



## CALL FOR EXPRESSION OF INTEREST for a participation in the IPCEI on Hydrogen technologies and systems

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*Deadline for the first wave: 15/04/2021*

### 1. Background and objectives

As stated in the *Manifesto for the development of a European Hydrogen Technologies and Systems value chain*<sup>1</sup>, “hydrogen applications and technologies can contribute both to the creation of sustainable industrial jobs and to the attainment of Europe’s energy and climate targets in line with the Paris Agreement”. Indeed, hydrogen and its derivatives can contribute to the reduction of climate gas emissions by transforming carbon-intensive processes and activities that cannot be effectively counteracted otherwise.

A *National Strategy on Hydrogen for Luxembourg* is currently being prepared with the involvement of key stakeholders, coordinated by the Ministry for Energy and Spatial Planning. It outlines the main strategic measures to support the target of climate neutrality by 2050, the priorities for the decarbonization and integration of the energy sector, as well as the key strategic actions for the development of renewable hydrogen in Luxembourg, amongst others.

Hydrogen and its derivatives further open up opportunities in terms of industrial policy which aims at developing strategic positions in an international future market and to create added value for Luxembourg and Europe. This can be applied to the different fields of the hydrogen deployment value chain, namely technologies for its production on the basis of renewable energies (i.e. “renewable”, “green” or “clean” hydrogen), transmission and distribution infrastructure, storage / buffering in energy systems, or for its end-use in industrial processes, green mobility (e.g. in fuel cells), or heat and electricity applications.

For hydrogen to transition from a potential solution to a mature market alternative, developments at both technology and cost-effectiveness level must take place. Indeed, a functioning self-sustaining green hydrogen market is not currently available neither at national nor on a European level, since green hydrogen technologies with their significantly higher costs are not yet competitive with conventional fossil counterparts. An efficient hydrogen production requires large-scale equipment that can only reach

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<sup>1</sup> <https://www.bmwi.de/Redaktion/DE/Downloads/M-O/manifesto-for-development-of-european-hydrogen-technologies-systems-value-chain.html>

long-term viability if a sufficiently high demand can be ensured. On the other hand, willingness to commit investments in hydrogen-consuming systems and applications can only be met if there is both sufficient certainty about the available supply and if the novel products are competitive at international level. A suitable policy instrument to overcoming this market failure is to promote the development and ramp-up of hydrogen technologies which requires an integrated approach along the entire value chain which includes clean hydrogen production, transmission-storage-distribution infrastructure and applications that use hydrogen.

Set up by the European Commission in 2018<sup>2</sup>, the *Strategic Forum on Important Projects of Common European Interest (IPCEI)* has identified “Hydrogen Technologies and Systems” as one of six strategic value chains that will contribute to Europe’s green and digital transformation, help improve its industrial competitiveness, and achieve its climate ambitions, strategic autonomy and security. To foster the establishment of this value chain, strategically important undertakings characterized by a high technological or financial risk from the different participating Member States will be interconnected for the benefit of the entire European internal market and society.

As a first step in the process, the Ministry of the Economy is conducting a Call for Expression of Interest in order to scout for and qualify specific projects that can become eligible for participation in the IPCEI on Hydrogen. The purpose of this Call is to create an overview of interested parties that are considering sufficiently relevant and mature projects (technological readiness level 6-7 or above) to be included as the contribution of Luxembourg to a joint European IPCEI project for the development of the hydrogen value chain. Expression of interest submitted by the parties is non-binding and will not be considered as a formal application for State aid. Please further note, that it is not yet possible to indicate whether such a European IPCEI will actually be created as it will depend on the level and quality of participation for each member state.

## **2. Funding principles**

The Luxembourg Ministry of the Economy, in coordination with the Ministry for Energy and Spatial Planning, plans to support projects in the field of hydrogen technologies and systems.

State aid approval is based on the assessment criteria outlined in the communication of the European Commission (2014/C 188/02)<sup>3</sup> regarding the compatibility of State aid with the internal market to promote the execution of important projects of common European interest (hereinafter "IPCEI Communication"). The contents of the IPCEI communication form therefore the basis for this Call of Expression of Interest and any subsequent project funding. The aid is approved in accordance to the guidelines set by the IPCEI Communication and according to provisions of the national legislation, including any administrative regulations or decrees issued for this purpose. Funding is further subject to the availability of the estimated budget and project approval following notification of the European Commission. No entitlement to a grant can be asserted by means of a legal claim.

