Hydrogen Europe

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@ Waterstofnet workshop

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Hydrogen Europe

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Verbund · VIESSMANN climate of innovation · VOLVO · VTT · WaterstofNet · WOIKOSKI · Wystrach · YANMAR · ZBT · ZODIAC AEROSPACE · ZSW

Fuel Cell & Hydrogen 2 Joint Undertaking

Hydrogen Europe
Industry

European Union represented by the European Commission

Hydrogen Europe
Research

A portfolio of clean, efficient and competitive solutions based on fuel cells and hydrogen technologies **in energy and transport**

Hydrogen Roadmap for Europe

Hydrogen Europe

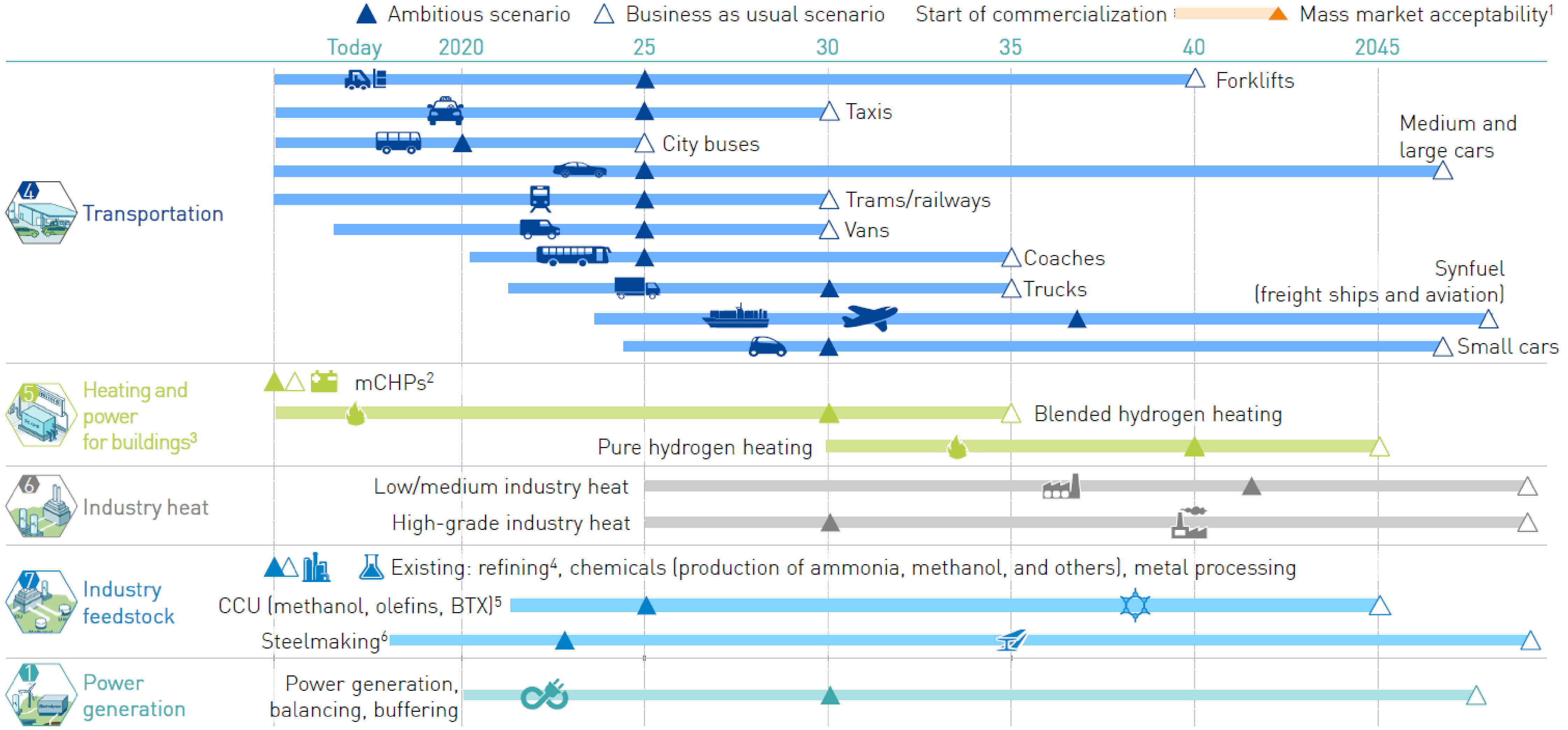
BESIDES CO_2 ABATEMENT, DEPLOYMENT OF THE HYDROGEN ROADMAP ALSO CUTS LOCAL EMISSIONS, CREATES NEW MARKETS AND SECURES SUSTAINABLE EMPLOYMENT IN EUROPE

