Clean Hydrogen Partnership

SBRA
Slovenian Business & Research Association
Slovensko gospodarsko in raziskovalno združenje

Clean Hydrogen Calls for Proposals 2022

Information day for Slovenian stakeholders

31st March 2022

Pedro GUEDES DE CAMPOS

Clean Hydrogen Joint Undertaking

EUROPEAN PARTNERSHIP

Clean Hydrogen Partnership

Clean Hydrogen Joint Undertaking

EU Institutional Public-Private Partnership (IPPP)

Hydrogen Europe

Industry
More than 315 members

European Commission

Hydrogen Europe Research

Research community
over 103 members

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

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Projects in the Clean Hydrogen JU

H_2 Valleys

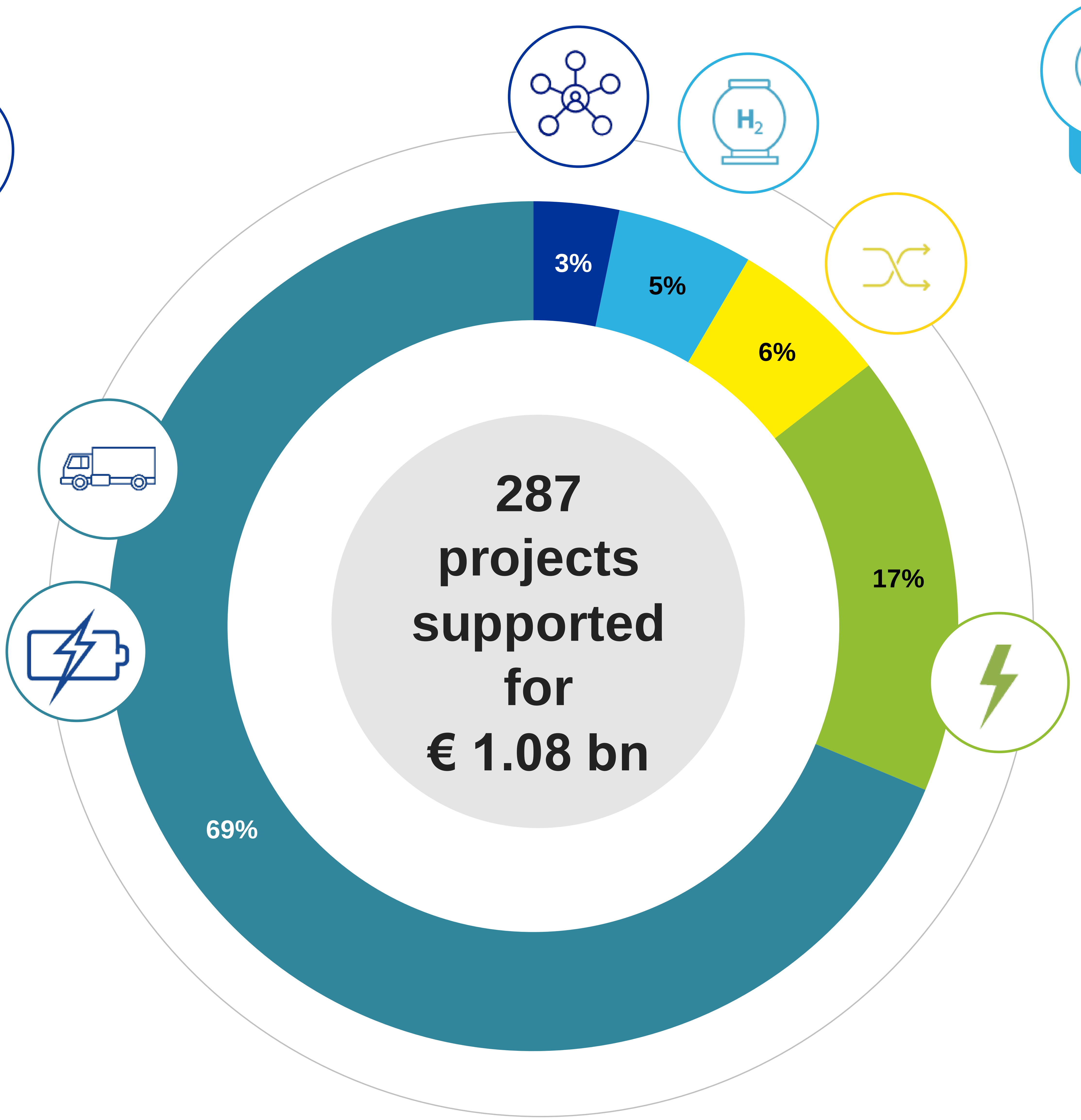
3 Projects
€ 35 mn

H_2 End Uses

Transport Applications

Clean Heat and Power

159 Projects
€ 739.6 mn



H_2 Storage & Distribution

22 Projects
€ 55.8 mn

Cross-cutting

46 Projects
