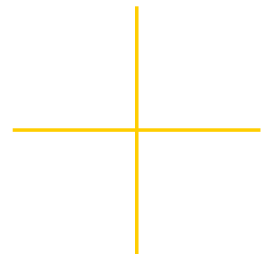


# Ramping up H2 mobility – the German National Innovation Programme (NIP)

HyTruck Breakfast Briefing

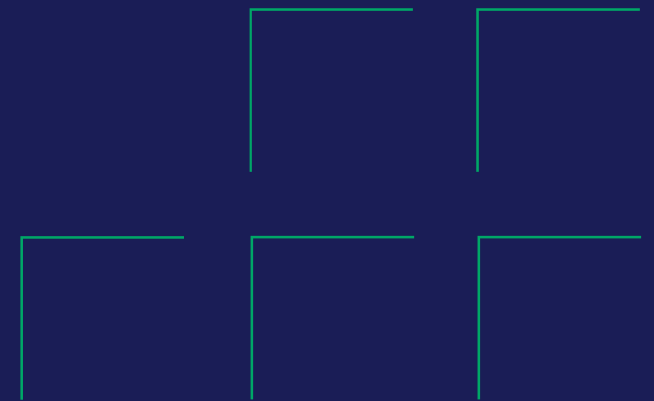
Carsten Beyer  
NOW GmbH, Programme Manager Hydrogen Refuelling Infrastructure

07.02.2024



# Content

1. NOW GmbH
2. Transport sector – the big picture / H2
3. National Innovation Programme for Hydrogen and Fuel Cell Technology (NIP)
4. AFIR and H2 demand
5. HRS



# Introducing the NOW GmbH

NOW - National Organisation Hydrogen and Fuel Cell Technology



- **Federally-owned company**, established in 2008



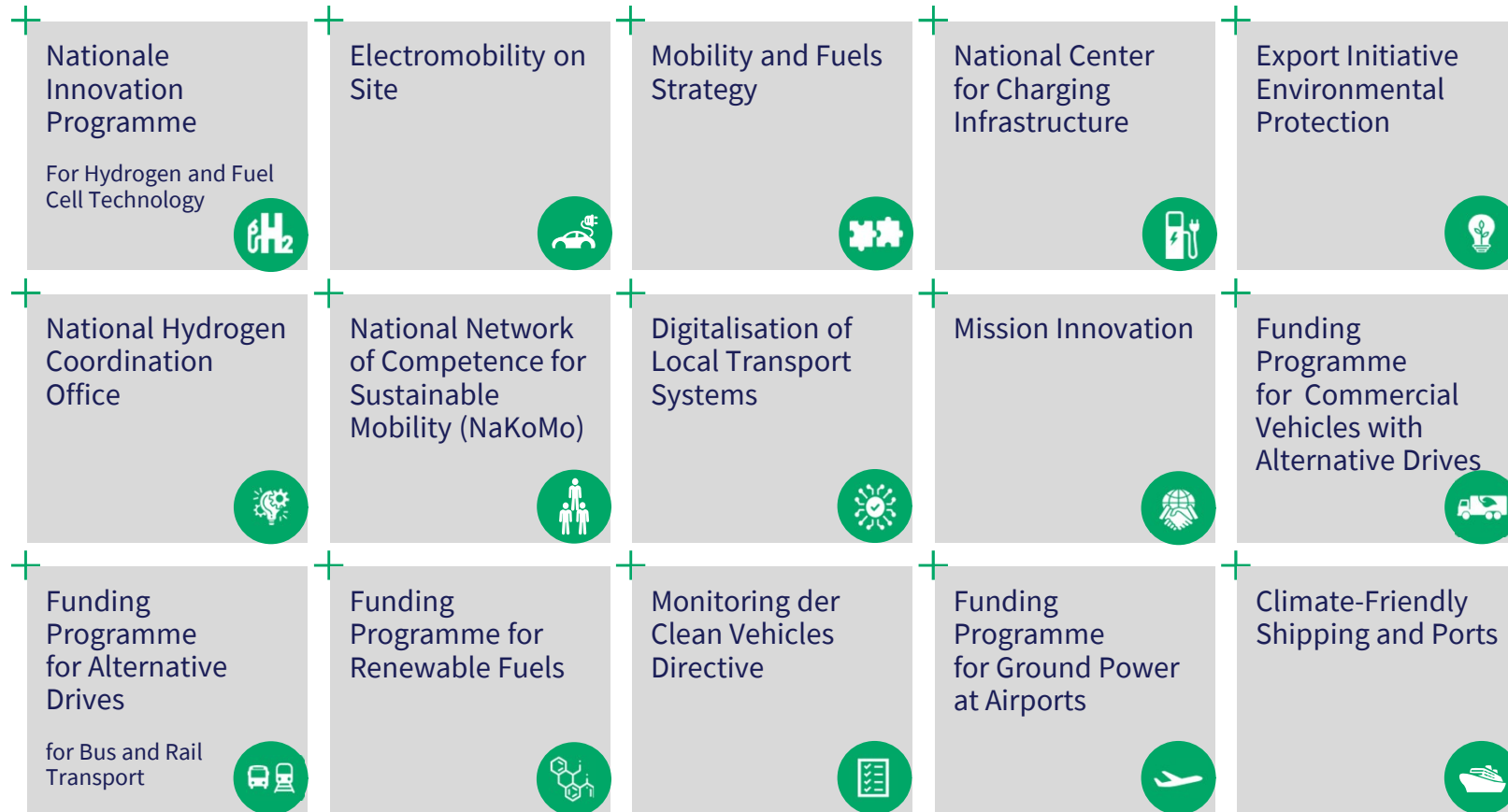
- **Main tasks:** we take assignments in the area of sustainable mobility & energy supply from federal ministries, e.g.: implementation & coordination of funding programs, strategic & advisory tasks



