

TNO innovation
for life



SHIP>NL
SUSTAINABLE HYDROGEN IMPORT PROGRAM

» AGENDA

SHIP>NL SESSIE II 15 FEBRUARI 2023

16:00-16:05 WELKOM

16:05-16:20 DEEP DIVE: H2 GLOBAL | RODRIGO PINTO SCHOLTBAACH | EZK

16:20-17:00 REFLECTIE GASUNIE & DISCUSSIE | WIM TICHELAAR & MARC VAN DER LINDEN

REFLECTIE PORT OF ROTTERDAM & DISCUSSIE | WILCO VAN DER LANS

REFLECTIE AIR PRODUCTS & DISCUSSIE | FRANK SCHNITZELER

17:00 AFSLUITING

'HUISREGELS'

- Camera aan, microfoon op 'mute'
- Vragen?
 - Plaats *verduidelijkingsvragen* in de meeting chat; of
 - Steek je hand op
- › De moderator zorgt ervoor dat je vraag beantwoord wordt (eventueel achteraf).
- Slides worden na de sessie gedeeld
- We bespreken uiteraard geen marktgevoelige zaken.
- Chatham house rules: De besproken informatie mag gedeeld worden, maar zonder de spreker te onthullen.

MEERJARIG KENNISPROGRAMMA MET 5 LIJNEN

In deze sessie:

1 Technisch economisch	2 Beleid	3 Markt	4 Internationaal	5 Omgeving
<ul style="list-style-type: none"> ▪ Inzicht in importketens productie-conversie-transport-opslag-reconversie-gebruik ▪ Vraagontwikkeling, scenario's ▪ Infrastructuur & systeemintegratie: corridors, benutten bestaande infra. ▪ Technology assessments, R&D 	<ul style="list-style-type: none"> ▪ Impact van 'Fit for 55', REDII, Delegated acts, ETS/CBAM, etc. ▪ Impact van certificering en CO2 allocatie: emissiefactoren, LCA ketenanalyse, etc. ▪ Financiering en stimulering (EU & NL): IPCEI, PCI, TEN-E, JTF, EIB, Horizon Europe, MOOI, DEI, MIEK, SDE++, etc 	<ul style="list-style-type: none"> ▪ Marktmodellen: bilaterale contracten, vrije handel, waterstofbeurs ▪ Internationale handelsstromen: verwachte vraag- en aanbodvolumes en transportstromen ▪ Importtarieven, trade agreements en handelsbeperkingen, WTO, etc. 	<ul style="list-style-type: none"> ▪ Samenwerking met omringende EU/niet-EU importlanden om corridors te ontwikkelen ▪ Concurrentie met omringende EU/niet-EU importlanden ▪ Geopolitieke aspecten: strategische voorraden, afhankelijkheid, politieke stabiliteit van exportlanden 	<ul style="list-style-type: none"> ▪ Ruimtegebruik van ketenelementen ▪ Veiligheid: brandbaarheid, zorgwekkende stoffen, risicocontouren, etc ▪ Milieu: stikstof, lekkage ▪ Maatschappelijke acceptatie ▪ MVO / samenhang met SDG's in exportlanden

Synthese

DEEP DIVE: H2 GLOBAL

Rodrigo Pinto Scholtbach | EZK

OVERVIEW: TARGETS

Key points and core elements



Bridging

Create business cases and investment security:
Shifting the timing of a market creation by promoting the market ramp-up until a viable green market has developed



Defined system

Long-term purchase agreements over 10 years
Clear definition of max. funding volume, products, geography and (sustainability) criteria



Contracts for Difference

Financial compensation in analogy to CfD mechanism:

