



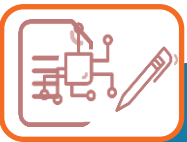
ENNOH
2nd public workshop
Preparatory work on future
market design & network codes

Brussels, 12 May

Time	Topics	Speakers
09:00 – 09:30	Registration & Welcome coffee	
09:30 – 09:45	Opening remarks & Workshop introduction	ENNOH Team
09:45 – 10:45	Panel 1: National approaches to market design	Christian Rutherford (Energienet)
		Andreas Martens (Thyssengas)
		Louis Fally (Fluxys)
10:45 – 11:00	Questions & Answers	
11:00 – 11:30	Coffee break & networking	
11:30 – 12:30	Panel 2: different aspects of future market design	Julia Menezes (Europex)
		Johanna Friese (EWE)
		Valentin Calfa (GD4S)
		Grzegorz Pawelec (Hydrogen Europe)
		Isabelle Chaput (IFIEC)
12:30 -12:45	Questions & Answers	
12:45 – 13:00	Closing remarks & way forward	ENNOH team
End of the workshop & lunch		

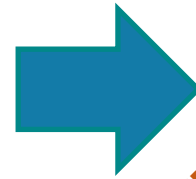
Opening remarks and workshop introduction

ENNOH Tasks and Deliverables in the area of Network Codes



Preparation of the Priority List to be issued by the EU COM

- Development of Network Codes:
 - Energy efficiency in H2 networks
 - Interoperability (data exchange, transparency, H2 quality)
 - Financial compensation for cross-border investments
 - Capacity allocation (CAM), Congestion management (CMP)
 - Tariffs
 - Value of Transferred Assets and dedicated charge
 - Balancing rules
 - Inter-temporal cost allocation
 - Cybersecurity
- Monitoring of Implementation, Amendment of Network Codes



Important considerations:

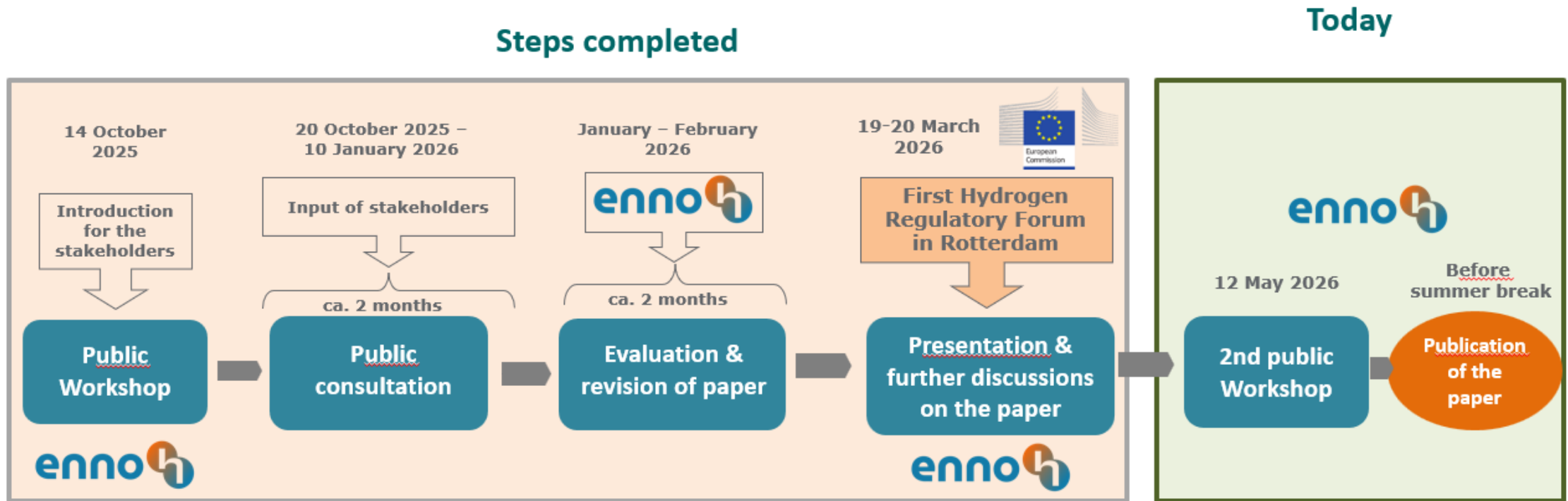
- ❖ Start of the process is a prerogative of the EU Commission
- ❖ The responsibilities are clearly defined in the Regulation
- ❖ Today ENNOH can only do preparatory work in anticipation of future formal process
- ❖ The work is without prejudice to the formal process and the content of the future network codes & framework guidelines

Taking the above into account, ENNOH took initiative and developed a

a Preparatory Groundwork Paper in the area of future network codes

which is supposed to help all parties to explore possible market designs and practical solutions and facilitate the future NC development processes, but without being prescriptive.

Timeline for Preparatory Groundwork



- *Importance of support & ideas from:*



- *Regular updates of the preparatory groundwork should take place – it should be a living document!*

Panel 1:

**Discussion on different national approaches to market design:
Danish, German, & Belgian rules**

Speakers:

Christian Rutherford (Energienet)

Andreas Martens (Thyssengas)

Louis Fally (Fluxys)

Moderation: Helena Astachowskaja (ENNOH)

Danish hydrogen backbone 1

Shortly about DHB1

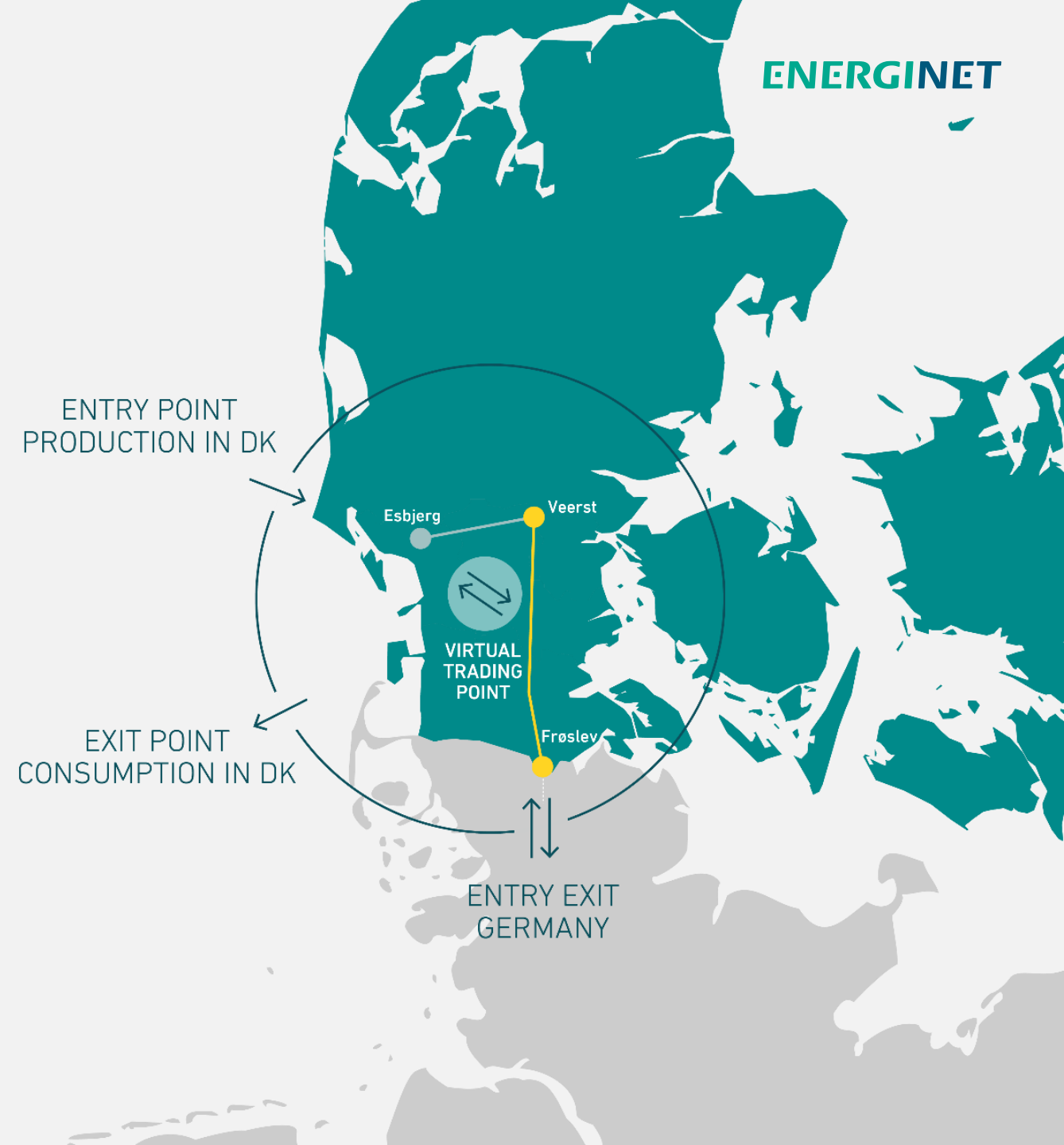
- 134 km in total (45 km new built, 89 km repurposed from NG).
- Initial purpose – to bring green hydrogen produced from solar and wind to Germany – later to unlock potentials also in Denmark.

