MINISTÈRE
DE L'ENSEIGNEMENT
SUPÉRIEUR,
DE LA RECHERCHE
ET DE L'INNOVATION

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horizon europe

Matinée d'information et de réseautage sur « Clean Hydrogen Partnership »

29 mars 2022

Merci de couper vos micros et caméras

horizon-europe.gouv.fr

Ordre du jour

9H00-9H10 : Le partenariat Clean Hydrogen, Xavier Montagne, *ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation, Représentant FR. et co-chair au States' representatives group (SRG) de Clean Hydrogen* **et Annabelle Rondaud**, *ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation, Représentante FR au SRG de Clean Hydrogen*

9H10-9H20 : Hydrogen Europe Research, Laurent Antoni, *Responsable des affaires publiques, technologies de l'hydrogène au CEA Liten et président d'Hydrogen Europe Research*

9H20-10H10 : Présentation des appels 2022 de Clean Hydrogen, Lionel Boillot, *Project Manager, Clean Hydrogen Partnership*

10H10-10H40 : Comment préparer une bonne proposition ?, Lionel Boillot

10H40-10H50 : Questions-réponses

10H50-11H00 : Pause

11H00-12H00 : Session de réseautage animée par **Vasile Iosub,** *PCN Climat/Energie*

Le partenariat Clean Hydrogen,

Xavier Montagne, ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation,
Représentant FR et co-chair au States' representatives group (SRG) de Clean Hydrogen
Annabelle Rondaud, ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation,
Représentante FR au SRG de Clean Hydrogen

Clean Hydrogen Partnership/JU

Règlement du Conseil portant création des **entreprises communes (x9)** dans le cadre d'Horizon Europe (adopté le 19 novembre 2021 & en vigueur le 30 novembre 2021) : **Single Basic Act**

Ses **activités de recherche et d'innovation** cadrées par un doc. pluriannuel : **Strategic Research and Innovation Agenda (SRIA)**

- Production d'hydrogène renouvelable
- Transport, distribution et stockage de l'hydrogène
- Technologies d'utilisation finale dans les transports, les bâtiments et l'industrie (incl. les piles à combustible, les brûleurs, les chaudières, etc.)

Programme annuel de travail (AWP) : contient les appels à propositions
Pour 2022 : **41 topics** //budget : **300,5M€** //2 deadline : 31/05 & 20/09/2022

Clean Hydrogen Partnership en quelques mots

- **Membres de Clean Hydrogen** (art. 73 du SBA) :
  - l'**Union** représentée par la CE (50% des droits de vote - nombre de sièges indéterminés);
  - **Hydrogen Europe** AISBL (43% des droits de vote - 6 sièges)
  - et **Hydrogen Europe Reseach** AISBL (7% des droits de vote - 1 siège)

- **Organes de Clean hydrogen** (art. 77 du SBA) :
  (a) the Governing Board (3 membres : UE ; HE; HER);
  (b) the Executive Director;
  (c) the States' Representatives Group (SRG, présidé par RO et co-présidé par FR et BE); } *Advisory bodies*
  (d) the Stakeholders Group.

  Nécessité également de recueillir des avis indépendants de la communauté scientifique au sens large, par le biais d'un atelier consultatif scientifique (H2 Week/H2 Forum)

- **Budget** de Clean hydrogen : **2 milliards d'€** d'investissement public/privé (art. 74 et 75 du SBA, en hausse par rapport à H2020)

Les objectifs de Clean Hydrogen

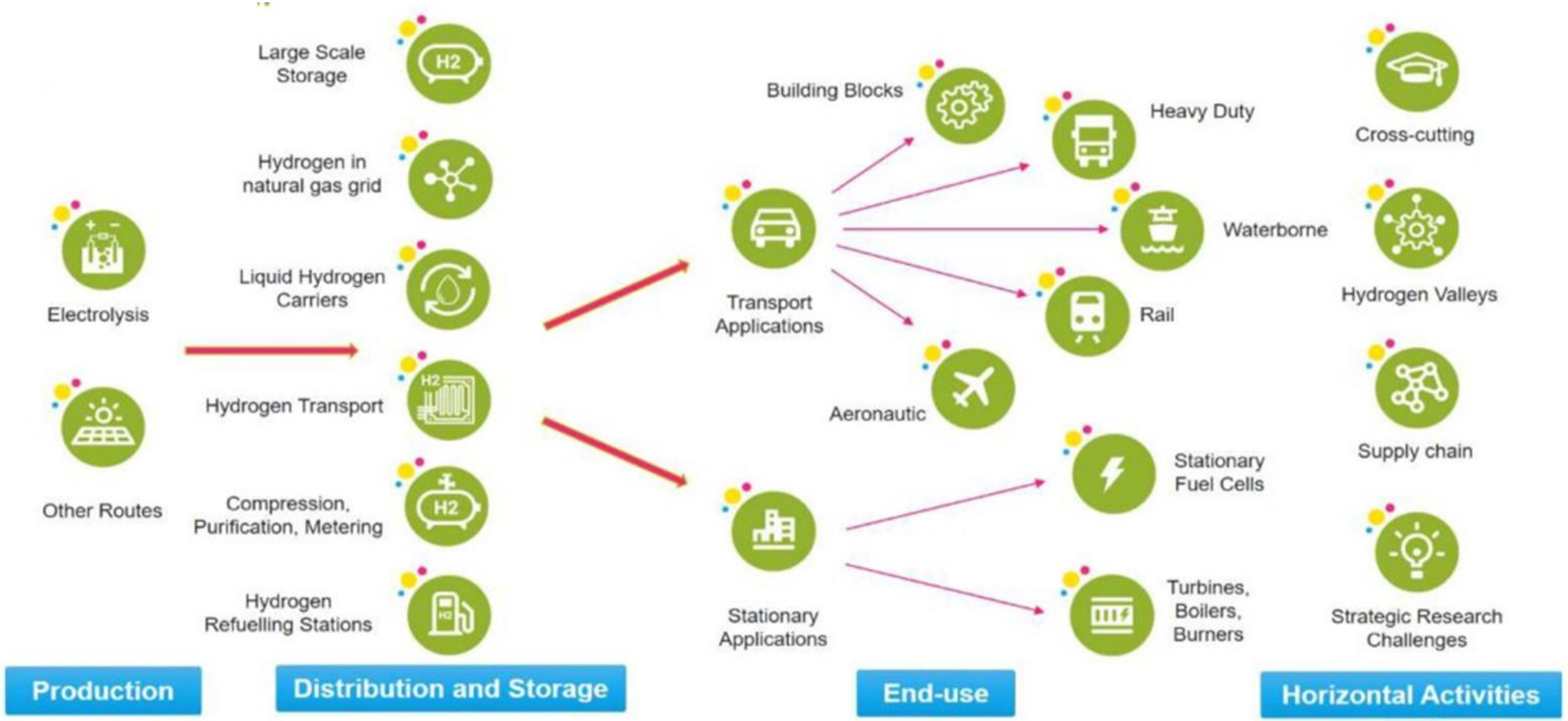
Objectifs généraux

- Soutenir la mise en œuvre de la stratégie hydrogène de la Commission
- Stimuler la R&I en matière de production d'hydrogène propre, de distribution, de stockage et d'applications d'utilisation finale
- Renforcer la compétitivité de la chaîne de valeur de l'hydrogène propre
- Contribuer aux objectifs ambitieux de l'UE pour 2030 et 2050 en matière de climat

Objectifs spécifiques

- Améliorer le rapport coût-efficacité, l'efficacité, la fiabilité, la quantité et la qualité des solutions d'hydrogène propre sur toute la chaîne de valeur
- Renforcer les connaissances/capacités des acteurs scientifiques et industriels tout au long de la chaîne de valeur de l'hydrogène de l'Union tout en soutenant l'acquisition de compétences
- Démonstrations de solutions d'hydrogène propre en vue d'un déploiement local, régional et à l'échelle de l'Union, visant à impliquer les parties prenantes dans tous les États membres et sur l'ensemble de la chaîne de valeur
- Sensibiliser davantage le public & le secteur privé (acceptation et adoption de solutions propres)

Les activités de Clean hydrogen :
Production, stockage, distribution et utilisateurs finaux



SRIA Clean Hydrogen : programme-strat-gique-de-recherche-et-d-innovation-de-clean-hydrogen-5867.pdf (horizon-europe.gouv.fr)

Les autres activités de Clean hydrogen

Des activités supplémentaires nécessaires pour remplir les objectifs de Clean Hydrogen

- Développer des **synergies avec d'autres partenariats et programmes**
- Réglementations, codes et normes
- Sécurité européenne de l'hydrogène
- Durabilité de l'hydrogène en Europe et circularité
- Gestion des connaissances
- Compétitivité, PME
- Coopération internationale
- Activités de communication

Synergies de Clean Hydrogen avec les autres partenariats et programmes européens

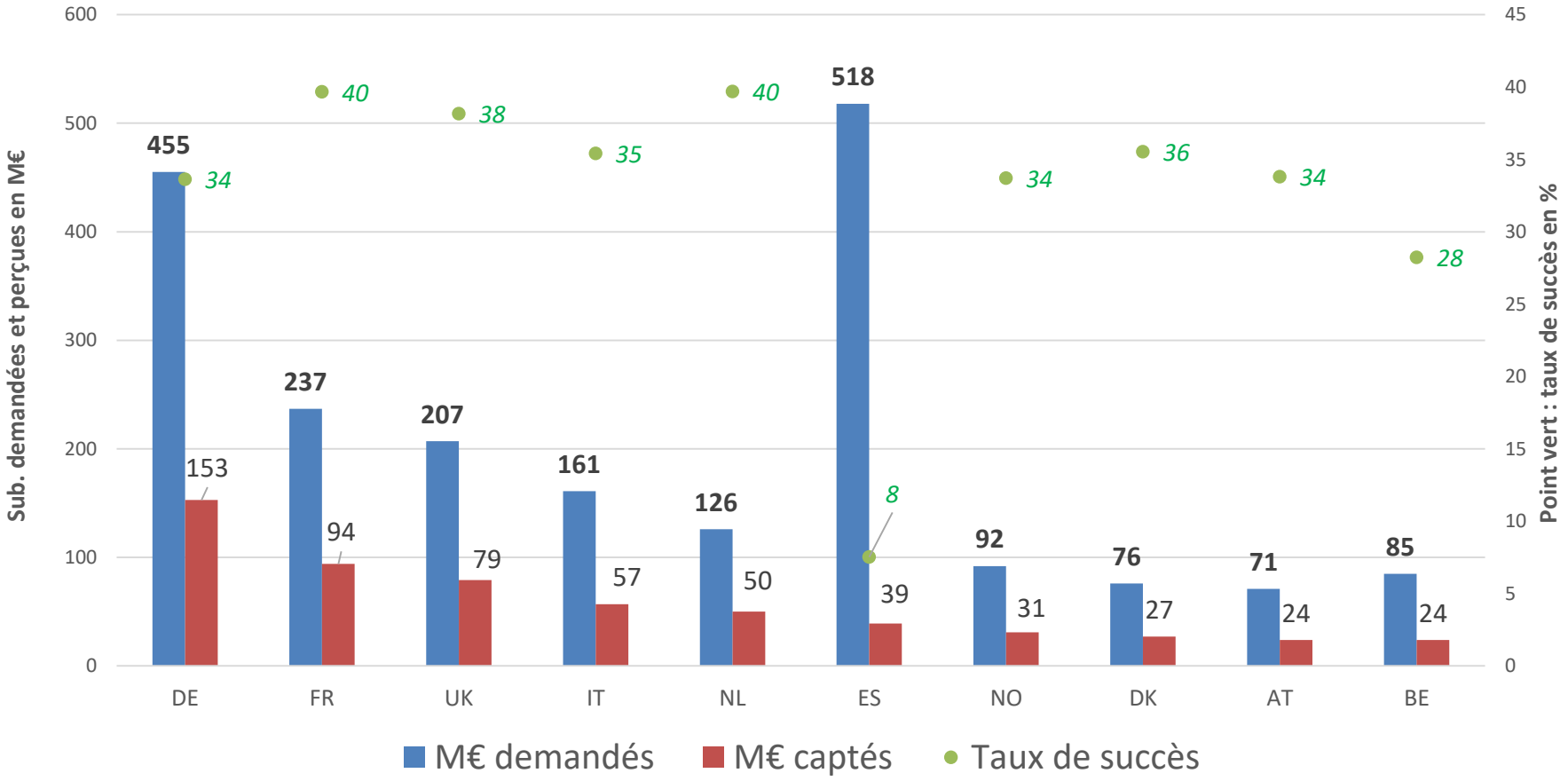
Figure 2 Mapping of EU Programmes & Funds supporting research and deployment activities for hydrogen.

