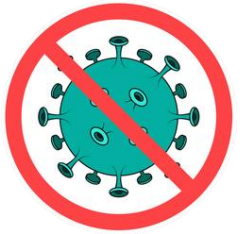
Welcome to our digital WIC meeting!



A few game rules:

- ✓ Mute yourself but you can use camera 
- ✓ Ask your questions in the chat 
- ✓ You can use mic/cam in the question round 

AGENDA

10.00 AM: ETS-IF by Grzegorz Pawelec (Hydrogen Europe)

10.30 AM: Status HRS Flanders by Jonas Cautaerts (DATS 24)

10.45 AM: News from the cluster/WaterstofNet

11.15 AM: Power to Methanol project Port of Antwerp by Didier Van Osselaer

11.30 AM: Question round

ETS Innovation Fund

Grzegorz Pawelec

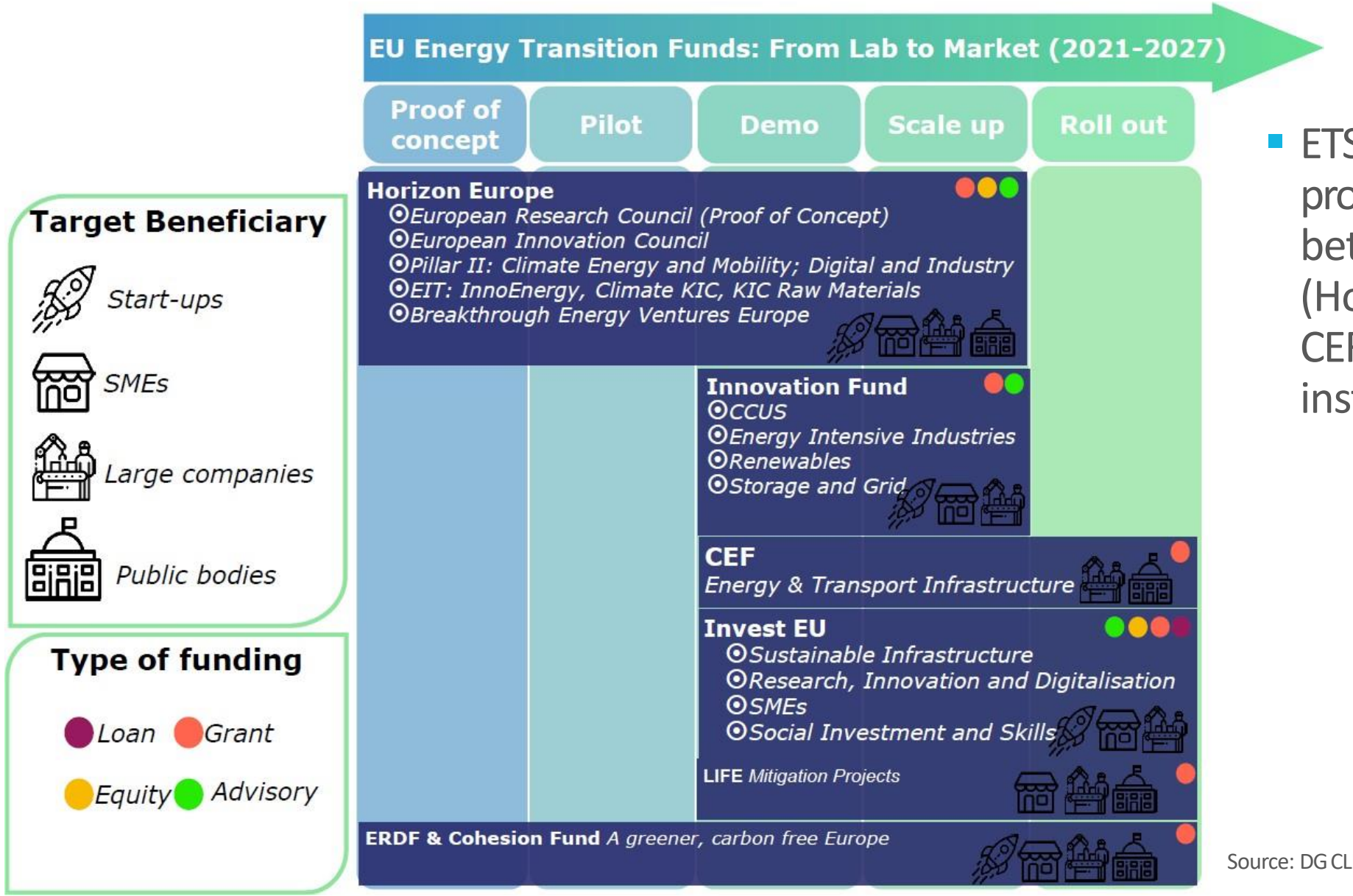
Hydrogen Europe

Hydrogen Europe

ETS Innovation Fund

Brussels, 03.06.2020

ETS IF role relative to other instruments



- ETS IF is designed to provide a 'bridge' a gap between H2020 (Horizon Europe) and CEF or Invest EU-type instruments

Source: DG CLIMA.

Key features of the Innovation Fund

Volume of at least EUR 10 billion at current carbon prices

Support of up to 60% of additional costs related to innovative technology

First call expected for 2020 and regular calls up to 2030

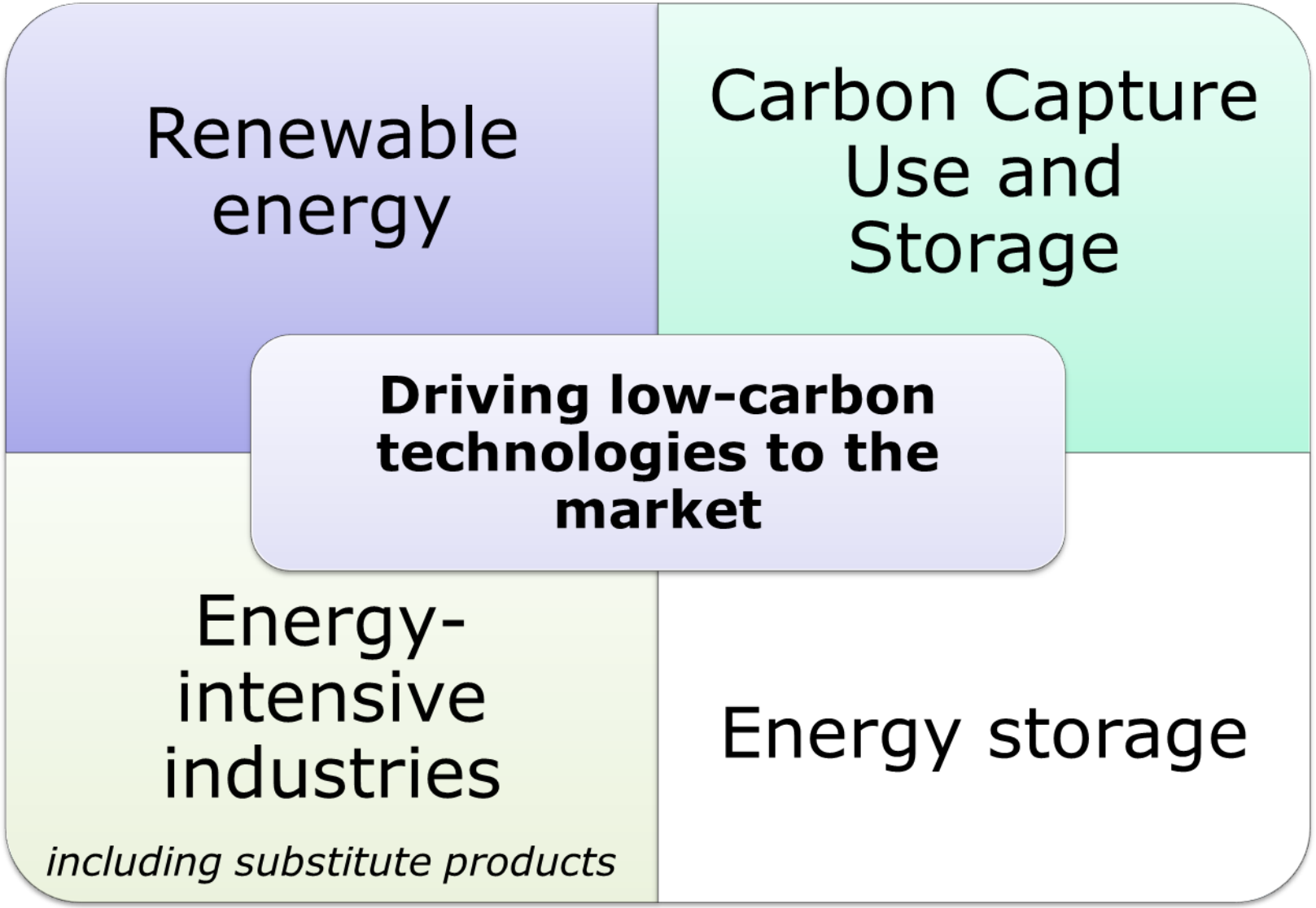
Financed from the revenues of the EU Emissions Trading System

