

Energietransitie: een knipoog naar de toekomst

14 november 2023

1996

BORING
STUFF

f50



Global Primary Energy Consumption by Source 1800-2020

180K Terrawatt-hours (TWh)

160K

140K

120K

100K

80K

60K

40K

20K

0K

1800

1850

1900

1950

2000

2020



before 1800

Prior to the Industrial Revolution, humans mainly relied on biomass for heat and muscles for kinetic energy.



1859

The first commercial oil well was drilled in Titusville, Pennsylvania, U.S.



1930

Coal usage increased with the growth of steam power and coal-fired power plants.



1960

Oil demand surged as gasoline vehicles took off, accounting for 40% of global energy consumption by 1970.

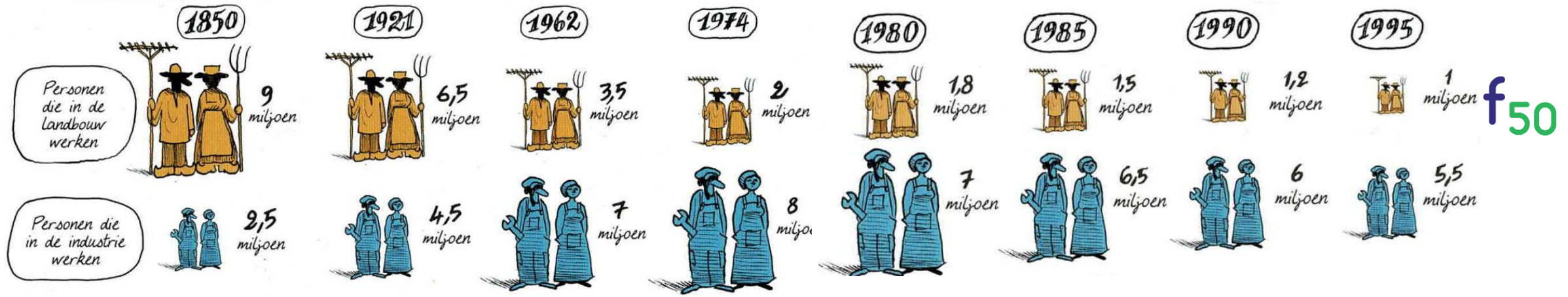
Other renewables
Modern biofuels
Solar
Wind
Hydropower
Nuclear
Natural gas

Oil

Coal

Traditional biomass

f50



Evolutie bruto toegevoegde waarde en productiviteit landbouw

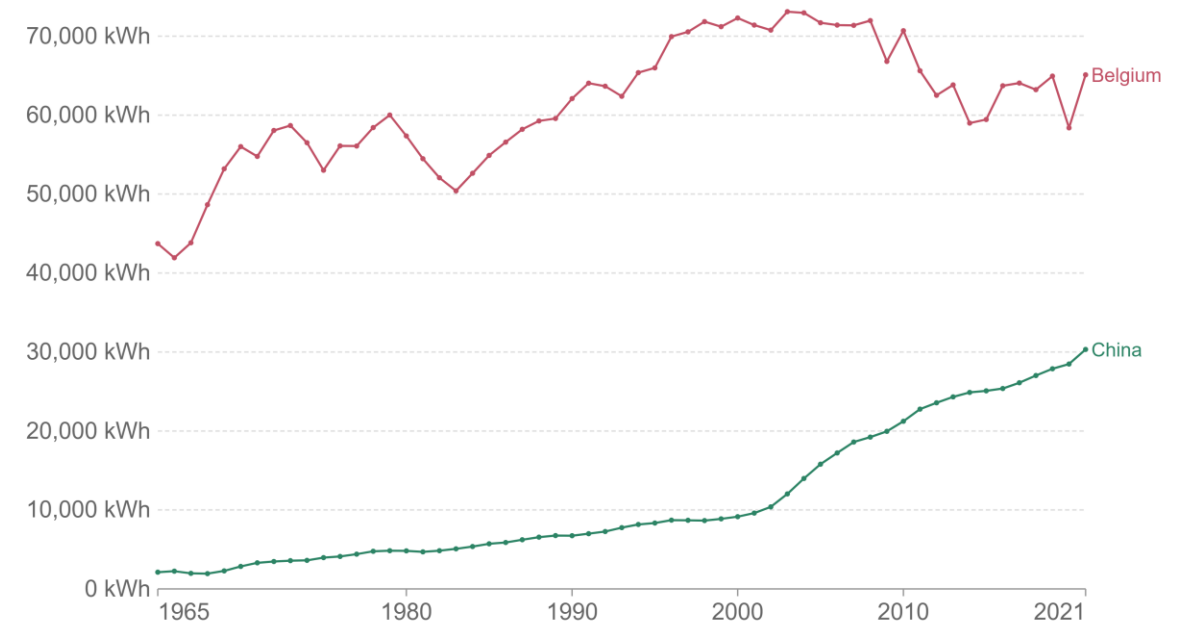
Vlaams gewest, verhouding t.o.v. 2005



Get the data • Created with Datawrapper

Energy use per person

Energy use not only includes electricity, but also other areas of consumption including transport, heating and cooking.

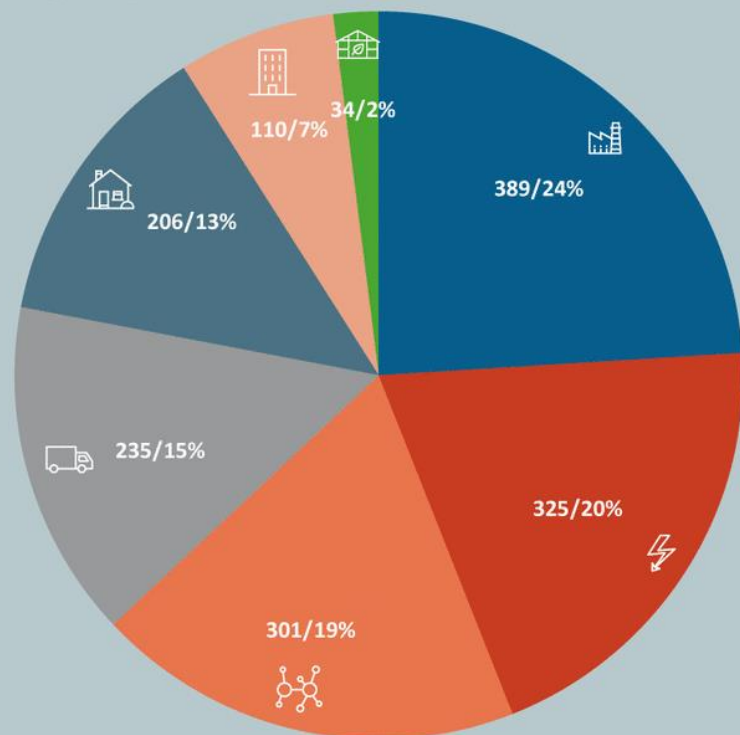


Source: Our World in Data based on BP & Shift Data Portal

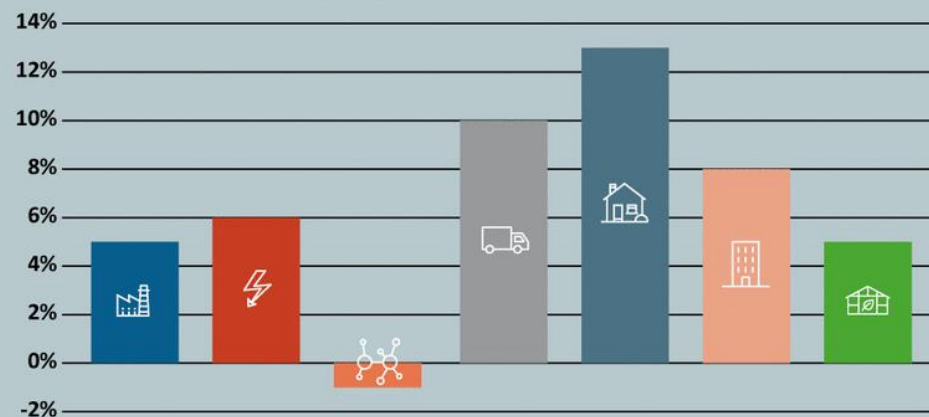
Note: Energy refers to primary energy – the energy input before the transformation to forms of energy for end-use (such as electricity or petrol for transport).

OurWorldInData.org/energy • CC BY

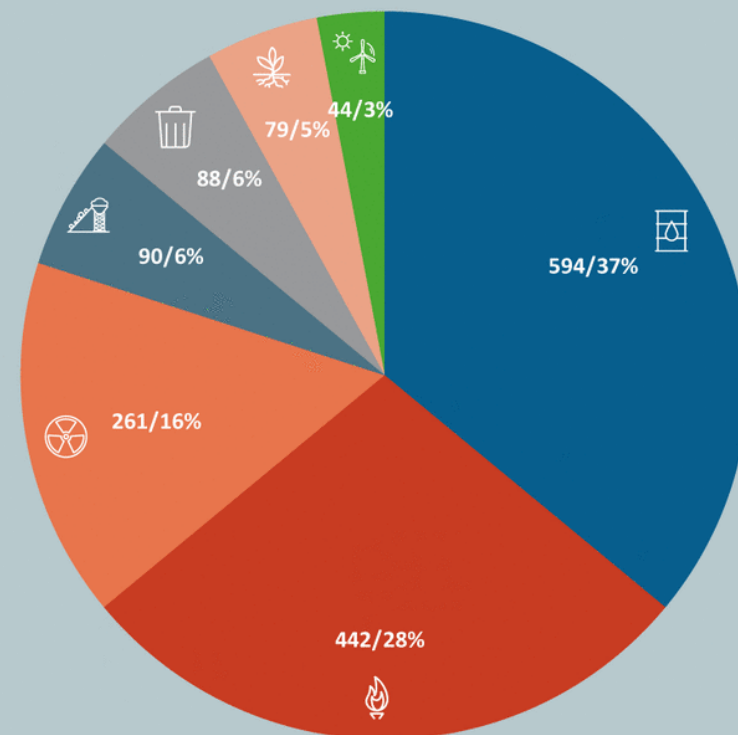
Energiegebruikers 2021 (in PJ/in %)



