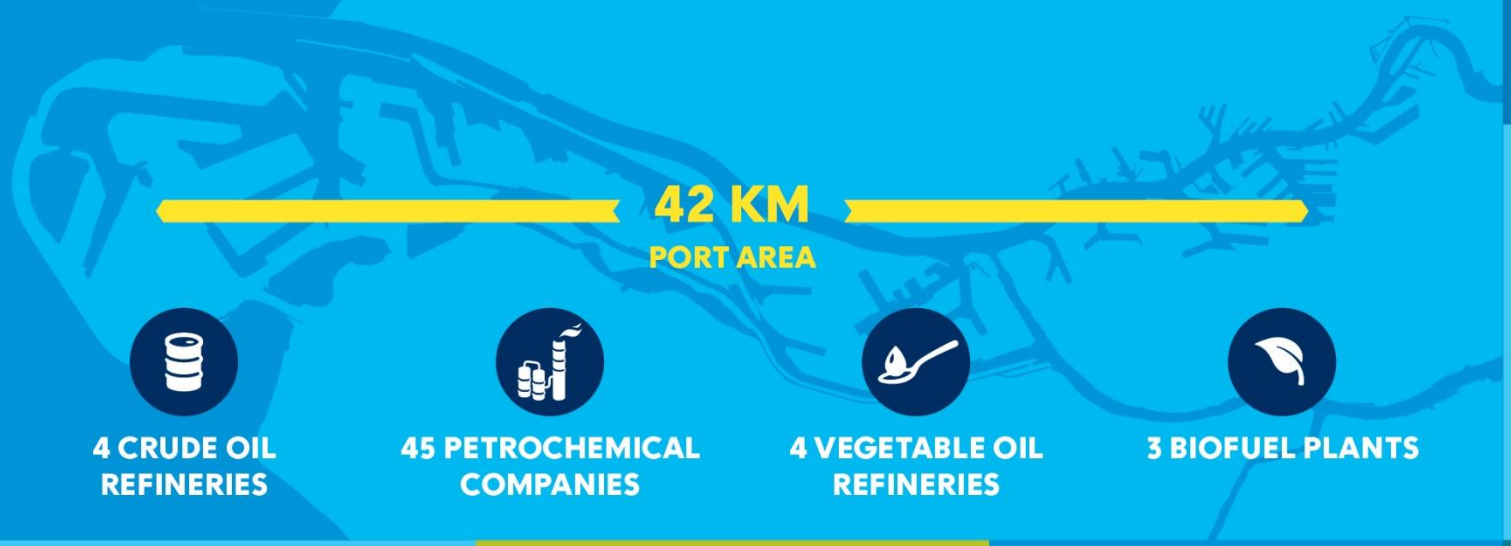
PORT OF ROTTERDAM — ENERGY HUB OF THE FUTURE

Maike Akkers — Programmamanager Energy-infrastructure

Port of Rotterdam

PORT OF ROTTERDAM FACTS
2022



42 KM
PORT AREA

4 CRUDE OIL REFINERIES

45 PETROCHEMICAL COMPANIES

4 VEGETABLE OIL REFINERIES

3 BIOFUEL PLANTS

AWARDED BEST PORT INFRASTRUCTURE

€63 BILLION
ADDED VALUE,
8.2% OF DUTCH BBP

100.000
INLAND VESSELS PER YEAR

30.000
SEA-GOING VESSELS PER YEAR

FRONTRUNNER IN SUSTAINABILITY

NR. 1 BIOPORT

469 MILLION TONNES OF FREIGHT THROUGHPUT
IN 2021

LARGEST EUROPEAN PORT

565.000
DIRECT & INDIRECT JOBS

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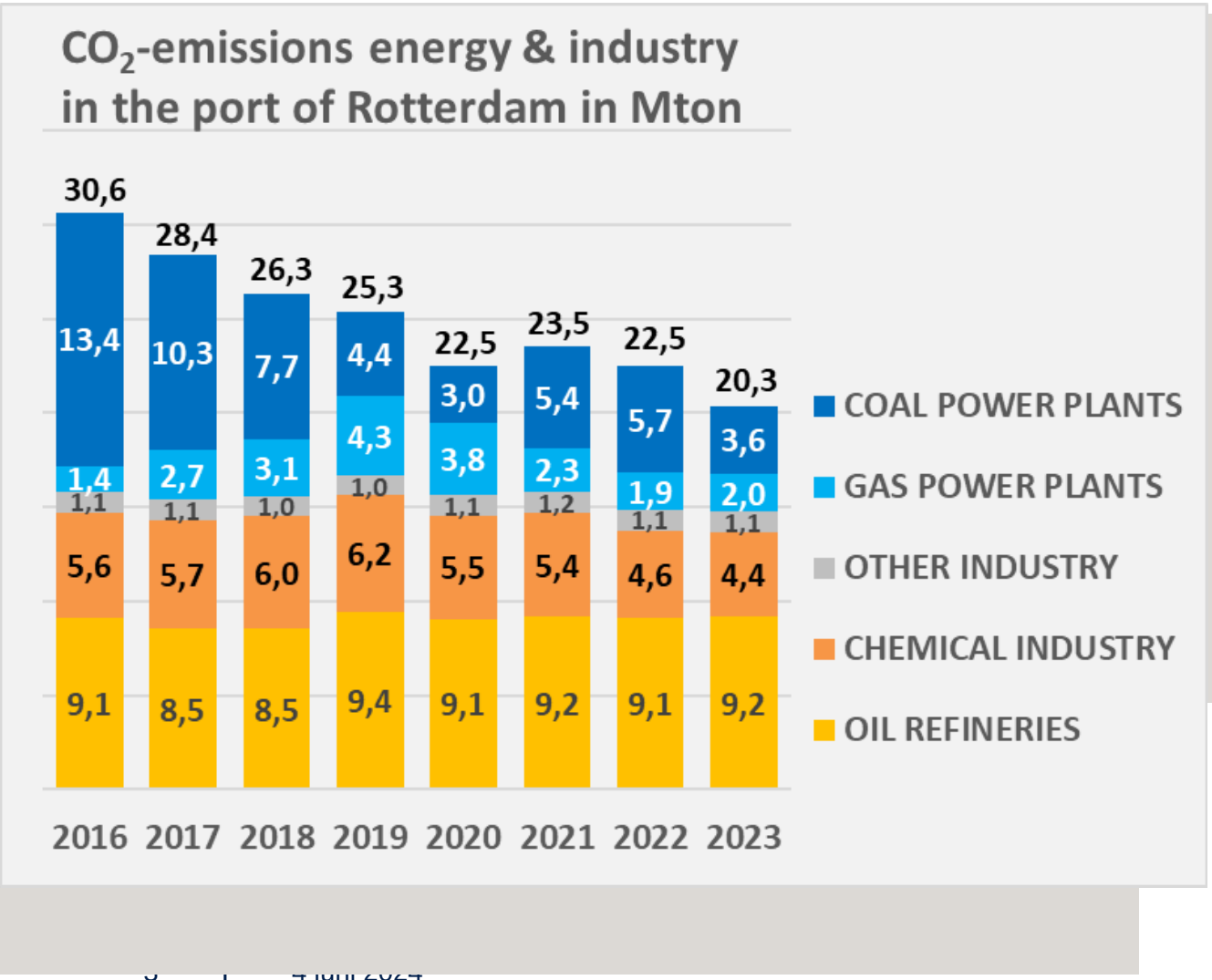
CO2 Emissions – past and future