€ 65 mn

H_2 Production

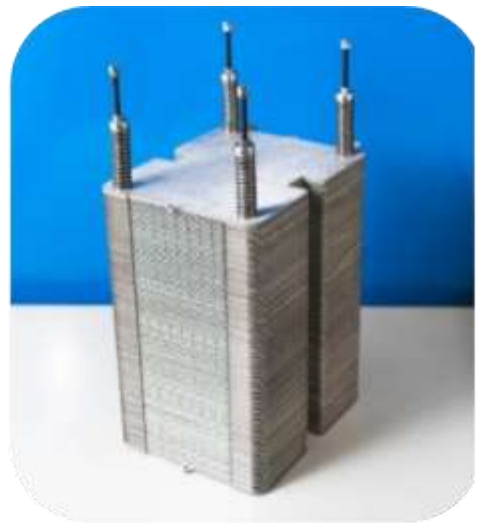
- Electrolysis
- Other routes

57 Projects
€ 181 mn

Clean Hydrogen Partnership

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

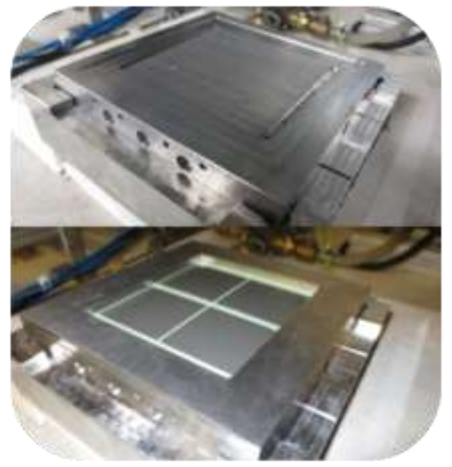
PoC

Domestic heat and power

Heat and power for industry

Heavy duty trucks

Logistics machinery



Materials

Gensets

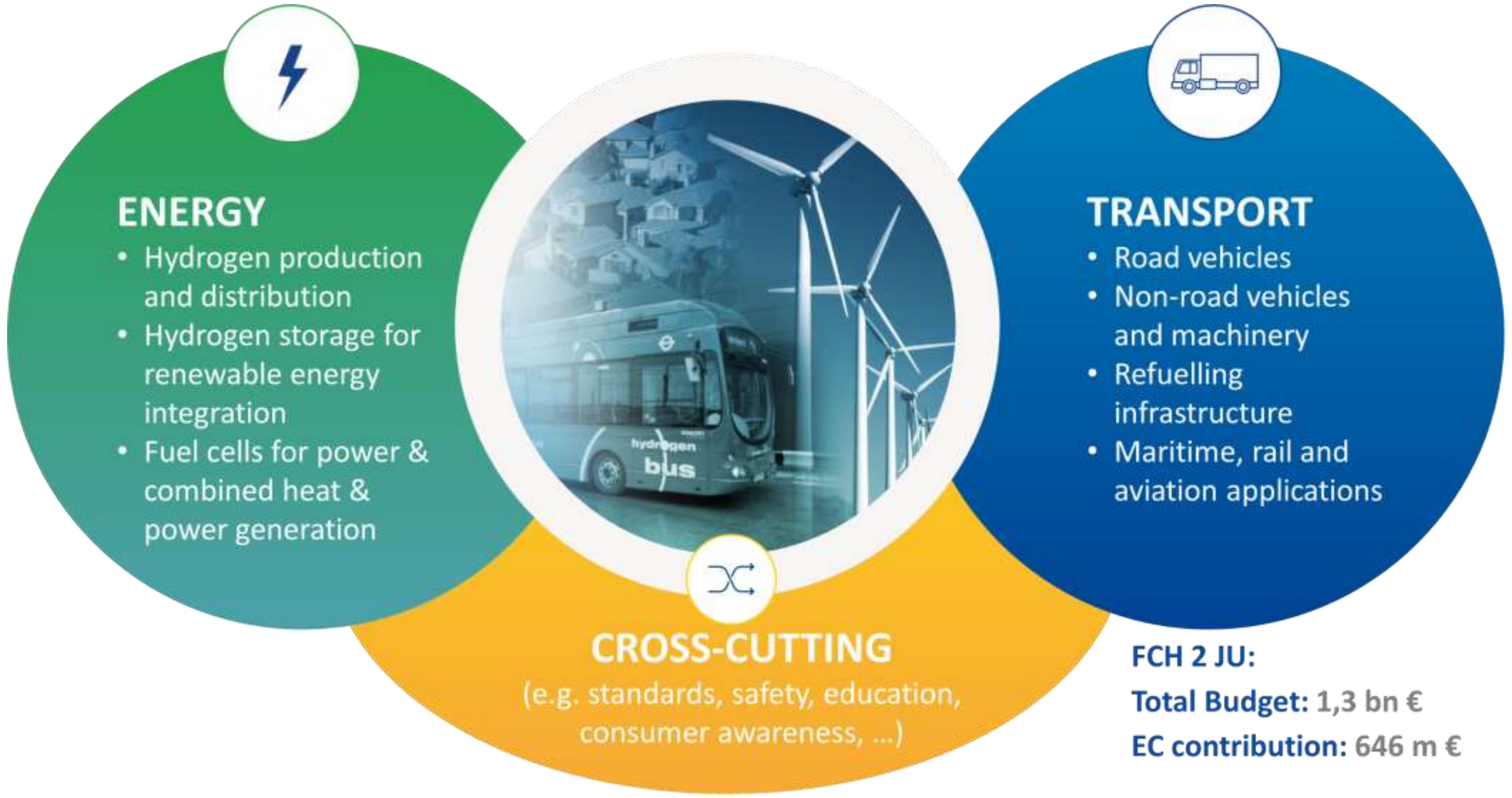
Light duty vehicles

Trains

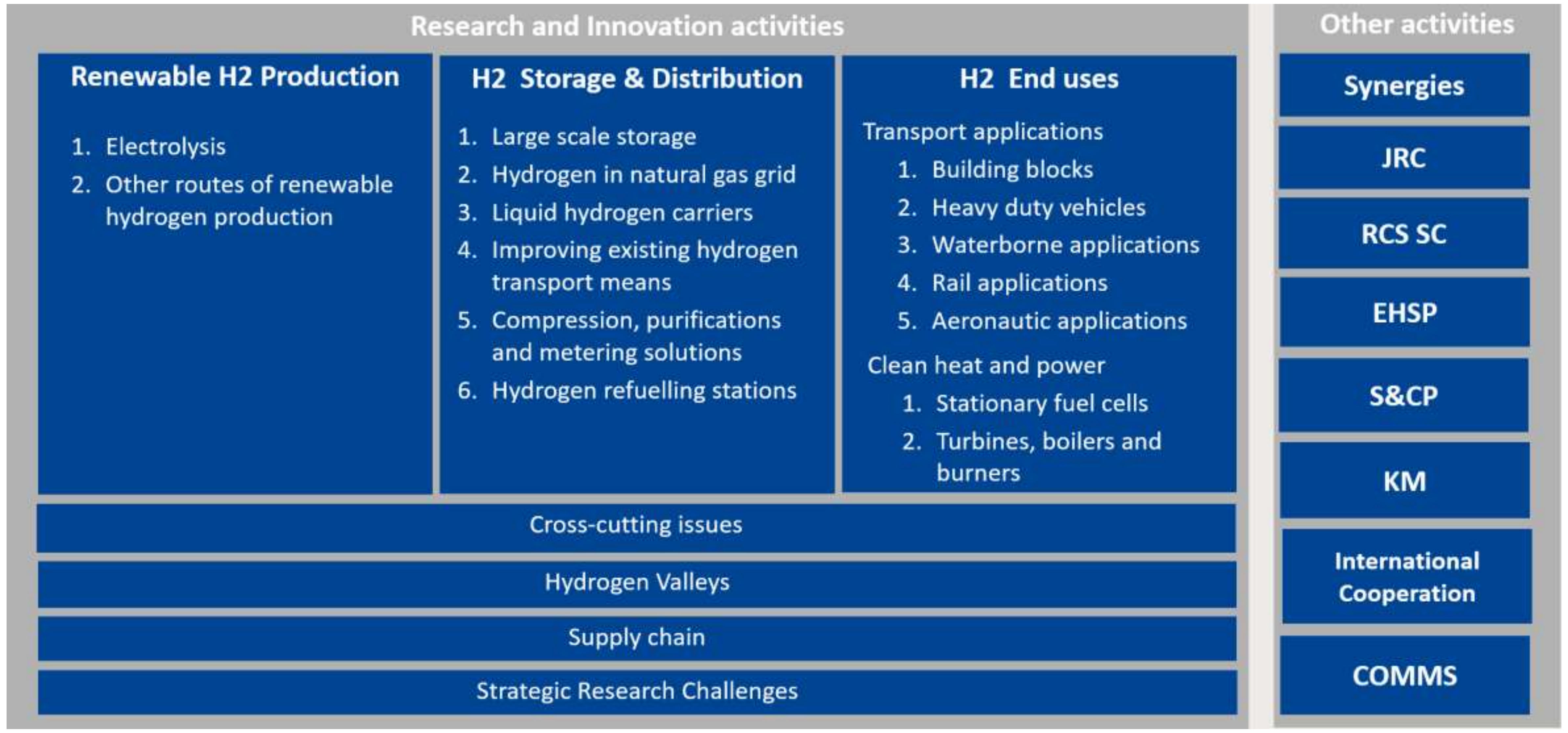
Clean Hydrogen Partnership
Continuation of the FCH 2 JU

- Clean Hydrogen Partnership (legal name: Clean Hydrogen Joint Undertaking)
- Universal successor of the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH 2 JU) and has taken over its legacy portfolio
- (HORIZON EUROPE) Budget: EUR 1 billion 2021-2027 (>50% increase compared to HORIZON 2020)

FCH 2 JU Programme structure



Clean Hydrogen JU Programme structure



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Objectives

General

- Support the implementation of the Commission's Hydrogen Strategy
- Stimulate research and innovation on clean hydrogen production, distribution, storage and end use applications
- Strengthen the competitiveness of the EU clean hydrogen value chain
- Contribute to the EU ambitious 2030 and 2050 climate ambition

Specific

- Improve the cost-effectiveness, efficiency, reliability, quantity and quality of clean hydrogen solutions across entire value chain
- Strengthen the knowledge/capacity of scientific and industrial actors along the Union's hydrogen value chain while supporting the uptake of skills
- Demonstrations of clean hydrogen solutions with a view to local, regional and Union-wide deployment, aiming to involve stakeholders in all Member States and across entire value chain
- Increase public and private awareness, acceptance and uptake of clean hydrogen solutions