General regulatory approach in Denmark

- Energinet develops the methods that forms the basis for the market terms – the Danish Utility Regulator must approve the methods.

Stepwise approach in making the regulation ready for 2030

- Not all regulation is in place up front – only the methods needed to perform the market test (capacity sale in 2026), such as long-term capacity allocation, and reserve of capacity for short-term.
- Other methods (e.g., general capacity terms, balancing, tariffs, products etc.) will come later (mainly during 2026 - 2028).
- To compensate for lack of final regulation before the capacity sale in 2026, Energinet have published 3 Information Packages, which gives the market guidance to how the future regulation for hydrogen is expected to be, on all relevant topics: [Hydrogen market dialogue](#)
- The picture on the right shows anticipated market model – much inspired from natural gas.



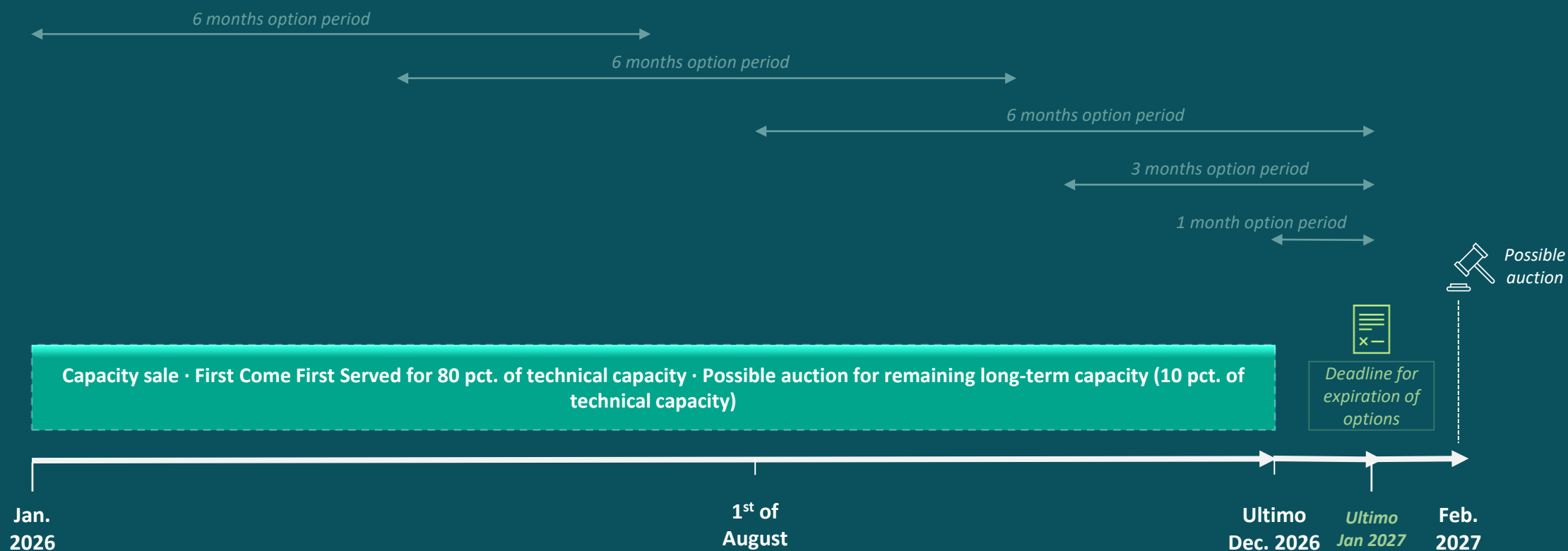
BALANCING



	<u>Natural gas</u>	<u>Hydrogen</u>	<u>Electricity</u>
 Market matureness	Mature, many actors	immature, few actors	Mature, many actors
 Balancing band	Collective	Combination of individual and collective	None
 Survival time	Within 3 hours	Within 1 hour	Within few seconds
 Balancing period & cash-out	24 hours and cash-out end-of-day (EoD)	No EoD cash-out but imbalance quantification	Imbalance quantification per market time unit (MTU)
 TSO balancing actions	Yellow-zone trades	At First: Cut-off Future: balancing market <i>"Key" for integrating with electricity system...</i>	Ancillary service markets
 Storage / flexibility	Abundant flexibility from linepack and storage (Lille Thorup)	Limited flexibility from linepack. Potentially much flexibility from storage (Lille Thorup)	No embedded flexibility in the system

CAPACITY SALE AND TARIFFS

CAPACITY SALE PROCESS FOR DHB1 - FCFS IN 2026 VIA PRISMA: [H2 Network Points](#)



How it works:

- The overall purpose of the capacity sale process in 2026 is to perform a market test towards a political determined booking requirement of 590 MWh/h (500 MWh/h lower heating value) for at least 10 consecutive years, from 2031 (end 2030) to 2040 – corresponding to approximately 14 pct. of total capacity (3,600 MWh/h).
- Market players are free to request for capacity via PRISMA capacity platform at any time throughout 2026 – capacity contracts are signed shortly after based on requests
- To increase flexibility, the contract will have an up to 6 months option period – in this option period the market player can terminate the contract without any cause or penalty
- However, for bookings made from 1st of August and onwards, the option period will be gradually shorter the later the contract is signed, to ensure compliance with Energinet's internal deadline for conclusion of contracts (i.e. with expired option periods)

HYDROGEN TARIFFS IN DENMARK



Anticipated tariff level

The goal is to ensure a payable transportation cost, which is set at 9.5 Euro/MWh, based on market input. This corresponds to a tariff level of approximately 25 euro/KWh/h/a per point (depending on load factor assumption)



Operational support account

The tariff level is backed up by the Danish state, ensuring stable tariffs for first 30 years of operation in case of low bookings (approx. 1.4 billion euro in total)

Tariff forecasting model

A Tariff Forecasting Model was published on [our website](#) in December 2025 – tariff level for start-up system is expected to be finalised during 2028

INTEROPERABILITY, ENERGY EFFICIENCY AND CYBER SECURITY



INTEROPERABILITY NETWORK CODE

- On one hand you could argue that interoperability is urgent, as border points are already being established (or will be established in next coming years).
- On the other hand, solutions are quite logic and a lot can be learned from natural gas = harmonisation not extremely critical.
- Note: market players express need for certainty on especially hydrogen quality.