Set up of an PtX intermediary - the **Hydrogen Intermediary Company**



Twin-auction-based

Competitive bidding procedures on the supply and demand side

Minimization of the price difference to be compensated by contributions

THE INTERMEDIARY: HINT.CO

Auctions for the purchase and resale of PtX products take place in German

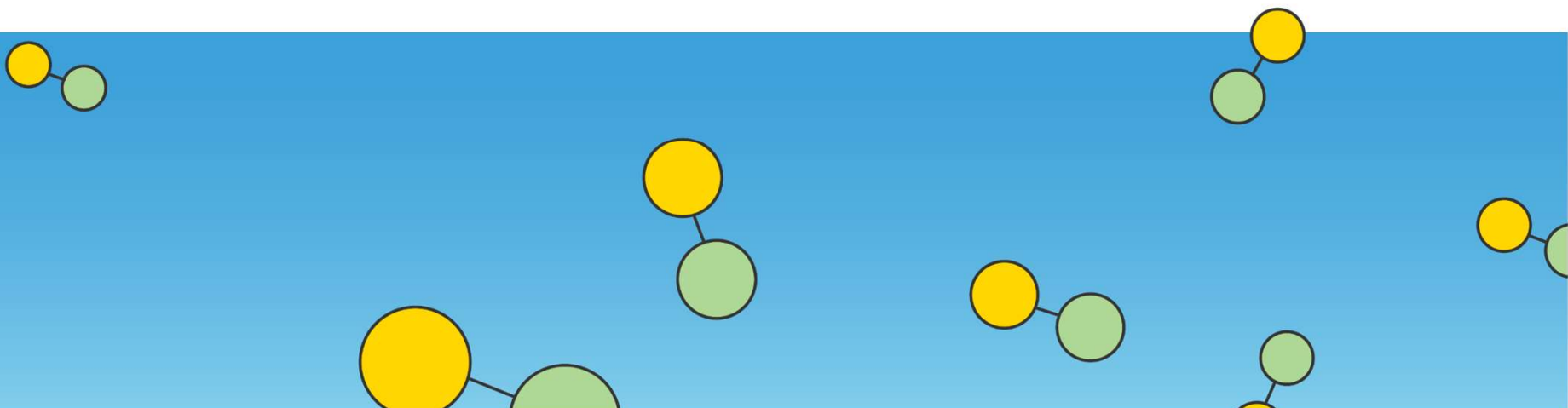


REFLECTIE: H2 GLOBAL

Marc van der Linden & Wim Tichelaar | Gasunie

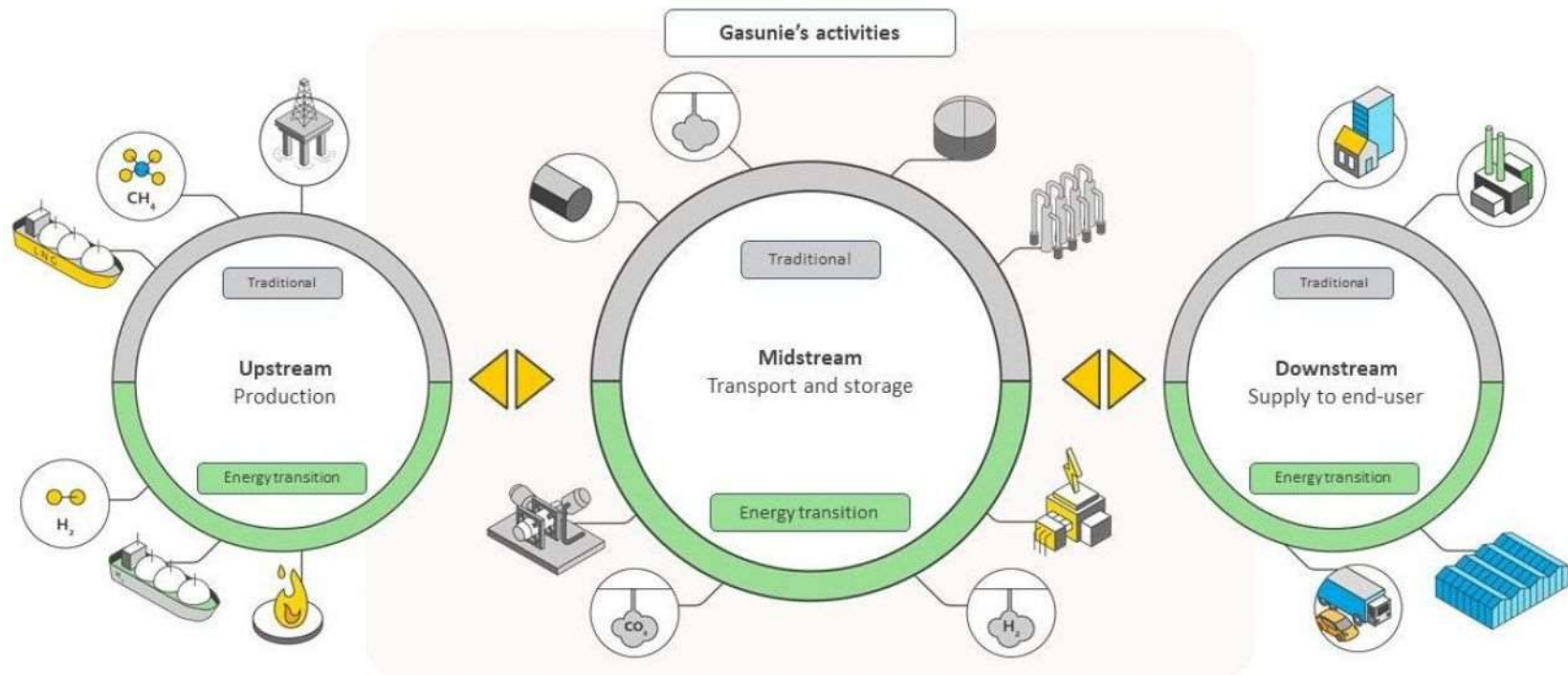
Vision & Discussion on H2Global

SHIP.NL | 15 February 2023
Marc van der Linden
Wim Tichelaar



Gasunie: a connecting factor in the energy value chain

Providing open access and non-discriminatory infrastructure in The Netherlands and the Northern part of Germany



H2Global | current view

What

Funding import of three carriers
Ammonia | Methanol | SAF

Aim

De-risk H2 investment
decisions import value chain

How

Step 1 – 10Y supply HPA (Dec.'22)
Step 2 – 1Y offtake HSA (timing?)

Budget

2022 Window €0.9 bln. (GER)