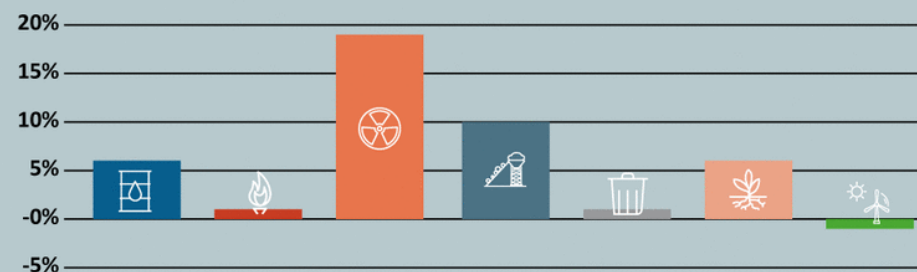
Evolutie energiegebruikers in 2021 t.o.v. 2020

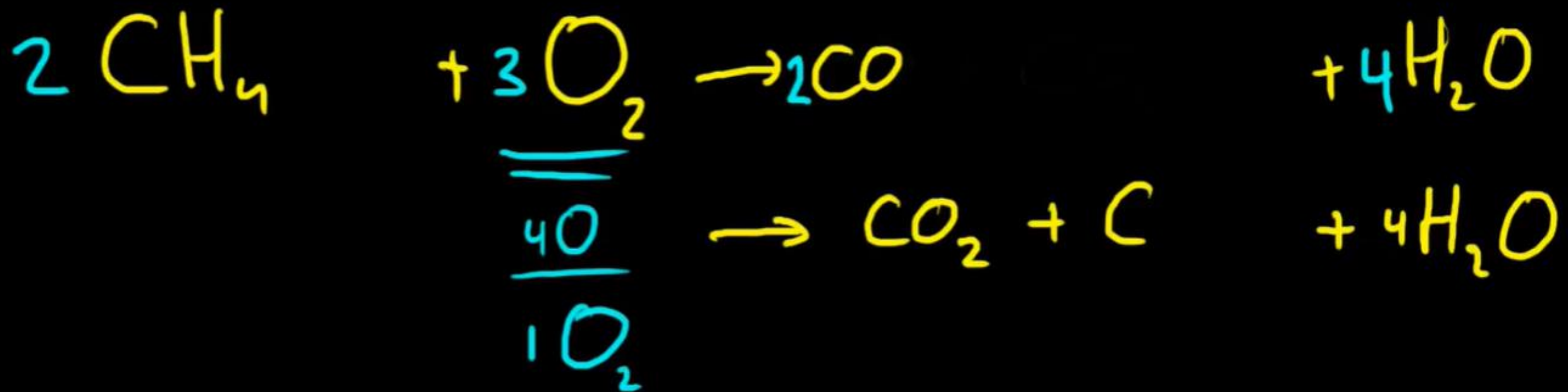


Energiedragers 2021 (in PJ/in %)



Evolutie energiedragers in 2021 t.o.v. 2020





De **energietransitie** is het **lopende** proces van vervanging van **fossiele** brandstoffen door **koolstofarme** energiebronnen. Meer in het algemeen is een energietransitie een ingrijpende **structurele verandering** in een **energiesysteem** wat betreft **aanbod** en **verbruik**.

Global fossil fuel production

GtCO₂eq/yr

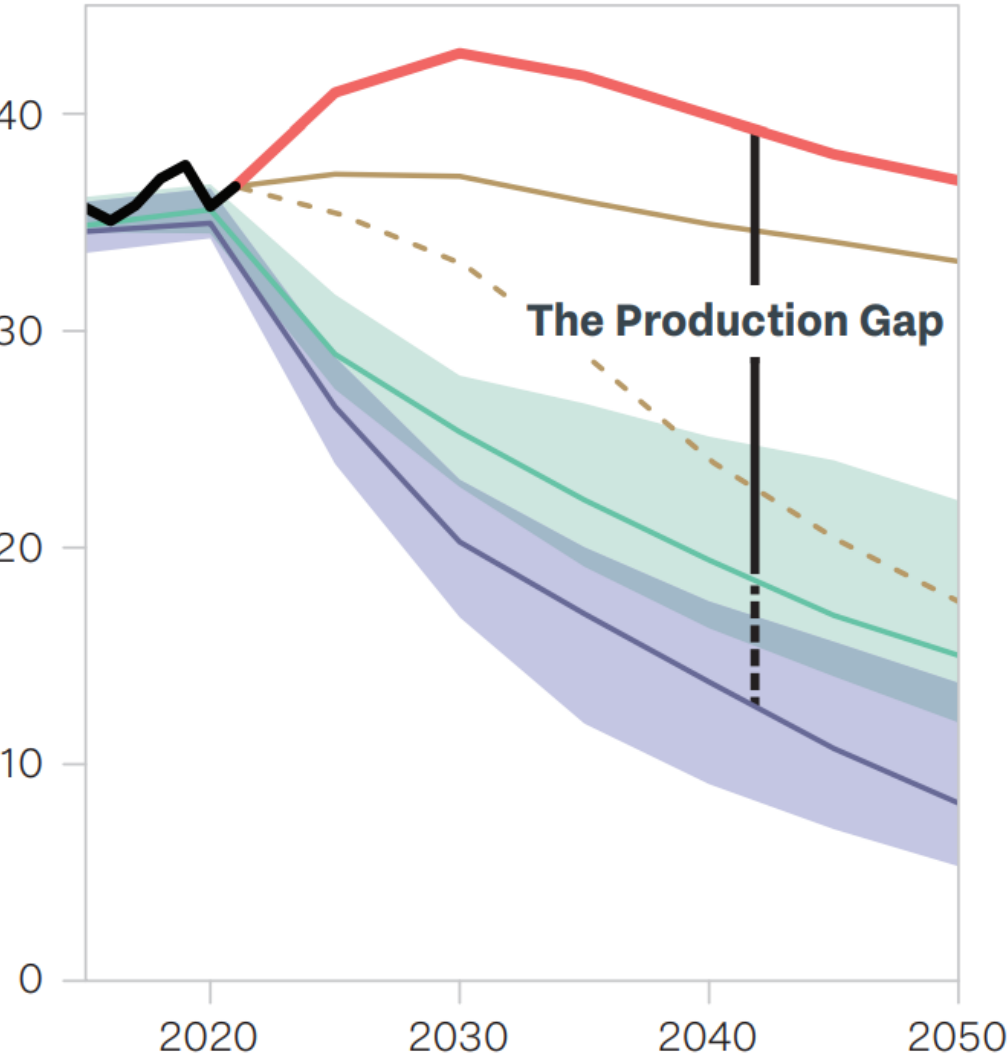
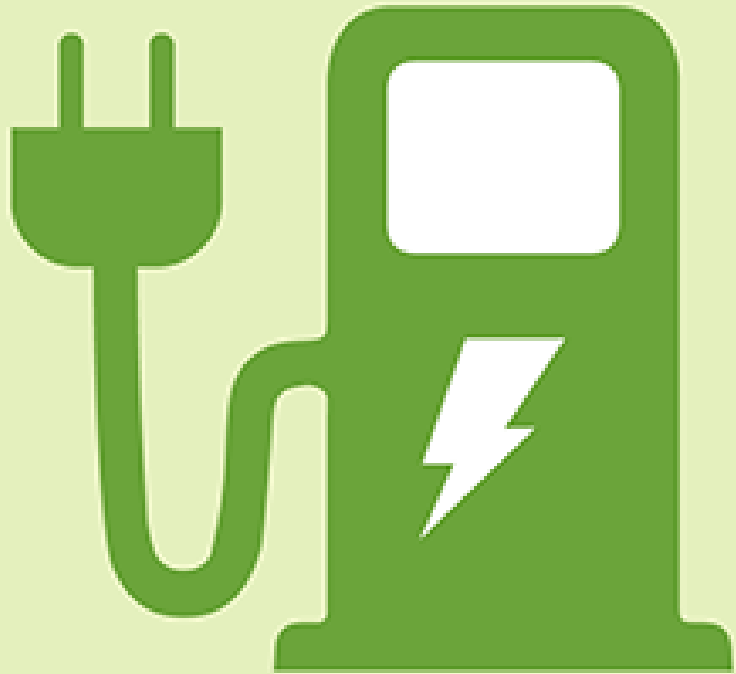


TABLE 2 | Summary of global progress toward power targets

INDICATOR	MOST RECENT DATA POINT (YEAR) ^a	2030 TARGET	2050 TARGET	TRAJECTORY OF CHANGE	ACCELERATION FACTOR	STATUS
Carbon intensity of electricity generation (gCO ₂ /kWh)	450 (2019) ^b	50–125	5–25 (2040) <0 ^c (2050)		5x	
Share of zero-carbon sources in electricity generation (%)	36 (2019) ^b	74–92	87–100 (2040) 98–100 (2050)		6x	
Share of unabated coal in electricity generation (%)	37 (2019) ^b	0–2.5	0 (2040) 0 (2050)		6x	
Share of unabated fossil gas in electricity generation (%)	24 (2019) ^b	17	5 (2040) 0 (2050)		N/A; U-turn needed	

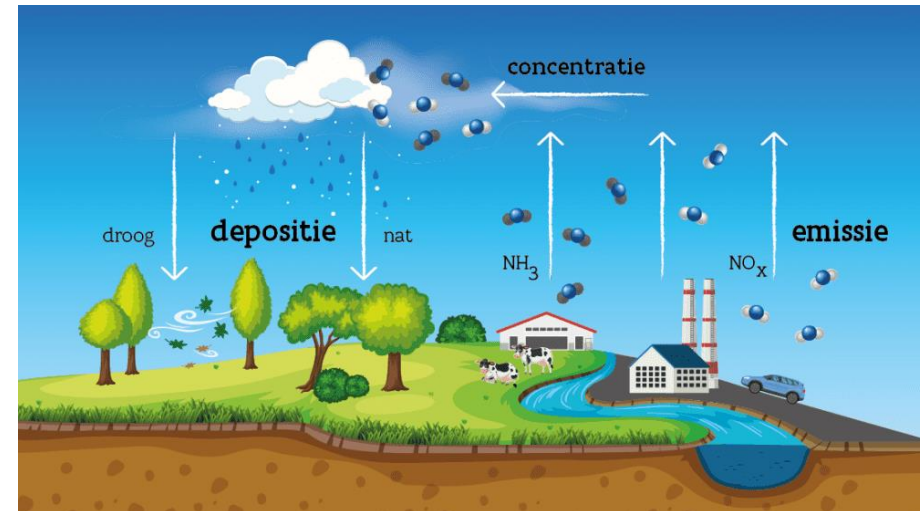
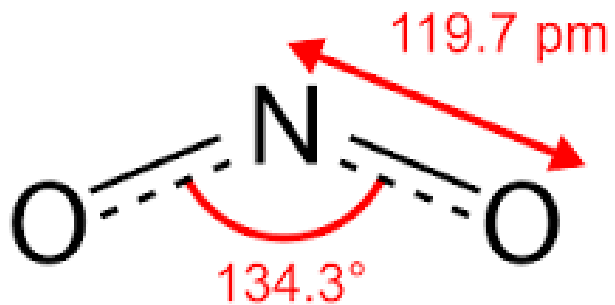
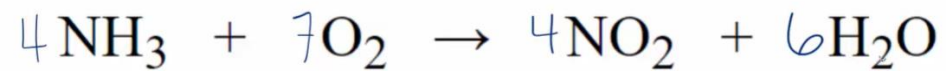
- Government plans & projections
- Stated policies
- Announced pledges
- 2°C-consistent
- 1.5°C-consistent





VS.