Support of additional capital and operating costs (up to 10 years)

Comprehensive selection criteria and project development assistance

Source: DG CLIMA

Innovation Fund: funding priorities



- Unique opportunity for large scale projects for H2 in industry

Source: DG CLIMA

Innovation Fund: selection criteria

Greenhouse gas emission avoidance

- The difference between the emissions from the project activity and the emissions from a reference scenario

Degree of Innovation

- "Technologies receiving support shall not yet be commercially available but shall represent breakthrough solutions or be sufficiently mature to be ready for demonstration at precommercial scale"

Project maturity

- Potential to reach financial close by 4 years since the grant agreement

Scalability

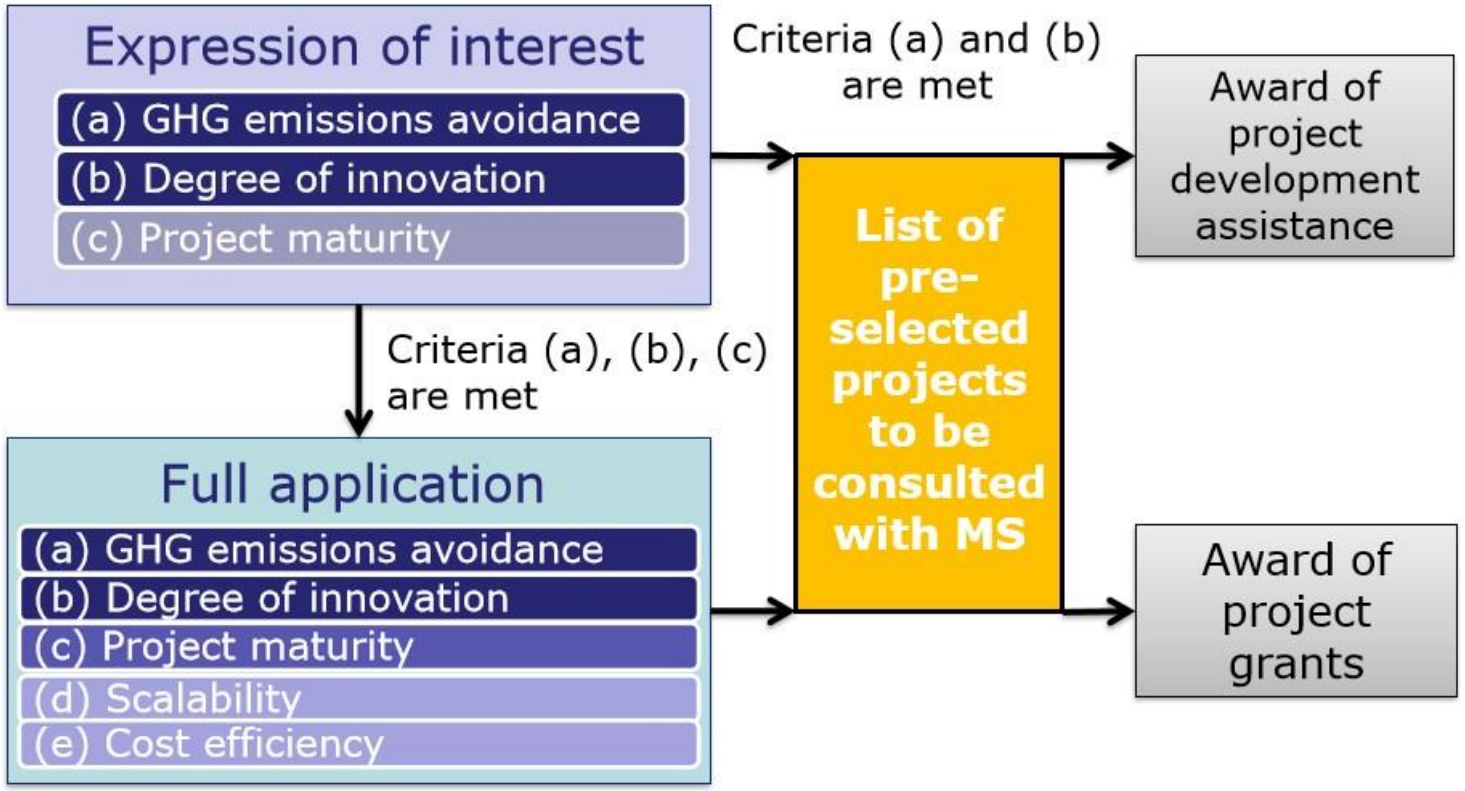
- Impact on the level of the project and the regional economy
- Impact on the level of the sector
- Impact on the level of the whole economy

Cost efficiency

- relevant costs of the project minus any contribution to those costs from the applicant, divided by the total projected amount of greenhouse gas emissions to be avoided in the first 10 years of operation

Two-stage selection process

- Expression of interest does not cover all selection criteria
- Projects not mature enough can apply for PDA's
- Cost efficiency and scalability criteria only evaluated during final application stage