- CO_2-emissions in the port decreased in 2023 with 2,2 Mton (10%) compared to 2022, 1/3 less dan than in 'all time high year' 2016
- Energy plants (2 coal, 3 gas) produced 20% less electricity from fossil sources due to increase in renewable power (in NL: -12%, +35% wind, +24% solar)
- Chemical industry did not recuperate; - 0.2 Mton (-5%) due to less production

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ENERGY TRANSITION: BASED ON 4 PILLARS

PILLAR 1

EFFICIENCY AND INFRASTRUCTURE

PILLAR 2

A NEW ENERGY SYSTEM

PILLAR 3

A NEW RAW MATERIALS AND FUEL SYSTEM

PILLAR 4

SUSTAINABLE TRANSPORT

-55% CO_2 IN 2030

CO_2-NEUTRAL IN 2050

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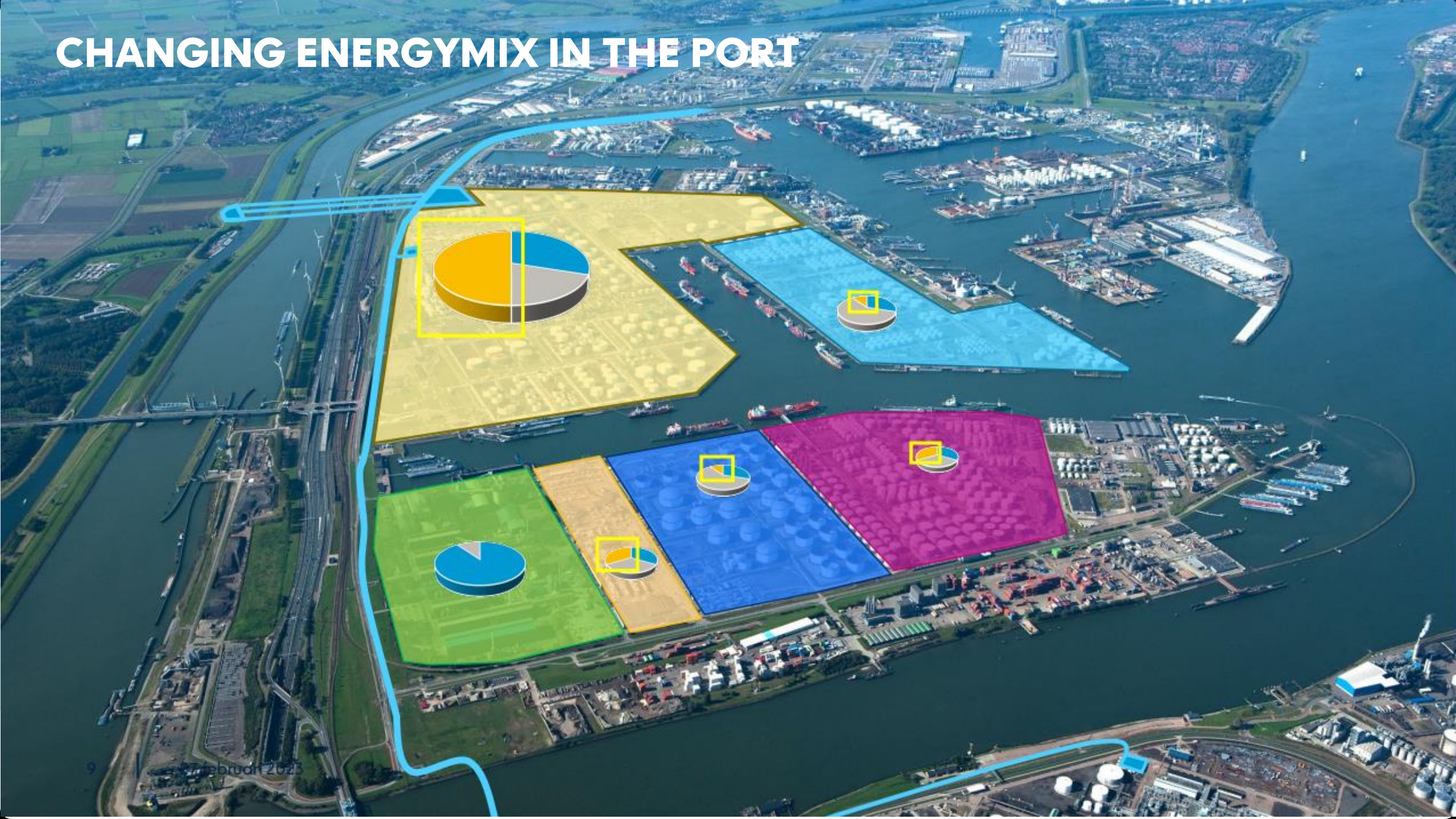
CHANGING ENERGYMIX IN THE PORT