- **Our vision:** A climate-neutral society.
  - **Our Mission:** We support the German Federal Government with regard to its climate and industrial policy goals by promoting sustainable technologies and innovative concepts. Hereby we pursue a systemic approach of an integrated energy system with a focus on the mobility sector.

# NOW's Portfolio

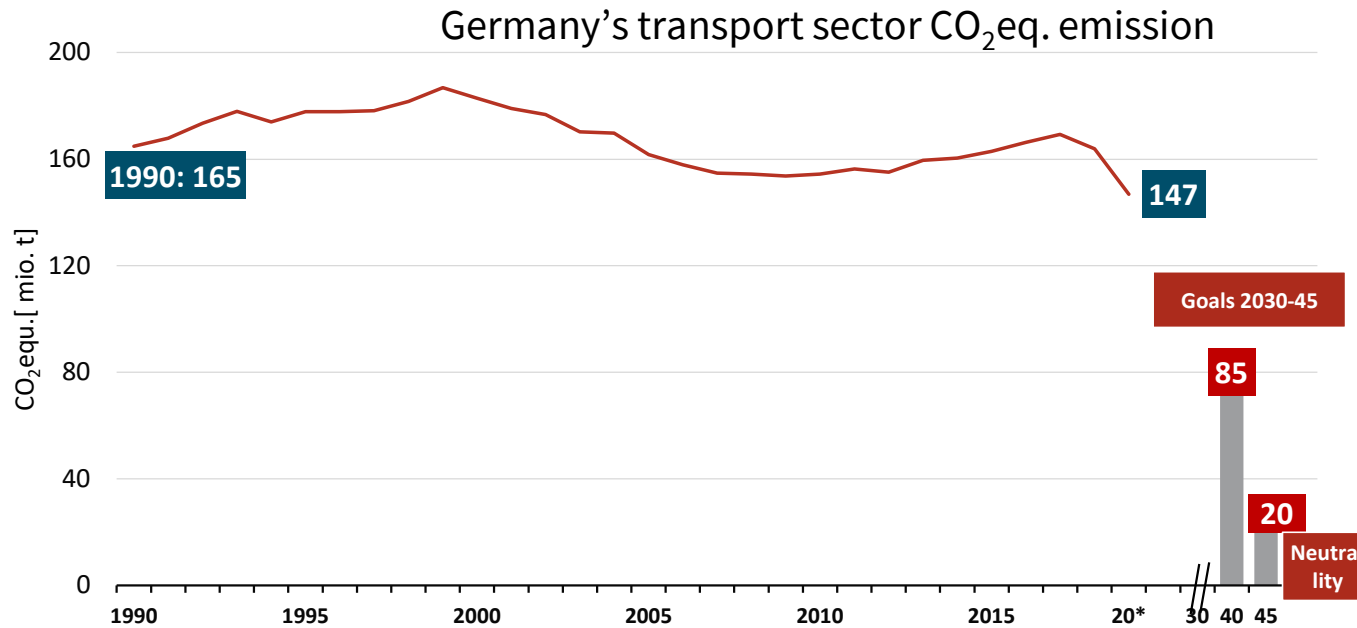
Coordination of funding programmes, technology advice, networking