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<sup>2</sup> Commission Decision C(2018)475 of 30/01/2018. [<https://europa.eu/!nT98kN>]

<sup>3</sup> Communication from the Commission (2014/C 188/02) of 20/06/2014 — Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest [[https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014XC0620\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014XC0620(01))]

### 3. Object of funding

The funding process aims to significantly contribute to the implementation of the *National Strategy on Hydrogen*, to the goals set in the *National energy and climate plan* (NECP), and to support the objectives at EU level in the areas of hydrogen production, infrastructure and use in the industrial, heat (CHP) and transportation sectors.

Projects from the following areas are included in the scope of this funding procedure:

- a) Production:
  - Production of renewable (clean) hydrogen,
  - Conversion of renewable hydrogen into gases, liquids or chemicals (hydrogen derivatives),
- b) Infrastructure:
  - Feed-in and output of hydrogen or its derivatives,
  - Storage of hydrogen and its derivatives (installation / expansion / repurposing),
  - Grid-/Pipeline-bound (installation / repurposing) and unbound transport of hydrogen and its derivatives, including necessary peripheral systems,
- c) Use in industrial applications:
  - Use of hydrogen or its derivatives in industrial manufacturing processes,
  - Development and manufacture of fuel cells to convert hydrogen into electricity (outside the mobility sector),
- d) Use in mobility applications (road, air, rail or waterborne transport):
  - Development and manufacture of fuel cell systems for vehicle drives,
  - Development and manufacture of light and heavy trucks / utility vehicles, buses, freight and passenger trains, cars in fleet applications, aviation and shipping with hydrogen-based propulsion systems (i.e. including hydrogen and its derivatives),
  - Construction and installation of fuel station or refuelling infrastructure.
- e) Use in heating or cooling applications (CHP).

The project may entail:

- Research development and innovation (R&D&I) which clearly goes beyond the state-of-the-art in the sector,
- First Industrial Deployment (FID) of highly innovative technology,

Please note that projects comprising an industrial deployment must encompass the development of a new product or service with high research and innovation content and/or the deployment of a fundamentally innovative production process. Regular upgrades without an innovative dimension of existing facilities and the development of newer versions of existing products do not qualify as IPCEI.

- Innovative investments that reduce greenhouse gas emissions for environment, energy and transport projects (EET).

Eligible costs are determined in accordance with the Annex section of the IPCEI Guidelines<sup>4</sup>.

They can therefore include feasibility studies, depreciation costs of equipment corresponding to the life of the project, acquisition (or construction) costs of buildings, infrastructure and land, other resources (including materials, supplies, components and similar products), costs associated with obtaining, validating and defending patents and other intangible assets and certain personnel and administrative costs. Operating costs (OPEX) can only be funded for projects within their first industrial application if this commercial use is the result of R&D&I activities, which in itself includes an important R&D&I component.

Funded equipment / fuel cells for the use of hydrogen should be operated with renewable hydrogen or its derivatives. The use of other gases or products is however not excluded from funding, provided that it constitutes a temporary necessity for reasons of insufficient availability or significantly higher costs, it is limited in time, and levels of greenhouse gas savings in adequacy with the current state of the art can still be achieved. In this case, an analysis proving that renewable hydrogen is not an option at this point in time, as well as an estimation of when and to what extent the equipment will be operated with green hydrogen or its derivatives must be provided separately. A corresponding CO<sub>2</sub> reduction path should be presented for the transition period.

Please note that costs incurred prior to the submission of an aid application are not eligible for subsidy. Indeed, this provision is in line with the principle stated under Article 38 of the IPCEI Guidelines: “Without the aid the project’s realisation should be impossible, or it should be realised in a smaller size or scope or in a different manner that would significantly restrict its expected benefits.”

#### **4. Eligibility criteria**

- a) The projects to be funded must meet the following requirements:
- The project must fulfil the *Eligibility Criteria* outlined in Section 3 of IPCEI Guidelines and meet one or more of the *Specific criteria* outlined in points 21 to 23 of the same document (i.e. be a major innovative R&D&I project, an initial industrial application with high research and innovation content, or an environmental, energy or transport project of great importance to the strategy of the EU).
  - In accordance with article 24 of the IPCEI Communication, an IPCEI project “must be important quantitatively or qualitatively. It should either be particularly large in size<sup>5</sup> or scope and/or imply a very considerable level of technological or financial risk”.
  - Co-financing by the applicant must be ensured.
  - The beneficiary requesting funding from Luxembourg must have a permanent establishment in the Grand Duchy of Luxembourg.