2050 hydrogen vision

~24%	~560 Mt	~EUR 820bn	~15%	~5.4m
of final energy demand[1]	annual CO_2 abatement[2]	annual revenue (hydrogen and equipment)	reduction of local emissions (NO_x) relative to road transport	jobs (hydrogen, equipment, supplier industries)[3]

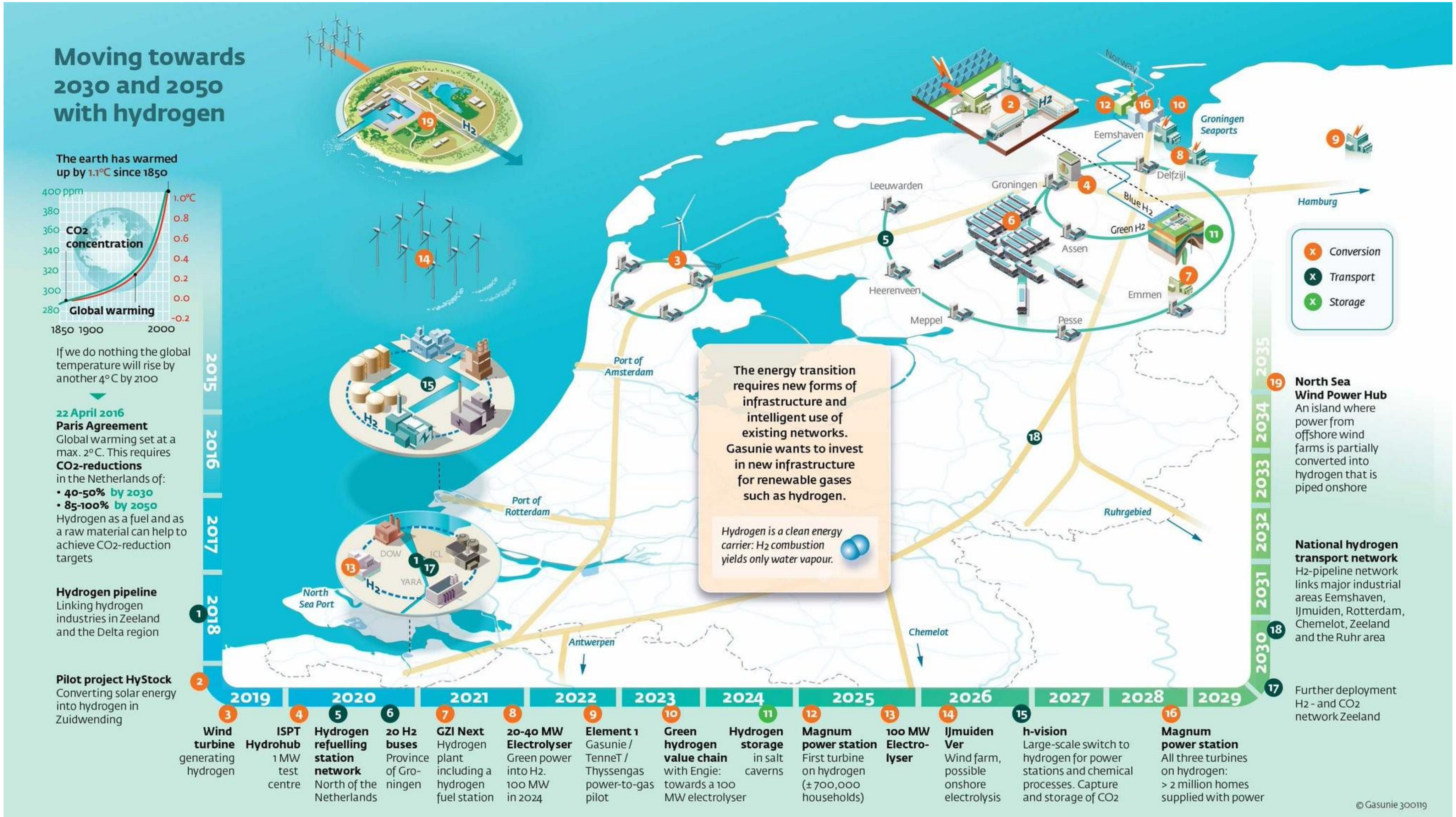
Hydrogen Roadmap for Europe

HYDROGEN TECHNOLOGY EXISTS AND IS READY TO BE DEPLOYED



Hydrogen Valleys: H2 in The Netherlands

Hydrogen Europe

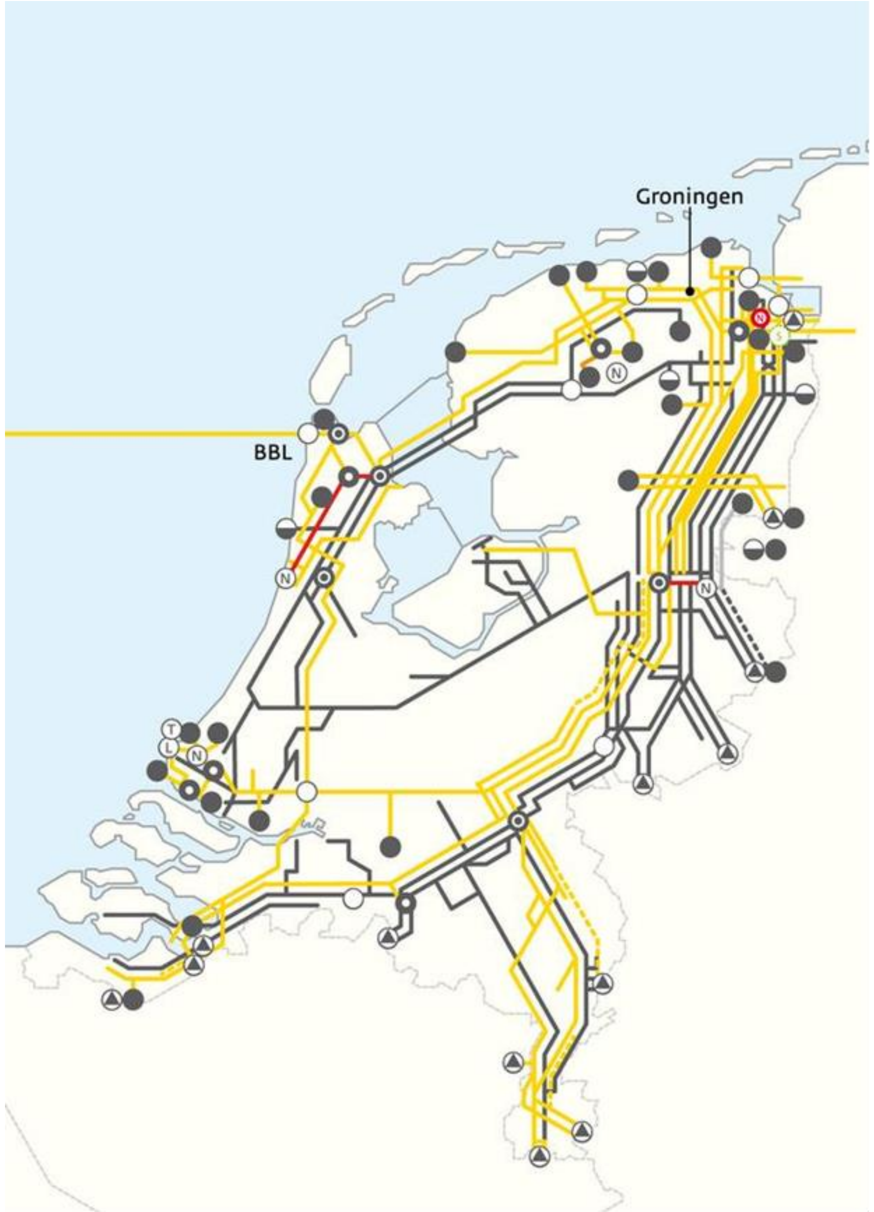


EU Legislative Framework & Financial Tools

Sector	Requirement	Legislative Tools	Financial Tools	Hydrogen's role
Transport	-CO_2 reduction -PM/NO_X/SO_X reduction -Integration of RES	1. Renewable Energy Directive (RED2) 2. Fuel Quality Directive 3. CO2 emission standards 4. Clean vehicle Directive 5. Alternative Fuel Infrastructure Directive	Enhanced use of Union funds, including additional funds to facilitate a just transition (RED2)*	-H2 as a fuel -H2 made fuels -Renewable hydrogen for refineries
Energy-intensive industries	Decarbonisation	EU ETS	Modernisation Fund / Innovation Fund	Renewable / low - carbon hydrogen as feedstock switch