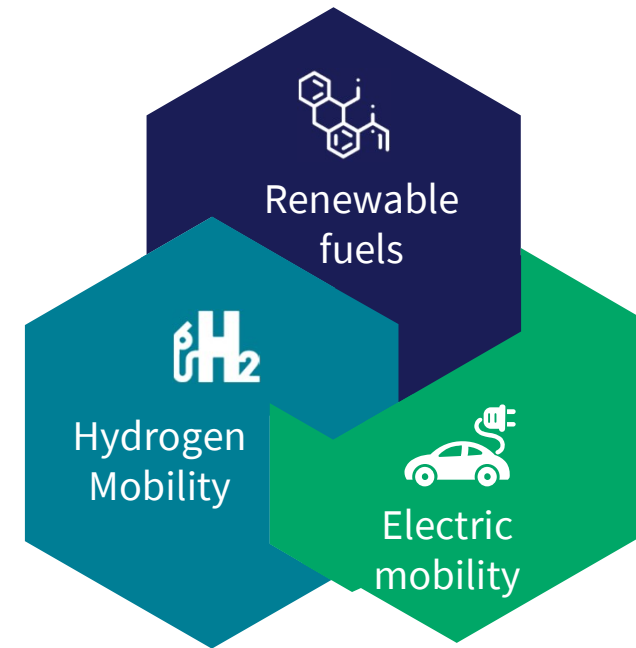
# The Challenge

is to cut transport CO<sub>2</sub> in half by 2030

- By 2030 compared to 2019: **-48 %** CO<sub>2</sub> in the transport sector
- By 2045 neutrality

