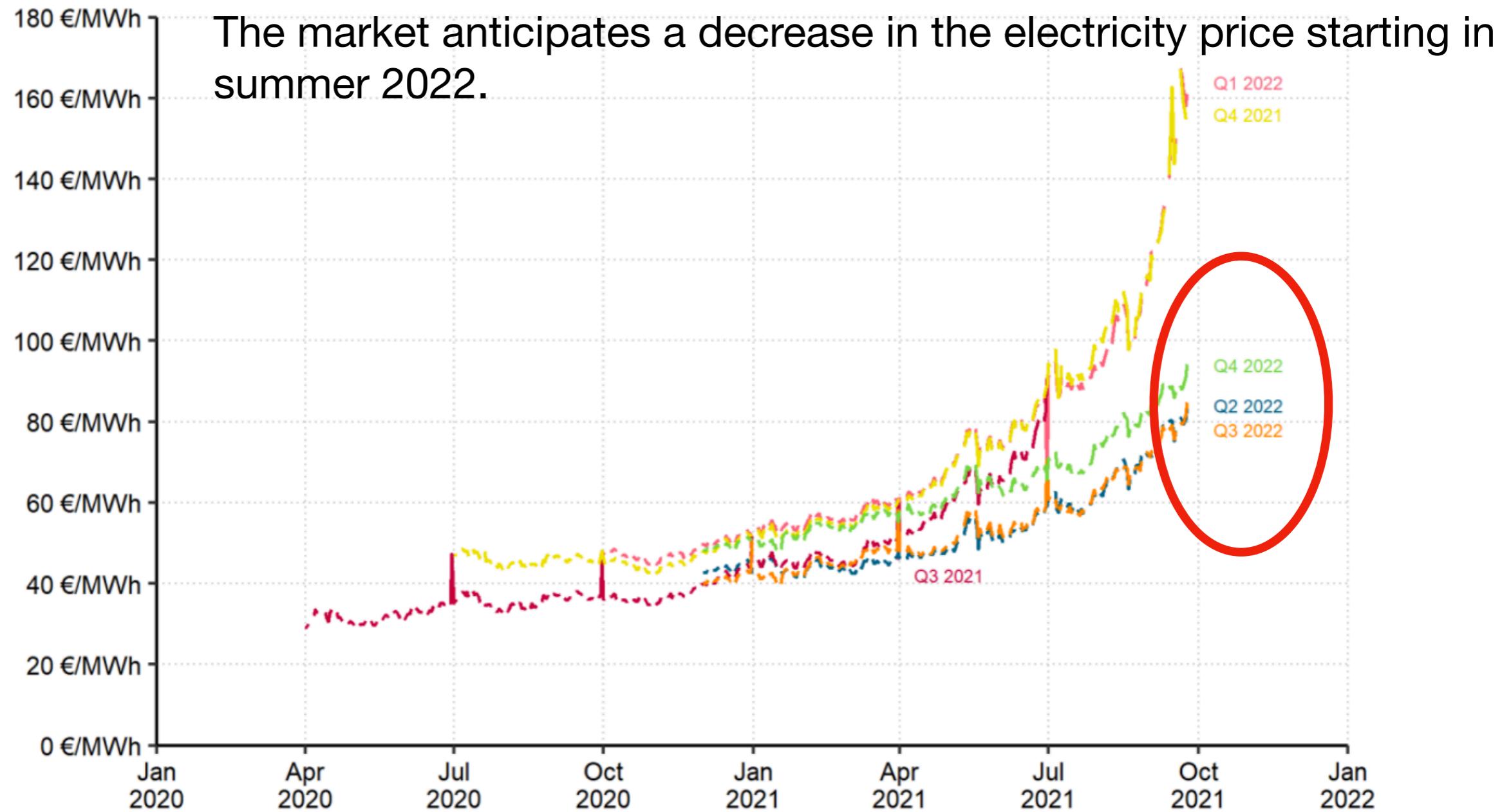
-> the clearing price is related to the **cost of the last kWh produced**,
most of the time produced by a coal or a gas power plant....



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

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Key factors of the increase of the future electricity price



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

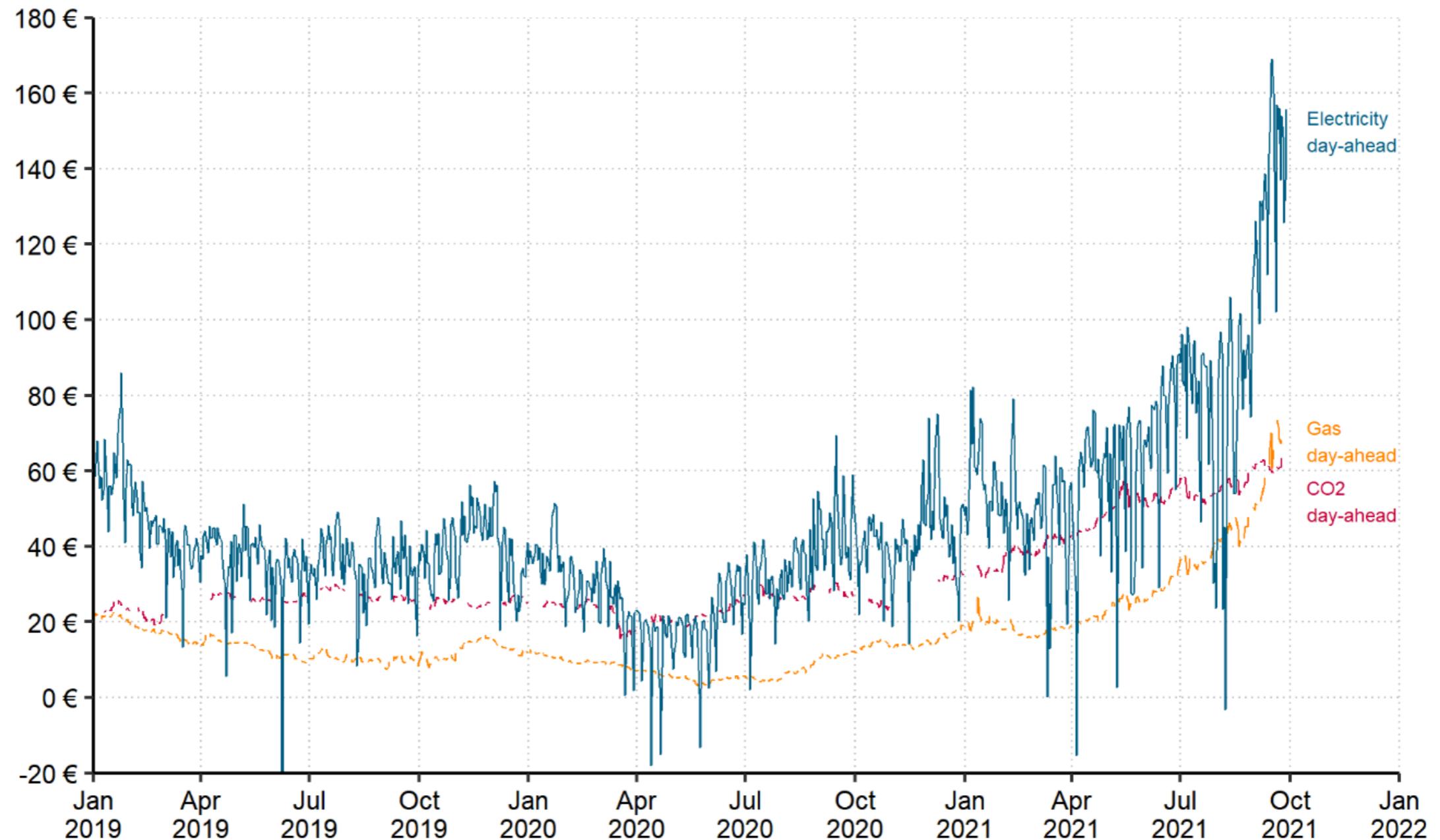
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Quiz

What about the day-ahead electricity price?