CYBER SECURITY & ENERGY EFFICIENCY

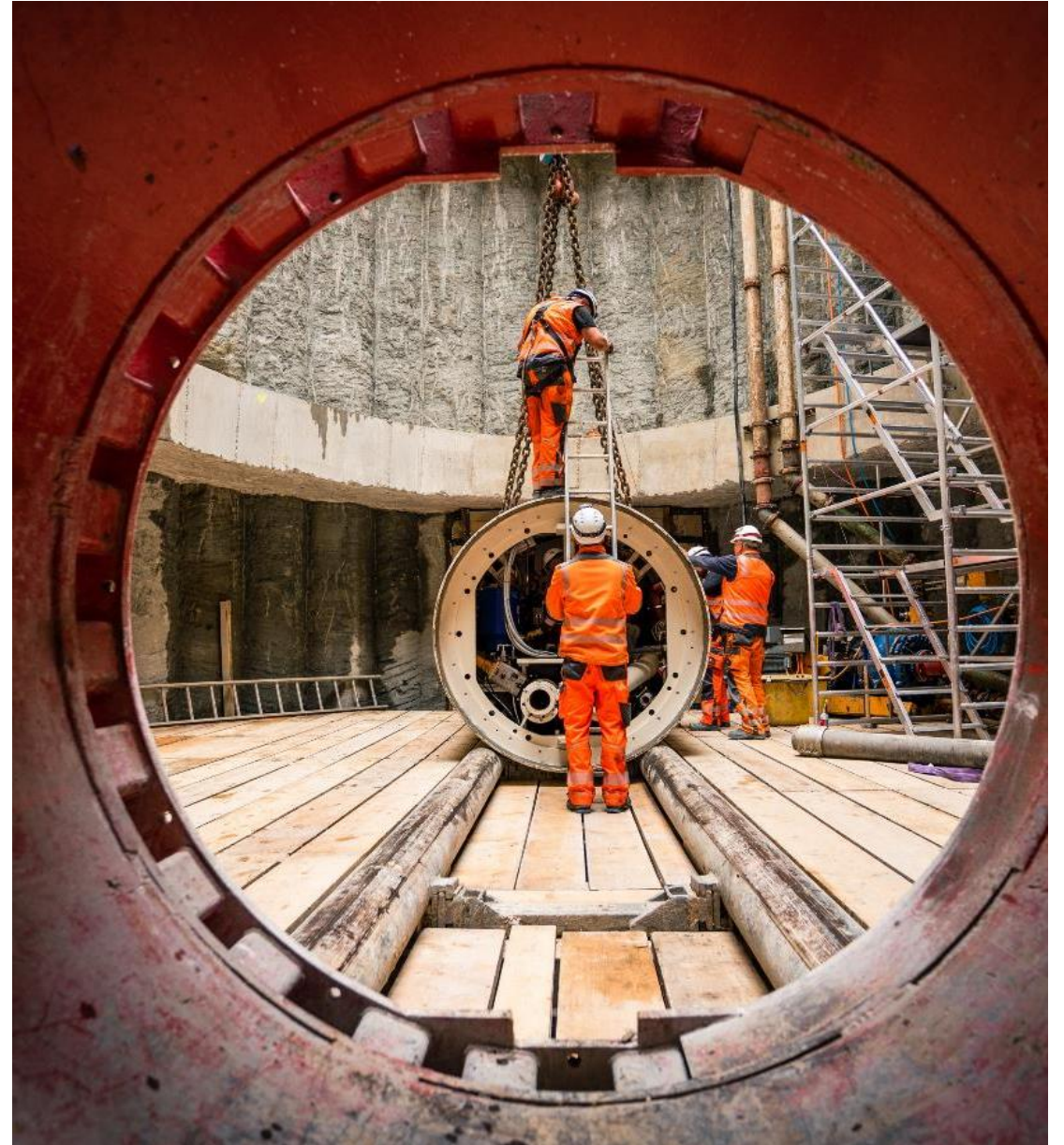
- Important topics, that are generally already high on the priority list.
- Open question: is there a need for specific regulation on these topics for hydrogen, or are they covered via general regulation?

WaKandA and WasABi

ENNOH workshop



General context of the national rules and their timeline



WaKandA and WasABi

Regulatory framework, Scope and timeline

- BNetzA determinations for market access (WaKandA) and balancing rules (WasABi)
 - Determination proceeding started in July 2024
 - 2 consultations for stakeholder feedback
 - Adopted in Nov. 2025
 - Applicable as from **01. Jan 2028**



- Energiewirtschaftsgesetz (EnWG), Gas and Hydrogen Package – Dir. (EU) 2024/1788, Reg. (EU) 2024/1789



- Early, ramp-up-oriented implementation of an entry-exit model for hydrogen networks (Clusters in the beginning)
- Partially based on market access rules on gas but also differences on balancing rules

WaKandA

Market Access Rules*

*selected requirements

Firm (FWK) and
Interruptible
(UWK), Cross
Cluster Transport

First Committed
First Served
(FCFS), Auctions
(booking level)

Bundling at IPs

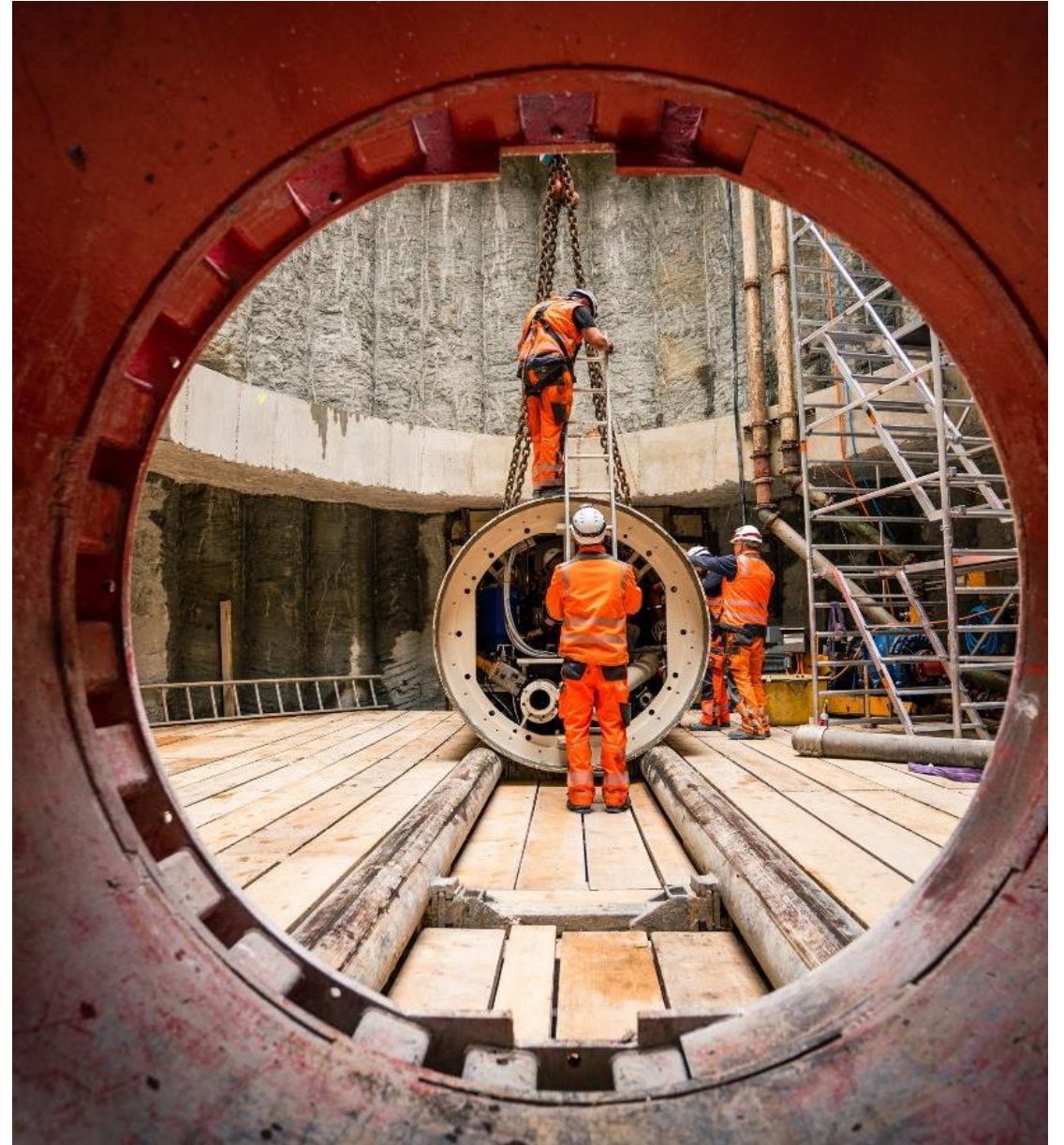
Yearly, Monthly &
Daily Products
(Calendar Year)

