# Consortium Building and Application Process of Horizon Europe Project

**Example of ECOHYDRO project** 

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- Some guides for Horizon Europe project applications are provided in a chronological order.
- An example of ECOHYDRO project (Clean Hydrogen Program) is shown.
- So, some rules/tips may not apply to the other calls or ERC calls.
- The jobs as a coordinator and as a participant are different; however, it is always useful to know both of them.
- The facts are written in gothic style.
- The personal tips and opinions are written in italic style.
- "Participant": Official partner (organization) of the project with funded budget

# **Before Application**

Many European partners have conducted a number of EU projects since long (...FP5, FP6, FP7, H2020, Horizon Europe...*FP10*) within their own club.

It's important to enter this club as a new member; in European culture, they prefer to work with those whom they already know.

Identify European actors with significant experience/network of EU projects.

### Networking with European academic and industrial partners

(Direct contact or) academic conferences & industrial conferences/exhibitions in Europe Make an impressive presentation at the session or ask questions to the presenter of your interest. Don't be shy at the coffee break and the banquet (where the most of networking happens.). Be sure to make a follow-up: visit in person, (at least) video conference. Introduce your lab/institution (not just yourself).

*Emphasize unique expertise (manpower/tools/facilities/know-how, etc.) rather than general research fields/equipment or publication record.* 

# Find a Call & Make a Consortium

- It is the most important to have an **original idea/topic**, if you would be the coordinator. Otherwise, you should be part of a small consortium with such idea, to apply for a call.
- Detect an appropriate call
- Never too early to start.
- Look at the draft for the next calls, before the call announcement.
- Attend the webinar or INFO day for the presentation of Horizon Europe programs.
- Some practical information can be obtained: recent trend, success rate, tips/traps, etc.
- Note the contact information of national contact person (NCP) and call/program responsible.
- Don't hesitate to contact the national contact person to obtain the complementary information: it's a kind of lobbying.
- Sometimes, the national contact person can introduce you a consortium looking for new or complementary participants.

### Once you found an appropriate call

# Google eu funding and tenders portal X Vidéos C C Tous Vidéos Images Actualités Livres Web Finance Outils



European Commission https://ec.europa.eu > opportunities · Traduire cette page

### EU Funding & Tenders Portal

The **Funding and Tenders Portal** is the single entry point (the Single Electronic Data Interchange Area) for applicants, contractors and experts in funding ...

#### Participant register

If you want to participate in a call for proposals or in a call for ...

#### Share this page

The Funding and Tenders Portal is the single entry point (the Single ...

#### See more news

The Funding and Tenders Portal is the single entry point (the Single ...

#### Horizon Europe Dashboard

The Funding and Tenders Portal is the single entry point (the Single ...

### Funding & Tenders

The Funding and Tenders Portal is the single entry point (the Single ...

#### Autres résultats sur europa.eu »

### Create an account / Login



#### Discover the funding & tenders opportunities

Find out how to participate by following these key steps.

### Find calls for proposals Call (previous, present, future) search

Explore the available EU funding opportunities by searching for calls for proposals within your topics of interest, find partners and submit a proposal.

#### View projects and results

Browse through EU funded projects and learn about the results. Invest in opportunities and get inspired by the highlights and success stories.

### After the application

#### Find calls for tenders

Find business opportunities in the calls for tenders managed by EU institutions, bodies and agencies.

#### Work as an expert

Proposals and projects need evaluations, monitoring and domain-specific knowledge advice from experts.

# Register as a potential evaluation expert !

Report fraud

### After the login



**Don't forget to complete both "F&T user profile" and "Expert profile."** *Expert: You can obtain more insight in the evaluation system of Horizon Europe program.* 



You can see the result of your application.

Once accepted, you can manage the project as the coordinator or a participant.



# **Call Description**

RIA (low TRL) or IA (high TRL) ? : Funding scheme, Consortium composition, Budget size, etc.