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Electricity grid

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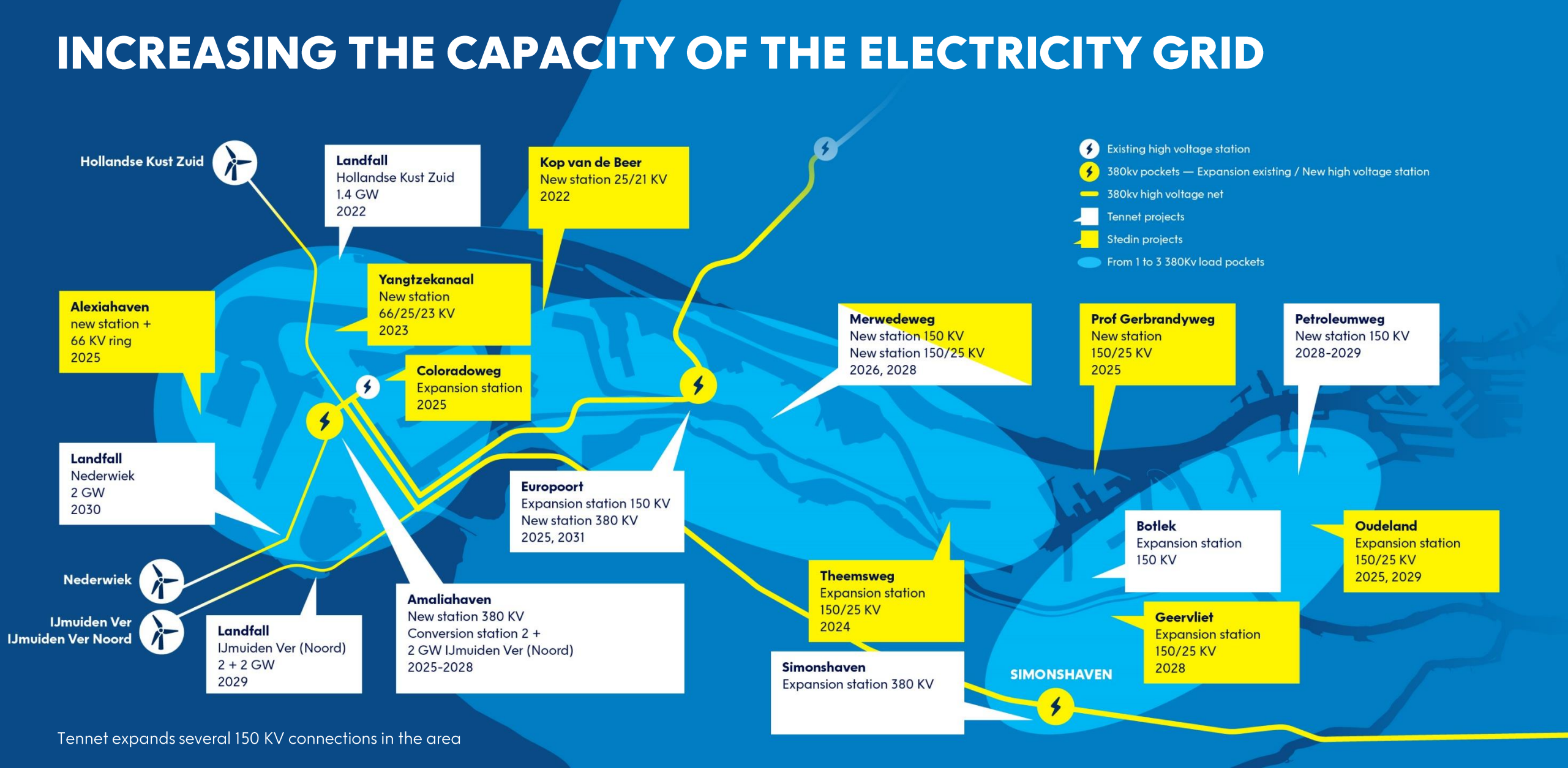
INCREASING THE CAPACITY OF THE ELECTRICITY GRID



Tennet expands several 150 KV connections in the area

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7.4 GW WINDFARMS NORTH SEA CONNECTED TO ROTTERDAM BY 2030

7.4 GW = 35% of all windpower projects in the Dutch part of the North Sea. These projects are to be realized by 2030.

Dutch ambition is to have 70 GW installed in 2050.
Rotterdam aims to connect 25 GW = 35% to the port.