Reservation
Quota 10% for
short-term

One Stop Shop
Registration via
Data Hub

Capacity
Booking Platform
as of 1 Jan 2028

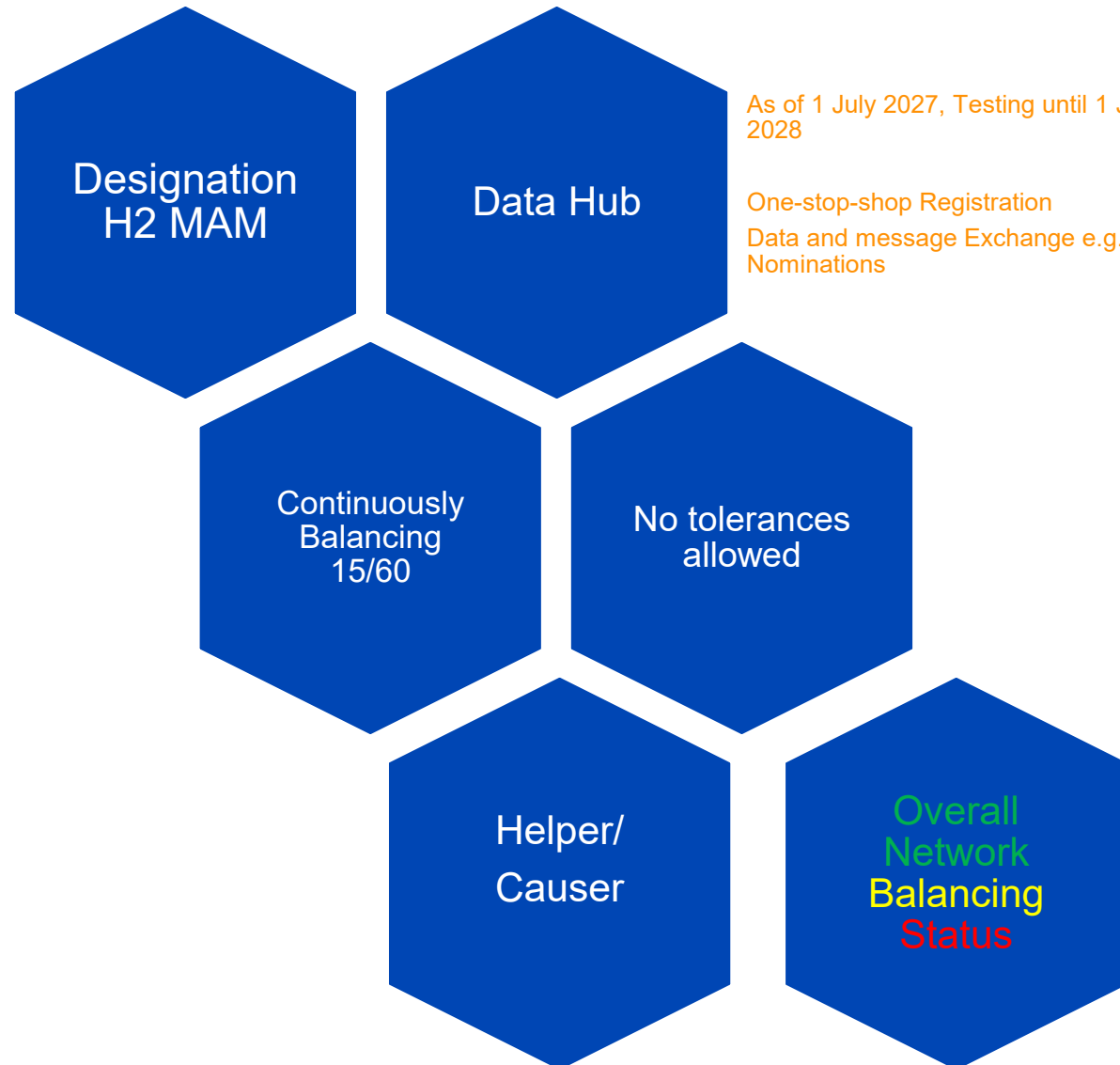
Balancing aspects



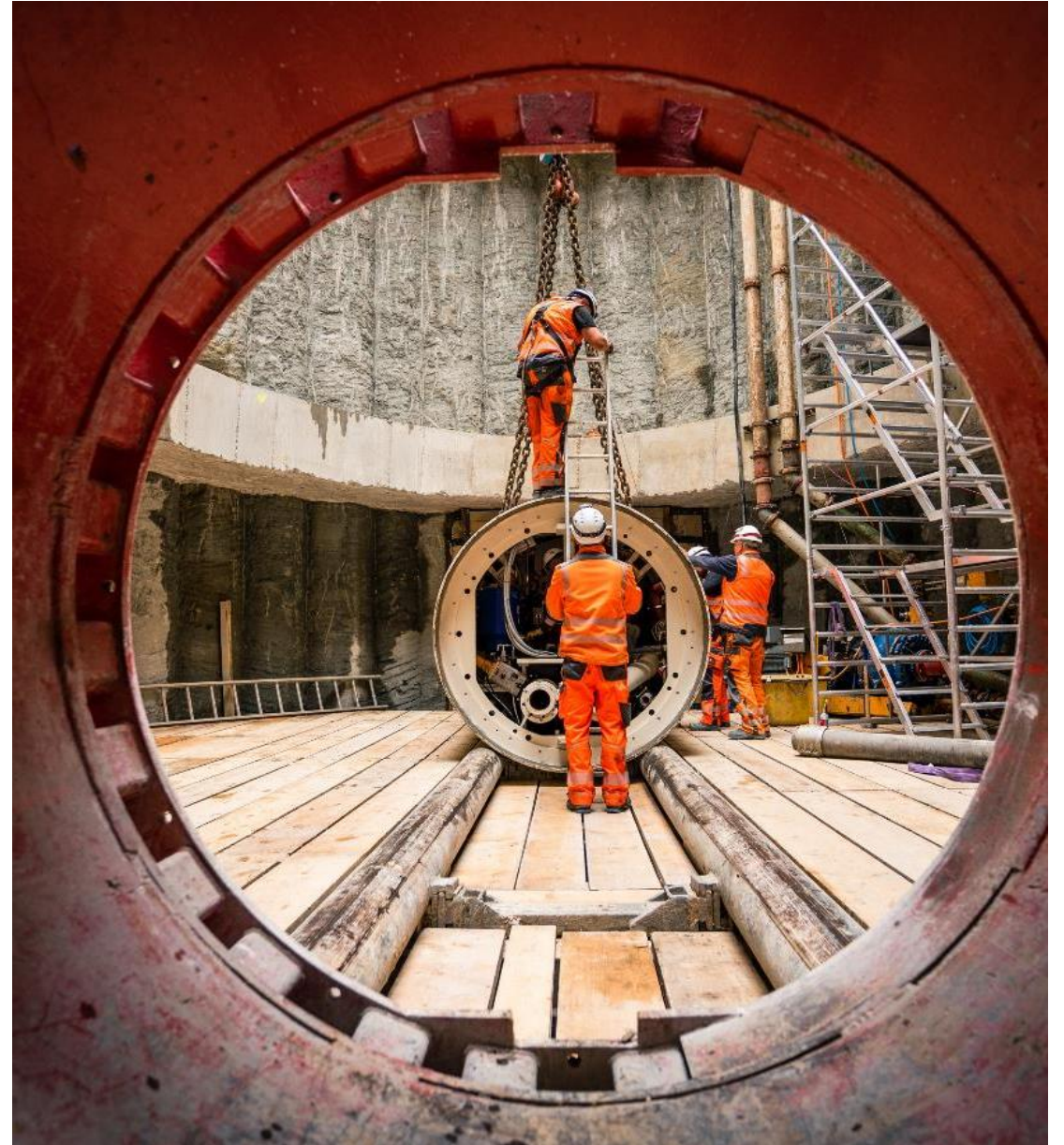
WasABi

Balancing Rules*

*selected requirements



Market access aspects



Cooperation Agreement for H2

Further Specification of the determinations

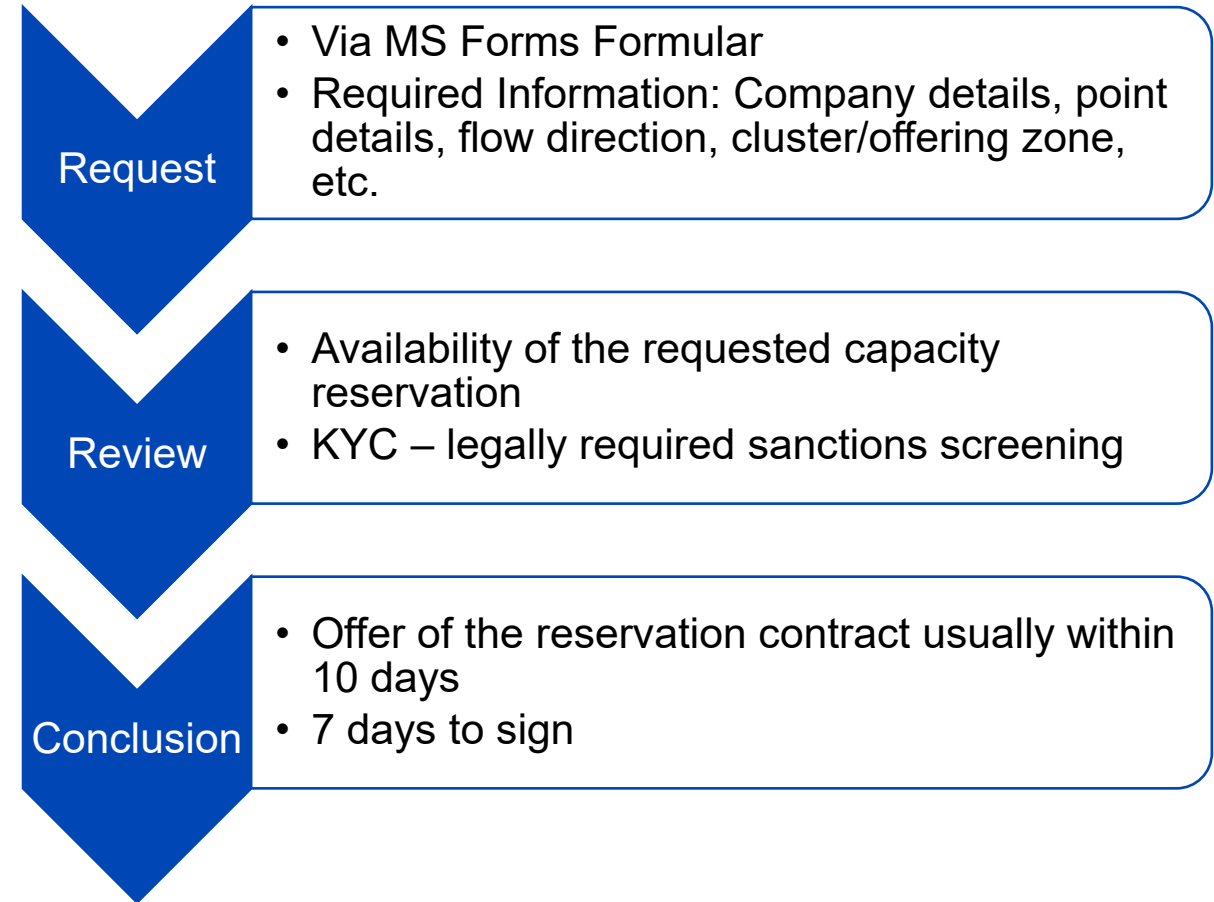
- HNOs are granted a certain degree of flexibility, to be exercised in coordination with other market participants within the process of developing the Hydrogen Cooperation Agreement (KoV H₂)
 - Regulation sets the framework through binding decisions → details are developed through self-regulation under BNetzA oversight
 - Harmonised access contracts and processes
 - Specify the detailed processes, including lead times, data formats, and interfaces
 - Stakeholder Engagement within BDEW / VKU / GEODE
 - Finalization by July 2027, applicable as from 01. January 2028
-
- Examples
 - Development of a method to determine the booking level from FCFS to Auctions
 - Nomination and Renomination Lead-Times, Data Formats
 - Development of a Capacity Reservation Process



Capacity Reservation Process

What When and How?

- Started on 19 March 2026 at 13:00
- Publication of a standardized MS forms formular on the website of the HNOs
- Secure future H2 transport capacity with reservation period: 7 years max.
- Allocation via FCFS
- Reservation basis: initially the core network infrastructure for the years 2026-2029, and thus the initial capacities in the offering zones → reallocation possible
- Reservation fee: individual, but refunded if a capacity booking is made