Positionnement de la France sur les appels FCH JU 2014-2020

Positionnement de la France sur les appels de la FCH JU (2014-2020)

FCH JU -Taux de succès par pays

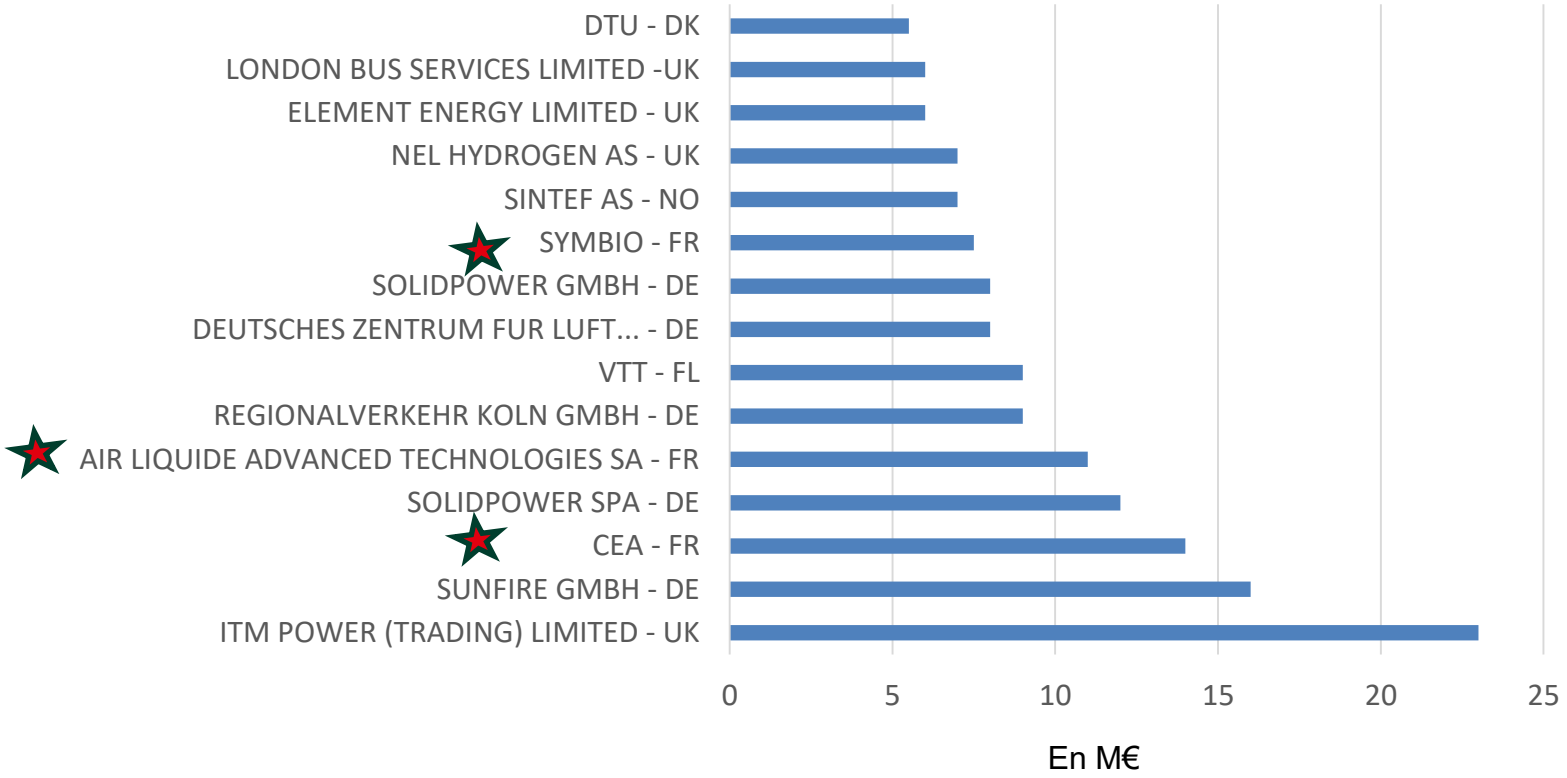
Appels 2014 à 2020 : 639M€ distribués



Source : Ecorda – oct. 2021

Place de la France dans les appels de la FCH JU (2014-2020)

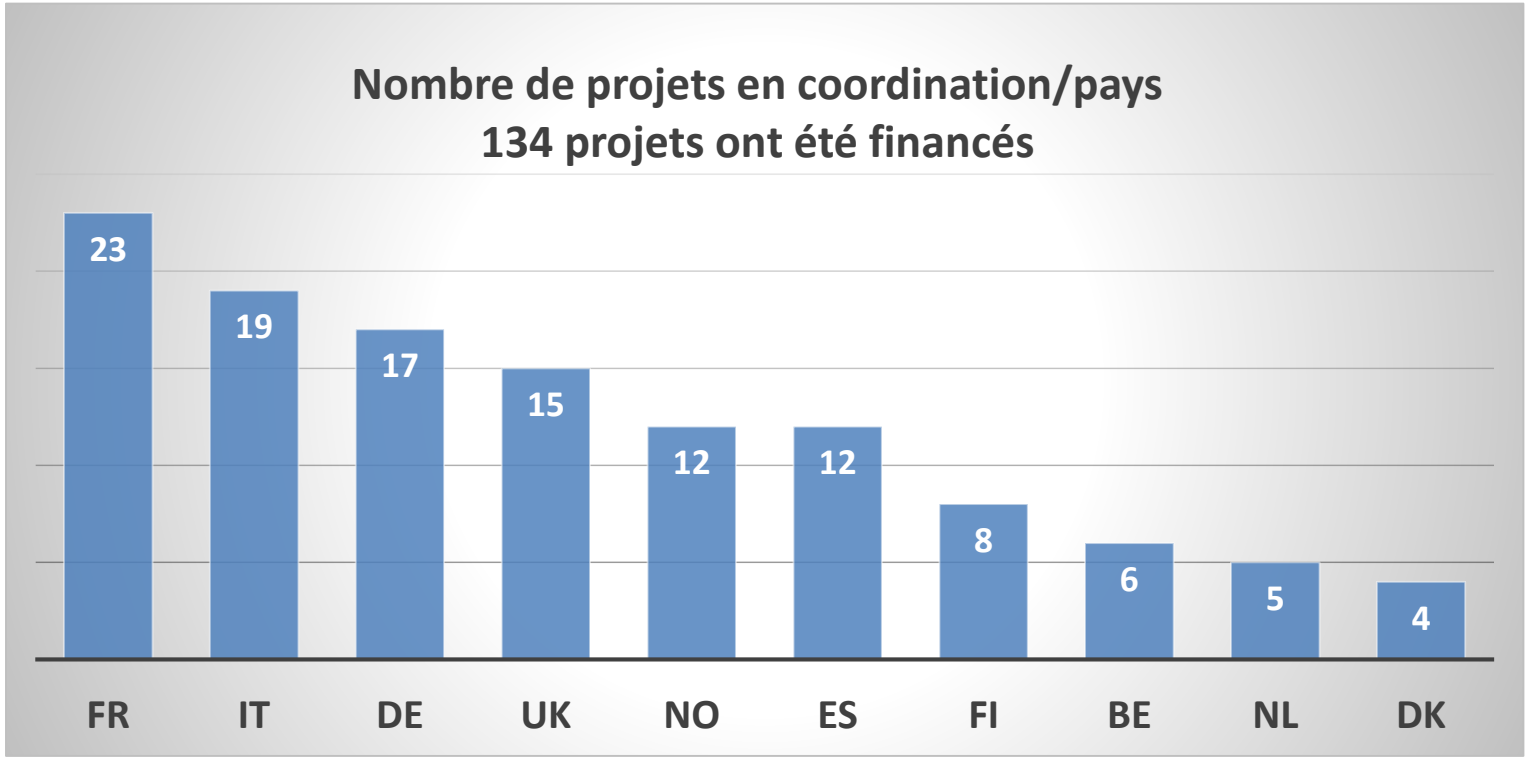
FCH JU – les 15 premiers bénéficiaires au niveau UE
Appels 2014 à 2020 - 639M€ distribués



Source : Ecorda – oct. 2021

Place de la France dans les appels de la FCH JU (2014-2020)

FCH JU – Les projets en coordination
Appels 2014 à 2020



Acteurs français coordinateurs :

- CEA
- Storengy
- CNRS
- Air liquide
- Geostock
- Centre technique des industries mécaniques
- Engie
- Faurecia
- Element energy
- Safran
- …

Source : Ecorda – oct. 2021

Infos et contacts utiles

15 mars 2022 : Infoday organisé par la Commission et Clean Hydrogen Partnership sur les appels 2022
Présentations en ligne : https://www.clean-hydrogen.europa.eu/apply-funding/info-day-2022_en

Ressources utiles :

- Single Basic Act
- Strategic Research and Innovation Agenda
- Annual Work programme
- Site Horizon Europe
- Site Clean Hydrogen Partnership

Pour vos questions sur le partenariat, ses topics :
pcn-climat-energie@recherche.gouv.fr
info@clean-hydrogen.europa.eu

Devenez experts-évaluateurs pour les appels Clean Hydrogen :
https://www.clean-hydrogen.europa.eu/media/news/call-experts-evaluation-project-proposals-2022-03-24_en

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Hydrogen Europe Research,

Laurent Antoni, Responsable des affaires publiques, technologies de l'hydrogène au CEA Liten et président d'Hydrogen Europe Research

Clean Hydrogen Joint Undertaking

EU Institutional Public-Private Partnership (IPPP)

Pour adhérer à Hydrogen Europe Research, contacter le secrétariat: secretariat@hydrogeneuroperesearch.eu

https://hydrogeneurope.eu/

To facilitate the transition to a greener EU society through the development of hydrogen technologies

Présentation des appels 2022 de Clean Hydrogen,

Lionel Boillot, Project Manager, Clean Hydrogen Partnership

Clean Hydrogen Partnership

Matinée d'information et de réseautage sur les appels 2022 de Clean Hydrogen

29 Mars 2022

Lionel BOILLOT

Clean Hydrogen Joint Undertaking

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Projects in the Clean Hydrogen JU