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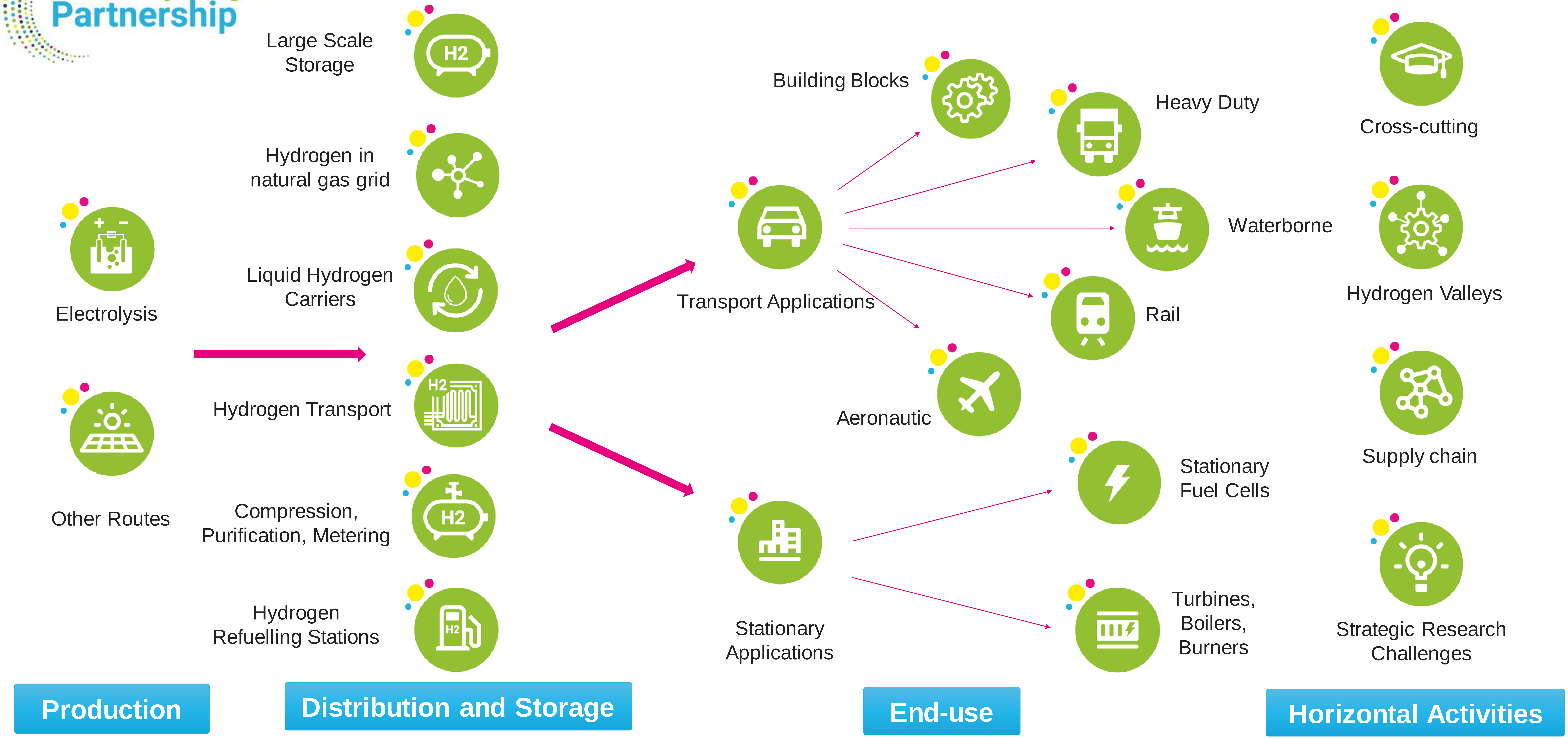
SRIA: Research & Innovation Activities



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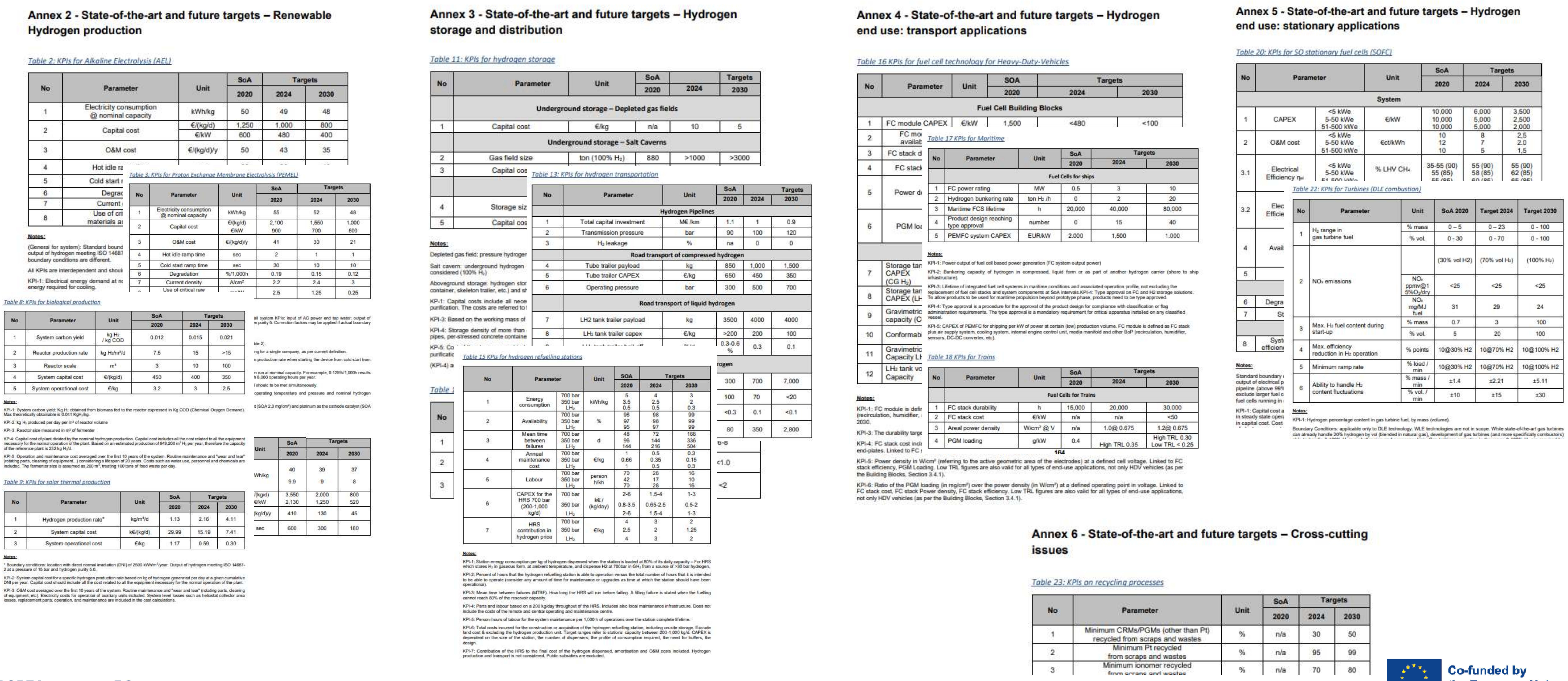
Clean Hydrogen Partnership
SRIA: Key Performance Indicators (KPIs) - Overview