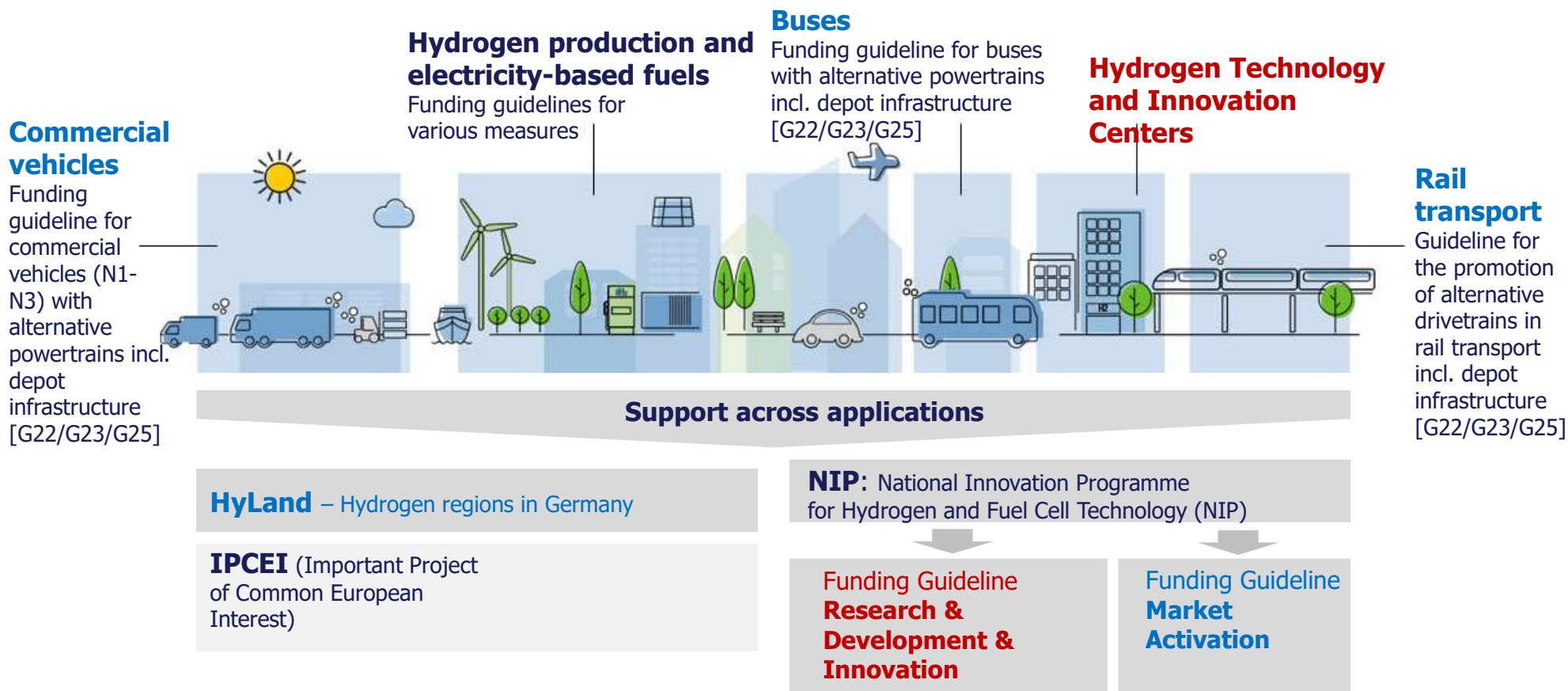


All options are needed



# BMDV Funding Programmes for hydrogen and fuel cells

Transport applications where hydrogen is a viable option

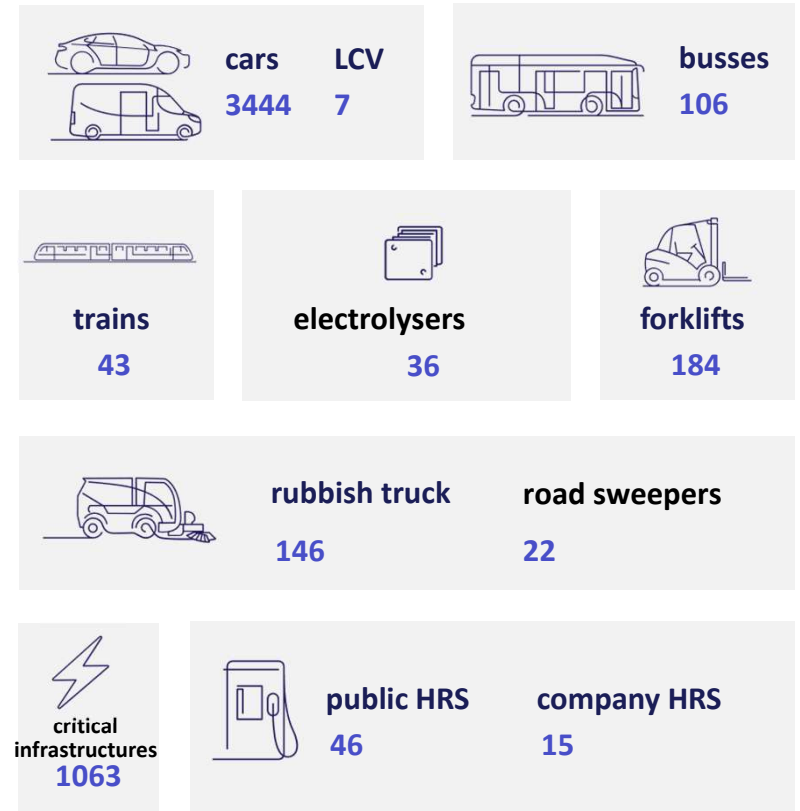
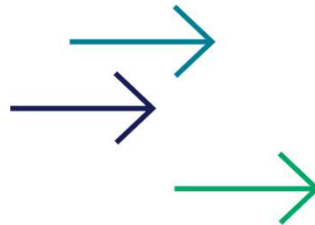
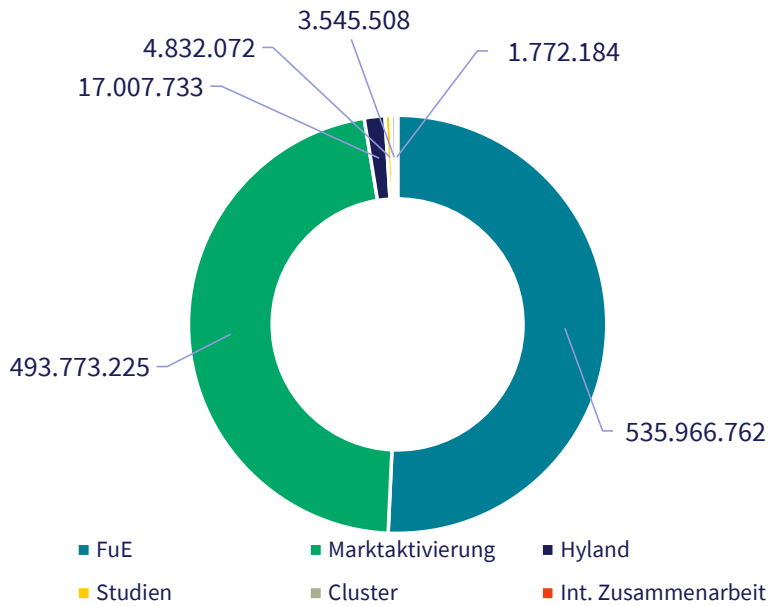


