elia group
Elia | 50Hertz | EGI
Elia Introduction
Congen Vlaanderen
30/09/2022
Powering
the decade
of electrification

Overview

1. Elia Group at a glance
2. Mission, vision & strategy
3. Secure & efficient grid
4. Infrastructure projects
5. System & markets

Elia Group

Grid management

System operations

Market facilitation

Trusteeship

REGULATED ACTIVITIES

50hertz

- Northern/Eastern Germany TSO operator
- On- and offshore transmission systems
- 80% owned by Elia Group (20% KfW)
- Monopolistic position in Northeast Germany

elia

- National TSO
- On- and offshore transmission systems
- 99.99% owned by Elia Group
- Monopolistic position in Belgium

nemolink

- 50/50 JV between Elia and National Grid (UK)
- Grid interconnection between BE and UK
- 50% owned by Elia Group

NON-REGULATED ACTIVITIES

egi

- International energy market consultancy and engineering services

realto

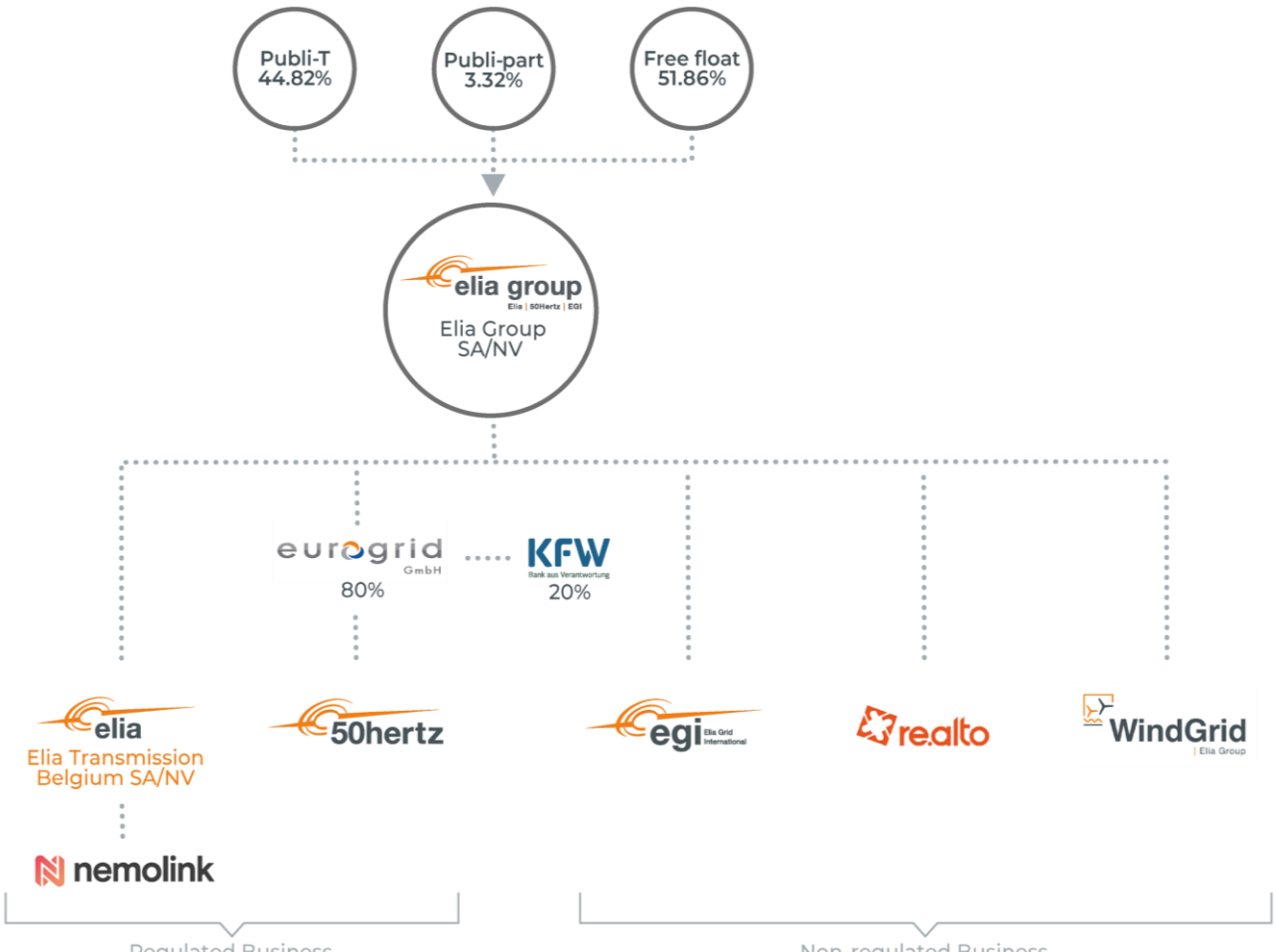
- European market platform
- Exchange and valorization of data and digital services
- 100% owned by Elia Group

WindGrid

- 100% subsidiary of Elia Group
- Focusing on international offshore developments

1 The Elia group at a glance

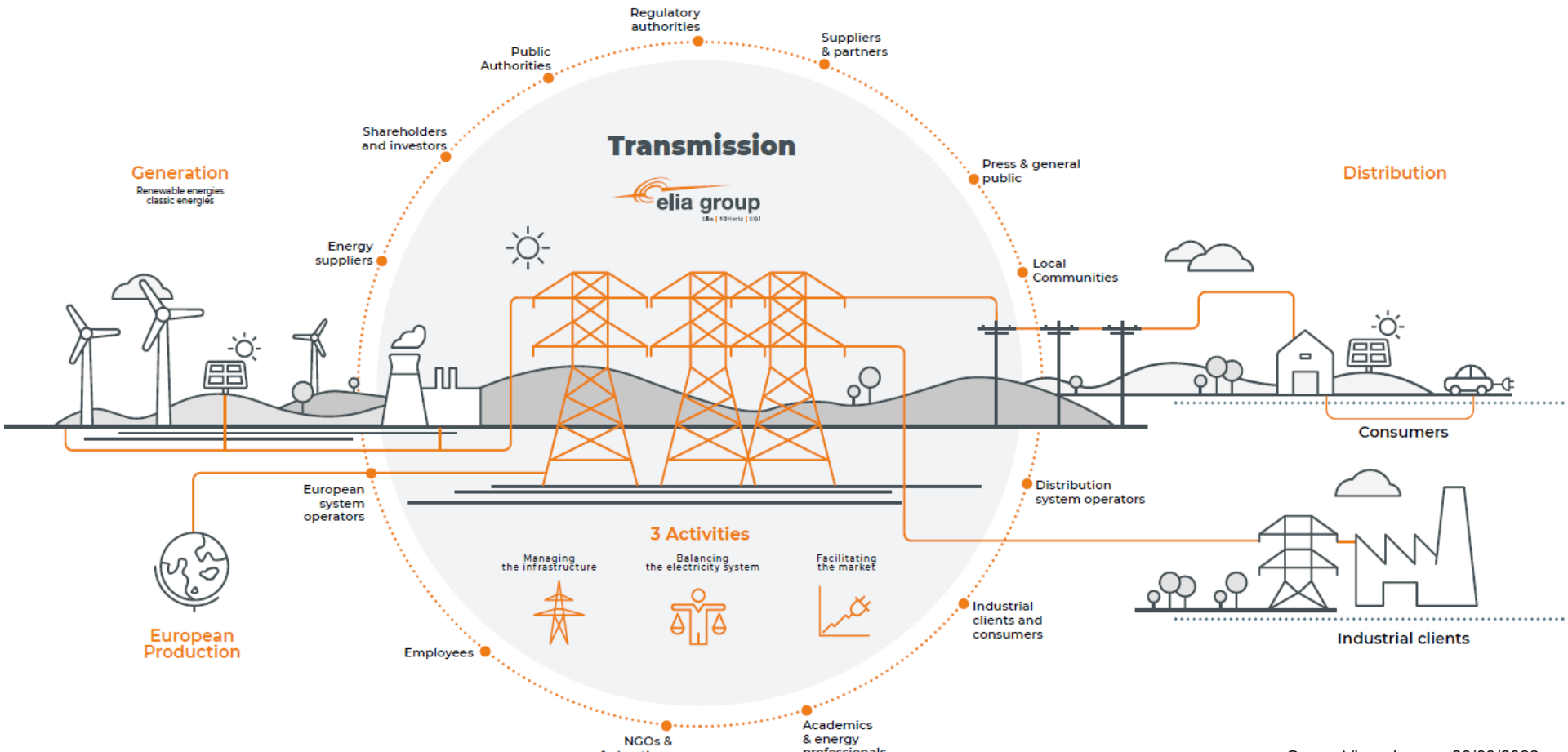
Legal structure and shareholder structure



12.9%
of outstanding shares are held by institutional investors

3.2%
of all investors are ESG focused funds

We connect generation and distribution



FINANCIAL KEY PERFORMANCE INDICATORS

€328.3 million

Adjusted Net Profit

€10.3 billion

Regulatory Asset Base[2]

7.56%

ROE (adj.)[1]

€1.75

Gross dividend per share

€376.7 million

Belgium

€850.9 million

Germany

Grid Investments

1 Determined as the result attributable to ordinary shareholder/equity attributable to owners of ordinary shares adjusted for the value of the future contracts (hedging reserve)

2 Includes 80% of 50Hertz; does not include Nemo Link

Environmental

NON-FINANCIAL KEY PERFORMANCE INDICATORS

CLIMATE ACTION

15,807
Scope 1 emissions (tCO_2e)

99.99%
Grid reliability (onshore, 150 kV and above)

1,092,151
Scope 2 emissions (tCO_2e)

60%
of Scope 3 emissions are accounted on the basis of mature (primary) data (see 'Our performance')

363 km
Lines commissioned

ENVIRONMENT & CIRCULAR ECONOMY

60%
HV lines critical to birds equipped with bird markers

79%
Forest corridors managed ecologically

NON-FINANCIAL KEY PERFORMANCE INDICATORS

Social

HEALTH & SAFETY

3.0%
Absentee Rate Group[3]

6.3
Group TRIR[4]

DIVERSITY, EQUITY & INCLUSION

22.2%
Women in total workforce

69*
Employee commitment index

37
Nationalities

3 Corresponds to health rate (1-x)

4 Calculated as: (the number of work accidents with and without lost time)*1,000,000 / (The total number of working hours over the year); excludes subcontrators - they will be included from 2022 onwards

* The survey is performed once every two years. It aims to collect feedback from employees about their views and general level of satisfaction with regard to Elia and 50Hertz as workplaces; the Index is made up of 7 questions.

NON-FINANCIAL KEY PERFORMANCE INDICATORS

Governance

GOVERNANCE, ETHICS & COMPLIANCE

4/12
ESG Governance Index[5]

68
Public info-dialogue sessions related to grid projects

5/12
Compliance Index[5]

5 Composition of the indexes available on our website

2 Mission & vision

Key industry megatrends

Decarbonisation of the energy sector

Decentralisation and new market players

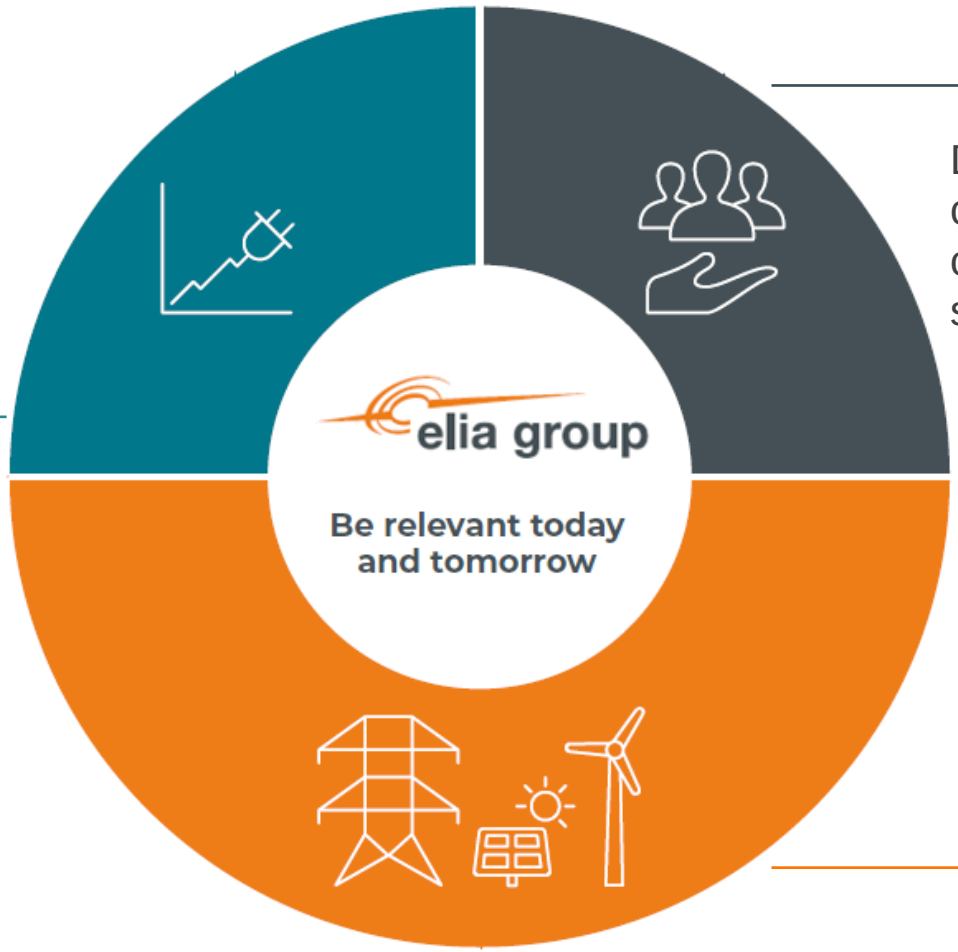
Supranational coordination

Digital transformation

Our 3 strategic pillars

Grow beyond current perimeter to deliver societal value

.2



.3

Develop new services creating value for customers in the energy system

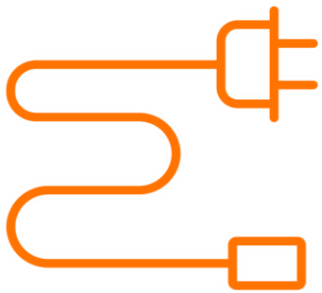
Deliver the infrastructure of the future & develop and operate a sustainable power system

1.