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Call for proposals 2022

Call: HORIZON-JU-CLEANH2-2022

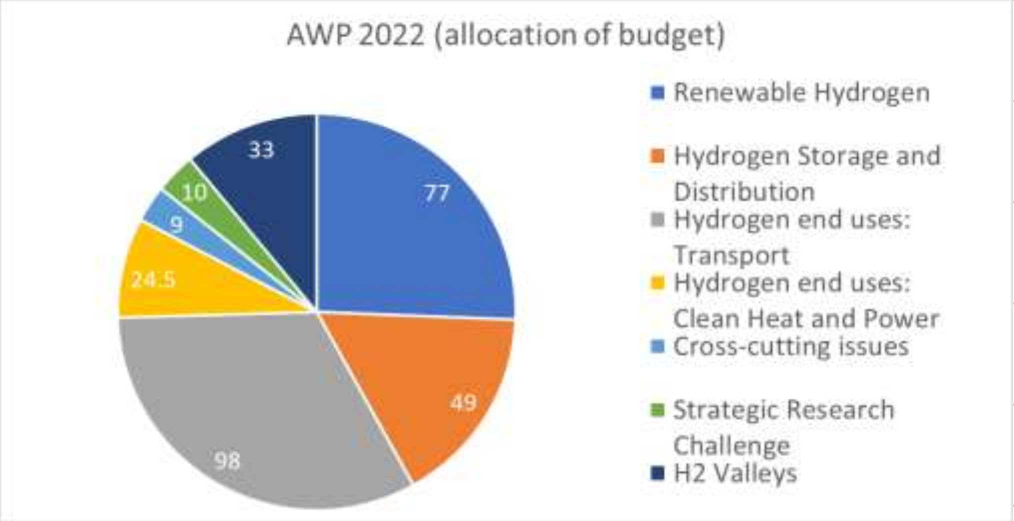
- Hydrogen production
- Hydrogen distribution
- Transport
- Heat and Power
- Cross-cutting
- Hydrogen Valleys

Total budget:
€300.5 mn

41 topics

41 topics available

- 10 - Renewable Hydrogen Production
- 11 - Hydrogen Storage and Distribution
- 8 - Transport
- 4 - Heat and Power
- 5 - Cross-cutting
- 2 - Hydrogen Valleys
- 1 - Strategic Research challenge



The topics will be grouped into 10 Innovation Actions (IA), 29 Research and Innovation Actions (RIA) and 2 Coordination and Support Actions (CSA). 6 Innovation Actions (IA) are considered of strategic importance and are selected as **flagship projects,** expected to have a significant impact in accelerating the transition to a hydrogen economy.

Synergies with other European partnerships and programmes, as well as with Member States and regional programmes are at the core of a number of 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

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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)

RIA

IA

- 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

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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

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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

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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

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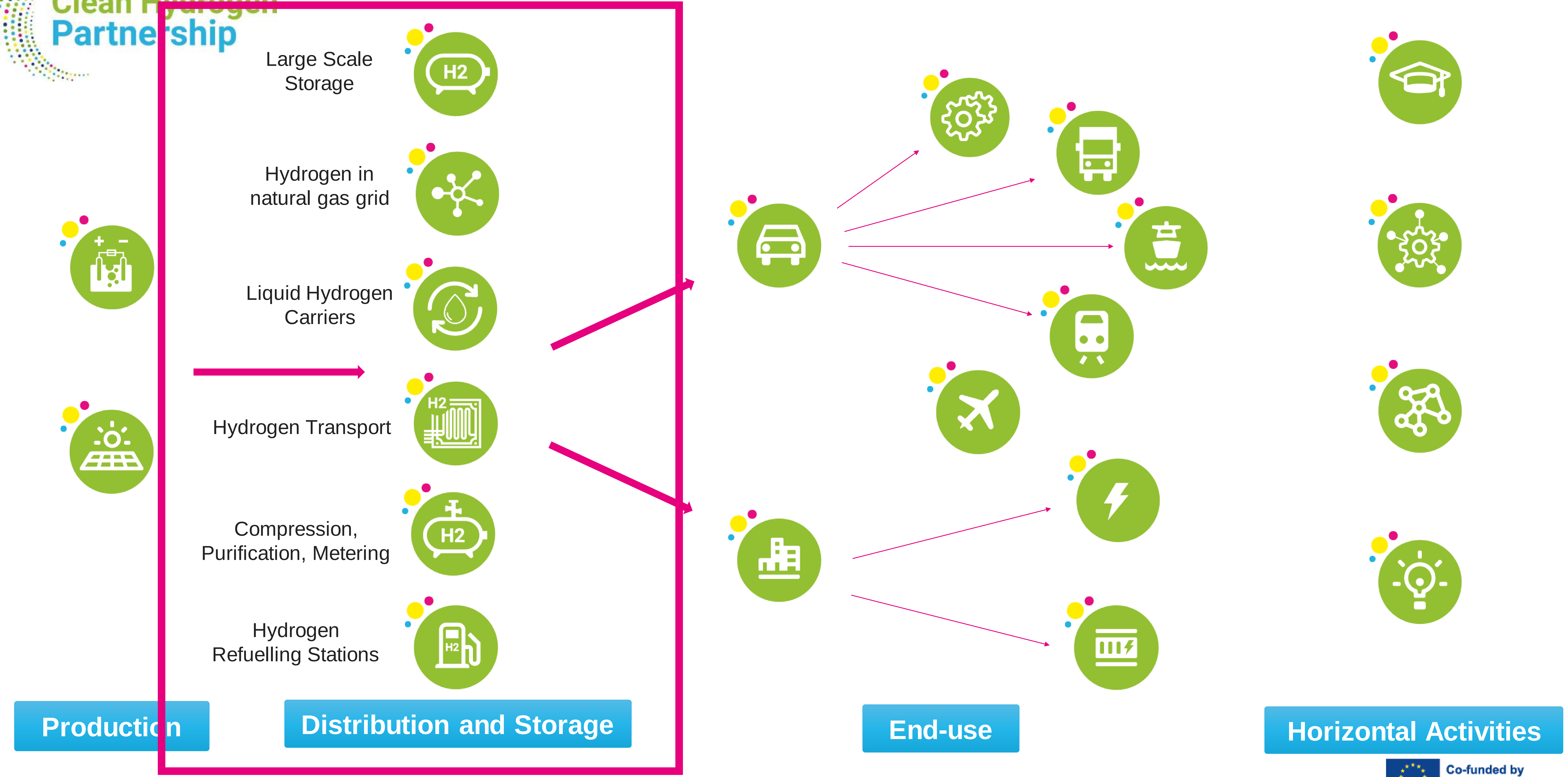
SRIA: Research & Innovation Activities