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<sup>4</sup> Guidelines for the analysis of the compatibility with the functioning of the EEA Agreement of state aid to promote the execution of important projects of common European interest - CONSOLIDATED VERSION (15/07/2020)  
[\[https://www.eftasurv.int/cms/sites/default/files/documents/Consolidated-version-Criteria%20for%20projects%20of%20common%20European%20interest.pdf\]](https://www.eftasurv.int/cms/sites/default/files/documents/Consolidated-version-Criteria%20for%20projects%20of%20common%20European%20interest.pdf)

<sup>5</sup> While no formal minimum size is mandated for individual sub-projects in an IPCEI, all IPCEI projects are subject to notification to the Commission / EFTA Surveillance Authority (ESA), regardless of their size. This process requires significant resources both on the part of the aid recipients as well as from the national authorities and funding bodies. Typically, IPCEI projects are therefore large projects, i.e. receiving a State aid of 15 Mio. EUR and above (for R&D and EET), which would otherwise also have been subject to a notification process.

b) In addition, the following criteria are used to select the projects to be funded:

- General funding criteria, in particular:
  - Consistency of the project outline,
  - Cost and funding efficiency and leverage effect,
  - Degree of innovation,
- Positive outlook regarding the fulfilment of the requirements of the IPCEI communication concerning State aid, in particular:
  - Contribution to and impact on the competitiveness of the EU, its sustainable growth, social challenges or the added value realised in the EU,
  - Cooperation with at least one other entity from one or more IPCEI member state(s),
  - High degree of cooperation in terms of number and diversity of partners,
  - High relevance and broad use of the project in the EU economy and society due to positive spill-over effects,
  - Great importance in qualitative and quantitative terms and high technological and financial risk,
- Potential to avoid greenhouse gas emissions, in particular with regards to process emissions for the primary industries, as a relation to the investment amount and level of subsidies applied for,
- Exclusion or lack of alternative or more efficient processes to avoid greenhouse gas emissions (e.g. through electrification),
- Potential capacity to compete on the regular market in the medium to long-term,
- Contribution to future export opportunities of the technology,
- Timely feasibility of the project,
- Participation of innovative small and medium enterprises (SME) or start-ups,
- Integrated approach of the hydrogen value chain, especially with respect to the potential inclusion of additional project partners,
- High systemic capacity building potential with respect to the energy ecosystem. A system-friendly operating mode and location are of great importance here to ensure seamless integration. In particular, projects should not generate or aggravate relevant bottlenecks in the power grid or distribution infrastructure. Depending on the future plans for the power grid and hydrogen infrastructure, additional requirements may arise.

Projects focussing on basic research as well as projects by scientific institutions and research institutes or other suppliers that do not individually correspond to the funding object are not eligible within the IPCEI scheme. They can however be funded indirectly by way of a subcontract to a project that fulfils the criteria outlined in the ICPEI Communication, provided that the activities are recognized as eligible costs.

## **5. Requirements for the project outline**

The project outline should be submitted in PDF format and not exceed 20 DIN A4 pages including the cover sheet, excluding potential annexes. The concept description must contain: 1) details that allow the assessment of the project's content and its technical feasibility, and 2) a financial plan, which in particular allows to assess profitability and funding gaps related to the project proposal both with and without a State aid.

More specifically, it should provide information on the objectives, the organizational structure, the work programme, the time schedule, the cost / expenditure plan and the funding needs of the project in the light of the current state of research, technology, market, infrastructure and regulatory framework, as well as signal compatibility with the relevant funding criteria and, if applicable, provide indication on the cooperation with other participating companies.

The project outline should follow the following structure:

1. Cover sheet with project title, basic information of the applying company and details of the main contact person and one proxy (names, telephones, email addresses).
2. Summary of the project (< 1 page): title, keywords, applicant, project location, objectives with quantifiable key figures, brief description, overall timeline (start and end date), costs and funding amount. Detailed technical descriptions are not necessary in this section.
3. Presentation of the project:
  - i. Detailed time and work schedule, milestones and interim goals of the project.
  - ii. Investment and financing plan, including rough cost estimation classification and budgeting in the form of a tabular financial overview (with specification of types of costs, own vs. third-party funds, person-months and, if applicable, additional costs / expenses, including operating costs). A clear breakdown between costs for (each of) the R&D&I activities and costs for (each of) the FID or EET activities should be provided in a disaggregated manner. For costs arising from FID or EET activities, the potential costs of R&D&I carried out should be mentioned specifically in order to provide an indication of the overall importance of the R&D&I.
  - iii. Presentation of the funding requirement and funding gap.  
(In case that additional frameworks are necessary in addition to the IPCEI funding for the implementation of the project, these should also be explicitly stated)
  - iv. Comments on the existing or potential connection of the project to (European) value chains as well as to up- or downstream activities or sectors (if applicable, participating partners as well as structure and status of the cooperation, strategic starting position of the partners involved, coverage of the value chain, supply and demand structure, etc.).
4. Justification of the necessity and adequacy of state funding (incentive effect of the aid), with regard to the technical and economic risk.
5. Estimation of the competitiveness of the project in the medium- to long-term on the regular market (specifying the expected boundary conditions).
6. Remarks on the sustainability and environmental friendliness of production, transport and reutilisation measures foreseen in the project (if available, description of the greenhouse gas mitigation potential and comparison to alternative processes),
7. Motivation for the selection of location(s) with respect to system compatibility in the existing power grid and energy system on the one hand, and the potential contribution to growth, employment, training, competitiveness and social challenge (e.g. structural change) on the other,

