

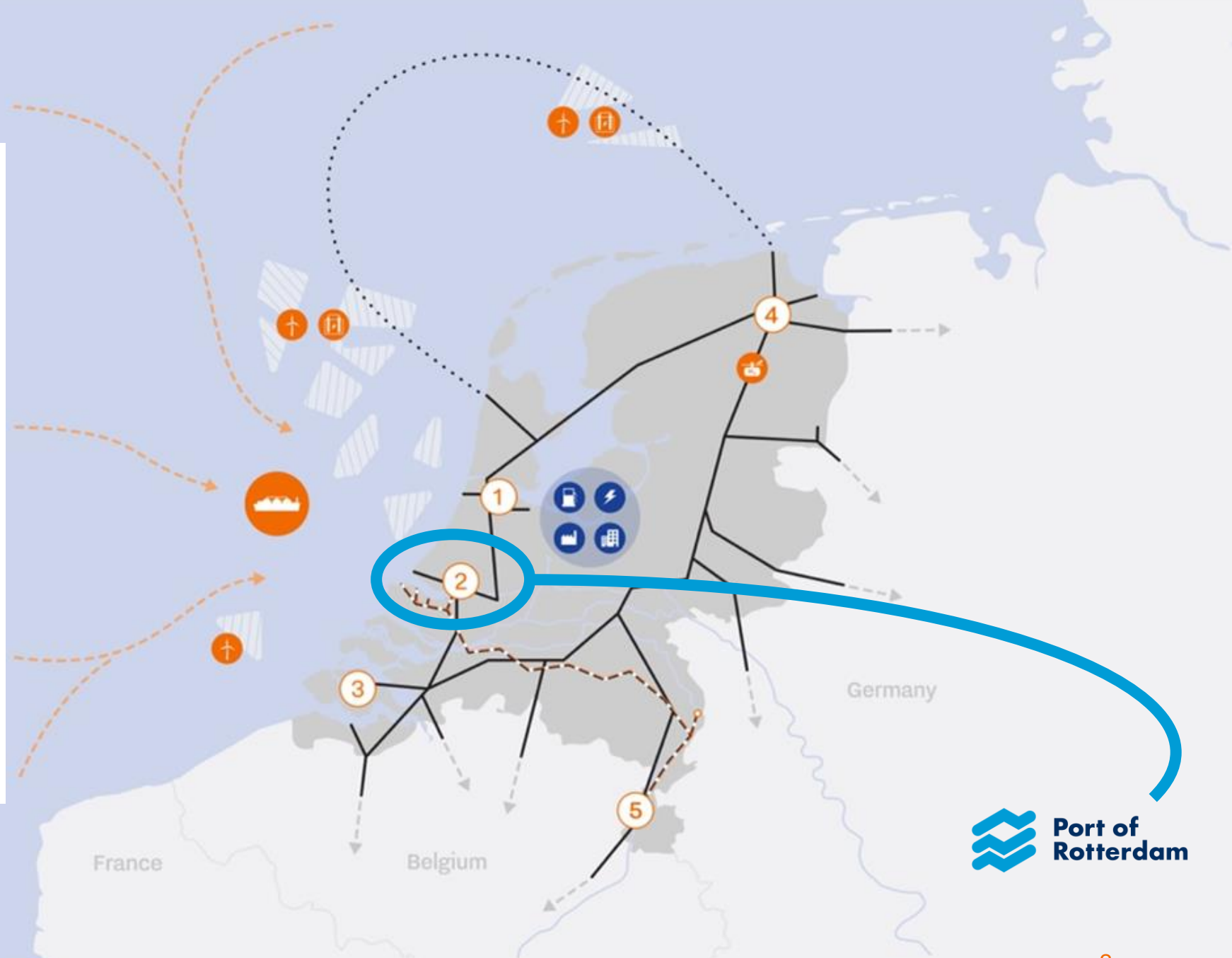


# Hydrogen value chain

## Major industrial clusters

- 1 Amsterdam
- 2 Rotterdam
- 3 Zeeland
- 4 Groningen
- 5 Chemelot

Onshore hydrogen network	Offshore hydrogen network	Delta Rhine Corridor
Upstream	Midstream	Downstream
Electrolysis	(Re)conversion	Industry
Offshore wind energy	Import	Mobility
	Storage	Power
	Underground storage	Built environment



