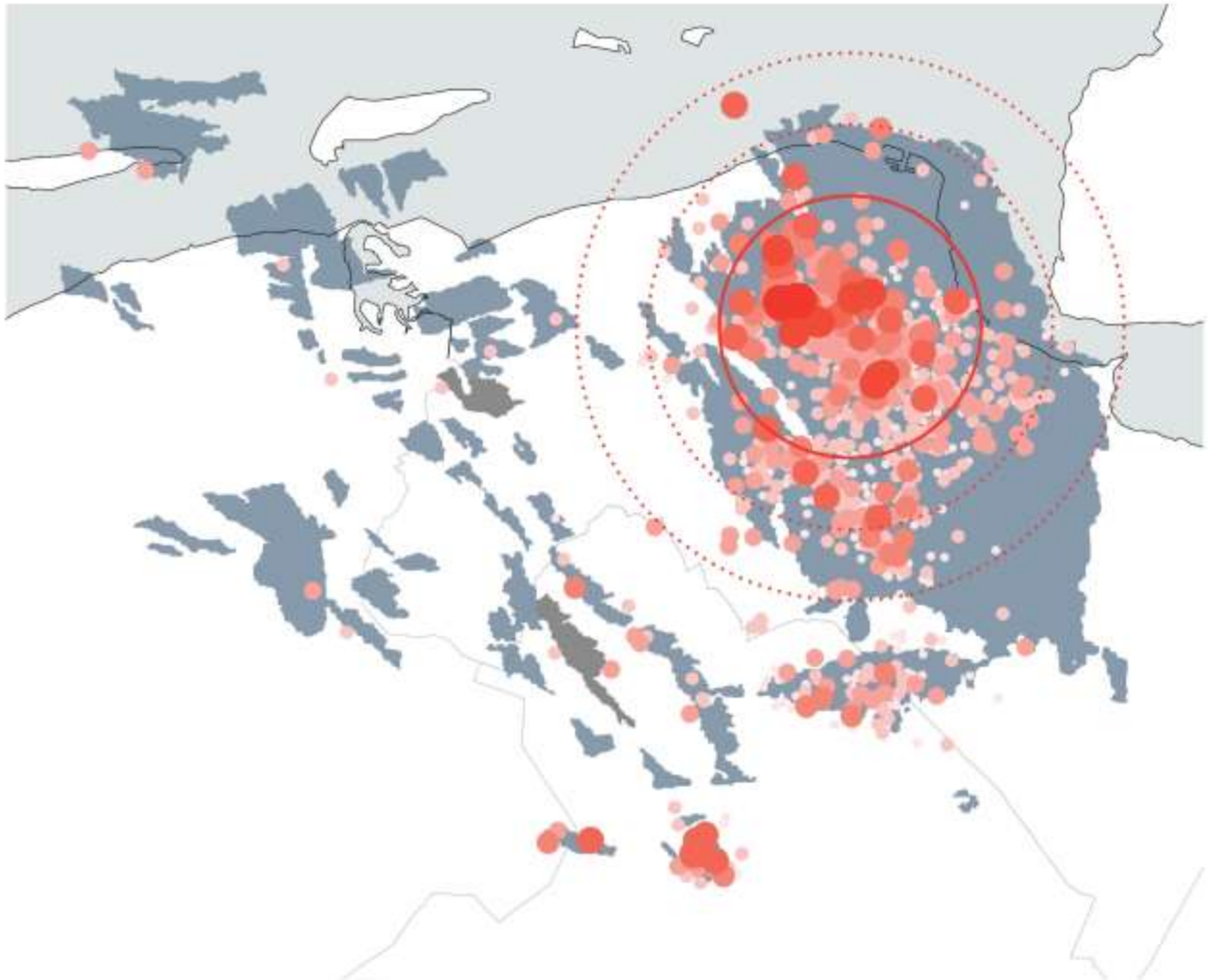
Green Hydrogen Economy in the Northern Netherlands