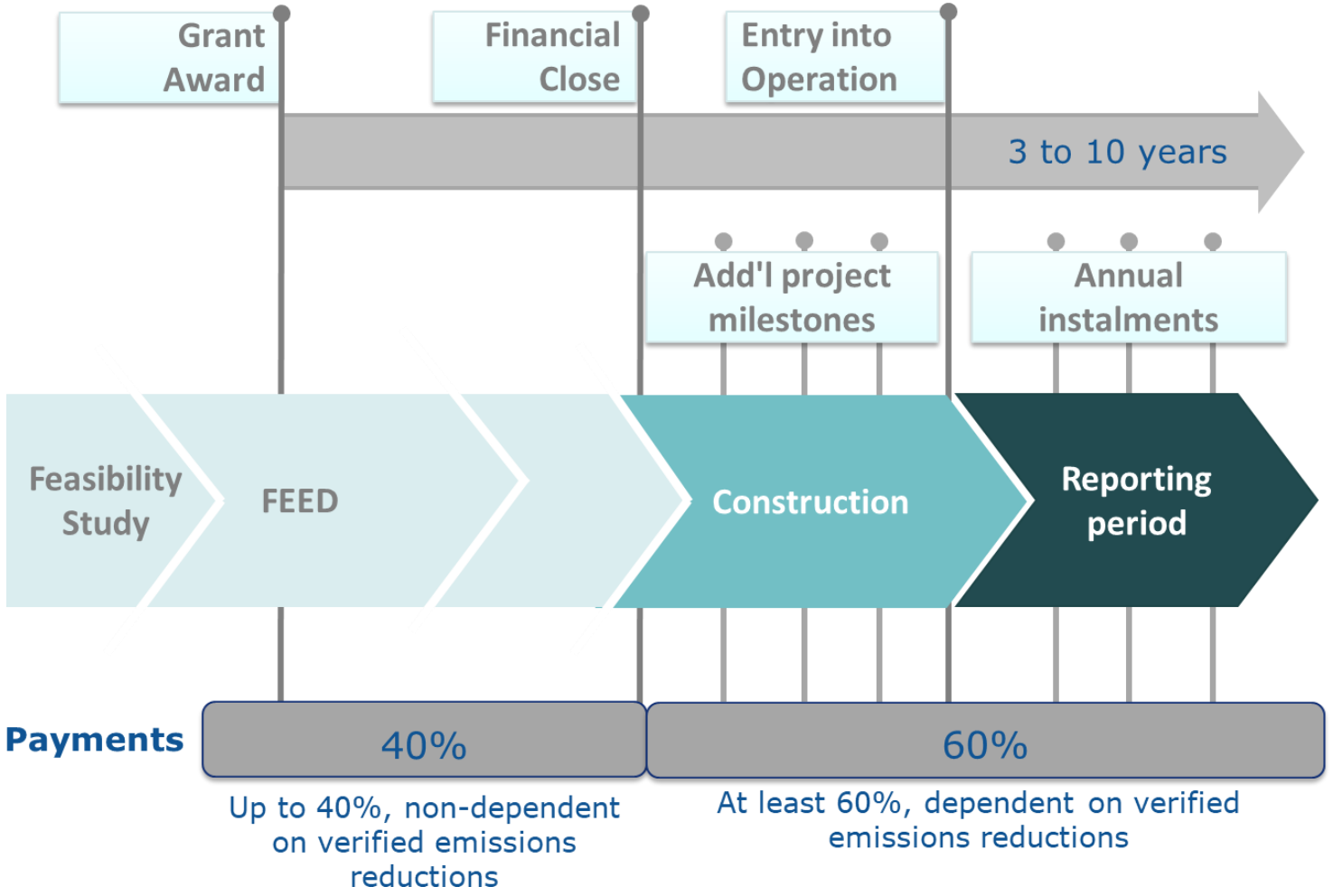


Support across project life-cycle

Payment modalities

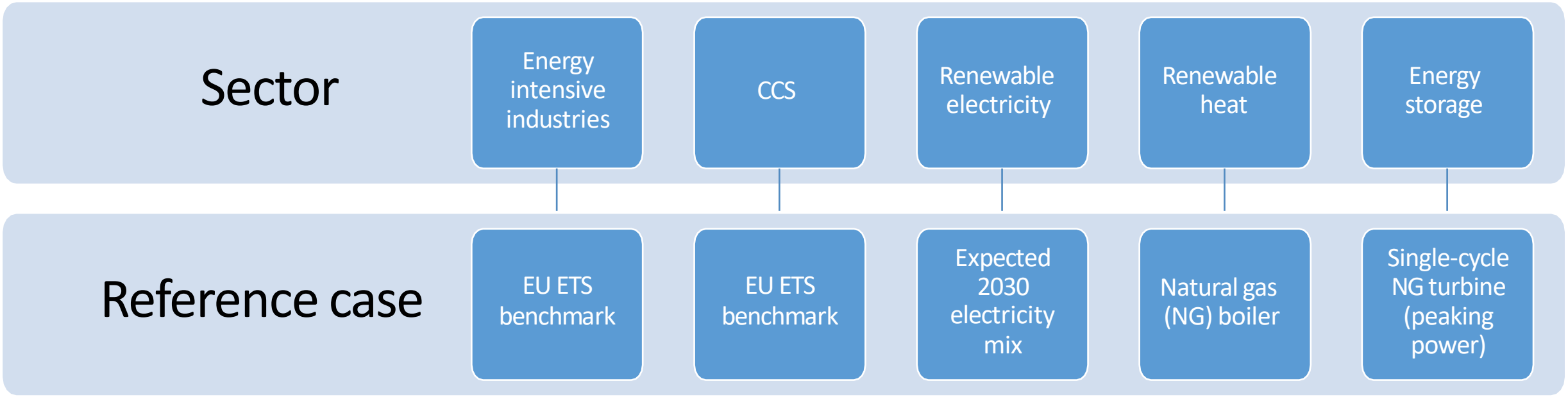
- **Up to 40% of the grants** can be given before the whole project is fully up and running at financial close or another pre-defined milestone

- The remaining grant will be disbursed taking into account the milestones achieved during the project lifetime => Projects slices to ensure GHG emissions achieved.



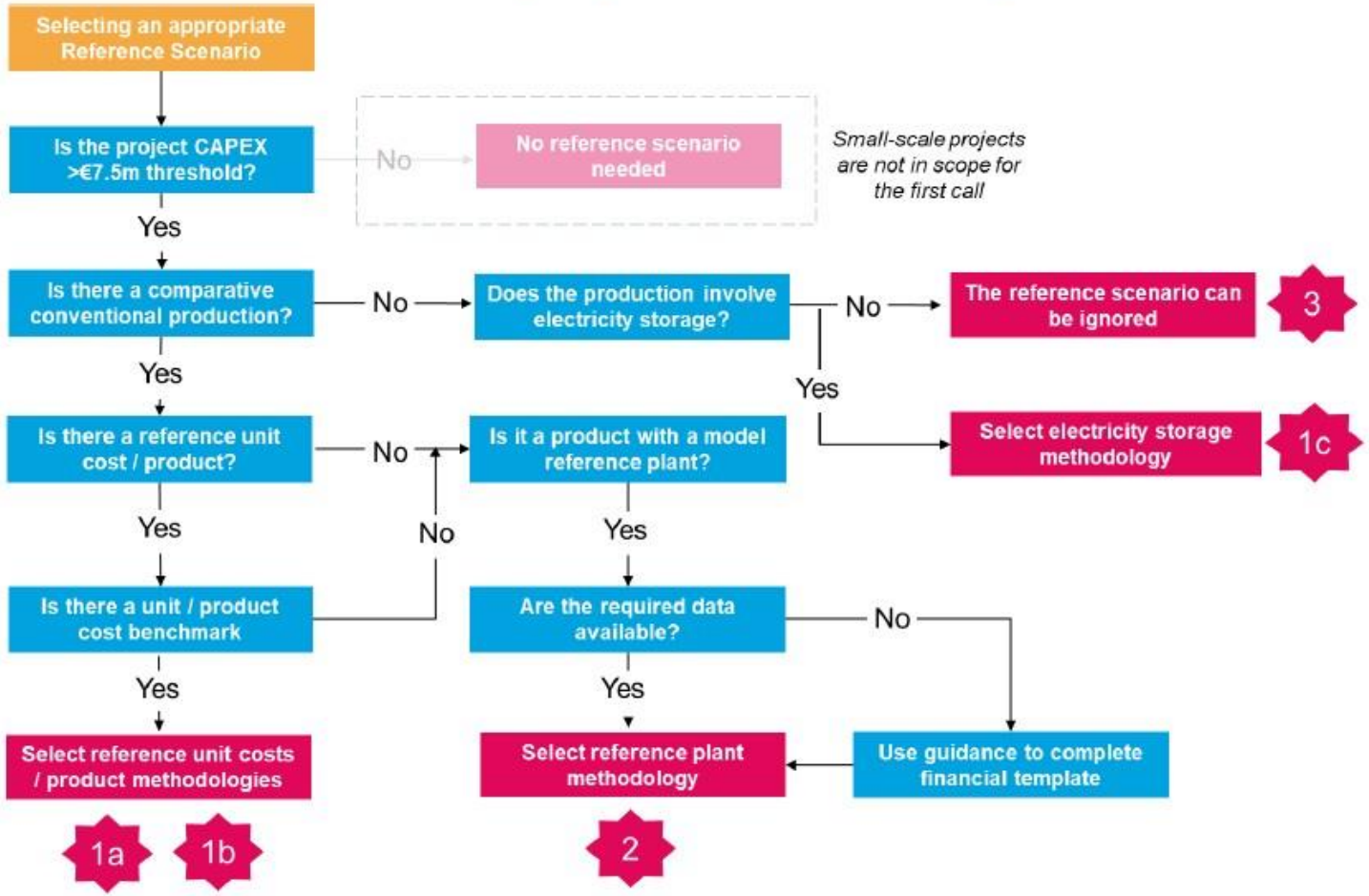
How to calculate the GHG emission reduction

- Changes in inputs, processes, and outputs between the project and the reference scenario



How to calculate the relevant costs

Figure 3.1 The Decision tree helps applicants to select the right calculation methodology



Note 1a 1b 1c *refer to Levelised Cost Models for energy, products and storage: 1a (LCOE); 1b (LCOP); 1c (LCOS)*