Our core tasks

Grid Ownership
We prepare to deliver the infrastructure of the future

System control
We maintain the balance



Market Facilitation
We are part of the European integrated market

ACT NOW
FOR A SUSTAINABLE WORLD

ESG

1. Climate Action
2. Environment & Circular Economy
3. Health & Safety
4. Diversity, Equity & Inclusion
5. Governance, Ethics & Compliance

7 AFFORDABLE AND CLEAN ENERGY
13 CLIMATE ACTION
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
15 LIFE ON LAND
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
14 LIFE BELOW WATER
8 DECENT WORK AND ECONOMIC GROWTH
10 REDUCED INEQUALITIES
16 PEACE, JUSTICE AND STRONG INSTITUTIONS

3 Secure & efficient grid

Elia Grid in Belgium

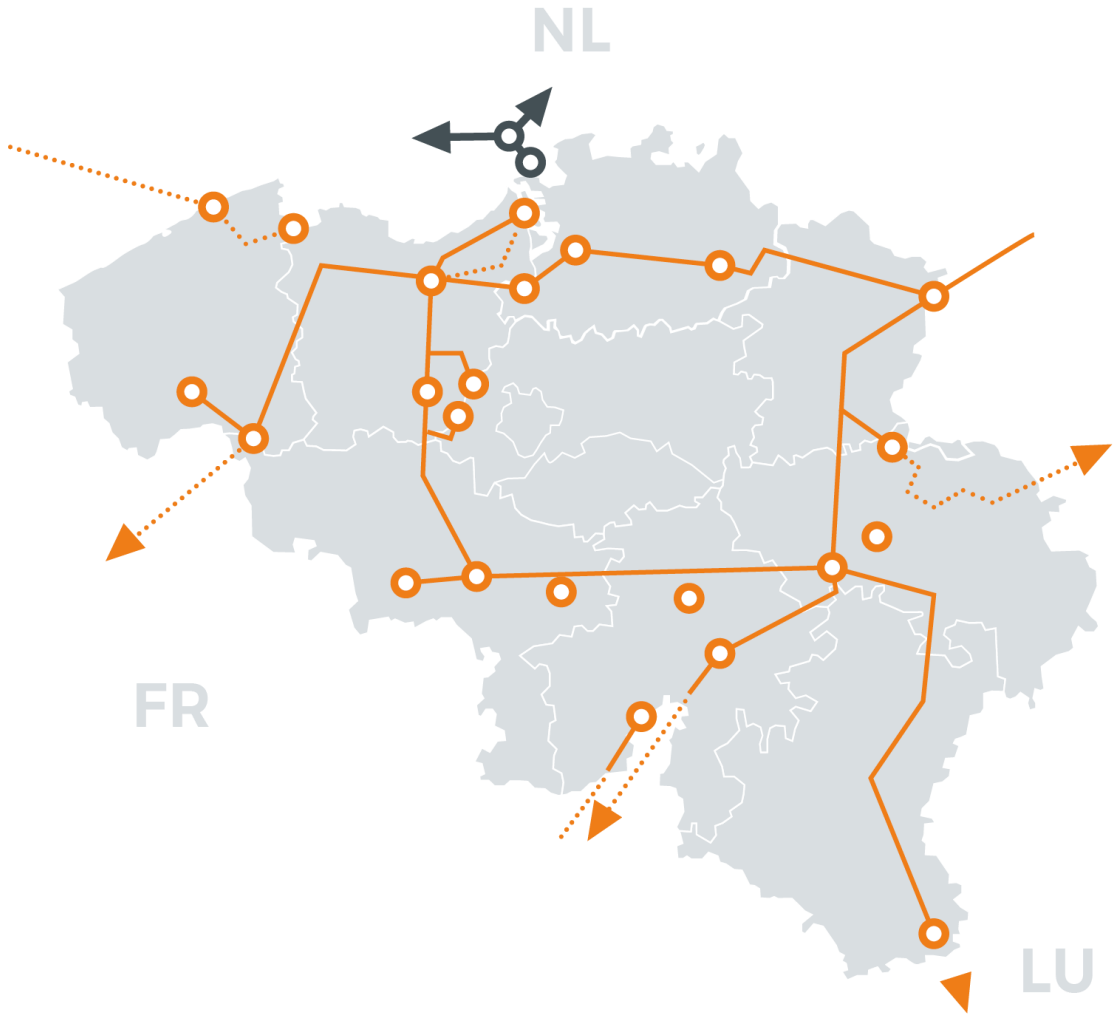
Length of lines

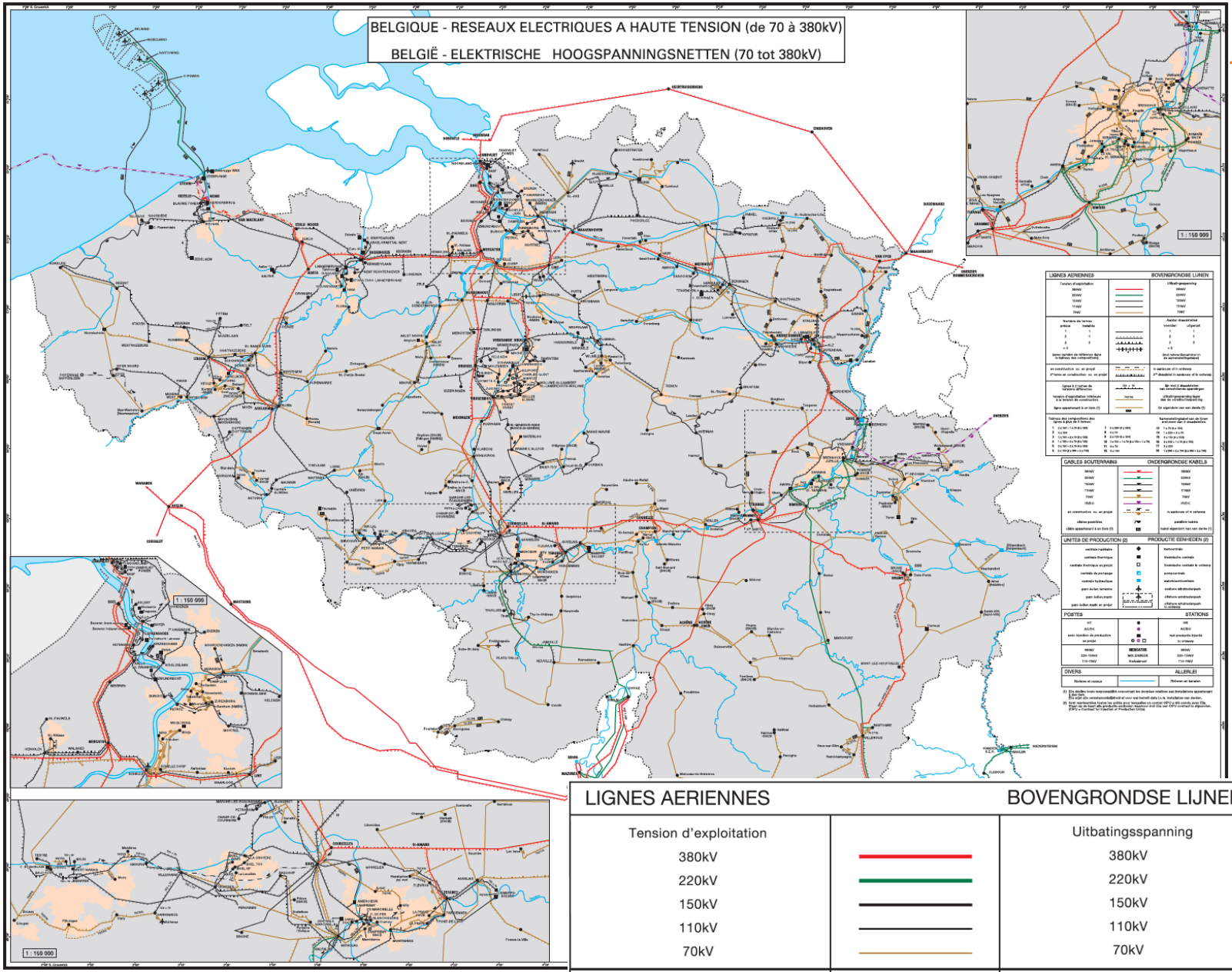
Voltage	2021 Underground/ **submarine** cabling (km)	2021 Overhead lines (km)
400 kV (DC)	70*	-
380 kV	41	940
320 kV	49	-
220 kV	162	300
150 kV	717	1,926
110 kV	-	9
70 kV	324	2,370
36 kV	1,865	8
30 kV	75	22
Total Lines/Cables	**3,292**	**5,575**
TOTAL	8,867	

Substations and converter stations

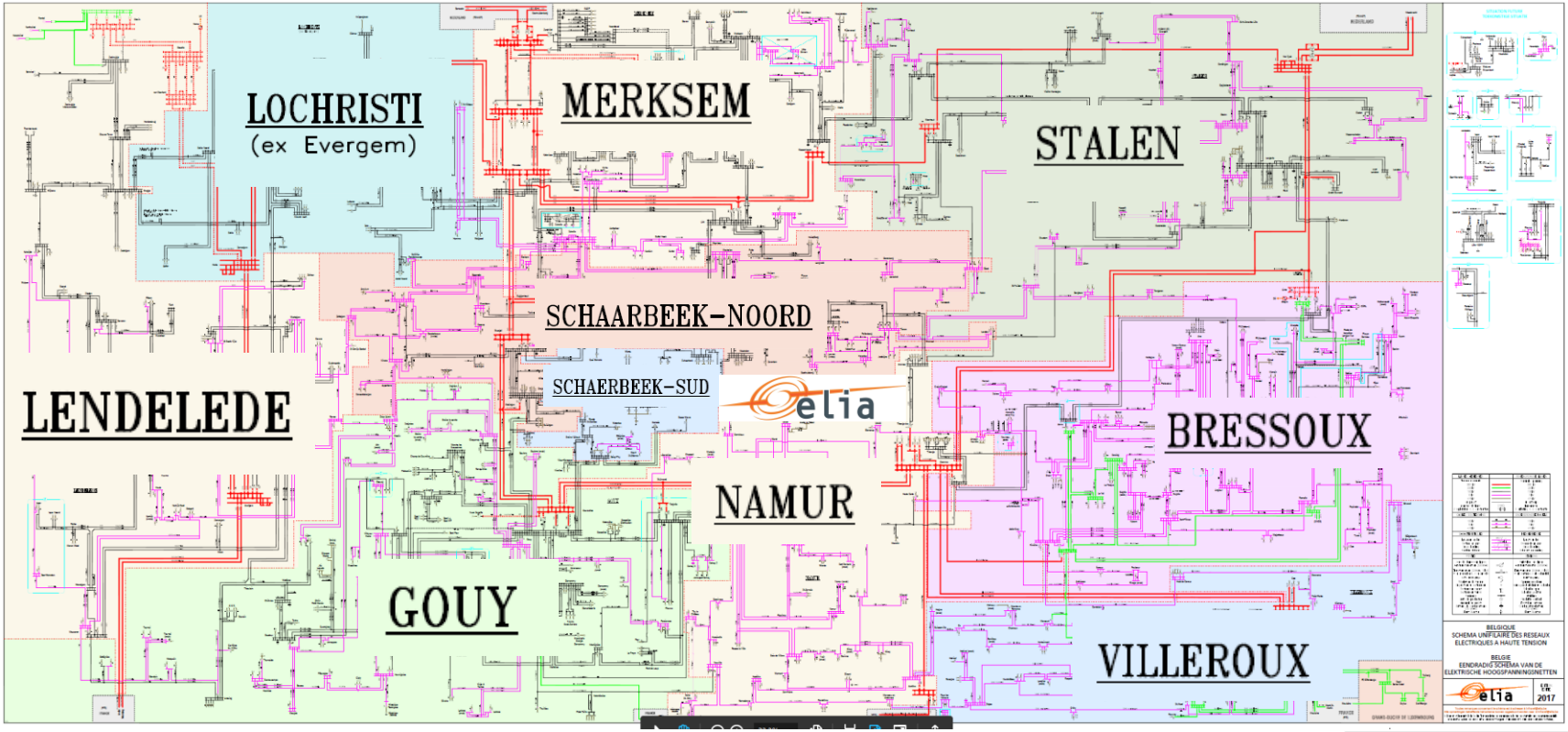
	2021
substations ≥ 150 kV	300
substations < 150 kV	507
HVDC* Converter station	2
TOTAL	809

* HVDC: High Voltage Direct Current





LIGNES AERIENNES		BOVENGRONDSE LIJNEN
Tension d'exploitation		Uitbatingsspanning
380kV		380kV
220kV		220kV
150kV		150kV
110kV		110kV
70kV		70kV



LIGNES AERIENNES		BOVENGRONDSE LIJNEN
Tension nominale		Nominale spanning
380 kV		380 kV
220kV		220kV
150kV		150kV
70kV		70kV
<70kV		<70kV
en projet		in ontwerp
numéro de ligne	(102)	lijnnummer
U exploitation < U construction	15[70]	U uitbating < U constructie
CABLES SOUTERRAINS		**ONDERGRONDSE KABELS**
150kV		150kV
70kV		70kV
<70kV		<70kV