Clean Hydrogen Partnership

H_2 Valleys

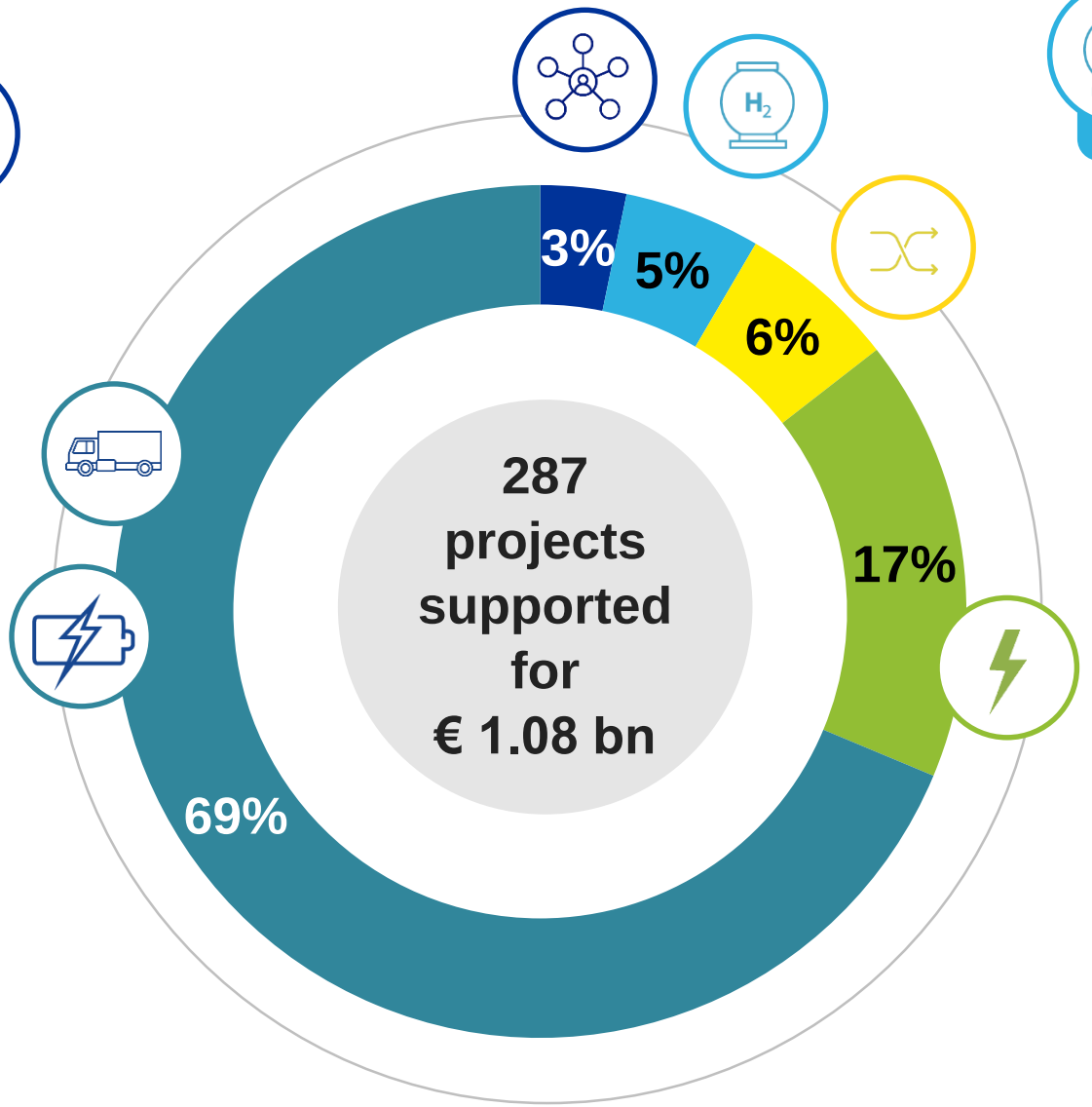
3 Projects
€ 35 million

H_2 End Uses

Transport Applications

Clean Heat and Power

159 Projects
€ 739.6 million



H_2 Storage & Distribution

22 Projects
€ 55.8 million

Cross-cutting

46 Projects
€ 65 million

H_2 Production

- Electrolysis
- Other routes

57 Projects
€ 181 million

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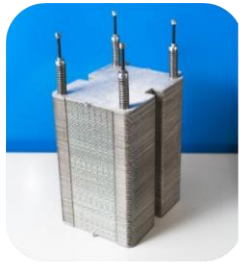
A 14 years journey of the Fuel Cells and Hydrogen JU

From research to delivering hydrogen solutions in the market: from individual applications to H2 Valleys



Manufacturing

Green H2 production

Buses

ships

Aviation

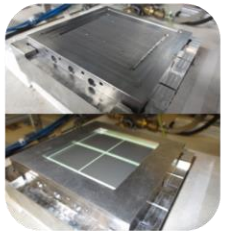
Research PoC

Domestic heat and power

Heat and power for industry

Heavy duty trucks

Logistics machinery



Materials

Gensets

Light duty vehicles

Trains

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Call for proposals 2022

Call: HORIZON-JU-CLEANH2-2022

- Hydrogen production
- Hydrogen distribution
- Transport
- Heat and Power
- Cross-cutting
- Hydrogen Valleys

Total budget: 300.5 M€

41 topics

	Budget (EUR 300.5 million)	Publication	Deadline
First deadline	179.5	1st March 2022	31st May 2022
Second deadline	121.0	1st March 2022	20th September 2022

Types of Actions and funding rates

RIA - Research and Innovation Actions

Activities that aim primarily to establish new knowledge or to explore the feasibility of a new or improved technology, product, process, service or solution. This may include **basic and applied research,** technology development and integration, testing, demonstration and validation of a small-scale prototype in a laboratory or simulated environment.

funding rate max.**100%**

IA- Innovation Actions

Activities that aim directly to produce plans and arrangements or designs for new, altered or improved products, processes or services. These activities may include prototyping, testing, demonstrating, **piloting, large-scale** product validation and market replication.

funding rate max.**70%***

*Funding 100% for non-profit legal entities

CSA - Coordination and Support Action

Activities that contribute to the objectives of Horizon Europe. **This excludes R&I activities.** Also eligible are bottom-up coordination actions which promote cooperation between legal entities from Member States and Associated Countries to strengthen the European Research Area, and which receive no EU co-funding for research activities

funding rate max.**100%**

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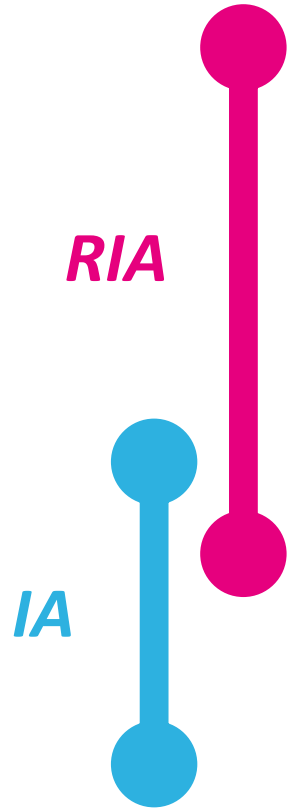
Technology readiness levels (TRL)



TRL 1 – basic principles observed

TRL 2 – technology concept formulated

TRL 3 – experimental proof of concept

TRL 4 – technology validated in lab

TRL 5 – technology validated in relevant environment

TRL 6 – technology demonstrated in relevant environment

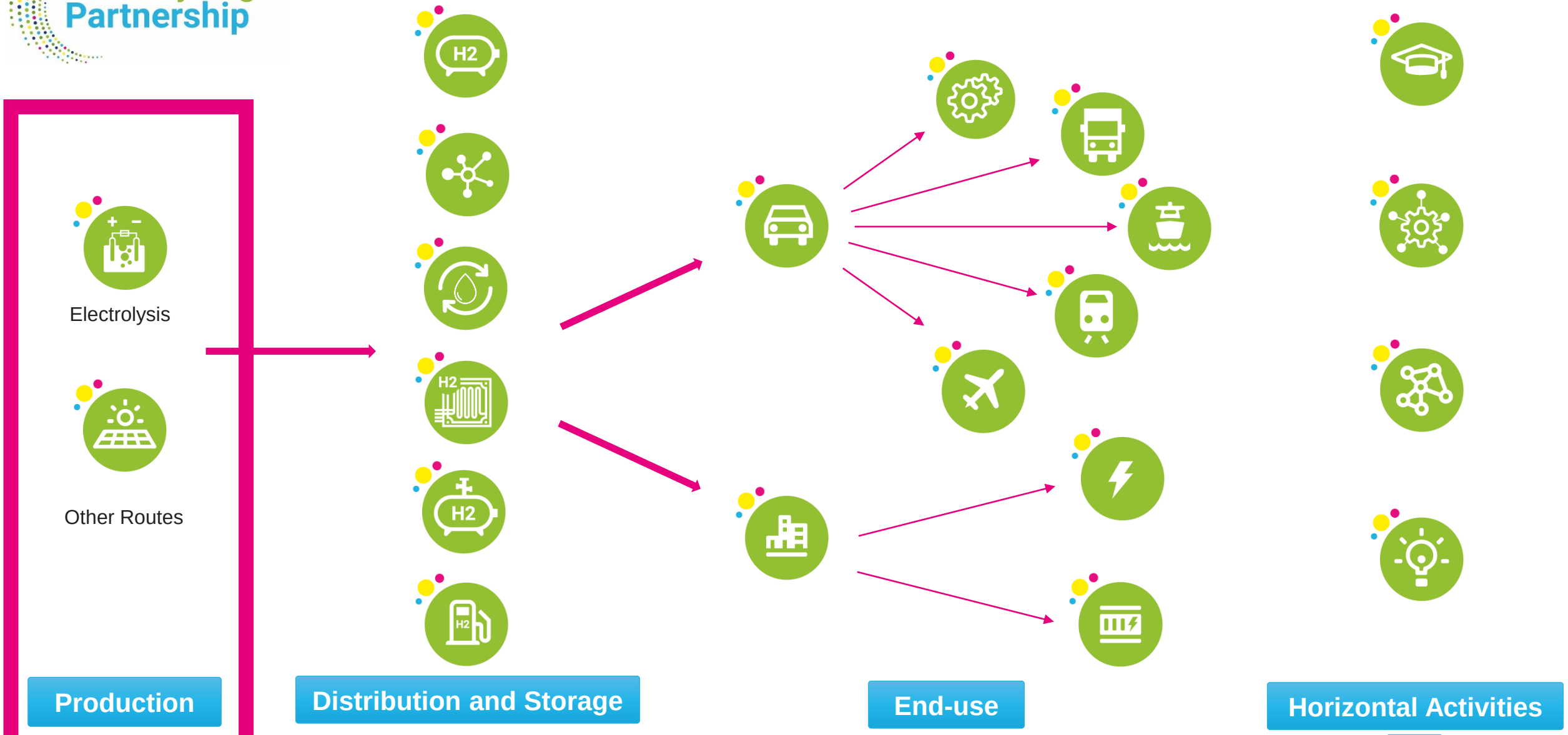
TRL 7 – system prototype demonstration in operational environment

TRL 8 – system complete and qualified

TRL 9 – actual system proven in operational environment

Manufacturing Readiness Level applies instead for Topics 01.04 and 04-01

SRIA: Research & Innovation Activities



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Renewable Hydrogen Production Overview

Main Focus

- Cost reduction and efficiency increase for renewable hydrogen production routes:
  - New LT and HT electrolyser designs for high pressure operation
  - Larger cell electrolyser stacks
  - Large scale electrolysers in industry, off-grid and offshore
  - Improved efficiency solar thermochemical H2 production.