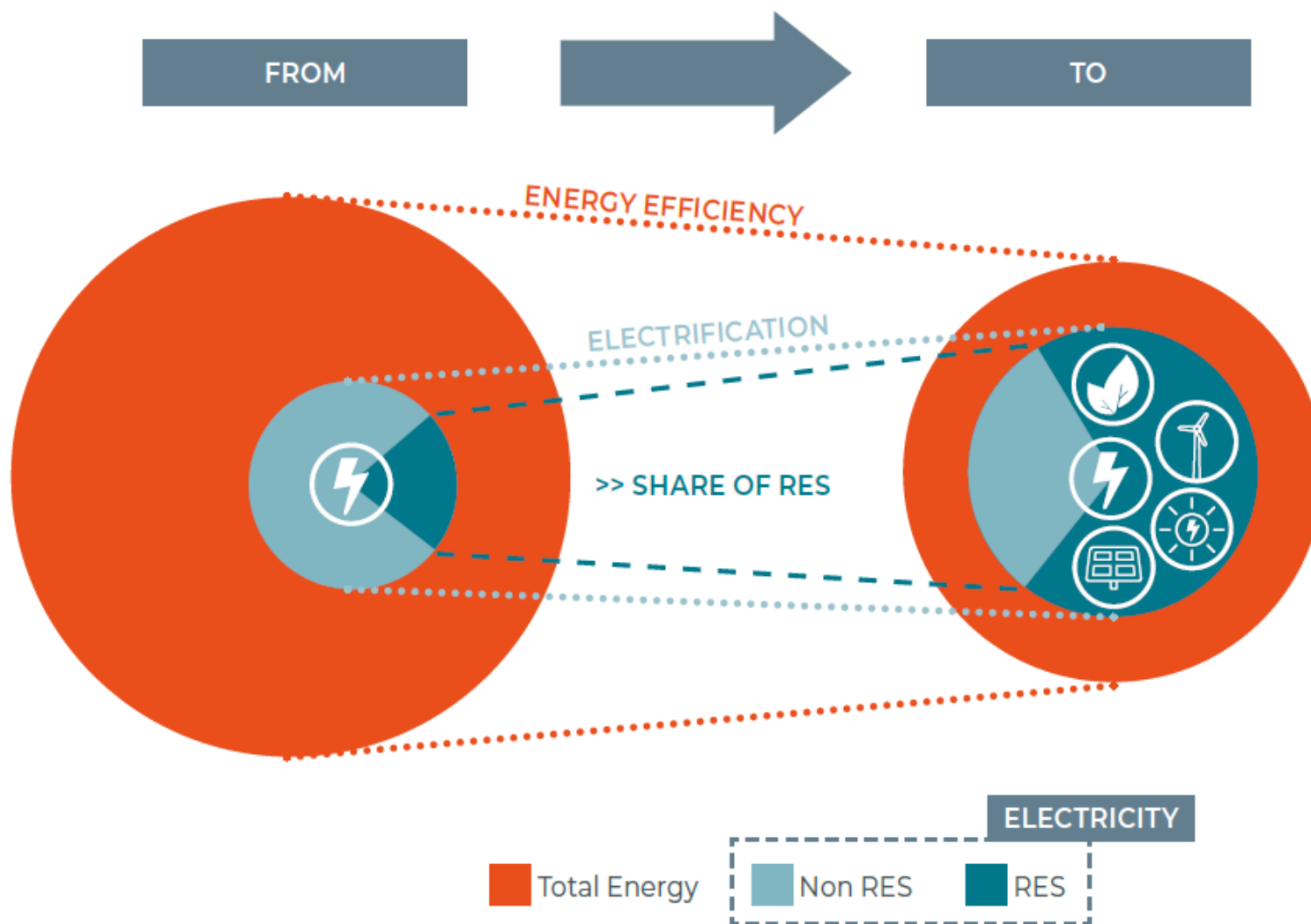
Prediction
is very
difficult,
especially
if it's about
the future.

- Niels Bohr

Energy study 2050+

- Energyville Paths 2050
- Elia Roadmap to Net Zero
- Planbureau Fuel for the future
- VLAIO industrieel transitiekader
- BBLV Hoe creëren we een klimaatneutrale industrie
- ...

[FIGURE 2-1] — TRENDS IN THE ENERGY SECTOR NEEDED TO ACHIEVE THE AMBITION OF A NET-ZERO SOCIETY



The total amount of energy consumed will be reduced through the use of additional **energy efficiency measures**

The share occupied by electricity in final/end consumption will increase with additional **electrification**

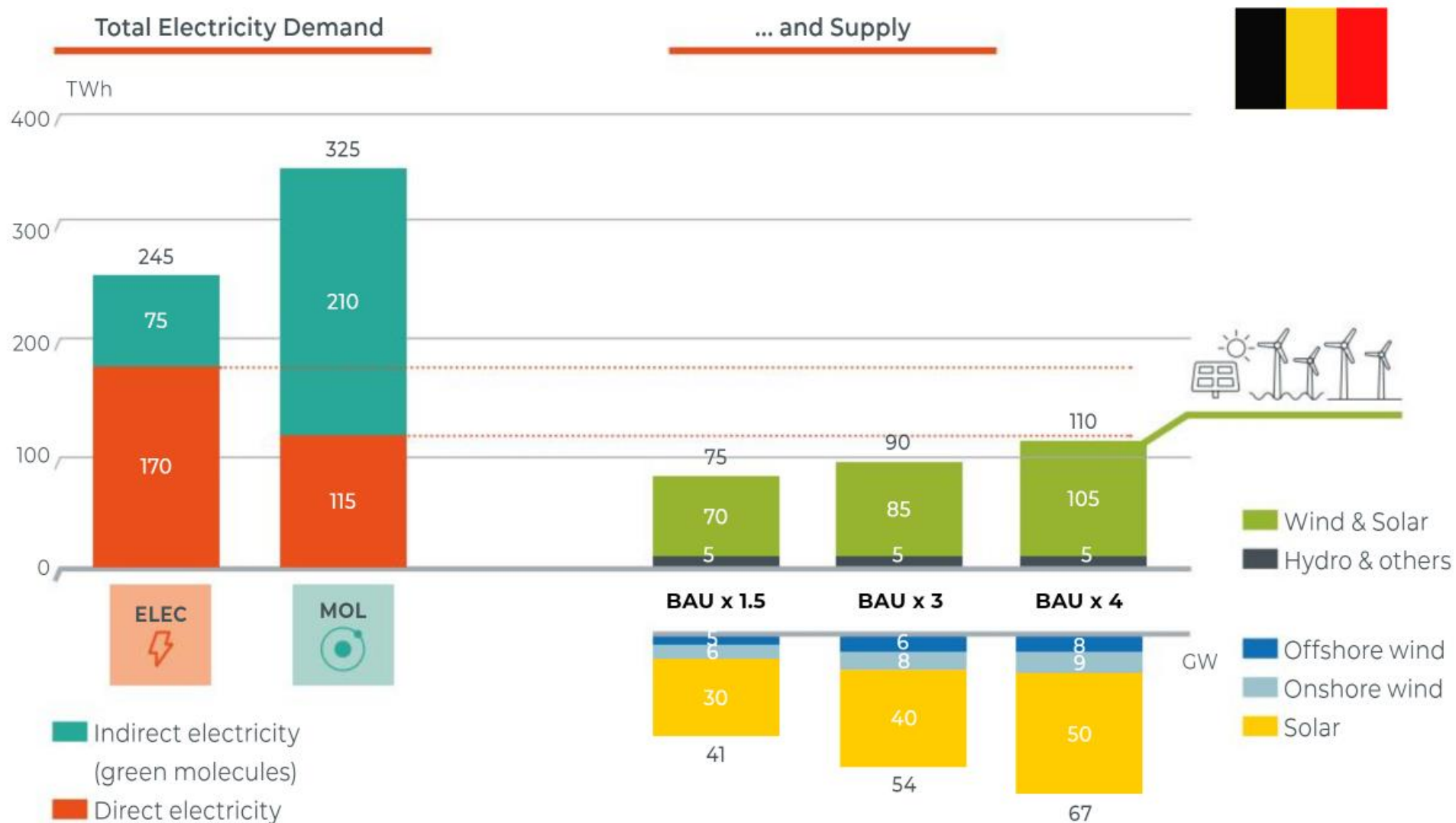
Renewables will increase both in the overall energy mix and in the electricity mix

Source : [EUC-1]