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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

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Clean Hydrogen Partnership

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

Clean Hydrogen Partnership

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

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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.

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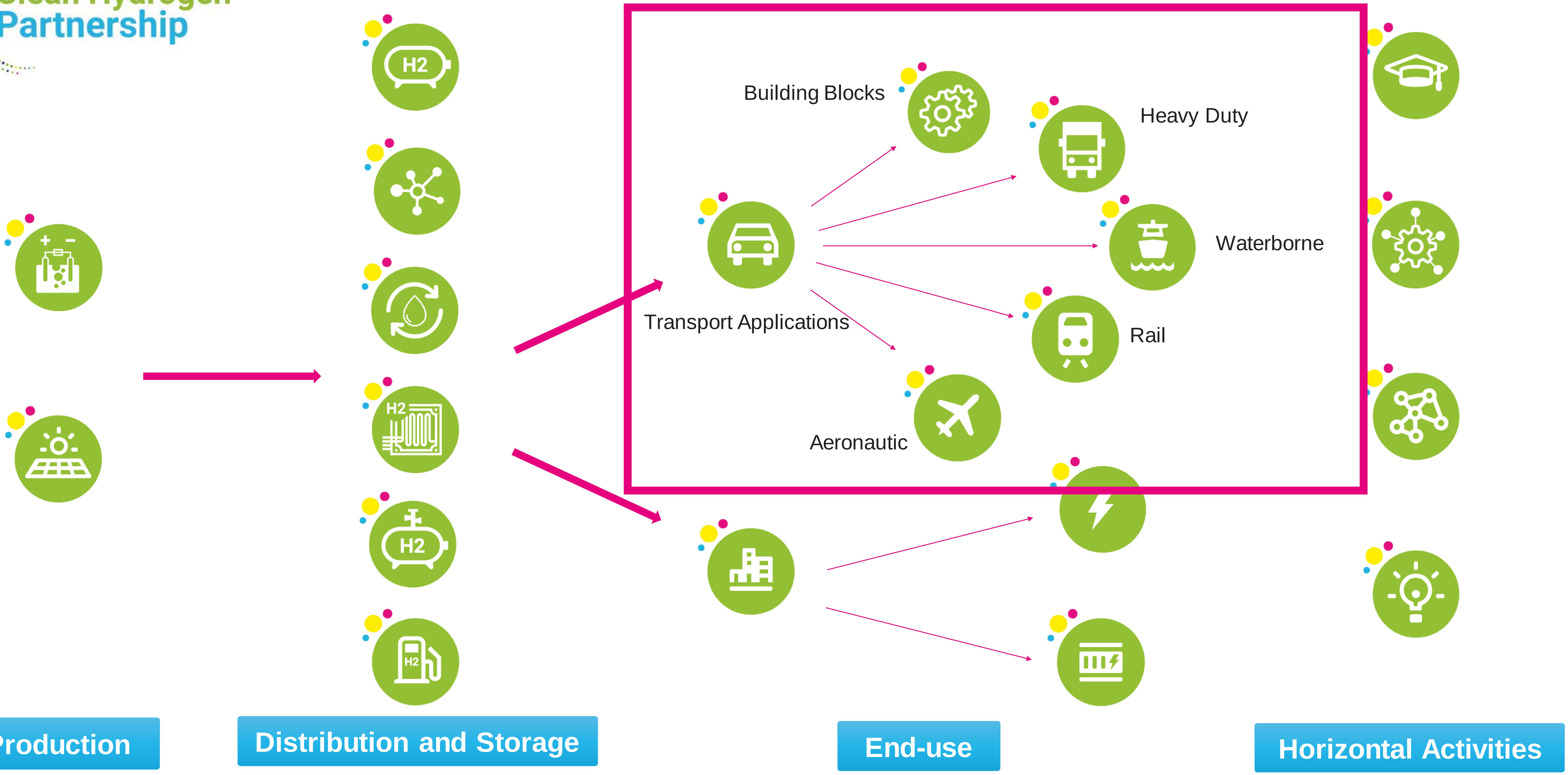
SRIA: Research & Innovation Activities



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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

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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

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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