An evolving electricity system

Decarbonisation of the energy sector

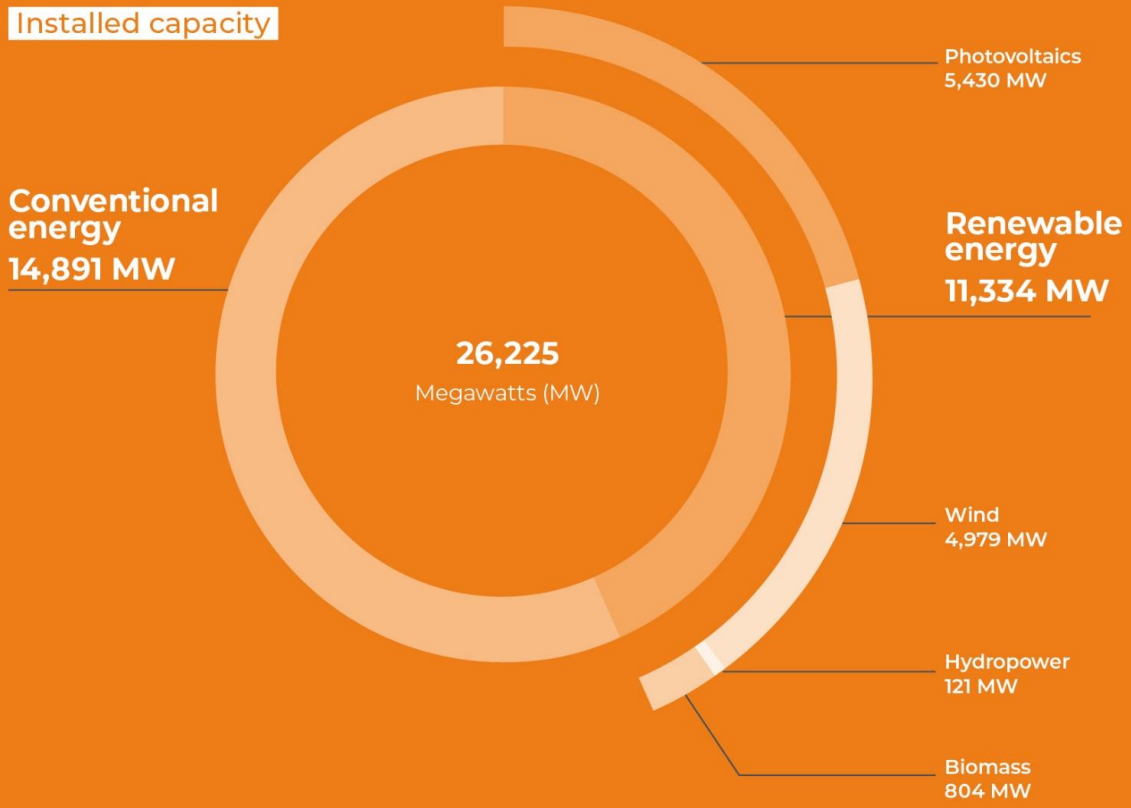
European integration of the electricity system and more supranational coordination

Decentralised generation & new players

Digitalisation of the power sector

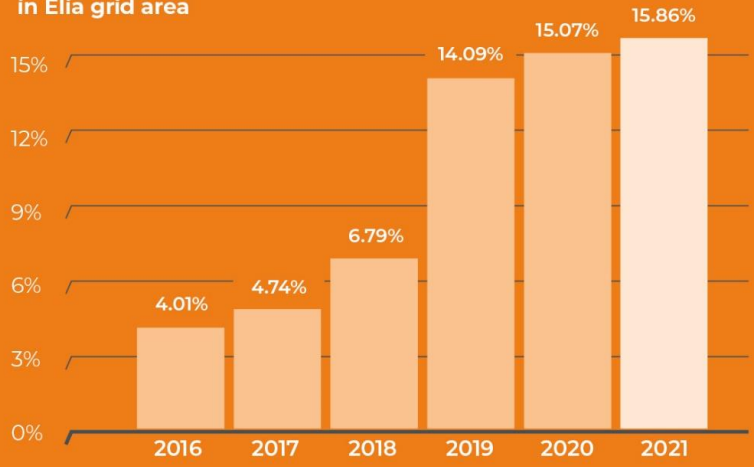
The energy mix in Belgium 2021

Installed capacity



Evolution

Development of the RE share in electric supply in Elia grid area



Group priorities to enable the energy transition

SAFETY

We go for Zero accidents

IN THE INTEREST OF SOCIETY

For a reliable, sustainable and affordable energy system

INNOVATION

To accelerate the energy transition

A reliable system:

A sustainable system:

An affordable system:

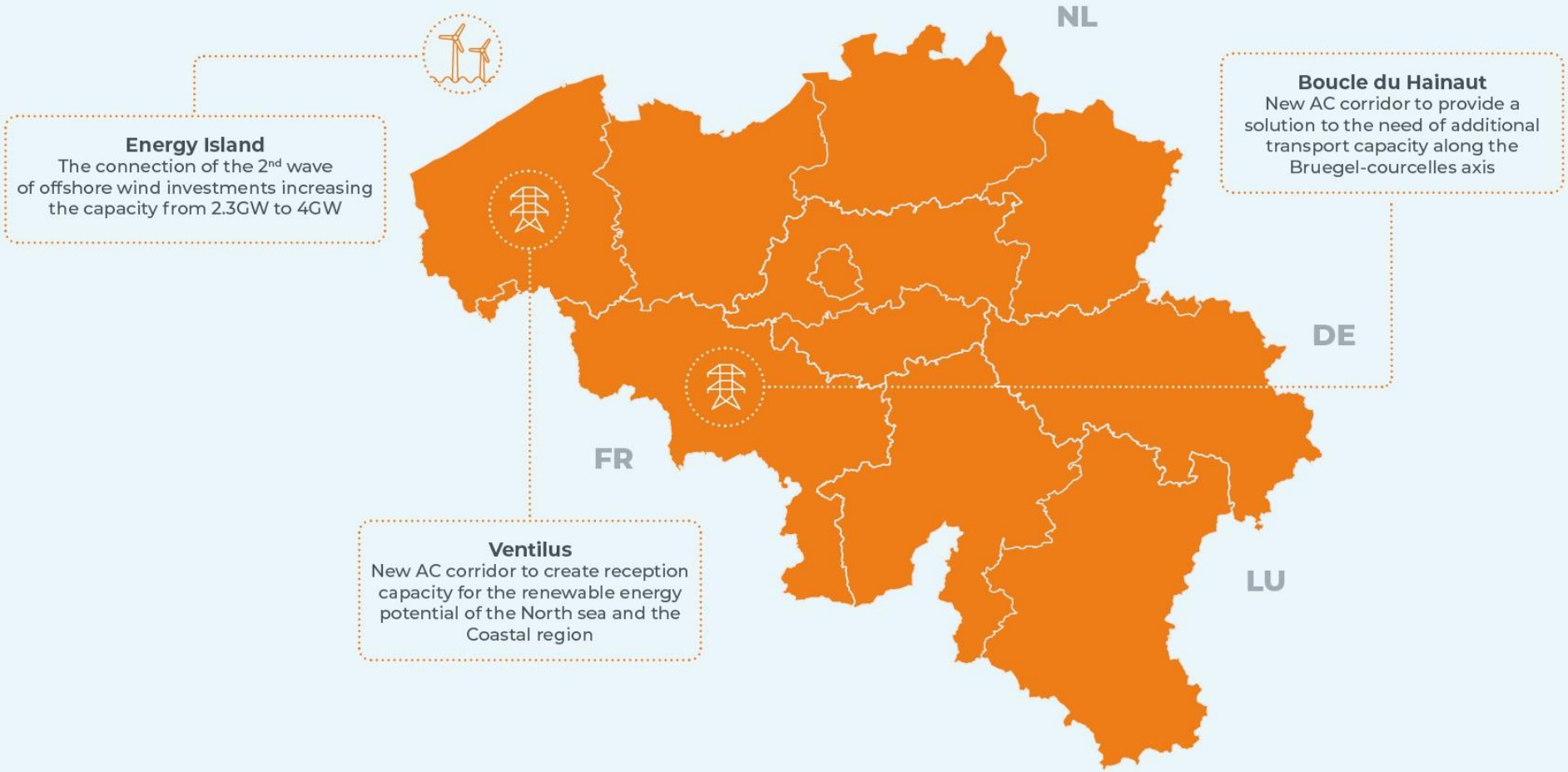
Our core tasks

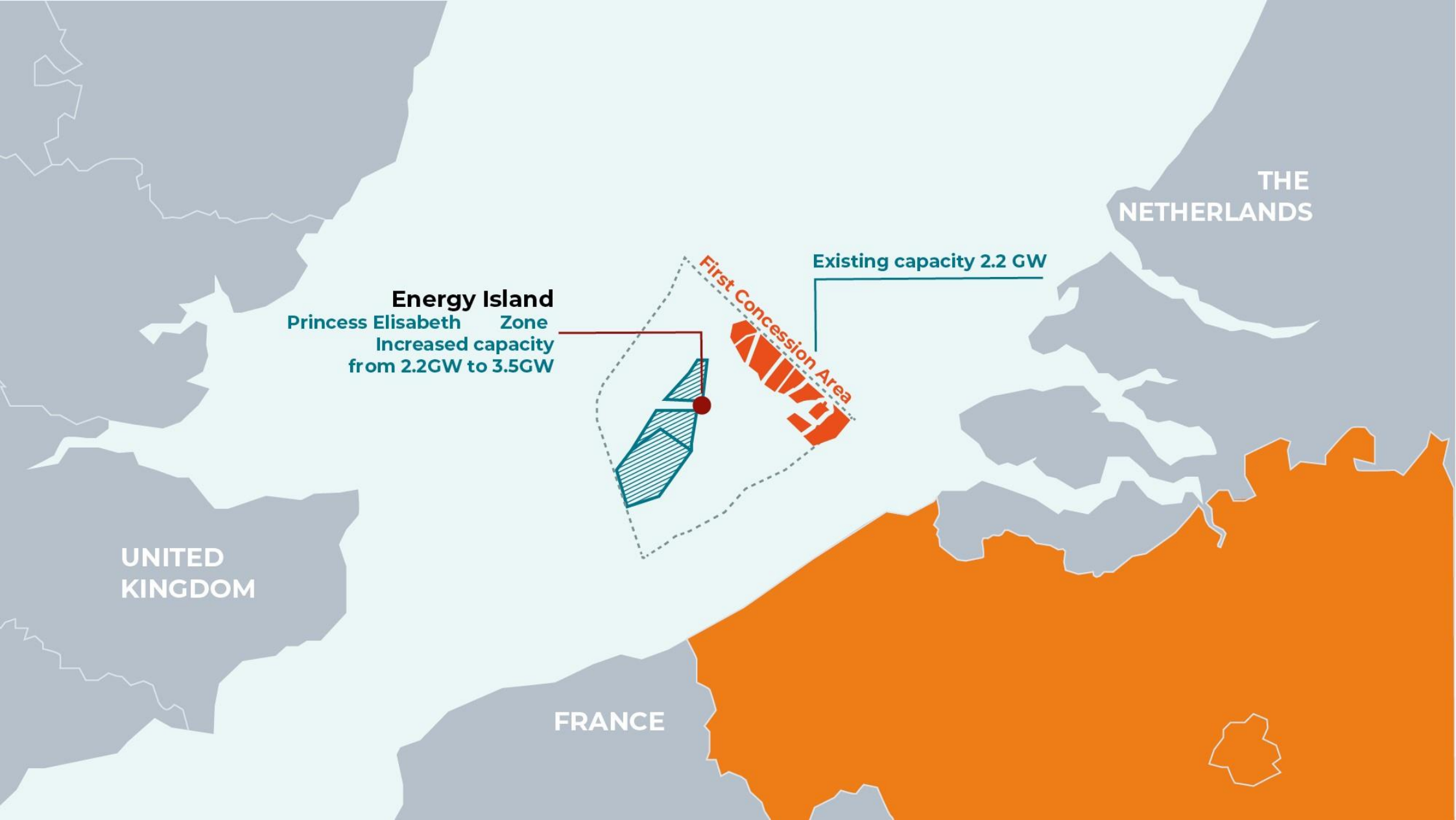
Grid Ownership
We prepare to deliver the infrastructure of the future