What is new

- Circularity
- Improved electrolyser manufacturing

Renewable Hydrogen Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022 -**01-01:** Development and validation of pressurised high temperature steam electrolysis stacks (Solid Oxide Electrolysis)	RIA	2.5	31/05/2022
HORIZON-JTI-CLEANH2-2022 -**01-02**: Development and validation of pressurised high temperature steam electrolysis stacks (Proton Conducting Ceramic Electrolysis)	RIA	2.5	31/05/2022
HORIZON-JTI-CLEANH2-2022 -**01-03**: Development of low temperature water electrolysers for highly pressurised hydrogen production	RIA	2 x 2.5	31/05/2022
HORIZON-JTI-CLEANH2-2022 -**01-04**: Design for advanced and scalable manufacturing of electrolysers	RIA	2 x 2	20/09/2022
HORIZON-JTI-CLEANH2-2022 -**01-05**: Scaling up of cells and stacks for large electrolysers	RIA	6	20/09/2022
HORIZON-JTI-CLEANH2-2022-**01-06**: Efficiency boost of solar thermochemical water splitting	RIA	4	31/05/2022

Renewable Hydrogen Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-**01-07**: Bringing renewable hydrogen MW scale off-grid installations closer to technical and financial maturity	IA	9	31/05/2022
HORIZON-JTI-CLEANH2-2022-**01-08**: Integration of multi-MW electrolysers in industrial applications	IA	18	20/09/2022
HORIZON-JTI-CLEANH2-2022-**01-09**: Scaling-up technologies for SOEL	RIA	2 x 3	31/05/2022
HORIZON-JTI-CLEANH2-2022-**01-10**: Demonstrating offshore production of renewable hydrogen	IA	20	20/09/2022

Renewable Hydrogen - Topics

HORIZON-JTI-CLEANH2-2022-01-08: Integration of multi-MW electrolysers in industrial applications

Demonstrate electrolyser technologies beyond state-of-the-art in a specific industrial application

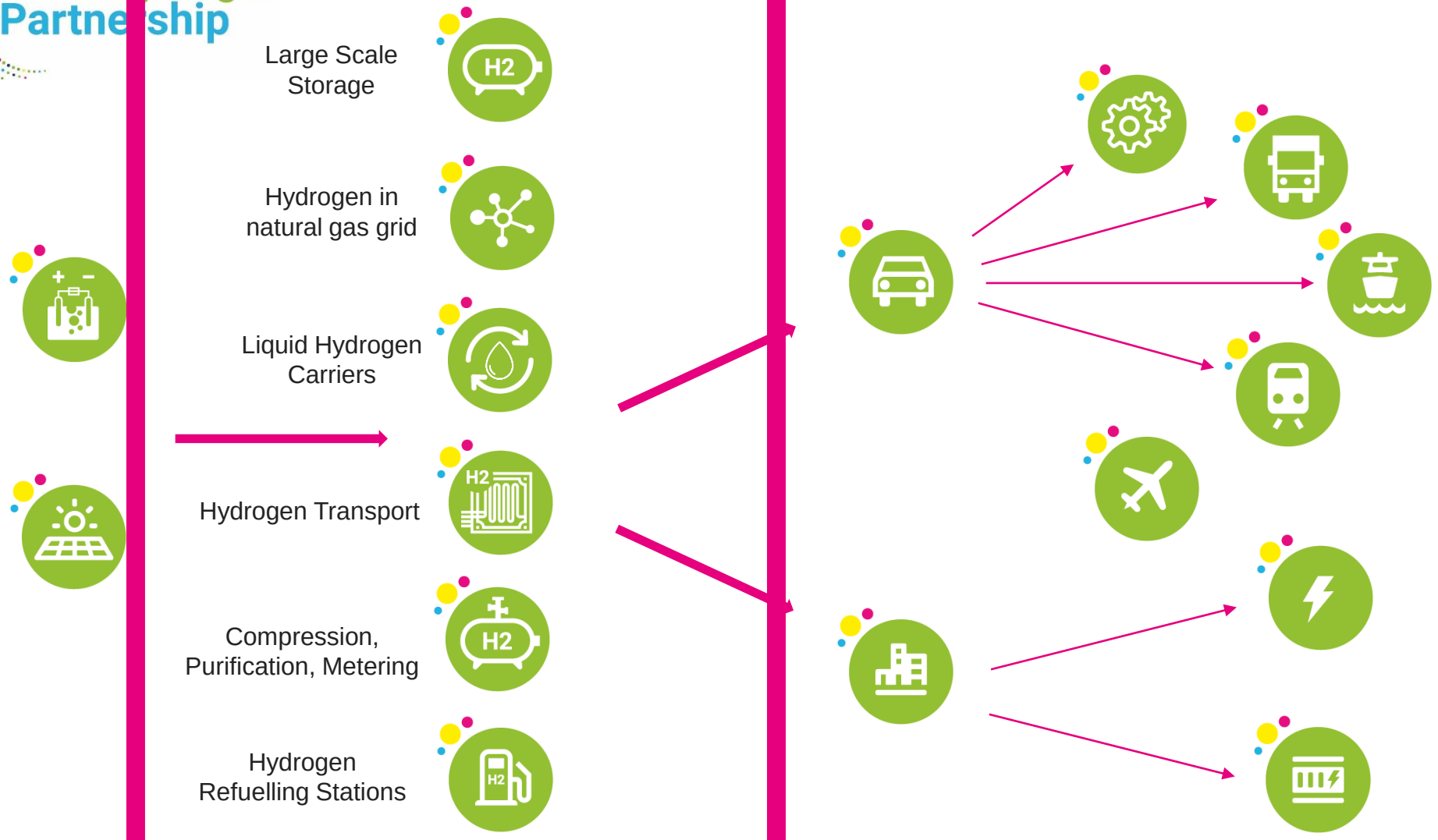
- >25MW electrolyser, LT or HT
- Possible innovations: possibly supply two customers; use of O2 and heat; grid services; footprint reduction
- Includes a go-no go decision, then 2-year operation
- Investigate synergies with Process4Planet or Clean Steel Partnerships

HORIZON-JTI-CLEANH2-2022-01-10: Demonstrating offshore production of renewable hydrogen

Design, construct and integrate a > 5MW electrolyser in an offshore infrastructure

- Re-use existing offshore oil/gas infrastructure or develop new – export wind energy as H2
- Safety aspects, remote control, autonomous operation, inspection & maintenance
- Design, construction & 2 years operation, assessment of performance (degradation, OPEX and maintenance costs), economic viability of using existing offshore infrastructure or building new

SRIA: Research & Innovation Activities



Production

Distribution and Storage

End-use

Horizontal Activities

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Hydrogen Storage and Distribution Overview

Main Focus

- Improved hydrogen carriers
- Preparing hydrogen refuelling stations for the demands of Heavy-Duty applications
- Scaling-up innovative hydrogen compression solutions

What is new

- Next generation liquefaction units and large scale liquid H2 storage for shipping.
- Developing increased capacity tube trailers
- Improving quality control for Hydrogen dispensed in HRS

Hydrogen Storage and Distribution Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-**02-01**: Compatibility of Distribution non-steel metallic gas grid materials with hydrogen	RIA	2,5	20/09/2022
HORIZON-JTI-CLEANH2-2022-**02-02**: Hydrogen and Hydrogen/Natural gas mixture leak detection system for continuous monitoring and safe operation of HRS and future Hydrogen/Natural gas mixture networks	RIA	2,5	31/05/2022
HORIZON-JTI-CLEANH2-2022-**02-03**: Validation of a high-performance hydrogen liquefier prototype	RIA	5	31/05/2022
HORIZON-JTI-CLEANH2-2022-**02-04**: Ammonia to Renewable Hydrogen: efficient system for ammonia cracking	RIA	3	20/09/2022
HORIZON-JTI-CLEANH2-2022-**02-05**: Efficient system for dehydrogenation of liquid organic hydrogen carriers	RIA	3	20/09/2022
HORIZON-JTI-CLEANH2-2022-**02-06**: Development of large scale LH2 containment for shipping	RIA	6.5	20/09/2022

Hydrogen Storage and Distribution Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-**02-07**: Increased hydrogen capacity of GH 2 road trailers	RIA	2,5	31/05/2022
HORIZON-JTI-CLEANH2-2022-**02-08**: Development of novel or hybrid concepts for reliable, high capacity and energy-efficient H2 compression systems at real-world scale	IA	5	31/05/2022
HORIZON-JTI-CLEANH2-2022-**02-09**: Sampling methodology and quality assessment of HRS	RIA	4	31/05/2022
HORIZON-JTI-CLEANH2-2022-**02-10**: Implementing new/optimised refuelling protocols and components for high flow HRS	RIA	2 x 4	31/05/2022
HORIZON-JTI-CLEANH2-2022-**02-11**: Development and demonstration of mobile and stationary compressed hydrogen refuelling solutions for application in inland shipping and short-distance maritime operations	IA	7	20/09/2022

Hydrogen Storage and Distribution - Topics

HORIZON-JTI-CLEANH2-2022-02-06: Development of large scale LH2 containment for shipping

To develop and validate containment concepts intended for the bulk shipping of liquid hydrogen

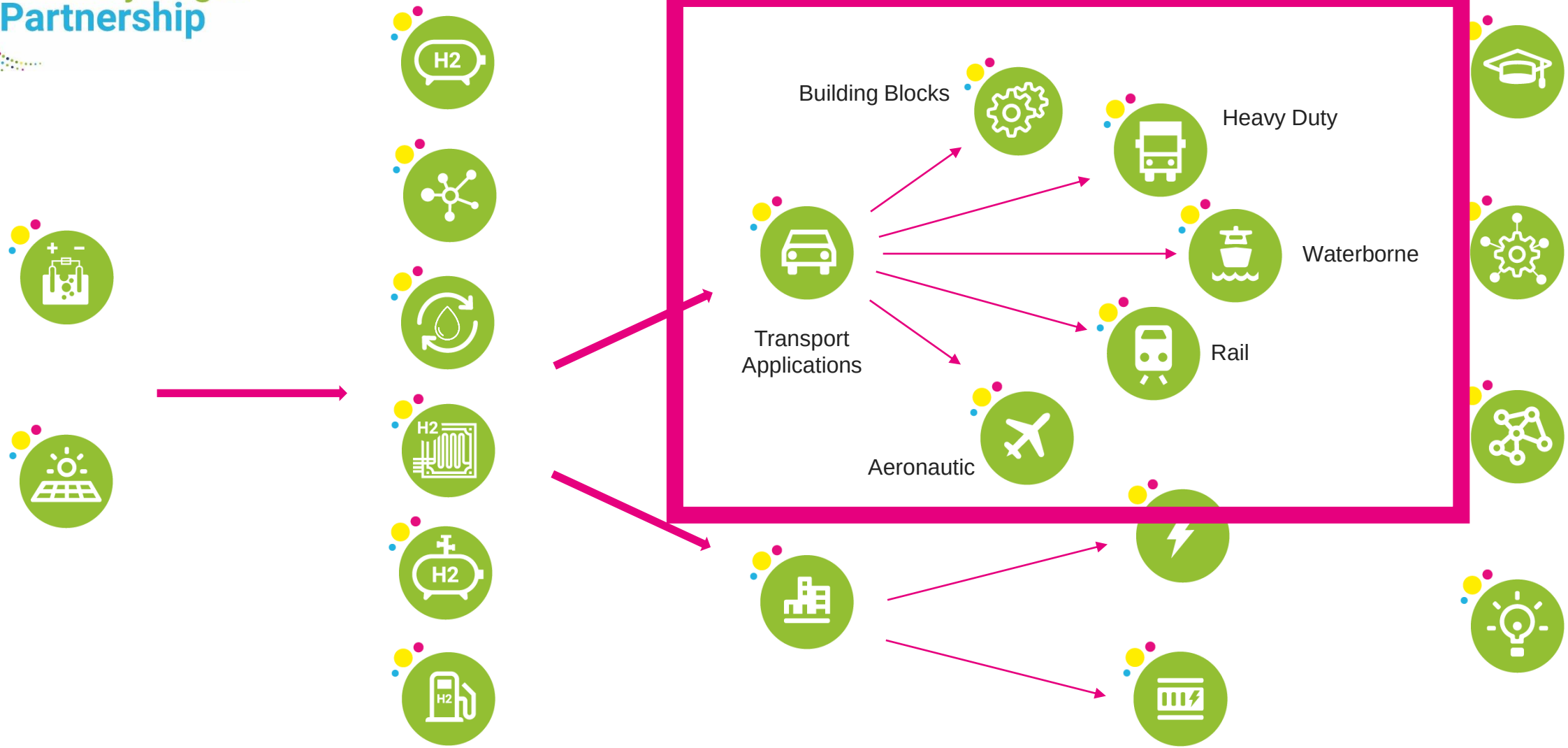
- Concept selection for large scale LH_2 containment to be used in shipping
- Detailed design, construction, and testing of a scaled-down prototype of at least 10 t LH2 capacity
- General Approval for the LH_2 containment system by one of the major IACS classification societies

HORIZON-JTI-CLEANH2-2022-02-11: Development and demonstration of mobile and stationary compressed hydrogen refuelling solutions for application in inland shipping and short-distance maritime operations

To focus on either a stationary (pipe-to-ship) or on a floating (ship-to-ship or platform-to-ship) solution

- Demonstrate smart and safe logistics solutions and develop a market standard to support front-running shipping projects.
- Techno-economic analysis of the proposed solution.
- Standardisation of the developed engineering solutions, including components such as refueller, connections, nozzles, as well as of fuelling protocols, is also a key priority.
- Synergies with HORIZON-JTI-CLEANH2-2022-03-05.

