

Waterstof Industrie Cluster: Minutes meeting 01/12/2022 @ North Sea Port Nieuwdorp (hybrid meeting)

Agenda:

10.00-10.05: Introduction NSP & WaterstofNet

10.05 -10.40: New members presentation

Keynote

10.40-11.00: Bert den Ouden, Project Director, HyXchange project NL (Platform for trading GO's and certificates for green H2)

11.00-11.20: Recent results & projects WIC members

11.20-11.30: Position on future applications of combustion technology H2 (WIC WG combustion)

11.30-11.45: WIC news

11.45-14.30: Boat tour in the port, with presentations NSP on H2 projects, including lunch

New members since last meeting

Virya Energy, Bosal, Euroports, Swagelok Belgium, Hyster-Yale, Emerson, Luyckx; Ruijtenberg Groep, ATPC (part of VTTI) , Ortus en TNO

Presentation new members:

- **North Sea Port** : presentation foreseen on the boat, but due to practical issues not shown. Presentation is added in the slide deck of the meeting
 - **P&V panels** : Steven Perrault
 - Design, building, upgrade & maintenance of distribution boards & control panels for different applications & sectors, e.g. in the offshore and hydrogen business.
 - **Smulders**: Jef Dijckmans
 - International steel construction company with many realisations in offshore constructions (foundations & substations). They offer complete EPCI projects. They recently signed an MoU for their first green H2 project.
 - **Brussels Airport**: Els Heyvaert
 - In the sustainability roadmap of the airport towards net zero carbon in 2025, H2 might play a role in the ground operations and in the sustainable aviation fuels. Brussels Airport participates in the Stargate project in which a demo project using hydrogen for ground service equipment is prepared.
 - **Bekaert**: Chris Dhulst
 - Bekaert is a international company that supplies technology base on steel wire and coatings. Today they already produce "Porous Transport Layers" for PEM/AEM electrolysers and are involved in the Hyve consortium on innovative MEA development ofr AEM electrolysis. They are exploring reinforced flexible pipes for H2 transport.
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- **Iulius:** Luc Schoonacker
 - A Belgian-Romanian company that is active in the naval industry and is looking for application of H₂ in naval propulsion systems for river vessels. They also are developing green H₂ production projects, based on electricity from PV, in Romania. They are looking for partners in the BE/NL region.
- **Strabag:** David Probyn
 - Construction company with broad-ranging experience in many different sectors (residential, public buildings & industrial). They are looking to broaden their expertise towards the construction of hydrogen production plants.
- **BIP Elneo:** Tony Lippens
 - Distributor of instrumentation such as valves & fittings, pressure regulators, pressure & flow transmitters and protection boxes for application in several markets, with several years of experience in hydrogen applications.

Keynote: Bert den Ouden presenting the **HyXchange project**.

- HyXchange is an initiative of Gasunie, 4 Sea ports in NL and 60 market parties
- The project has run a pilot on the trading (within NL) of Green Hydrogen Guarantees of Origin
- The system has been implemented according Dutch law since October 22.
- The GO's can be used (via book & claim method) as HBE (Hernieuwbare brandstofeenheden) in the NL transport sector (if produced from non-subsidized renewable electricity).
- The GO's can also be used in industry without a constraint on the electricity subsidies.
- In 2023 a G2 GO 'auction' will be developed.
- Besides GO's also certification is developed within the project. A pre-certification (in attendance of the final EU rules) is developed, based on the CertifHY criteria for green and low carbon H₂.
- A simulation of a H₂ spot market based on an (inter)national hydrogen grid and taking into account several H₂ sources (local green H₂ production, import of ammonia and subsequent cracking, SMR with CCS), storage in line pack and salt caverns and diverse offtakers (industry, housing, transport) is done for the year 2026, with optimisation of hourly marginal cost of H₂.

More info available on the [Hyxchange.org](https://hyxchange.org) website

News from cluster members:

Cummins: Denis Thomas

Cummins presents its state of play on development of PEM electrolyzers, scaling up from 2,5MW to 5MW modules to enable projects from 100MW to 1GW in the future.

Cummins is expanding their production capacity to 2-3GW in 2023-2024, with important production & development activities in Oevel BE and extended capacities in Spain, Canada, USA and China.

Bosal : Ted Straten

Bosal has been a main supplier of technological solutions for automotive and energy applications (emission control systems, heat exchangers..). With the decreasing market of conventional cars, Bosal is looking at exploring new markets for the future.

With their experience on high temperature applications, they have developed a roadmap for the cost-effective mass-production of solid oxide electrolysis & fuel cell products.

The plan consists of product technology development, design for manufacturing and industrialisation developments.

With a number of NL partners (e.g. VDL) , a proposal for funding will be submitted within the NL groeifonds in 2023.

However, Bosal sees many more opportunities for collaboration for this ambitious development path and launches a call for other parties to join the initiative.

The following key technologies & tools have been defined:

Virtual Development Tools, AI en IoT

- Control Oriented Modeling & Controls
- Optimisations (1-3D)
- Field data IoT

Efficiency, Durability, Reliability and Recycling

- Advanced smart Heat & Energy management
- Reliability engineering, predictive maintenance
- LCA

Product Cost Reduction

- Components, Material, Catalysts
- Non-rare materials, stability supply chain
- DfM, DfA, Function Integration

Process Cost Reduction

- Digital Twin Lean Manufacturing, Adaptive machine learning, AI
- In-line quality control
- Full automation in flow

WG combustion: position paper on (future) use of H2 combustion technology

- A white paper is prepared on this topic, together with the members of the WG
- It describes the main advantages of the technology (robustness, experience, flexibility, availability of materials) and discusses the (perceived) drawbacks (maintenance, noise, NOX emissions etc..).
- The paper will be presented on an event on spring 2023.