System control
We maintain the balance

Market Facilitation
We are part of the European integrated market

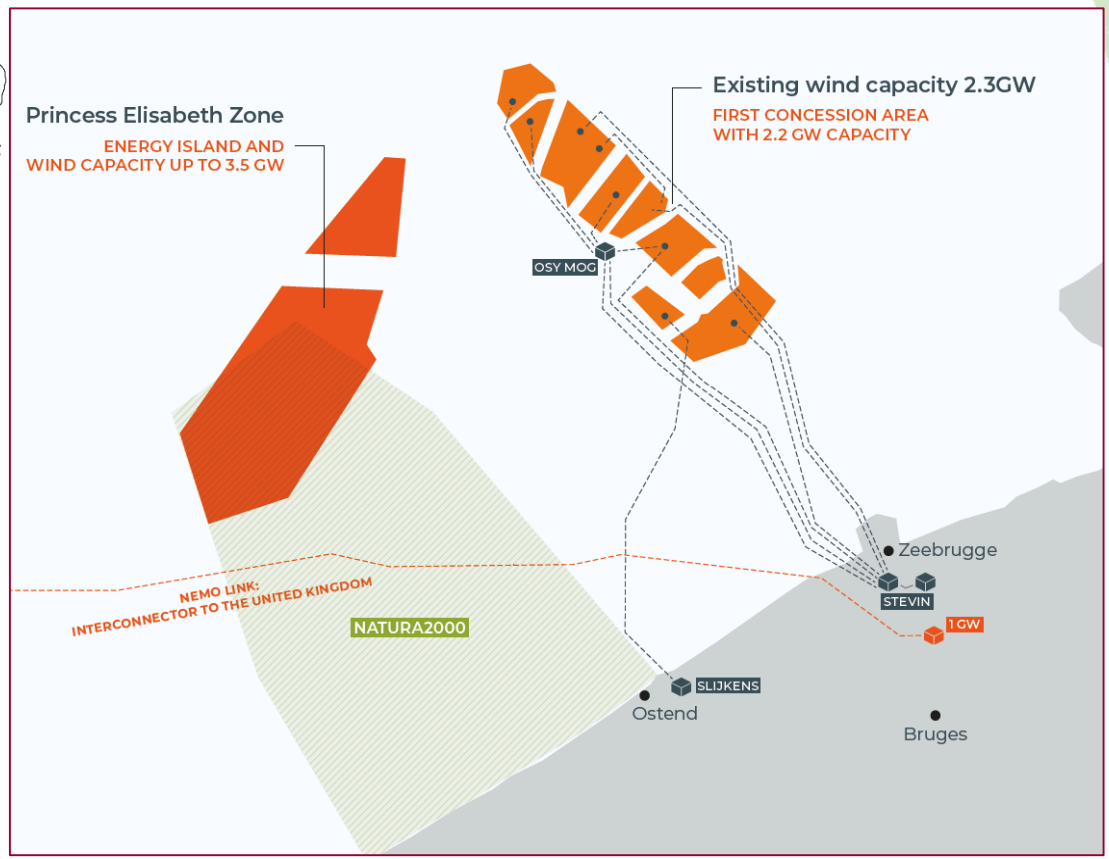
4 Future
infrastructure
projects

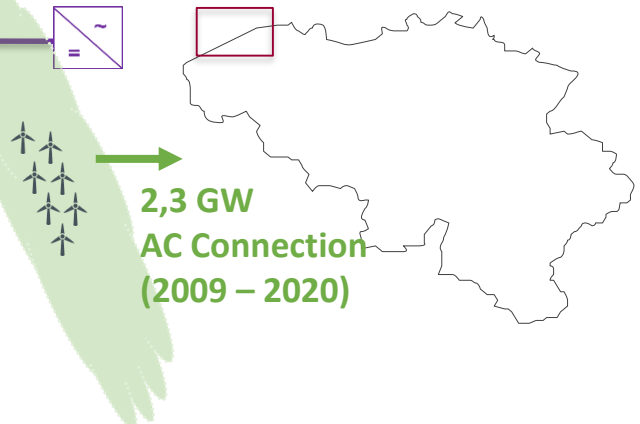

NL
DE
FR
LU
Energy Island
The connection of the 2nd wave of offshore wind investments increasing the capacity from 2.3GW to 4GW
Boucle du Hainaut
New AC corridor to provide a solution to the need of additional transport capacity along the Bruegel-courcelles axis
Ventilus
New AC corridor to create reception capacity for the renewable energy potential of the North sea and the Coastal region


THE NETHERLANDS
Existing capacity 2.2 GW
First Concession Area
Energy Island
Princess Elisabeth Zone
Increased capacity
from 2.2GW to 3.5GW
UNITED KINGDOM
FRANCE

Current situation

NEMO Point-to Point HVDC interconnector 1 GW (2019)



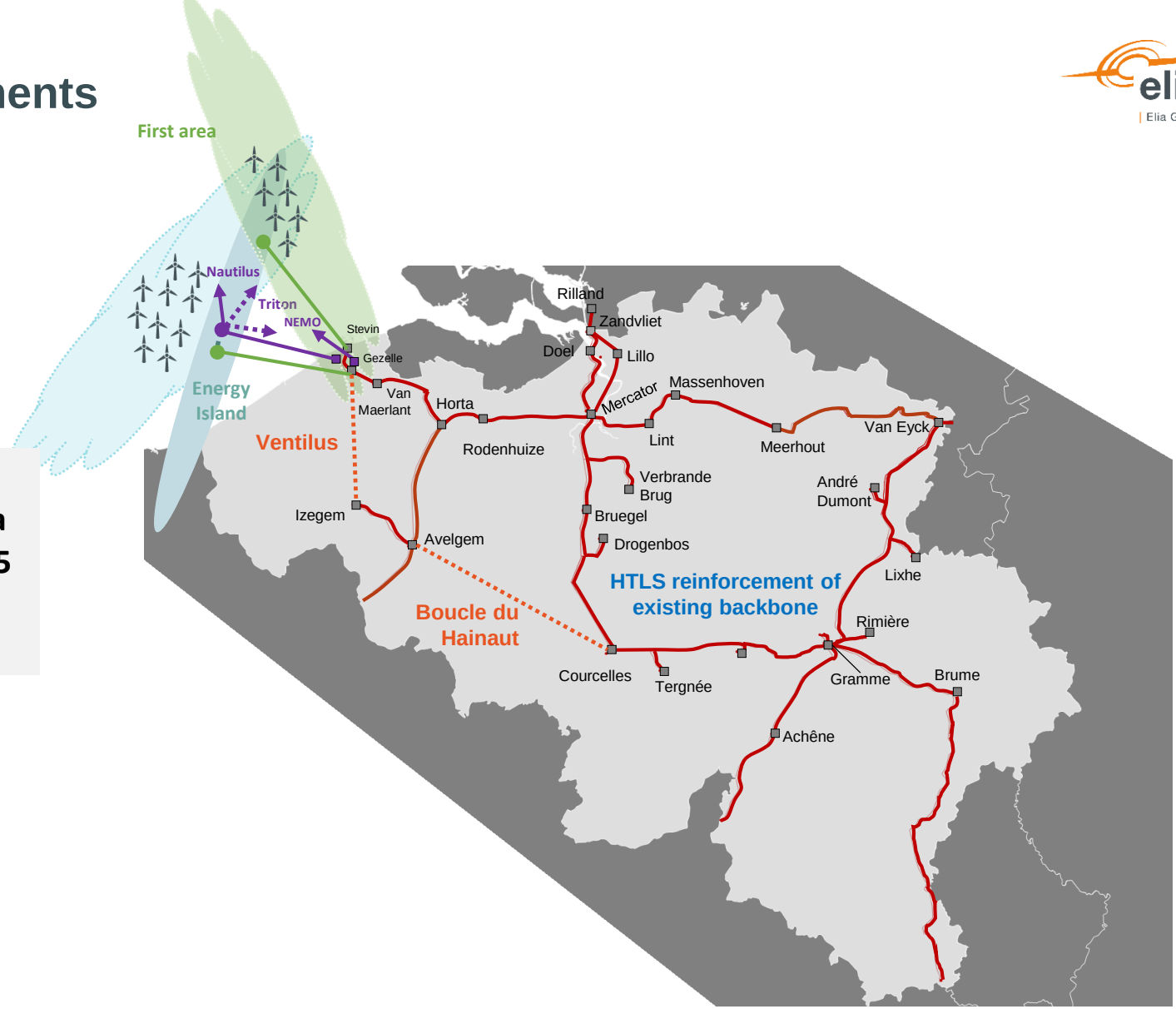


2,3 GW AC Connection (2009 – 2020)

Backup Slide

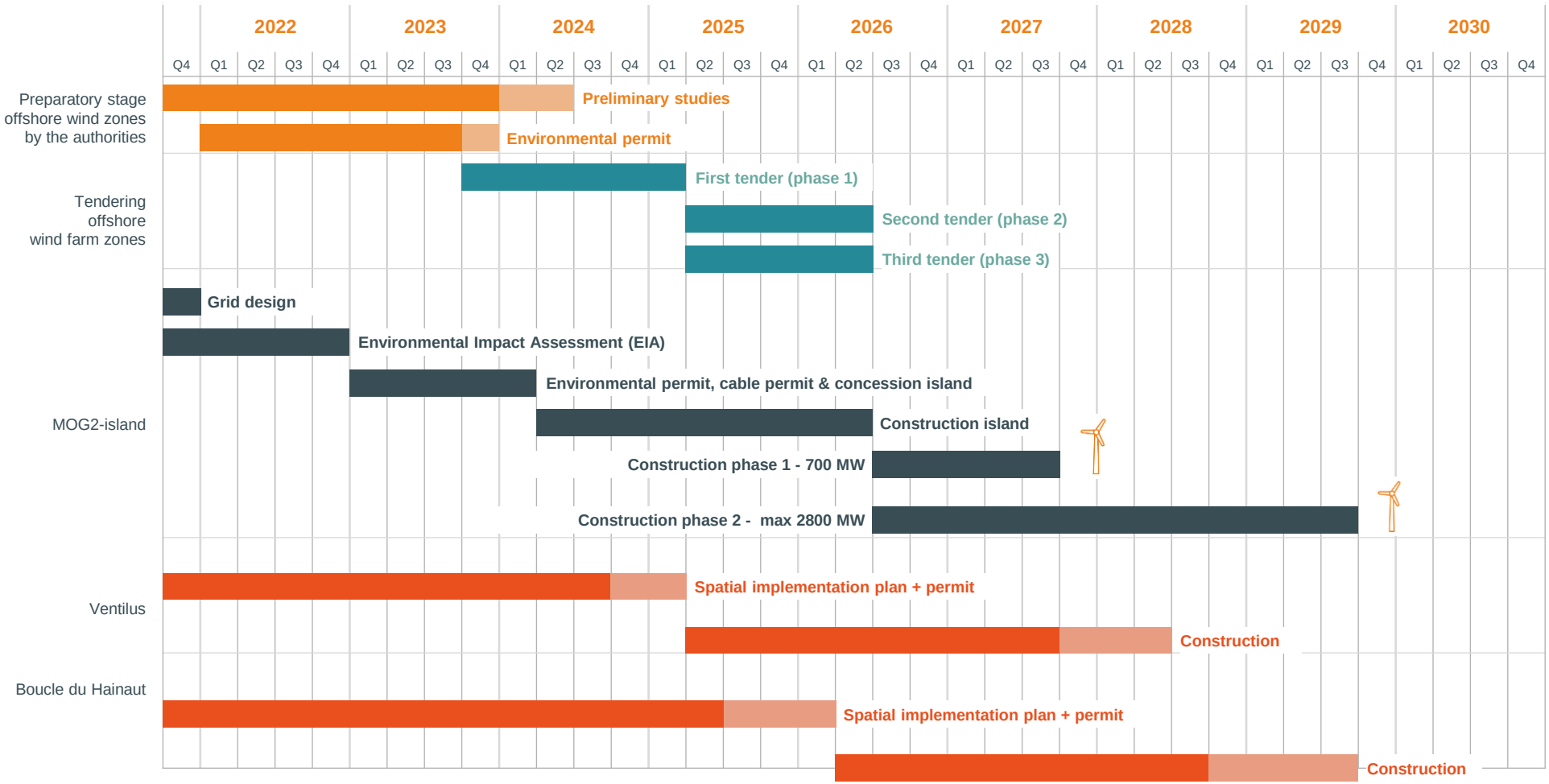
Onshore reinforcements

‘Ventilus’ and ‘Boucle du Hainaut’ projects unlock a grid hosting capacity of 3,5 GW on the coast for offshore projects.



The Energy Island Timeline

Official timing as communicated on administration website

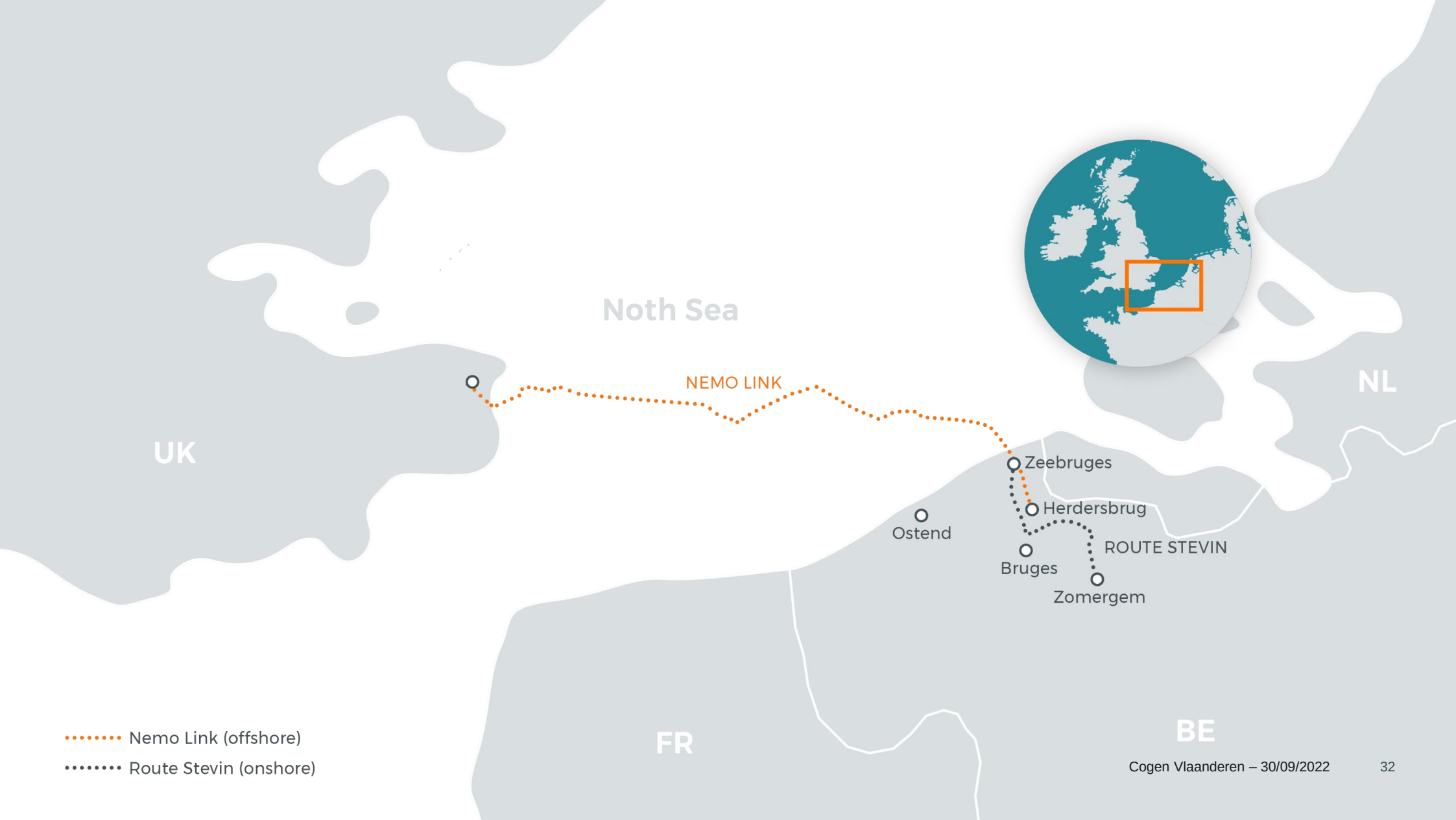


Triton Link
DK-BE
DANEMARK
Energy
Island
Nautilus: 2nd
interconnector
between UK-BE
UNITED
KINGDOM
THE
NETHERLANDS
FRANCE