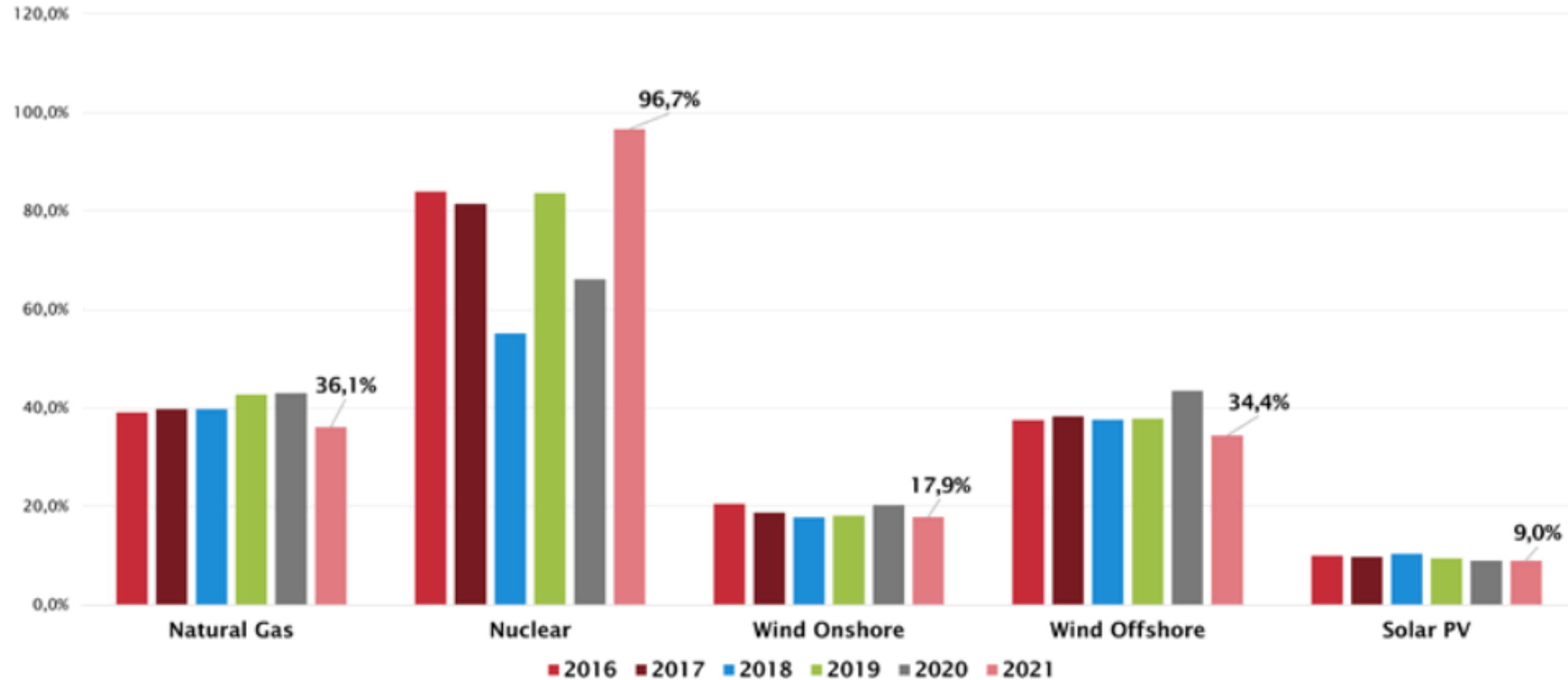


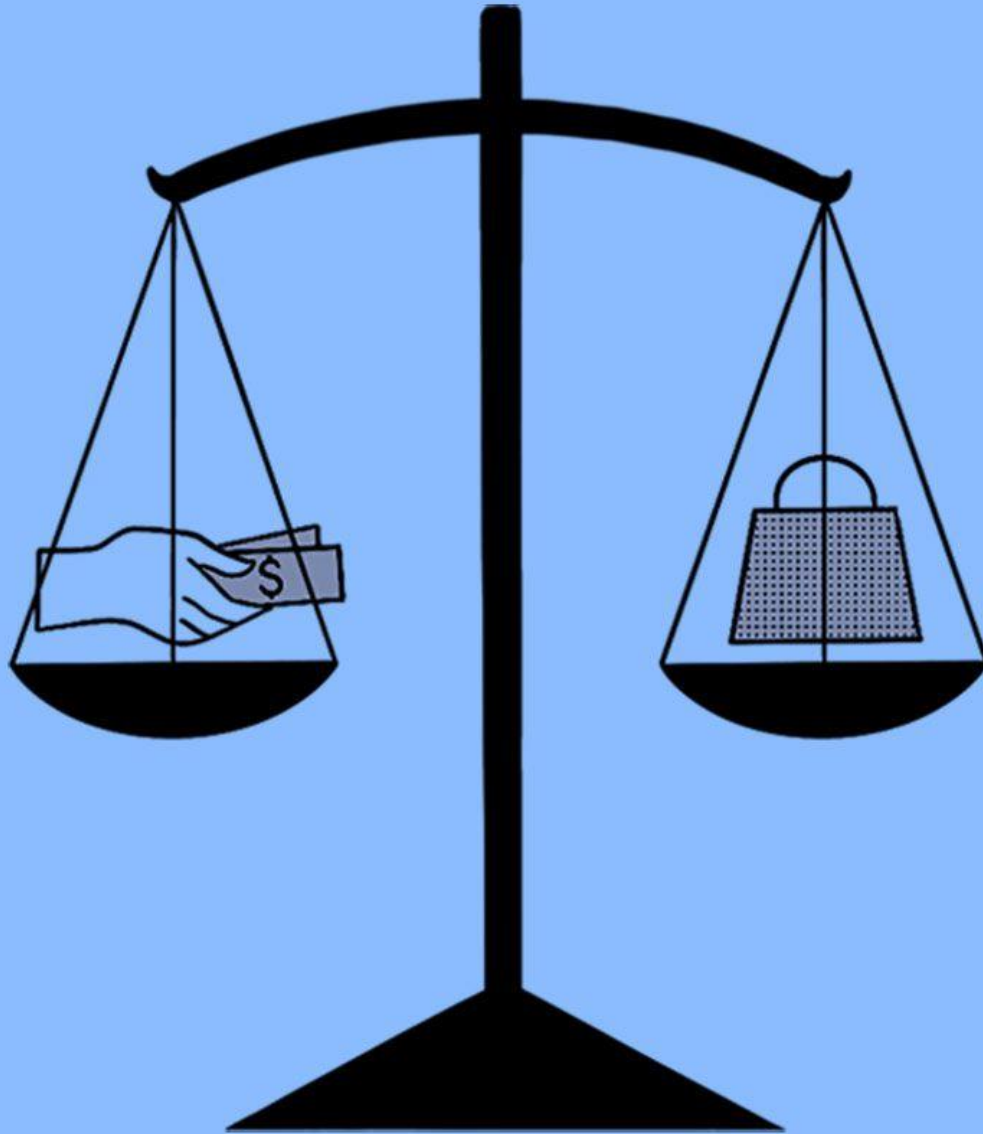
Elektrificatie

FIGURE 10: COMPARISON BETWEEN THE TOTAL ELECTRICITY DEMAND AND THE ELECTRICITY SUPPLY FOR BOTH TRANSFORMATION PATHWAYS AND ALL THREE SUPPLY SCENARIOS FOR BELGIUM IN 2050



Load factor: percentage of total number of hours per year when production assets are in operation in Belgium (equivalent full load hours capacity)





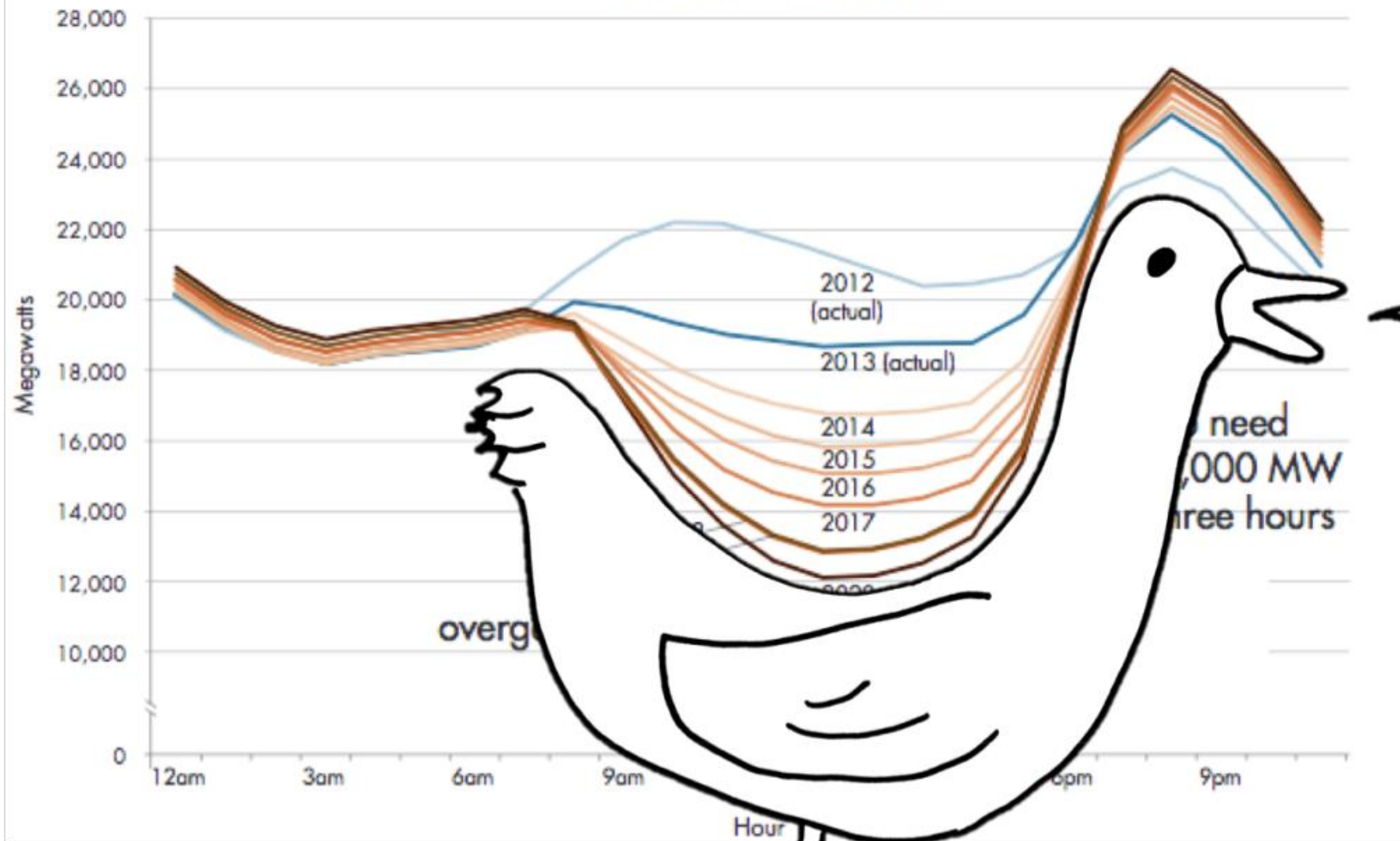
Equilibrium

[,ē-kwə-'li-brē-əm]

A state in which the supply and demand for a given good or service are in balance.



