FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

FCH2 JU

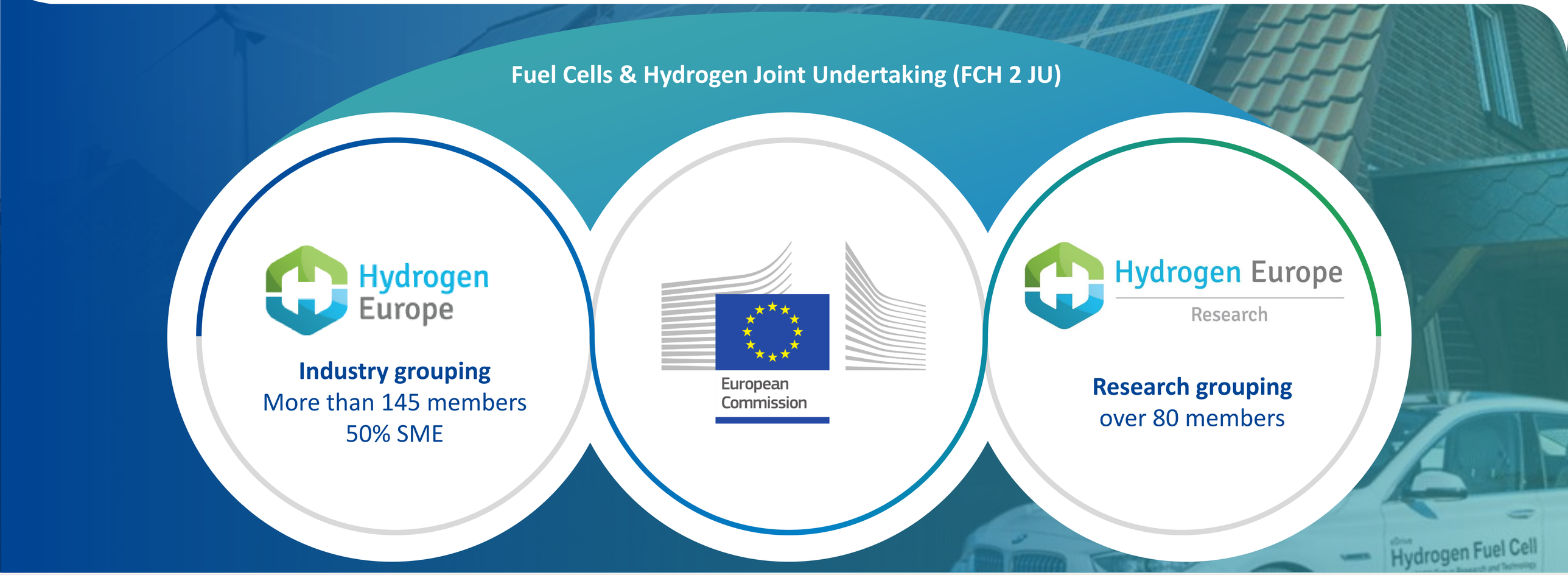
Appel à projets 2020

Lionel BOILLOT

5 Février 2020

Strong public-private partnership with a focused objective

EU Institutional Public-Private Partnership (IPPP)



To implement an *optimal research and innovation programme* to bring FCH technologies to the point of market readiness by 2020

FCH JU programme implementation (2008-2019)

Energy

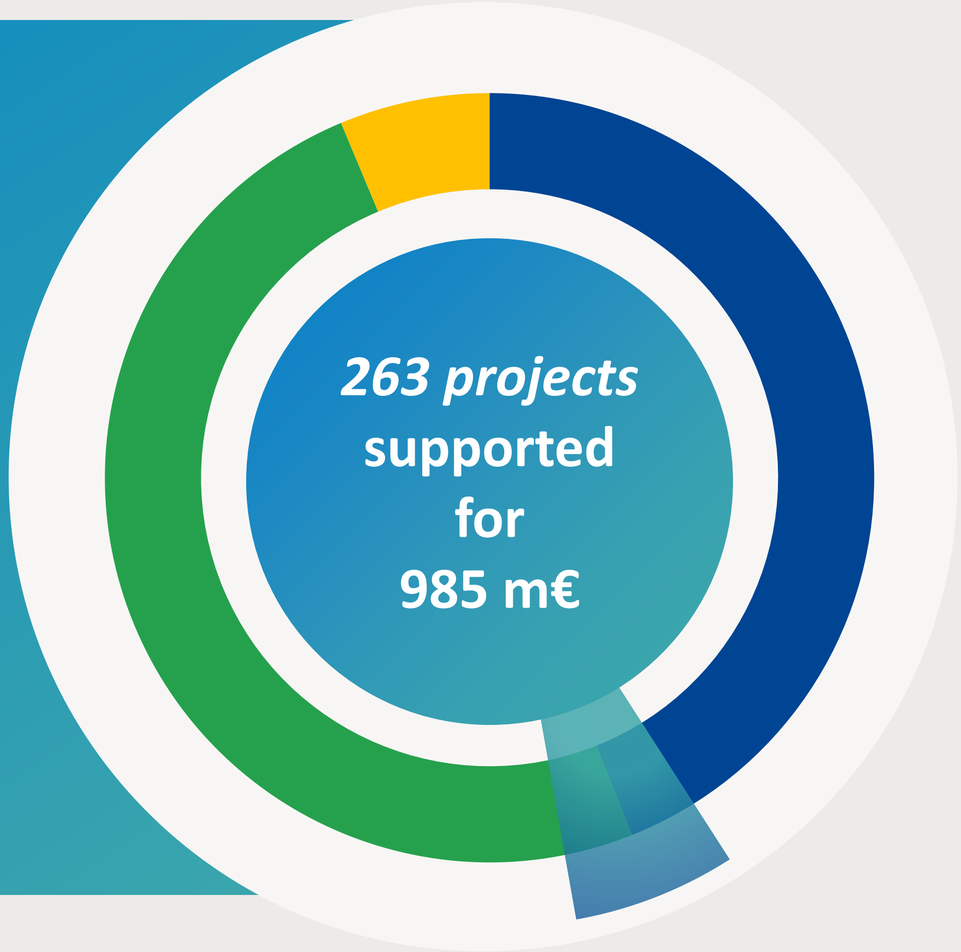
- Hydrogen production and distribution
- Hydrogen storage for renewable energy integration
- Fuel cells for power & combined heat & power generation

Transport

- Road vehicles
- Non-road vehicles and machinery
- Refuelling infrastructure
- Maritime rail and aviation applications

Cross-cutting

- E.g. standards, safety, education, consumer awareness …



46 %

457 million euros

145 projects

41 %

404 million euros

70 projects

6 %

58 million euros

43 projects

7 %

66 million euros

5 projects

Similar leverage of other sources of funding: 1 b€

Aperçu de l’appel FCH 2020

Généralités

Généralités

Appel: H2020-JTI-FCH-2020-1

Budget total: 93 millions d’euro

Ouverture: 14 Janvier 2020

Clotûre: 21 Avril 2020 à 17:00 (CET-Brussels)