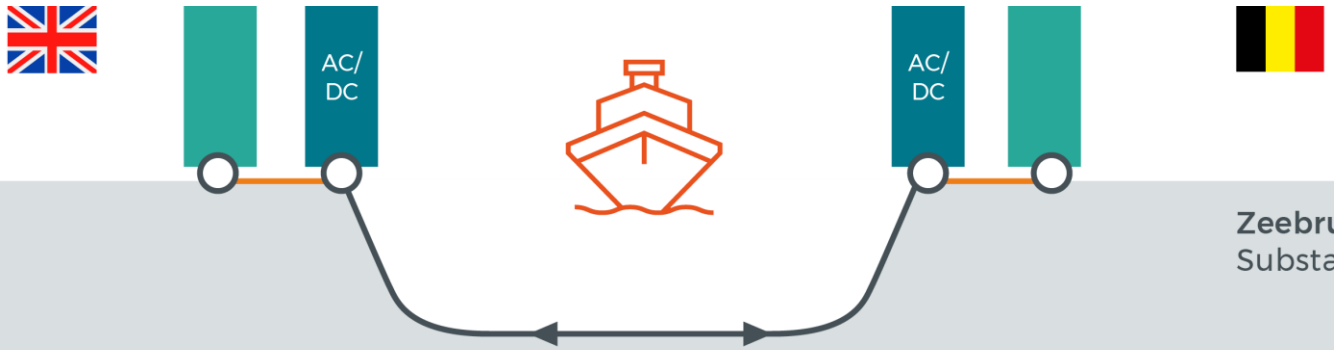
Towards a more interconnected EU grid

Nemo Link

— First interconnector with the UK
— Elia's first subsea electricity cable
— Belgium's first high voltage direct-current (HVDC) project
— Collaboration with British system operator National grid
— Investment of around €650 million (half covered by Elia)
— Operational since Q1 2019


Noth Sea
NEMO LINK
UK
NL
Zeebruges
Herdersbrug
Ostend
ROUTE STEVIN
Bruges
Zomergem
FR
BE
Nemo Link (offshore)
Route Stevin (onshore)

Nemo Link



underground cable
HVAC Electricity

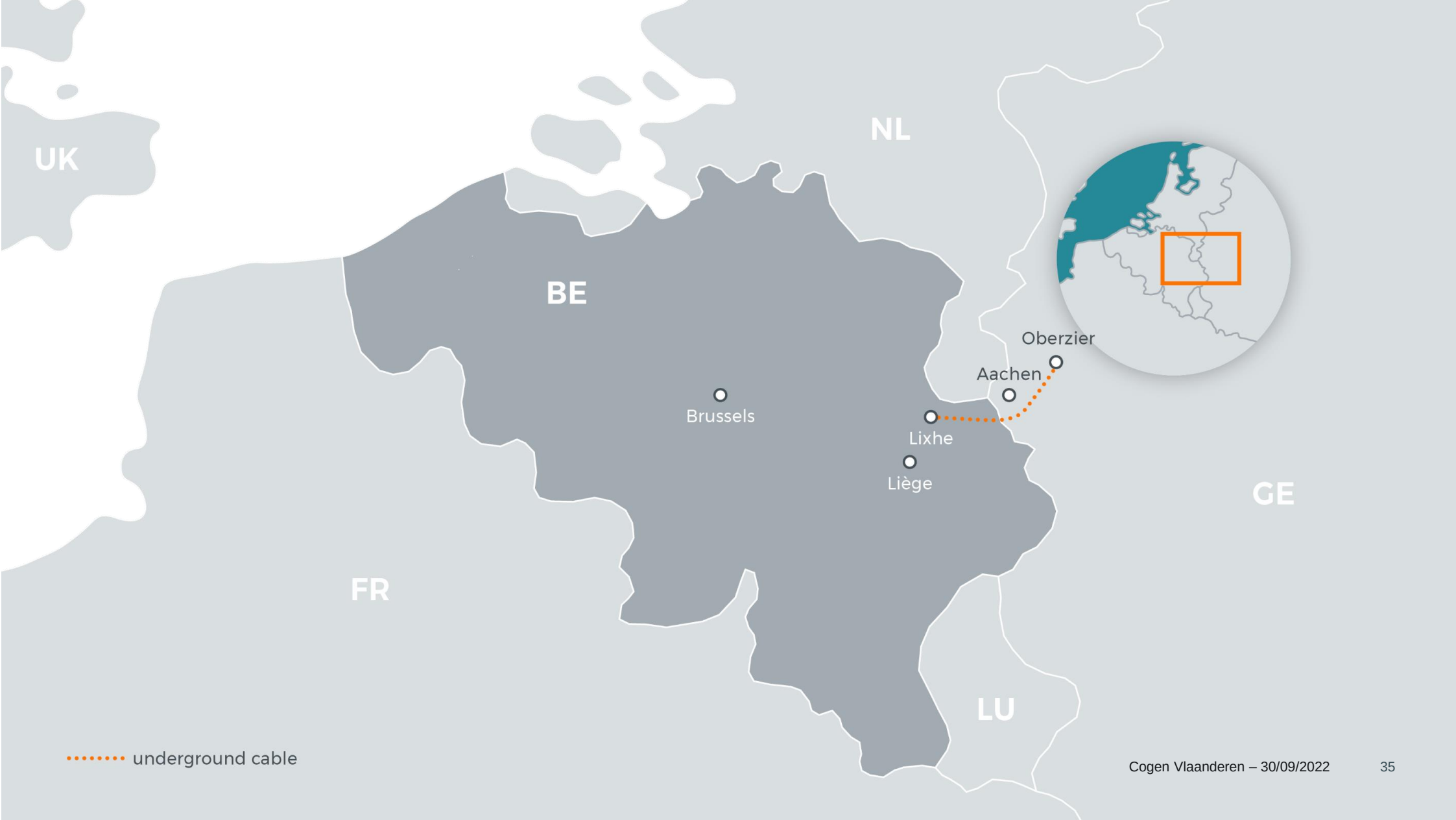
underground subsea cable
HVDC Electricity

underground cable
HVAC Electricity

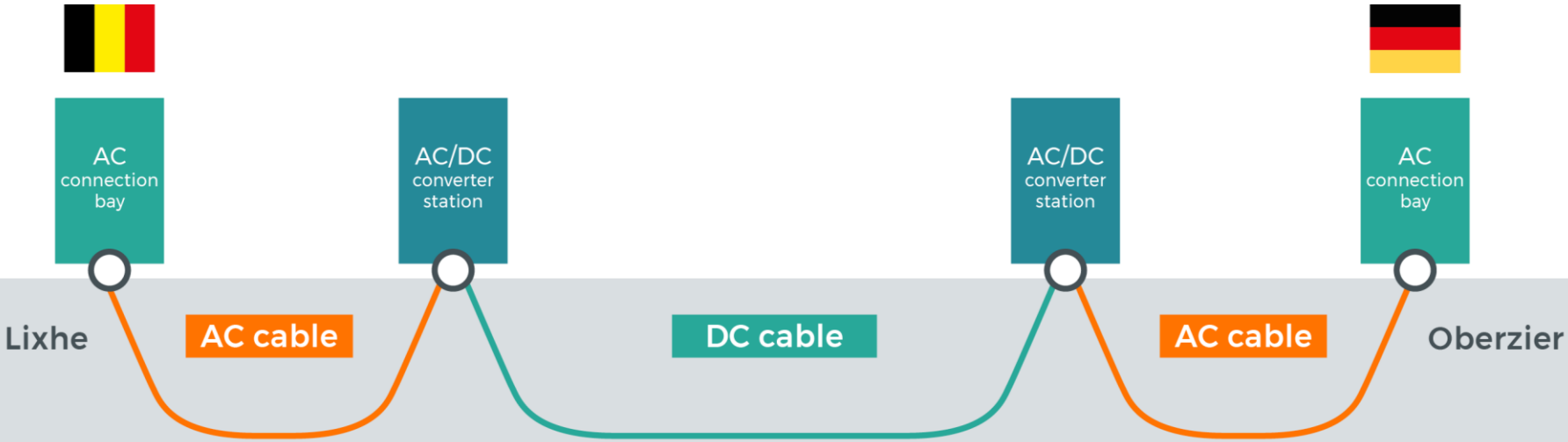
Alegro

First interconnector with Germany

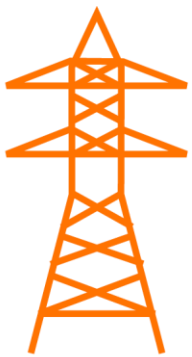
ALEGrO


UK
NL
BE
Oberzier
Aachen
Brussels
Lixhe
Liège
GE
FR
LU
underground cable

ALEGrO

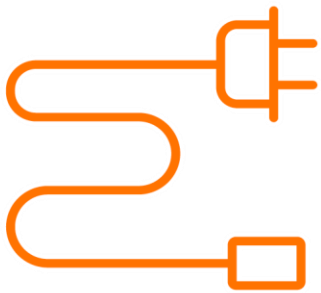

AC connection bay
AC/DC converter station
AC/DC converter station
AC connection bay
Lixhe
AC cable
DC cable
AC cable
Oberzier

Our core tasks



Grid Ownership
We prepare to deliver the infrastructure of the future

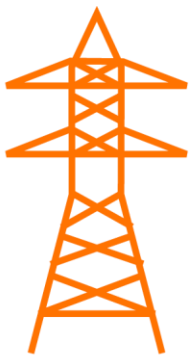
System control
We maintain the balance



Market Facilitation
We are part of the European integrated market

5 System & markets

Our core tasks



Grid Ownership
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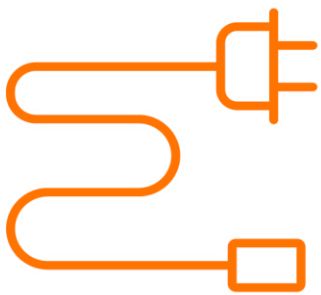
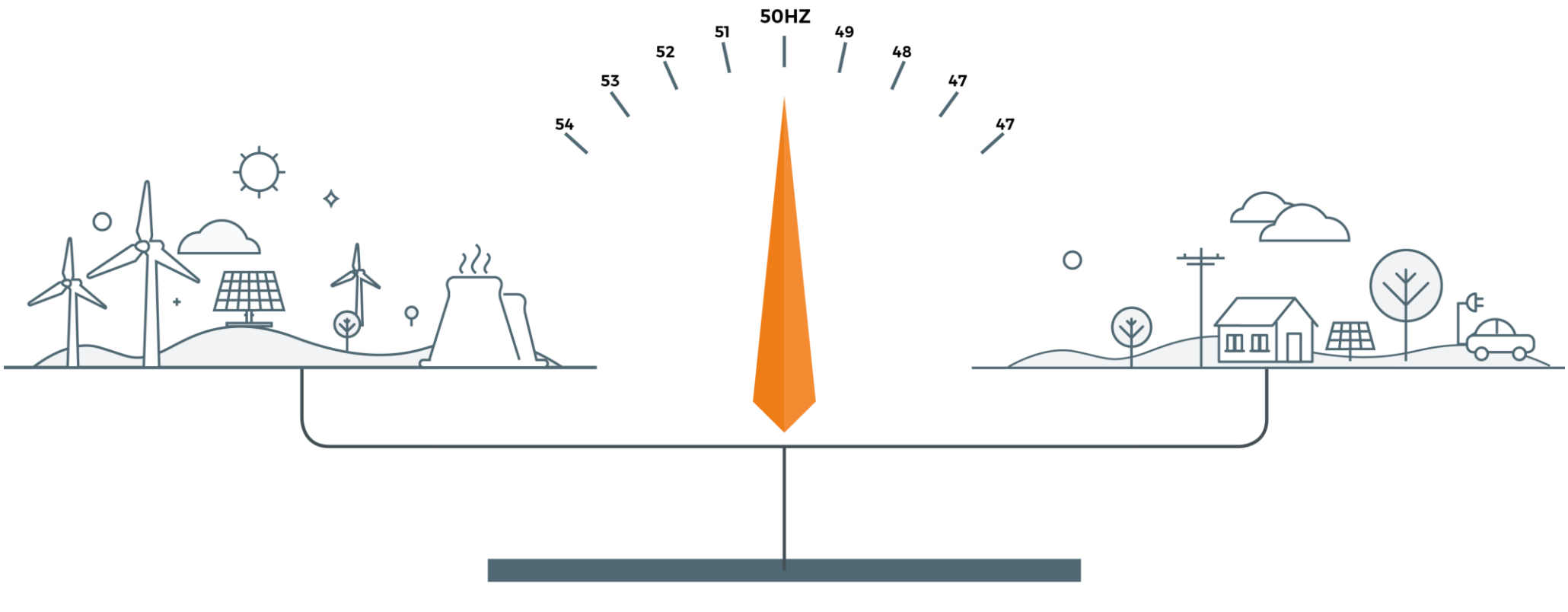
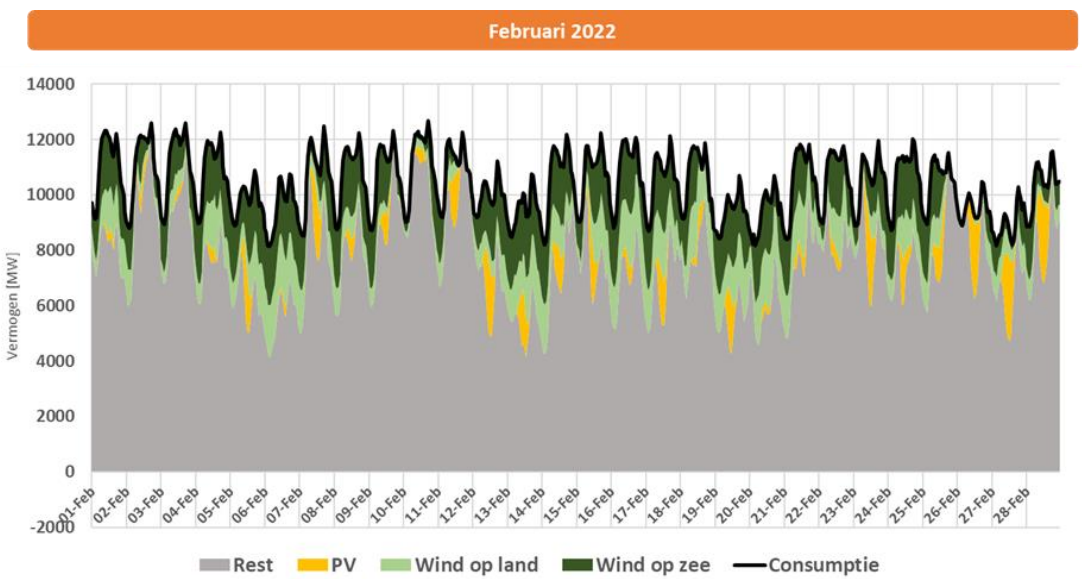