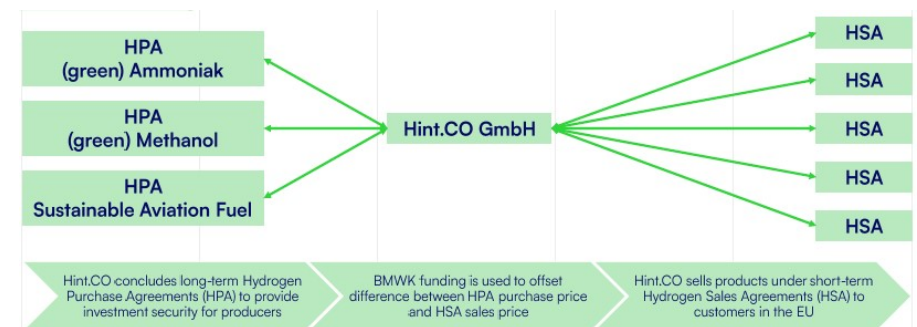
Note: equal per carrier

2023 Window €3.5* bln. (GER)

2023 add fund NL €0.3 bln.**

* criteria not defined yet ** to be approved in spring

H2Global



Observations of H2Global

Destination clause = EU
(not country specific)

One funding country
(GER)

CfD based on product
price (not H2 price)

Equal funding per carrier

Export countries global but
excluding supply from
South Europe

Carriers

- only 3 H2 derivatives
- no pure H2, LH2, CH2 or LOHC

CfD scope excl conversion of derivatives

Two key questions:

Aim: to further improve the instrument to the built-up of the hydrogen value chain

Question 1

CARRIERS

Ammonia | Methanol | SAF

How to improve the instrument?

- Carrier preferences?
- Funding weight?

Two key questions:

Aim: to further improve the instrument to the built-up of the hydrogen value chain

Question 2

EXPORT REGION

Outside EU and EFTA States

Where is added value to improve?

- Target on specific countries/regions?