# Production and imports in Rotterdam



# NH3 projects



# NH3 Cracker

## REPowerEU Plan:

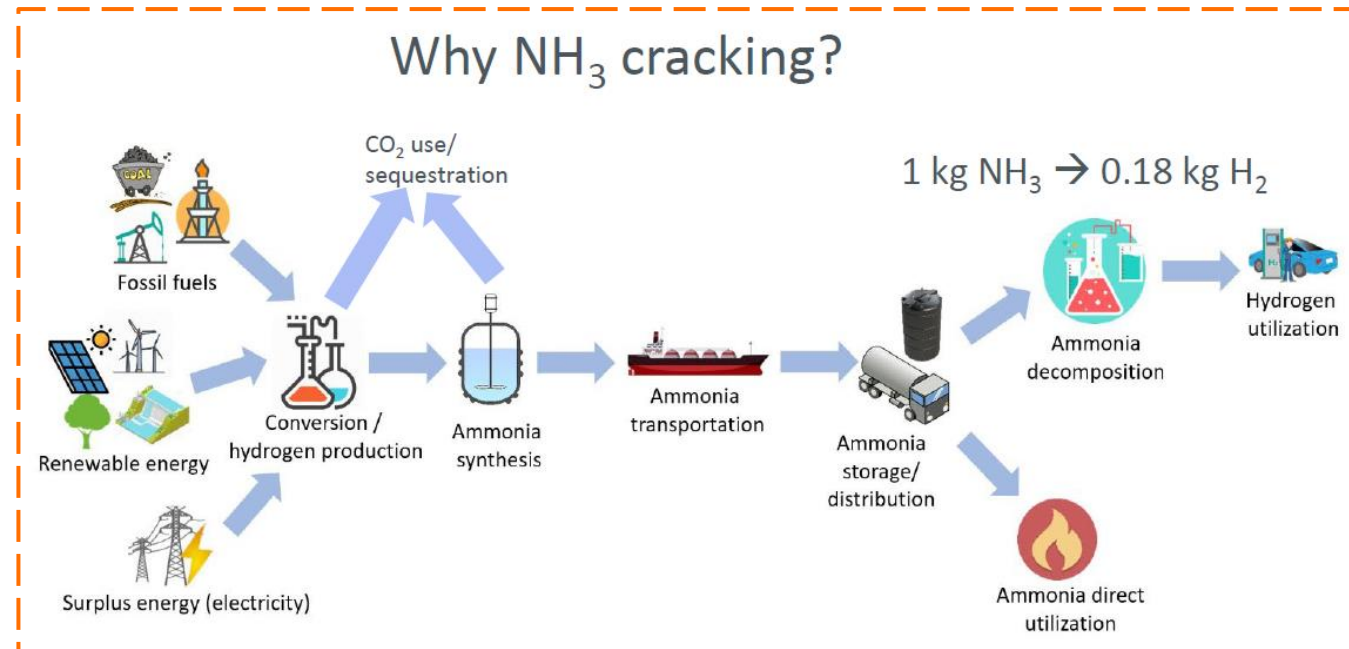
European Commission proposed to produce 10 million tons and import 10 million tons renewable H2 by 2030

## Port of Rotterdam - Study:

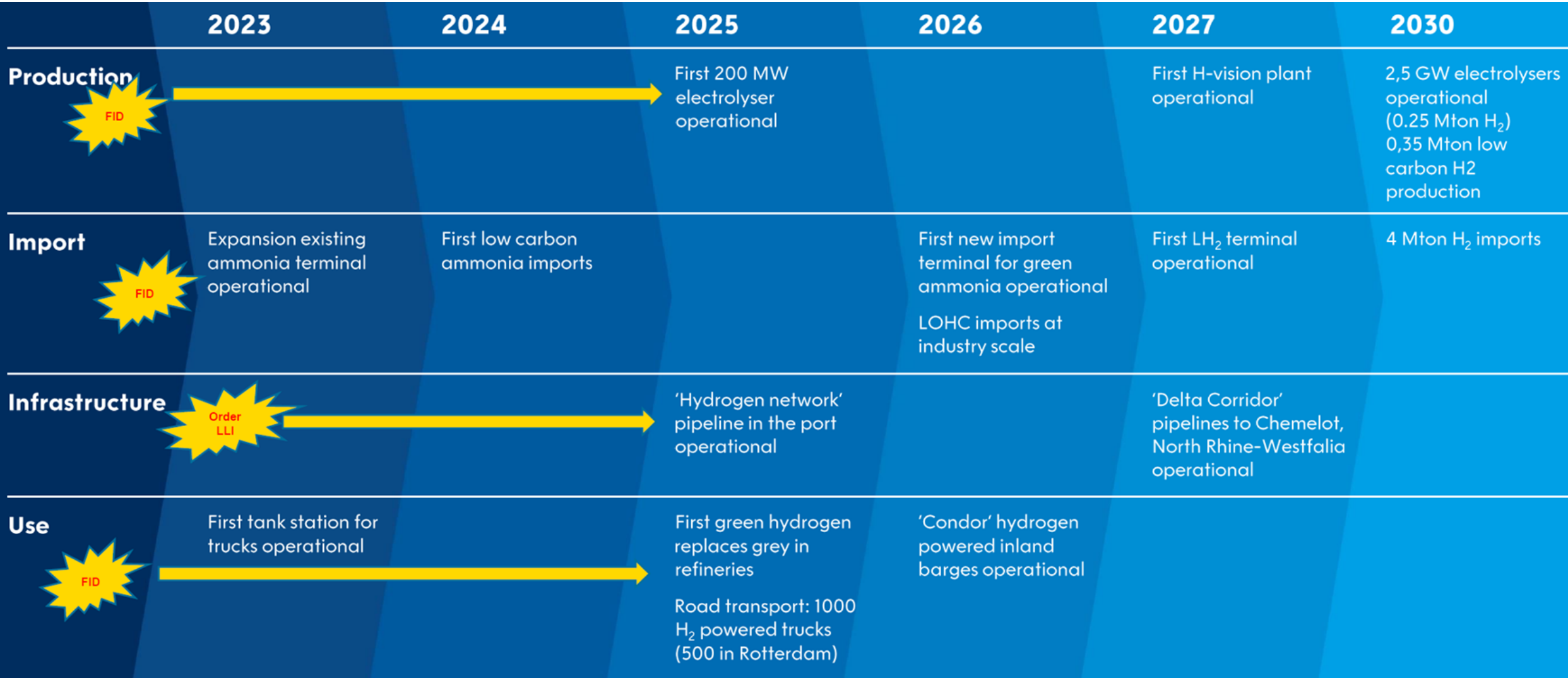
1 million ton/year H2 from NH3 Cracker → ± 7 million ton/year NH3 (with no external fuel usage)