#### https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-jti-cleanh2-2023-07-01

# **Expected Outcome**

### Propose specific plans to achieve all these outcomes (to be mentioned in the proposal).

Expected Outcome: For hydrogen, as well as its derivatives, to be a truly sustainable energy vector and part of a future sustainable energy system, their storage technologies need to be further developed. This topic aims to develop a step change, supporting key elements of the long-term needs of hydrogen storage, notably:

- •Reduction of whole lifetime costs of hydrogen storage technologies;
- Development of environmentally sustainable and circular storage systems;
  Ensuring the safety of innovative hydrogen storage technologies.

### Project objectives in the proposal

Some projections expect that hydrogen will account for 24% of Europe's energy needs by 2050<sup>[1]</sup>. This requires storage at multiple stages and transportation between the production and end-use phases, thus there is going to be a need for a significant storage solutions. For example, considering mobility needs, there will be required many storage tanks by 2050<sup>[2]</sup> with a lifetime from 3 years to 15 years depending on the application. Additionally, there will be a significant number of storage tanks to support the mobility aspect, i.e. in refuelling stations. The outcomes of this topic will consider the new generation of materials required for the storage of all forms of hydrogen and how they can be used in a circular economy business approach. Project results are expected to contribute to **all** of the following expected outcomes.

- Development of multifunctional materials, focusing on reducing the whole life cost of hydrogen storage solutions by 50%. Materials as hydrogen carriers are not in scope of this topic;
- Identification and development of sustainable materials enabling a circular design as per the Circular Economy System Diagram<sup>[3]</sup>;
   Development of standardised inspection and repair methods that can be used to increase the lifetime of hydrogen storage solutions;
- •Development of smart solutions that allow for cross-application uses of hydrogen storage, specifically for end of first life scenarios, thus reducing the total number of storage tanks produced;
- •Strengthening the EU value chain without an effect on the sustainability aspects of the storage solution, in line with the objectives of the RePower EU action plan<sup>[4]</sup>;
- •Improvement of safety aspects relative to hydrogen storage in tanks, considering industrial needs, and thus contributing to improving public acceptance of hydrogen technologies;
- Increase in knowledge of the wider research community, industry and support to the adoption of hydrogen by the wider society;
  This SRC should also provide solutions for technologies for other partnerships within Horizon Europe, including, but not limited to, Sean Aviation, Circular Bio-based Europe, EU Rail and Key Digital Technologies, as well as Clean Hydrogen JU itself.

# **Key Performance Indicator**

# Propose specific plans to achieve all the KPIs (Key Performance Indicators) which should be mentioned in the proposal.

These KPIs are to achieve after the project termination ("in 2030").

Propose two KPIs: the one in the end of the project and the other in 2030, vs. State-of-the-Art.

Project results are expected to contribute to **all** of the following objectives and KPIs of the Clean Hydrogen JU SRIA: •For aboveground storage of hydrogen there should be an increase in storage size and reduction in capital cost according to the following KPI's:

- Storage size: 20 tonnes in 2030;
- Cost reduced: 600 €/kg in 2030.

•For road transport of hydrogen there should be an increase in tube trailer payload, reduction in capital cost and increase in operating pressure according to the following KPI's:

- For compressed hydrogen, trailer payload: 1,500 kg in 2030;
- For compressed hydrogen, trailer capital cost: 350 €/kg in 2030;
- For compressed hydrogen, operating pressure: 700 bar in 2030;
- For LH<sub>2</sub> trailer payload, trailer payload: 4,000 kg in 2030;
- For LH<sub>2</sub> trailer payload, trailer capital cost: 100 €/kg in 2030.

•For onboard storage of hydrogen in heavy-duty truck applications there should be a reduction in capital cost, an increase of gravimetric capacity and increase of conformability according to the following KPI's:

- For compressed hydrogen, storage tank capital cost: 300 €/kg H<sub>2</sub> in 2030;
- For liquid hydrogen, storage tank capital cost: 245 €/kg H<sub>2</sub> in 2030 ;
- For compressed hydrogen, increase in gravimetric capacity: 7% in 2030;
- For liquid hydrogen, increase in gravimetric capacity: 12% in 2030;
- For liquid hydrogen, increase in conformability: 55% in 2030.