New Energy Coalition

The position in Northern Netherlands

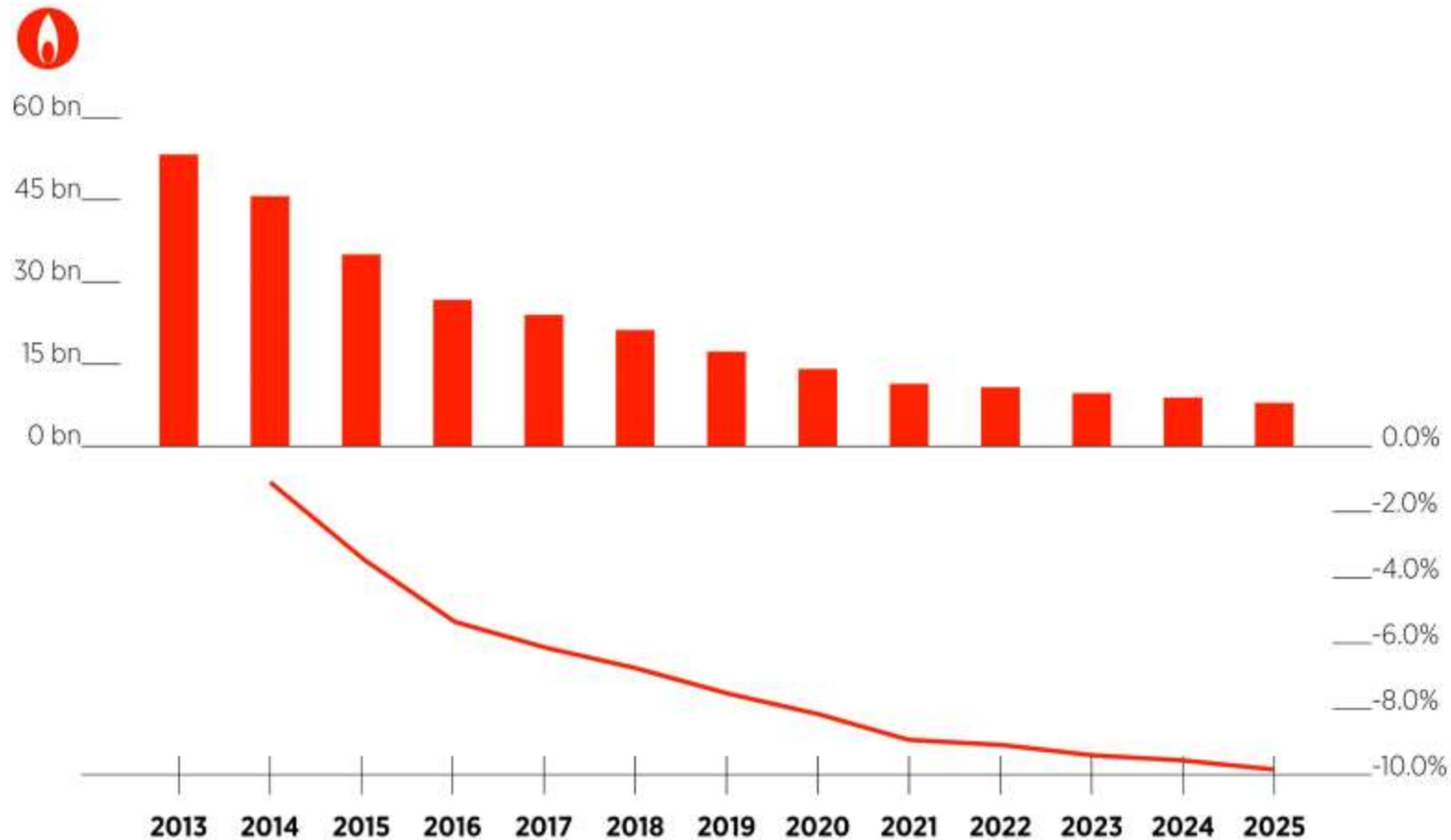
Situation in the Northern Netherlands



- Gas production since 1963
- 265 billion euros from gas revenues for the Netherlands
- About 780 billion m^3 gas produced

Situation in the Northern Netherlands

Gas production and economic decline 8-10% in 2025 without alternative



Gas Production 2013-2025

Cumulative impact on the economy in the Northern Netherlands

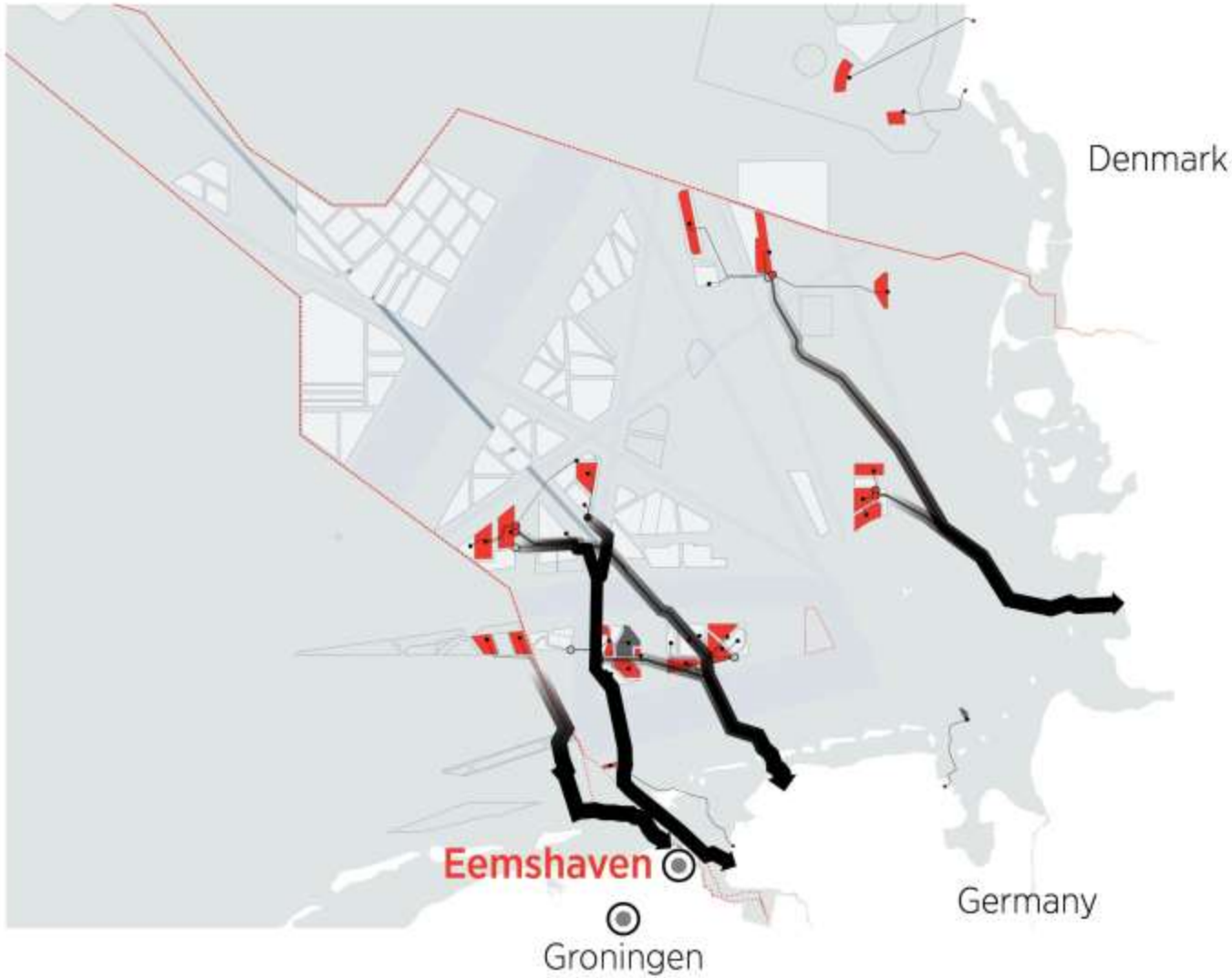
Urgency for change in the Northern Netherlands