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Clean Hydrogen Partnership

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

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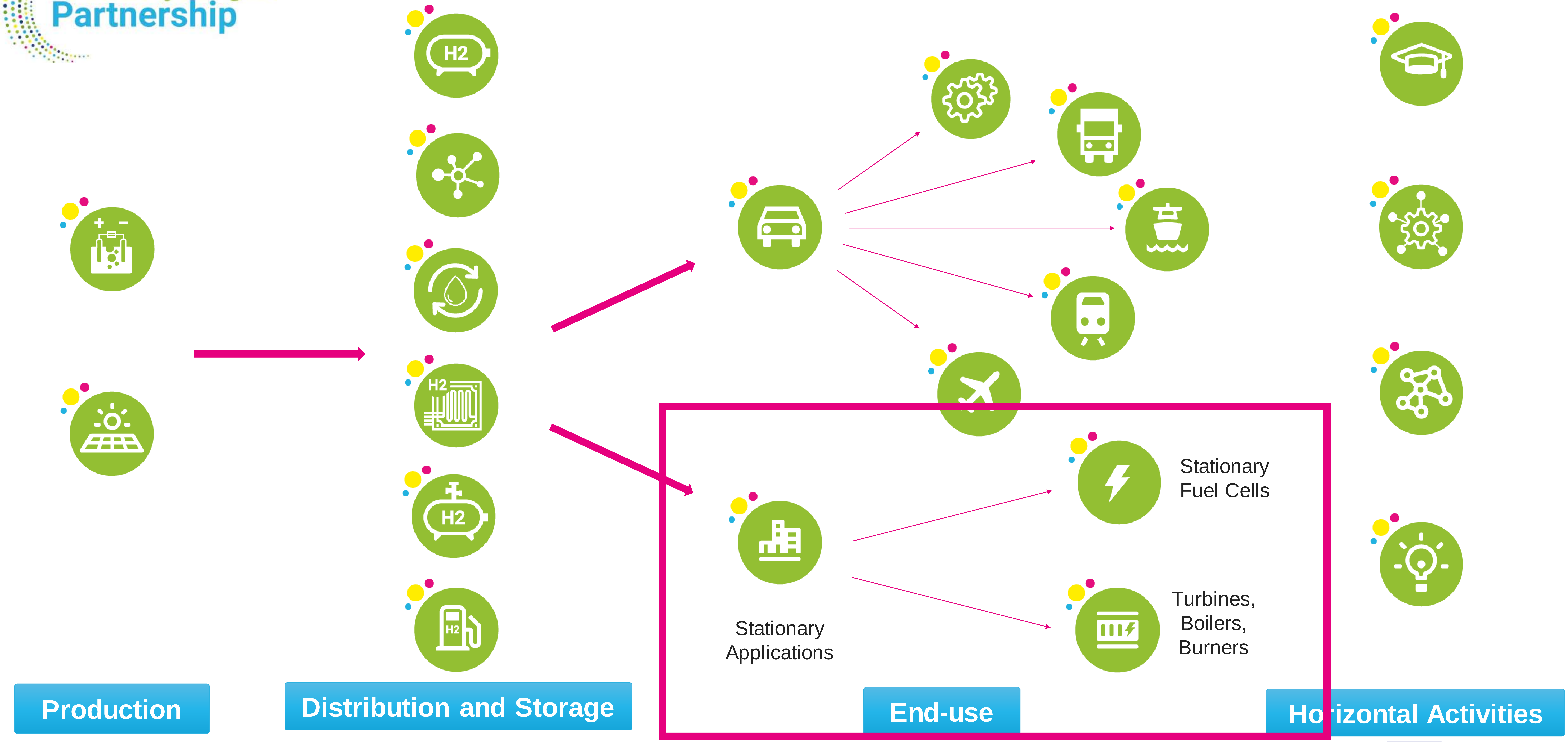
SRIA: Research & Innovation Activities



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

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Clean Hydrogen Partnership

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

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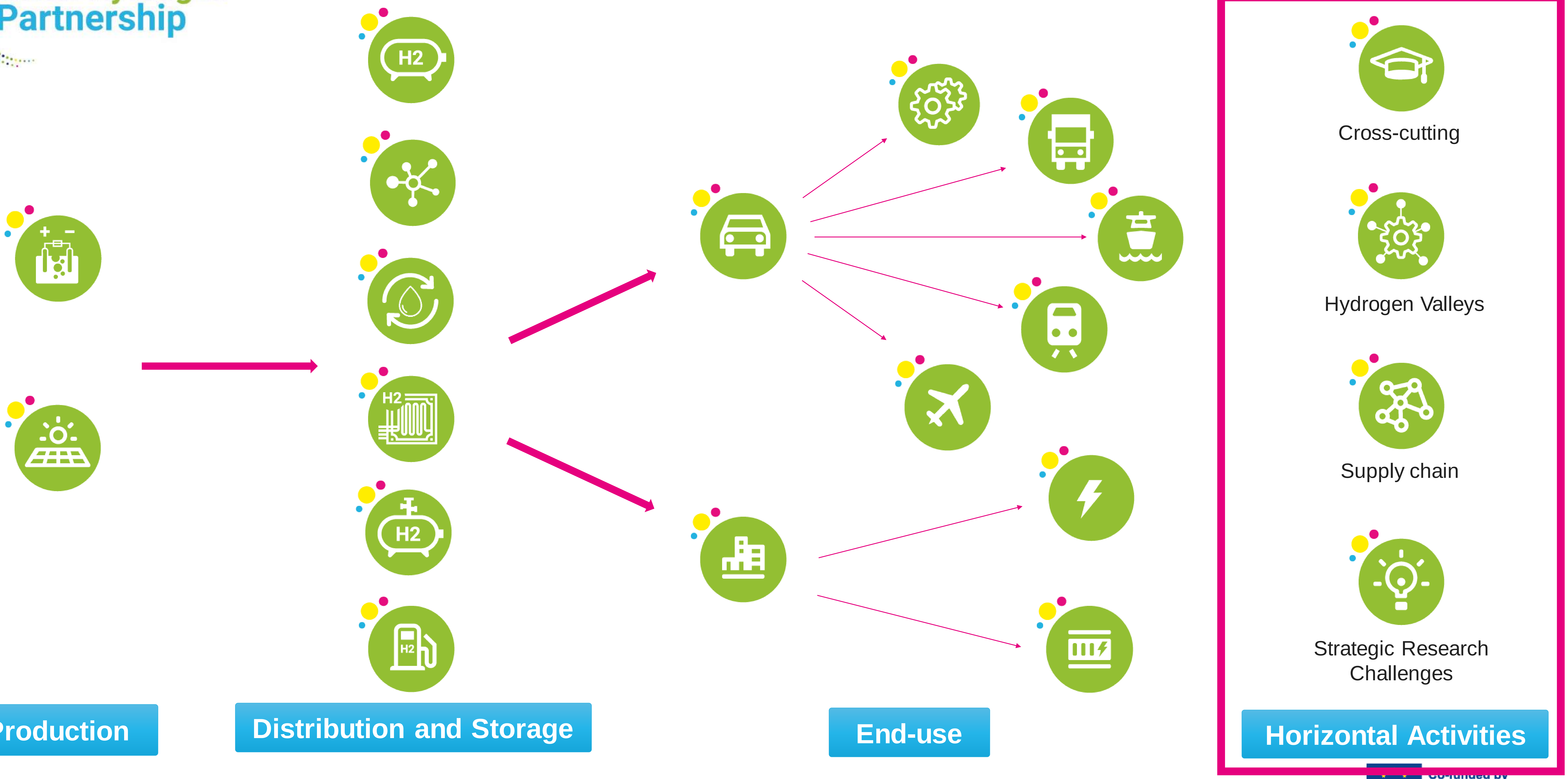
Clean Heat and Power - Topics