# NIP II – BMDV

Funding facts (from 2016 until 2023)



## NIP funds [Euro] provided by BMDV



# AFIR Criteria for HRS (Art. 6)

Published as (EU)2023/1804 on 13th September 2023

- Max. distances  $\leq 200$  km on the TEN-T core network by the end of 2030
  - Applies across borders
  - Max. 10 km distance from TEN-T exit
- HRS in every urban node by the end of 2030
- HRS must be designed for light and heavy commercial vehicles
- Filling option 700 bar is the minimum standard, further filling options should be included
- Cumulative capacity of HRS of 1 t/day in urban nodes
- Formulation for interim target 2027
- Electronic payments via payment card readers or devices with contactless functionality



Source: <https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?layer=22>



# AFIR: HRS Goals

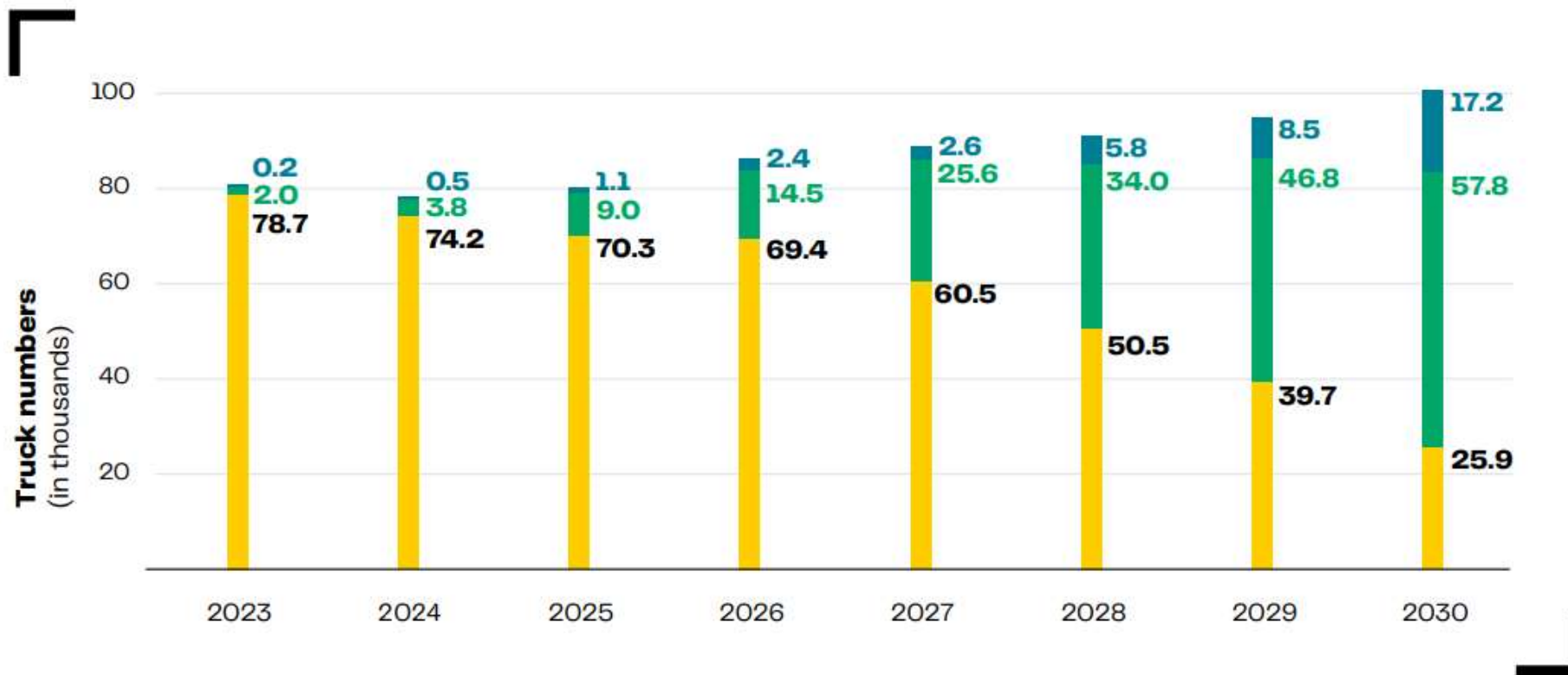
## For Hydrogen Refueling Infrastructure for Cars and Trucks

