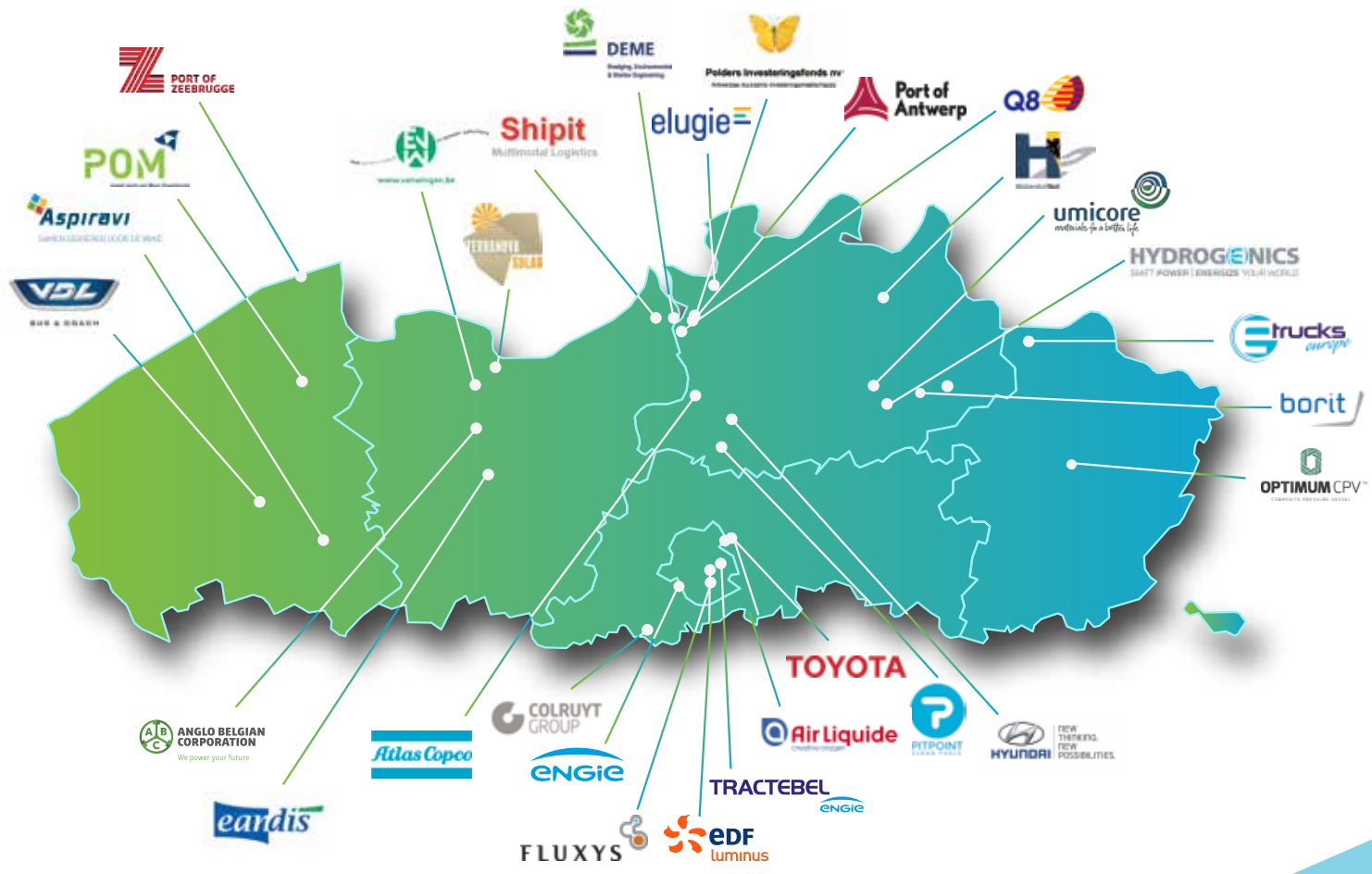
CLUSTERPOWERTOGAS

Innovative Industry Cluster Flanders



The Innovative Industry Cluster 'Power-to-Gas' unites companies who wish to cooperate on hydrogen as a means of renewable energy storage and the use of hydrogen for zero emission mobility, heat or chemical applications.

FLANDERS INNOVATION & ENTREPRENEURSHIP

POWERTOGAS Industry Cluster Flanders

Clusters for Innovation

www.power-to-gas.be

The cluster

The Power-to-Gas cluster was created as a follow-up of the Power-to-Gas Roadmap study for Flanders (2014-2015). One of the conclusions of this roadmap study is that hydrogen and power-to-gas demonstration projects are required in Flanders to increase the expertise and develop markets and regulations.