Transition from fossil to sustainable energy of realization of the Paris climate goals

Earthquakes

Strong and green economy

Offshore Wind Development



Operational

Under construction

Proposed

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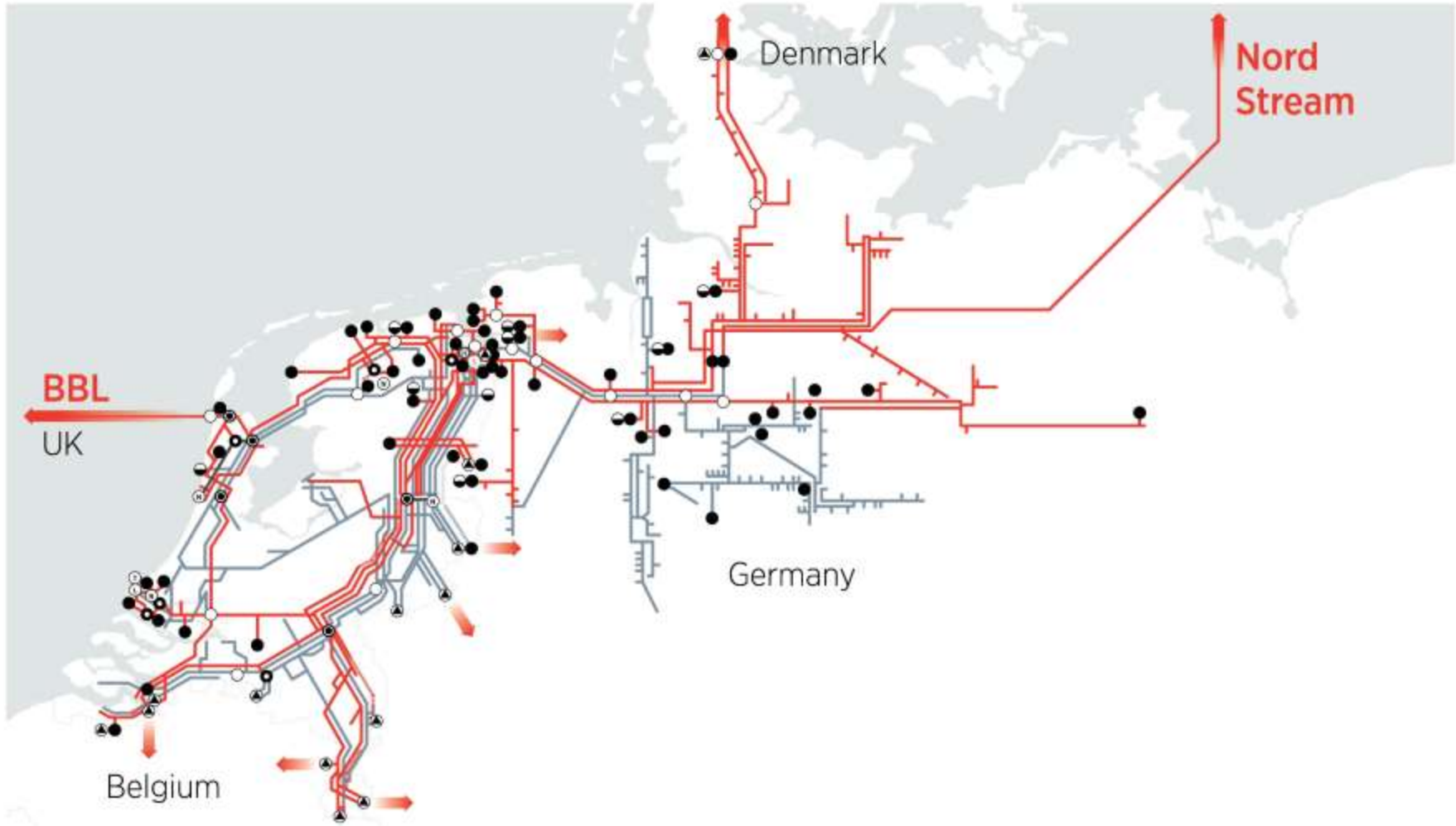
Eemshaven - The Energy Harbor