Contact

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gasunie

crossing borders in energy

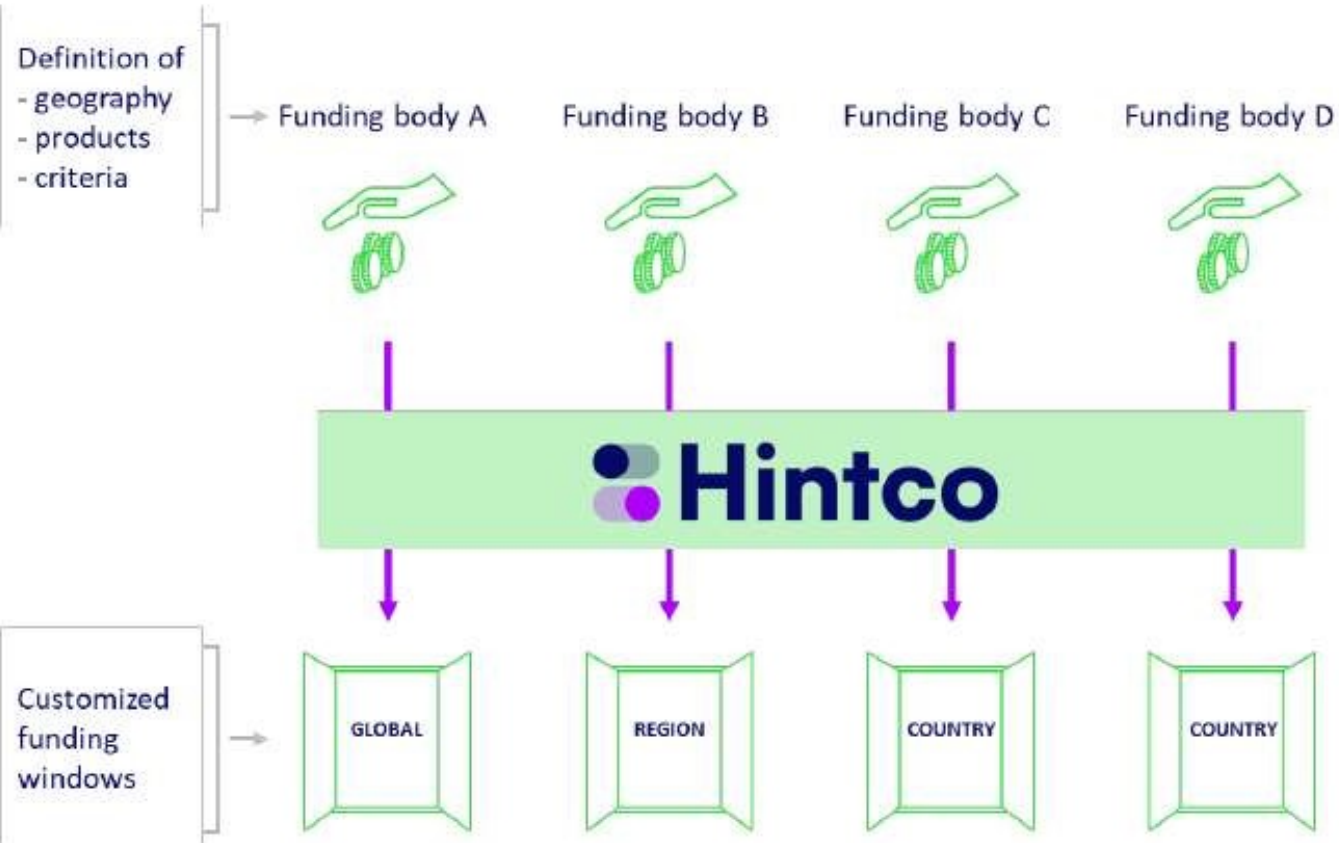
Confidentiality

The information in this presentation is for information purposes only. This information is subject to change and subject to internal and external approvals and decision-making. This information does not contain any offer that is subject to acceptance. Gasunie assumes no responsibility or liability for the correctness, accuracy and completeness of this information. This information shall not have any legal effect whatsoever and no one shall have the right to rely on it in court, either as a basis for any claim for performance or damages or as a defence against any claim.