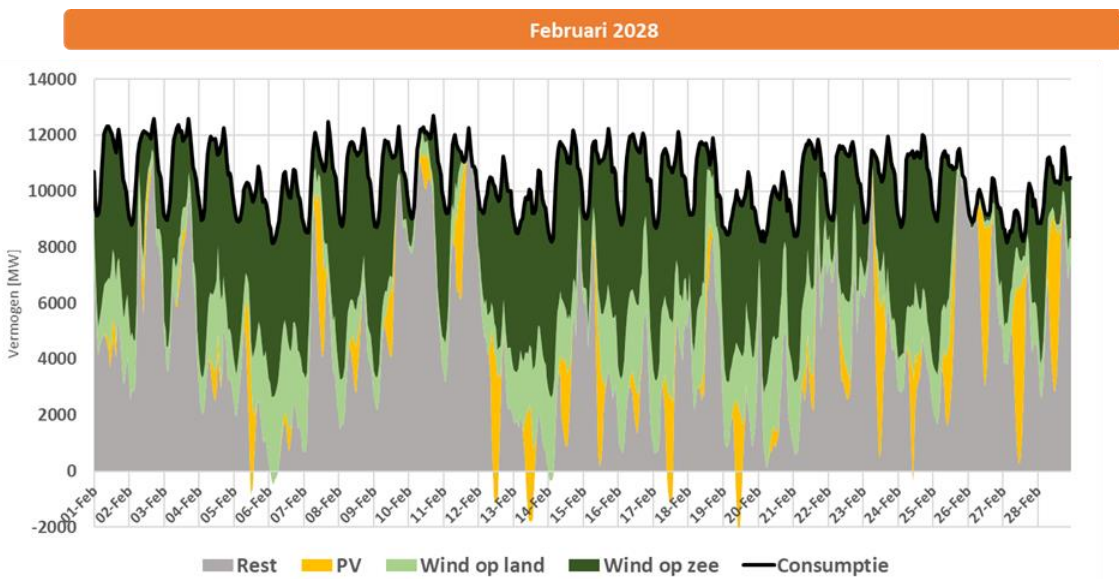
Market Facilitation
We are part of the European integrated market

Monitoring the generation/consumption balance in real time, 24 hours a day



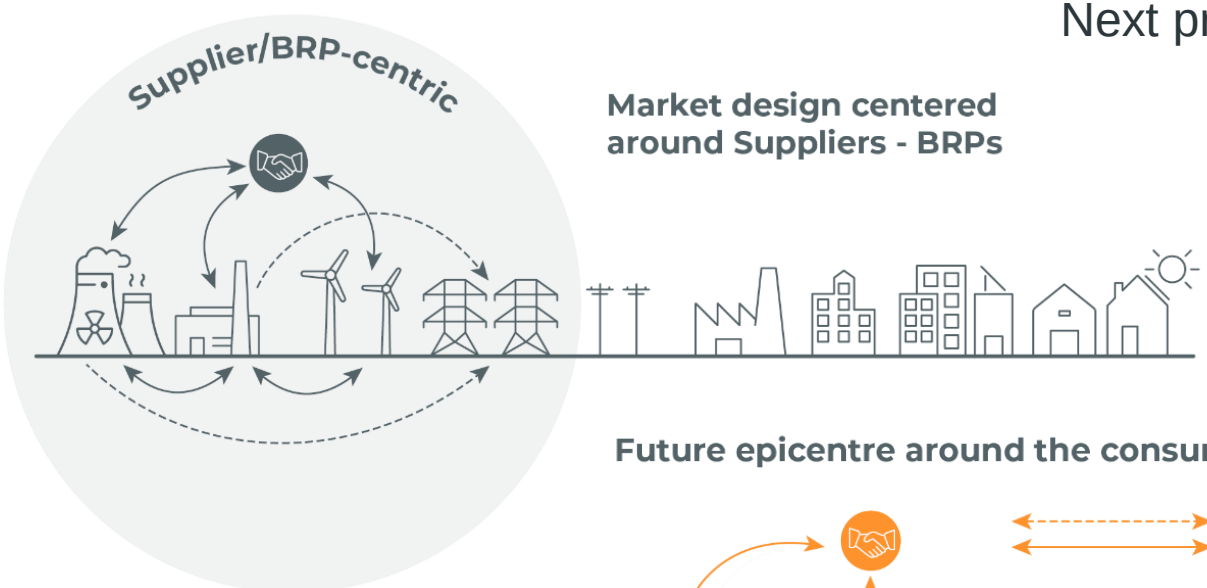
Rising RES variability and increasing need for flexibility - 2022 versus 2028

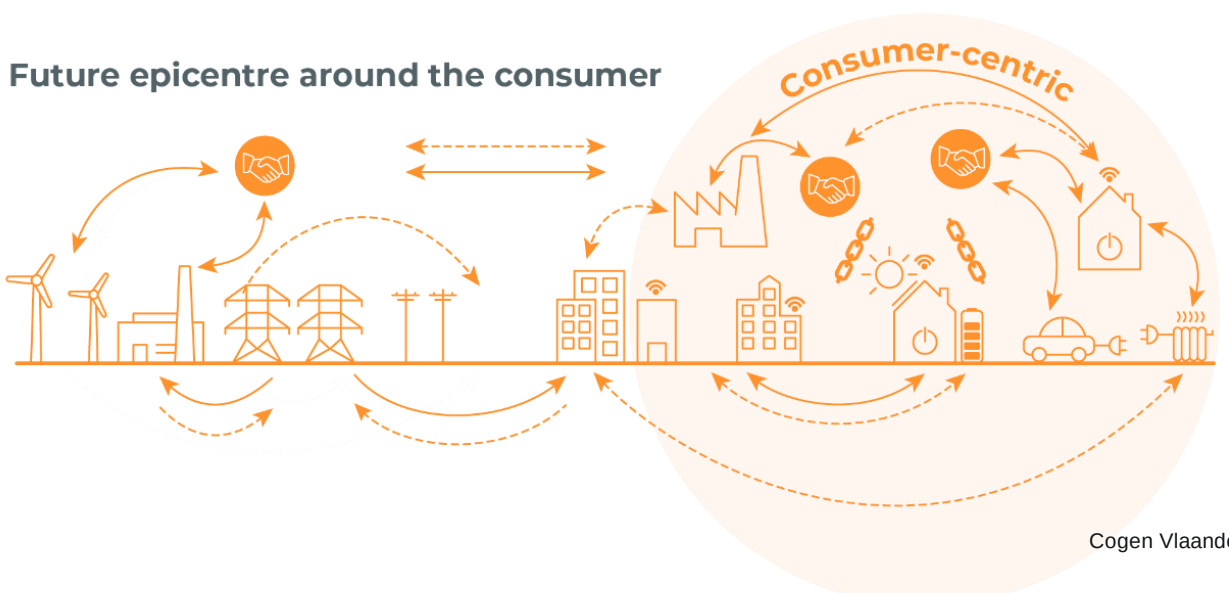




Paradigm shift

⇒ **Consumer Centric Market Design**
Next presentation





Generic principles

…Between injection and offtake

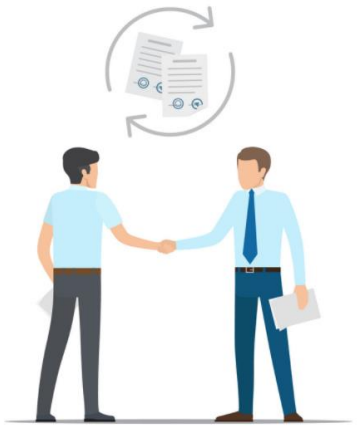
Balance Responsible Parties (BRP) are in charge of taking all required actions to maintain their portfolio in balance

Elia is responsible for the residual imbalance in real-time leading to activation of Balancing Services provided by the Balancing Service Providers (BSP)

Restore the balance

FCR 30 seconds	aFRR 7,5 min	mFRR 15 min
Frequency Containment Reserve	***Automatic Frequency Restoration Reserve***	***Manual Frequency Restoration Reserve***
Automatic local control of the frequency	Automatic central control of the frequency	Manual control of the frequency
Activation based on frequency deviation	Setpoint requested by Elia each 4 seconds	Volume requested on purpose by Elia Control Center

Generic principles : Who can participate?



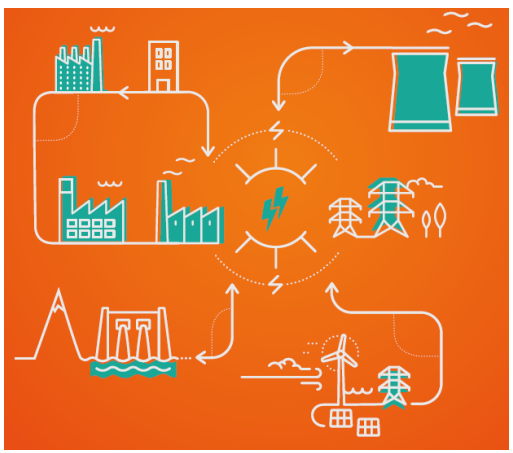
Who can provide balancing services to Elia?

The BSP can be

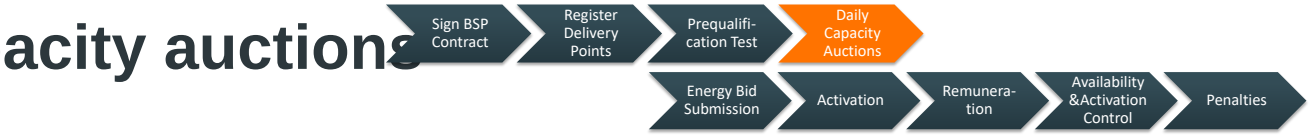
- ✓ The Grid User himself
- ✓ A third party (e.g. an aggregator)

What type of technology (“delivery points”) can participate?

- ✓ Demand facilities
- ✓ (Local) production units
- ✓ Storage devices
- ✓ Any technology that can, by itself or pooled with others, satisfy the technical requirements of the concerned balancing service



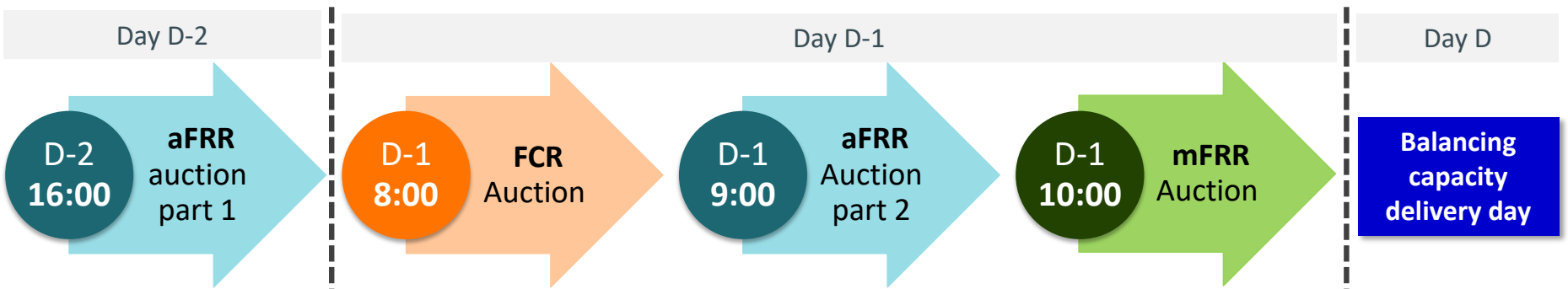
Generic principles : capacity auctions



4 Capacity Auctions

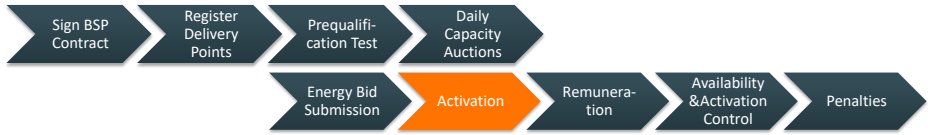
Capacity volumes are procured by Elia thanks to **daily capacity auctions**:

- Purpose of capacity procurement is to reserve in advance (D-1, D-2) some volume that will be available only for balancing activation on day D.
- Results of capacity auctions are published at the latest 30' after Capacity Gate Closure Time
- Capacity volumes to procure are published on Elia Website