WINDFARMS	CAPACITY	OPERATIONAL
Hollandse Kust Zuid, kavel 1-4	1.4 GW	2023 ✓
IJmuiden Ver, kavel 3-4	2 GW	2029
IJmuiden Ver Noord, kavel 5-6	2 GW	2029
Nederwiek, kavel 2	2 GW	2030
Total	7.4 GW **H_2 production: 2-2,5GW**	

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GREEN HYDROGEN PRODUCTION STARTS AT DEDICATED SITES FOR ELECTROLYSIS

Ambition Rotterdam
2030: 2.5GW (onshore)
2050: 20GW (onshore & offshore)

Conversion park 1

PROJECT (COMPANY)	CAPACITY	PLANNED FID	OPERATIONAL
H2-Fifty (bp&HyCC)	250MW	2024	2027
Holland Hydrogen I (Shell)	200MW	2022 ✓	2025
CurtHyl (Air Liquide)	200MW	2024	2027
Confidential	200MW	2025	2028

Conversion park 2

IJmuiden Ver GW-scale project	1000MW	2025	2029

Local developments

PROJECT (COMPANY)	CAPACITY	PLANNED FID	OPERATIONAL
H2Maasvlakte (Uniper)	500MW	2025-2026	2029-2030
Eneco Electrolyser (Eneco)	800MW	2025	2029

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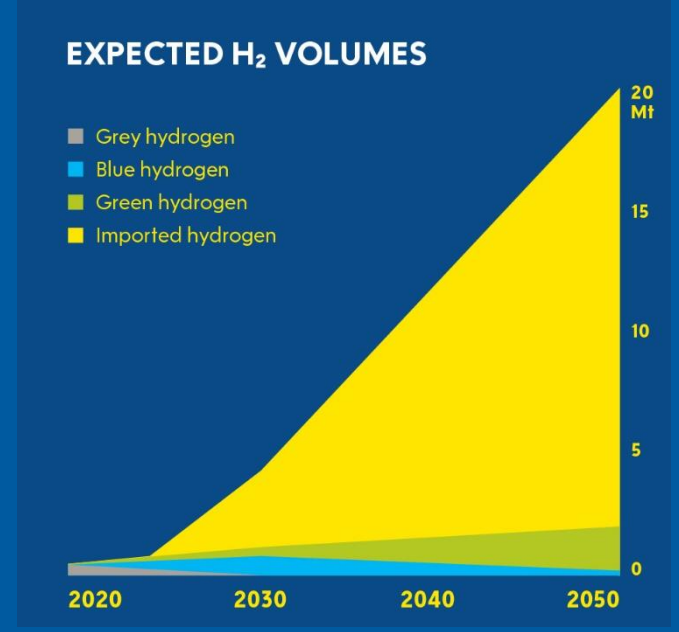
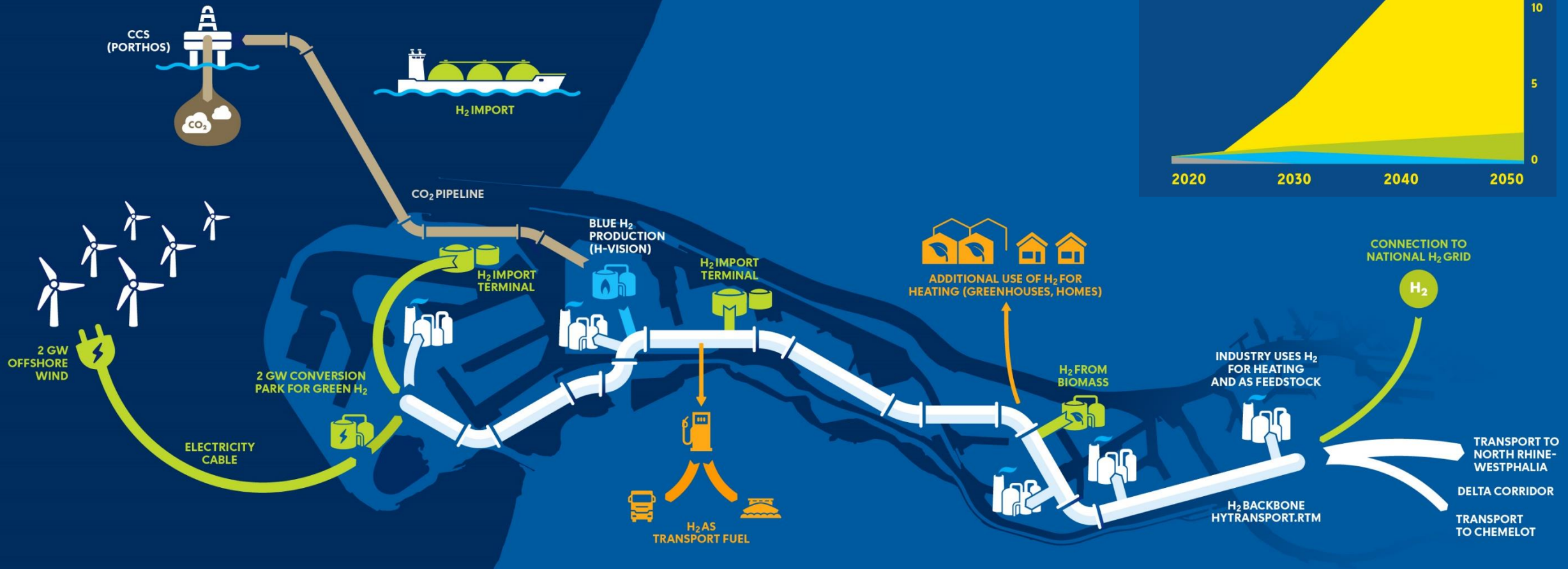
HYDROGEN ECOSYSTEM IN ROTTERDAM





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IMPORTS ARE ESSENTIAL FOR EUROPE, AS IT USES MORE ENERGY THAN IT CAN PRODUCE

High potential areas for green hydrogen export

PROGRESS AND PLANNING

- Expected import Hydrogen and its derivatives in Rotterdam:
  4 Mtpa in 2030, 18 Mtpa in 2050
- Huge potential for production in many areas worldwide
- Imports Rotterdam are expected to start around 2025
- 9 terminals have announced plans for import facilities
- Rotterdam is preparing itself for Ammonia, Methanol and LOHC, Liquid Hydrogen
- Multiple MoU's in place

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EXISTING AND NEW INFRASTRUCTURE

Existing infrastructure
In East-West direction new infrastructure needed.