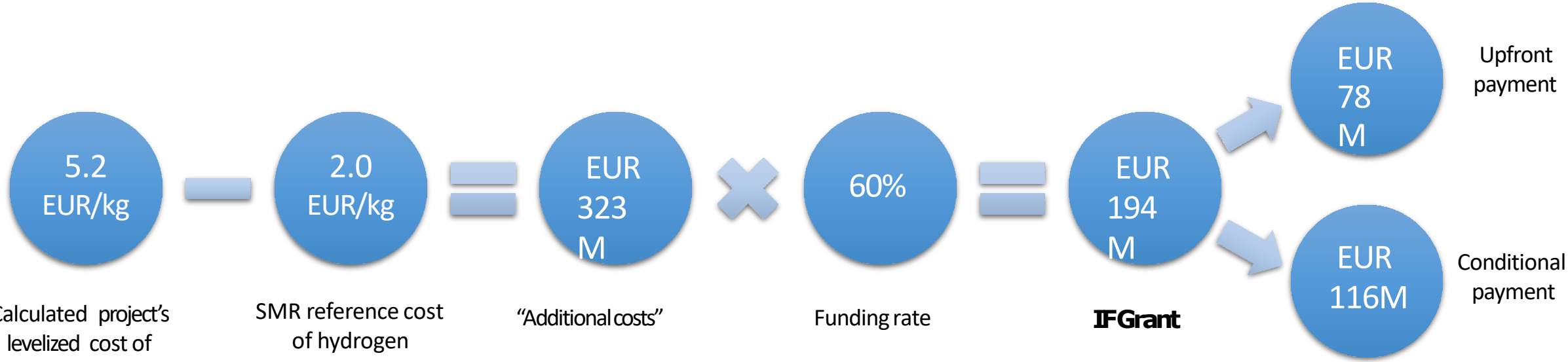
Three approaches possible depending on the case:

1. Reference unit costs / product methodology
2. Reference plant methodology
3. No reference case

How to calculate the relevant costs

Example H2 production case

	Investment phase			Operational phase									
Year	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Hydrogen production													
CAPEX (mEUR)	-20	-20	-50	0	0	0	0	0	0	0	0	0	0
OPEX (mEUR)	0	0	0	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40
H2 volume (t)	0	0	0	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
CO2 price savings (mEUR)	0	0	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8



Relevant costs and cost efficiency of Projects

Cost efficiency criteria

- max 60% of relevant costs
- … but can be less!

- 75% need to be proven during operation to claim the entire grant)

Timeline for the first call

Expert group meeting on draft guidance	5th June 2020
Launch first call	June / July 2020
Submission 1st phase	Sept-Oct 2020
Invitation 2nd phase	Q1 2021
Submission 2nd phase	Q2 2021 +Second Call
Grant award	Q4 2021

ETS-HF an ambitious pipeline of projects

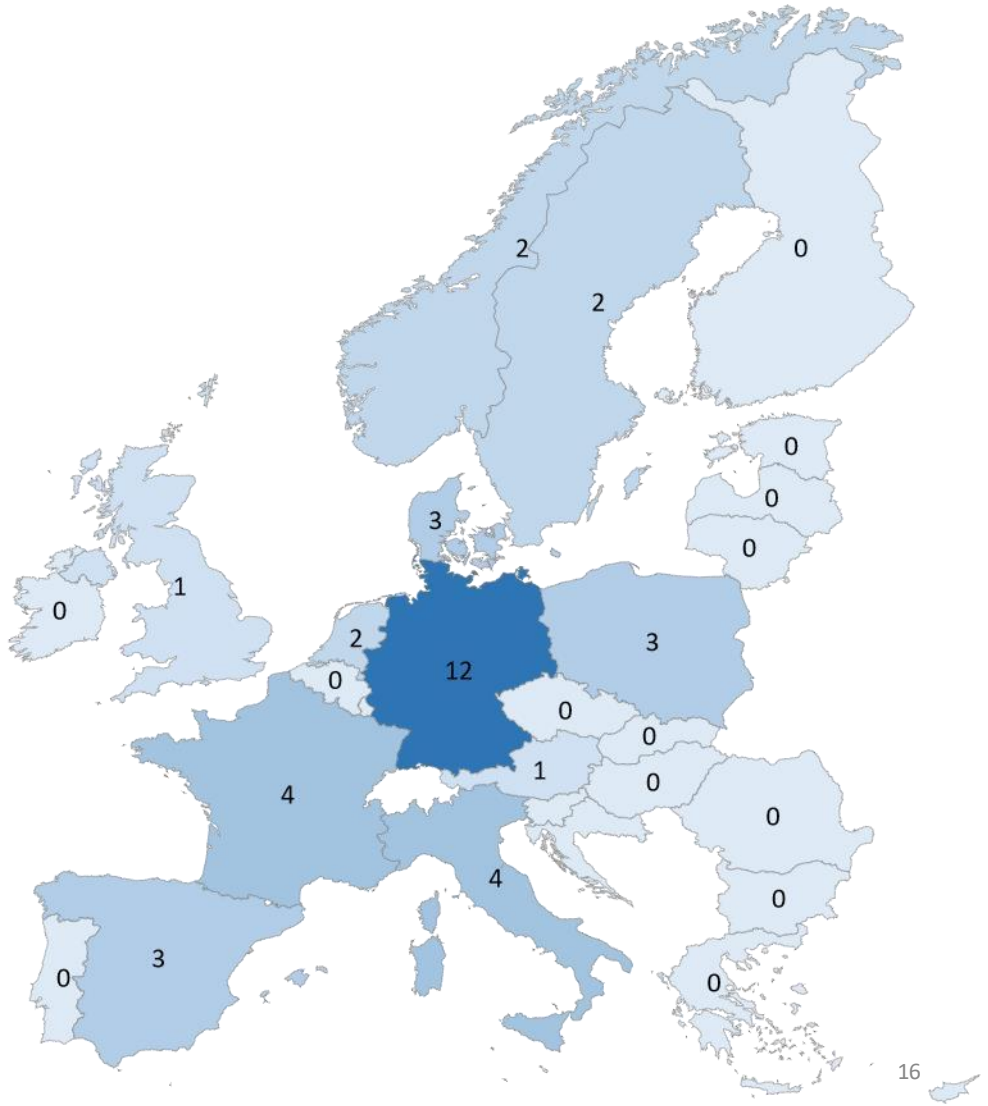
In response to a request from the Commission, we have created an overview of projects in the "pipeline" classified by

- (1) level of maturity,
- (2) priorities as expressed in the ETS Innovation funds decision and
- (3) country
- (4) indicative level of the project's budget

At this stage we have a total of **38 projects** with a total budget of **EUR 3.2 –4.4 Billion**

This includes **more than 20 mature and ambitious projects** that could be ready for the 2020 call, for a total amount of **EUR 2.5 –3.2 Billion**