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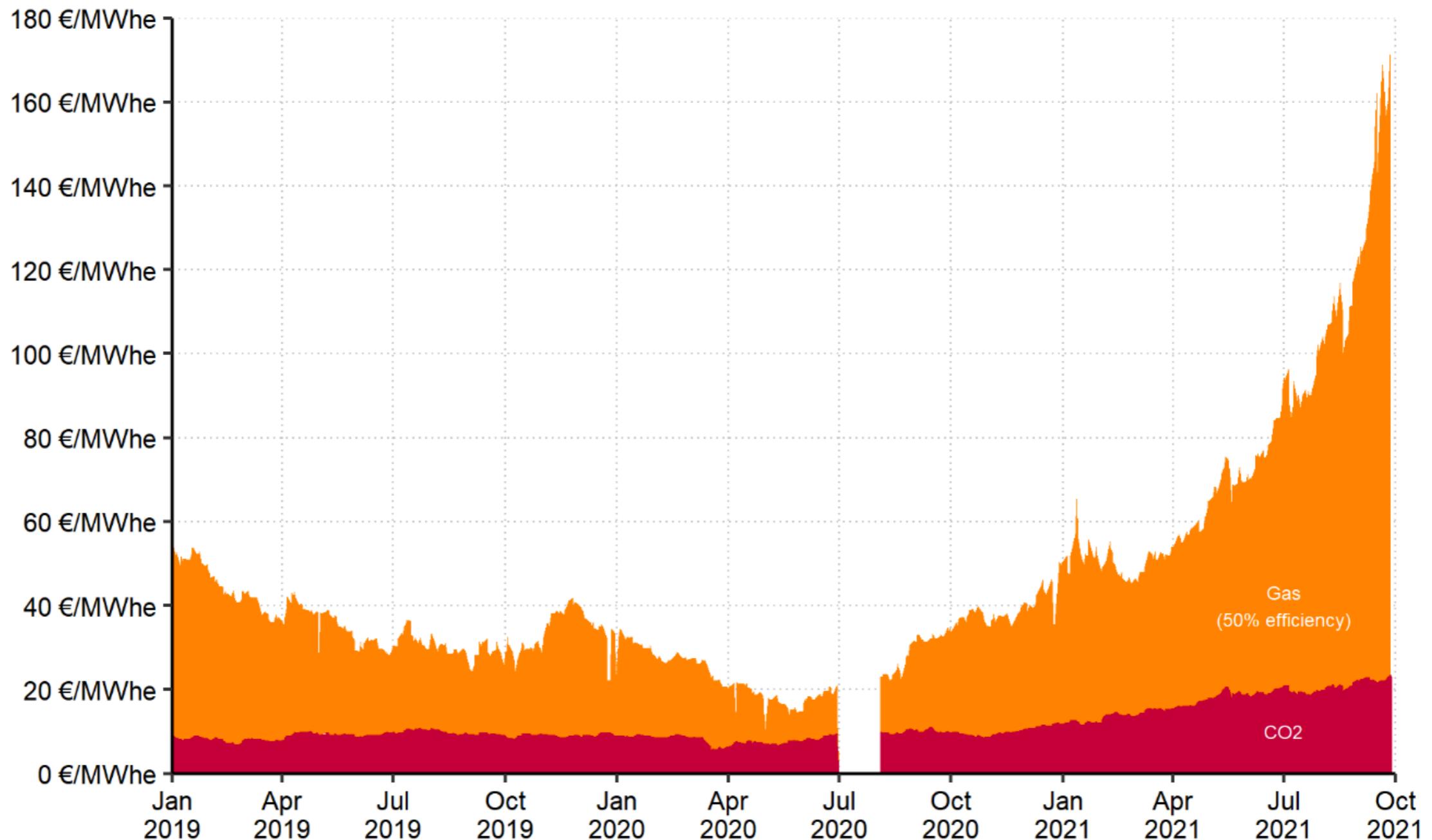
Evolution of the day-ahead electricity price



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

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Evolution of the variable cost of a gas power plant



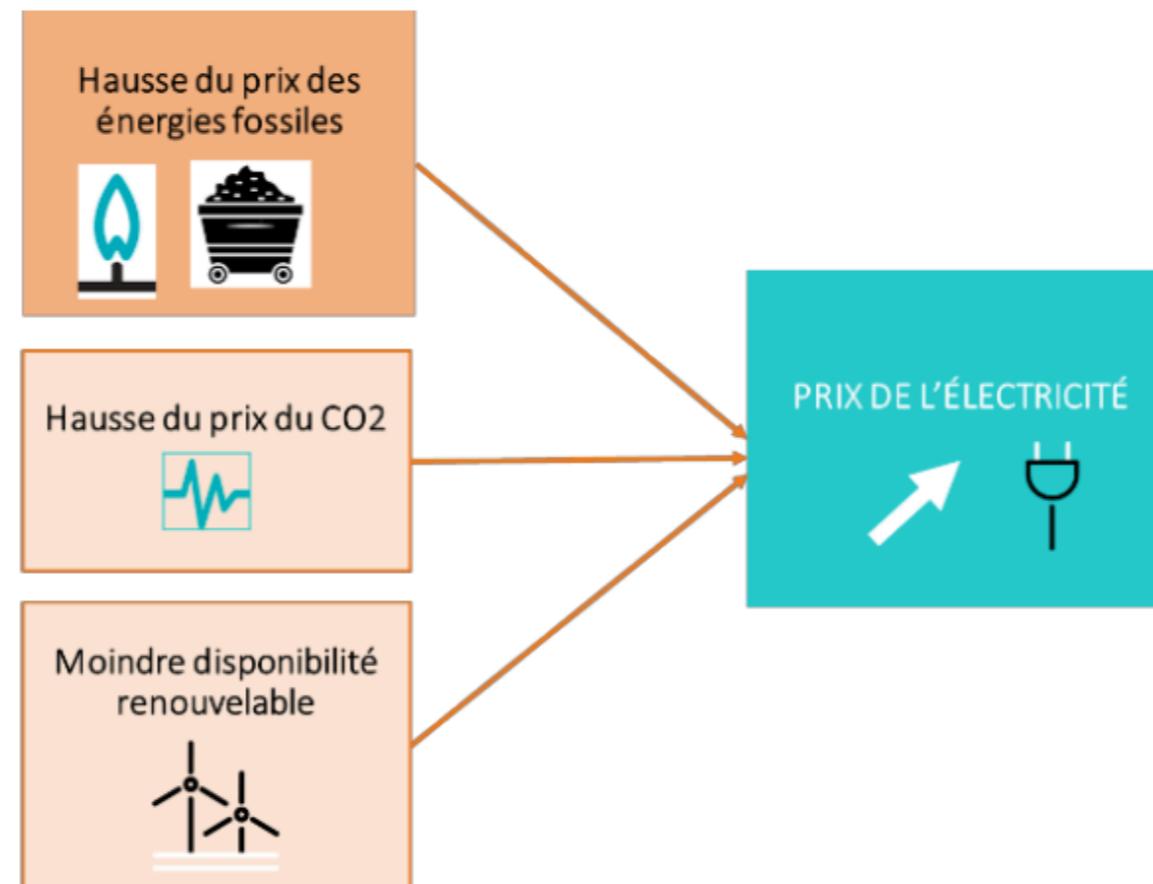
Source: CREG <https://www.creg.be/fr/publications/etude-f2289>

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Key factors of the increase of the day-ahead 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>

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Quiz

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

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Quiz: answer

Residential consumers with fixed price:

- 68% electricity
- 64% gas

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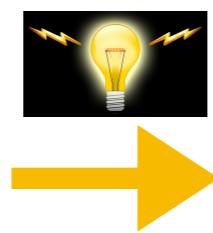
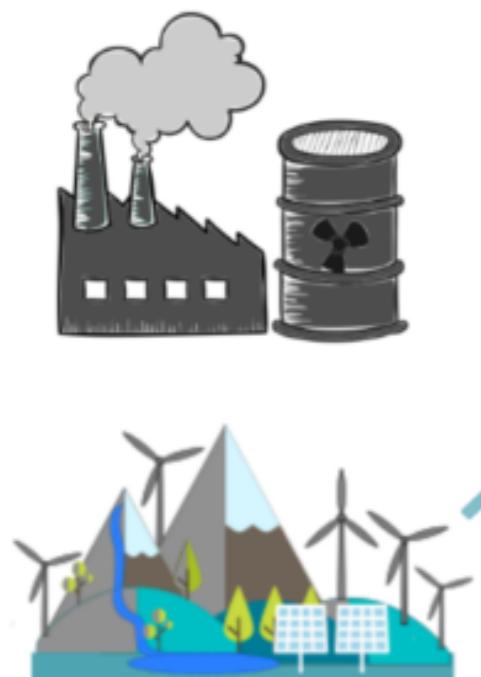
Quiz

Do you know the energy key market players?

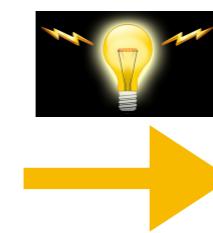
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Context: What are the energy market players ?

Energy producers



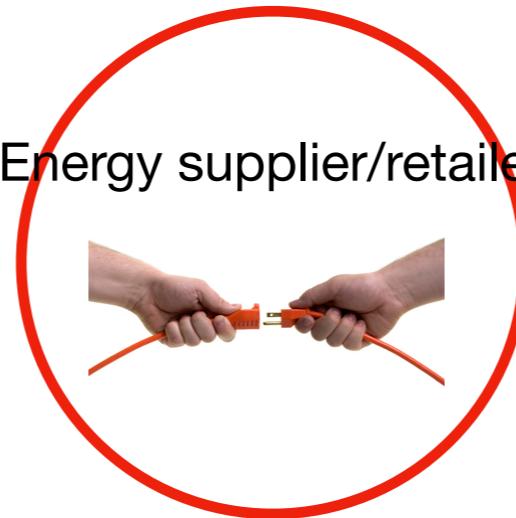
TSO / DSO



Residential customers (small)



Energy supplier/retailer



Industrial customers (large)



Regulator CREG

Commission for Electricity and Gas Regulation



Politie Police



Market operator: EEX, EPEXSPOT

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Context: What are the energy market players ?