WATERSTOFBACKBONE GASUNIE

- Alleen H_2

PIPELINE CORRIDOR

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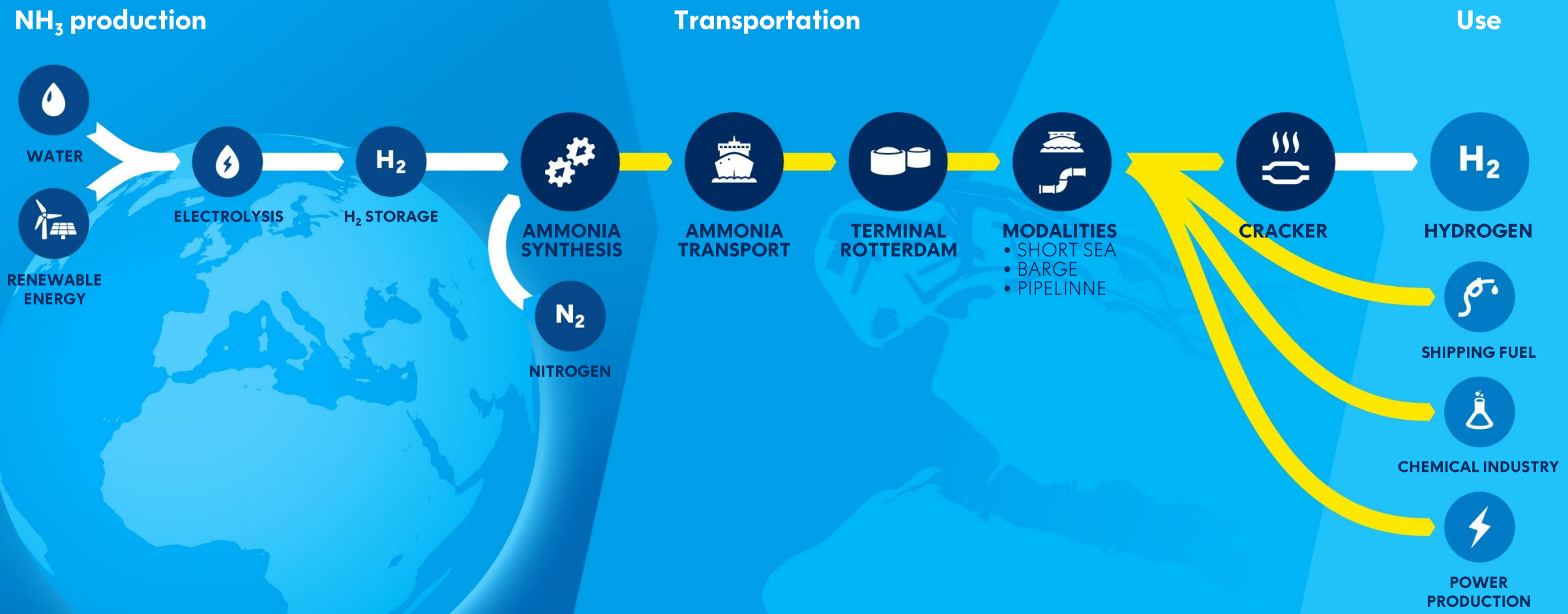
AMMONIA VALUE CHAIN



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13 HYDROGEN TERMINAL PROJECTS ANNOUNCED

More initatives expected

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DELTA RHINE CORRIDOR IS ESSENTIAL FOR DECARBONIZATION INLAND INDUSTRY

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HEAT NETWORK

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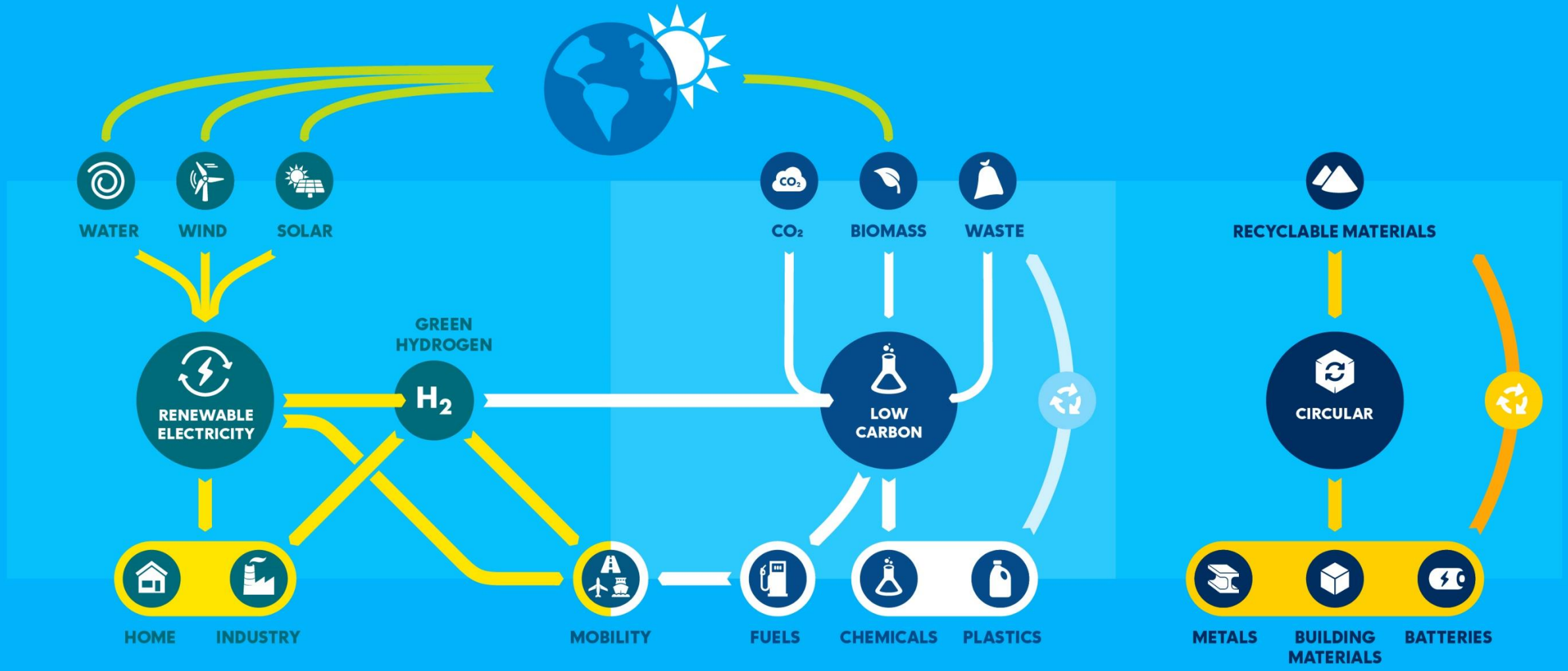
PILLAR 3: FOCUSSING ON THE FEEDSTOCK AND MATERIAL TRANSITION