MODULAR SYSTEM

H2Global – Composition of a funding window

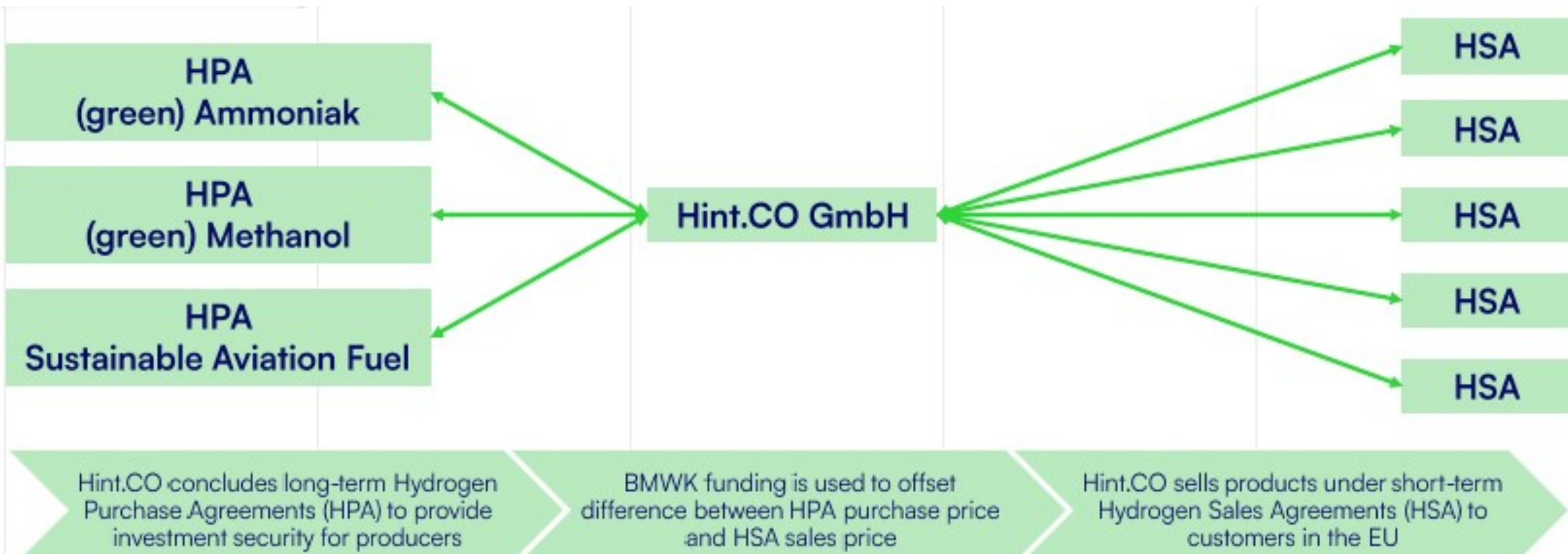
- Adapted to the needs of the funding body
- Customized regarding
 - Geography (region, country)
 - PtX-product selection
 - Product and sustainability criteria
- Adaptable to targets:
 - Price optimization
 - Promotion of green technology
 - Energy policy
 - Development policy



Gasunie: a connecting factor in the energy value chain

Providing open access and non-discriminatory infrastructure in The Netherlands and the Northern part of Germany

H2:Global



Gasunie – Hydrogen ambitions

Gasunie drives the development of the hydrogen market, by establishing infrastructure at early stage

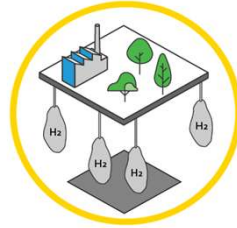
1

Transport



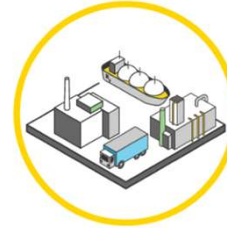
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Speicher