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

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Goals

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

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

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Quiz

What are the main missions of an energy supplier?

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Energy supplier perimeter

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>

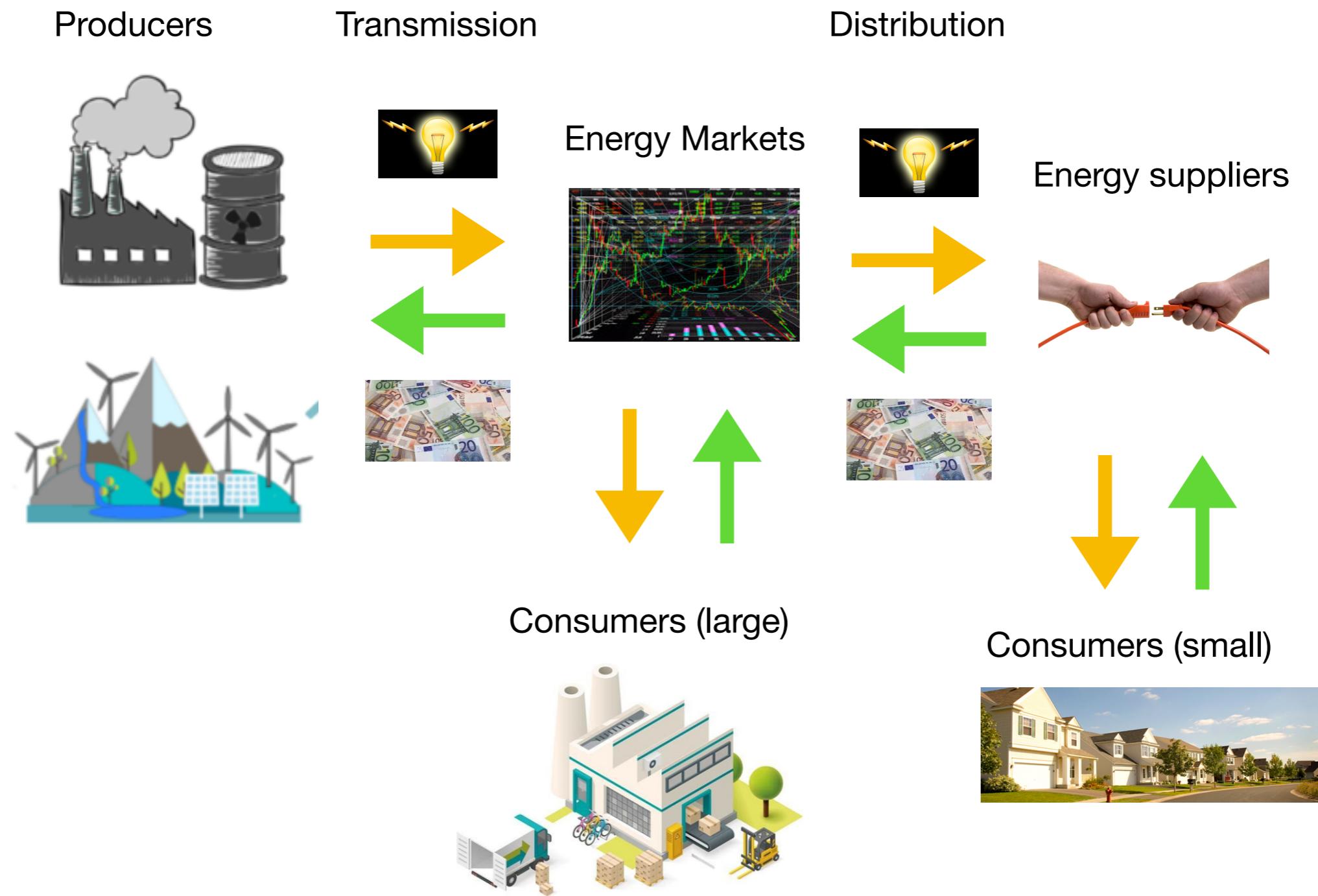
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Summary

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

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Building a residential energy offer



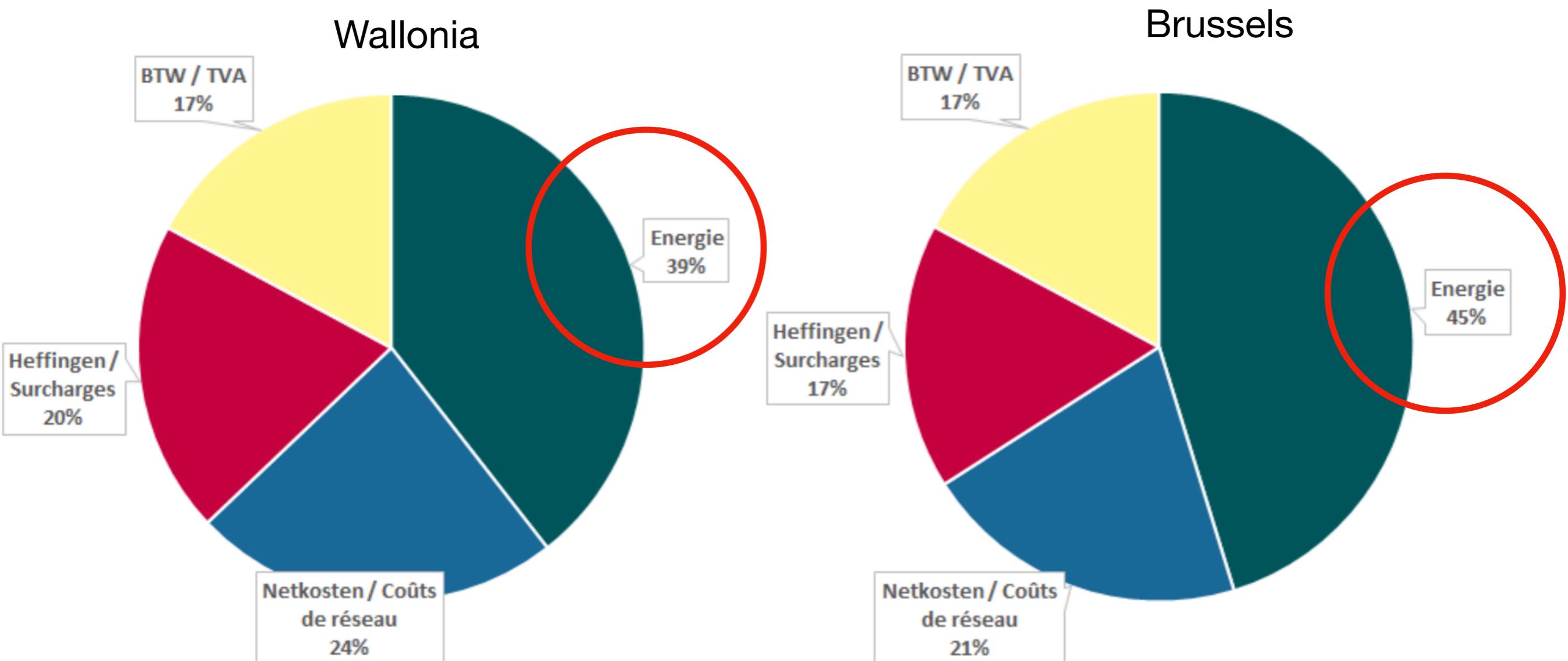
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Quiz

What are the components of the electricity bill?