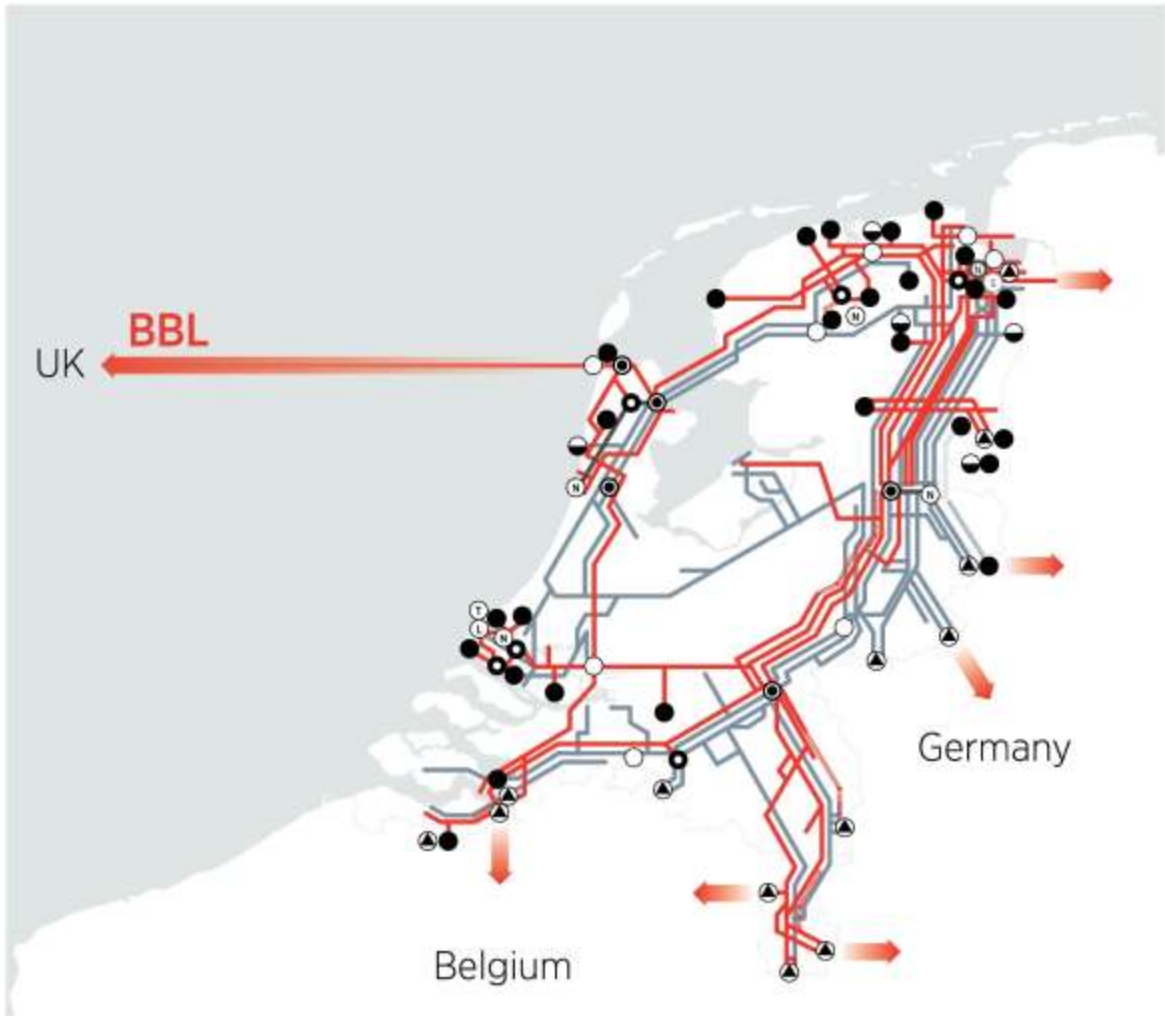
1. Norned Cable 700 MW
2. Cobra Cable 700 MW (2019)
3. Gemini Offshore Wind Farm 600 MW
4. Onshore Wind Farms > 275 MW
5. Nuon Magnum power plant 1,320 MW
6. RWE Coal fired power plant 1,560 MW
7. Engie Gas fired power plant 2,450 MW