Gas/Heating	Decarbonisation (to remain a player) Integration of RES	1. Renewable Energy Directive (RED2) **2. Upcoming Gas Regulation (2020)**	Possibly CEF Energy RED2*	Renewable / low - carbon hydrogen as feedstock Fuel cell as energy converter
Power	Storage / ancillary services Integration of RES	1. Renewable Energy Directive (RED2) 2. Electricity Market Design	RED2*	Rapid response electrolysers + Sectoral Integration

Gas Market Regulation (next battlefield)

- Prepared now but presented beginning 2020
- It will be a Regulation and not a Directive
- **Content**:
  1. One part of the package will be mirroring the electricity market (retail).
  2. Another part of the package will mostly cover the future **content of the gas grids**



⇒ **<u>Hydrogen Europe to publish its Vision paper</u>**

Vision structure

1. **Our political goals**

(COP21, LTDS2050, complementary H2 and GI, jobs, SoS)

2. **Creating a market for H2**

(H2 key role, introduction of GI)

3. **Role of GI in an H2 economy**

(RES integration, transport, ≠ in elec. and H2 costs, volumes, etc., sectoral integration, role of TSO/DSO)

4. **Barriers and hurdles**

(gas grid readiness, storage facilities, end-users, HyLAW)

5. **Need for a regulatory framework**

(Definitions, Certification, injection harmonisation, ownership, mapping of coupling possibilities, remuneration mechanisms, state aid guidelines revision,)

6. **Conclusions**

The need for a regulatory framework for gas/H2

Definitions

Renewable Hydrogen

Low-carbon Hydrogen

Synthetic methane/gas

Power-to-gas

Power-to-hydrogen

Biomethane

Fuel cells

Sectoral integration

Sector coupling

Ownership

Regulated vs. unregulated

Role of TSO/DSO

P2G vs. P2H (market differentiation)

Regional specificities

Etc.

H2 Market + Quotas

Introduce the possibility for the creation of a specific H2 market design in a review clause, depending on market update across applications

Proposal for Renewable gas/H2 quotas per decade until 2050

Remuneration / Support

Market creation through support:

FiT, CfD, Auctioning, etc.

What about missing energy transition costs to be internalised?

Call for issues under CEP to be clarified in Gas Package

e.g.: ES vs. SI definition

Important Projects of Common European Interest

Hydrogen Europe

Geographically, 3 IPCEI's can be identified

Important Projects of Common European Interest

IPCEI 3: Spain, Portugal, France, Germany & Poland:

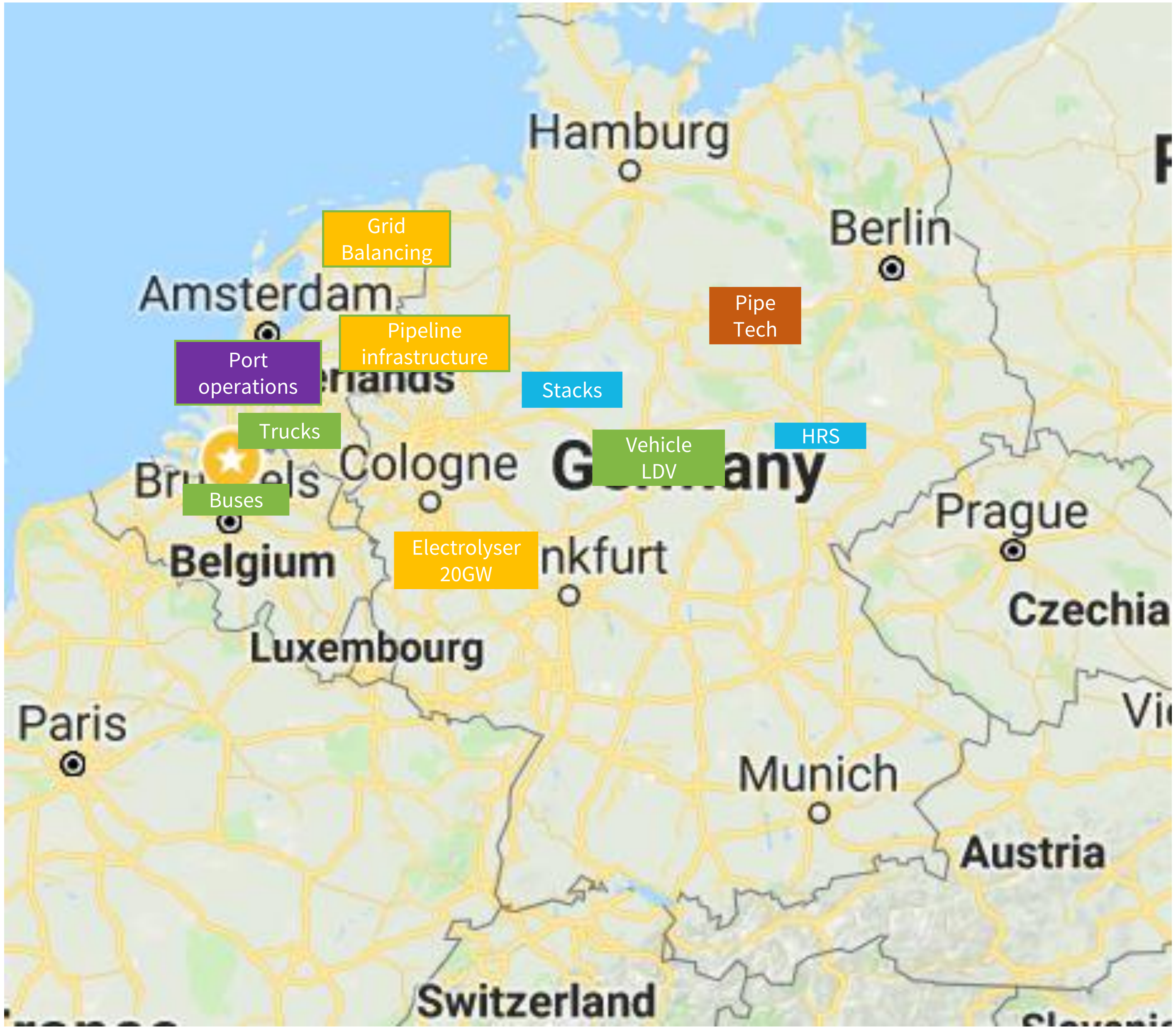
- Stacks
- Buses & trains
- Tanks
- Electrolyser capacity?

Important Projects of Common European Interest

IPCEI 2: Italy, Slovenia & Austria:

- Port strategy
- Pipeline hub in Austria
- Liquid hydrogen

Important Projects of Common European Interest



IPCEI 1: Netherlands, Belgium & Germany:

- Off-shore wind
- L-gas pipelines
- Electrolyser capacitity
- Trucks
- Light Duty Vehicles

<u>Contacts</u>

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