SRIA: Research & Innovation Activities



Production

Distribution and Storage

End-use

Horizontal Activities

Transport Overview

Main Focus

- Adaptation of key FC system components for heavy duty applications
- Push toward aviation propulsion: upscaling stack and LH2 storage
- Bringing the learnings from first demonstrations (inland vessels and trucks) to fleets

What is new

- Large scale demonstration of trucks
- Decarbonisation of the inland waterways
- Cooperation with Connecting Europe Facility for Transport work programme

Transport Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-**03-01**: Development and optimisation of reliable and versatile PEMFC stacks for high power range applications	RIA	2 x 3,5	20/09/2022
HORIZON-JTI-CLEANH2-2022-**03-02**: Innovative and optimised MEA components towards next generation of improved PEMFC stacks for heavy duty vehicles	RIA	2 x 3	31/05/2022
HORIZON-JTI-CLEANH2-2022-**03-03**: Large scale demonstration of European H2 Heavy Duty Vehicle along the TEN-T corridors	IA	30	31/05/2022
HORIZON-JTI-CLEANH2-2022-**03-04**: Liquid hydrogen tanks for heavy-duty vehicles	RIA	2 x 2,5	31/05/2022
HORIZON-JTI-CLEANH2-2022-**03-05**: Large scale demonstration of hydrogen fuel cell propelled inland waterway vessels	IA	15	31/05/2022
HORIZON-JTI-CLEANH2-2022-**03-06**: Development and optimisation of a dedicated Fuel Cells for Aviation: from dedicated stack (100s kW) up to full system (MWs)	RIA	20	31/05/2022

Transport Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-**03-07**: Development of specific aviation cryogenic storage system with a gauging, fuel metering, heat management and monitoring system	RIA	10	31/05/2022
HORIZON-JTI-CLEANH2-2022-**03-08**: Development and optimisation of a dedicated Fuel Cells for Aviation: disruptive next-gen high temperature Fuel Cells technology for future aviation	RIA	5	31/05/2022

Transport - Topics

HORIZON-JTI-CLEANH2-2022-03-03: Large scale demonstration of European H2 Heavy Duty Vehicle along the TEN-T corridors

Deployment and operation in real-life conditions of 150 FCH trucks.

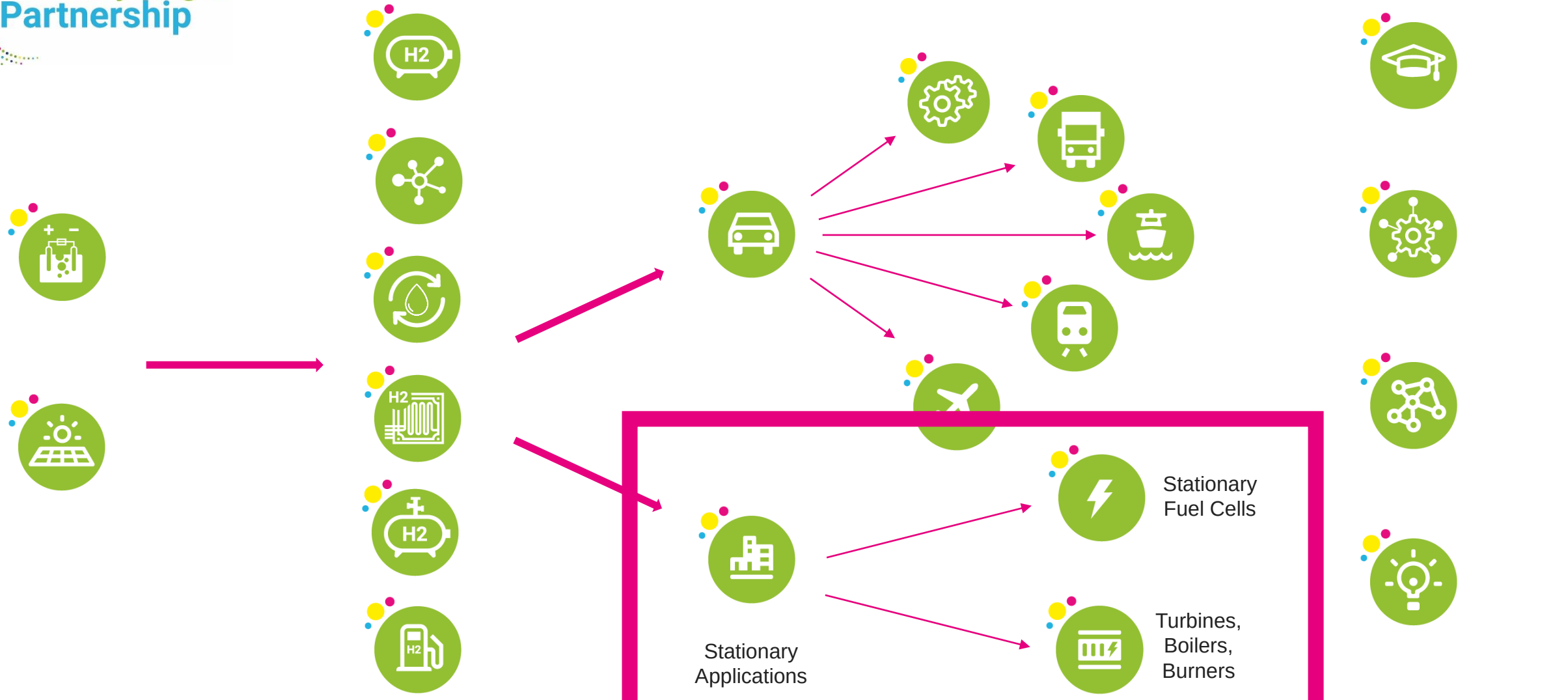
- Trucks rigid or tractors
- Minimum range for 50% of the trucks: 600 km and at least 65% of the fleet should be long haul: > 37 tons
- Trucks to be operated for a minimum of 2 years, yearly minimum milage 40.000/60.000 km (distribution/long haul)
- Solid data monitoring strategy
- Deployment along the core and comprehensive TEN-T corridors – complementary proposal to CEF Transport for the HRS funding

HORIZON-JTI-CLEANH2-2022 -03-05: Large scale demonstration of hydrogen fuel cell propelled inland waterway vessels

Deployment of 5 inland waterway vessels with fuel cells and electric propulsion.

- Retrofitting and/or new build with a focus on converting ship types with the highest impact on emissions
- FC power above 500kW and preferably at 1 MW scale (modular and easy-to-scale solution)
- Bunker hydrogen in at least 2 different ports
- Deployment along the core and comprehensive TEN-T corridors – complementary proposal to CEF Transport for the HRS funding

SRIA: Research & Innovation Activities



Co-funded by the European Union

Clean Heat and Power Overview

Main Focus

- Cost reduction through manufacturing
- Fuel and technology diversification
- Enhanced system flexibility

What is new

- Automation of manufacturing, equipment manufacturers at the core of the action
- Gas turbines running on 0-100% H2 in gas

Co-funded by the European Union

Clean Heat and Power Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-**04-01**: Design and industrial deployment of innovative manufacturing processes for solid oxide fuel cells systems and fuel cell components	IA	7	20/09/2022
HORIZON-JTI-CLEANH2-2022-**04-02**: Ammonia powered fuel cell system focusing on superior efficiency, durable operation and design optimisation	RIA	4	31/05/2022
HORIZON-JTI-CLEANH2-2022-**04-03**: Reversible SOC system development, operation and energy system (grid) integration	RIA	5.5	31/05/2022
HORIZON-JTI-CLEANH2-2022-**04-04**: Dry Low NOx combustion of hydrogen-enriched fuels at high-pressure conditions for gas turbine applications	RIA	2 x 4	31/05/2022

Clean Heat and Power - Topics

HORIZON-JTI-CLEANH2-2022 -04-01: Design and industrial deployment of innovative manufacturing processes for solid oxide fuel cells systems and fuel cell components

Automation of time-consuming manufacturing steps and time/resource efficient quality control

- adaptation & development of manufacturing processes on prototype tool, progress measured by increase in MRL
- automation/equipment manufacturer/s at the core -> beneficial to all SOC manufacturers
- several manufacturing processes can be targeted; synergies with Made in Europe partnership to be explored
- stack production cost <800 €/kW @ annual production volume of 100 MW (single manufacturing line)

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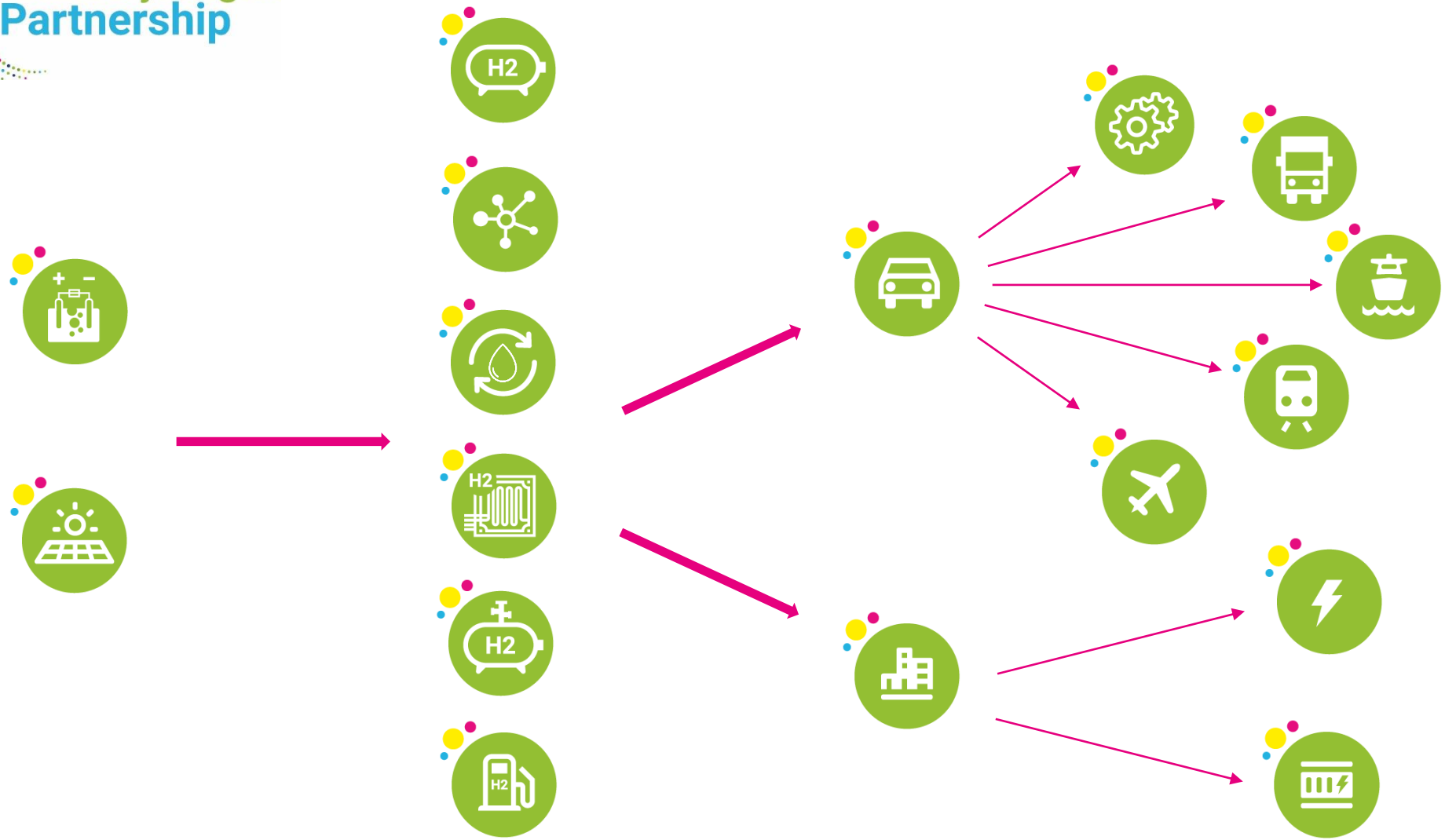
SRIA: Research & Innovation Activities



Production

Distribution and Storage

End-use

Cross-cutting

Hydrogen Valleys

Supply chain

Strategic Research Challenges

Horizontal Activities

Cross-cutting Issues - Overview

Main Focus

- Raise public awareness and trust towards FCH technologies
- Safety-related aspects of (i) Cryogenic H_2 transfers for mobile applications, (ii) H_2 injection management at network-wide level
- Test methods and requirements for measuring devices in the gas network
- Support cooperation with the African continent

What is new

- Guidance for raising awareness and trust in the public and key stakeholders in Europe
- Addressing safety aspects on (i) new distribution applications, and (ii) network management
- Test methods and limits and tolerances for currently used devices
- Shape future cooperation with African countries on renewable H_2 tech.