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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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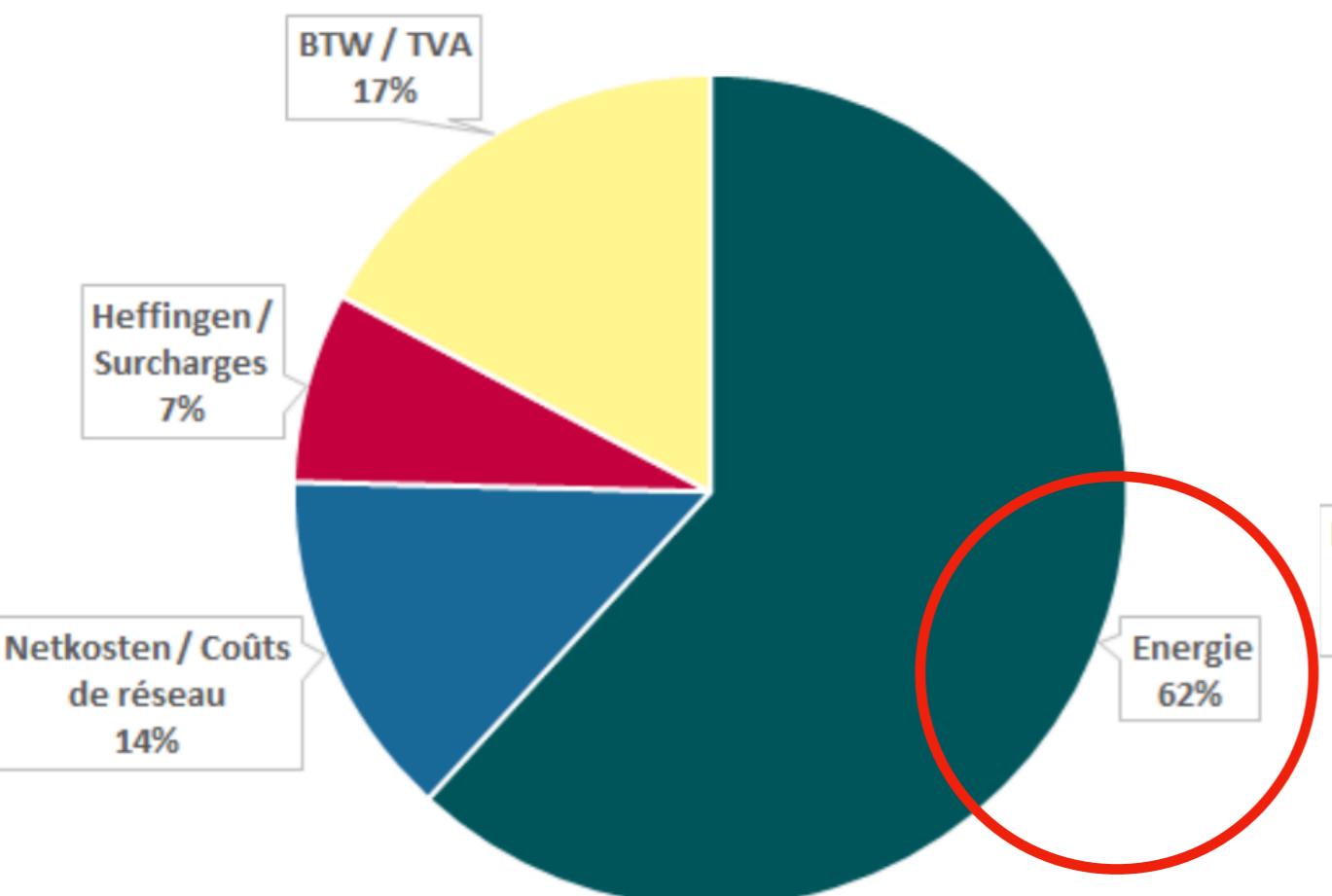
Quiz

What are the components of the gas bill?

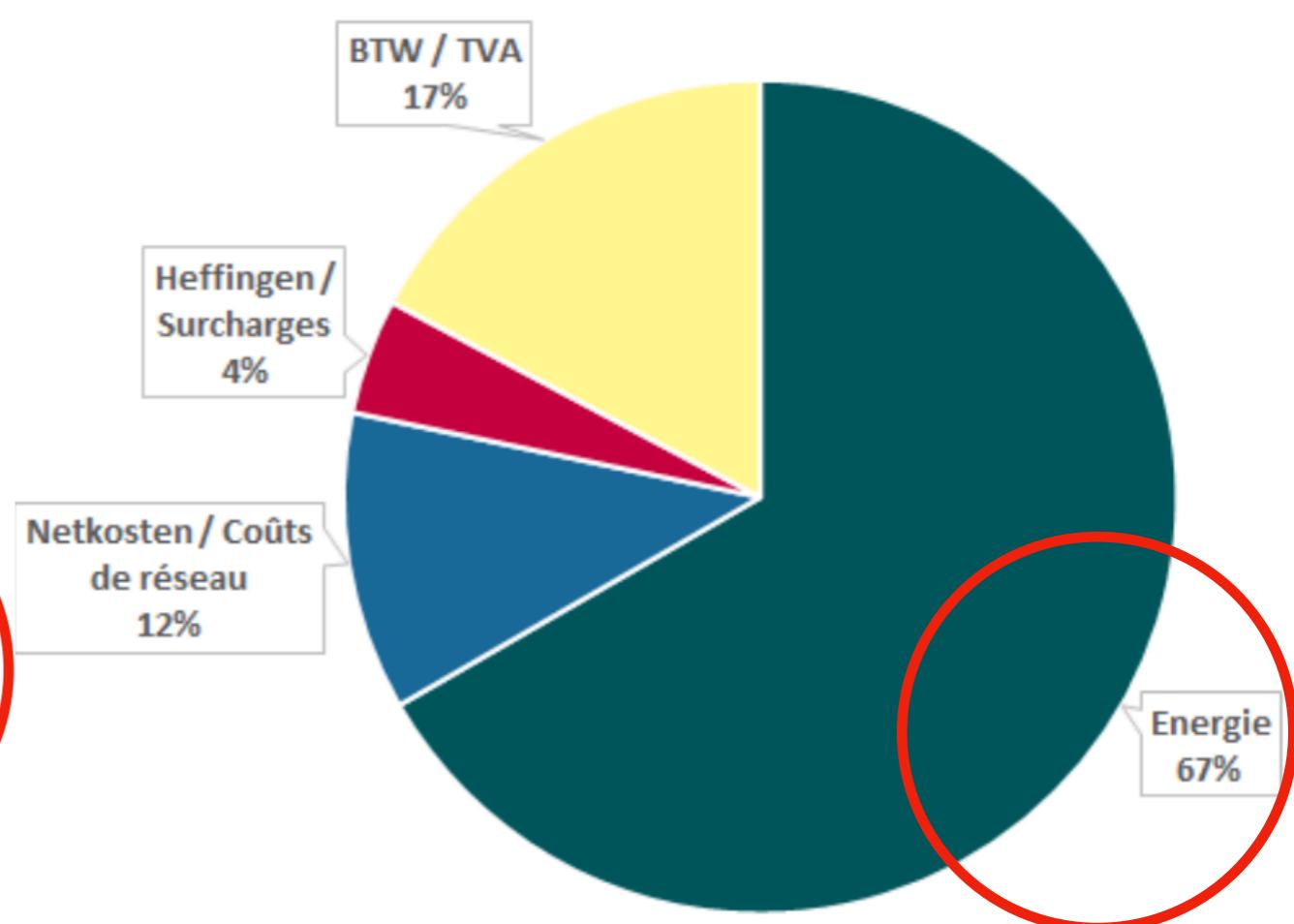
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The energy components of the gas bill: 10/2021

Wallonia



Brussels



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

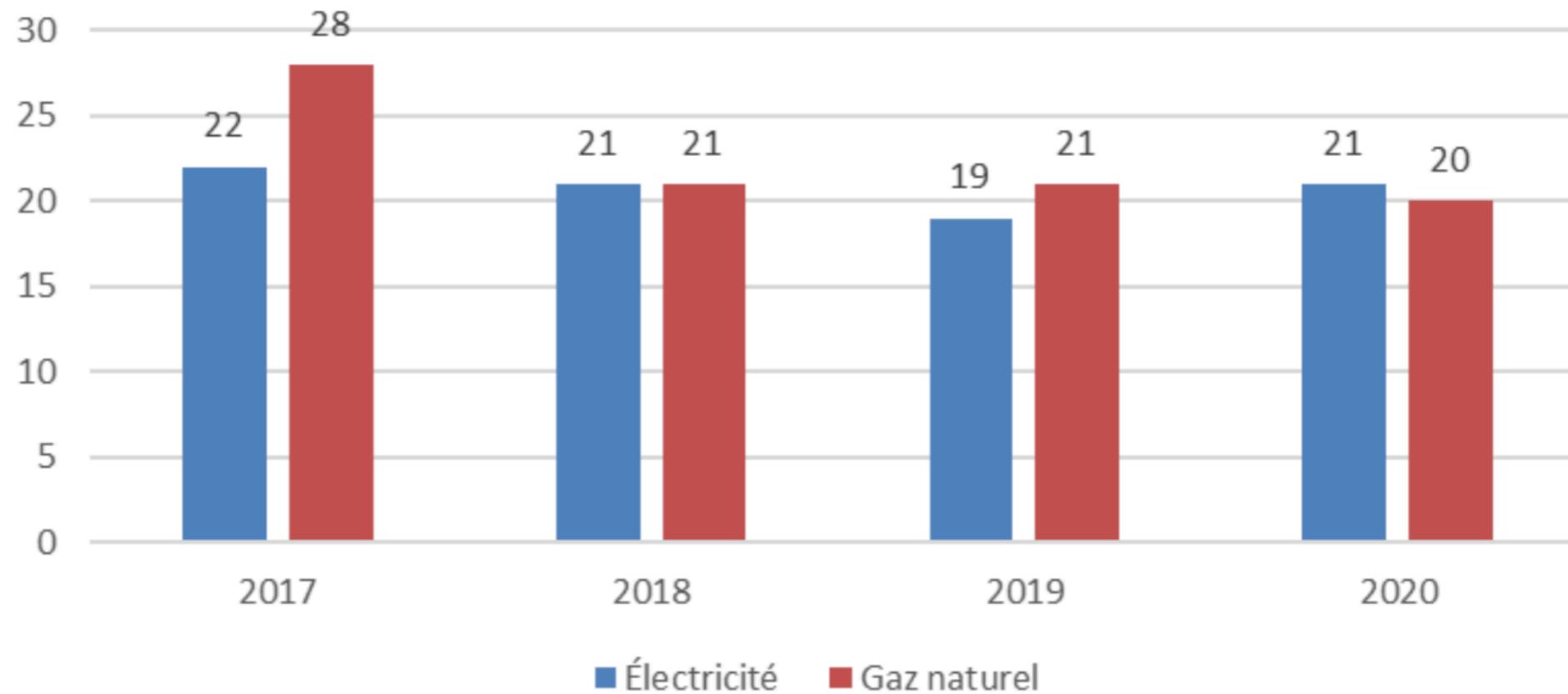
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Quiz

How many energy suppliers are in Belgium?