- Potential numbers of HRS to fulfil AFIR criteria:
  - Up to **424** HRS in urban nodes in Europe
  - **72** HRS in urban nodes, **min. ~ 105** overall in Germany
- This is not enough!
- AFIR is clearly considered as a minimum goal



# Forecast Sales Figures for HDV (N3/> 12t)

In Germany according to manufacturer data



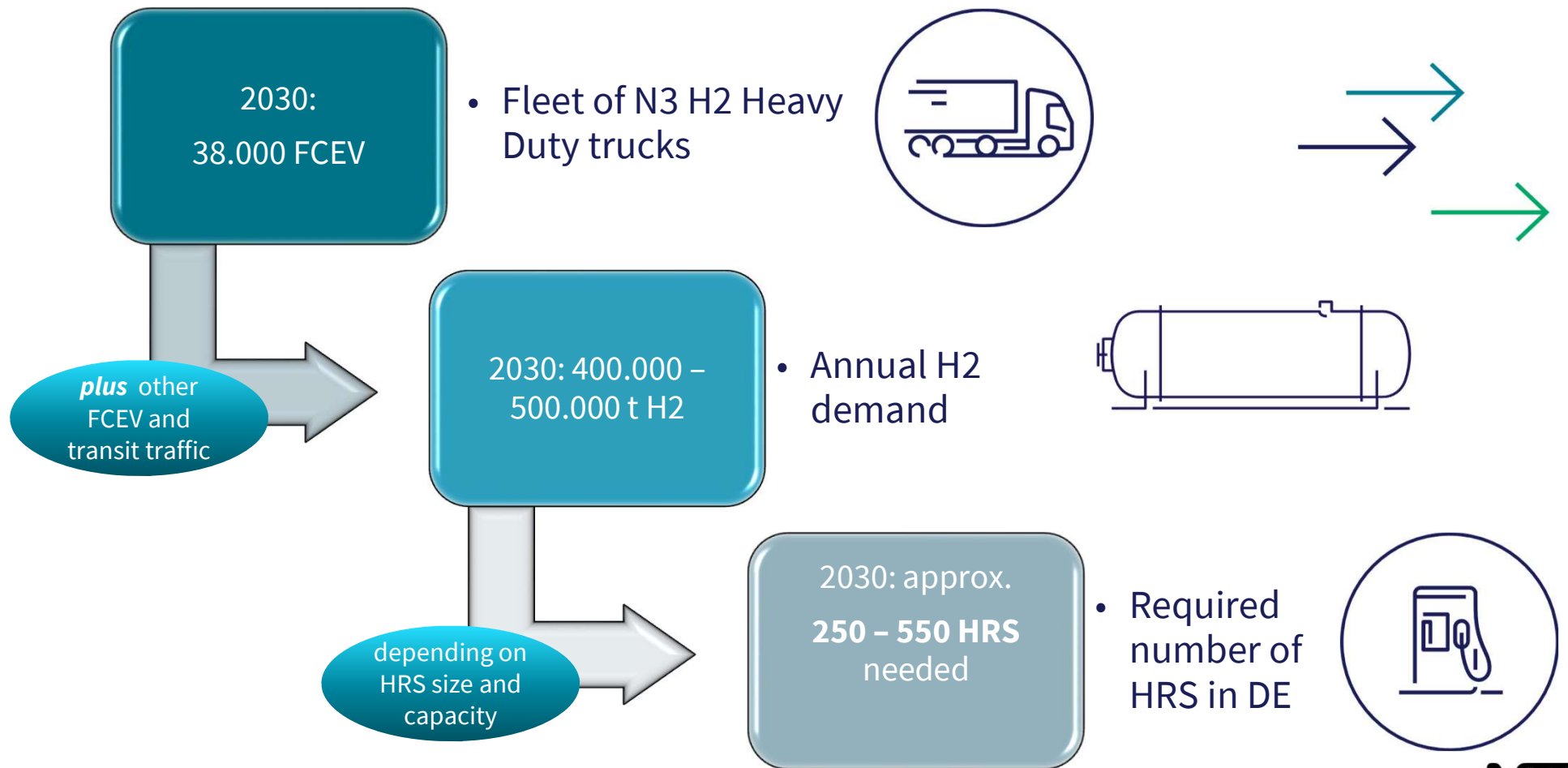
Notes on uncertainty due to incomplete market coverage:

- Data is not available for all drivetrain types, manufacturers and years.
- For the second half of the decade, the response rate in terms of current market shares is 95%.
- For fossil fuel-based drivetrains, the response rate was between 70% and 90% by 2025.