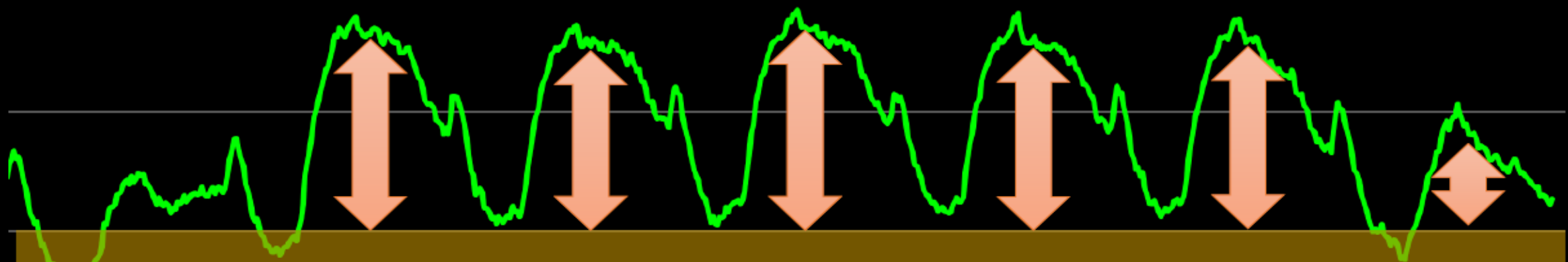
Net load - March 31



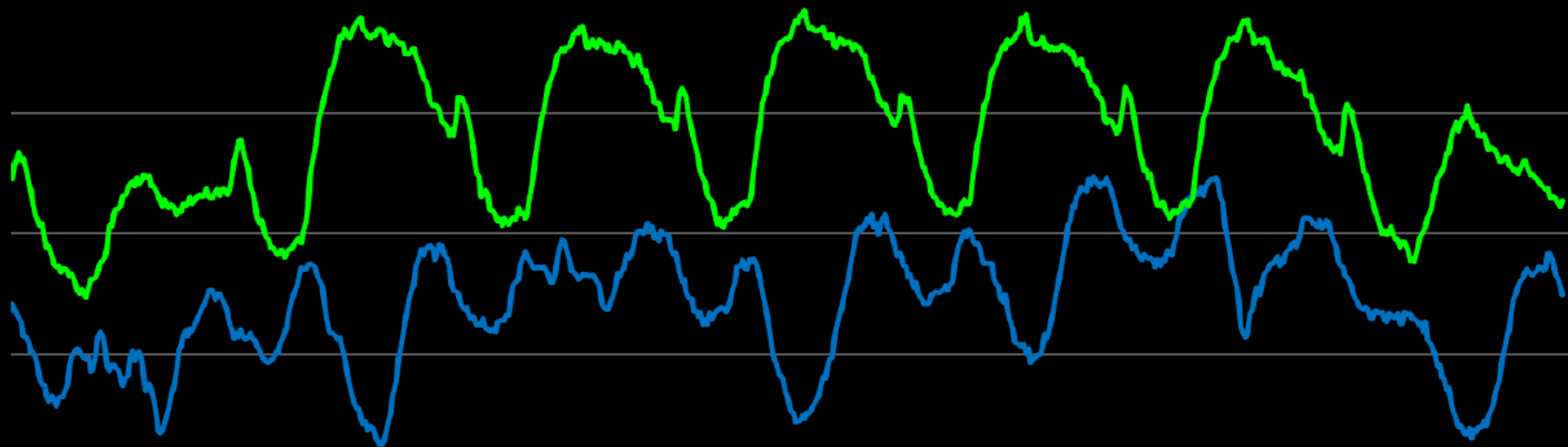
f50

Quack!