3

Import



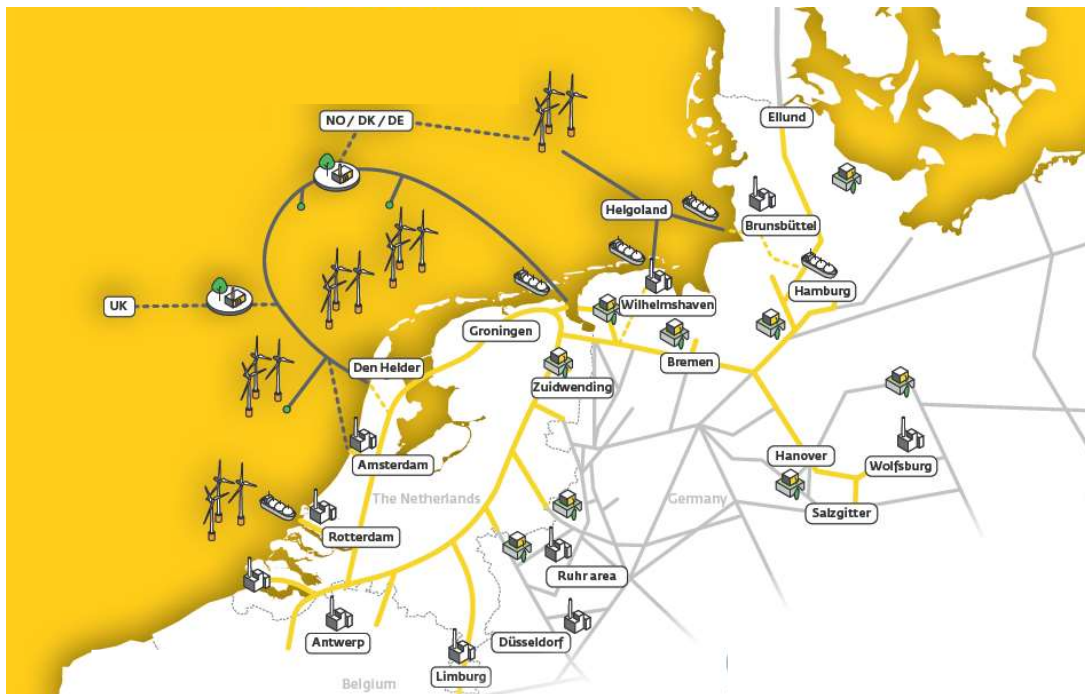
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Offshore



Gasunie – a European Energy Infrastructure Company

Gasunie will contribute and develop the hydrogen economy and will invest jointly with partners in hydrogen infrastructure projects.



Gasunie's contribution?

- Development of **Open-Access Infrastructure**
- **Combined use of electrons and molecules**
- **Cooperation with Partners.**

Gasunie's hydrogen scope:

- **Transmission (onshore, offshore)**
- **Import**
- **Storage**

REFLECTIE: H2 GLOBAL

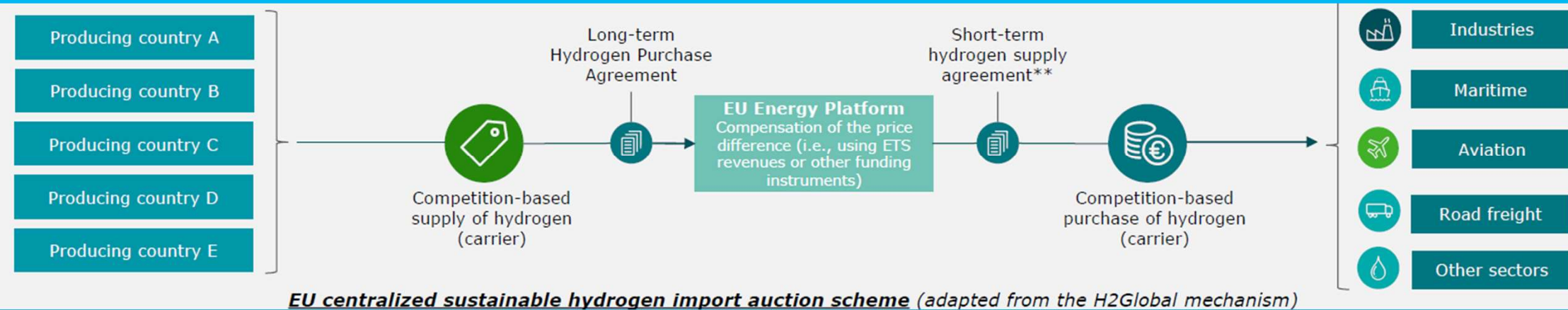
Wilco van der Lans | Port of Rotterdam

An aerial photograph of a port facility, likely the Port of Rotterdam, showing a large container terminal with many colorful shipping containers, several large cargo ships docked at a quay, and a large area of solar panels in the foreground. A rainbow is visible in the sky on the right side of the image. The text 'H2-GLOBAL' is overlaid in large blue letters on the left side of the image.