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Belgian energy suppliers 2017-2020



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>

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2020 Wallon fuel mix

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

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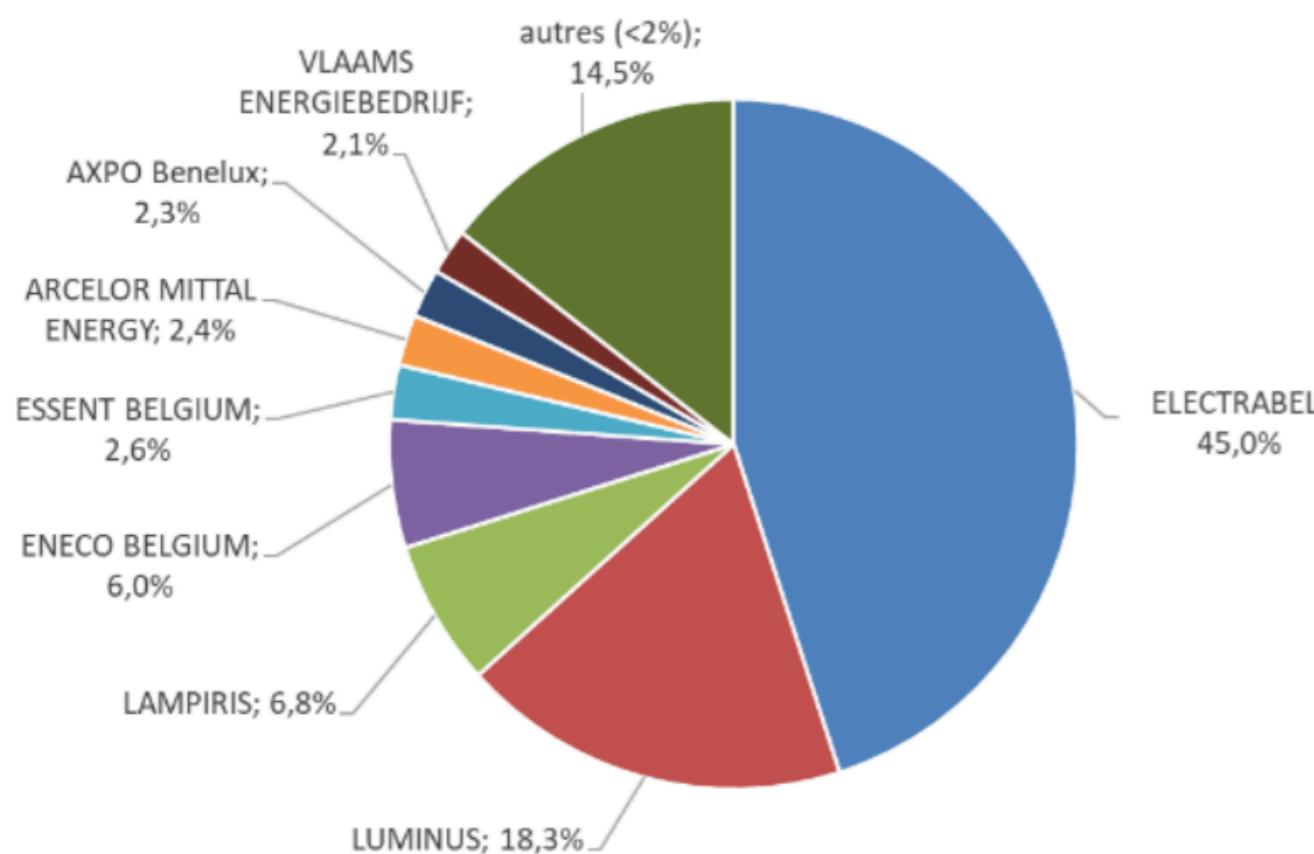
Quiz

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

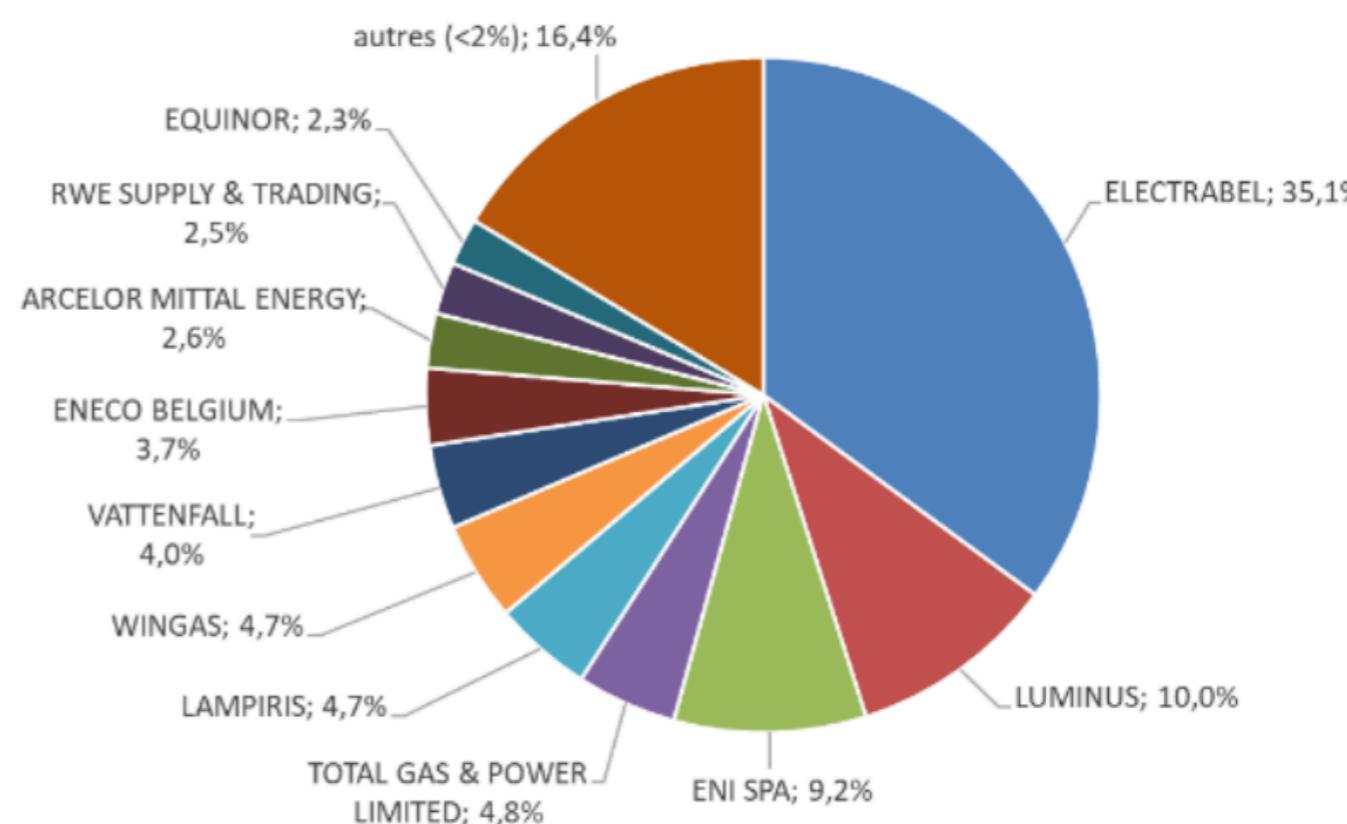
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Energy share per supplier (%TWh): Wallonia 30/06/2021

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>

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Summary

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

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Quiz

Do you know what is a Guarantee of Origin?