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Cross-cutting Issues Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-05-01: Public understanding of hydrogen and fuel cell technologies	CSA	1	20/09/2022
HORIZON-JTI-CLEANH2-2022-05-02: Safety of cryogenic hydrogen transfer technologies in public areas for mobile applications	RIA	2	31/05/2022
HORIZON-JTI-CLEANH2-2022-05-03: Safe hydrogen injection management at network-wide level: towards European gas sector transition	RIA	3	20/09/2022
HORIZON-JTI-CLEANH2-2022-05-04: Development of validated test methods and requirements for measuring devices intended for measuring NG/H2 mixtures	RIA	2	31/05/2022
HORIZON-JTI-CLEANH2-2022-05-05: Research & Innovation co-operation with Africa on hydrogen	CSA	1	31/05/2022

Hydrogen Valleys & Strategic Research Challenges Overview

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-06-01: Hydrogen Valleys (large-scale)	IA	25	20/09/2022
HORIZON-JTI-CLEANH2-2022-06-02: Hydrogen Valleys (small-scale)	IA	8	20/09/2022

Topic	Type of Action	Ind. Budget (M€)	Deadline
HORIZON-JTI-CLEANH2-2022-07-01: Addressing the sustainability and criticality of electrolyser and fuel cell materials	RIA	10	31/05/2022

Hydrogen Valleys - Topics

HORIZON-JTI-CLEANH2-2022-06-01: Hydrogen Valleys (large-scale)

Develop, deploy and demonstrate a large-scale H_2 valley with interlinkages outside its boundaries

- Production of ≥ 5,000 tonnes of renewable H_2 per year using new hydrogen production capacity (GOs)
- ≥ 2 FCH applications from ≥ 2 sectors (energy, industry, transport)
- Demonstrate: existing/new H_2 markets, contribution to economic growth, impact and replicability, commitment of stakeholders
- Financing structure and strategy describing the business model, including envisaged sources of co-funding/co-financing needed

HORIZON-JTI-CLEANH2-2022-06-02: Hydrogen Valleys (small-scale)

Develop, deploy and demonstrate a H_2 valley (particular attention to areas of Europe with no or limited presence of H_2 Valleys)

- Production of ≥ 500 tonnes of renewable H_2 per year (GOs)
- Supply more than one end sector or application (mobility, industry energy) / >20% H_2 produced for each of the 2 main applications
- Demonstrate: existing/new H_2 markets, contribution to economic growth, impact and replicability and commitment of stakeholders
- Financing structure and strategy describing the business model, including envisaged sources of co-funding/ co-financing needed

Strategic Research Challenges - Topic

HORIZON-JTI-CLEANH2-2022-07-01: Addressing the sustainability and criticality of electrolyser and fuel cell materials

Removing the CRMs and materials of environmental concerns from electrolysers and fuel cells

- Development of low or free-CRM catalysts and poly/perfluoroalkyls-free ionomers according to SRIA's KPIs
- Improvement of CRM and ionomer recycling from scraps, wastes and end-of-life equipment
- Three innovative solutions for each PEM, AEM, AEL, PCC and SOC technologies
- Breakthroughs in electrocatalysts, coatings, electrode architectures and cell designs
- Life cycle analyses

Flagship projects

expected to have significant impact in accelerating the transition to a hydrogen economy, to demonstrate the viability of clean hydrogen solutions at scale

Topic	Full Cap. Costs	Seal of Excellence	Limited JU funding		Dead line
HORIZON-JTI-CLEANH2-2022-01-08: multi-MW electrolysers in industrial applications	X			X	20/09
HORIZON-JTI-CLEANH2-2022-01-10: offshore RES to H2	X			X	20/09
HORIZON-JTI-CLEANH2-2022-03-03: HD Trucks along TEN-T	X		X	X	31/05
HORIZON-JTI-CLEANH2-2022-03-05: H2 (FC) inland waterway vessels (TEN-T)	X		X	X	31/05
HORIZON-JTI-CLEANH2-2022-06-01: H2Valleys (large)	X	X	X	X	20/09
HORIZON-JTI-CLEANH2-2022-06-02: H2Valleys (small)	X	X	X	X	20/09

Complex projects requiring special conditions and preparation (in particular on synergies with CEF/regional funds)–

Further guidance provided by the Programme Office (contact us!)

- **Six Innovation Actions considered of strategic importance** (combined budget of EUR 116 million)
- Normally, **first-of-a-kind demonstration at scale, in real operational environment of the different generations of hydrogen products (including sectoral integration such as Hydrogen Valleys).**
- Concrete **synergies with other programmes and instruments** (such as other partnerships or other instruments at EU, national or regional level)

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Novelties in the call conditions

Full capitalised costs for purchases

(equipment, infrastructure or other assets purchased specifically for the action)

For the topics listed below, in line with the Clean Hydrogen JU SRIA, mostly **large-scale demonstrators or flagship projects specific equipment, infrastructure or other assets purchased specifically for the action (or developed as part of the action tasks) can exceptionally be declared as full capitalised costs.**

Seal of Excellence

For **two topics in the Call (related to H2 Valleys)** the 'Seal of Excellence' will be awarded to applications exceeding all of the evaluation thresholds set out in this Annual Work Programme but cannot be funded due to lack of budget available to the call.

Novelties in the call conditions

Maximum EU/JU funding per topic

- **Additional eligibility criterion to limit the Clean Hydrogen JU requested contribution**
- For actions performed at high TRL level, including demonstration in real operation environment and with important involvement from industrial stakeholders and/or end users such as public authorities
- Expected to leverage co-funding as commitment from stakeholders. e.g. through the private investment or co-funding from regional/local funds

Involvement of private members

- **Additional eligibility criterion to ensure that one partner in the consortium is a member of either Hydrogen Europe or Hydrogen Europe Research**
- For topics targeting actions for large-scale demonstrations, flagship projects and strategic research actions, where the industrial and research partners of the JU play a key role in accelerating the commercialization of hydrogen technologies

Synergies

Opportunities for synergies – for all applicants (in particular flagship projects)

- Possibilities for **complementary funding from other R&I-relevant EU, national or regional programmes** (such as European Structural and Investment Funds, Recovery and Resilience Facility, Just Transition Fund, Connecting Europe Facility, Innovation Fund, Modernisation Fund, LIFE, InvestEU, etc.), as well as private funds or financial instruments.
- Encouraged to consult **the national recovery and resilience plans in order to identify specific mentions of synergies with Horizon Europe** and to detect further opportunities for complementarity between the plans' rich R&I portfolio and the Framework Programme.
- Specific opportunities for **synergies with other partnerships** have been included in some topics' description.
- Whenever synergies are foreseen, they should be reflected in **a financing structure and strategy describing the business model, including envisaged sources of co-funding/co-financing and in line with state-aid rules.**

Call 2022 specific requirements:

- Two flagship topics (deployment of hydrogen trucks and inland vessels) in the Call 2022 strongly recommend **synergies/complementary funding for the H2 refuelling infrastructure from the Connection Europe Facility for Transport** (realisation of the alternative fuels targets for hydrogen along the TEN-T networks)
- Additional two flagship topics (Hydrogen Valleys) strongly recommend **synergies/complementary funding from regional/local funding** and foresee the awarding of a 'Seal of Excellence' to applications which cannot be funded due to lack of budget, therefore increased chances to find alternative funding in other Union programmes, including those managed by national or regional Managing Authorities.

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Safety Plans and Guarantee of Origin

Safety Plans

- For all topics **a ‘safety by design’ approach should be considered**. In particular, for topics involving Innovation Actions proposals should provide **a preliminary draft on ‘hydrogen safety planning and management’ at the project level,** which will be further developed during project implementation (deliverables to be reviewed by the European Hydrogen Safety Panel)
- For topics involving Research and Innovation Actions or Innovation Actions, projects should foresee to **report any safety-related event that may occur during the project implementation to the European Commission's Joint Research Centre (JRC) dedicated database HIAD** through mailbox JRC-PTT-H2SAFETY@ec.europa.eu

CertifHy

- For some of the topics involving Innovation Actions it is expected that **Guarantees of Origin (GOs) will be used to prove the renewable character of the hydrogen that is produced/used.**

Projects with hydrogen production/consumption:

Issuance/purchase and subsequent cancellation of GOs from the relevant Member State issuing body;

If the latter is not yet available, the consortium may proceed with the issuance/purchase and cancellation of non-governmental certificates (e.g CertifHy).

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Explicit encouragement for International Collaboration

Mission Innovation 2.0

For some identified topics, **proposals are expected to contribute towards the activities of Mission Innovation 2.0 - Clean Hydrogen Mission**. Cooperation with entities from Clean Hydrogen Mission member countries, which are neither EU Member States nor Horizon Europe Associated countries, is encouraged.

In recognition of the benefits that international collaboration can bring, encouragement of international collaboration beyond EU Member States and Horizon Europe Associated Countries could be foreseen.

A particular example is topic ***HORIZON-JTI-CLEANH2-2022-05-05: Research & Innovation co-operation with Africa on hydrogen***, in which additional eligibility criteria have been introduced to allow African countries to *i)* participate in proposal, *ii)* be eligible for funding and *iii)* ensure a sufficient geographical coverage of the African continent.

Summary of novelties/call conditions elements to pay attention to:

- EU competitiveness and **industrial leadership**
- Opportunities for **synergies**
- Contribution to the **monitoring framework** (TRUST database)
- **International Collaboration**
- Involvement of **private members** (HE/HER)
- **Limited JU funding**/contribution
- Safety plans
- **Guarantees of origin** of hydrogen
- Regulation, Codes and Standards
- Activities developing **test protocols**
- Sustainability and **circularity**

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Evaluation by independent experts

European Commission database of experts

Register through the **Funding & tender opportunities Portal and notify us with your interest**

25% new experts

Selection of experts

- High level of skill, experience and knowledge
- Independence and absence of conflict of interest

And **a balance** in terms of:

- geographical diversity
- gender
- where appropriate, the private and public sectors, and
- an appropriate ‘rotation’ from year to year.

Large fields of expertise

In principle, each proposal will be examined by **at least three experts**

Network with fellows

Presence of **one or more independent observers**

Experts that have a **conflict of interests** will be excluded by us !