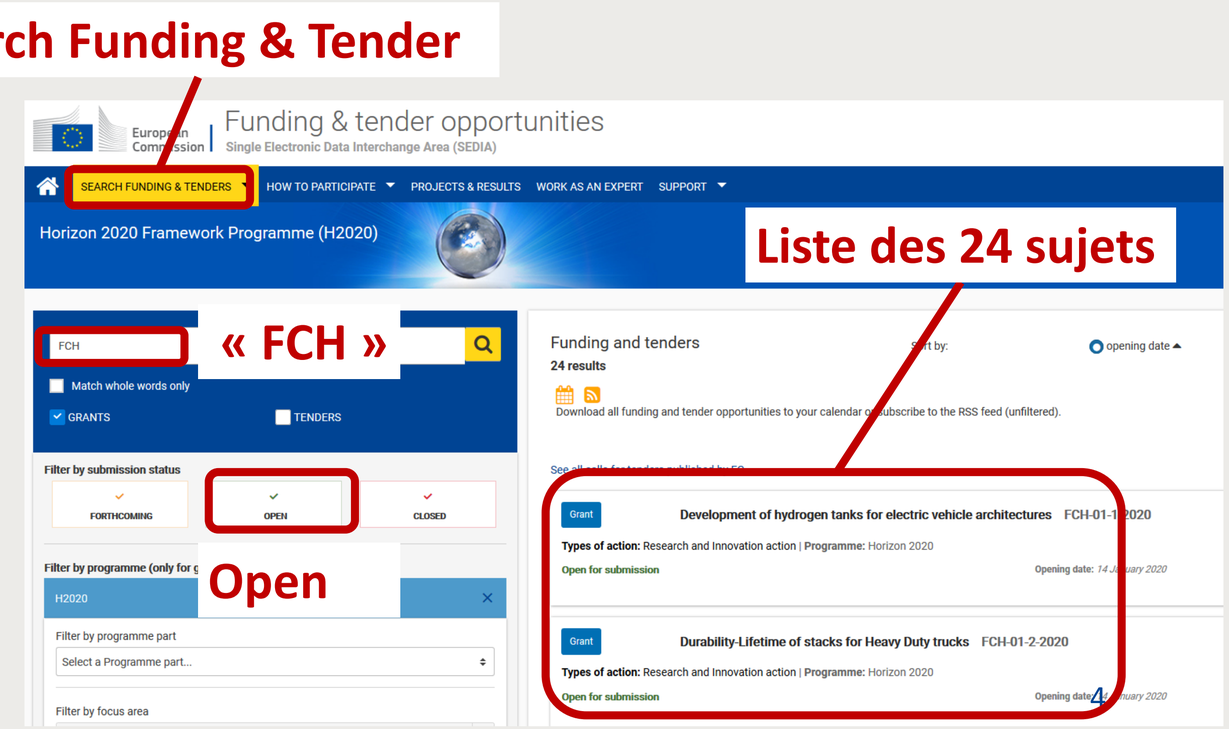
Contenu: 24 sujets selon:

- Transport : 41 millions d’euro, 8 sujets (5 IA et 3 RIA)
- Energie: 30 millions d’euro, 9 sujets (3 IA et 6 RIA)
- Overarching: 13 millions d’euro, 2 sujets (1 IA et 1 RIA)
- Cross-cutting: 9 millions d’euro, 5 sujets (4 RIA and 1 CSA)

Où trouver l’appel?

Un document clé: AWP 2020

Sur le site du FCH2 JU ou Portal Européen “funding & tender opportunities”:



Détails d’un sujet et recherche de partenaires

Topic description

Topic conditions and documents

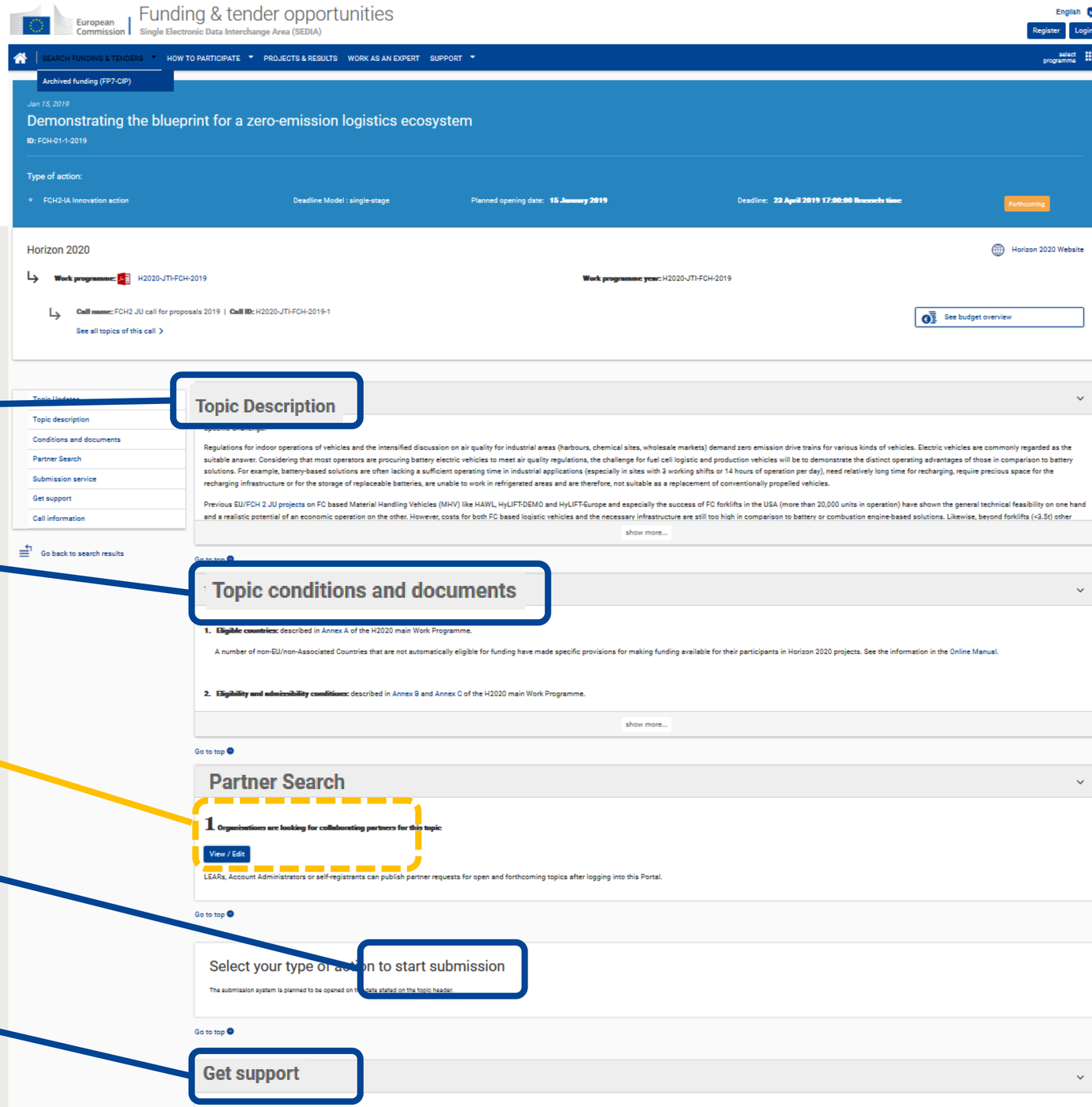
Partner search

Submission

- Templates of proposals
- On-line tool for submission

Support and Guidance

- H2020 Online Manual
- HOW TO



Description d’un sujet

Specific Challenge

- Context of the topic

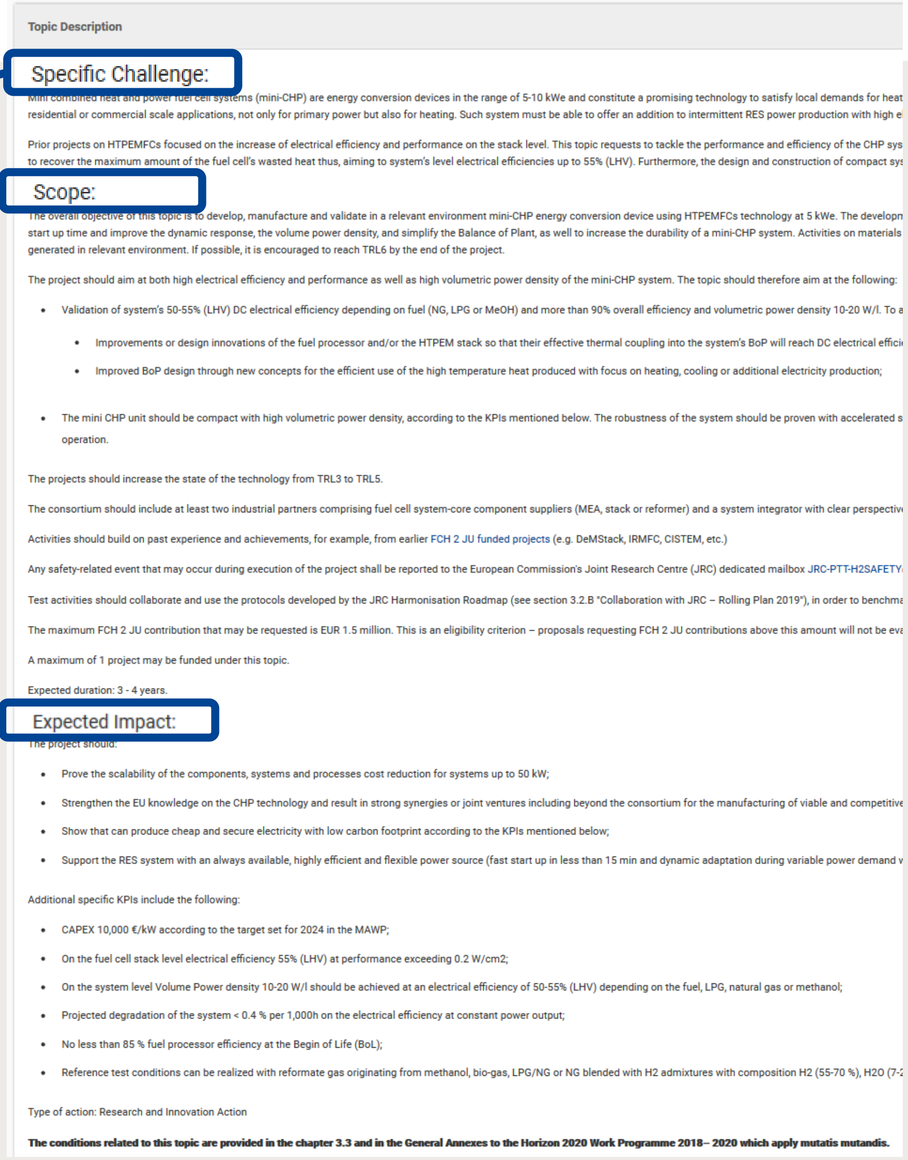
Scope

- Operational requirements and focus
- TRL
- Consortium composition
- Indicative budget
- Expected duration
- …

Expected Impact

- Technical targets
- Costs reduction
- Contribution to policies (env., indus., …)
- …

Out-of-scope proposals = ineligible



Topic Description

Specific Challenge:

Mini combined heat and power fuel cell systems (mini-CHP) are energy conversion devices in the range of 5-10 kWe and constitute a promising technology to satisfy local demands for heat residential or commercial scale applications, not only for primary power but also for heating. Such system must be able to offer an addition to intermittent RES power production with high e

Prior projects on HTPEMFCs focused on the increase of electrical efficiency and performance on the stack level. This topic requests to tackle the performance and efficiency of the CHP sys to recover the maximum amount of the fuel cell's wasted heat thus, aiming to system's level electrical efficiencies up to 55% (LHV). Furthermore, the design and construction of compact sys

Scope:

The overall objective of this topic is to develop, manufacture and validate in a relevant environment mini-CHP energy conversion device using HTPEMFCs technology at 5 kWe. The developn start up time and improve the dynamic response, the volume power density, and simplify the Balance of Plant, as well to increase the durability of a mini-CHP system. Activities on materials generated in relevant environment. If possible, it is encouraged to reach TRL6 by the end of the project.

The project should aim at both high electrical efficiency and performance as well as high volumetric power density of the mini-CHP system. The topic should therefore aim at the following:

- Validation of system's 50-55% (LHV) DC electrical efficiency depending on fuel (NG, LPG or MeOH) and more than 90% overall efficiency and volumetric power density 10-20 W/l. To a
  - Improvements or design innovations of the fuel processor and/or the HTPEM stack so that their effective thermal coupling into the system's BoP will reach DC electrical effici
  - Improved BoP design through new concepts for the efficient use of the high temperature heat produced with focus on heating, cooling or additional electricity production;
- The mini CHP unit should be compact with high volumetric power density, according to the KPIs mentioned below. The robustness of the system should be proven with accelerated s operation.

The projects should increase the state of the technology from TRL3 to TRL5.

The consortium should include at least two industrial partners comprising fuel cell system-core component suppliers (MEA, stack or reformer) and a system integrator with clear perspectiv

Activities should build on past experience and achievements, for example, from earlier FCH 2 JU funded projects (e.g. DeMStack, IRMFC, CISTEM, etc.)

Any safety-related event that may occur during execution of the project shall be reported to the European Commission's Joint Research Centre (JRC) dedicated mailbox JRC-PTT-H2SAFETY

Test activities should collaborate and use the protocols developed by the JRC Harmonisation Roadmap (see section 3.2.B "Collaboration with JRC – Rolling Plan 2019"), in order to benchma

The maximum FCH 2 JU contribution that may be requested is EUR 1.5 million. This is an eligibility criterion – proposals requesting FCH 2 JU contributions above this amount will not be eva

A maximum of 1 project may be funded under this topic.

Expected duration: 3 - 4 years.

Expected Impact:

The project should:

- Prove the scalability of the components, systems and processes cost reduction for systems up to 50 kW;
- Strengthen the EU knowledge on the CHP technology and result in strong synergies or joint ventures including beyond the consortium for the manufacturing of viable and competitive
- Show that can produce cheap and secure electricity with low carbon footprint according to the KPIs mentioned below;
- Support the RES system with an always available, highly efficient and flexible power source (fast start up in less than 15 min and dynamic adaptation during variable power demand v

Additional specific KPIs include the following:

- CAPEX 10,000 €/kW according to the target set for 2024 in the MAWP;
- On the fuel cell stack level electrical efficiency 55% (LHV) at performance exceeding 0.2 W/cm2;
- On the system level Volume Power density 10-20 W/l should be achieved at an electrical efficiency of 50-55% (LHV) depending on the fuel, LPG, natural gas or methanol;
- Projected degradation of the system < 0.4 % per 1,000h on the electrical efficiency at constant power output;
- No less than 85 % fuel processor efficiency at the Begin of Life (BoL);
- Reference test conditions can be realized with reformate gas originating from methanol, bio-gas, LPG/NG or NG blended with H2 admixtures with composition H2 (55-70 %), H2O (7-2

Type of action: Research and Innovation Action

The conditions related to this topic are provided in the chapter 3.3 and in the General Annexes to the Horizon 2020 Work Programme 2018– 2020 which apply mutatis mutandis.

International cooperation

Renewable and Clean Hydrogen Challenge under Mission Innovation

H2020 is open to the world - All topics are opened to international cooperation

In particular **international cooperation is strongly encouraged** with Mission Innovation countries and for the 11 topics identified with icons

Mission Innovation

Mission Innovation

- ➔ Launched in May 2018
- ➔ 16 countries
- ➔ Objective: *"To accelerate the development of a global hydrogen market by identifying & overcoming key technology barriers to the production, distribution, storage, and use of hydrogen at GW scale"*
- ➔ Scope:
  - focused multinational research & large scale demonstration efforts
  - from both public & private sectors
  - industry-directed breakthroughs within the next 3 years
  - renewable & clean hydrogen
  - 4 activity streams: making, sharing, using hydrogen & cross-cutting issues
- ➔ Australia, EU & Germany as co-lead countries

CEM9/MI-3
COPENHAGEN MALMÖ

Types of Actions and 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

RIA - Research

*funding rate max.**100%***

IA - Innovation

*funding rate **max.70%** and max.100% for non-profit entities*

***CSA** – Coordination and Support*

*funding rate max.**100%***

FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

Transport

41 millions d’euro

5 IA et 3 RIA

Transport Pillar Overview

8 topics, 41M€

Main Focus

- Heavy-duty applications
  - Advance in the development and demonstration of new transport applications: coach buses, trains, ships
  - Improve on-board storage technologies
    - Focus on liquid hydrogen

What is new

- Coach buses
- Trains: new prototypes
- Advanced storage technologies

Transport Pillar

8 topics, 41M€

Topic	*Type of Action*	*Ind. Budget (M€)*
FCH-1-1-2020: Development of hydrogen tanks for electric vehicle architectures	*RIA*	*2***
FCH-1-2-2020: Durability-Lifetime of stacks for Heavy Duty trucks	*RIA*	*3.5***
FCH-1-3-2020: Liquid Hydrogen on-board storage tanks	*RIA*	*2*
FCH-1-4-2020: Standard Sized FC module for Heavy Duty applications	*IA*	*7.5**

** Eligibility criterion: maximum funding; ** Included under leftover budget flexibility*

Transport Pillar

8 topics, 41M€

Topic	Type of Action	Ind. Budget (M€)
FCH-1-5-2020: Demonstration of FC Coaches for regional passenger transport	*IA*	*5**
FCH-1-6-2020: Demonstration of liquid hydrogen as a fuel for segments of the waterborne sector	*IA*	*8**
FCH-1-7-2020: Extending the use cases for FC trains through innovative designs and streamlined administrative framework	*IA*	*10*,***
FCH-1-8-2019: Scale-up and demonstration of innovative hydrogen compressor technology for full-scale hydrogen refuelling station	*IA*	*3**