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



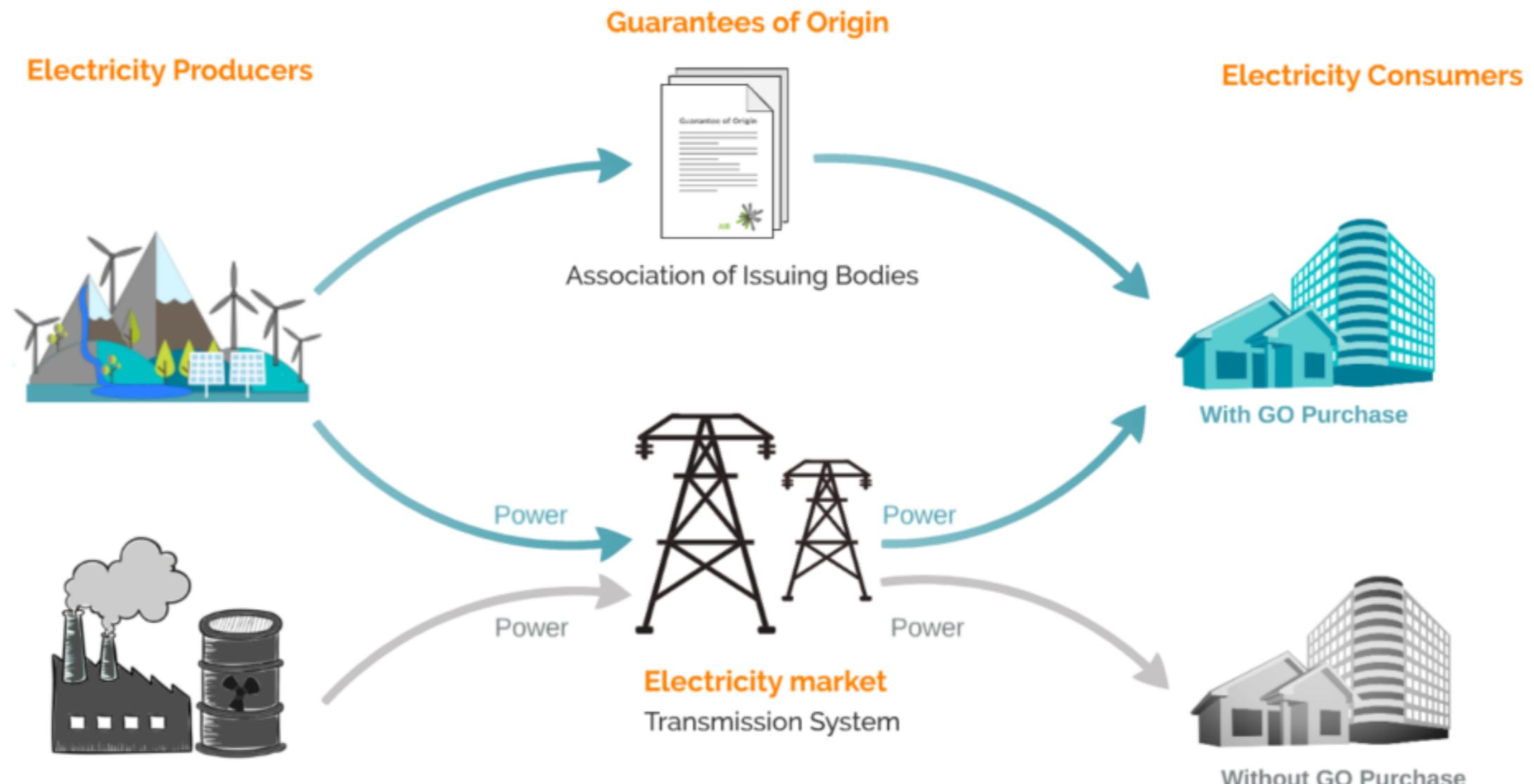
VIDEO : Les dessous de l'électricité verte.

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« 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>



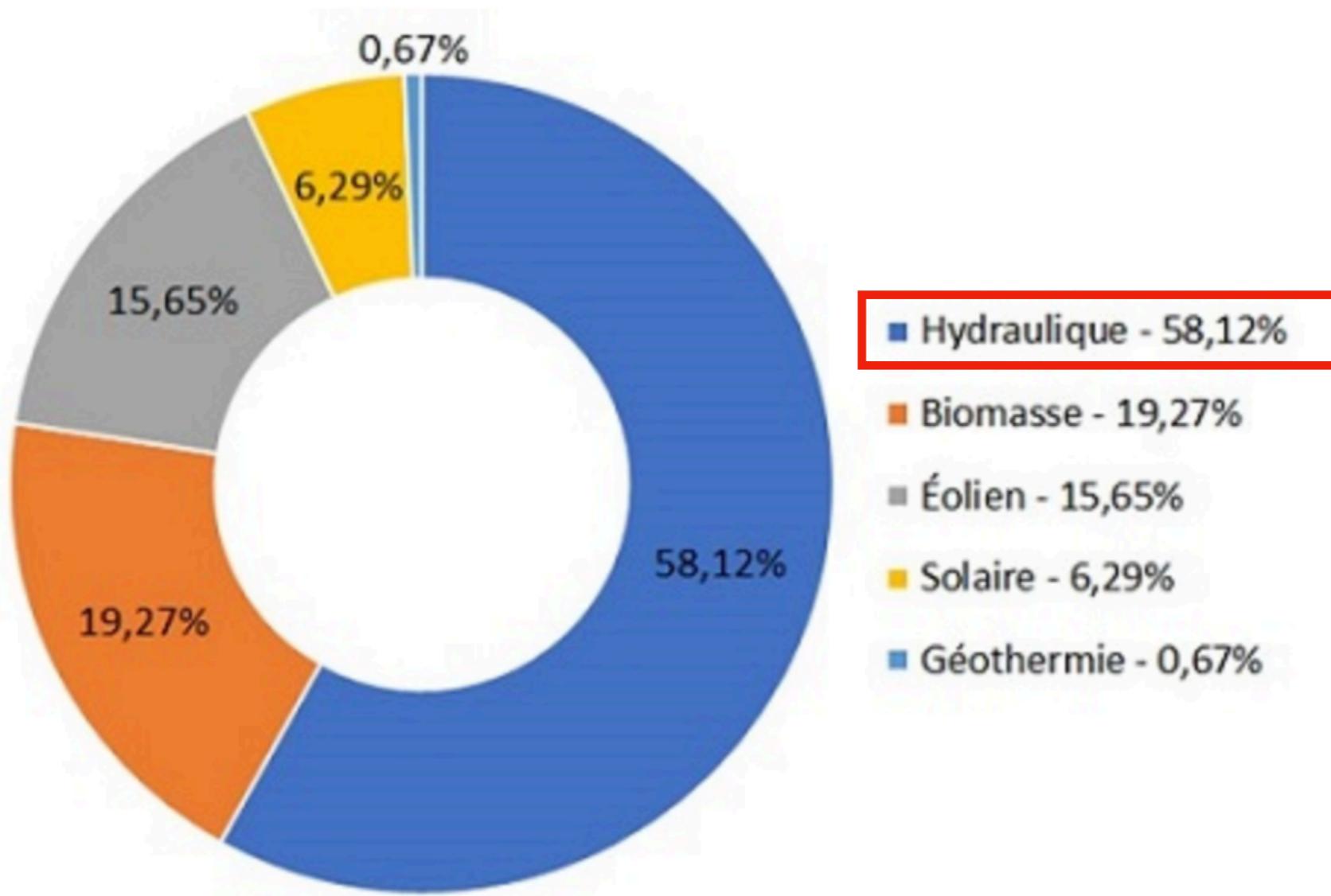
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Quiz

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

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2020 Walloon GO mix per renewable energy source