Location of the projects



Contacts

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Belgium

E-mail: secretariat@hydrogeneurope.eu

Tel.: +32 2 540 87 75

www.hydrogeneurope.eu

Status HRS Flanders

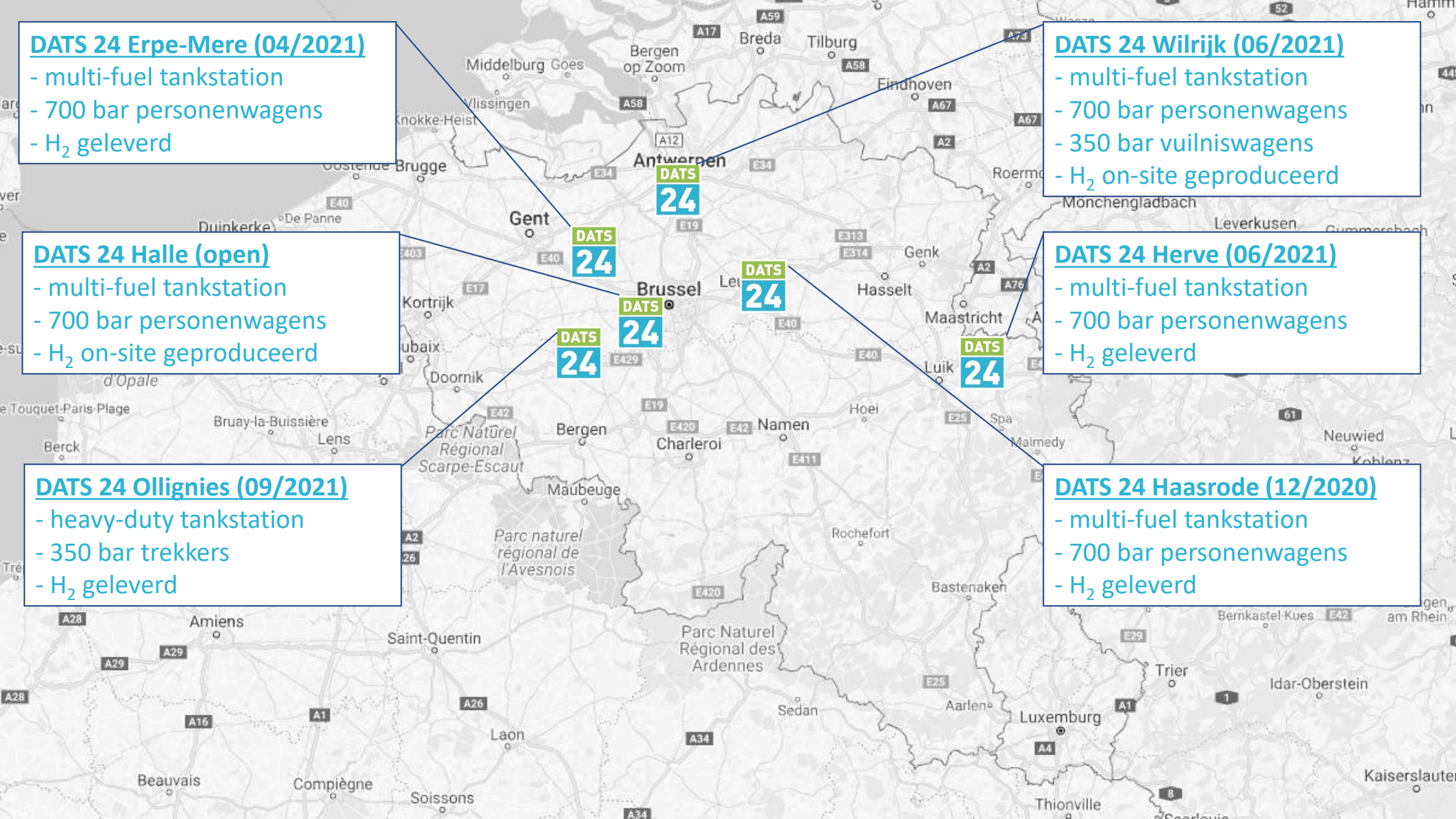
Jonas Cautaerts

Availability 97,0%
State of charge 95,4%

Waterstoftankstations België

4,3 ton - 21 wagens

DATS 24


DATS 24 Erpe-Mere (04/2021)
- multi-fuel tankstation
- 700 bar personenwagens
- H_2 geleverd
DATS 24 Wilrijk (06/2021)
- multi-fuel tankstation
- 700 bar personenwagens
- 350 bar vuilniswagens
- H_2 on-site geproduceerd
DATS 24 Halle (open)
- multi-fuel tankstation
- 700 bar personenwagens
- H_2 on-site geproduceerd
DATS 24 Herve (06/2021)
- multi-fuel tankstation
- 700 bar personenwagens
- H_2 geleverd
DATS 24 Ollignies (09/2021)
- heavy-duty tankstation
- 350 bar trekkers
- H_2 geleverd
DATS 24 Haasrode (12/2020)
- multi-fuel tankstation
- 700 bar personenwagens
- H_2 geleverd
Antwerpen
Gent
Brussel
Leuven
Brugge
Middelburg
Bergen op Zoom
Breda
Tilburg
Eindhoven
Hasselt
Genk
Maastricht
Luik
Kortrijk
Doornik
Bergen
Charleroi
Namen
Hoei
Spa
Malmedy
Neuwied
Koblenz
Mönchengladbach
Leverkusen
Roermond
Duinkerke
De Panne
Oostende
Knokke-Heist
Vlissingen
Berck
Bruay-la-Buissière
Lens
Le Touquet-Paris-Plage
Parc Naturel Régional Scarpe-Escaut
Maubeuge
Parc naturel régional de l'Avesnois
Rochefort
Bastenaken
Amiens
Saint-Quentin
Laon
Sedan
Parc Naturel Régional des Ardennes
Aarlen
Luxemburg
Trier
Bernkastel-Kues
Idar-Oberstein
Beauvais
Compiègne
Soissons
Thionville
Kaiserslautern


NEDERLAND
BELGIË
UTRECHT
ARNHEM
ROTTERDAM
EINDHOVEN
BRUGGE
GENT
HASSELT
BRUSSEL
DATS 24
DATS 24
DATS 24
DATS 24
DATS 24
storm
Polders Investeringsfonds nv
BERKMAN
Ballast Nedam
suez
Nedstack
Port of Antwerp
CMB
BLUEGATE
Oiltanking
BEHYDRO
DEME
TOTAL
PORT OF ZEEBRUGGE
AGFA
remeha
Q8
Shipit
SOLENCO POWER
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TERRANOVA SOLAR
trucks
DENYS
NIPPON GASES
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borit
HYDROGENICS
POM
Tessenderlo Group
EVERY MOLECULE COUNTS
VDL
fluvius
TOYOTA
VANHOOL
Eneco
Aspiravi
ANGLO BELGIAN CORPORATION
We power your future
Atlas Copco
Air Liquide
DELHAIZE
von KARMAN INSTITUTE FOR FLUID DYNAMICS
pom
Limburg economisch versnellen
De Vlaamse Waterweg
COCAS
COLRUYT GROUP
luminus
fluxys
PMV
HYUNDAI
NEW THINKING. NEW POSSIBILITIES.
FARYS
renewi
SIEMENS
Ingenuity for life
ENGIE
TRACTEBEL
INFRABEL
COBRA
WATERSTOF INDUSTRIE CLUSTER

VLAAMSE REGERING 2019-2024

REGEERAKKOORD

We werken samen met de industrie aan oplossingen voor grote maatschappelijke uitdagingen. De klimaatuitdaging zetten we om in een economische opportuniteit. Het genomen engagement met betrekking tot de Moonshot "Vlaanderen CO2-neutraal" wordt gehonoreerd. We realiseren voor dit onderzoeksprogramma een decretaal kader dat rechtszekerheid kan bieden voor de lange termijn. We ondersteunen de uitbouw van CCS-netwerken en CCU-installaties (Carbon Capture & Storage/Usage), en doen hiervoor maximaal beroep op Europese middelen. We investeren in dit verband ook verder in onderzoek naar duurzame en hernieuwbare energie. We hebben hierbij de ambitie om Europese koploper te worden in onder meer waterstof.