** Eligibility criterion: maximum funding; ** Included under leftover budget flexibility*

Transport Pillar Overview

Research and Innovation Action

FCH-01-1-2020: Development of hydrogen tanks for electric vehicle architectures

New 70 MPa tank system in a conformable shape that can be integrated in cars with flat architectures

- Must fit into a design space of 1800 x 1300 x 140 mm^3
- At least 10 prototypes to be built
- Exhaustive tank testing expected

Mission Innovation

FCH-01-2-2020: Durability-Lifetime of stacks for Heavy Duty trucks

Study degradation mechanisms and enable increased durability for heavy-duty stacks

Mission Innovation

- Characterize and rank most critical degradation mechanisms for HD use
- Can be done with aged samples (& corresponding ageing data from field tests or actual trucks) or by performing ageing tests in labs on short stacks following realistic load profiles
- Propose and validate more durable stacks based on re-designed MEAs

Transport Pillar Overview

RIA and IA

FCH-01-3-2020: Liquid Hydrogen on-board storage tanks

Feasibility of liquid H2 on-board storage for heavy-duty vehicles

- Evaluate feasibility through a design study and demonstration test bench
- Must be compatible with existing LH2 refueling technology
- Target capacity: 40-100 kg LH2; boil-off rates < 5%/day and compatibility with fuelling rates of up to 10 kg/min

FCH-01-4-2020: Standard Sized FC module for Heavy Duty applications

Develop and validate standard FC module for heavy-duty applications

- First 12 months: define standard module frame (size, connections, etc…); by min. 7 FC suppliers and 3 OEMs
- After 12 months, a minimum of 7 FC suppliers develop, build and commit their standard sized FC + BoP module
- FC module(s) to be tested on an independent reference test device (to be built during the project)

Transport Pillar Overview

Innovation Actions

FCH-01-5-2020: Demonstration of FC Coaches for regional passenger transport

Demonstrate FC-powered coach buses

- Design of coach buses, optimizing efficiency and space utilization
- Demonstration of at least 6 FC Coaches in two coach segments (inter-city and long-distance)
- To be operated for min. 2 years and 80,000 km per coach per year with a minimum daily travel distance of 100 km

FCH-01-6-2020: Demonstration of liquid hydrogen as a fuel for segments of the waterborne sector

Use of LH2 as on-board storage in ships

- Develop on-board storage of LH2; min 1.5tons capacity
- Must include integration into a ship (min 2MW power), bunkering and prove scalability up to 20MW
- Operational period ≥12 months (including both winter and summer season) & minimum 3,000 operational hours

Mission Innovation

Transport Pillar Overview

Innovation Actions

FCH-01-7-2020: Extending the use cases for FC trains through innovative designs and streamlined administrative framework

Develop new FC-powered train designs

- Innovative prototype design to be tested (demonstrate TRL 7)
- Can address: regional trains, shunting or main line locomotives
- Propose a normative framework for the placement on the market of trains using FCH propulsion

FCH-01-8-2020: Scale-up and demonstration of innovative hydrogen compressor technology for full-scale hydrogen refuelling station

Scale up and demonstrate new compressor technology

- Upscale and integrate innovative compressor in HRS
- Demonstration in HRS ≥200kg/d H2; can be 100% with innovation or in combination with conventional technology
- Testing period of >1year under real operation conditions with 700bar refuelling and meeting requirements (purity, etc…)

FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

Energie

30 millions d’euro

3 IA et 6 RIA

Energy Pillar Overview

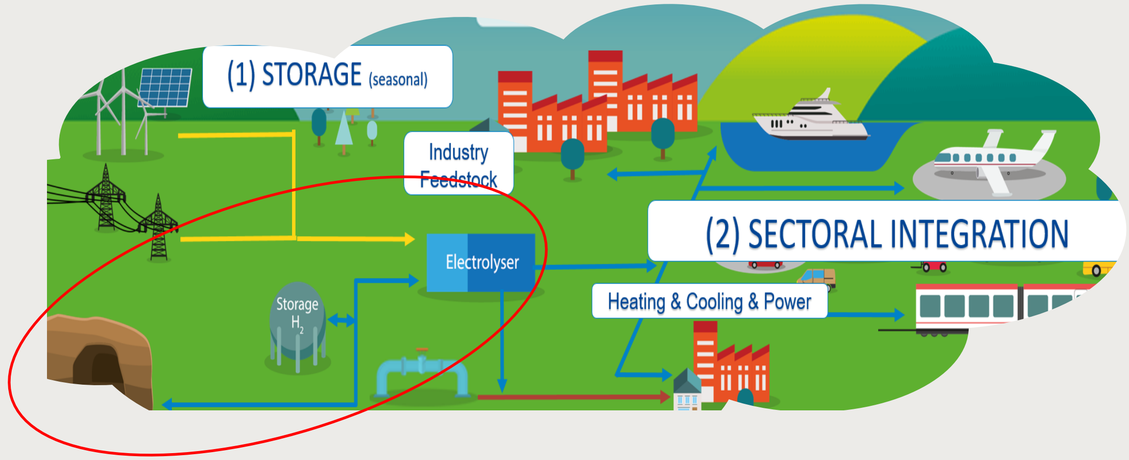
Hydrogen storage and distribution; Electrolysers for off-shore H_2 production

Main Focus

- Preparing for Bulk H_2 storage
- Preparing for off-shore H_2 production

What is new

- Underground storage of H_2 in salt caverns or depleted gas fields
- Electrolyser suitable for off-shore production



Energy Pillar

Hydrogen storage and distribution; Electrolysers for off-shore H_2 production

Topic	*Type of Action*	*Ind. Budget (M€)*
FCH-02-1-2020: Catalyst development for improved economic viability of LOHC technology	*RIA*	*2.5*
FCH-02-5-2020: Underground storage of renewable hydrogen in depleted gas fields and other geological stores	*RIA*	*2.5*,***
FCH-02-6-2020: Electrolyser module for offshore production of renewable hydrogen	*RIA*	*5*,***
FCH-02-7-2020: Cyclic testing of renewable hydrogen storage in a small salt cavern	*IA*	*5**

** Eligibility criterion: maximum funding ** Included under leftover budget flexibility*

Energy Pillar

Research and Innovation actions

FCH-02-1-2020: Catalyst development for improved economic viability of LOHC technology

Reduce LOHC system costs through improved catalysts or novel catalytic system architecture

Mission Innovation

- Decrease PGM loading, increase catalytic selectivity & space-time yield
- Open to all LOHC concepts provided carrier addresses efficiency, regulatory, safety issues
- Capacity of rig @ dehydrogenator >10 kW_{th} & < 6 kWh/kg H_2

FCH-02-5-2020: Underground storage of renewable hydrogen in depleted gas fields and other geological stores

Assess techno-economic feasibility of storing H_2 in depleted gas or oil fields

- Identification of stores – proximity to wind/solar plants & NG networks
- Geological, microbiological, engineering etc. tests and modelling
- Involve geologists

Energy Pillar

Research and Innovation actions, continued.

FCH-02-6-2020: Electrolyser module for offshore production of renewable hydrogen

Develop a >1MW electrolyser compatible with an offshore environment

- One module of multi-module design, certified for offshore operation
- Off-shore operation fully simulated – desalination, high salinity, direct connection to RES, transportation, maintenance
- Involve electrolyser OEM, off-shore energy sector, hydrogen safety competence centre

Innovation Action

FCH-02-7-2020: Cyclic testing of renewable hydrogen storage in a small salt cavern

Understand cycling of salt caverns storing H_2

- Suitable cavern identified coupled to MW-scale electrolyser and H_2 demand that lead to daily cycling
- Establish technical (geological, geochemical, microbiological) and economic capabilities and limitations of salt caverns for H_2 buffering
- Address purity/composition issues after injection/extraction cycles
- Evaluate scalability for sector coupling with industry / mobility / NG grid injection