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

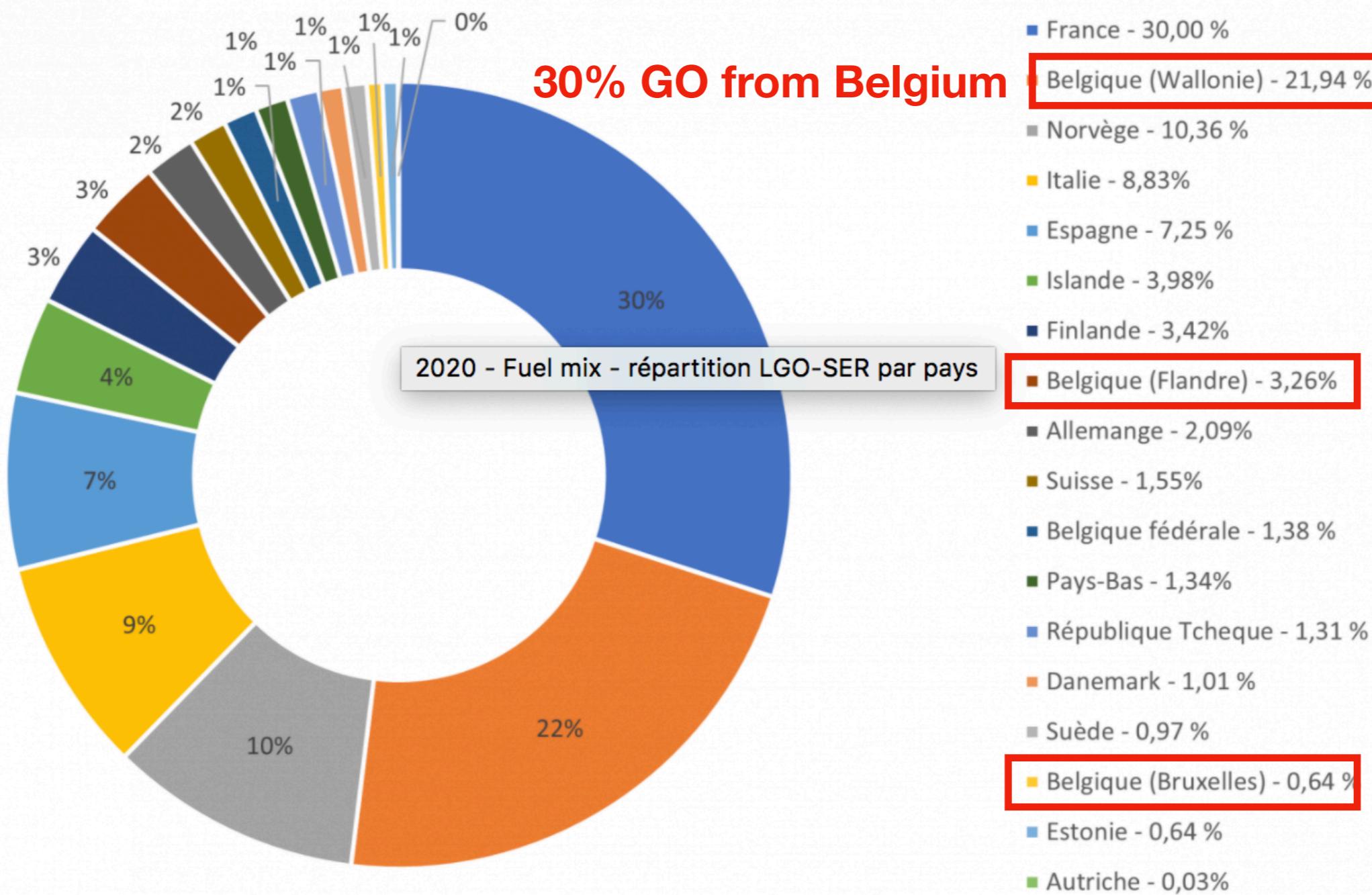
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Quiz

All the GOs do come from Belgium?

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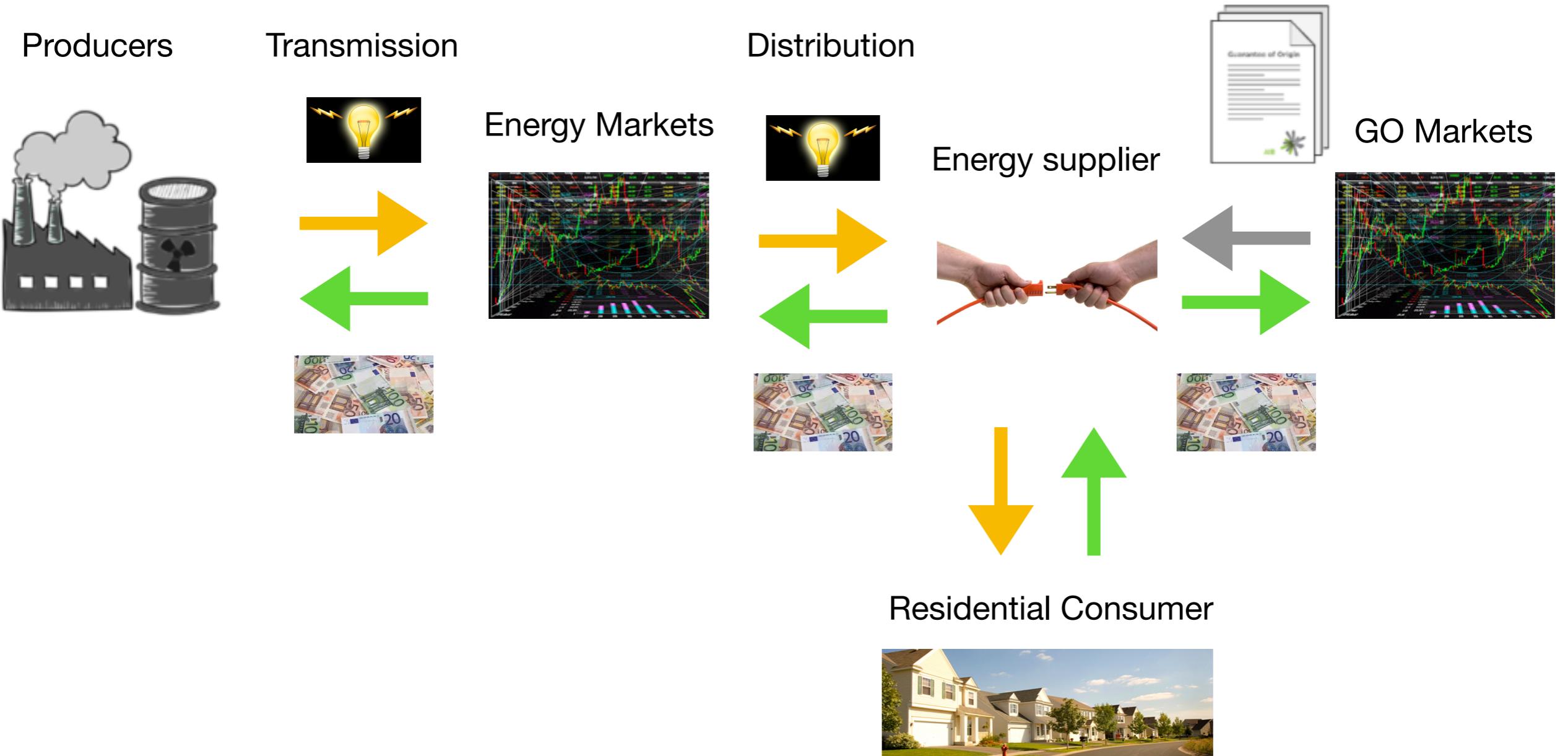
Walloon 2020 GO distribution per country



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

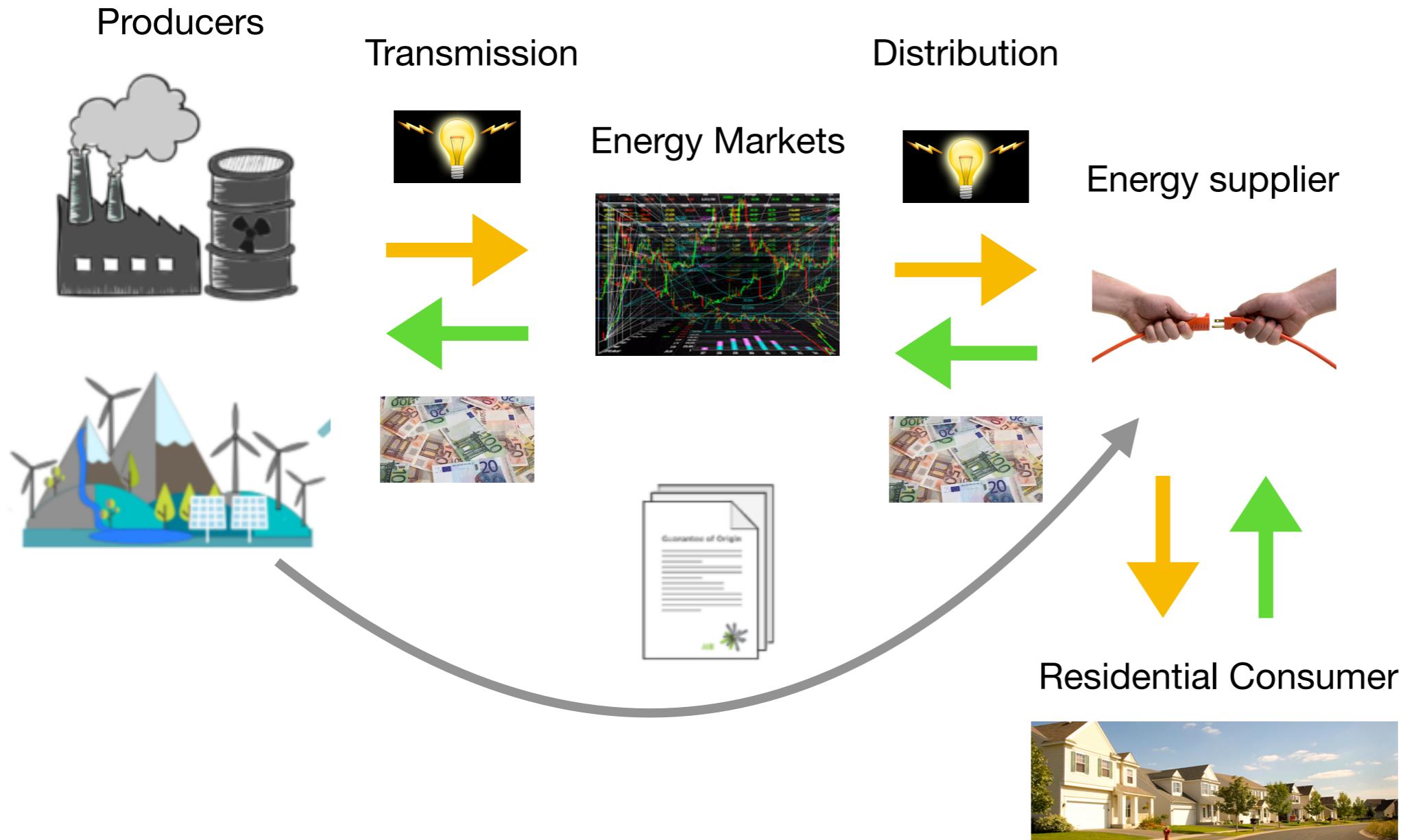
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Non-« green » to « green » market offer