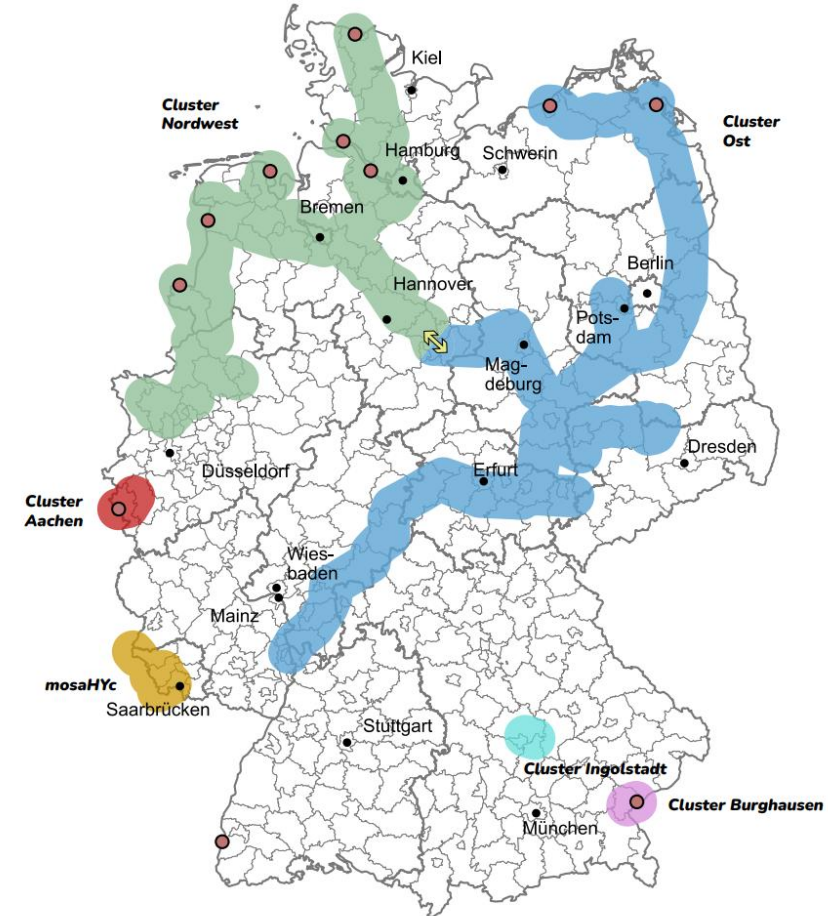


Capacity Reservation Process

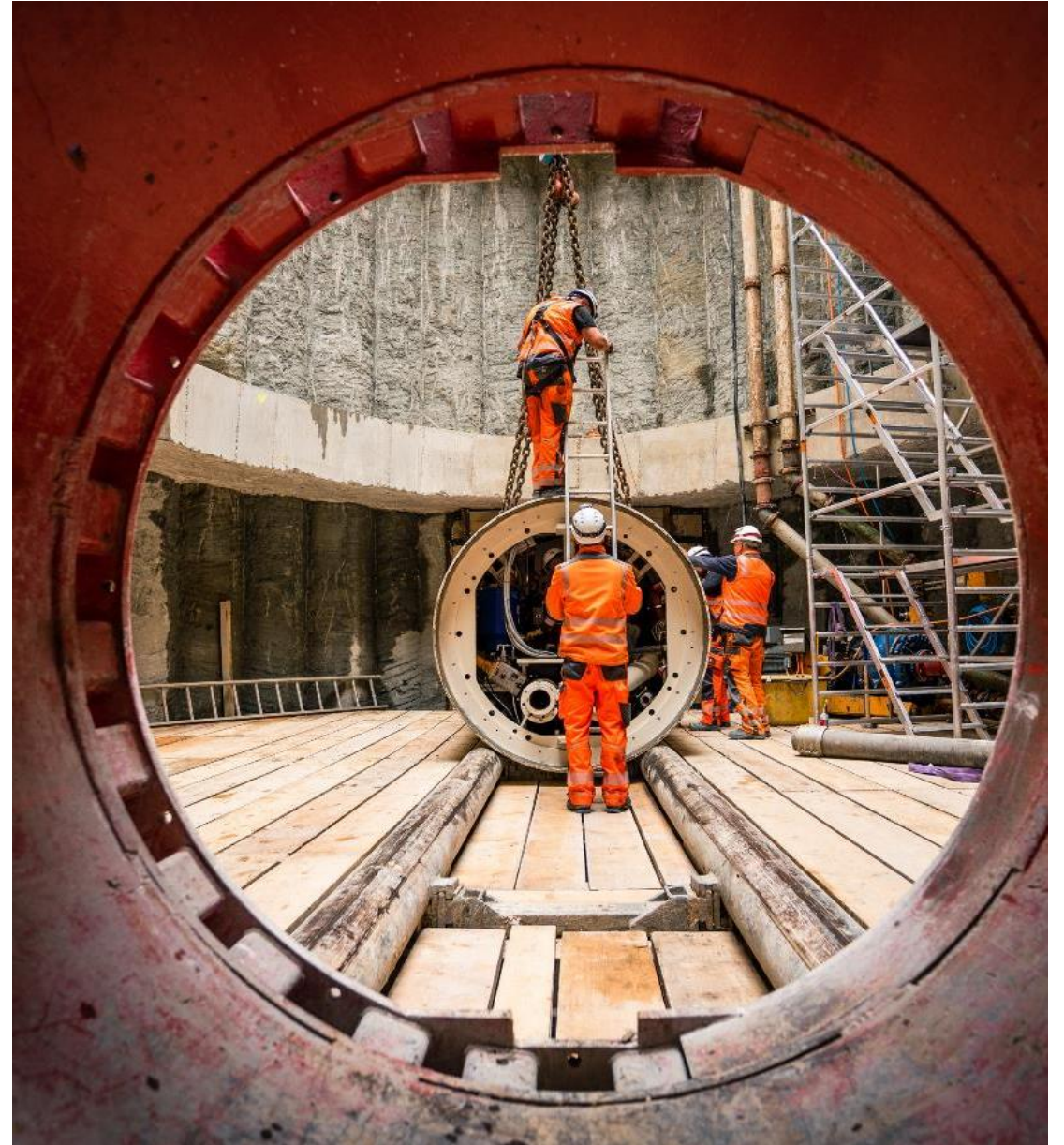
Cross Cluster Transport reservations

- Basic premise: The FWK enables free allocation within the German market area without defining a specific transport path
- Cluster phase: Free allocation is initially limited to respective cluster
- Cross-Cluster-Transport (CCT): Is possible when a connection exists between two clusters, but this connection is not congestion-free (full merger of the clusters is not yet reached)
- CCT reservation: Concluding a reservation contract with the H2-MAM (THE)
- Prerequisites: Capacity reservation or booking in source- and/or target-cluster (supply-contract in the other cluster is sufficient)
- Allocation of CCT reservation contracts is carried out via FCFS and without additional reservation fee
 - Exception: surcharge in the event of congestion

31.12.2029



Other market design rules



Tariff Rules

WANDA determination, Ramp-Up Tariff for the hydrogen core network, KOSMO

- WANDA and Ramp-up tariff
 - Basic regulatory framework for calculating the core network tariffs
 - “Hochlaufentgelt”-Determination: 25 Euro €/kWh/h/a in 2025, inflation rate added for the upcoming years → 25,55 €/kWh/h/a in 2026
 - Evaluation every 3 years & amendment if necessary
- KOSMO - determination of provisions to represent costs of certain transport services
 - Multiplier 1,33 for monthly and 3,38 for daily products
 - Ensure cost-reflective pricing: Higher tariffs for short-term bookings reflect the higher risk of unused capacity
 - Support network cost recovery: Contribution to financing stranded capacity costs
 - Prevent inefficient booking patterns
 - UWK 10 % discount
 - Exit Points to Storage: Discount for Monthly and Daily Products (no application of the Multipliers for injections)