Energy Pillar Overview

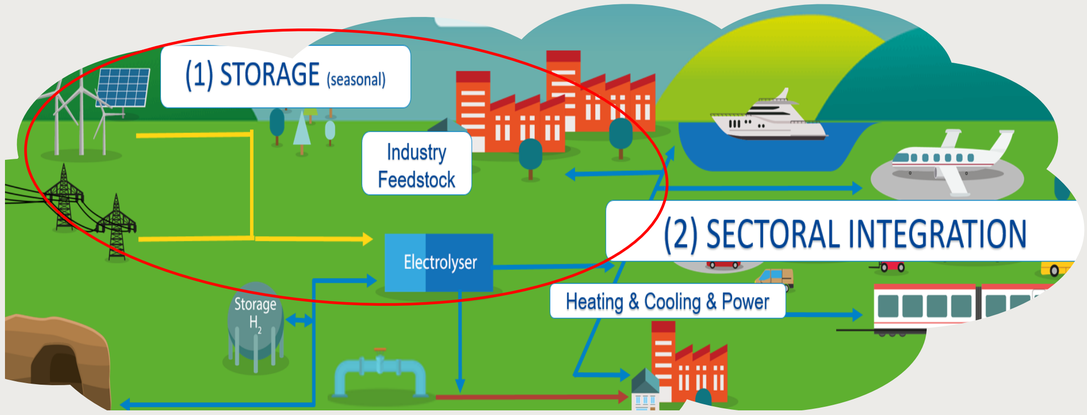
H2 production: Pushing the State of the Art on Solid Oxide Electrolysis to maintain European leadership

Main Focus

- Expanding the scope of SOE applications

What is new

- Improving SOE lifetime through diagnostics and control
- Coupling SOE to Renewable Energy Sources
- Co-electrolysis for industrial scale syngas production



Energy Pillar

H2 production: Pushing the State of the Art on Solid Oxide Electrolysis to maintain European leadership

Topic	*Type of Action*	*Ind. Budget (M€)*
FCH-02-2-2020: Highly efficient hydrogen production using solid oxide electrolysis integrated with renewable heat and power	*RIA*	*2.5*
FCH-02-3-2020: Diagnostics and Control of SOE	*RIA*	*2.5*
FCH-02-8-2020: Demonstration of large-scale co-electrolysis for the Industrial Power-to-X market	*IA*	*5**

** Eligibility criterion: maximum funding*

Energy Pillar

Research and Innovation actions

FCH-02-2-2020: Highly efficient hydrogen production using solid oxide electrolysis integrated with renewable heat and power

Optimising the coupling of the SOE with two intermittent sources, renewable electricity and high temperature heat

- Demonstrate an SOE system of 20kWel and operate> 1,000h with availability >98%
- Investigate the effect of heat and electricity variation on the SOE system under diurnal cycling
- Perform a concept design study for scaling up the SOE system to 100MWel with renewable electricity and heat supply

FCH-02-3-2020: Diagnostics and Control of SOE

Develop and validate a physical product that can provide monitoring, diagnostic and control services for SOE, r-SOC, and co-SOE operation

- Enhance understanding of degradation mechanisms in SOE, rSOC and co-SOE in relevant operating conditions and switching
- Develop algorithms to perform diagnostics and control strategies to improve durability and availability of systems
- Validate the diagnostic and control strategy in a relevant environment
- Evaluate the TCO for this diagnostic and control product and focus on exploitation pathways

Energy Pillar

Innovation Actions

FCH-02-8-2020: Demonstration of large-scale co-electrolysis for the Industrial Power-to-X market

The specific challenge is to scale up to the MW range and advance it to a TRL that is relevant for industrial syngas consumers while getting the cost of green syngas close to the steam reformer level.

- System of 700kWel that is capable of producing at least 80kg of syngas/h
- Fully equipped system incl. CO2, steam and electricity supply as well as compression of the syngas as required by consumer
- Demonstration of the system for 2 years producing 500-900 tons of syngas at >95% availability
- A techno-economic analysis indicating the TCO and an LCA indicating GHG mitigation potential should be delivered

Energy Pillar Overview

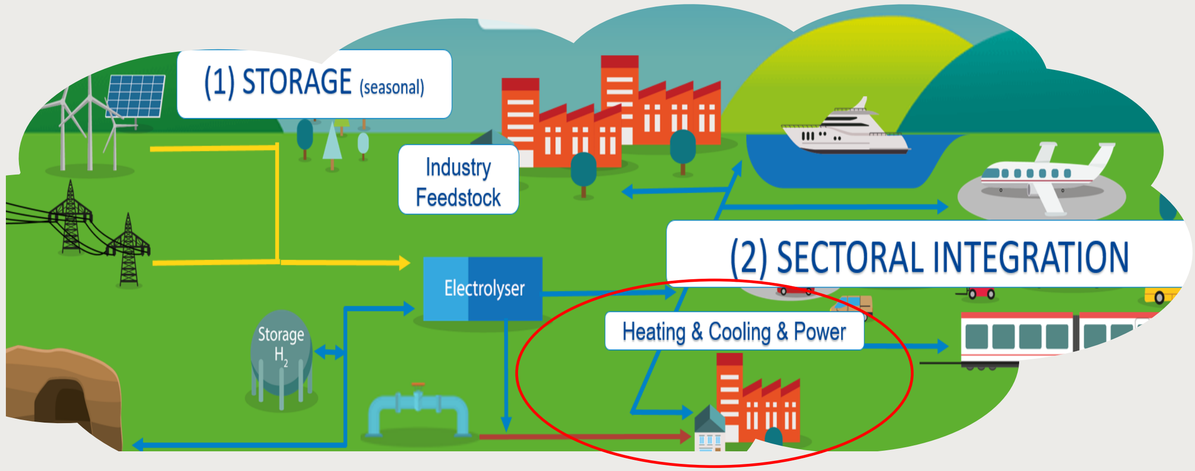
Fuel cells for Energy

Main Focus

- **Consolidating European leadership** on SOFC
- Opening-up **new markets**
- Preparing **next generation SOFC systems**

What is new

- **Next generation of SOFC** running on a 0-100% H2 mixture in gas grid
- Cost-competitive solutions for **data centres**



Energy Pillar

Fuel Cells for Energy

Topic	*Type of Action*	*Ind. Budget (M€)*
FCH-02-4-2020: Flexi-fuel stationary SOFC	*RIA*	*2.5*
FCH-02-9-2020: Fuel cell for prime power in data-centres	*IA*	*2.5**

*** Eligibility criteria: maximum funding**

Energy Pillar

Research and Innovation Action

FCH-02-4-2020: Flexi-fuel stationary SOFC

Develop and demonstrate in a **relevant environment** a stationary SOFC system capable to operate over a **wide range of gas compositions** including **H2 mixture** in natural gas from zero to 100% and additions of **biogas** in the gas grid

- At least **2 SOFC system manufacturers** based in EU or H2020 Associated Country
- Demonstrate in the operation window from **0 to 100% H2**
  - 6000 h at **stack level** with degradation rate below 1%/1000h
  - >9 months at **system level**, electrical efficiency >48% LHV, availability >90%

FCH-02-9-2020: Fuel cell for prime power in data-centres

Provision of highly reliable **power supply to data-centres** within **urban areas** and with **air quality** restrictions

Demonstration of **building integrated** solution using **fuel cells** adapted to **data centre** in urban areas

- Provide a **99.999% availability**
- Demonstration in a **real data centre** for at least **8,000 hours**
- Foster **replication** and strengthen the **competitiveness** of EU industry

FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

Overarching

EUR 13 million

1 IA et 1 RIA

Overarching topics

Topic	*Type of Action*	*Ind. Budget (M€)*
FCH-03-1-2020: HT proton conducting ceramic materials for highly efficient and flexible operation	***RIA***	***3*****
FCH-03-2-2020: Decarbonising islands using renewable energies and hydrogen - H2 Islands.	***IA***	***10****

*** Eligibility criteria: maximum funding** ***** Included under leftover budget flexibility***

Overarching topics

Research and Innovation, and Innovation Action

FCH-03-1-2020: HT proton conducting ceramic materials for highly efficient and flexible operation

Unlock the potential of **proton conducting ceramic materials** as an alternative way to **compress and purify H2**

- **Integrated approach** of material science, reactor design and multiscale modelling
- Targets **laboratory scale validation** and a PCC technology system operated in different conditions.
- Proposed materials and cells should be implemented in **short stacks and/or mini-reactors**
- **LCA** compared to conventional purification and compression technologies **needed**

Mission Innovation

FCH-03-2-2020: Decarbonising islands using renewable energies and hydrogen - H2 Islands

Showcasing the ability of **hydrogen** and its associated technologies to **decarbonize islands in EU**

Demonstrating how **H2** enables **sector coupling and** allows **large integration of renewable energy** on the selected island