Momentum is NU

jonas.cautaerts@colruytgroup.com

News from the cluster and WaterstofNet

NEW MEMBERS SINCE MARCH

WATERSTOF INDUSTRIE CLUSTER

Tessenderlo Group
EVERY MOLECULE COUNTS

von KARMAN INSTITUTE FOR FLUID DYNAMICS

De Vlaamse Waterweg nv

PRESENTATIONS NEW MEMBERS

WATERSTOF INDUSTRIE CLUSTER

Ballast Nedam Industriebouw

GASCOMPONENTEN

Tessenderlo Group
EVERY MOLECULE COUNTS

NIPPON GASES

von KARMAN INSTITUTE FOR FLUID DYNAMICS

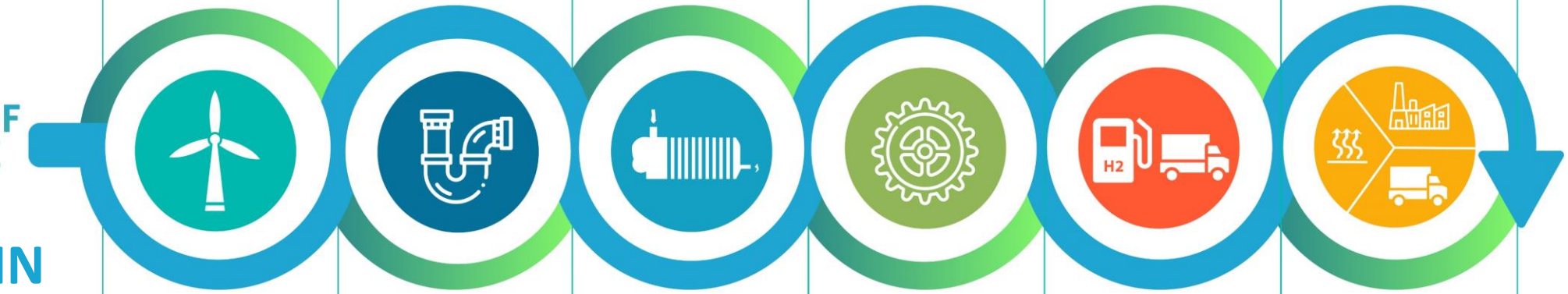
De Vlaamse Waterweg nv

➔ Presentations in September


storm
Polders Investeringsfonds nv
Antwerpse duurzame investeringsmaatschappij
BERKMAN
Sinds 1903
Ballast Nedam
UTRECHT
Nedstack
PEM FUEL CELLS
Port of Antwerp
CMB
BLUEGATE
ANTWERP
Oiltanking
suez
ROTTERDAM
ARNHEM
BEHYDRO
DEME
Dredging, Environmental & Marine Engineering
TOTAL
PORT OF ZEEBRUGGE
AGFA
remeha
Q8
NEDERLAND
Shipit
Multimodal Logistics
SOLENCO POWER
WaterstofNet
the green wave
in power solutions
www.vanwingen.be
TERRANOVA SOLAR
EINDHOVEN
trucks europe
H2
DENYS
www.denys.com
BRUGGE
ANTWERPEN
NIPPON GASES
The Gas Professionals
umicore
materials for a better life
GENT
borit
BELGIË
HASSELT
HYDROGENICS
SHIFT POWER | ENERGIZE YOUR WORLD
POM
maakt werk van West-Vlaanderen
BRUSSEL
PLASTIC OMNIUM
Tessenderlo Group
EVERY MOLECULE COUNTS
VDL
BUS & COACH
fluvius.
TOYOTA
VANHOOL
Eneco
Aspiravi
SAMEN GEDREVEN DOOR DE WIND
ANGLO BELGIAN CORPORATION
We power your future
Atlas Copco
Air Liquide
creative oxygen
DELHAIZE
von KARMAN INSTITUTE FOR FLUID DYNAMICS
De Vlaamse Waterweg nv
pom
Limburg economisch versnellen
HYUNDAI
NEW THINKING. NEW POSSIBILITIES.
COCAS
COLRUYT GROUP
luminus
fluxys
PMV
DOE- EN DURFBEDRIJF
FARYS
renewi
waste no more
SIEMENS
Ingenuity for life
ENGIE
TRACTEBEL
ENGIE
INFRABEL
Right On Track
COBAT
H2
WATERSTOF INDUSTRIE CLUSTER

WATERSTOF INDUSTRIE CLUSTER

VALUE CHAIN



PRODUCTION RENEWABLE ENERGY & H2

- Aspiravi – SAMEN GEDREVEN DOOR DE WIND
- EOLY – COLRUYTGROUP ENERGY
- Tessenderlo Group – EVERY MOLECULE COUNTS
- ENGIE
- TERRANOVA SOLAR
- luminus
- Polders Investeringsfonds nv – Antwerpse duurzame investeringsmaatschappij
- SUEZ
- storm
- Eneco

TRANSPORT & DISTRIBUTION OF H2

- Air Liquide – creative oxygen
- fluvius.
- DENYS – www.denys.com
- Oiltanking
- fluxys
- NIPPON GASES – The Gas Professionals

H2 TECHNOLOGY

- AGFA
- Atlas Copco
- ANGLO BELGIAN CORPORATION – We power your future
- von KARMAN INSTITUTE FOR FLUID DYNAMICS
- www.vanwingen.be
- Nedstack – PEM Fuel Cells
- COCAS
- borit
- remeha
- SIEMENS – Ingenuity for life
- PLASTIC OMNIUM
- HYDROGENICS – SHIFT POWER | ENERGIZE YOUR WORLD
- umicore – materials for a better life
- SOLENCO POWER

SYSTEM INTEGRATION

- BLUEGATE – ANTWERP
- De Vlaamse Waterweg nv
- DEME – Dredging, Environmental & Marine Engineering
- pom Limburg economisch versnellen
- FARYS
- Port of Antwerp
- POM
- TRACTEBEL – ENGIE
- PORT OF ZEEBRUGGE
- WaterstofNet
- PMV – DOE- EN DURFBEDRIJF

H2 APPLICATION

- BERKMAN – Sinds 1903
- VANHOOL
- DATS 24
- CMB
- TOTAL
- Q8
- Shipit – Multimodal Logistics
- TOYOTA
- VDL – BUS & COACH
- Ballast Nedam – Industriebouw
- Etrucks europe – H_2
- HYUNDAI – NEW THINKING. NEW POSSIBILITIES.

H2 END USER

- DELHAIZE
- INFRABEL – Right On Track
- COLRUYT GROUP
- renewi – waste no more

MEMBERS PORTAL AND WEBSITE

- Old Power-to-Gas website incorporated in WaterstofNet site
- Translation in English in progress
- Members portal operational
  - Current content:
    - Cluster expert matrix
    - Presentations from meetings
    - Newsletters
  - Expected content
    - Cluster documents
    - Overview funding instruments

NEWSLETTER

- Monthly newsletter

- Spam issues
  - ➢ Please accept “Waterstof Industrie Cluster” yannick.vandenbroeck@waterstofnet.eu as trusted sender

- Share your news with us!

Newsletter May 2020

WATERSTOF INDUSTRIE CLUSTER

Dear Yannick,

First of all we hope that each and every one of you is safe and healthy in these turbulent Corona times. Secondly, we hope that the economic impact on your company due to this crisis is manageable. As Waterstof Industrie Cluster we are convinced that the Green Deal is the way forward for a sustainable economic recovery of Europe. Obviously, hydrogen is an important part of this. In the meantime Corona is still ruling our daily lives, which means that we will organise the cluster meeting of June 3 as a digital meeting. Please find more details below.

News from our cluster members

DOCUMENTS FROM THE CLUSTER

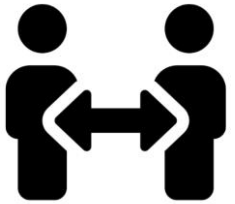
- Strategic hydrogen vision Flanders
  - Bottom-up via questionnaire
  - Will be presented to Flemish government
  - Timing: autumn

- H2 status report
  - Ongoing projects from cluster members
  - Yearly update
  - Timing: end of the year

CLUSTER ACTIVITIES

- Working visit ‘South meets North’
  - Postponed due to Corona
  - New dates: 24 – 25 September (TBC)
  - Check for interest and possibility to go by questionnaire in summer

- Hydrogen conference
  - December 7: full day
  - Location: Mechelen (TBC)
  - Keynote speakers
  - Corona?