H2-GLOBAL

SHIP.NL meeting 15.02.2023
Wilco van der Lans

NAAR EEN EU CONTRACT FOR DIFFERENCE SYSTEM

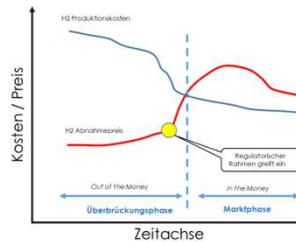


Cornerstones and core elements



Bridging

Immediate creation of instruments for market ramp-up until regulatory framework takes effect



Defined system

- Creation of a system limited to at least 1 GW
- Clear time limit of 10 years



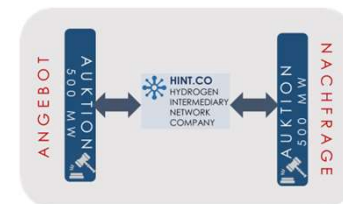
Contracts for Difference

- Compensation payments in the form of CfDs
- Setting up an H2 intermediary: the HYDROGEN INTERMEDIARY NETWORK COMPANY, HINT.CO



Competition

- Auctions (or comparable mechanism) on H2 buy and sell side
- Setting competition-based prices on both sides



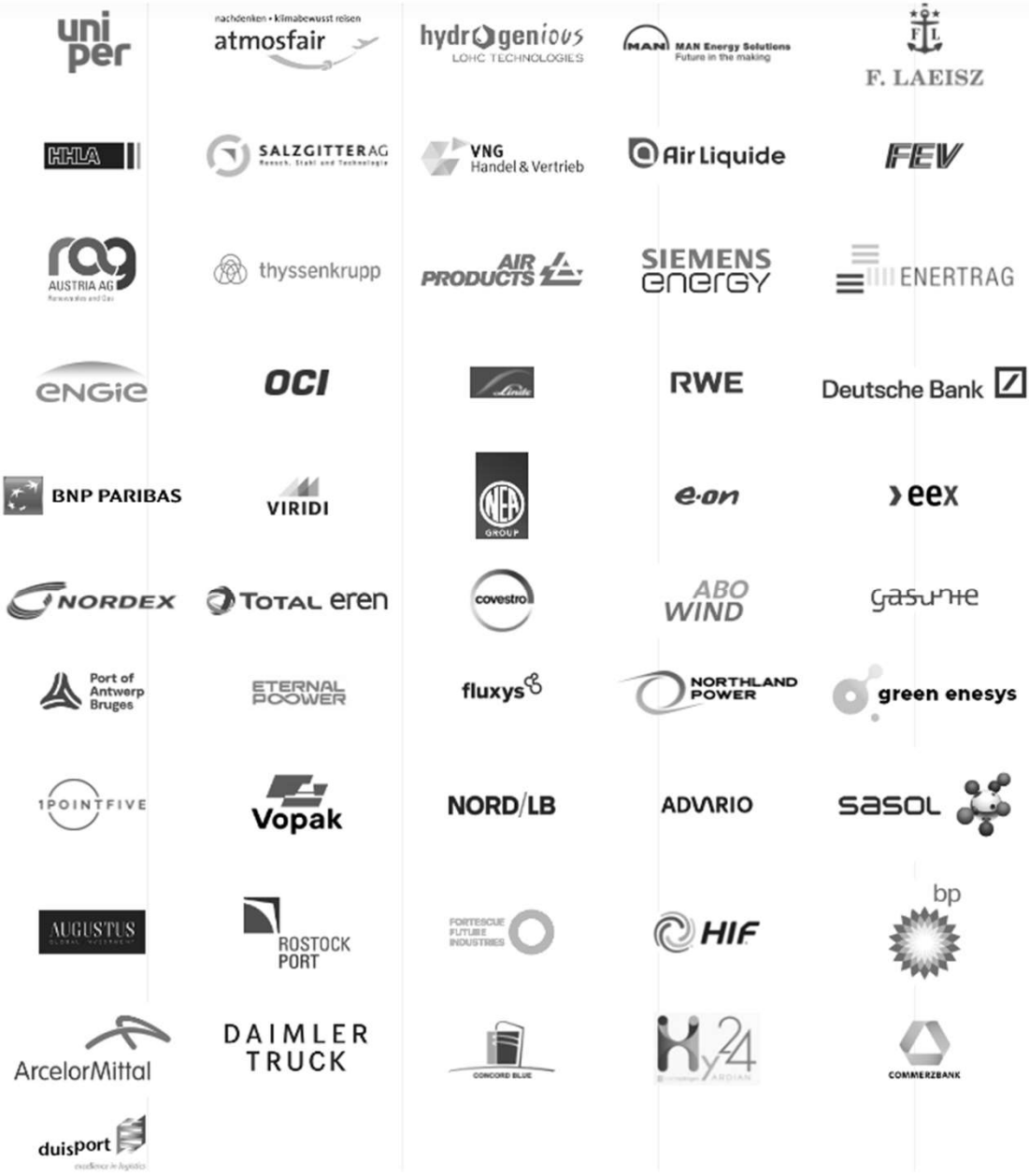
ENKELE KENMERKEN

De eerste veiling(en) is/worden uitgezet. Enkele kenmerken:

- Fonds van 900 M€ ingebracht door BMWK (Duitse EZK)
- Inkoop buiten EU en EFTA
- Aanlevering via een daartoe geschikte haven in België, Nederland of Duitsland,
- Verkoop aan Duitse en EU companies aan de hoogsteieder.
- Producten gebaseerd op groene H₂: ammonia (lopend) en later methanol, jet-fuel
- Tender voor ammoniak 360 M€ over looptijd van 10 jaar
- Elektriciteit uit additionele hernieuwbare bronnen. CO₂ Emissie reductie over de keten well-to-wheel 70%
- Eerste levering eind 2024 begin 2025 verwacht

H2 GLOBAL STIFTUNG

- Purpose of non-profit H2Global Stiftung: promote environmental and climate protection.
- Open to all interested companies and institutions that want to shape the transformation towards climate-neutral energy sources
- The H2-Global Stiftung is owner of the auction model. Objectives:
 - Development of H2Global and the implementation and operation of Hintco GmbH