- All **H2** produced from **RES** installed **on the island (“CertifHy Green H2”** should be used)
- At least **2 FCH applications** from energy and transport sectors
- At least **300 tons H2/year** should be produced and consumed on the island
- The **replicability and scalability** of the project is fundamental.
- Identify and **secure additional funding** -> include **financing scheme**
- Long-term vision (roadmap) on the **local/regional H2 economy plans** on the island towards 2050

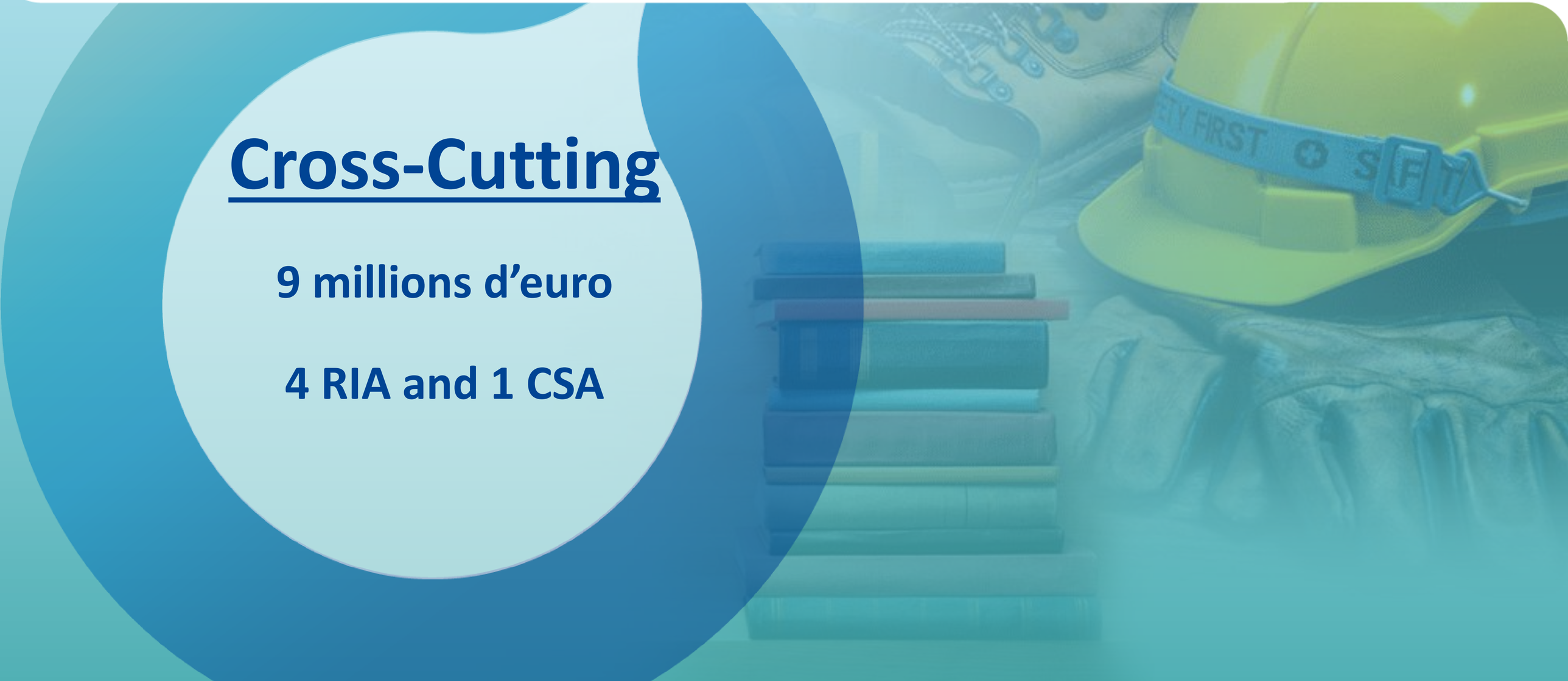
Mission Innovation

FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

Cross-Cutting

9 millions d’euro

4 RIA and 1 CSA

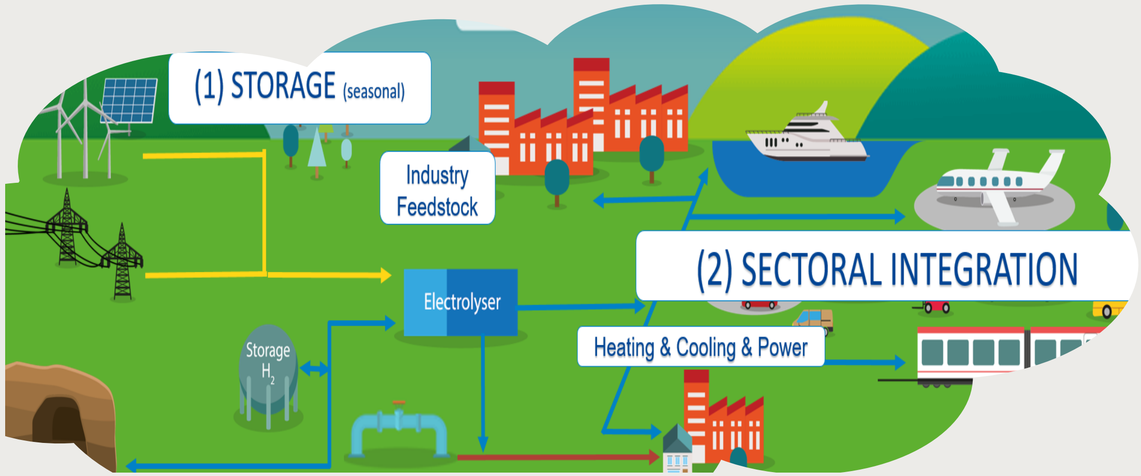


Cross-cutting Activity Area Overview

Activity Area facilitating the market uptake

Main Focus

- **Regulations, Codes and Standards (RCS),** providing science-based information for a more suitable regulatory framework
  - Multi-fuel Refuelling Stations
  - Waterborne applications
- **Sustainability**
  - Life Cycle Sustainability Assessment (LCSA)
  - Eco-design guidelines
  - Recycling



What is new

- Focus on tech. & **administrative barriers; PNR for ships**
- LC**S**A: addressing also **economic and social dimensions**
- **Eco-design** -> Integration of the environmental dimension into the design phase
- Validate existing and develop novel **recycling technologies**

Cross-cutting Activity Area

5 Topics - 9 M€

Topic	Type of Action	Ind. Budget (M€)
FCH-04-1-2020: Overcoming technical and administrative barriers to deployment of multi-fuel hydrogen refuelling stations (HRS)	RIA	2
FCH-04-2-2020: PNR on hydrogen-based fuels solutions for passenger ships	RIA	2.5
FCH-04-3-2020: Development of eco-design guidelines for FCH products	RIA	1
FCH-04-4-2020: Development and validation of existing and novel recycling technologies for key FCH products	RIA	1.5
FCH-04-5-2020: Guidelines for Life Cycle Sustainability Assessment (LCSA) of fuel cell and hydrogen systems	CSA	2

Cross-cutting Activity Area Topics Overview

Research and Innovation Action – RIA

FCH-04-1-2020: Overcoming technical and administrative barriers to deployment of multi-fuel hydrogen refuelling stations (HRS)

To provide guidance to assist the deployment of H2 dispensing in a multi-fuel environment across EU

Work scope:

- **Detailed investigation of current status in EU** for light and heavy duty road vehicles
- **Generate best practice guidance that can be applied throughout EU** -> Common approach
- Engage with permitting authorities and Standards Developing Organisations (SDOs) -> knowledge sharing

Mission Innovation

FCH-04-2-2020: PNR on hydrogen-based fuels solutions for passenger ships

Pre-Normative Research (PNR) **to facilitate** and speed up **the development of a regulatory framework applicable to hydrogen-fuelled ships** (GH2, LH2 and hydrogen-based alternative fuels) in the International Maritime Organization (IMO)

Work scope:

- **To review of the current regulatory framework**: needs, challenges, obstacles/ barriers…
- **To generate technical knowledge** for the development of a regulatory framework
- **To provide a roadmap to add GH2, LH2 and H2-based alternative fuels into the IGF Code**

Cooperation with IMO, SDOs, etc. -> dedicated **chapter of the IGF Code dedicated to H2**