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)

SRIA: Research & Innovation 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

Clean Hydrogen Partnership

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

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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

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Clean Hydrogen Partnership

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	[logo]	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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Clean Hydrogen Partnership

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

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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.

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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**

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.

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

Presence of **one or more independent observers**

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

25% new experts

Large fields of expertise

Network with fellows

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/work-as-an-expert

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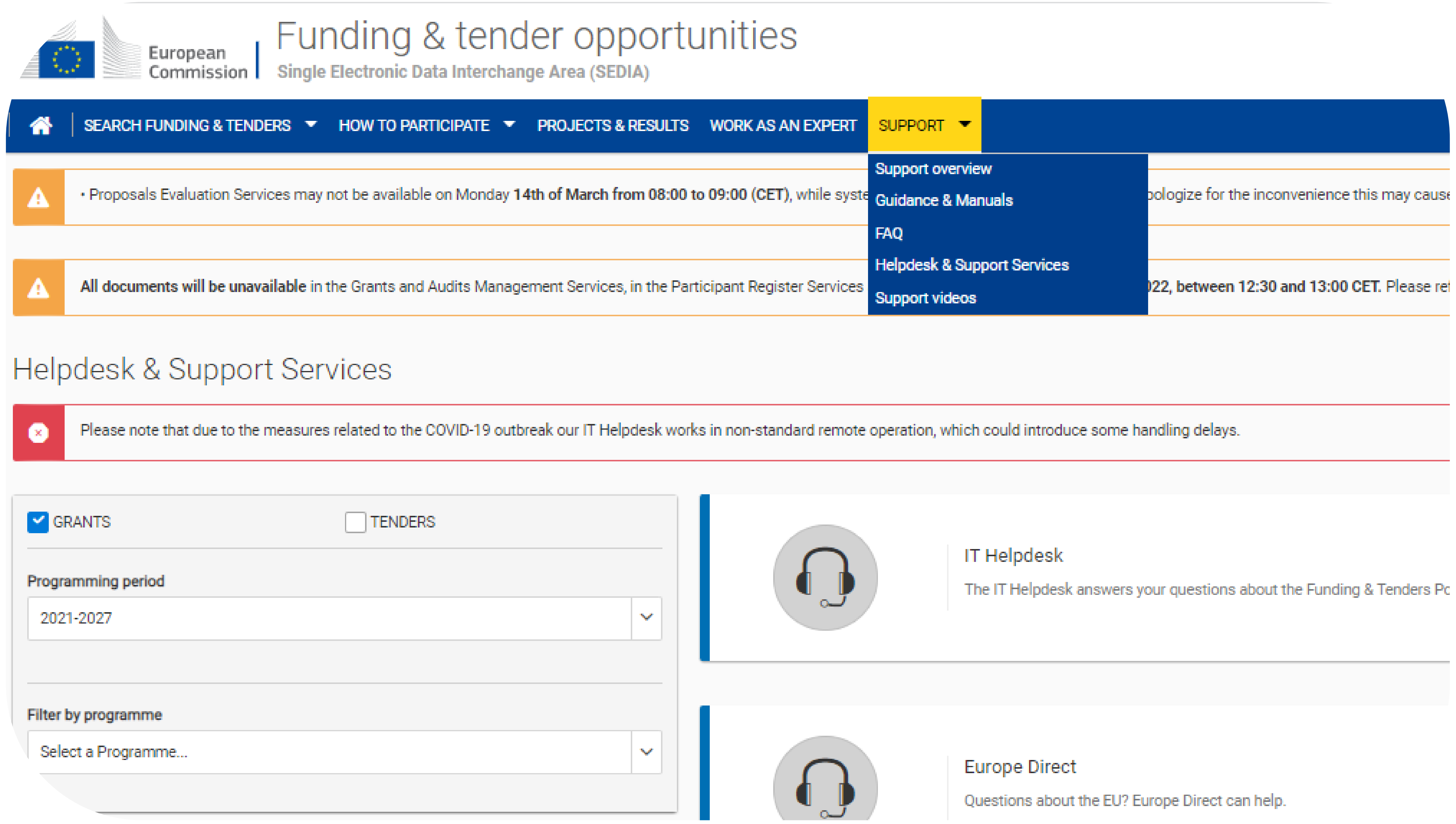
Resources and Support

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

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