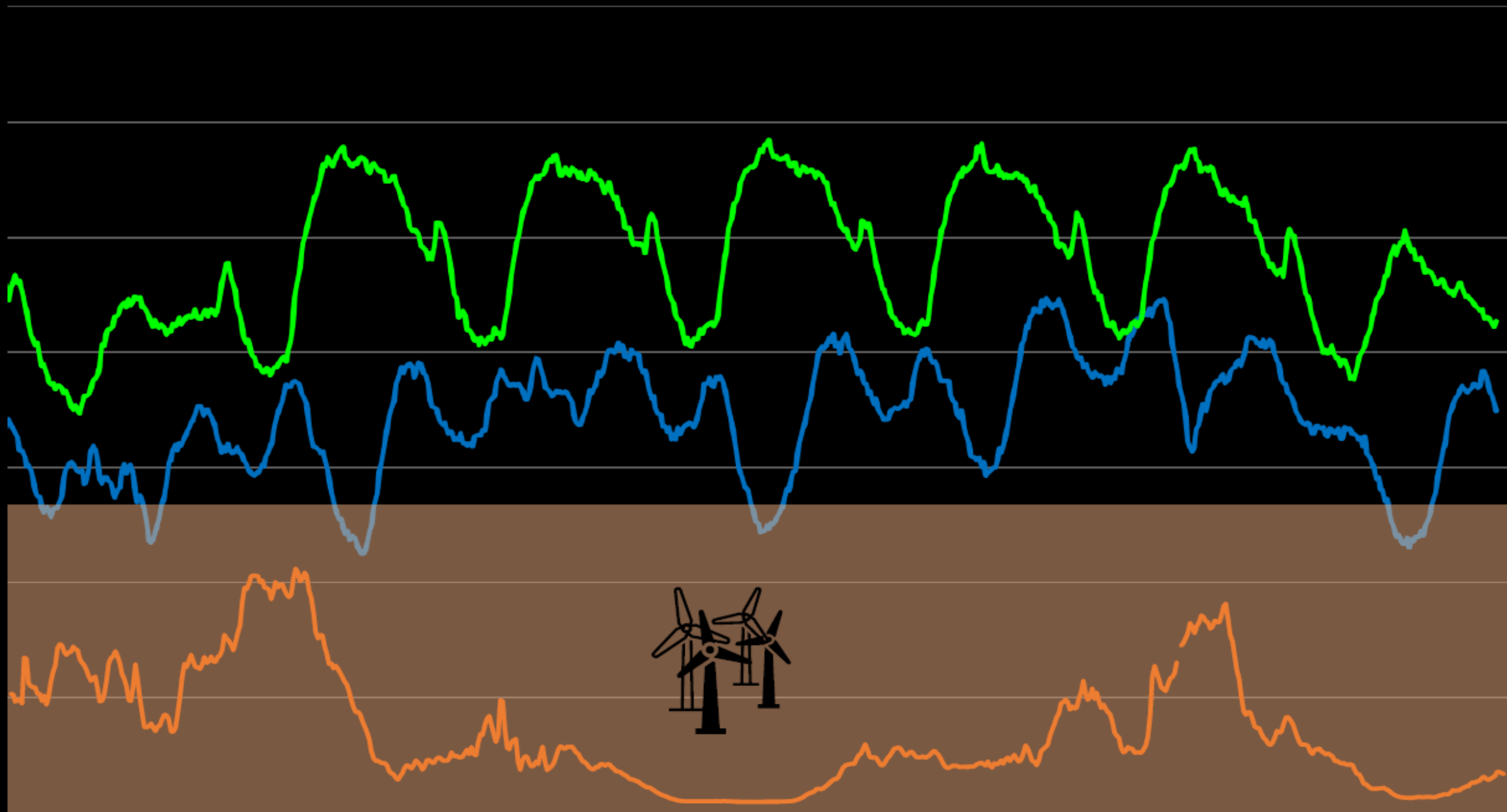


Een week in juni 2006



Een week in juni 2006

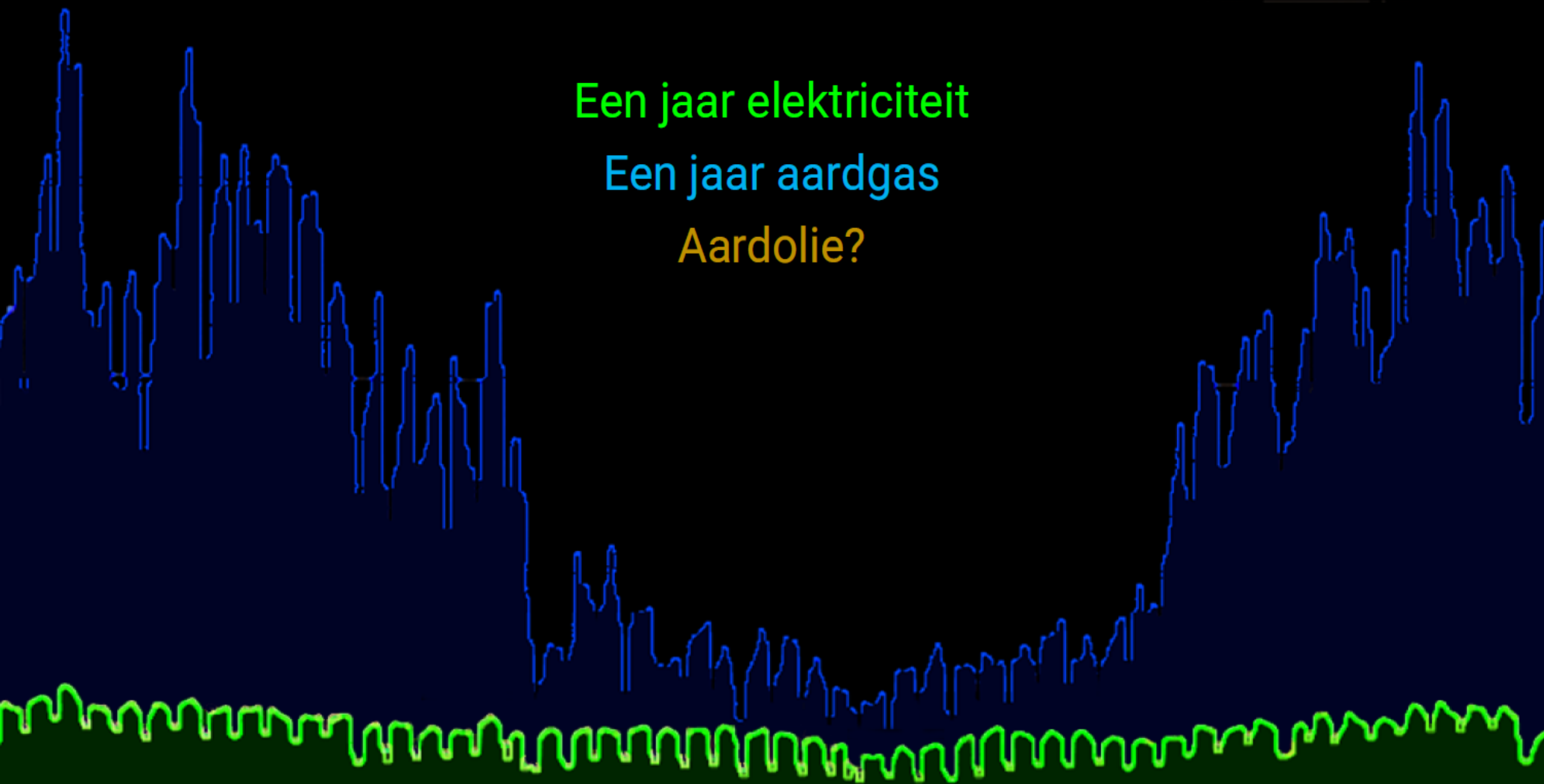
Een week nu



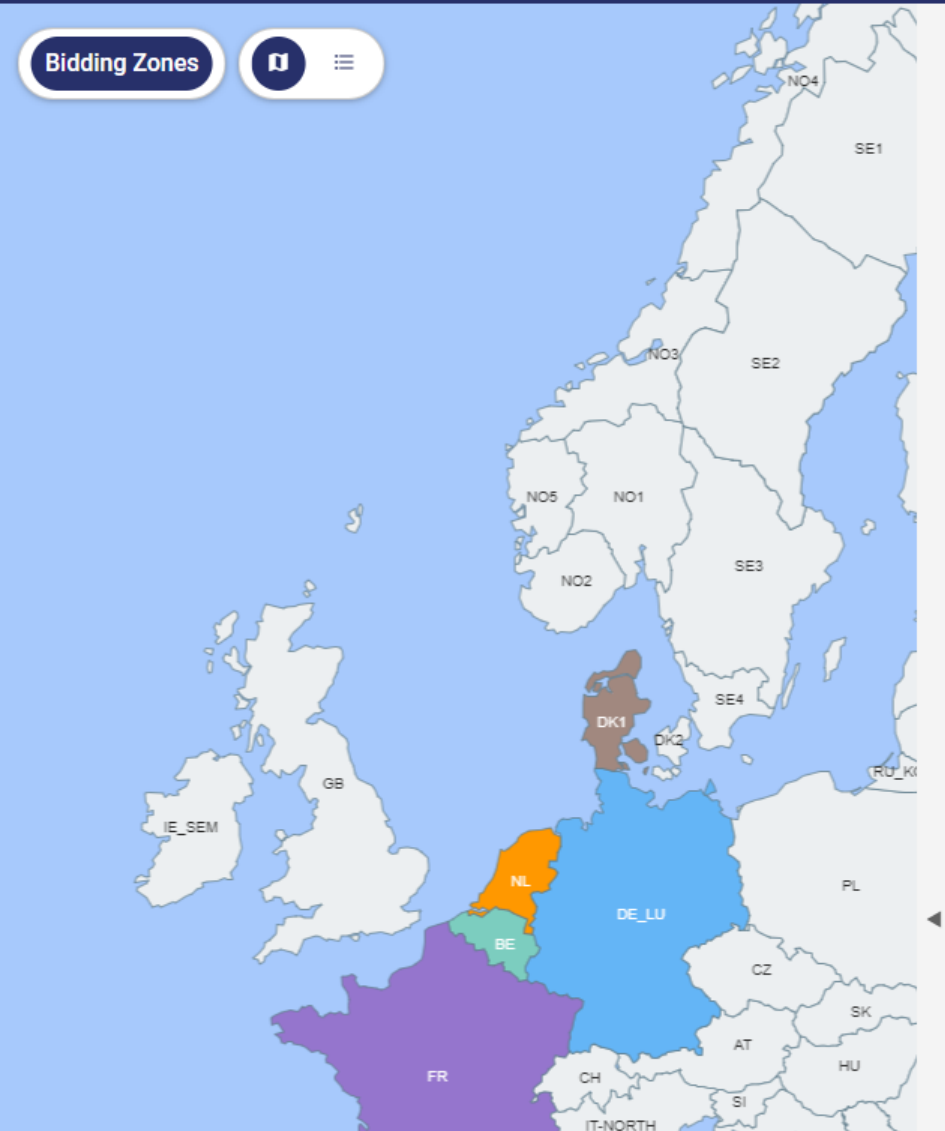
Een jaar elektriciteit

Een jaar aardgas

Aardolie?