CLUSTER ACTIVITIES

- **Hydrogen Academy**
  - Postponed due to Corona
  - New dates: 12/10, 19/10, 26/10, 9/11 and 16/11
  - Webinar if necessary
  - Fully booked: next one in early 2021

- **Workshop permitting procedures FL**
  - Organized together with VITO
  - Timing: end of October/early November
  - Location: Flanders (TBC)
  - WIC members invited

EUROPEAN INITIATIVES

- IPCEI Hydrogen
  - Green Octopus: hydrogen backbone between France - Belgium - The Netherlands - Germany
  - Expressions of interest 5th of May: 20+ companies
  - More substantial submission by 5 June 2020
  - Contact us for info or help
  - Unsure how Belgium/Flanders will support

EUROPEAN INITIATIVES

- **Some elements of the Green Deal call (link)**
  - **Support for pilot applications, demonstration projects and innovative products**
  - **Development and demonstration of 100MW electrolyser**
  - **Hydrogen also mentioned as clean heating option and to realise green maritime and inland ports**
  - **Budget: close to €1 billion**
  - **Timing proposals: mid-September 2020 - end January 2021**

EUROPEAN INITIATIVES

- EU hydrogen strategy (link)
  - Role of clean hydrogen in reducing EU economy's carbon emissions
  - Roadmap: H2 approach in strategy for energy system integration
  - Deadline feedback: June 5
  - WIC prepared draft to check with members
    - Flanders – Southern Netherlands = potential H2 hub
    - Cross-border collaboration, regulatory barriers and dedicated support mechanisms

EUROPEAN INITIATIVES

- **Penta Declaration Signed (link)**
  - Joint political declaration of the Pentalateral Energy Forum on the role of hydrogen to decarbonise the energy system in Europe
  - Austria, Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland
  - Production clean H2, common long-term vision, possible objectives for 2030 and beyond, certification for clean hydrogen, hydrogen blending, develop common concepts for cooperation, …

PRACTICAL ARRANGEMENTS

- Next cluster meeting: September 16 @ ABC (Ghent)
  - ✓ Hopefully ‘back as usual’

- Reschedule of cluster meeting December ➔ November 18
  - ✓ Location TBC
  - ✓ Outlook invite will be sent

Power to Methanol project Port of Antwerp

Didier Van Osselaer

Port of Antwerp


ENGIE
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inovyn
INDAVER
Oiltanking
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The Investment Partners

"ENGIE's purpose is to act to accelerate the transition towards a carbon-neutral economy, through reduced energy consumption and more environmentally-friendly solutions. The purpose brings together the company, its employees, its clients and its shareholders, and reconciles economic performance with a positive impact on people and the planet.."

Fluxys is a fully independent gas infrastructure group active across Europe in gas transmission & storage and liquefied natural gas terminalling. Fluxys is committed to accommodate hydrogen, biomethane or any other carbon-neutral energy carrier of the future and to help developing Carbon Capture and Storage/Utilisation chains

Indaver biedt afvaloplossingen aan industriële bedrijven en openbare besturen en is een leverancier van hoogwaardige grondstoffen en hernieuwbare energie.

INOVYN is a vinyls producer that ranks among the top three worldwide. Our portfolio consists of an extensive range of class leading products arranged across General Purpose Vinyls, Specialty Vinyls, Organic Chlorine Derivatives, Chlor Alkali and Electrochemical & Vinyls Technologies.

Is one of the largest independent operators of tank terminals for oils, gases and chemicals worldwide. As Oiltanking we want to ensure "peace of mind in liquid storage logistics" going forward. This peace of mind should extend to all stakeholders. As a quality service provider, we focus on our customers' needs by providing innovative solutions, responsibly and safely.

ParticipatieMaatschappij Vlaanderen is een publieke investerings-maatschappij die participeert in ondernemingen en die o.a. risicokapitaal verschaft aan ontwikkelingen die de transitie naar de circulaire economie versnellen.

Port of Antwerp is a public authority and active landlord for the port area. Energy transition is in the heart of our mission. A Home port as a lever for a sustainable future!

Extended Partnership configuration

Investment Partners

Engie
Fluxys
Indaver
INOVYN
Oiltanking
Port of Antwerp
ParticipatieMaatschappij Vlaanderen

Knowledge partners

VITO tbc

UA tbc

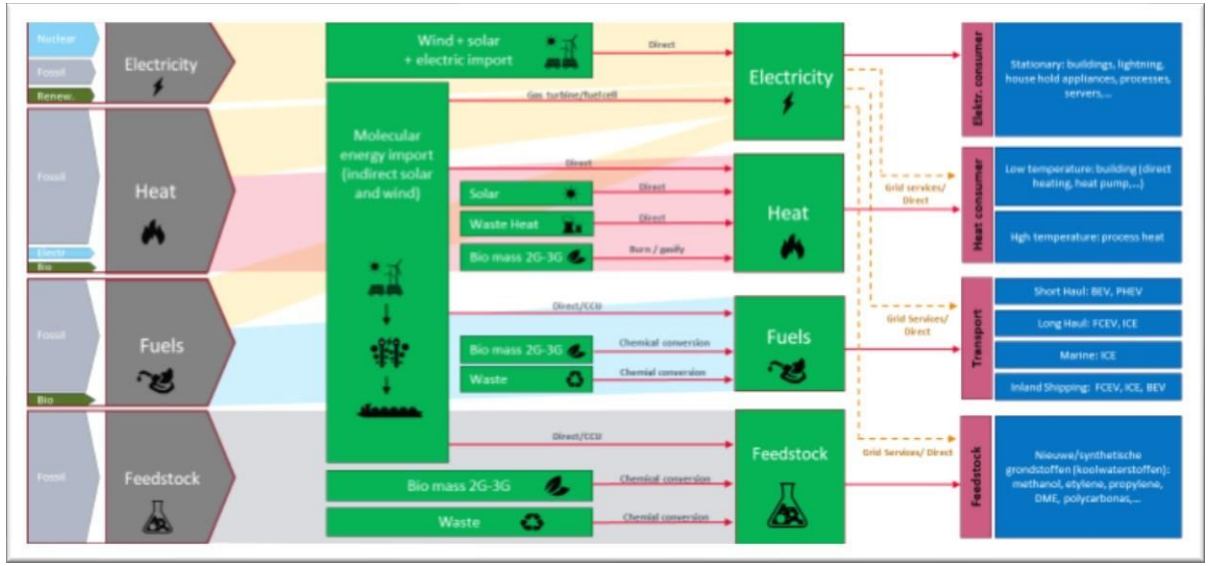
UM tbc

Associated partners

Offtake, Certification ❼ dossier ongoing

Community Building, dissimination: Waterstofnet tbc

Main conceptual ground



The future is renewable (H) and circular (C)

Wind and solar will globally be the main primary energy sources but

- Energy systems will require balancing and buffering to cope with intermittency
- Face limitations in terms of transmission capacities ❼ molecules+pipelines/ships as a transport vector
- Domestic production shouldn't be the doctrine: imports can aid to scale up, lower system cost

Electrification is an almost certain energy trend but

- Not the holy grail: molecules are the logical energy carrier for certain consumers
- Organic chemistry requires both H and C

Port of Antwerp · ENGIE · INDAVER · Oiltanking · fluxys · Inovyn · PMV DOE- EN DURFBEDRIJF

Main demonstration drivers

Learning by doing:

how process efficiency copes with operational flexibility

how synergy with industrial waste stream can increase viability

Proving how flexibility can lead to viability

Using energy market flexibility to mitigate energy costs

amortising the cost impact of flexibility by waste hydrogen synergy

Showing how CCU-based-molecules can enable transition in energy, chemistry and fuels