- H<sub>2</sub> fuel cell
- Battery
- Diesel

# Scenario for HDV (N3/> 12t) based on forecast from cleanroom talks

Necessary number of HRS to refuel fleet

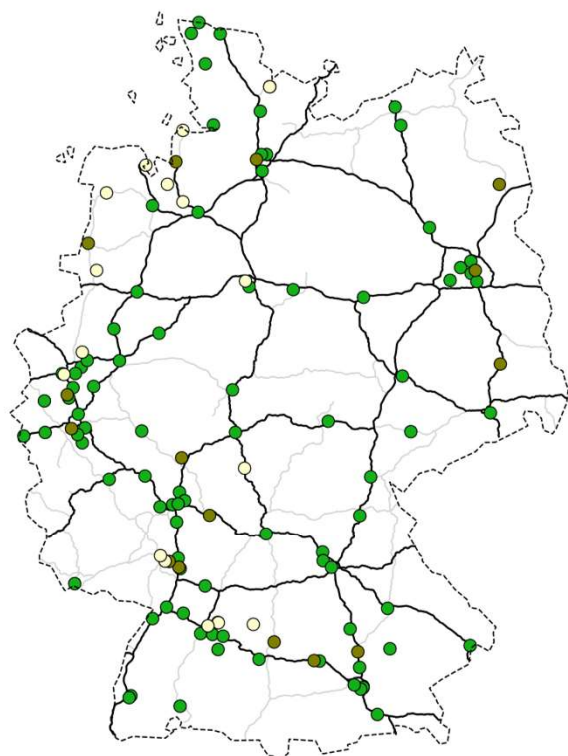


# Current ramp-up status of HRS in Germany

to our best knowledge - subject to correction

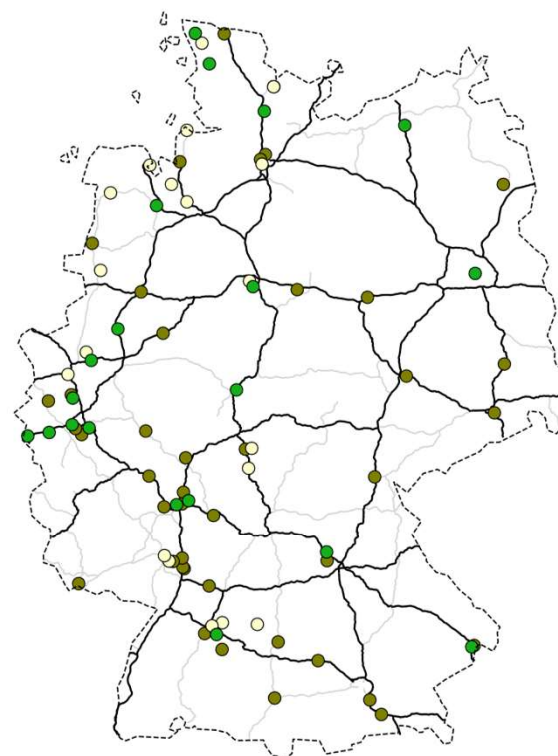


700 bar (for Light-Duty Vehicles) HRS in Germany  
(state of knowledge 01/2024)



- in operation: 87
  - under construction: 16
  - in planning: 16
- TEN-V Core Network  
- - - TEN-V Extended Network

350 bar (for Heavy-Duty Vehicles) HRS in Germany  
(state of knowledge 01/2024)



- in operation: 20
  - under construction: 42
  - in planning: 19
- TEN-V Core Network  
- - - TEN-V Extended Network

# HRS funding calls

Past, current and future calls in the NIP



- Specifics and focus vary from call to call
- Selection criteria of last call (05/2023):
  - Only dispensing of 100% renewable H2
  - HRS must be along TEN-T network or within urban nodes
  - Min. capacity 2t / day
  - HRS must serve light and heavy commercial vehicles.
  - It must be possible to refuel with H2 at 700 bar (additional dispensing options - 350 bar / LH2 / CcH2 - are welcomed)
- Decision pending whether outcome of last call can be realized

03/2018

07/2019

01/2022

05/2023



More calls planned

# NIP HRS funding call 2023

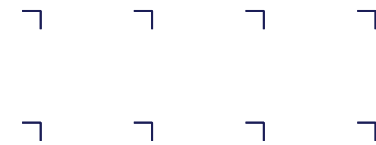
Preliminary Outcome – pending funding decision