 - Further development of the double auction mechanism and of additional funding windows [e.g. EU (internal market & import into the economic area)];
 - Focus on accompanying application-oriented research
 - Network for players in international H2 and derivatives trade



NEXT STEPS

- Eerst veilig voor NH3 loopt, volgend voor methanol en e-SAF aangekondigd
- Lessons learned uit 1^e veilingen
- Evolutie van het instrument (budget, schaal, parameters als looptijd, stoffen, landen)

REFLECTIE: H2 GLOBAL

Frank Schnitzeler | Air Products

REFLECTIE: AIR PRODUCTS

Frank Schnitzeler| Air Products

- Indien de H2Global Contract for Difference (CfD) systematiek zich richt op het verschil tussen vraag en aanbod van groene waterstof gemaakt uit geïmporteerde waterstofdragers, moeten de conversiekosten ook door het CfD mechanisme afgedekt worden gedurende de gehele looptijd van het lange termijn leveringscontract.
- De afname contracten moeten langer zijn dan 1 jaar.
- De intermediair is verantwoordelijk voor de opslag van groene waterstof/waterstofdragers.

VOLGENDE KENNISSESSIE WOENSDAG 15 MAART

Face-2-Face

- Ministerie van EZK – Bezuidenhoutseweg 73, Den Haag

15 maart	Voorlopige agenda
14.30 – 15.00	Ontvangst
15.00 – 15.30	Tour de table
15.30 – 17.00	<ul style="list-style-type: none">• IRA en hoe ontwikkelingen in Amerika Nederland beïnvloeden• Electrolyser opschaling
17.00 – 18.00	Borrel

- Data overige F2F kennissessies
 - › 17 mei
 - › 19 juli
 - › 20 september
 - › 15 november
- Overige maanden online deep dives

HARTELIJK DANK VOOR UW AANDACHT

Vragen? Neem gerust contact met mij op:

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