Another observation is that there is already a strong hydrogen industry in place in Flanders with key international players having production sites in Flanders. The ambition of the Power-to-Gas cluster is to gather these companies, operating in different fields that are complimentary with respect to the power-to-gas market, so that they can reinforce each other with their specific knowledge and experiences. The aim of the cooperation is eventually the launch of new products and services, which can serve as a break-through for the hydrogen market.

WaterstofNet coordinates the cluster since September 1st 2016.

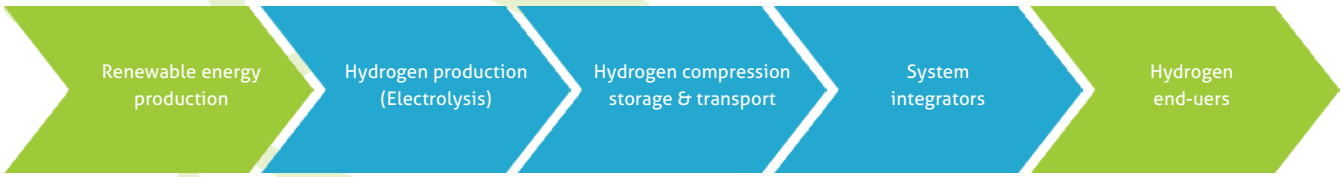
Objectives

- Development and realization of power-to-gas demonstration projects in Flanders,
- Creation of innovative business models to enable a future profitable power-to-gas market,
- Knowledge exchange and knowledge build-up with respect to power-to-gas concepts,
- Positioning of the Flemish industry in the European power-to-gas market,
- Act as point of contact on the Flemish/Belgian level in strategic discussions with respect to the transition towards renewable energy and the potential of hydrogen in this field.

Target group

Every company active in a part of the power-to-gas value chain:

- Production of renewable energy,
- Hydrogen or gas technology (production, transport, storage),
- System integration,
- Applications on hydrogen (transport, chemistry, H2-to-power,...).



What's on offer:

- Participation in project teams targeting the development of specific demonstration projects,
- Guidance and advice by the cluster organization (WaterstofNet) of the companies' own activities on hydrogen,
- Yearly visit to a power-to-gas project abroad,
- Knowledge exchange in quarterly general meetings.

Some of the first initiatives:

- Feasibility study for H2-project at solar park Terranova Solar (TNS) completed,
- Project proposals approved by VLAIO, which resulted in ongoing projects for TNS and the Port of Zeebruges,
- Successful visit to Energiepark Mainz.

Why hydrogen?

European environmental objectives

Europe aspires a drastic reduction of greenhouse gases by 2050 (reduction by 80%). In order to achieve this, various objectives have been formulated for 2020, 2030 and 2050. The well-known '20 20 20' objective aims for:

- 20% reduction of greenhouse gases (compared to 1990),
- 20% less energy consumption,
- 20% share of renewable energy in the overall energy consumption,
- more specific for transport: 10% of the energy consumption should be renewable.

Hydrogen can play an important role in achieving these goals in terms of zero-emission transport and energy storage.

Zero-emission transport

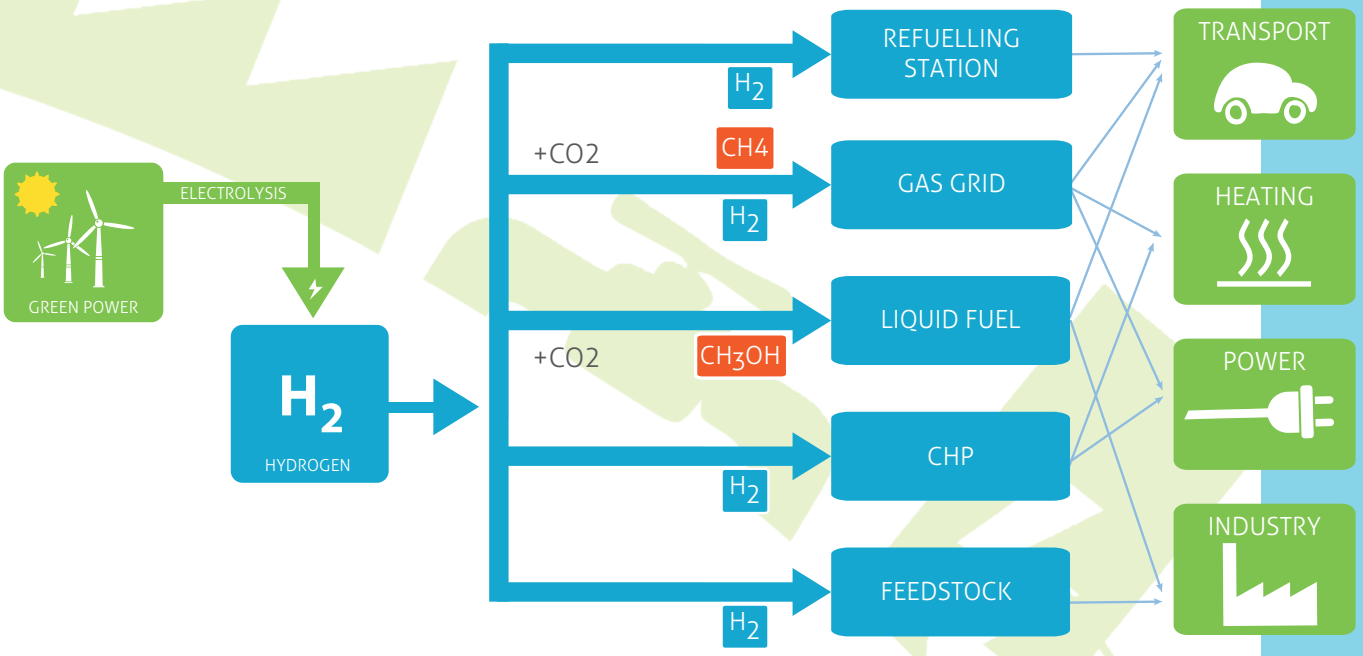
Vehicles running on hydrogen create no emissions and little noise. Their fuel range and refuelling time are comparable to vehicles running on traditional fuels. Hydrogen can be used in cars, buses, forklifts, waste collection vehicles, watercrafts, ships and heavy-duty vehicles like trucks.