•For onboard storage of hydrogen for aviation applications there should be an increase in tank gravimetric efficiency, where the gravimetric efficiency of a storage tank is the mass of stored hydrogen divided by the mass of the system (included mass of hydrogen), according to the following KPI:

Tank gravimetric efficiency: 35% in 2030.



### Describe the novelty of the current project over the previously funded projects.

Scope: Storage of hydrogen is specifically challenging, depending on its physical state; in gas form hydrogen is difficult to contain, whilst in liquid form it requires extremely low temperatures. The current hydrogen storage solutions utilise a number of high-performance materials, such as high-performance steels, aluminium or composites (parbon fibres specifically), which have been developed over many years with projects such as CHATT<sup>[5]</sup> and more recent THOR<sup>[6]</sup>, which considers both the performance and the recyclability. As these materials substantially affect the cost and mass at system level, it is critical that lower cost and lighter storage solutions are developed for hydrogen technologies to be adopted widely<sup>[1]</sup>. Ongoing EU funded project SH2APED<sup>[8]</sup> bocuses on cost reduction and safety. However, as materials used in the hydrogen storage solution can be a leading cause behind the environmental impacts,<sup>[9]</sup> sustainable and circular material solutions are critical for the storage tank materials. There are currently very few materials for storage of hydrogen that could be considered as a sustainable material or developed within the circular economy model. This topic focuses on developing advanced materials to reduce whole life costs and produce lighter solutions for hydrogen storage, whilst developing sustainable circular economy-based components and considering the environmental and social impacts. The hydrogen storage emphasised under this topic covers the form of **gas, liquid or cryo-compressed** states supporting high-pressure tanks even up to 1,000 bar.

In addition, the EU security of materials supply/independency should be investigated and addressed. All materials used should comply with the actions laid out in the REPowerEU Plan<sup>[10]</sup> and other EU initiatives relevant to this topic.

Of particular interest are advanced and next-generation materials with multi-functionality enabling better integration of the storage into the system or having a notable effect on the total system operation (for example, materials which selfheal, thus reducing maintenance requirements). Moreover, materials which allow for storage solutions that occupy more of the useable space are within the scope of this topic. In order to use the benefits of these materials, in their manufacturing, joining often represents a mandatory task to use the benefits of the developed materials. Such joining processes should not compromise the initial material properties or functions. Development of the joining process should consider how this could enable improvement in environmental sustainability and a reduction in whole life costs.

In addition to materials development, the scope includes the development of methods for the inspection and repair of hydrogen storage systems, starting from initial manufacturing to end of life with a specific concern for where access can be challenging. This should enable and support end of life scenarios and life extension of the hydrogen storage solutions.

### Ambiguity, How to interpret ","?: gas AND liquid/cryo ? gas OR liquid/cryo ? Ask the NCP !

# **Scope: Demonstrators**

Proposals should include the materials development for tank hull (e.g. the bottom portion of the tank) focusing on storage solutions for the following uses:

..

Hydrogen storage solutions for space applications and large underground storage as well as development of hydrogen carrier materials / solid state storage are out of the scope of this topic. Building across the applications listed, digitalisation of circular economy (open access) system / platforms should be considered as well as contributions to new standards and regulations within scope of this topic. In order to validate the project, one for each type of the following demonstrators tested in lab environment (TRL 4) () with the associated full-sized documentation should be included (the testing conditions should be in line with the objectives and KPIs of the Clean Hydrogen JU SRIA stated above):

Above ground storage demonstrator:

- Operating pressure test;
- Ambient temperatures;
- Hydrogen gas form;
- 1 tank containing more than 300 kg of hydrogen.
- •Transport of hydrogen demonstrator:
  - Operating pressure test;
  - Ambient temperatures;
  - Liquid hydrogen or gas form;
  - 1 tank containing more than 150 kg of hydrogen.
- •Heavy-duty road transport demonstrator:
  - Operating pressure test;
  - Ambient temperatures;
  - Liquid hydrogen or gas form;
  - 1 tank containing more than 40 kg of hydrogen.
- Aviation demonstrator:
  - Operating pressure test;
  - Ambient temperatures;
  - Liquid hydrogen;
  - One tank containing more than 100 kg of hydrogen (Boil-off < 2% in 24 hours).