- **Cable Inland 4,000 MW**
- **Expansion to 5,610 MW**

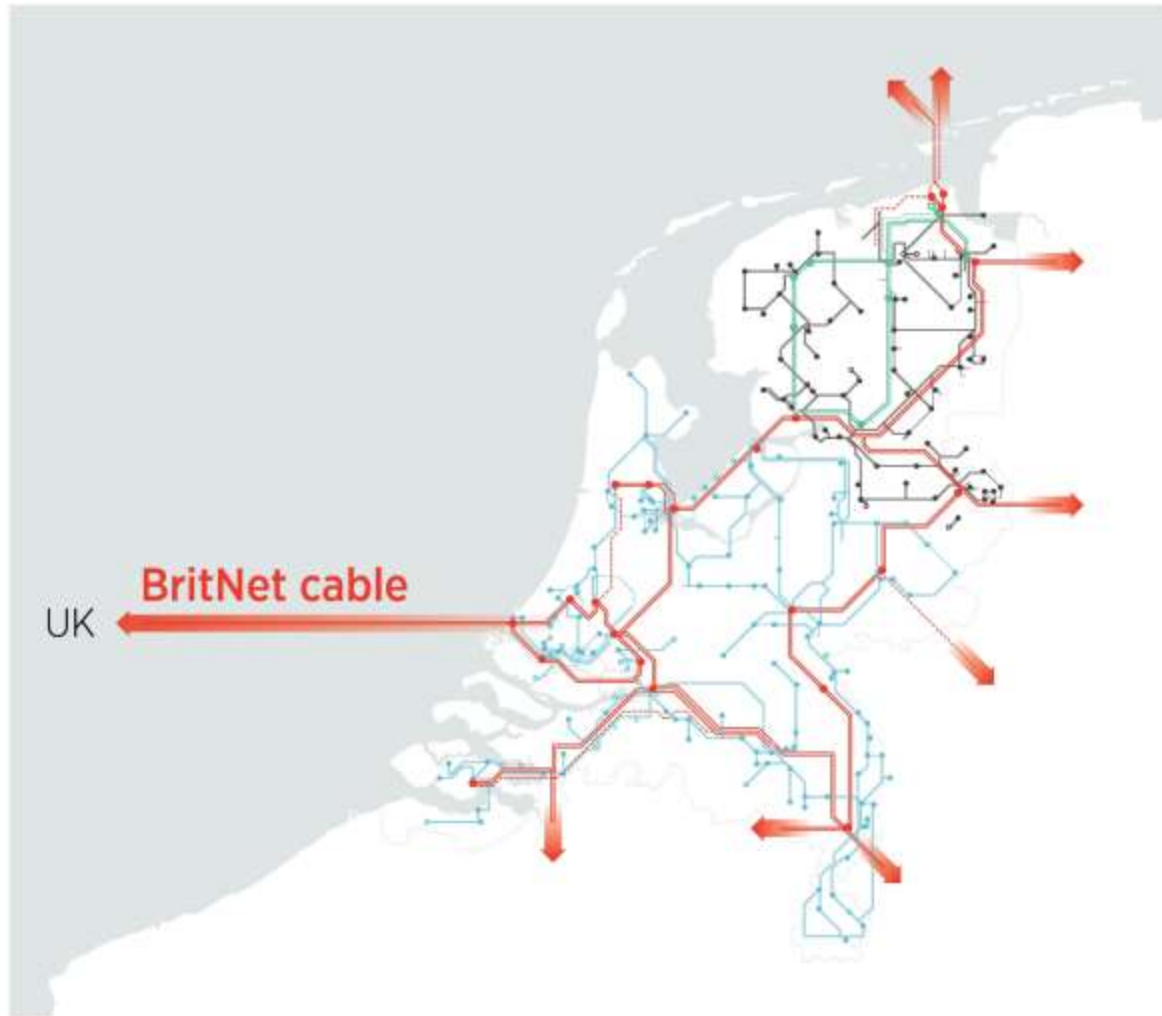
Transport pipelines Gasunie



Transport pipelines

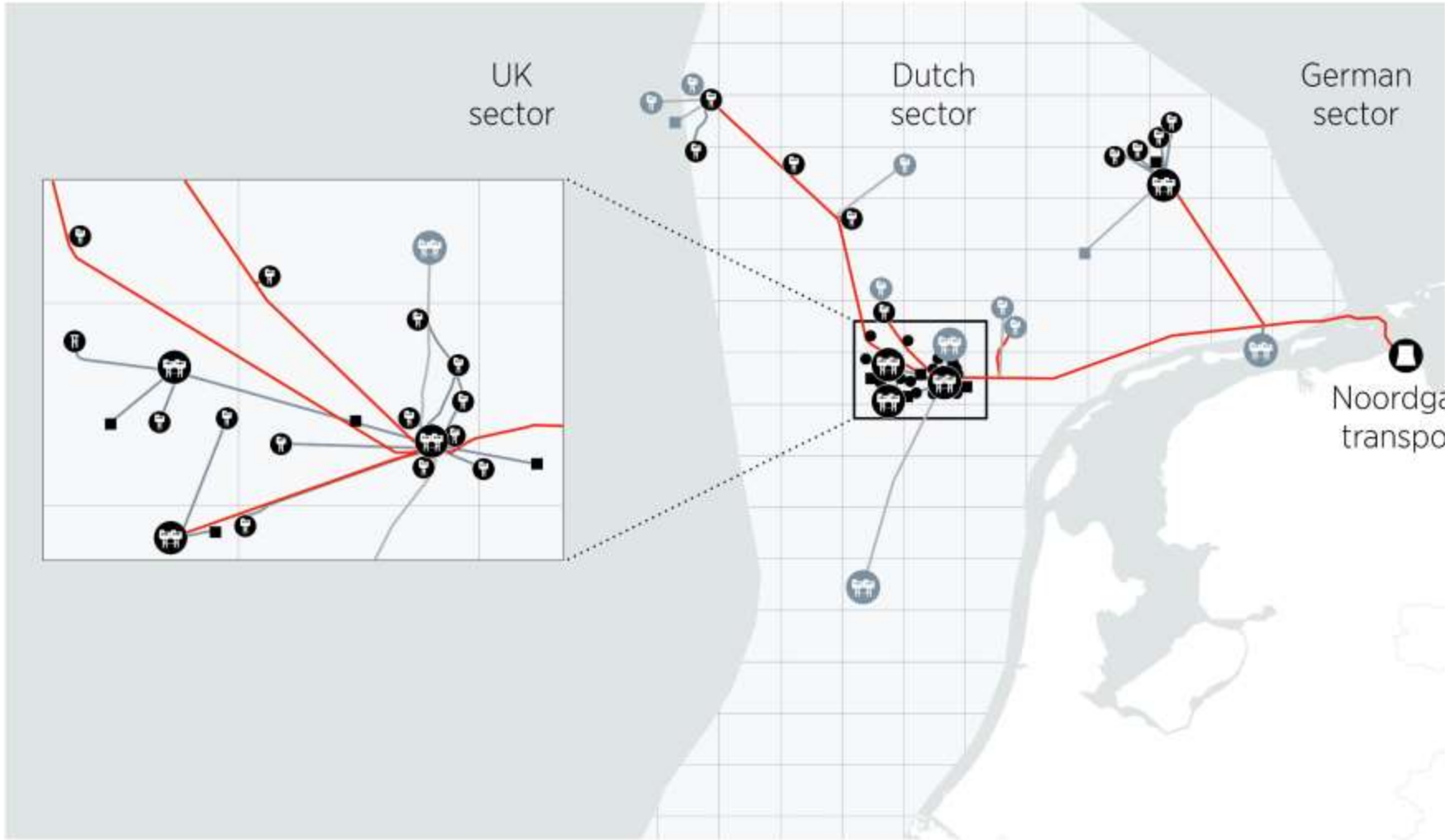