Energy storage

With its relatively low specific weight and high energy density, hydrogen is the ideal medium for storing energy. Peak production of renewable energy generation, such as solar and wind, can cause problems for the power grid's stability and its operation. Converting surplus renewable energy into hydrogen creates an energy buffer and helps stabilize the energy grid. The produced hydrogen can be used in transport applications. During periods of energy scarcity, it can be used to generate electricity. Hydrogen can also be added to the natural gas grid ('power-to-gas') or be used as a raw material for chemical products ('power-to-chemicals').

‘Power-to-gas’ principle

'Power-to-gas' stands for the conversion of (variable) renewable energy to hydrogen, which can then be used in a number of applications, such as mobility or heat.



POWERTOGAS
Industry Cluster Flanders

Project teams

Several project teams work on specific projects on a number of themes:

Power to Mobility

H_2 refuelling stations/users

Hydrogen filling stations on production sites of renewable energy (wind and solar parks), to be used for green mobility applications, such as passenger cars, freight transport,... or for logistical applications, such as forklifts in distribution centers.

Power to Gas

H_2 injection in gas grid

Injecting green hydrogen into the natural gas grid, as a step towards greening the gas supply for example for heating. The hydrogen can also be further converted to methane (with reuse of CO2 from industrial sources) before it is injected.

Power to Fuel

H_2 + CO_2 > methanol

Conversion of green hydrogen to methanol, to be used as fuel for freight transport or as a basic component in chemistry. In these applications methanol can provide an added value through its higher energy density compared to gaseous hydrogen. This can offer an answer to put 'carbon capturing and usage' (CCU) into practice.

H_2 in shipping

H_2 or methanol in ships

For inland shipping, de-carbonization will become a priority in the near future. Inland shipping in Flanders is well developed and therefore we examine some applications of hydrogen in domestic container transport. For heavier vessels, or where the requested autonomy is very large, methanol can be an interesting option.

Offshore wind

Storage large energy volumes

A large part of the renewable energy production will take place at sea in the future. Storage of temporary surpluses and the conversion to hydrogen or even complete offshore hydrogen factories at sea are an option for which the necessary technology must be developed.

Legislation

'Green' H2, gas, methanol,...

Follow-up of the European initiatives concerning the certification of green hydrogen and the specific legislation that is being developed on the use of hydrogen in mobility. Consultation with governments with regard to the Flemish/Belgian legislation that can further stimulate hydrogen development.

www.power-to-gas.be

‘Innovative Industry Clusters’ or ‘Innovatieve Bedrijfsnetwerken’ (IBN)

“Together for strong and ambitious innovation”

In our opinion Flanders should be a bit more innovative when it comes to doing business. We need more innovation-conscious companies with strong ambitions for growth and an international outlook. We are committed to strong cooperation between these companies, knowledge institutions and governments with the aim of setting up activities that lead to an economic added value for both individual and large groups of companies.

‘The Agency for Innovation and Entrepreneurship’ or ‘Agentschap Innoveren & Ondernemen’ combines its forces and resources with the Innovative Industry Clusters. 'Power-to-Gas' is one of these clusters, established in 2016 with the support of the Flemish government.

Discover the other ones on www.vlaio.be/clusters. #sterkinnoveren

In practice

The membership of the cluster amounts to € 5,000 (excluding VAT) per year.

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