8. Intended spill-over effects (national and European) in terms of scientific-technical, economic and social contribution(s), support in strengthening Europe as a centre of commerce and industry (indication of activities with target location, target audience, content). Ideally a plan regarding knowledge dissemination should be provided, indicating in what form and to what extent (e.g. IP protected results, non-protected results, etc.) information about the project's results will be made available,

9. Assessment of the effects on the internal market (positive and negative effects), remarks on possible market distortion,

10. Other relevant information regarding the eligibility criteria mentioned in Section 4 of this document,

11. Disclosure of previous requests or approvals for state aid at national or EU level.

Submitted documents are not to be considered as an application for State aid. Project proposals will be rated according to the selection criteria outlined under *Section 4* of this Call. Qualified projects will be invited to participate in the further process and to join the "matchmaking" sessions which will allow them to connect to projects selected in other countries that are participating in the IPCEI Hydrogen. In order to qualify for participation under the IPCEI mechanism, it is mandatory for companies to register their interest through this Call.

All information submitted will be treated confidentially. Projects that are invited to participate in the matchmaking process will however need to share sufficient information to make it possible to link the different projects and initiatives at EU level. The parties concerned will have the opportunity to approve the information that can be shared.

#### *Application as a consortium*

Companies can also submit their documents as part of a consortium, possibly as an integrated proposal. In this case, the separate presentations of the projects from the participating companies should be preceded by a general part, which contains in particular the joint programme, roadmap, project phases and timeline, as well as the information that applies equally to all individual projects.

Financial information should also be presented separately for the individual projects, in particular the indications listed in this section under item 3., letters b) and c), as well as item 4., and the information directly related to the IPCEI notification, in particular items 8. and 9. The decision about the agreement of an aid and its amount will be made separately for each applicant.

For the scope of a joint application, the maximum number pages stated above applies to each participating company, not to the total length of the joint application.

## 6. Procedure for participating in the expression of interest procedure

Applicants can submit their short project outlines expressing interest for funding by email to the following address, which also serves as a point of contact: [IPCEI-Hydrogen@eco.etat.lu](mailto:IPCEI-Hydrogen@eco.etat.lu).

Complete applications are to be sent until the 15<sup>th</sup> of April 2021 at the latest.

Late submission of an Expressions of interest can only be accepted in exceptional cases, provided that the project is of particular importance for achieving the goals above and that it does not cause a delay to the process agreed between the Member States and the Commission. Successful applicants will receive detailed information on how to proceed at a second stage of the process. Project executing organisations can be appointed to support during the operational implementation phase of the forecasted funded project.

Subject to change, the preliminary schedule for the work on the IPCEI on Hydrogen is as follows:

- **Deadline for submitting interest at national level: 15<sup>th</sup> of April 2021, at 12:00**
- Match-making at national (where appropriate) and EU level: April / May 2021  
(A joint “Fact Sheet” template will be provided at EU level to shortly describe the projects)
- Start of pre-notification: July 2021
- Notification to the Commission: November 2021
- Earliest start of project implementation: Q1/2022

On behalf of the  
Luxembourg Ministry of the Economy

Christian TOCK, PhD

Luxembourg, 12 March 2021

*Annex: Guidance documents and additional information*



## **Annex 1 – Guidance documents and additional information**

The European Green Deal:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576150542719&uri=COM%3A2019%3A640%3AFIN>

A hydrogen strategy for a climate-neutral Europe:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0301>

EU strategy for energy system integration:

<https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2020:299:FIN>

Sustainable and Smart Mobility Strategy:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789>

A New Industrial Strategy for Europe:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593086905382&uri=CELEX%3A52020DC0102>

EU strategy on offshore renewable energy:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A741%3AFIN&qid=1605792629666>

Non-Papers of the Commission with additional indications on IPCEI requirements:

- [Non-paper on RDI of “Major innovative nature”](#)
- [Non-paper on spillover effects](#)
- [Non-paper on integration](#)
- [Non-paper on proportionality](#)
- [Non-paper on antitrust](#)

Additional information on the hydrogen IPCEI:

<https://www.hydrogen4climateaction.eu/about>

European Clean Hydrogen Alliance:

[https://ec.europa.eu/growth/industry/policy/european-clean-hydrogen-alliance\\_en](https://ec.europa.eu/growth/industry/policy/european-clean-hydrogen-alliance_en)