Volume to procure (figures 2021)		
	aFRR	mFRR
87 MW	145 MW	Dynamic dimensioning ~ 650 MW

Generic principles : activation



6 Activation

- ✓ Activation of balancing services is performed as last action in real-time to maintain the balance on the Elia grid
- ✓ Activation of balancing services is either automatic, either manual (ad hoc request by Elia)

Day-Ahead Market	Intra Day (ID) Market	ID to Real Time (RT)	RT Balancing Market
▪ Each Balancing Responsible Party (BRP) nominates hour per hour its portfolio in balance based on predictions ▪ To reach for a balanced portfolio every hour of the day, diverse flexibility needs are deployed, via contracts or own flexibility means	▪ Adjustment of the portfolio based on the new prognoses: ✓via Intra Day Market (until 1 to 2 hours before Real Time) ✓with own flexibility means	▪ Incentivation via **Elia's** balancing tariff to keep the portfolio balanced ▪ Additional deviations (outages, wind …) can still be settled bilateral between market parties or by proper means	▪ Elia resolves residual imbalances caused by unpredictable events (FOs, etc.) or forecasts errors remaining near real-time (load, RES, etc.) ▪ **Elia** regulates the residual global imbalance of the system: ✓with contracted & non-contracted reserves (FCR, aFRR & mFRR) • **Elia's** regulating actions determines the Imbalance Tariff that shall incentivize BRPs to stay in balance

Uncertainty

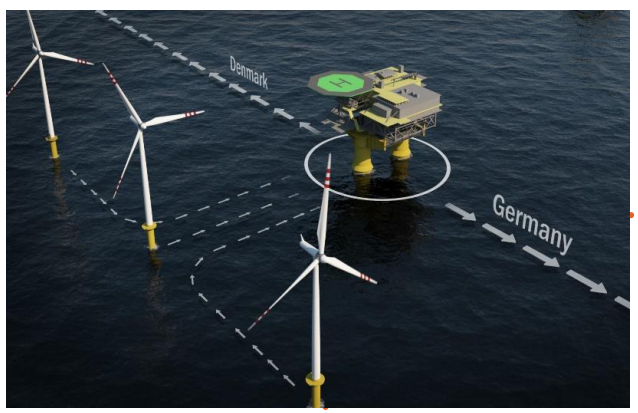
Market Parties/ Balance Responsible Party | **Elia**

FO: Forced Outage

Continuing to be a pioneer in market facilitation

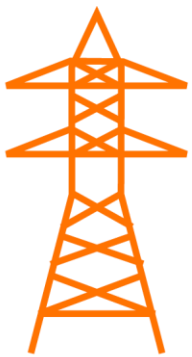
Internet of Energy

EU first Blockchain pilot in the energy sector



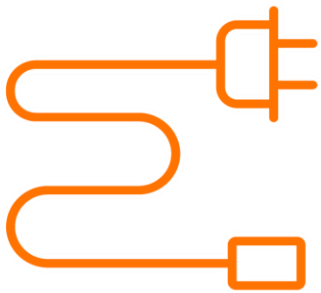
Mastercontroller for Interconnector Operation

Our core tasks



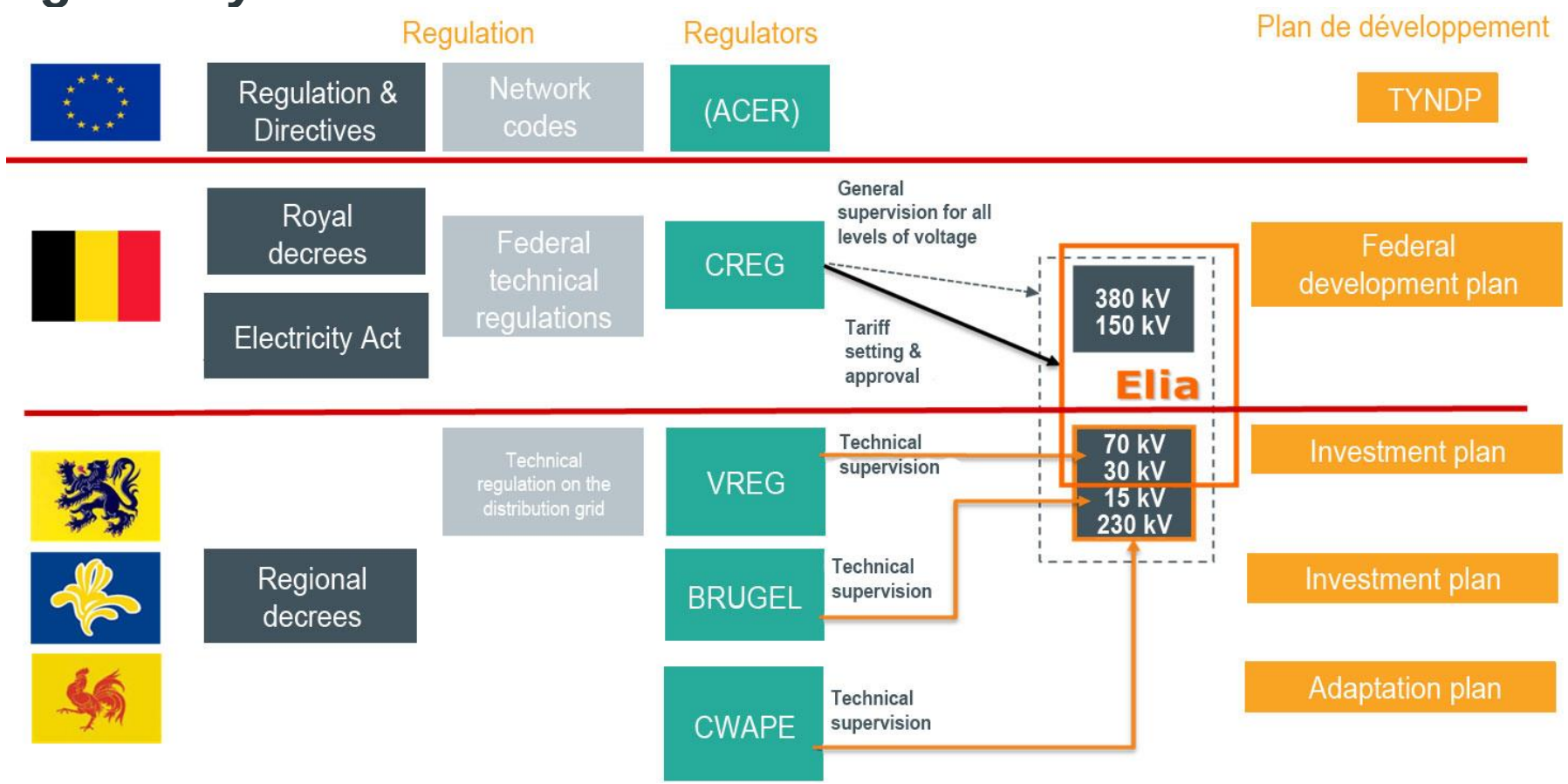
Grid Ownership
We prepare to deliver the infrastructure of the future

System control
We maintain the balance



Market Facilitation
We are part of the European integrated market

Regulatory overview



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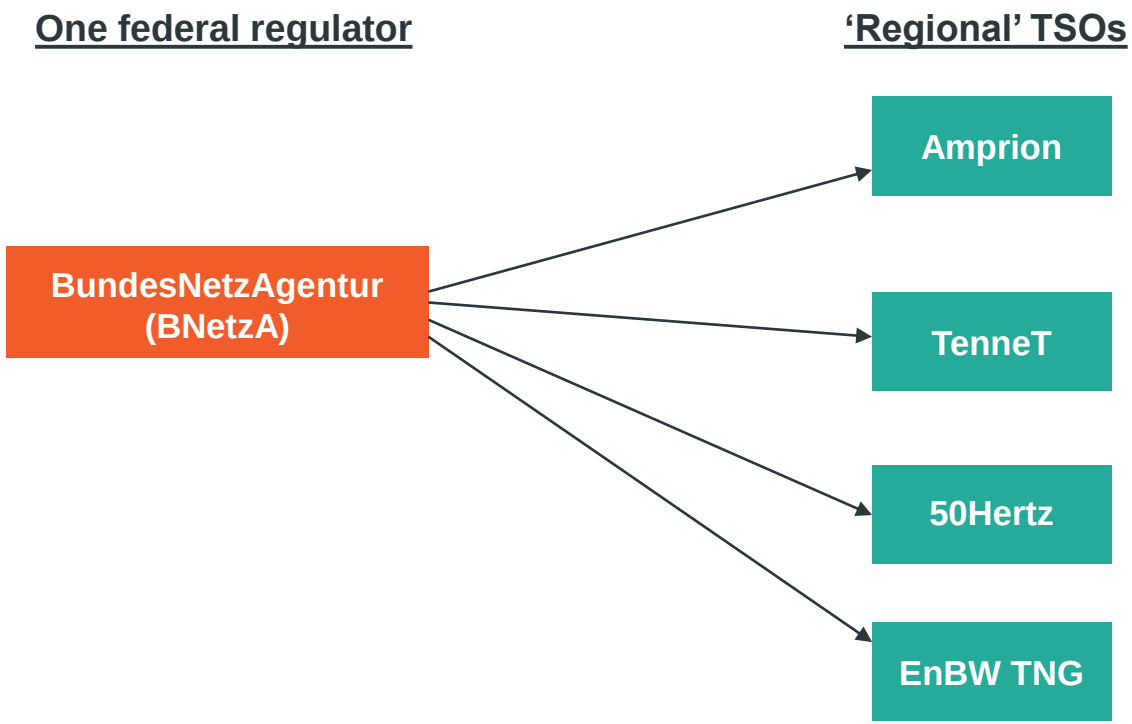
Regulatory framework in Germany: 4 TSOs, 1 regulator



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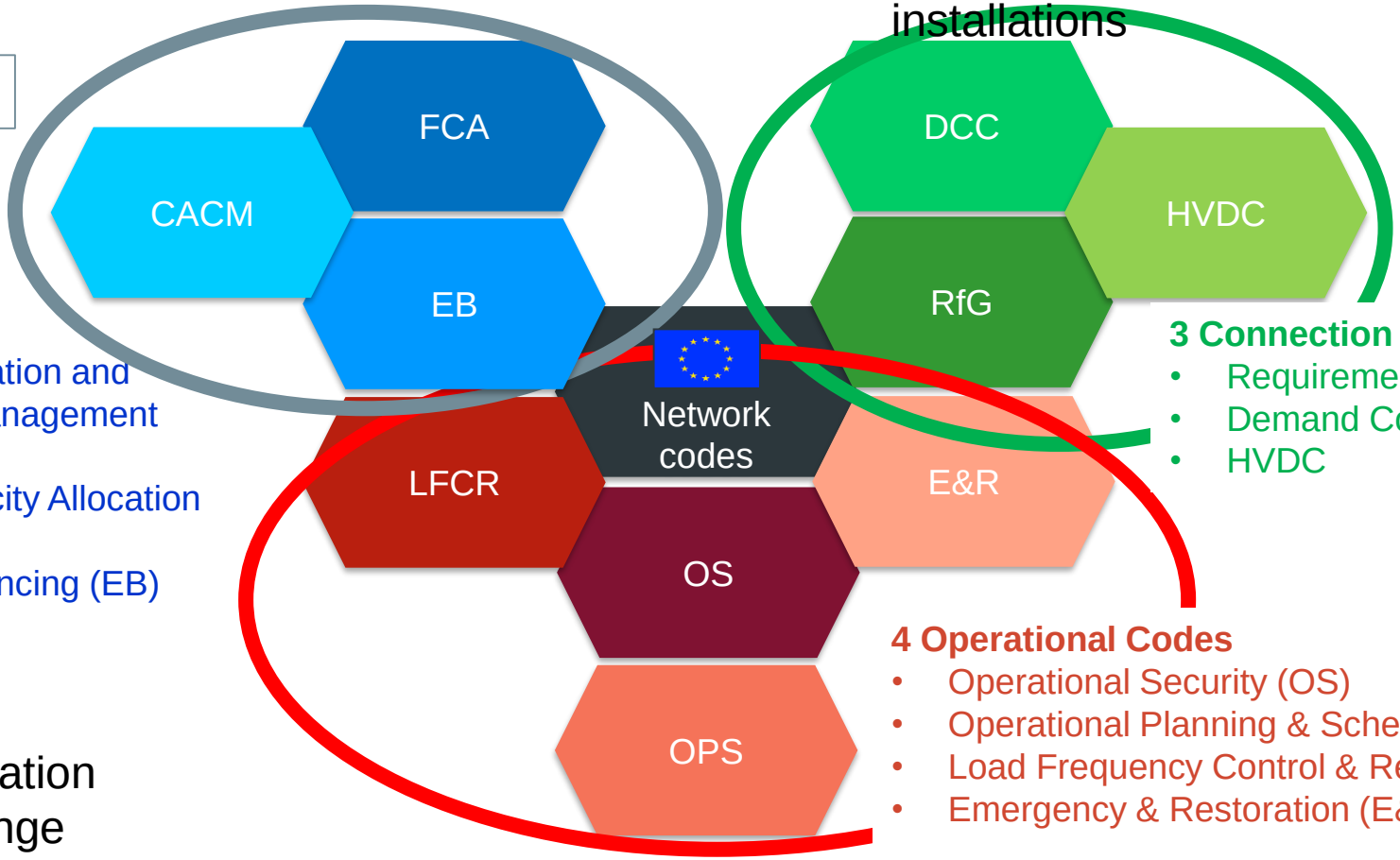
EU regulation, the network codes

Technical requirements installations

Market



3 Market Codes

- Capacity Allocation and Congestion Management (CACM)
- Forward Capacity Allocation (FCA)
- Electricity Balancing (EB)