Electricity transport cables



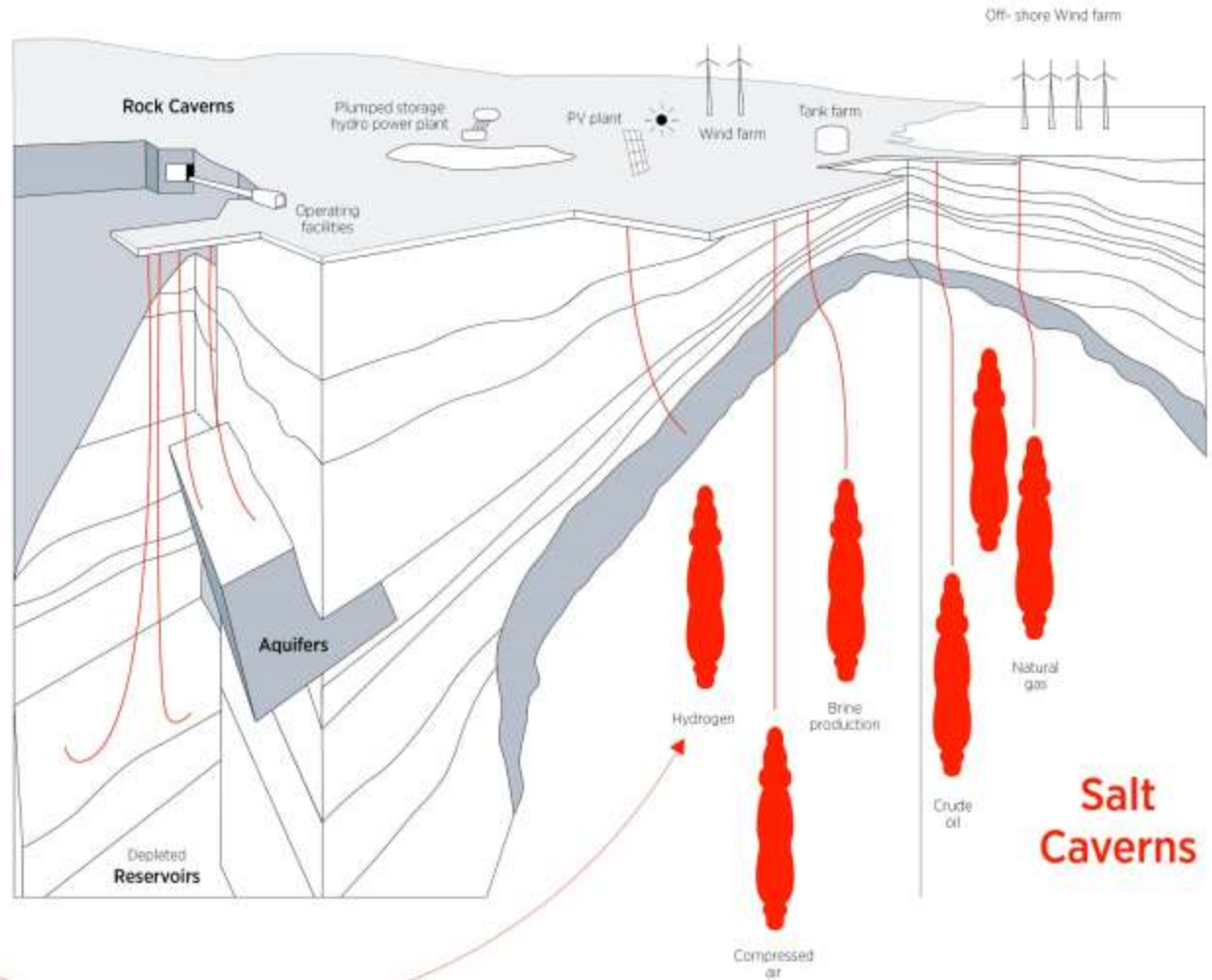
Electricity transport cost via new cables is 100-200 times more expensive than hydrogen transport cost via adapted natural gas pipelines