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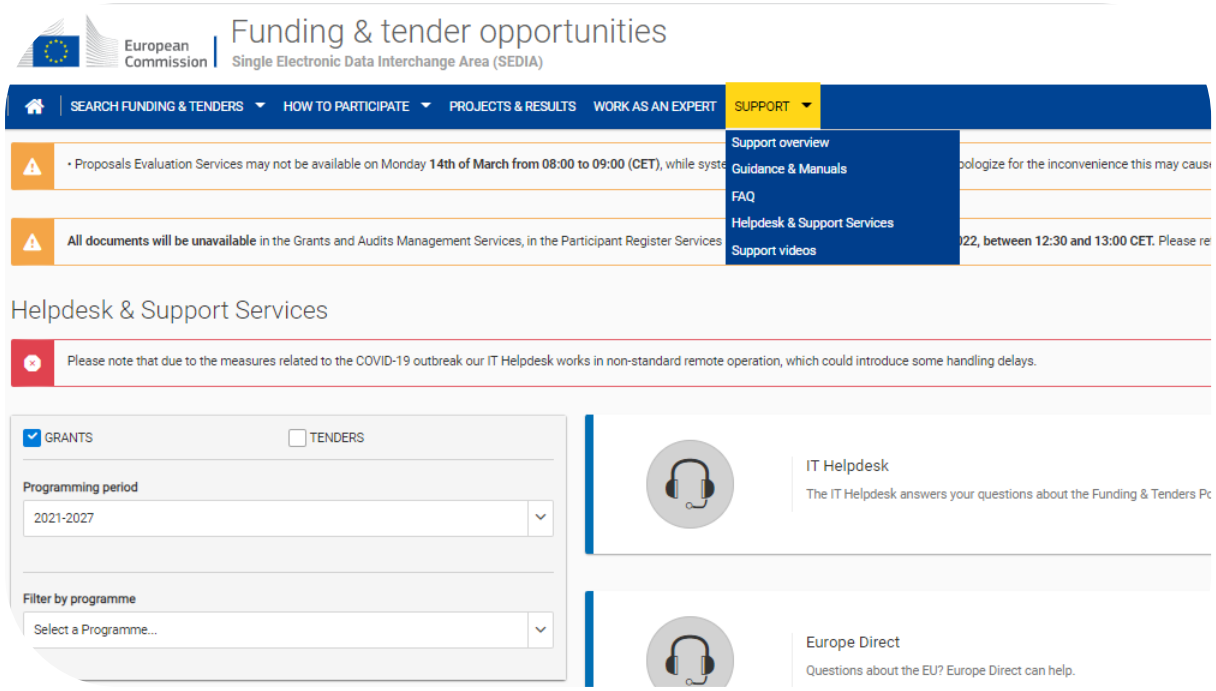
Resources and Support

Funding and Tenders Opportunities Portal

Get Support

- Online Manual is your guide on the procedures from proposal submission to managing your grant
- Funding & Tender Portal FAQ find the answers to most frequently asked questions on submission of proposals, evaluation and grant management
- Research Enquiry Service enquiries about the validation process of the legal entities
- PROJECTS@clean-hydrogen.europa.eu



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Clean Hydrogen Partnership

Lionel BOILLOT
Call coordinator

Lionel.Boillot@clean-hydrogen.europa.eu

For further information
https://www.clean-hydrogen.europa.eu/

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Comment préparer une bonne proposition ?,

Lionel Boillot, Project Manager, Clean Hydrogen Partnership

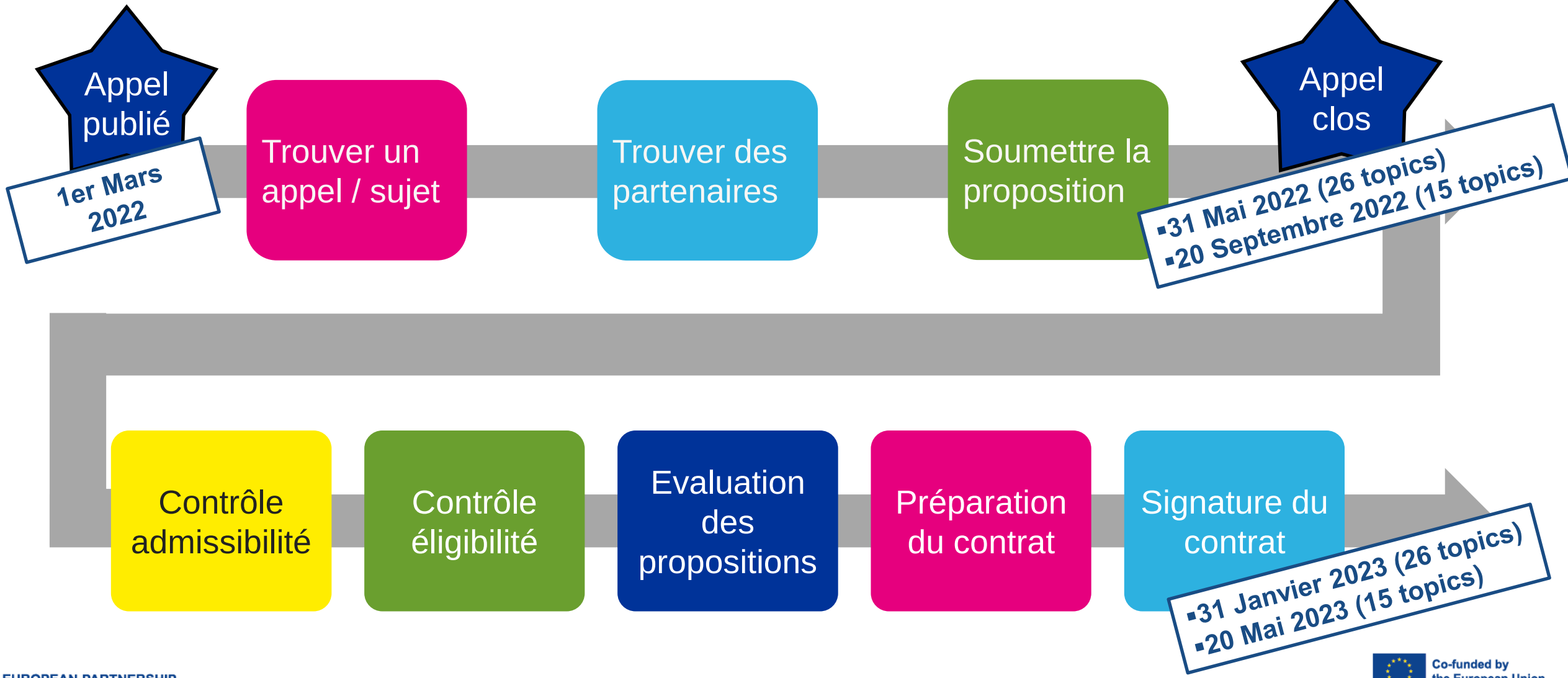
Clean Hydrogen Partnership

Comment préparer une bonne proposition ?

29 Mars 2022

Lionel BOILLOT

Etapes de la publication à la signature du contrat



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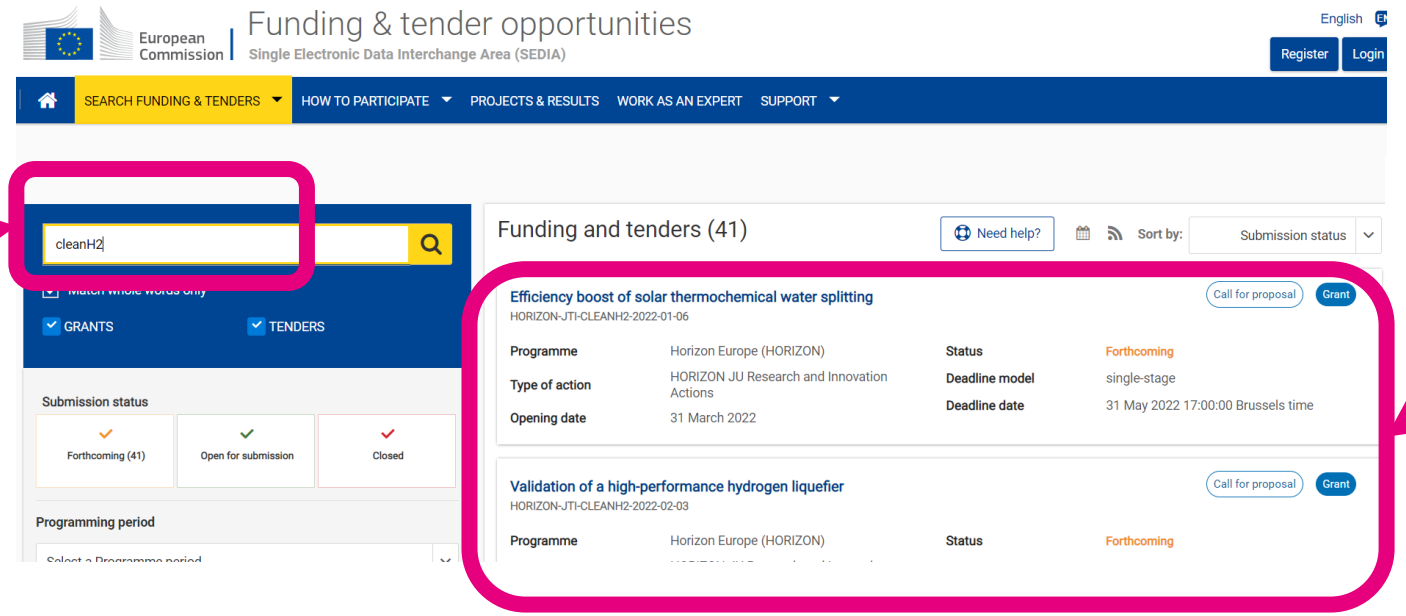
Où trouver l'appel à projet?

Trouver un appel / sujet → Trouver des partenaires → Soumettre la proposition

- Un document clé: Work Programme 2022
- Sur le site du Clean Hydrogen JU ou Portail "funding & tender opportunities":

CleanH2



Liste des 41 sujets

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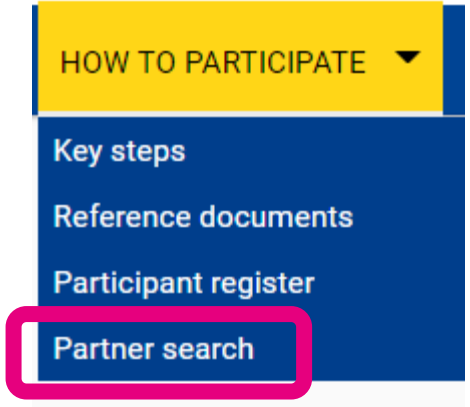
Comment trouver l'appel à projet?

- Fonctionnalité dédiée sur le portail: Partner Search
- Sur le topic ciblé pour manifester son intérêt – fonction "partner search"
- Via les secretariats de Hydrogène Europe (HE) / HE Recherche
- Actions de réseautage en France
- Recherche des projets précédents sur le site Clean Hydrogen JU ou CORDIS



Coopération internationale et éligibilité au financement

Partenaires internationaux peuvent participer (sauf les entities sujettes aux mesures restrictives UE - EU Sanctions map)

MAIS, pour être eligible au financement, les partenaires doivent être établis dans un des pays éligibles:

- Etats membres de l'UE
- Pays associés à Horizon Europe – les accords d'association sont en préparation
- Pays à moyen-faible revenus: Afghanistan, Algérie, … , Zambie, Zimbabwe
- **Exceptionnellement,** un autre pays, **si:**
  - Le pays est explicitement indiqué comme eligible dans l'appel à projet
  - Le Clean Hydrogen JU considère que la **participation** du partenaire est **essentielle** pour réaliser les taches du projet

Pays de l'Union Africaine - topic 05-05

Si le partenaire n'est pas eligible au financement, alors il doit couvrir sa participation avec ses fonds propres. Le partenaire doit **expliquer dans la proposition, comment ces fonds seront sécurisés**.