H2 market model for Belgium



Fluxys hydrogen

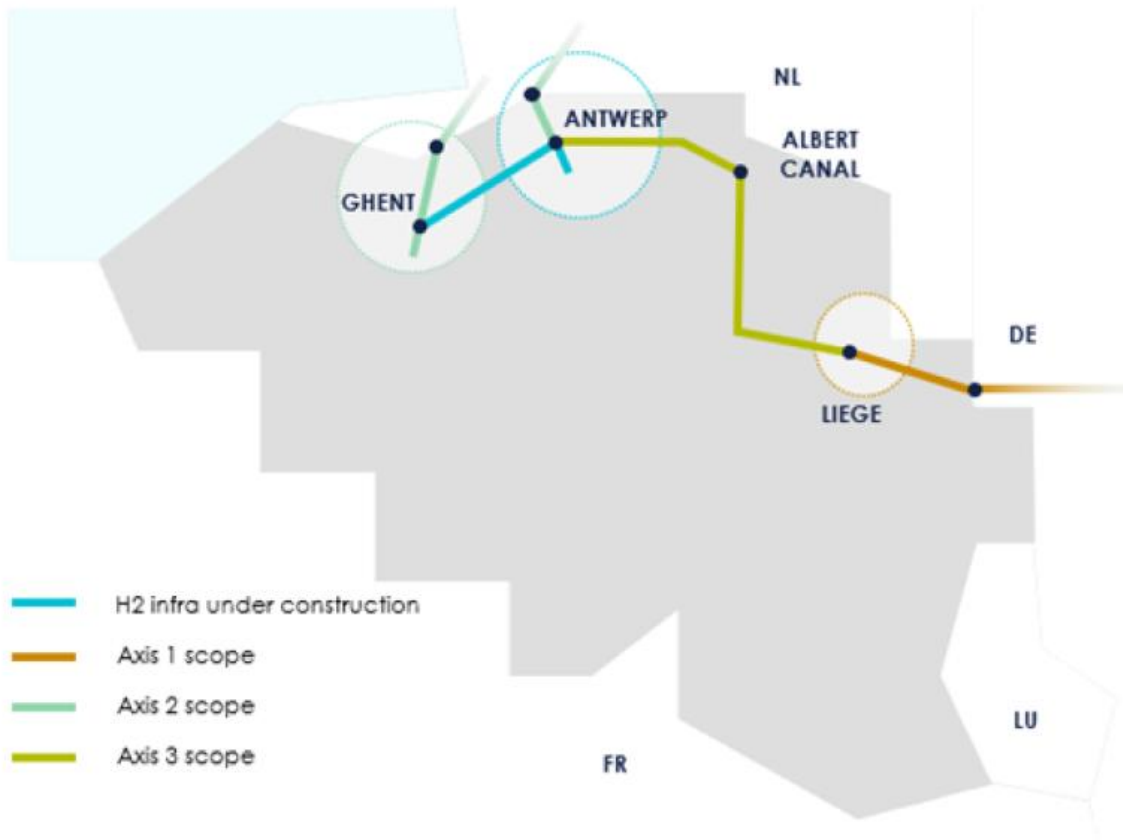
12 May 2026



shaping together
a bright energy
future

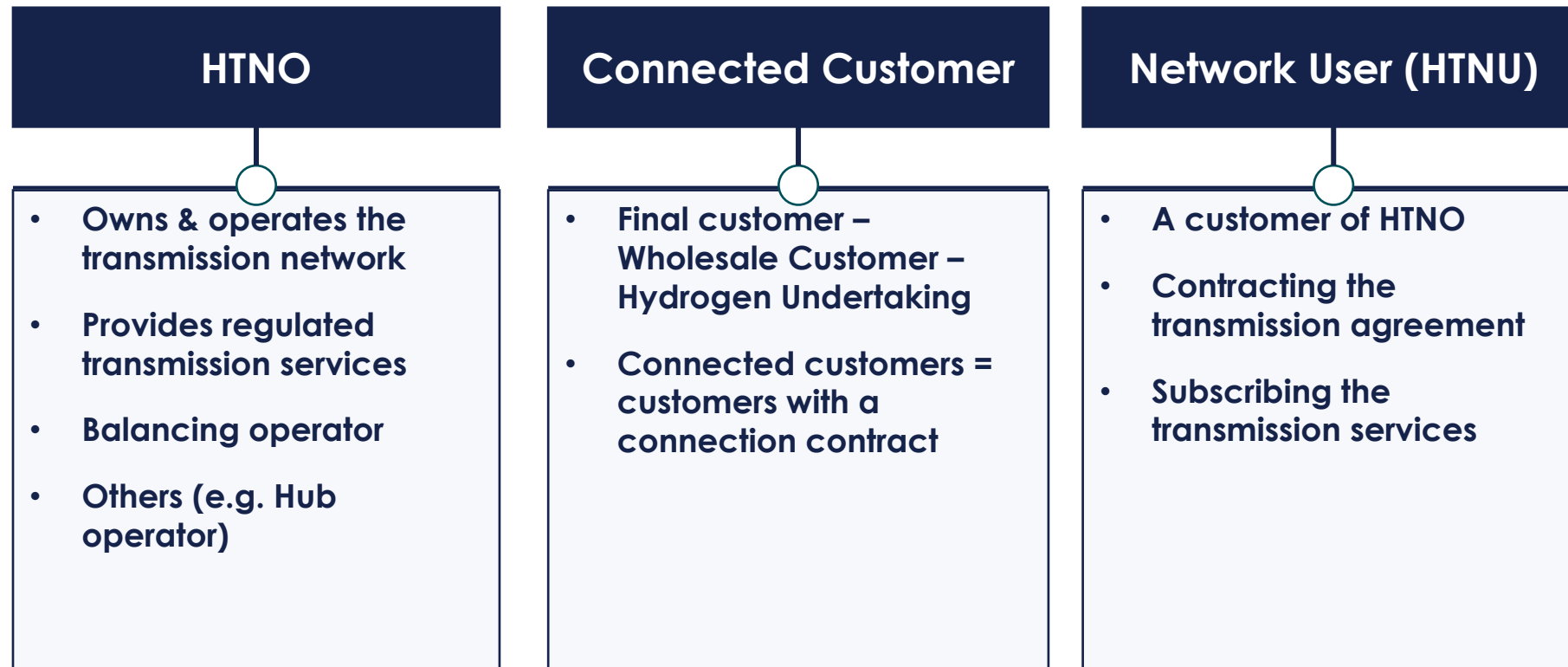
The market model must fit 1st development phase and be scalable for further developments

Foreseen H2 transmission network development



- Development of a transmission network to connect Belgium and its import terminals to consumption areas and neighbouring countries
- First milestone in Antwerp-Ghent area
- Further development subject to market evolution and transmission capacity demand

The market model is based on three categories of players active in the H₂ transmission market



+ Adjacent HTNO to guarantee inter-operability



An Entry-Exit System with “operational” routes

*From 1 January 2033,
hydrogen networks
shall be organised as
entry-exit systems**