Offshore Gas Production and Pipelines



Hydrogen storage in Salt Caverns

1 salt cavern can contain 6,100 ton hydrogen, equivalent of 17 million Tesla Power walls



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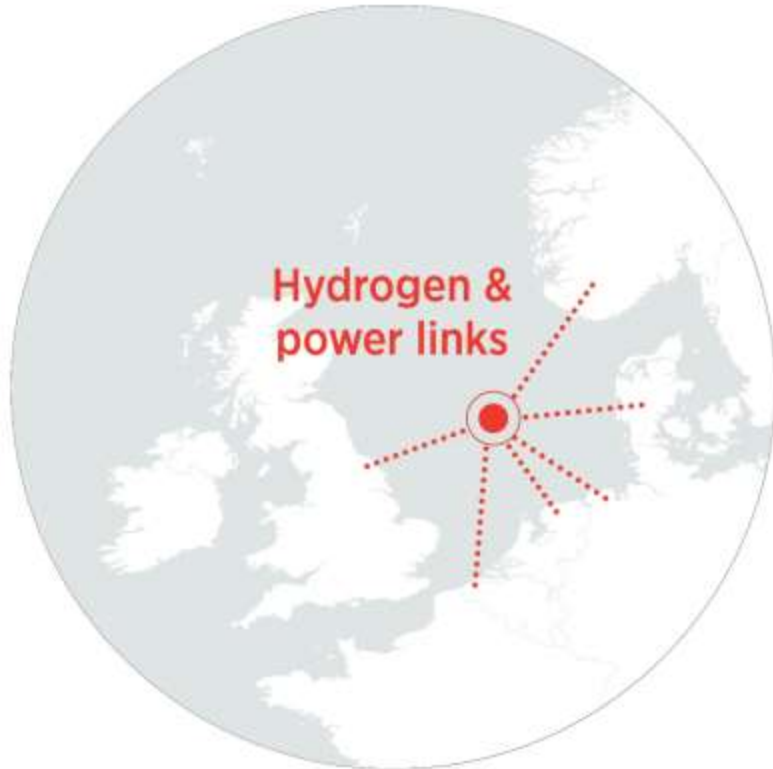
Doggersbank Energy Island, North Sea



gasunie
crossing borders in energy

TenneT

The opportunity in Northern Netherlands

- Large scale green electricity production
- Large scale green electricity import
- Existing gas knowledge infrastructure
- Existing chemical clusters; Delfzijl and Emmen
- Space in the Eemshaven
- Existing gas infrastructure which can be retrofitted easily and cheaply to transport hydrogen

The Northern Netherlands is ideally positioned for green hydrogen

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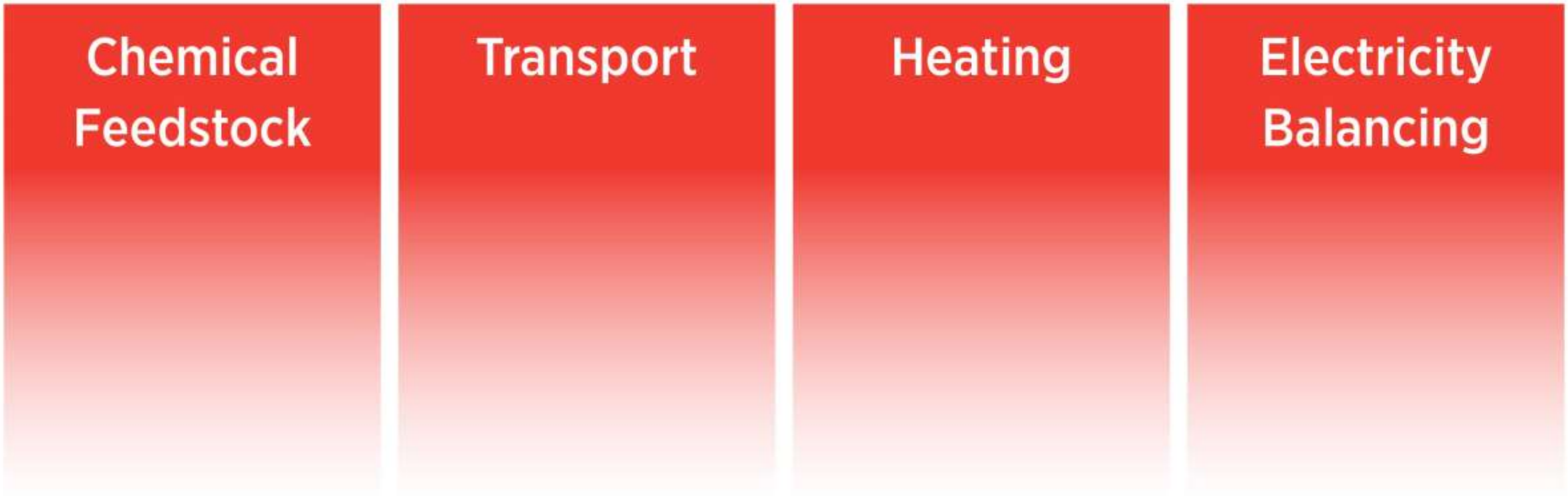
Green Hydrogen Markets