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Comment soumettre la proposition?

- Via le Portail "funding & tender opportunities" – à partir du 31 Mars 2022

Proposition =
- **Partie A**
- **Partie B**

Partie A (**aspects administratifs**): formulaire en ligne généré par le système IT, base sur les informations remplies par les participants dans le portail.

Partie B (**description technique**): document PDF à soumettre dans le portail par le coordinateur. Le format est imposé et téléchargeable sur le portail et le site du Clean Hydrogen JU

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Admissibilité

Une proposition est ADMISSIBLE lorsqu'elle est :

- **Soumise** dans l'outil informatique dédié via Funding & Tender Portal **à temps**
- **Lisible**, accessible et imprimable
- **Complète**:
  - Avec tous les formulaires admin et annexes en pdf
  - Preuve de la capacité opérationnelle
  - Plan préliminaire de l'exploitation et la diffusion des résultats
  - « Package » avec Partie A (formulaires administratifs) et Partie B (description technique)

Limite de pages pour la partie B!
CSA = 30 pages
RIA = 45 pages
IA = 70 pages

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Eligibilité

Une proposition est ELIGIBLE lorsqu'elle :

- Répond à un sujet (topic) de l'appel 2022 du Clean Hydrogen JU et a trait uniquement aux applications civiles
- Se conforme aux conditions additionnelles d'éligibilité de l'appel 2022 du Clean Hydrogen JU
- Satisfait aux exigences de partenariat

RIA and IA	- At least one independent legal entity established in a Member State - And at least two other independent legal entities, each established in different Member States or Associated Countries.
CSA	- At least one legal entity established in a Member State or Associated Country

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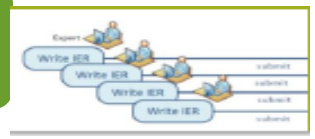
Evaluations et preparation du contrat

Contrôle admissibilité → Contrôle éligibilité → Evaluation des propositions → Préparation du contrat → Signature du contrat

Au moins 3 experts



Etape 1: Evaluation Individuelle

Etape 2: Consensus

Etape 3: Panel

→ **Liste des propositions classées par score**

→ **Liste des propositions éligibles au financement**

→ **Lettre des résultats d'évaluation**

→ **Préparation du contrat**

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8 mois max. entre clôture de l'appel et signature du contrat

Date limite		**Signature du contrat**
31 Mai 2022	➔	31 Janvier 2023
20 Sept. 2022	➔	20 Mai 2023

La qualité de la proposition est fondamentale !

- Interactions Clean H2 JU et partenariat (coordinateur)
- Transformation de la proposition en projet
- Pas de négociation possible
- Corrections des erreurs cléricales et prise en compte des commentaires des évaluateurs

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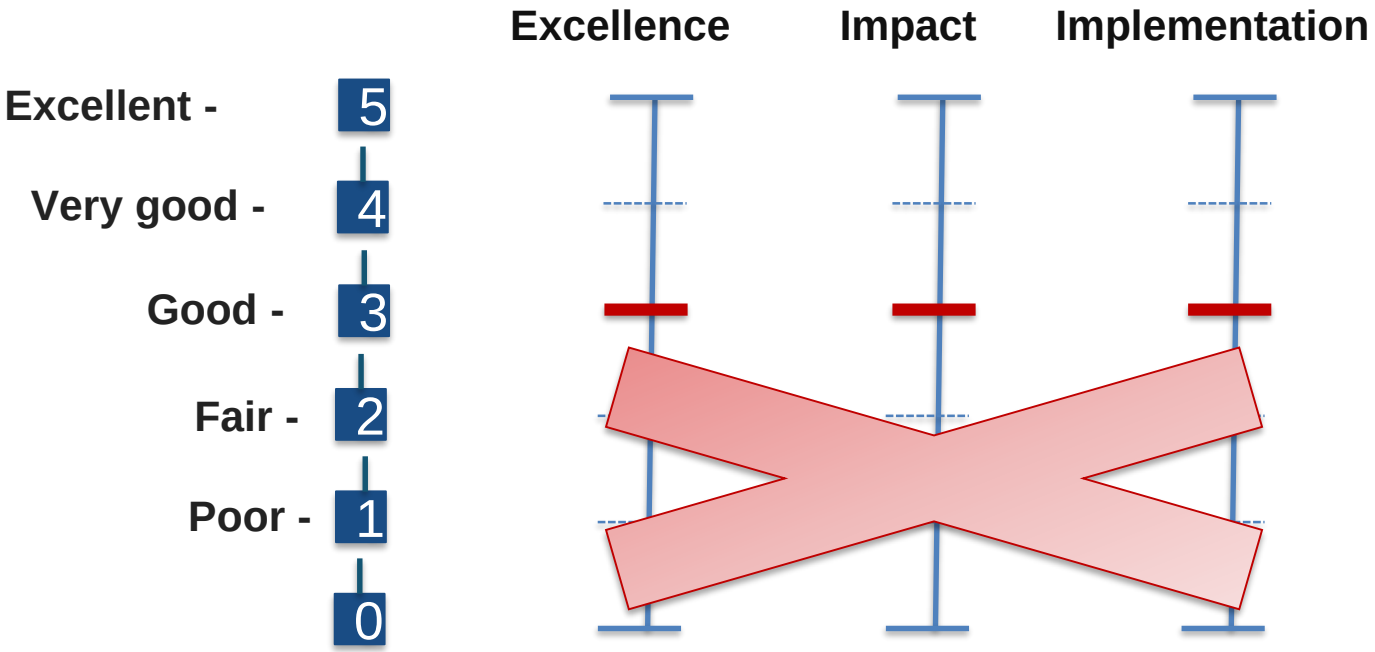
Règles d'évaluations

Les propositions sont évaluées selon 3 critères:

- **Excellence**
- **Impact**
- Qualité et efficacité de la **mise en oeuvre** - implementation

Grille d'évaluation complète disponible en Annexe D



Seuil minimum applicables:

- Critère individuel, la note doit être ≥ 3
- Note totale doit être ≥ 10

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Excellence - A éviter

- Les **objectifs sont génériques et non quantifiables**
- L'approche tecnologique/scientifique n'est pas crédible ou manque de details
- Le **projet est trop ambitieux** et donc peu convaincant
- Analyse insuffisante de l'état de l'art et du savoir-faire issu de projets en cours ou passés
- **Clareté et pertinence du projet sont faibles**
- Niveau faible d'innovation, pas de progress au delà de l'état de l'art
- Les points de départ et d'arrivée technologique **(TRL) ne sont pas clairs**

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Excellence - Recommandations

- Vérifiez que la proposition est en **lien direct avec le sujet**
- **Expliquez l'état de l'art** et comment la proposition va au-delà de celui-ci (spécialement si la proposition continue de précédents projets toujours en cours)
- Expliquez le potentiel novateur et ce que votre proposition apporte de neuf par rapport aux projets / activités existants
- Déclarez clairement quelle est la science supportant le projet
- Définissez des **KPI clairs**, quantifiez-les et montrez comment vous allez les atteindre
- Donnez les détails d'éventuelles tâches déjà réalisées par les membres du partenariat – le projet ne commence pas par une feuille blanche !
- Montrez que le risque est limité (ou mesurez le degré de risque)

Impact – A éviter

- Les impacts ne sont pas clairement détaillés
- Les impacts attendus ne sont pas crédibles, il n'existe **pas de plan convaincant pour atteindre ces impacts**
- L'impact sur le secteur industriel n'est pas clair
- Le **plan d'exploitation n'est pas fourni**/convaincant/manque l'engagement de plusieurs partenaires
- Le plan de diffusion, la gestion de la propriété intellectuelle n'est pas indiqué / pas suffisamment raisonné
- Pour la communication, l'audience cible et comment/quand/où elle sera engagée n'est pas spécifié

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Impact - recommandations

Lien avec Clean Hydrogen JU

- Répondez aux impacts attendus listés dans l'appel à projets CleanH2 JU 2022
- Comment le projet permet d'atteindre les objectifs du SRIA/WP 2022 du CleanH2 JU?

Au-delà…

- **Mesurez l'impact** ~~de la technologie~~ **du projet spécifiquement**, et précisez quelles seront les mesures/activités prises pour réaliser cet impact
- **Quantifiez** les impacts
- Incorporez les aspects socio-économiques (création d'emploi, investissements, etc.)
- Présentez dans le détail le plan d'exploitation des résultats, et la viabilité à long terme
- Détaillez le **modèle économique** (Innovation Action)

Plan de diffusion

- Identifiez ce que vous souhaitez communiquer, à qui, pourquoi, et comment
- Utilisez aussi les nouveaux moyens/méthodes de dissémination
- Décrivez l'open access aux données de recherche
- Incluez suffisamment de **livrables publics**
- Traitez les questions de propriété intellectuelle – IPR

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Implementation / Mise en oeuvre – A éviter

- Le plan de travail est maigre et **sans structure adequate**. Les details sont manquants; l'information sur la gouvernance et la gestion du projet est absente
- Il n'y a **pas d'analyse des risques**, les risques non-technologiques ne sont pas analysés, les mesures de contingences / mitigation des risques ne sont pas convaincantes
- L'allocation des ressources est ni justifiée ni équilibrée. Le détail des postes majeurs de coûts est manquant
- Le nombre de jalons est fortement limité et n'est pas approprié
- **Partenariat déséquilibré** vers la recherche/université démontrant un faible soutien industriel
- L'expertise cruciale/clé n'est pas inclue dans le partenariat, par exemple il n'y a pas d'utilisateurs finaux

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Implementation - recommandations

Le **plan de travail** doit être crédible et cohérent avec le type d'action, les défis et la méthodologie

- **Liez tâches, responsabilités, livrables et ressources**

Calendrier

- Les **jalons** (milestones) permettent un suivi du projet: mesurables et points de décision
- Vérifiez le timing des demonstrateurs (IA), les interdépendances entre tâches

Analyse des risques et plan de mitigation doivent être complets et crédibles. Pensez aussi aux risques techniques / administratifs

Budget: justifiez et détaillez les postes principaux, spécialement le recours à la sous-traitance

- Surestimation du budget / personnel = échec de la proposition
- Détaillez les postes budgétaires (équipement, voyages, etc.) ≥15% coûts de personnel
- Annoncez clairement la dépréciation et l'utilisation des équipements / capitalisation

Implementation - recommandations

Le **partenariat** doit répondre aux exigences de Horizon Europe et de l'appel à projets CleanH2 JU 2022.

- Prenez en compte la **coopération internationale**.
- Veillez à la **dimension européenne** du projet: si le focus est trop déplacé sur un pays/une entreprise, alors une autre source de financement doit être trouvée.
- Construisez un **partenariat équilibré** (secteur et géographie) en lien avec la nature/taille/complexité du projet; et complémentaire, en évitant les partenaires fantômes/cosmétiques

Structure de gestion

- Soyez simple et efficace
- Identifiez les rôles, la composition, les interactions entre les différents comités
- Définissez la gestion de la qualité et suivi des performances

Evaluation par des experts indépendants

Base de données d'experts de la Commission Européenne

Enregistrement sur le portail "**Funding & tender opportunities**"

Sélection des experts évaluateurs

- Haut niveau de compétence et d'expérience
- Independance et absence de conflit d'intérêt

Equilibre en terme de :

- Diversité géographique
- Genre
- Secteur public/privé
- "Renouvellement" d'année en année

Chaque proposition est examinée par au moins 3 experts évaluateurs

Presence d'un **observateur indépendant**

25% nouveaux experts

Large champ d'expertise

Réseautage et apprentissage de bonnes pratiques

Lionel BOILLOT
Call coordinator

Lionel.Boillot@clean-hydrogen.europa.eu

For further information
https://www.clean-hydrogen.europa.eu/

Questions/Réponses