REQUIRED NEXT TO ENERGY TRANSITION TO REACH TARGETS AND STAY COMPETIVE



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ROTTERDAM
FRONTRUNNER IN RENEWABLES & CIRCULARITY

42 KM
PORT AREA

- 4 CRUDE OIL REFINERIES
- 45 PETROCHEMICAL COMPANIES
- 8 SORTING & RECYCLING COMPANIES
- 3 BIOFUEL PLANTS

BUILDING ON EUROPE'S LARGEST FUEL & PETROCHEMICAL CLUSTER

2.5 Mton Production

12 Mton Throughput

RESULTING IN EUROPE'S LARGEST BIOFUEL CLUSTERS

FRONTRUNNER IN SUSTAINABILITY

50+ TRANSITION PROJECTS

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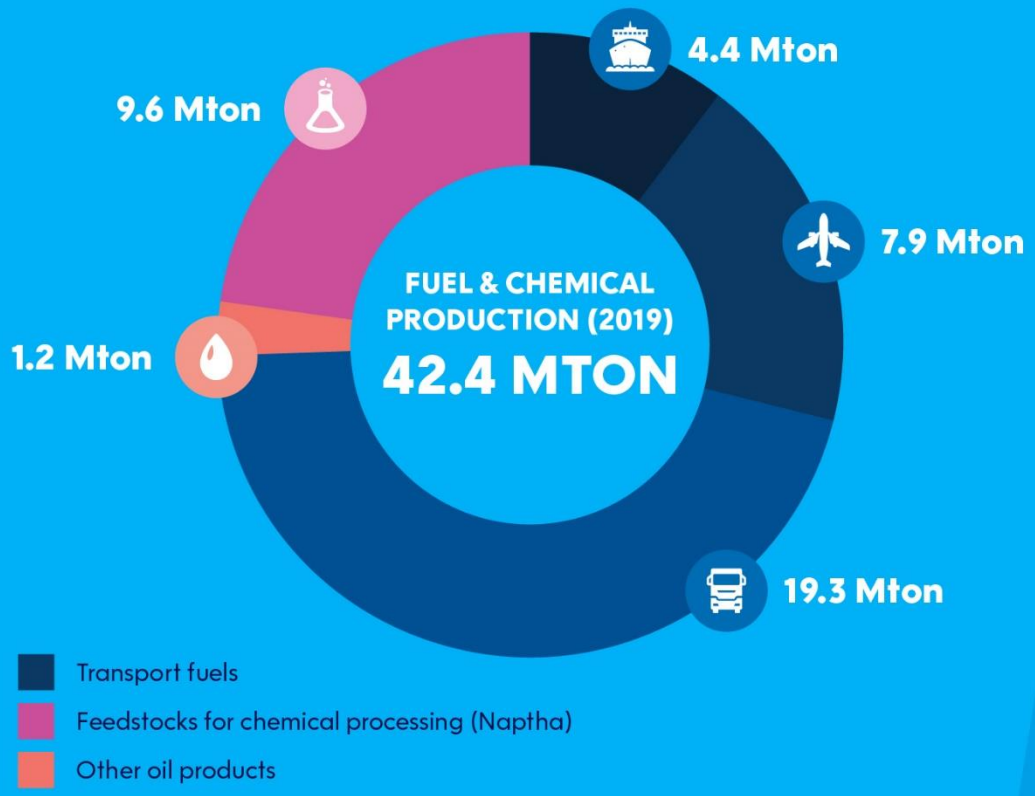
AMBITION: 8.2 MTON RENEWABLE PRODUCTION IN 2030

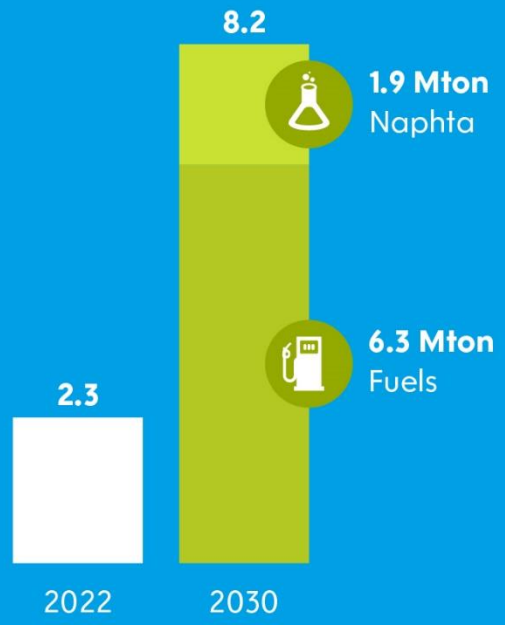
= 20% of fuel and chemical production 2019

2019



2030

Renewable fuel & chemical production



RESULTS

€10 billion
Private investments

26 Mton
CO_2-reduction

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OVERVIEW BIOFUELS CLUSTER (2023)