TRL4 : lab-scale demonstrators But, the KPIs are very specific.

Information from the NCP: the participation (or advise at least) of endusers for these applications are highly recommended.

# **Consortium Building**

- Start with core members (3-5 participants).
- Make a list of missing participants.
- Each core member recruits missing participants.
- Rules: nation balance (number, budget, region), academic/industrial (SME, Big), gender
- It is advantageous to recruit EU representative industrial partners in the corresponding sector.

### Consulting firm ?

- In some organizations, there are staff members for EU project management: They can become the project coordinator whereas there is another scientific coordinator (often, for high TRL Innovation Action projects). The personal cost for such staff can be included in the project budget.
- Otherwise, in many successful applications, a consulting firm help the consortium with preparing a good proposal and submitting the proposal at EU portal.
- Sometimes, a consulting firm can be a participant of the project and, once accepted, continue to manage the project; or a consulting firm can be a subcontractor to manage the project.
- The charge for the consulting firm can be shared by the participants: Anticipate this budget.

# **Example: ECOHYDRO Project**

TOPIC ID: HORIZON-JTI-CLEANH2-2023-07-01, Advanced materials for hydrogen storage tanks

01 JAN 2024 - 31 DEC 2027

- Budget : 10M euros (for 1 project)
- Type: RIA (Research and Innovation Action), TRL 2~4
- 2 types of H2 storage: Compressed gas, Cryogenic liquid
- 4 demonstrators: Aboveground station, Tube trailer (road transport), Truck, Aviation *Low TRL; but, many*

**Knowledge providers** 

- Recycling methods
- Repair & joining methods
- In-situ SHM method, AI algorithm
- Numerical model of residual lifetime
- Numerical model of filament winding

сапое

Wrocław University of Science and Technology

## **Materials developers**

- Multi-functional (fire resistance, selfhealing) acrylic resin
- Hybrid carbon/basalt tow
- New fibre tow & prepreg using recycled carbon fibres and resin

ARKEMA

etex



End-users (H2 storage)

- Aboveground station storage
- Tube trailer for road transport
- Truck, Bus
- Aviation











Total budget: 9 997 627.50 euros (9.617M from EC + 0.381M from UK) 15 partners in 7 countries 2 advisory board members \*

# **Evaluation Sheet**

Before writing a proposal, you may as well take a look at the evaluation sheet.

There are thresholds for each criteria: it's important to obtain a good score for all the criteria.

Evaluation Result Total score: XX (Threshold: 10)

Criterion 1 – Excellence Score: XX (Threshold: 3/5.0, Weight: - )

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Criterion 2 – Impact
Score: XX (Threshold: 3/5.0, Weight: - )
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Criterion 3 – Quality and efficiency of the implementation Score: XX (Threshold: 3/5.0, Weight: - )

Scope of the application Status: Yes/No

Exceptional funding, Use of human embryonic stem cells (hESC), Use of human embryos, Activities excluded from funding,
 Do no significant harm principle,
 Exclusive focus on civil applications, Artificial Intelligence
 Don't forget to mention these criteria
 in the proposal.

# **Evaluation Criteria**

### Criterion 1 – Excellence

### Score: XX (Threshold: 3/5.0, Weight: - )

The following aspects will be taken into account, to the extent that the proposed work corresponds to the description in the work programme:

- Clarity and pertinence of the project's objectives, and the extent to which the proposed work is ambitious and goes beyond the state of the art.
- Soundness of the proposed methodology, including the underlying concepts, models, assumptions, inter-disciplinary approaches, appropriate consideration of the gender dimension in research and innovation content, and the quality of open science practices, including sharing and management of research outputs and engagement of citizens, civil society and end users where appropriate.