3 Connection Codes

- Requirements for generators (RfG)
- Demand Connection Code (DCC)
- HVDC

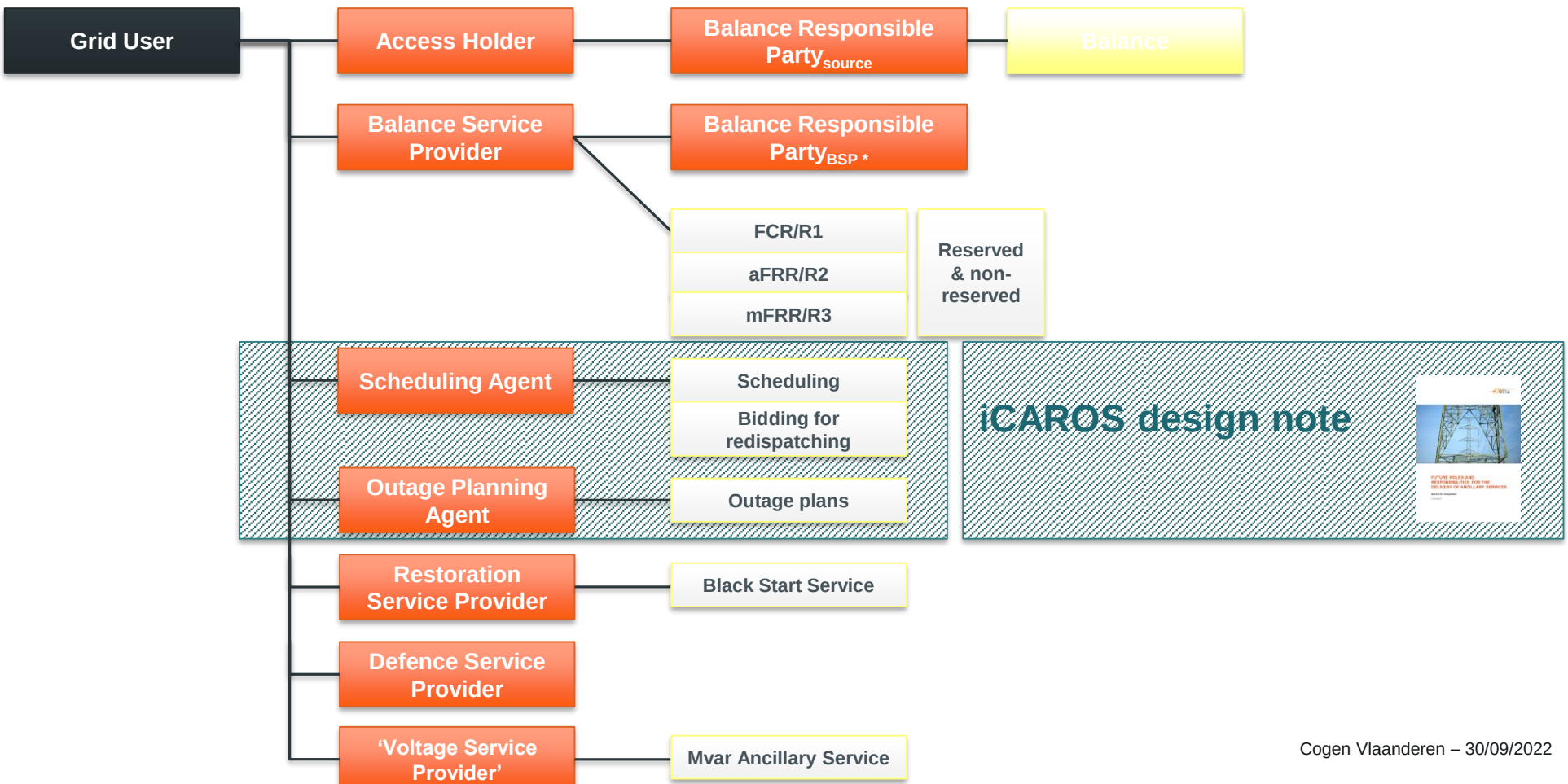
4 Operational Codes

- Operational Security (OS)
- Operational Planning & Scheduling (OPS)
- Load Frequency Control & Reserves (LFCR)
- Emergency & Restoration (E&R)

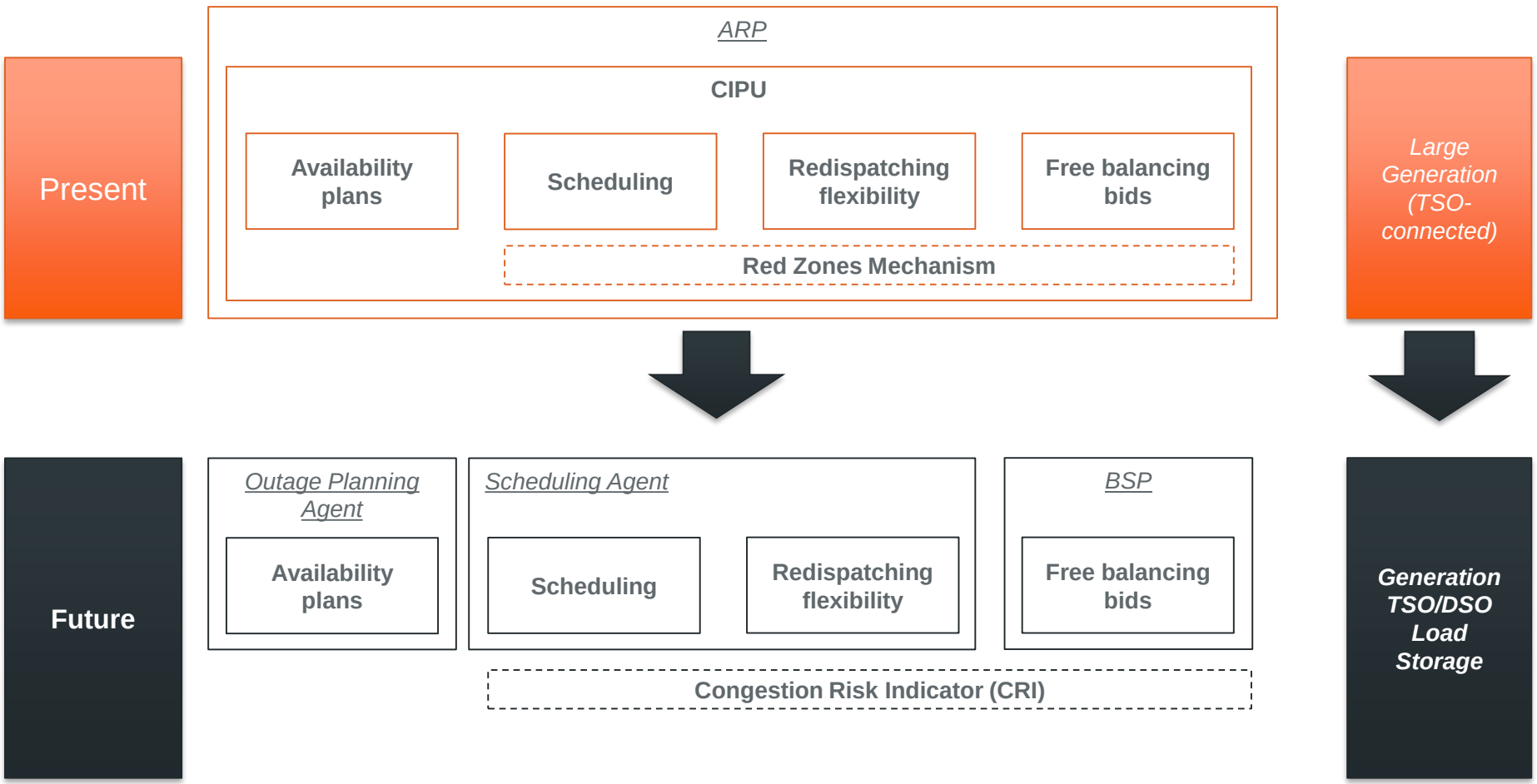
Information exchange

EU Network codes & guidelines cover a large scope to which all concerned parties (TSOs, market parties, …) have to comply.

Future roles & responsibilities



Changing perspective



CRM : How to valorize your flexibility?

Your (upcoming) Flexibility sources:

From your **processes**:
- Load Shedding
- Load Shifting

+

From your local:
- **Production** units
- **Storage** facility

+

Energy Markets revenue

Spot market revenue
- Day ahead , intraday market, imbalances prices
- Upwards / Downwards possible
- You or through an optimizer / partner

Ancillary Services to Elia
- Upwards / Downwards possible
- Through a Balancing Service Provider

Capacity Remuneration yearly fix revenue

- Incentive mechanisms for **Upwards flexibility** (less consumption / more production)
- New projects are surely welcome and may be granted of multi-year fix remuneration
- Auction / Low Carbon Tender* in 2022, 2023, 2024
- For Effective delivery as of 2025 (2024*)

* Low Carbon Tender: possible one-shot mechanism for 2024-2025 (WG Adequacy 13/09)

Introduction to the Capacity Remuneration Mechanisms: CRM & Low Carbon Tender

Belgian Authorities Capacity Mechanism(s)

- To secure the supply/demand balance after 2025 (2024*)
- How: financial supporting mechanisms
- **Target: capacities** playing an upwards role
  = **less consumption *or* more production**
- When: already started with upcoming starting gates

Who participates?

- The grid user or mandated partner
- New flexible demand
- New projects of storages
- New projects of local production
- For CRM: also Existing flexibilities

Service to deliver?

- **Flex being available** and reactive **in case of high day ahead market (DAM) prices**
- = Only if Trigger price is achieved at DAM publication (*'tight situation'*) ➔ signal the day before
- Trigger price calibrated for 15 moments / year (max 30)

CRM yearly fix revenue

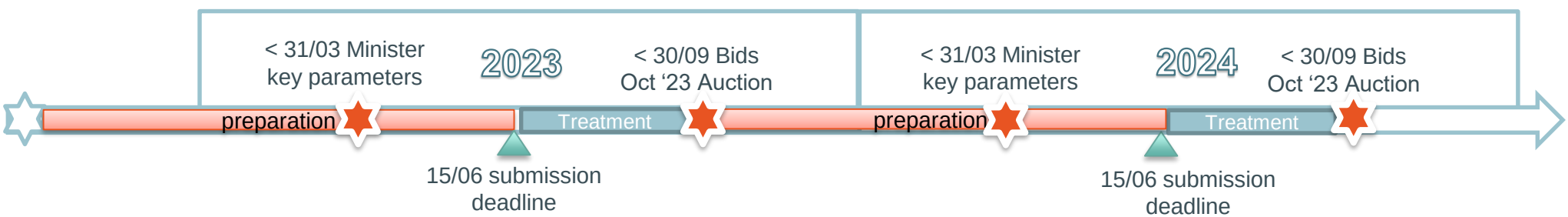
- Max 75k€/MW/y (2022 figure)
- Max 20k€/MW/y for existing unit (2022 figure)
- On top of all Energy Market revenues
- No combination with // Green variable supports

CRM & Tender to come: Act now

➔ **Upcoming Auctions & Low Carbon Tender require a prequalification in Q2 2023 or Q2 2024**

Auctions/Tender	Service as of
CRM Y-4 Oct 2021 *(closed)*	Nov 2025
CRM Y-4 Oct 2022 *(closed)*	Nov 2026
*2023 Low Carbon Tender * (tbd)*	*Nov 2024*
CRM Y-4 Oct 2023 *(tbd)*	Nov 2027
CRM Y-1 Oct 2024 *(tbd)*	Nov 2025
CRM Y-4 Oct 2024 *(tbd)*	Nov 2028

➔ **CRM Timeline**



➔ **Elia as market facilitator all along for preparation and treatment: customer.crm@elia.be**

➔ **2023 Tender Timeline to come – CRM-like**

➔ **Main take-away: start the investigation in Q4 2022 / Q1 2023 as new projects or new Flex may require Grid Studies as prequalification prerequisite**

Introduction to the Capacity Remuneration Mechanism ('CRM')

- The **Belgian Authorities developed the CRM mechanism in a Law** to provide a financial supporting mechanism to compensate the missing money of the participating capacities (existing or new ones) and targeting so a comfort to reach Belgian Adequacy for 2025-2026 and soon 2026-2027 (Ministerial decision by 31/03).
  - A chosen Financial support to existing or new eligible capacities (production, storage or demand side management) for their upcoming Availability commitment on top of the market revenues (AS, hedging and spot revenues)
  - Elia facilitates, operates and contracts the CRM with key prerogatives at Energy Minister Cabinet, FPS Economy and CREG levels
- **Revenue:** The revenue is paid as of Nov 2026 is chosen by the candidate under:
  - A max of 20k€/MW/year (2021 Auction parameter) for the existing or projects that can't prove a sufficient 'missing money' (➔ CREG)
  - A max of 75k€/MW/year (2021 Auction parameter) for the projects with CAPEX investments (CREG approval for up to 3, 8 or 15 years capacity contract)
- **Service:** The contracted CRM Capacities provider commits on an **Availability Service in the Market in counterparty of a fix payment** (it is not a 'booking')
  - During Delivery Period (e.g. 2025/2026): **Availability** when the DAM prices are high ➔ Trigger price (AMT) calibrated for 15 moments/y (could be 0 and max 30) (e.g. 220€/MWh)
  - During Pre-delivery period: regular checks on the contracted projects evolution and sporadic checks for existing units
  - In both periods: monitoring, controls & tests are foreseen with penalties in case of missing capacity
- **A CRM contract is awarded in an Auction**, either 4 years in advance (Y-4) either 1 year in advance (Y-1) of the Service delivery period ➔ competition for a volume
  - November 2026 Delivery Period, supported by 2 preliminary Auctions.
  - November 2025 Delivery Period, is supported by;
    - the Auction Y-1, and
    - as of 2023 through the Secondary Market

2021	2022	2023	2024	2025	2026	2027	…
Auction Y-4 2025			Auction Y-1 2025	Delivery Period 2025			
	Auction Y-4 2026			Auction Y-1 2026	Delivery Period 2026		
		Auction Y-4 2027			Auction Y-1 2027	Delivery Period 2027	
			Auction Y-4 2028			Auction Y-1 2028	Delivery Period 2028

Many thanks for your attention!

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