ONLY PUBLICLY DISCLOSED PROJECTS

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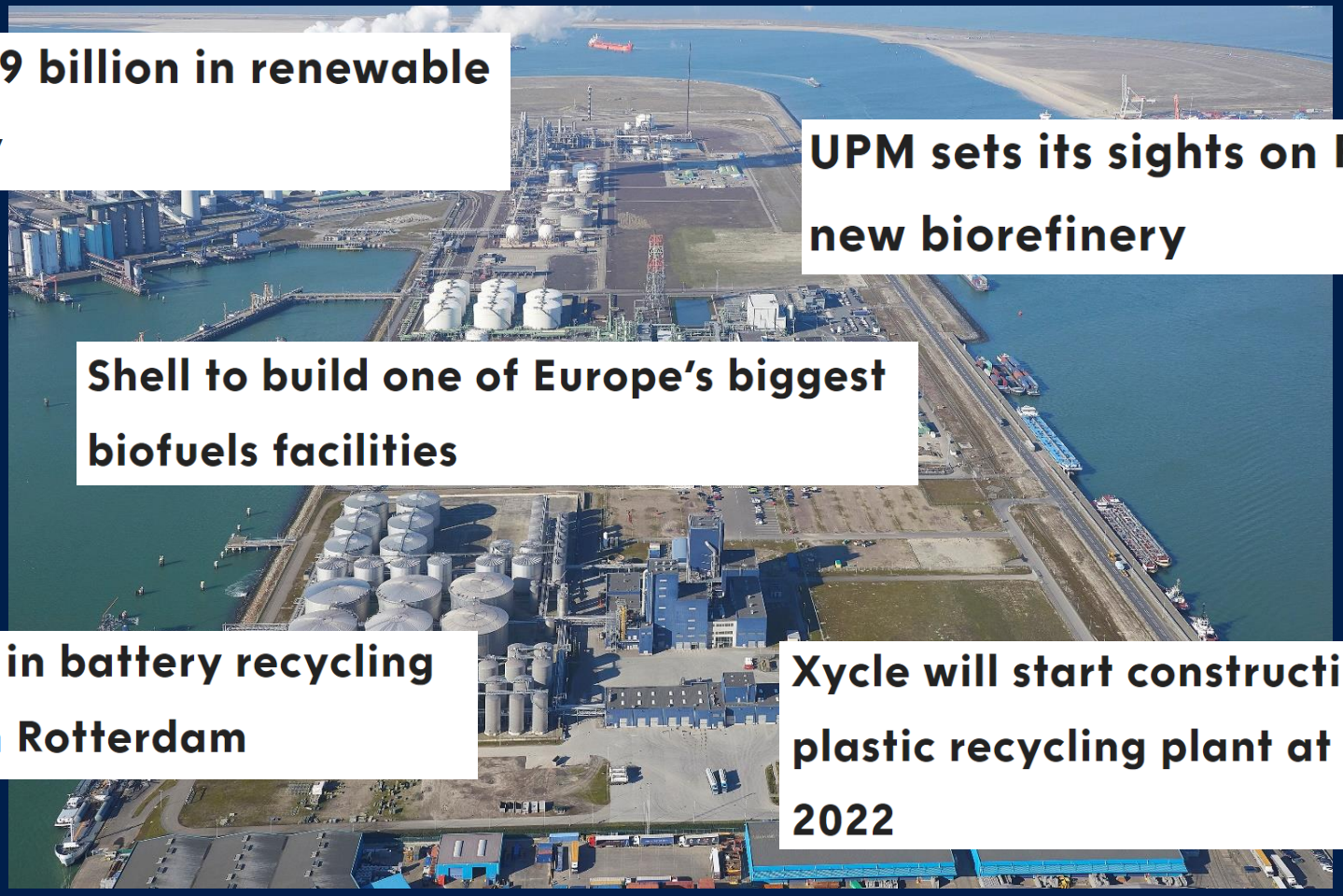
MATERIAL & FUEL TRANSITION EXAMPLES

Neste invests € 1,9 billion in renewable products refinery



UPM sets its sights on Rotterdam for new biorefinery

Shell to build one of Europe's biggest biofuels facilities

Global player in battery recycling opens plant in Rotterdam

Xycle will start construction of its first plastic recycling plant at the end of 2022

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CIRCULAR PLASTICS HUB ROTTERDAM 2030

New low-carbon circular plastic hub enables scale-up & new energies.