Bidding Zones



BZN|BE, BZN|DE-LU, BZN|NL, BZN|FR, BZN|DK1

Close X

€ Market ⬇ Load ⬆ Generation ↔ Transmission 🔧 Outages ⚖ Balancing ⚡ Operations

Day-ahead Prices

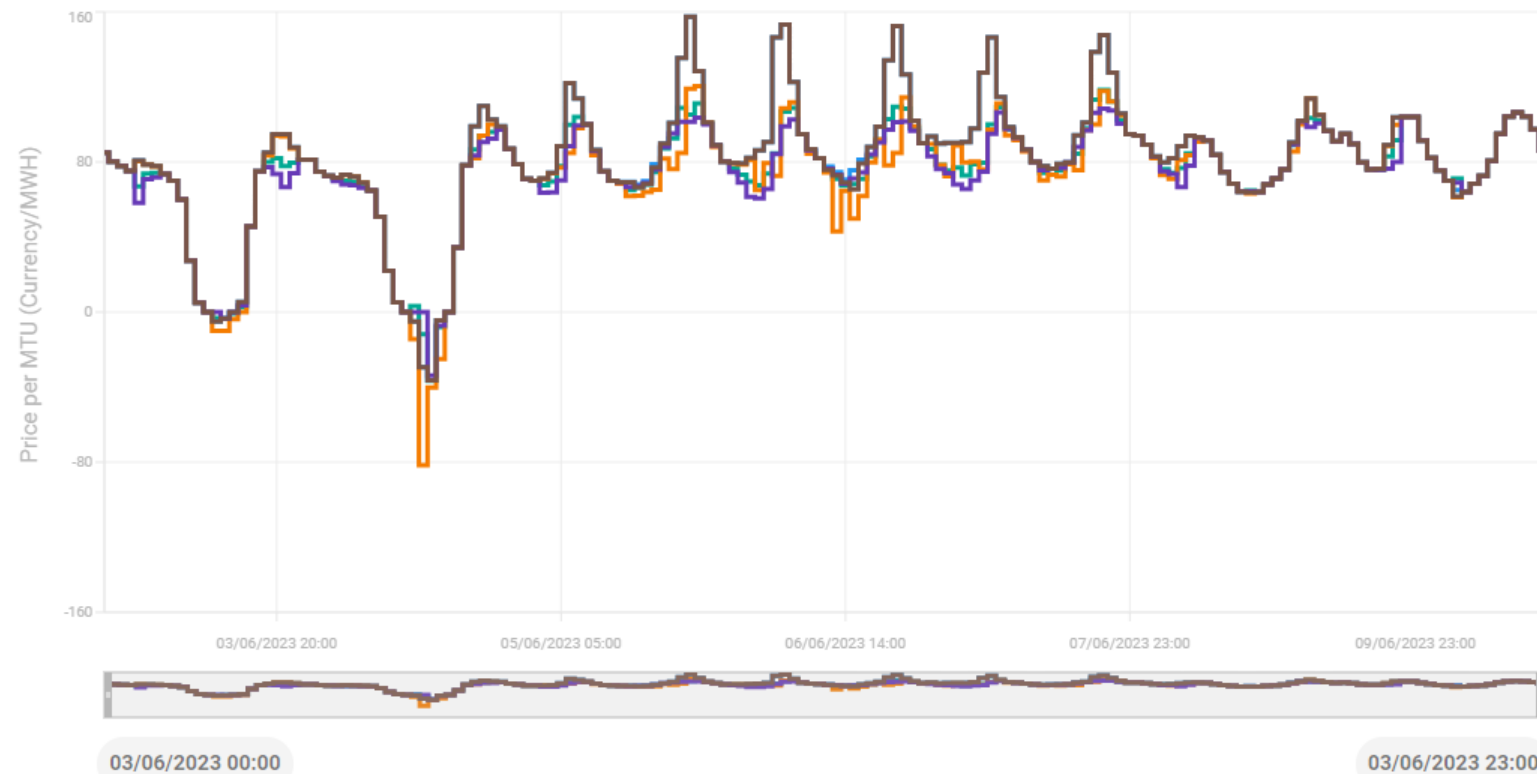


PT15M

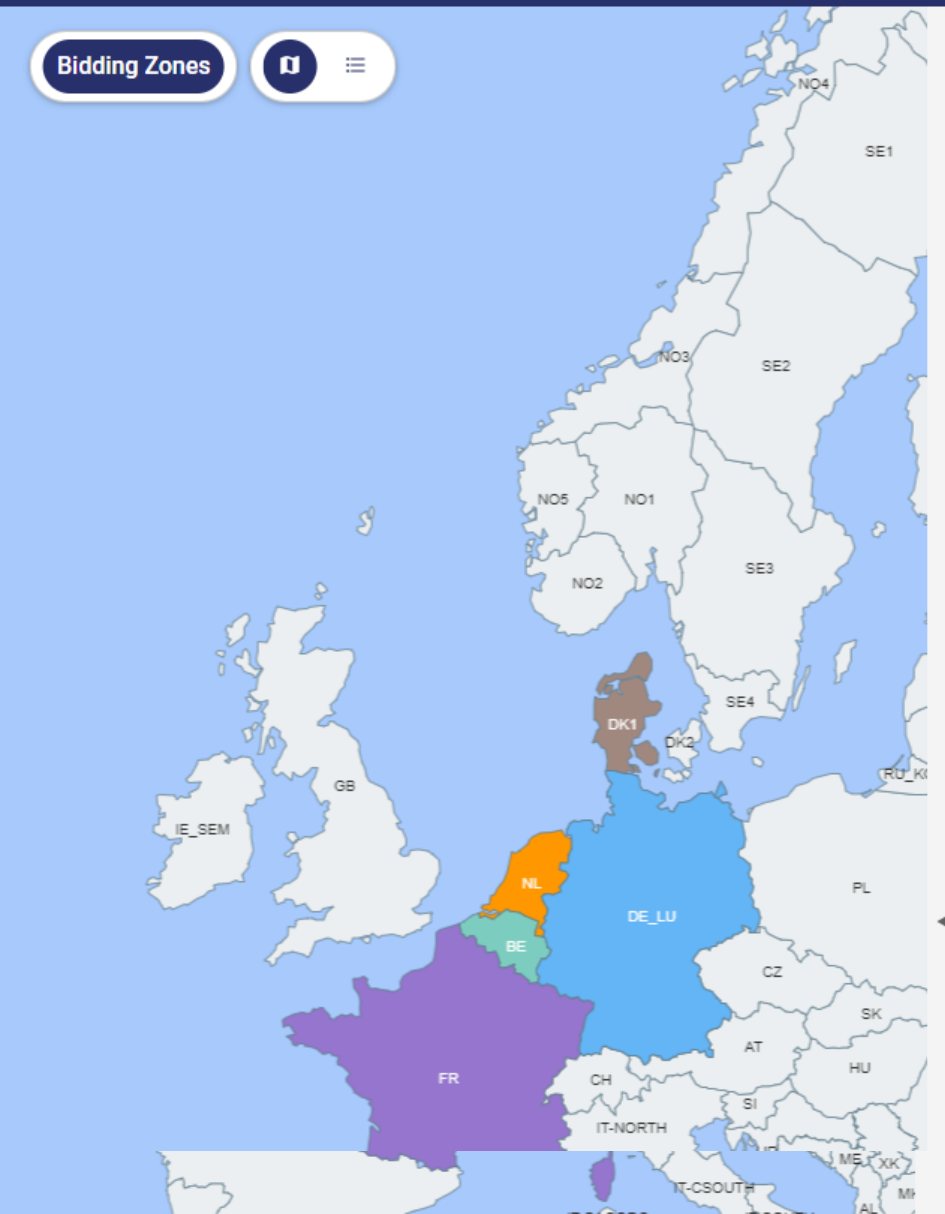
PT30M

PT60M

📅 03/06/2023 - 09/06/2023



Bidding Zones



BZN|BE, BZN|DE-LU, BZN|NL, BZN|FR, BZN|DK1

Close X

€ Market

Load

Generation

Transmission

Outages

Balancing

Operations

Day-ahead Prices



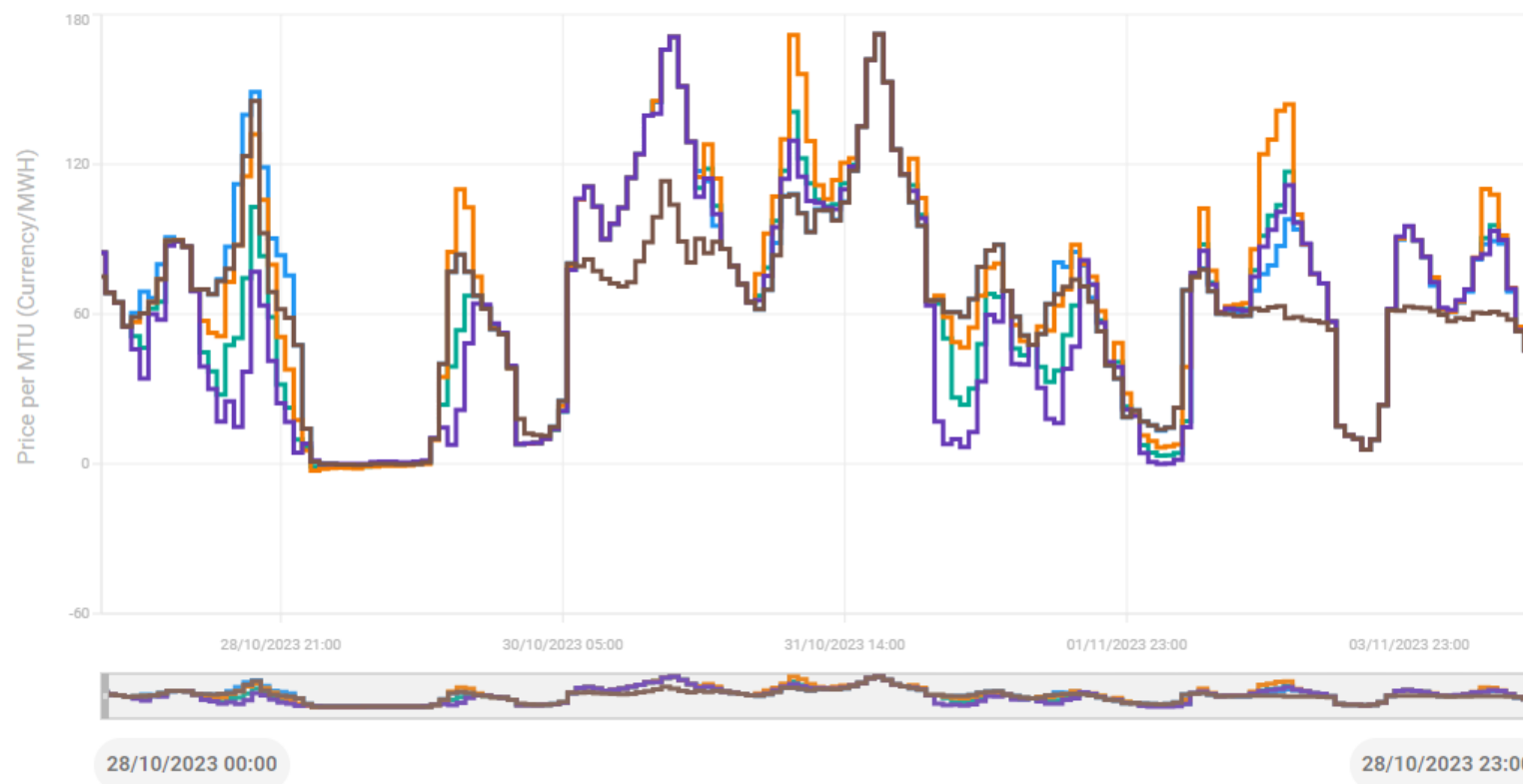
PT15M

PT30M

PT60M



28/10/2023 - 03/11/2023



Select all

Unselect all

● BZN|BE

● BZN|DE-LU

● BZN|NL

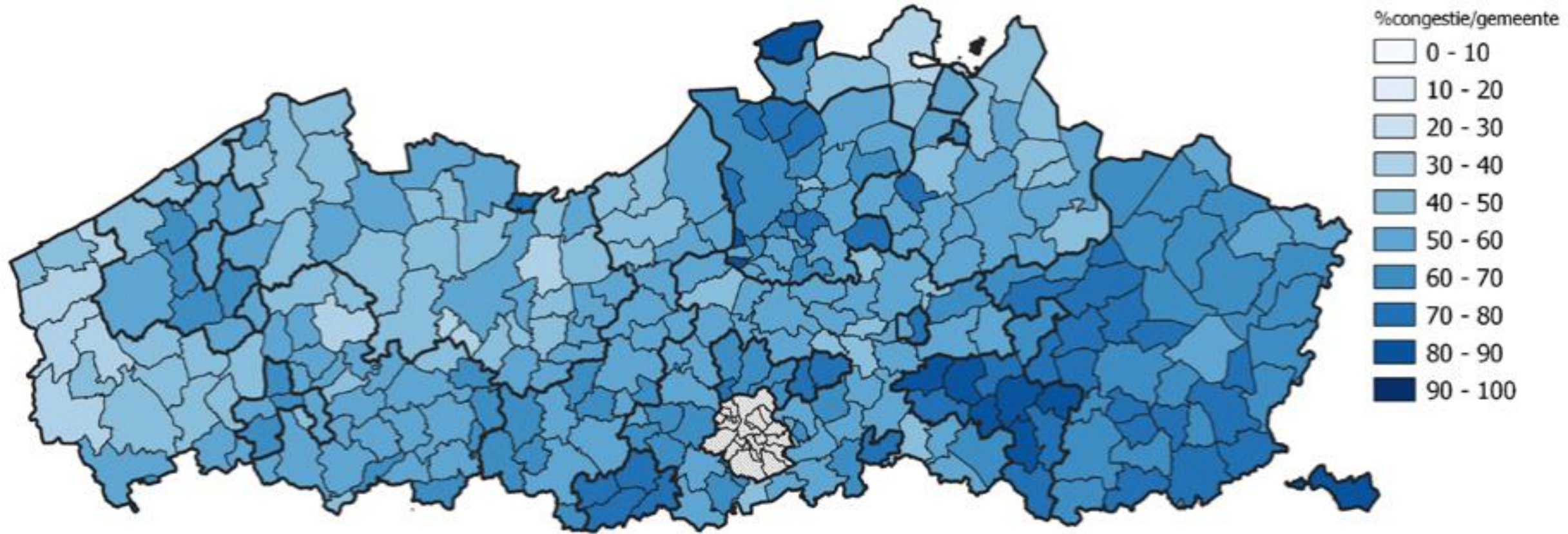
● BZN|FR

● BZN|DK1

Actueel aandeel netten dat potentieel in congestie kan komen (% per gemeente)