### Criterion 2 – Impact

### Score: XX (Threshold: 3/5.0, Weight: - )

The following aspects will be taken into account, to the extent that the proposed work corresponds to the description in the work programme:

- Credibility of the pathways to achieve the expected outcomes and impacts specified in the work programme, and the likely scale and significance of the contributions from the project.
- Suitability and quality of the measures to maximise expected outcomes and impacts, as set out in the dissemination and exploitation plan, including communication activities.

### Criterion 3 – Quality and efficiency of the implementation

### Score: XX (Threshold: 3/5.0, Weight: - )

The following aspects will be taken into account, to the extent that the proposed work corresponds to the description in the work programme:

- Quality and effectiveness of the work plan, assessment of risks, and appropriateness of the effort assigned to work packages, and the resources overall.
- Capacity and role of each participant, and the extent to which the consortium as a whole brings together the necessary expertise.

# **Proposal Structure: ECOHYDRO**

Part a is automatically

### Part b: technical description

1. EXCELLENCE	generated by Portal.
1.1 OBJECTIVES AND AMBITION	<b>C</b> ,
1.1.1. Objectives	
1.1.2 Ambition	All the evaluation
1.1.3 Project position	•, •
1.2 METHODOLOGY	criteria are
1.2.1 Overall methodology and concept	transforred to the
1.2.2 Compliance with the 'do not significant harm' principles	nansjerrea to the
1.2.5 Links to other research and innovation activities	section titles.
1.2.5 Interaction of social sciences and humanities in the project	,
1.2.7 Gender dimension in research activities	,
1.2.8 Open Science practice	,
1.2.9 Data Management and management of other research outputs	Delated projects of
	Related projects of
2. INITACI	the participants
2.1 PROJECT'S PATHWAYS TOWARDS IMPACT	
2.1.1 ECOHYDRO contribution to expected outcomes and wider impacts	(show the
2.1.2 Potential barriers	ovportico lovporionco
2.1.3 Scale and significance	expertise/experience
2.2 MEASURES TO MAXIMISE IMPACT - DISSEMINATION, EXPLOITATION, AND COMMUNICATION	of the participants)
2.2.1 Fian for the dissemination and exploitation including communication activities	
2.2.2 Interfectual Property (IP) management and foreseen protection measures	
2.5 508.04.4.1	
3. QUALITY AND EFFICIENCY OF THE IMPLEMENTATION	
3.1 Work plan and resources	
3.1.1 Overall structure of the work plan	Subcontracting
3.1.2 Gantt chart	
3.1.4 Budget justifications	Equipment:
3.2 CAPACITY OF PARTICIPANTS AND CONSORTIUM AS A WHOLE	depreciation
3.2.1 Consortium composition and complementarity	
3.2.2 Participants role and contribution to ECOHYDRO4/	
4 ETHICS SELF-ASSESSMENT:	

# Lessons & Tips

- For specific calls (e.g. Clean Hydrogen), the time to prepare a submission is very short: Call open 30 JAN 2023, Submission close 18 APR 2023.
- The information on the next call publication is shared only within the inner circle.
- The applicants may as well anticipate proper calls and build a consortium (at least some key partners) before the call announcement.
- The participation at INFO days is very useful.
- The contact with NCP (National Contact Person) is very helpful: some practical information (e.g. success rate) and potential partner matching.
- The survey on the state-of-the-art of the topic in the USA (and in the other regions) and on the previous/on-going EU projects can be effective to convince the evaluators.
- The choice of industrial partners (both SMEs and Big group) is crucial to run a successful project as well as to prepare a successful proposal: in particular, deliverables, budget/expense, tasks, human resources, etc.
- Even for low TRL projects (i.e. RIA), the plan for demonstrator development (hence, the participation of end-users) is important.
- Risk anticipation & mitigation are crucial for a successful project management (e.g. Pandemic, War, etc.).