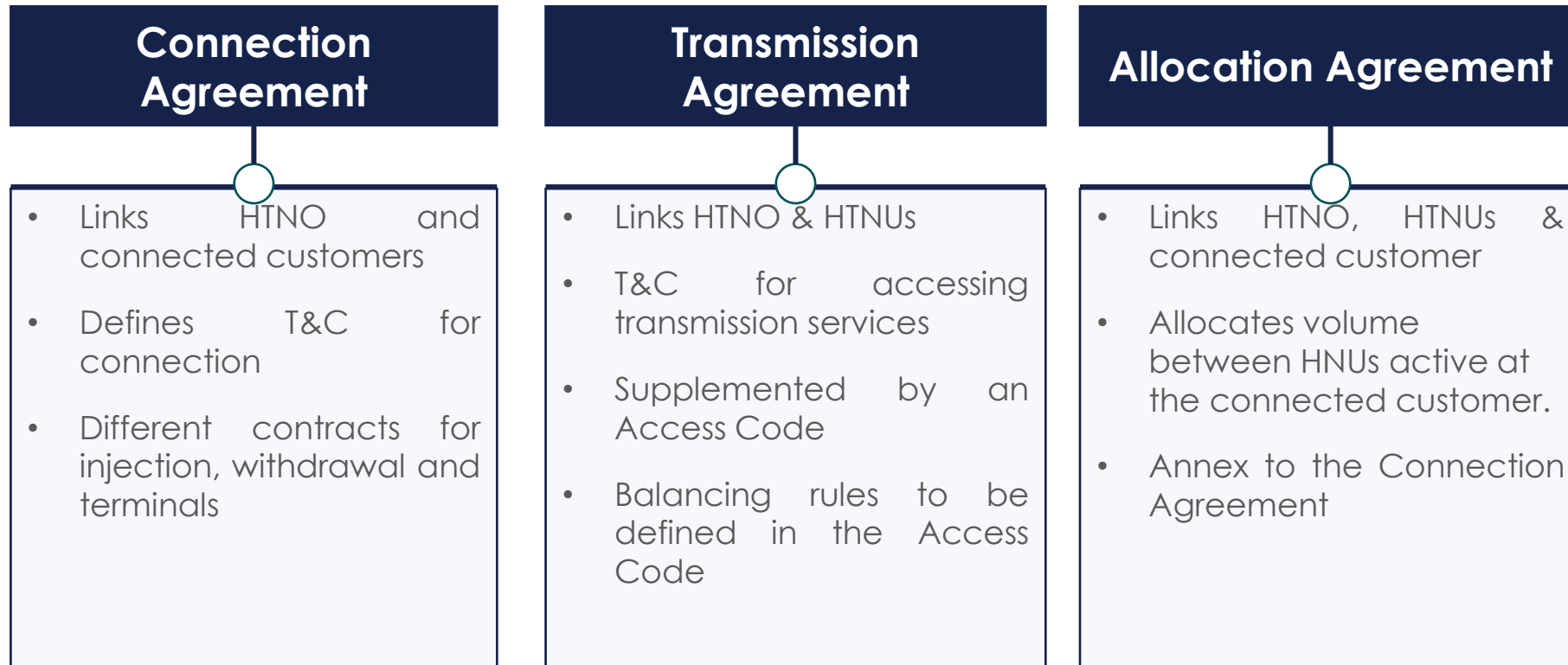


- Entry-Exit System as from the start, i.e. Entry and Exit capacity are booked independently
- After capacity bookings, HTNUs must link entry and exit capacity (1 to 1, n to 1 or 1 to n) to ease the identification of causers of imbalances when interventions are required by the HTNO
- Possible for HTNUs to review their groups accordingly to a pre-defined rule

*Article 7.6 of Regulation (EU) 2024/1789



There are three main contracts amongst market players



Transmission services must be designed to meet market needs

KEY FEATURES

	Type of services	• Entry/Exit services • Additional services to meet market's needs
	Capacity	• Capacity maximization considering system integrity • Firm capacity
	Allocation	• Ongoing investment : FCFS • Next investments : Open Season + FCFS • Capacity surrender/ transfer based on terms defined in HSTA
	Duration	• Yearly – evolving with customers' needs • HTNU needs vs. HTNO financial risk mitigation (i.e. rather LT)
	Tariff	• Defined in the tariff proposal based on tariff methodology • Capacity based, expressed in €/kWh/h/y



Defining an evolutive balancing model dealing with emerging market constraints

Dealing with initial constraints

- Limited number of market players
- Large-scale players responsible for their own SoS via their contracts
- Limited means of flexibility
 - No storage, limited linepack, no liquid market, no flexibility providers, pressure management via HTNO injunctions
- Limited geographical scope

Evolving with future development

- New players, including flexibility providers?
- Increasing liquidity?
- Larger hydrogen flows and import/export flows?
- Geographical expansion and Interconnections adjacent networks?
- Technical/operational constraints?



What's next?



Q&A session with the speakers

Coffee & networking break

Panel 2:

Discussion on different aspects of future market design

Speakers:

Julia Menezes (Europex)

Johanna Friese (EWE)

Valentin Calfa (GD4S)

Grzegorz Pawelec (Hydrogen Europe)

Isabelle Chaput (IFI EC)

Moderation: Helena Astachowskaja (ENNOH)

Q&A session with the speakers

Closing remarks & way forward

Preparatory groundwork and the formal process: correlation and responsibilities



Drafting
Committee



Preparatory groundwork on the future market design

Priority List

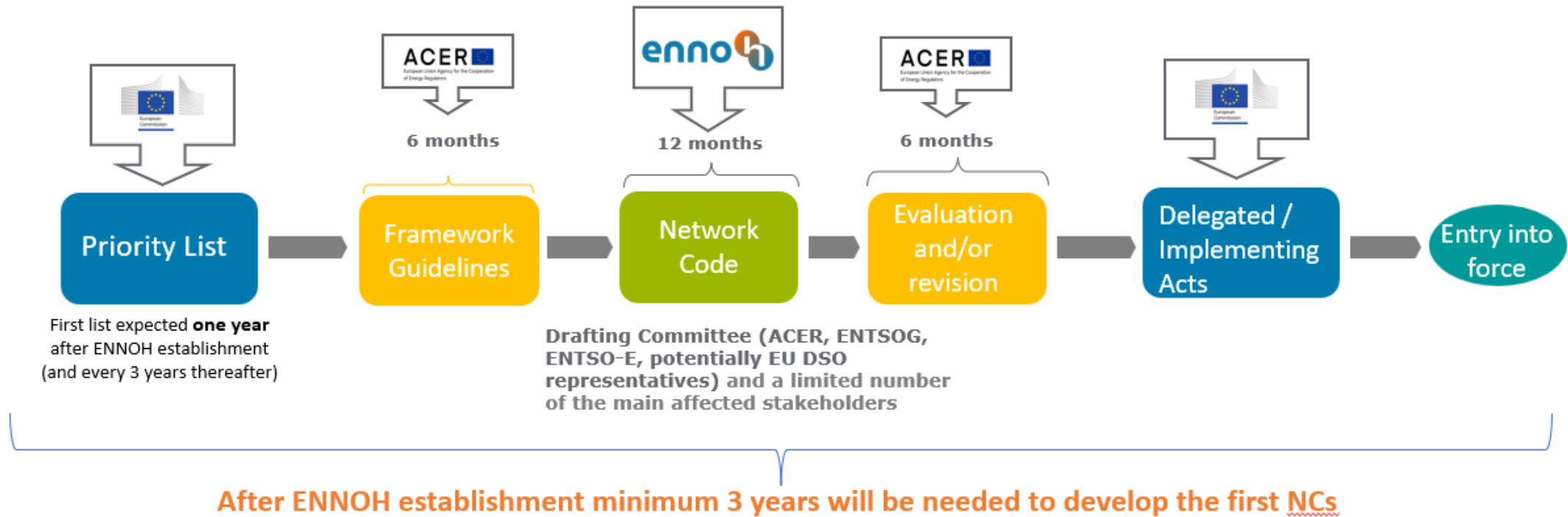
Formal NC development process

- Aim – to present initial ideas and considerations on future market design rules, including the rules on accessing and financing H2 infrastructure, as well as other aspects;
- Ideas to be included in a “living” paper subject to regular updates to keep pace with market developments;
- No legally binding act is foreseen or possible at this stage
- The work is likely to “flow into” the formal process after the formal process is triggered by the EU COM

Acc. to Art. 72
of the
Regulation
2024/1789

- The formal process will be triggered according to the Regulation (EU COM in charge)
- Formal process is subject to rules and timing foreseen in the Regulation, involves multiple stages and different actors
- The outcome will be legally binding act(s) in form of a regulation or guidelines issued by the EU COM
- The results from the preparatory groundwork could be used to support the NC development

Network Code Development Process: Article 72 of Regulation (EU) 2024/1789





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