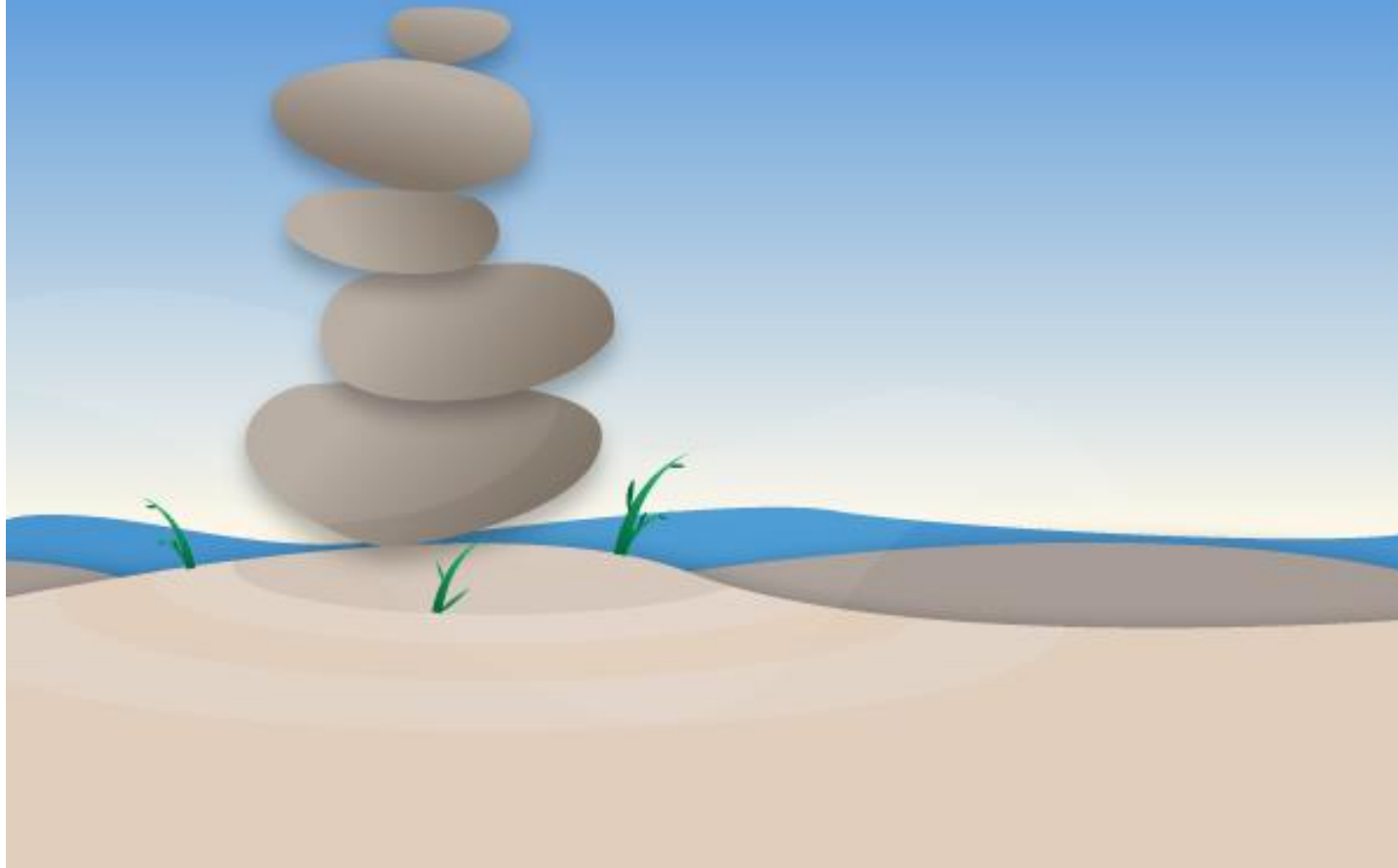
2035 - aandeel netten dat potentieel in congestie kan komen (% per gemeente)

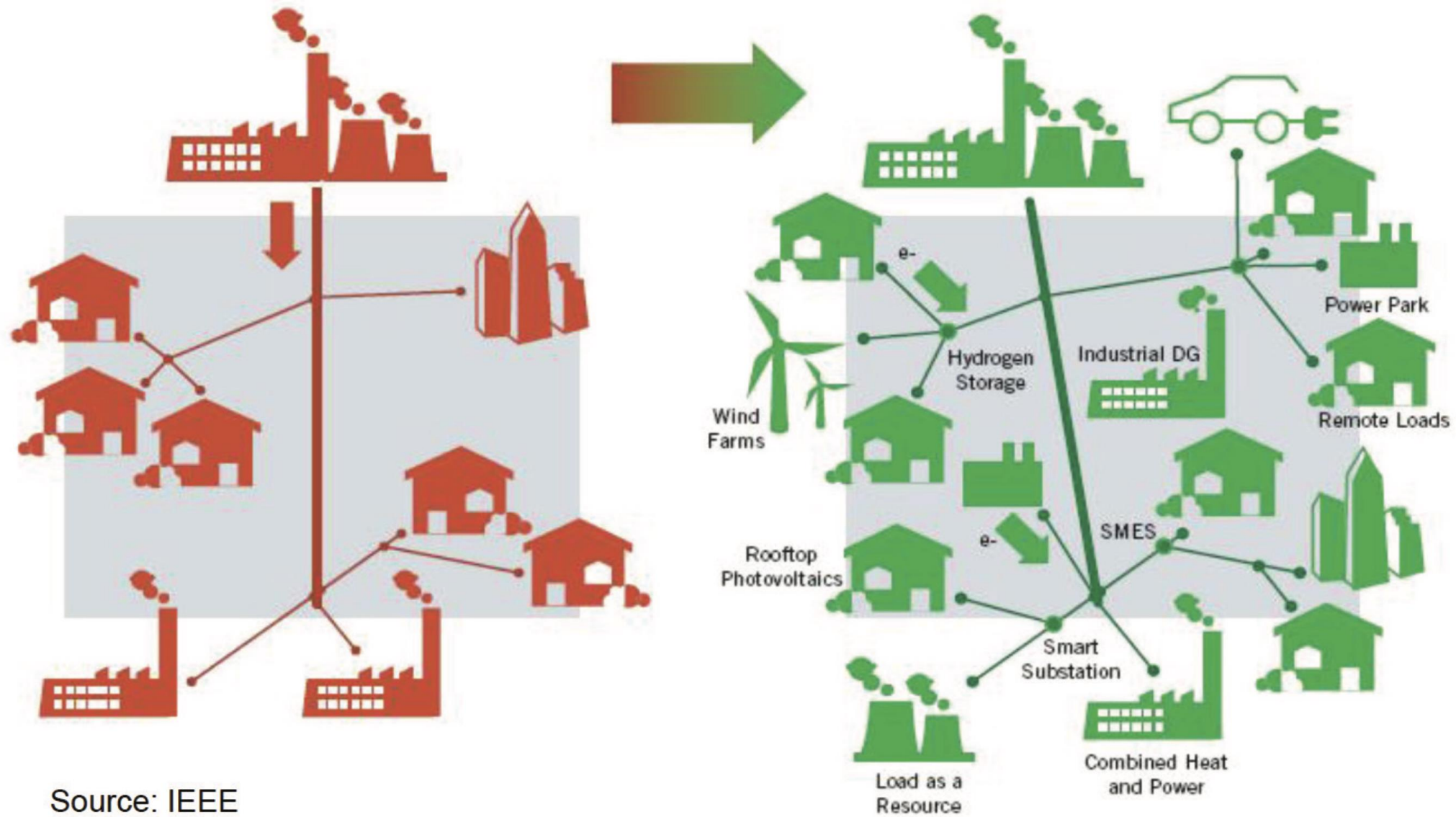


0 10 20 km

FLEXIBILITY IS KEY

FOR LONG TERM STABILITY





Source: IEEE



A revised **EU electricity market design** to:



Boost renewable
energy
investments



Better protect
and empower EU
consumers



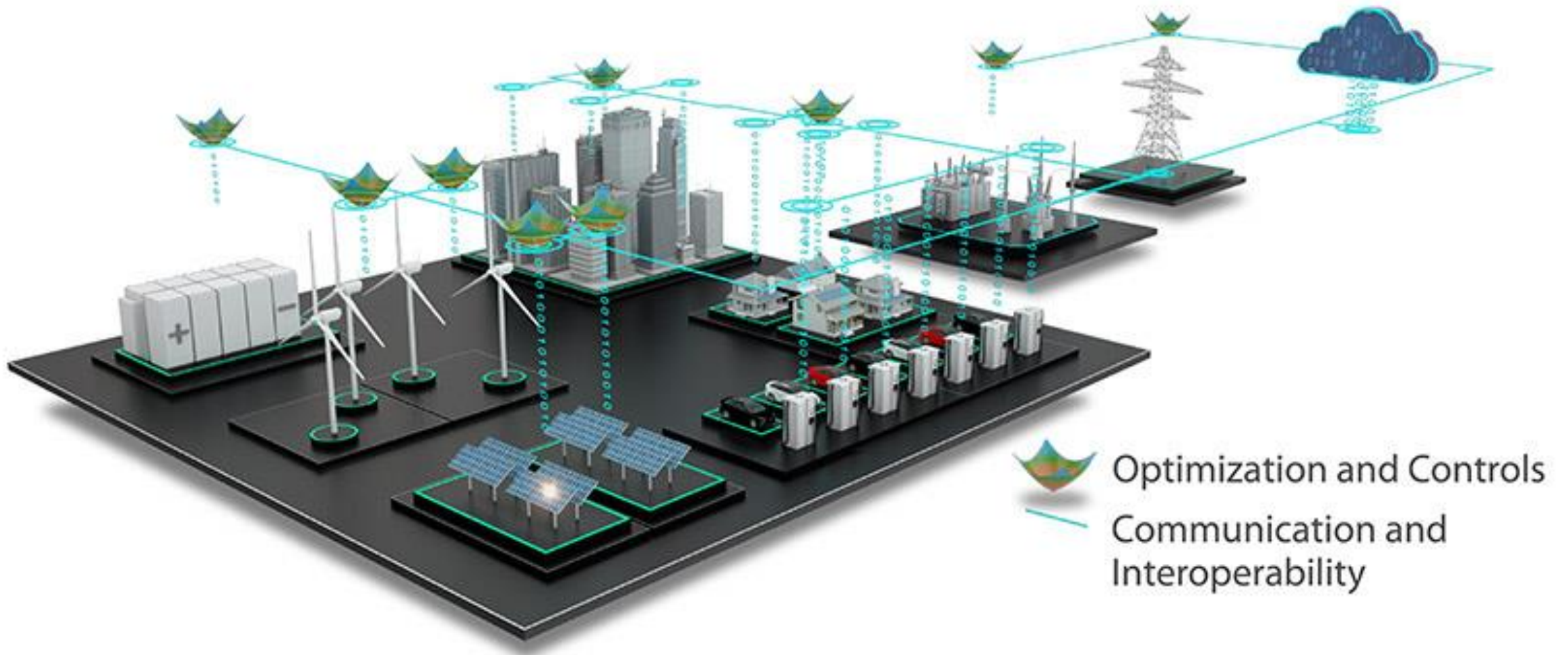
Enhance the
competitiveness
of EU industry



European
Commission



Er is daarmee nog vaak vrije ruimte op het net.





Eindgebruikers begrijpen er niets van en dat is niet zo gek

A close-up photograph of a person's hand holding a glowing crystal ball. The crystal ball is translucent and contains the text. The background is dark and out of focus.

“The best way to
predict the
future is to
create it”.

Abraham Lincoln



CONTACT

Flux50

Frederik Loeckx

Koningsstraat 146

B-1000 Brussel

Frederik.loeckx@flux50.com

Twitter: @flux_50