## Objectives:

- Understanding NH3 cracking technology landscape
- Maximum achievable single train capacity
- Technical Readiness Level (TRL) of technologies
- Feedstock, energy, utility consumption
- Environmental footprint
- Plot footprint
- Investment & operating cost of plant, Cost of H2 production
- Safety aspects associated with NH3 storage and transport
- Limitations to plant scale up
- Ammonia cracking technology advancements
- Benefits of a centralised cracking plant compared to several decentralised facilities

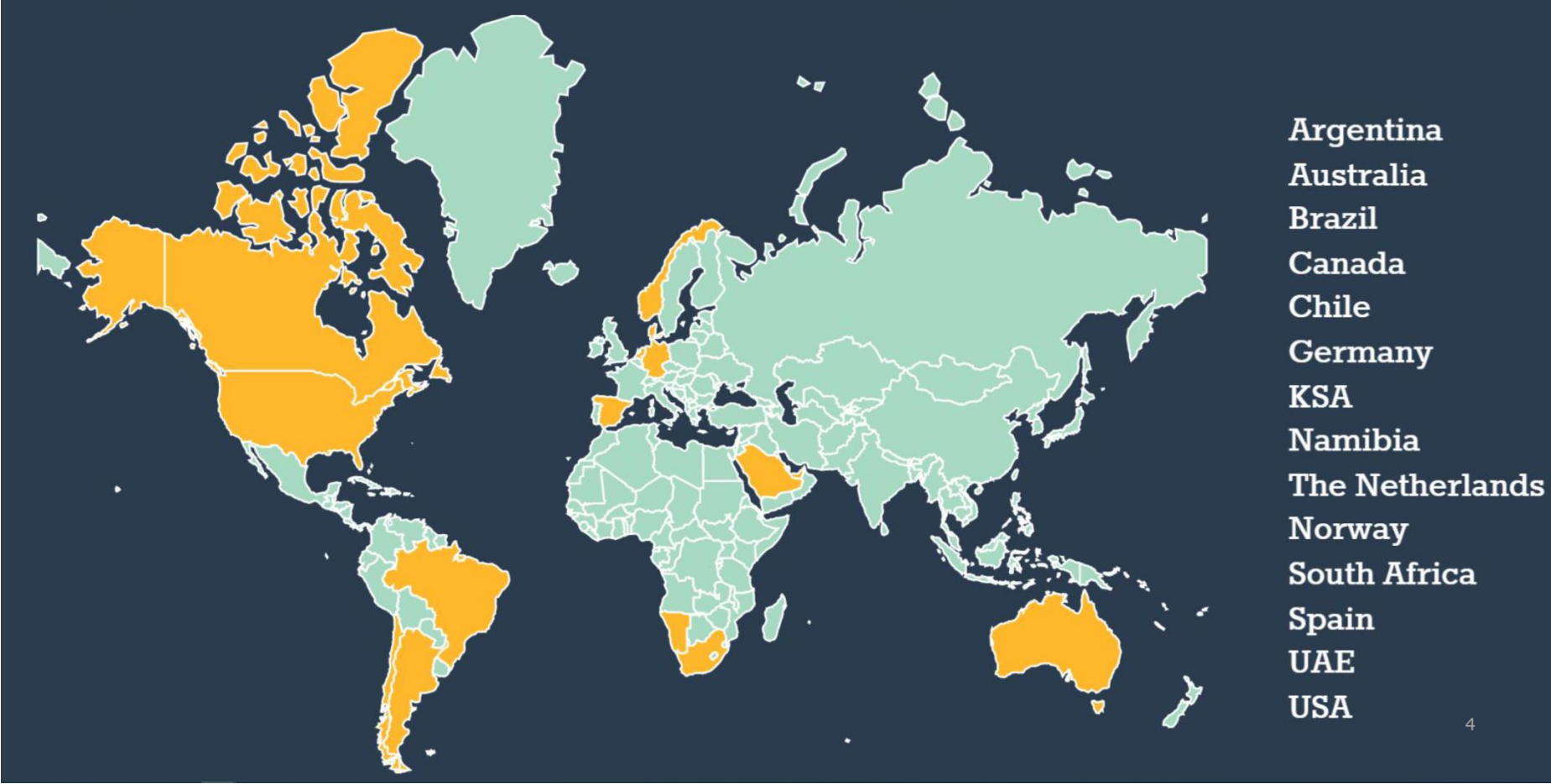


# Planning Projects Rotterdam



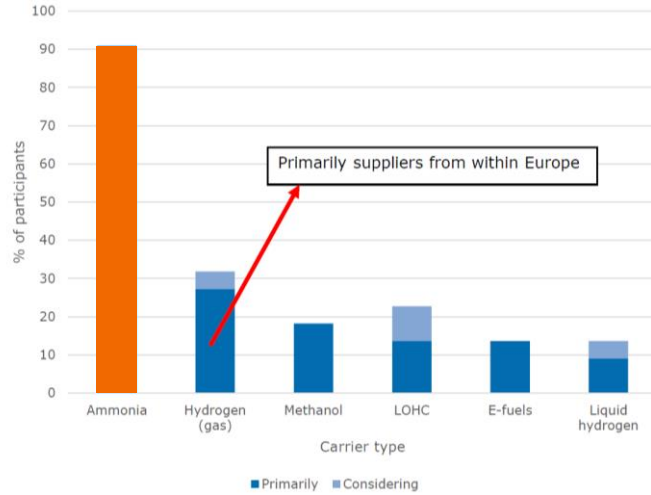
# World Hydrogen Summit – May 2023

## Suppliers' countries of origin

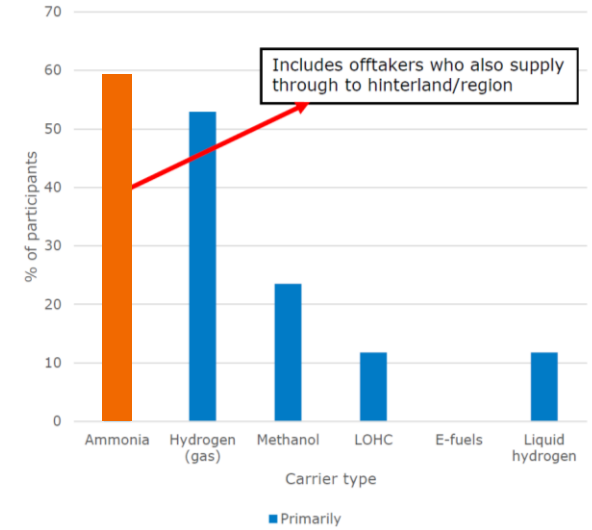


# World Hydrogen Summit – May 2023

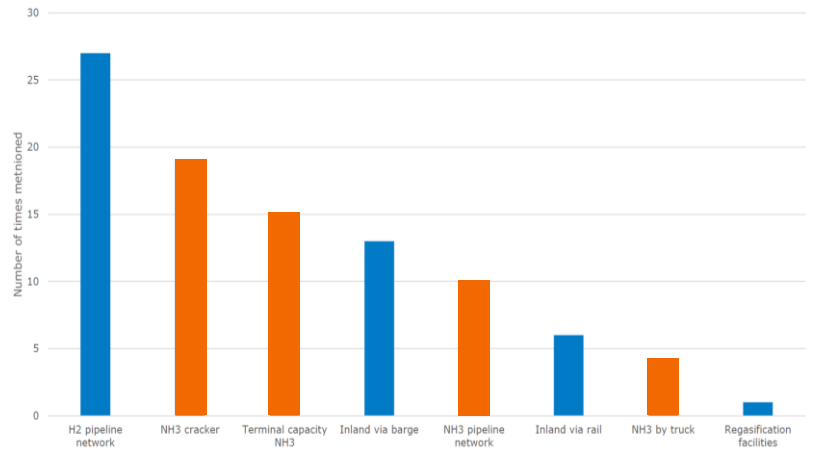
## Type of carrier expected to supply



## Type of carrier expected to offtake



## Infrastructure needed



## Expectations from public entities