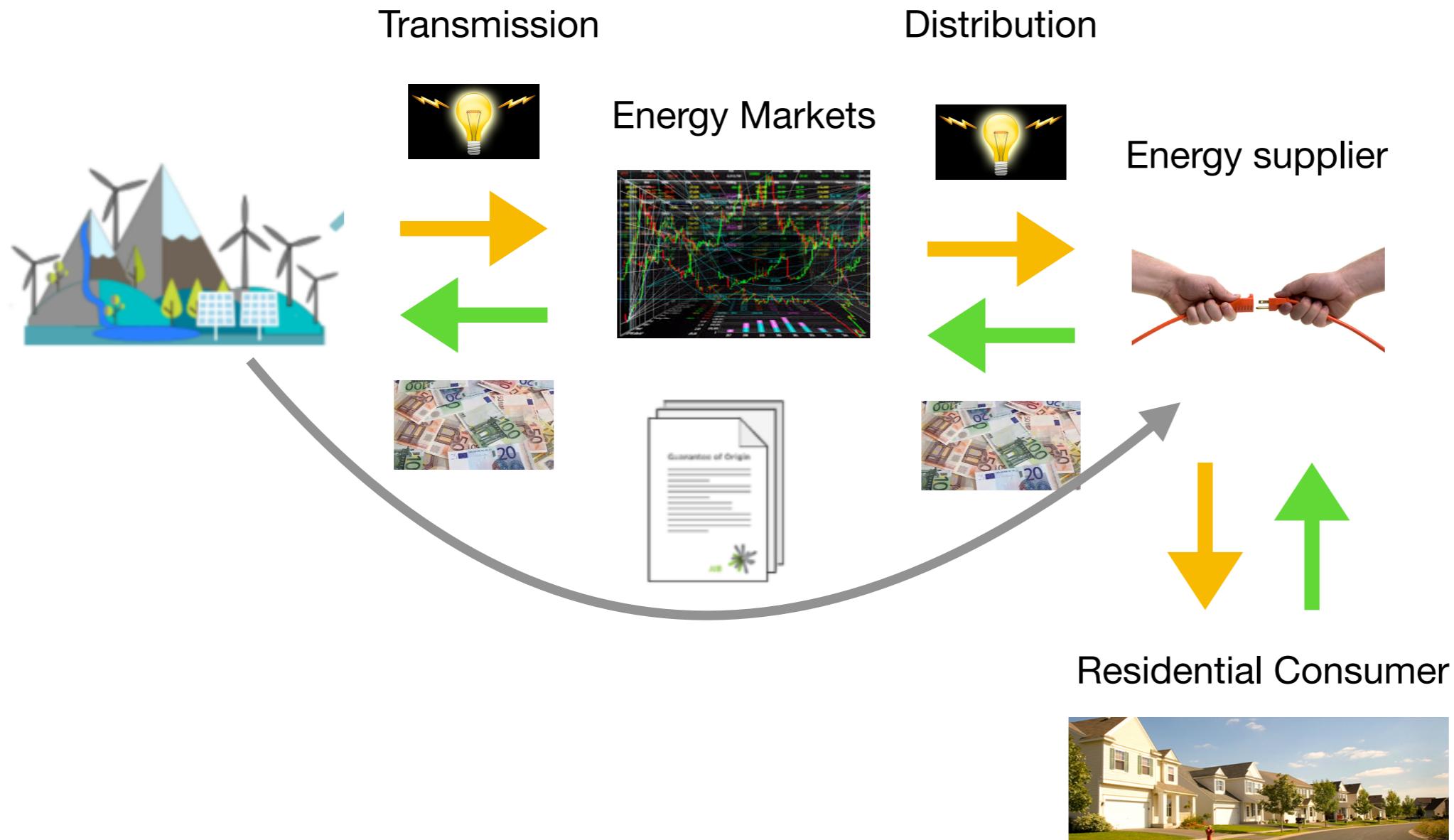
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Mix « green » to « green » market offer



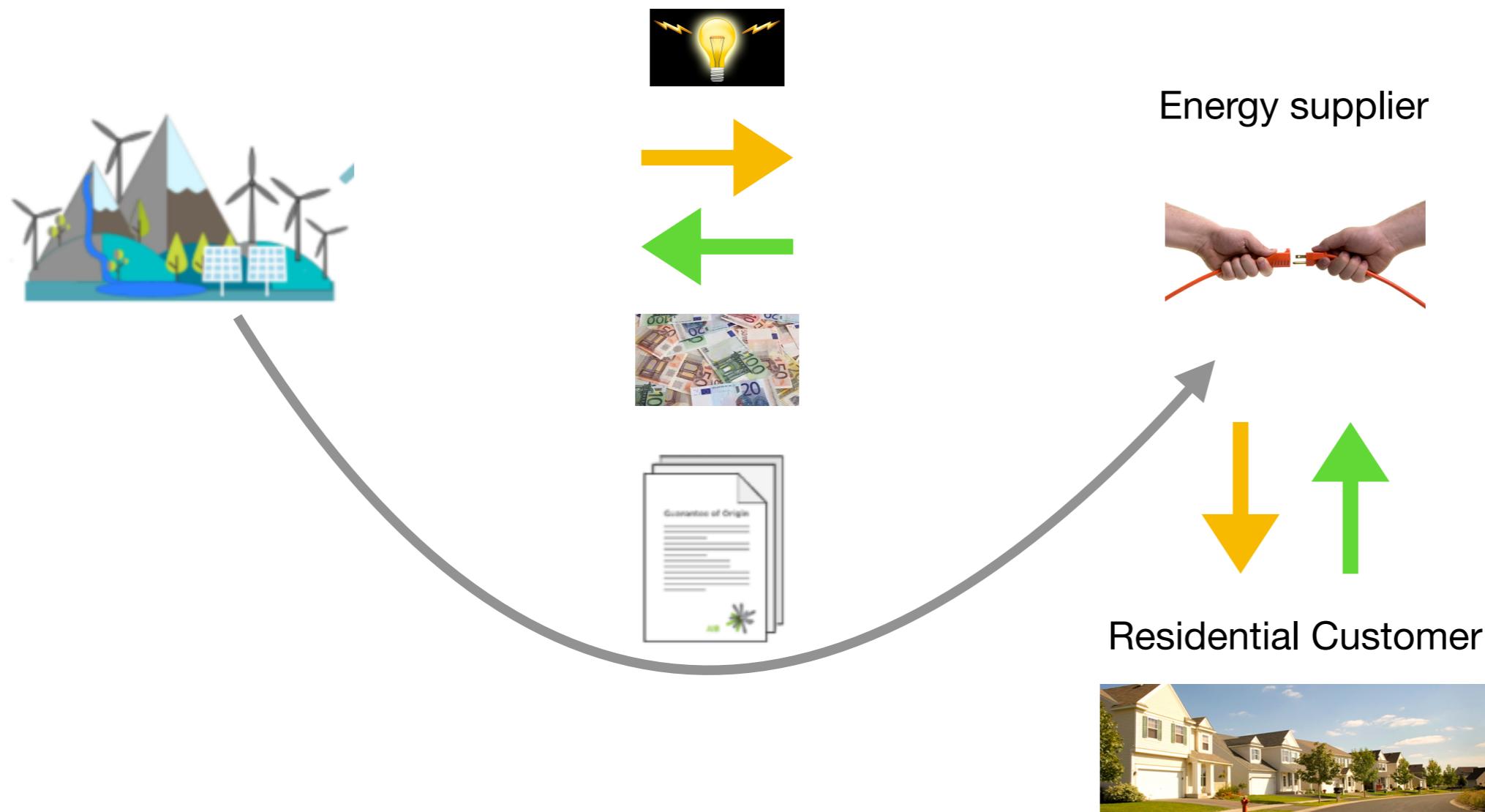
Residential energy supplier

« Green » market offer



Residential energy supplier

Direct « green » offer



Residential energy supplier

Video summary



VIDEO : Les dessous de l'électricité verte.

Residential energy supplier

Small recap

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 !!!

Residential energy supplier

To dig the topic on green electricity offer



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

Conclusion

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 !!!