Mission Innovation

Cross-cutting Activity Area Topics Overview

Research and Innovation Action – RIA

FCH-04-3-2020: Development of eco-design guidelines for FCH products

Eco-design guidelines including well-defined solutions for FCH products focused on the minimisation of the environmental impacts along their life cycle

Work scope:

- **At least two FCH products**: PEMFC, PEMWE, SOC, AWE…
- **Set of prioritised eco-design actions** in the product design methodology, **emphasis in design for recycling** , frameworks from more mature sectors
- **EU Taxonomy framework**, methodology of **eco-efficiency assessment** -> solutions' **impact assessment, benefits for actors** in the products' lifecycle (including EoL recovery and recycling)

Cross-collaboration with FCH-04-5-2020 on Life Cycle Sustainability Assessment (LCSA)

Strong international dimension

Mission Innovation

Cross-cutting Activity Area Topics Overview

Research and Innovation Action – RIA

FCH-04-4-2020: Development and validation of existing and novel recycling technologies for key FCH products

Materials recovery and recycling technologies for key FCH products

Work scope:

- **Physical, chemical and thermal processes** for materials recovery should be identified, assessed and ranked
- **Adaptation & validation** for FCH products **of existing processes in conventional recycling/ recovery centres**
- At least two (existing) recycling processes for two different FCH products' materials
- **At least two novel recycling techniques**, particular focus on precious metals
- **Validation of the suitability of the materials recovered** for their reuse (open/close-loop recycling)
- Environmental-economic analysis of the EoL strategy

Multidisciplinary partnership: OEMS, recovery and recycling companies, experts in life-cycle assessment…

Strong international dimension

Mission Innovation

Cross-cutting Activity Area Topics Overview

Coordination and Support Action – CSA

FCH-04-5-2020: Guidelines for Life Cycle Sustainability Assessment (LCSA) of fuel cell and hydrogen systems

Methodological framework and guidance for the LCSA of FCH systems

Work scope:

- **Identification of development needs** concerning the FC-HyGuide guidance document
- **Update FC-HyGuide guidance documents**
- Widen the assessment framework to **include social and economic indicators**
- Collect **life cycle inventory data** for FCH systems and competing solutions - > **publicly available!**
- At least one **test application case** for FCs and one for H2 production systems

Strong international dimension

Mission Innovation

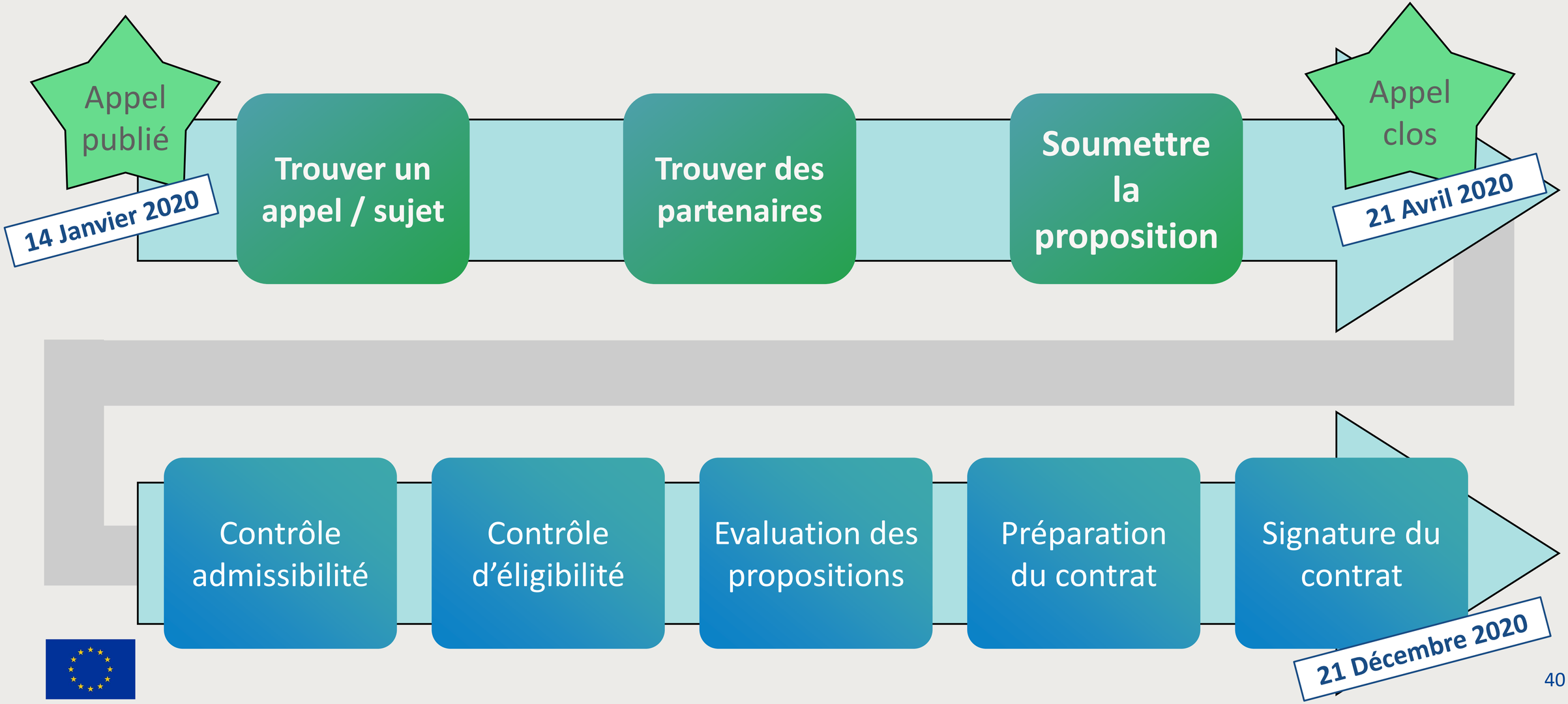
FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

FCH2 JU Appel à projets 2020

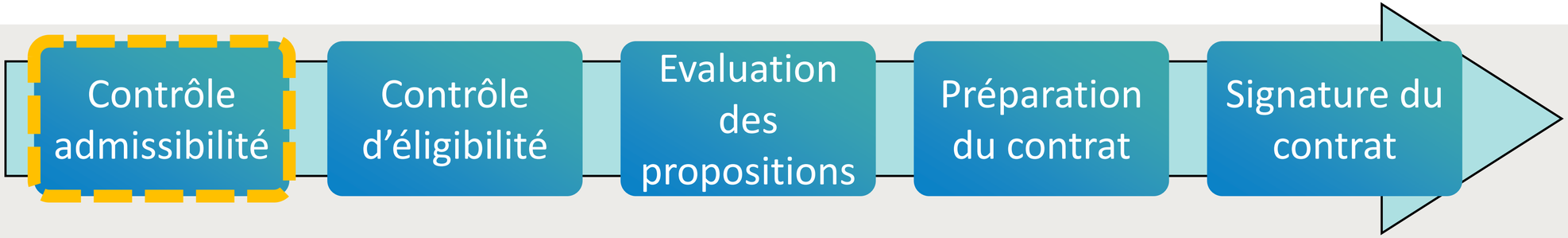
- Mode d'évaluation
- Conseils

5 Février 2020

Etapes de la publication à la signature du contrat



Admissibilité

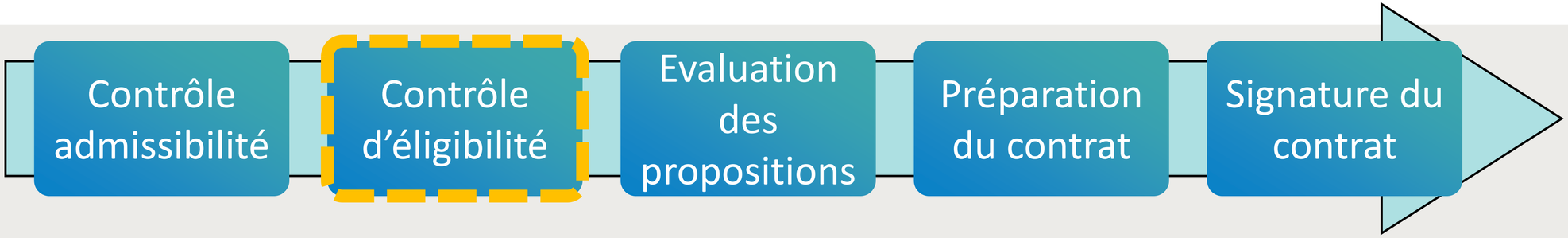


Une proposition est admissible lorsqu'elle est :

- **Soumise** dans l'outil informatique dédié via Participant 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

Respectez le format et les limitations de pages !