- IMPORT TERMINAL
- COLLECTING CONSUMER & INDUSTRIAL WASTE
- SORTING & PRE-TREATMENT FOR RECYCLING

IMPORT PRE-SORTED WASTE PLASTICS
FROM COUNTRIES WHERE WASTE IS INCINERATED OR LANDFILLED

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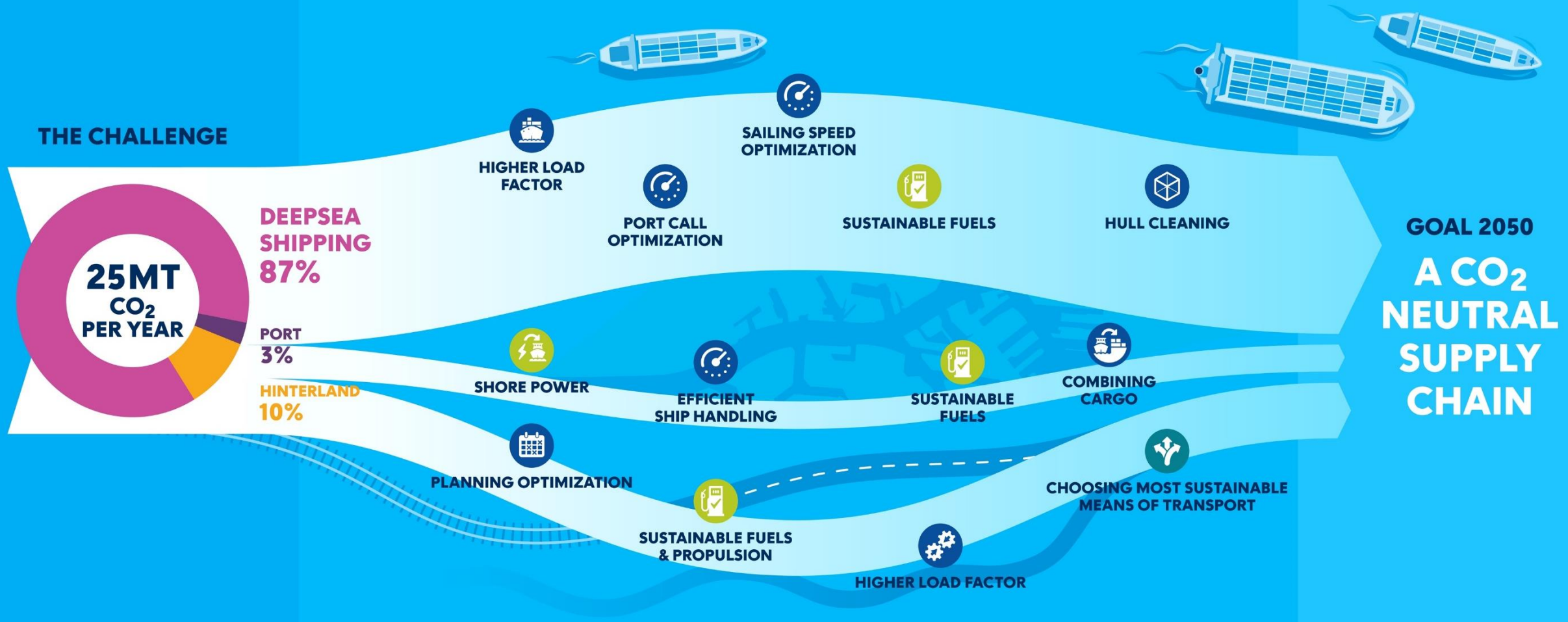
OPPORTUNITIES TO CREATE SUSTAINABLE SUPPLY CHAINS



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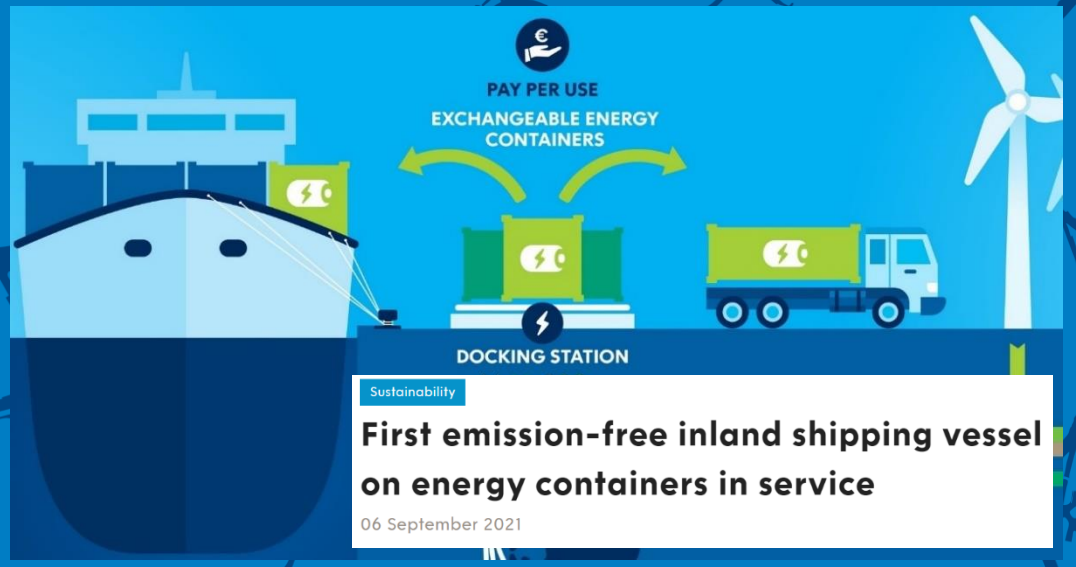
THINK BIG, START SMALL
FUEL SWITCH & VALUE CHAIN COLLABORATION IN ACTION

4

THE WORLD'S LONGEST GREEN & DIGITAL SHIPPING CORRIDOR



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offtake agreement, decarbonizing a key link in the global shipping chain

TankMatch B.V.
1,101 followers
3d • Edited •

We are welcoming the container vessel Laura Maersk in the Port of Rotterdam for our first green methanol bunkering into a container vessel. Mt Laura Maersk is world's first green methanol powered containership.

TankMatch thanks both Maersk and the Port of Rotterdam for their proactive approach to further develop and share bunkering guidelines which will help to form a framework for bunkering of future green methanol powered ships.

#Maersk

TankMatch B.V. , A.P. Moller - Maersk , Port of Rotterdam , Delfia Inland Shipping

Waterfront Shipping takes leadership role in demonstrating simplicity of methanol bunkering to marine industry

12 May 2021

4

Unifeeder Takes on B100 Biofuel at Rotterdam

by Ship & Bunker News Team

Tuesday February 8, 2022

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Launching Joint Study Framework and MoU for Ammonia Bunkering Safety

06 April 2022

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CONCLUSIONS

- Port is becoming more sustainable; aim to be CO2 neutral by 2050
- Port is on course, we are ready and we are navigating the known political challenges
- The first CO2 reductions in our port are a reality
- Without hydrogen, we will not achieve the climate goals, but only the development of hydrogen is not enough; we need all the opportunities
- Double use of space, both below and above ground is a challenging task, but we are in control
- We can not wait: projects push policy

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POWER UP
YOUR IDEAS
MAKE IT HAPPEN

Maike Akkers
MM.Akkers@portofrotterdam.com

LET'S CONNECT

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