Green Hydrogen Economy

In the Northern Netherlands 2030

270,000 tons Total hydrogen **production**

- **120,000** Chemicals Northern Netherlands
- **30,000** Mobility
- **20,000** Grid Balancing
- **100,000** Transported by pipeline outside Northern Netherlands

270,000 tons Total hydrogen **consumption**

The Northern Netherlands is determined to realize a Green Hydrogen Economy

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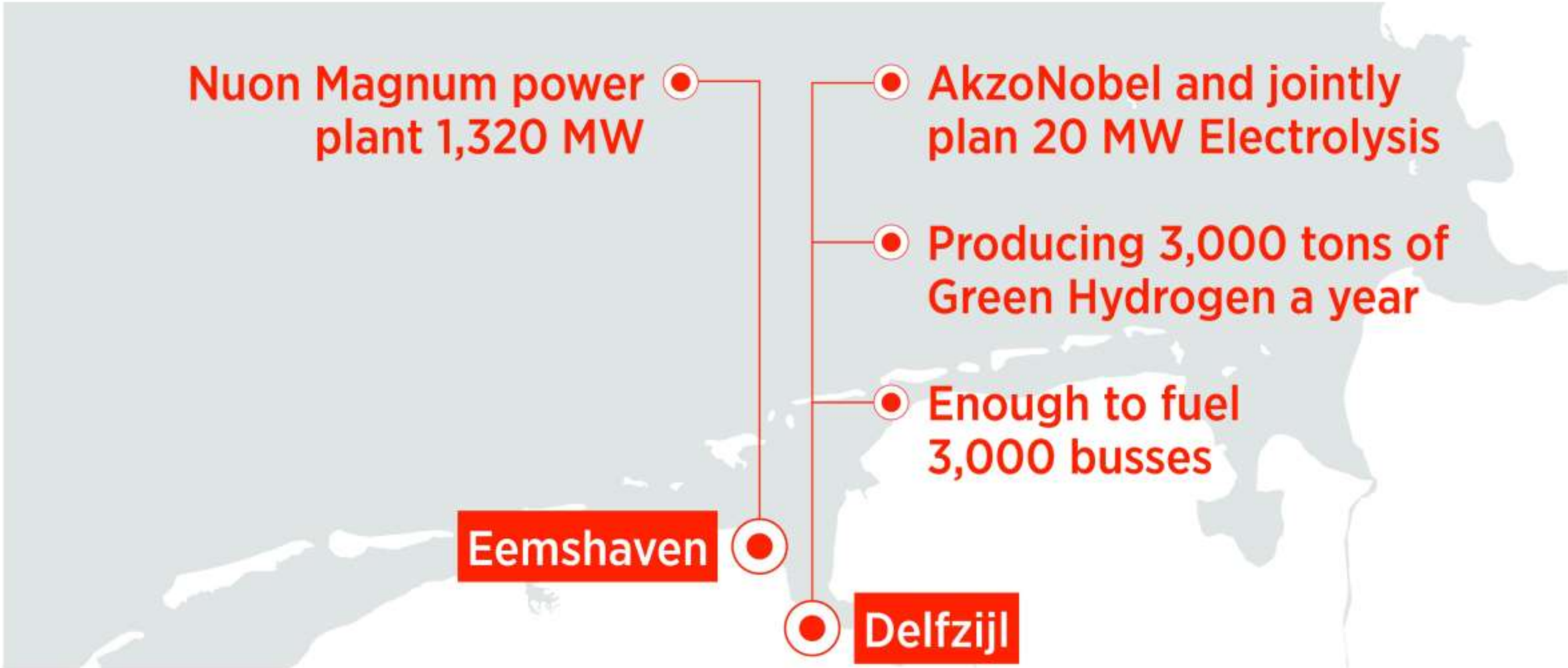
Selection of current projects



City Gas production in The Netherlands: 1826-1959

> 50%

hydrogen in town gas

Hesla


WELKOM
We Are Top Dutch H2
HESLA
RJ-862-X
Roll'Lam


We Are Top Dutch
provincie Drenthe
HOLTHAUSEN
GROEP

City Groningen vehicles on hydrogen