Eligibilité



Une proposition est éligible lorsqu'elle :

- Répond à un sujet (topic) de l'appel 2020 du FCH2
- Se conforme aux conditions d'éligibilité de l'appel FCH
- Satisfait aux exigences de partenariat

RIA and IA ➔	At least three legal entities each established in a different Member State or Associated Country. All three legal entities shall be independent of each other.
CSA ➔	At least one legal entity established in a Member State or in an Associated Country

Evaluations et prep. du contrat

Contrôle admissibilité

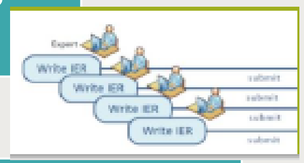
Contrôle d'éligibilité

Evaluation des propositions

Préparation du contrat

Signature du contrat

Au moins 3 experts



Etape 1: Evaluation Individuelle

Etape 2: Consensus

Etape 3: Panel

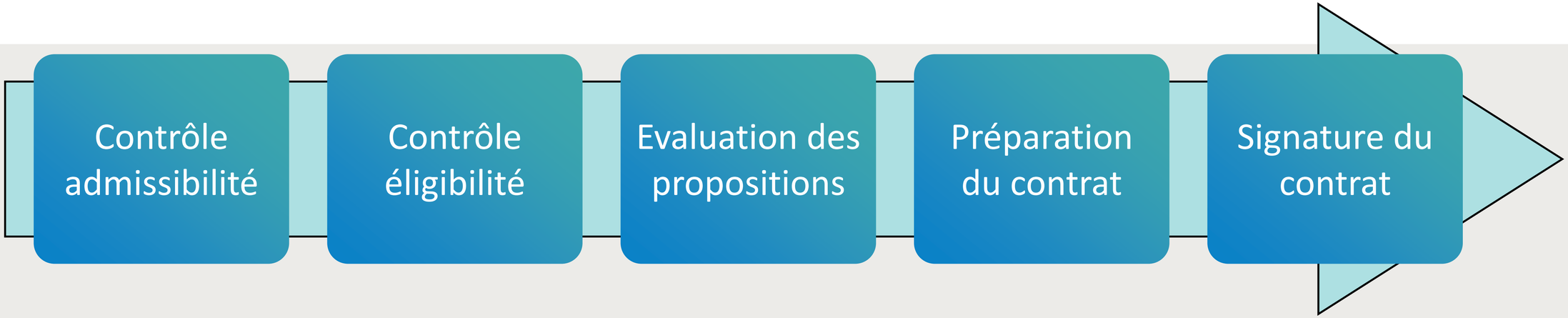
Liste des propositions classées par score

Préparation du contrat

Lettre des résultats d'évaluation

Liste des propositions éligibles au financement

8 mois entre clotûre de l’appel et signature du contrat



La qualité de la proposition est fondamentale

Préparation du contrat

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

Evaluation par des experts indépendants

Comment sont sélectionnés les experts évaluateurs?

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

25% nouveaux experts

Large champ d'expertise

Chaque proposition est examinée par au moins 3 experts évaluateurs

Presence d'un **observateur indépendant**

Réseautage et apprentissage de bonnes pratiques

Règles d’évaluation

Système de notation des propositions

Les propositions sont évaluées selon 3 critères:

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

Grille d’évaluation complete disponible en “Annexe H”

Notes et seuils minimums

Excellent - 5

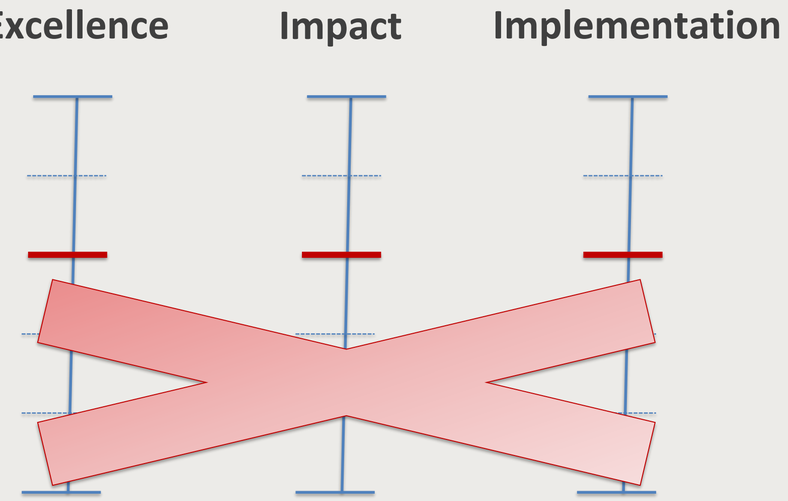
Très bien - 4

Bien - 3

Passable - 2

Médiocre - 1

Nul - 0



Seuil minimum applicables:

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

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 faible**
- 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**

Excellence - Recommandations

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)
- Définissez des KPI clairs, quantifiez-les et montrez comment vous allez les atteindre
- Déclarez clairement quelle est la science supportant le projet
- Expliquez le potentiel novateur et ce que votre proposition apporte de neuf par rapport aux projets / activités existants
- 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

Impact - recommandations

Lien avec FCH2 JU

- Répondez aux impacts attendus listés dans l'appel à projets FCH 2020
- Comment le projet permet d'atteindre les objectifs du AWP/MAWP du FCH2 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.)
- Annoncez clairement les aboutissants du projet et comment ils seront utilisés
- 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

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 riques, 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 recherché/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

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

Implementation - recommandations

Le **partenariat** doit répondre aux exigences de H2020 et de l ’appel à projets FCH 2018.

- Prenez en compte la **coopération internationale**, sujets avec IPHE.
- 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

Resources

- Research Enquiry Service
http://ec.europa.eu/research/index.cfm?pg=enquiries

- H2020 documents in Participant Portal
http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html

- Ethics in Participant Portal
http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/ethics_en.htm

- IPR in Participant Portal
http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/intellectual-property_en.htm

- European IPR Helpdesk
https://www.iprhelpdesk.eu/

Fact Sheet
IP Management in Horizon 2020:
at the proposal stage

FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

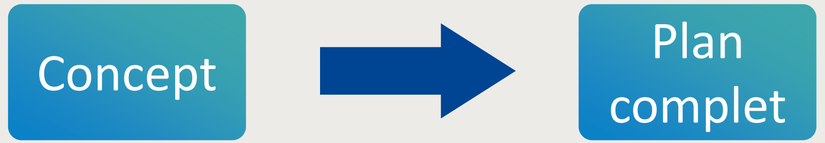
PDA – Project Development Assistance pour les plans régionaux hydrogène

Project Development Assistance - PDA

Appel à projet pour affiner les plans régionaux sur l'hydrogène et les piles à combustible

Objectif

Passer du concept à un plan de travail détaillé, avec l'aide de consultants (40-85 personne-jour par projet)



Intérêt pour les villes et régions

- **Plan détaillé du projet**: description des applications, où, quand, comment, dimensionnement et localisation des équipements, recherche de fournisseurs et de clients finaux,
- Plan détaillé du **budget**: dépenses en capital (CAPEX) et en opération (OPEX), mesures de contingence
- Plan de **financement et subventions**: estimation des revenus, des coûts, calendrier des dépenses et des revenus
- Stratégie et bonnes pratiques pour l'achat d'infrastructure hydrogène et des véhicules/unité de co-génération, etc.
- Possibilité de **marché public commun** avec d'autres territoires pour réduire les coûts d'achat
- Un groupe de travail liant tous les projets européens du PDA

Project Development Assistance

L’appel à candidature en pratique

- Durée de l’assistance: 1 an, de Avril 2020 à Avril 2021
- Soutien prévu pour 10 projets minimum
- Candidats: **autorités locales** avec un concept de projet hydrogène et piles à combustible existant
- Date limite: 27 Février 2020 à 23:59:59
- Notification: les candidats sélectionnés seront informé d’ici le 9 Avril 2020
- Les projets concrets sur l’hydrogène et les piles à combustible doivent débuter au plus tard en Avril 2022
- Comment candidater? **Dossier de candidature** et soumission via le site www.fch-regions.eu