WIC/WaterstofNet news

- Communication: new biweekly newsletter for WIC members replacing current newsflashes and separate mails about funding calls and events. First newsletter to be sent next week Thursday (16/9).
- The WIC member database is entering its test phase, if all goes right it can go live on December 15 and a call for input will be sent to the members.
- Different working groups are presented: policy, H2for all, mobility, combustion engines, shipping, port equipment. Interested members can always join.
- A new WG on permitting has its first meeting on Dec 7 (based on feedback from 12 members on questionnaire).

- The topic of training & education of future H2 skilled workforce is also being tackled at WaterstofNet. The first phase is inventory of available education (technical to academic levels). Next comes analysis of shortages and proposals for new training, also based on best practices in other countries.

WIC events in 2023

- New WIC meetings 2023
WIC meeting 1: Thursday 2 maart
WIC meeting 2: Thursday 8 juni
WIC meeting 3: Thursday 21 sept
WIC meeting 4: Thursday 7 dec
- Hyvolution Feb 1-2
- Hannover Messe April: WIC or regional (FL) representation?
- WIC conference end of April-beginning of May to be planned
- WIC visit NRW (Q1, 2023, to be planned)
- Meet & Greet: to be planned
- Webinars: Ad hoc, depending on input from WIC members

Present in the meeting

In person

<u>Name</u>	<u>Company</u>	<u>Name</u>	<u>Company</u>
Patrick Vanschoubroek	Actemium	Matthijs Janssens	Sirris
Hans Magits	Atlas Copco	David Provyn	Strabag
Thom Leeuwestein	Ballast Nedam	Fedrik Vancraeynest	Sweco
Wouter Koster	Ballast Nedam	Tim Maeyens	Terranova Solar
Chris Dhulst	Bekaert	Hans Hooyberghs	Tialoc Belgium
Tony Lippens	BIP Elneo	Sasa Marinic	TotalEnergies
Ted Straten	Bosal	Bjorn Veldhuizen	TotalEnergies
Nicole Van Klaveren	Bureau Veritas	Sven Goethals	Tractebel
Jasper Smets	Chevron Phillips Chemicals	Ruud Bouwman	VDL
Nicolas Blouin	Chevron Phillips Chemicals	Sam Schotte	VIVES
Denis Thomas	Cummins-Hydrogenics	Ferenc Petkovics	VoltH2
Tom Bakker	Eriks	Peter Simkens	Von Karman Institute
Guy Verkoeyen	Exion Hydrogen	Franky Van den Berghe	Willemen Groep
Dirk Focroul	Fluxys		
Matthias Schnellmann	Ineos	Adwin Martens	WaterstofNet
Christian Gateley	Ineos	Chris Lefrère	WaterstofNet
Peter Gysen	Intertek	Samira Farahani	WaterstofNet
Martin Dorsman	Kelvion Thermal Solutions	Chris Lefrère	WaterstofNet
Kristof Vanhoorne	Luminus	Davine Janssen	WaterstofNet

Mariëlle Vande Lanotte	Luminus	Isabel François	WaterstofNet
Arie Meerkerk	NEWES	Tom Verlinden	WaterstofNet
Pascal Meyvaert	Nippon Gases	Mathieu Wuyts	WaterstofNet
Charlotte Herman	North Sea Port		
Arjan Schipaanboord	North Sea Port	Bert den Ouden	HyXchange project
Annelies De Groote	North Sea Port		
Steven Keyzer	Ocas		
Koen Pellaers	P&V Panels		
Steven Perrault	P&V Panels		
Georges Leysen	SEA-Tank Terminal Antw.		
Mark Philips	SGS		

Online

Nick Valckx	Agfa	Arnoud Delange	MRC global
Roeland Smets	Altea	Gilles Decan	Port of Antwerp-Bruges
Adrien Theunissen	Besix	Wim Van Den Mosselaer	Siemens Energy
Els Heyvaert	Brussels Airport	Johan De Blicck	Siemens
Roman Latsuzbaia	Bureau Veritas	Jef Dijckmans	Smulders
Rene Peperkamp	Croonwolter&Dros	Alexandra Lybaert	Sweco Belgium
Wim Lauwers	De Lijn	Olivier Bravin	Swagelok Belgium
Kristof Heyndrickx	Emerson	Yannick Sijssens	Tessengerlo Group
Roxanne Vande Zande	Engie	Johan Dekervel	Total Energies
Annelies	E-trucks Europe	Yassine Makhoukh	Toyota Belgium
Michel Vanden Brande	Fluxys	David Bolsman	TÜV Austria Belgium
Leon Cappaert	FPIM	Paul Olivier	Uniper energy
Stephan Laux	Fuel Cell Power	Rein Borgoo	vk-architects-engineers
Luc Haesaerts	Haesaerts	Herman Vandamme	G&V
Wessel Hofs	Hitachi Energy	Pierre Fache	Smart Hub vlaamsbrabant
Stefan van der Spek	Hyzon Motors	Lynn Eyckmans	De Vlaamse Waterweg
Luc Schoonacker	Iulius	Sofie Marivoet	De Vlaamse Waterweg
Kris Martens	Karel de Grote Hogeschool	Lut Bollen	EWI-Vlaanderen
Duncan Versteeg	Kelvion	John van Leeuwen	Weidmüller
Pieter den Hooglander	Linde	Peter	Ziero
Lesya Nadzon	Linde	Michel Honselaar	WaterstofNet
Mathias Goris	Luyckx		

Isabel François

Dec 2, 2022