Funding of more than 60 HRS for Heavy Duty approved

All HRS will offer 350 bar and 700 bar dispensers, - some even LH2

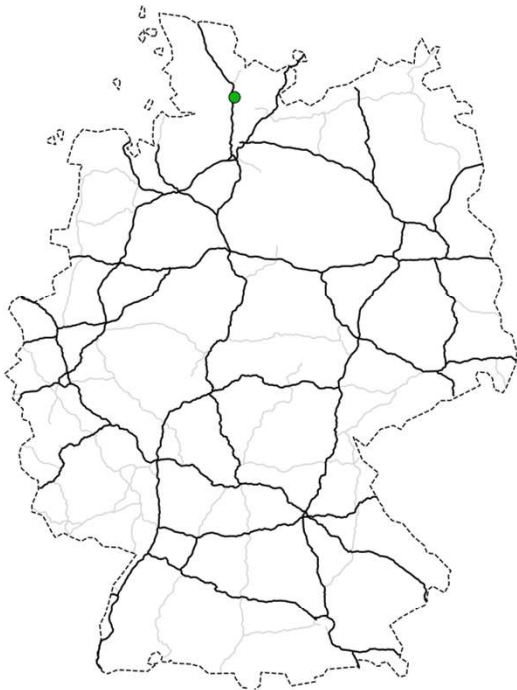
Broad coverage of urban nodes and TEN-T corridors across 15 (out of 16) German Federal States



# AFIR-compliant HRS

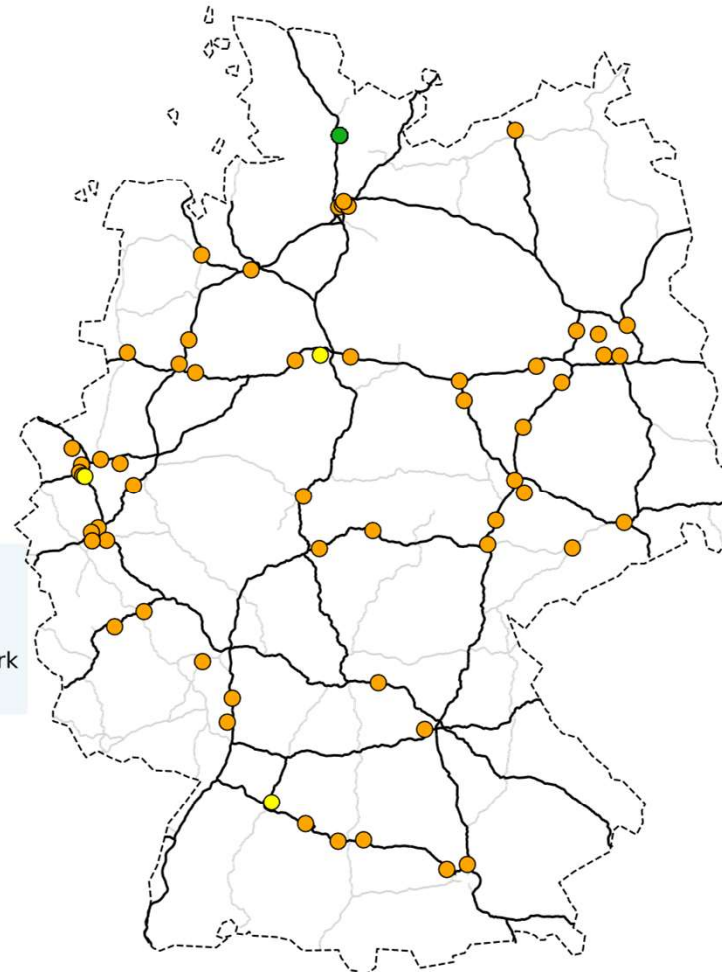
Still a long way to go

Today: AFIR compliant HRS in Germany  
(State of knowledge 01/2024)



- in operation: 1
- TEN-V Core Network
- TEN-V Extended Network

Tomorrow: AFIR compliant HRS in Germany  
(State of knowledge 01/2024)

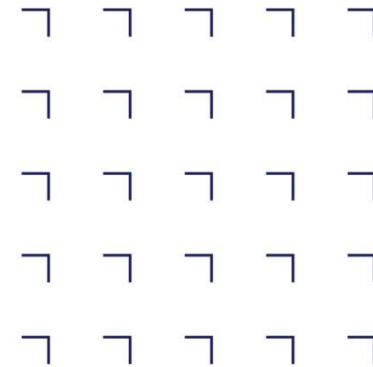


- under construction: 3
- in planning: 55
- in operation: 1
- TEN-V Core Network
- TEN-V Extended Network





# Thank you!



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**Berlin, 07.02.2024**



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