RED II CCUfuel lighthouse project

In support of climate action plans

Port of Antwerp

ENGIE

INDAVER

Oiltanking

fluxys

Inovyn

PMV

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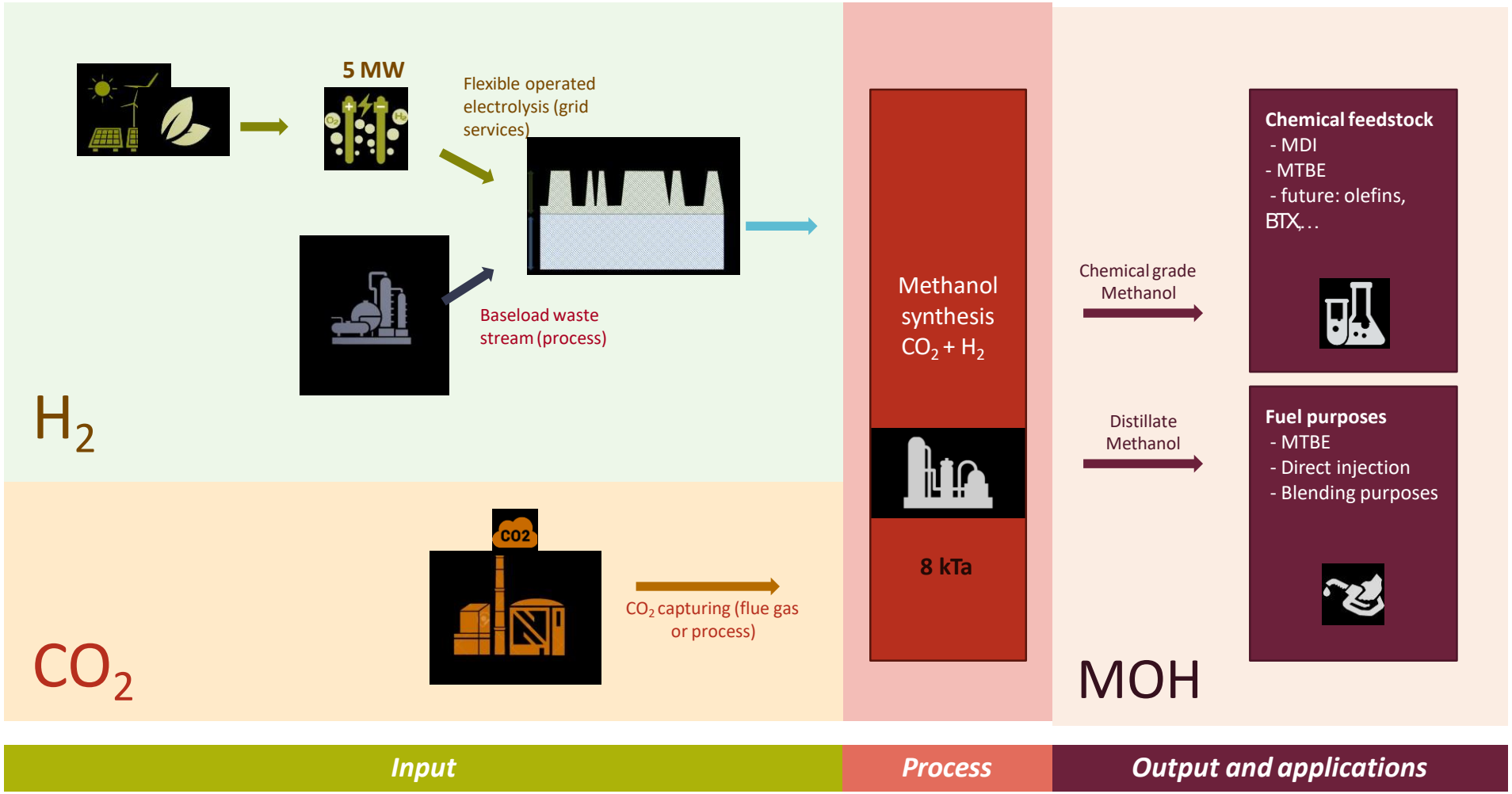
Demonstrator host site: INOVYN Lillo

High level concept



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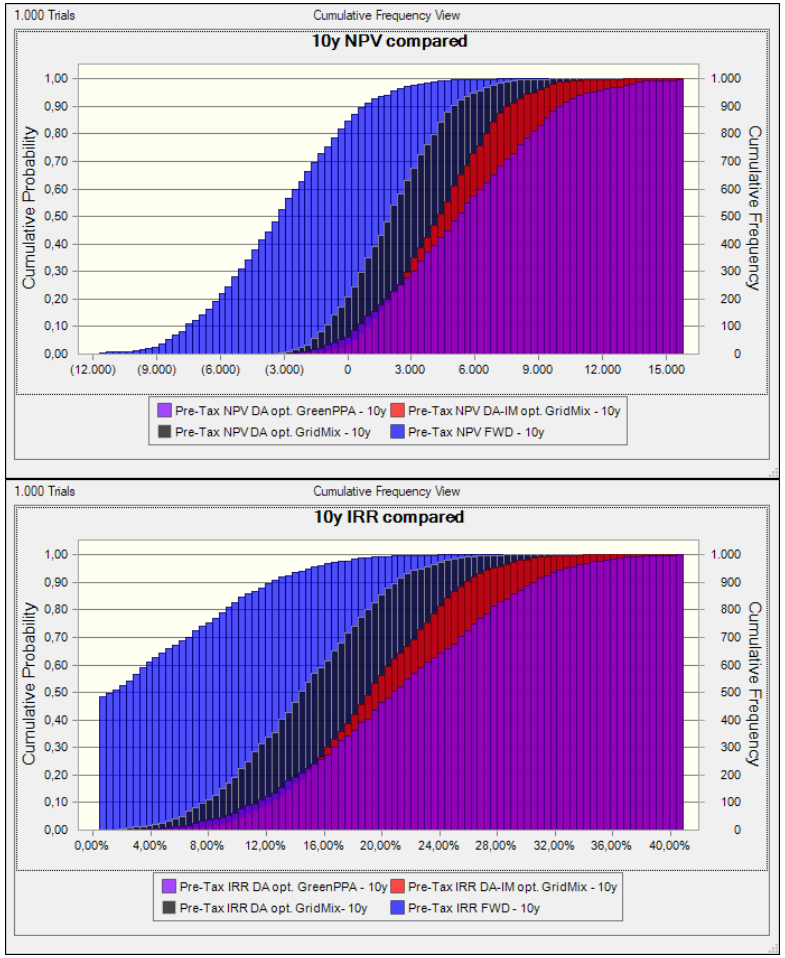
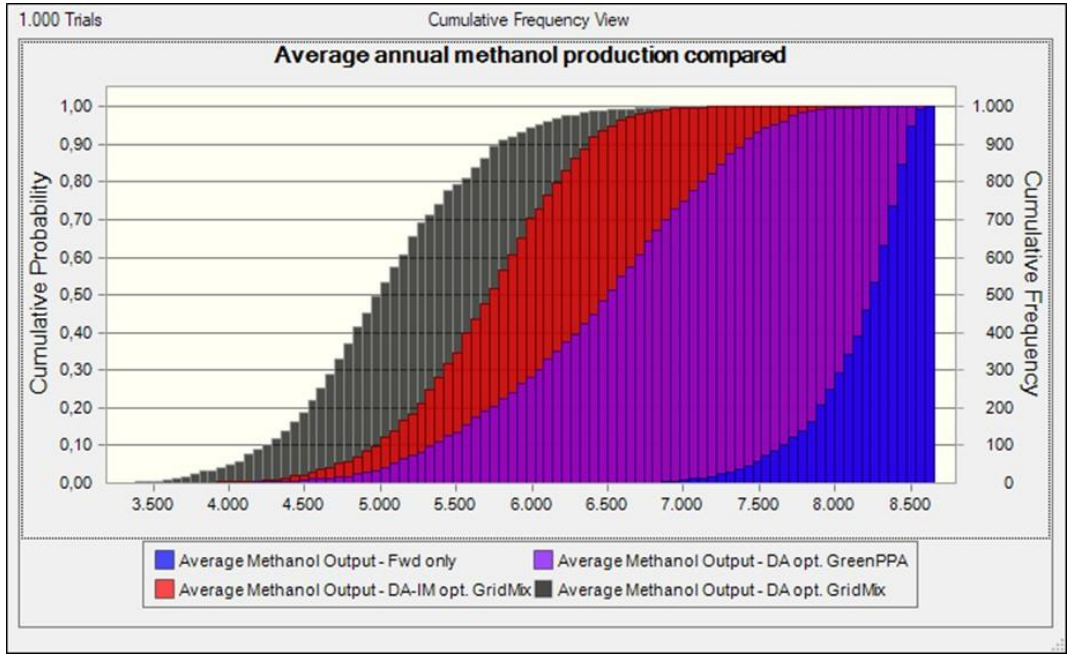
Flexibility as key parameter





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Planning

Q2-Q4 2019	Pre-FID: contractual framework, financial risk analysis
Q4 2019:	 or 
2020:	Birth of Power to Methanol Antwerp BV
	Development, design, integration
2021	Procurement
2022	Construction
2023	Commissioning – producing CCUfuels

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Thx for the attentio

The PtMA partn

Question round