EU Green Deal Call

”Develop and demonstrate a 100 MW electrolyser upscaling the link between renewables and commercial/industrial applications”

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23 October 2020

EU Hydrogen strategy

- A long term and holistic vision
- Anchored in the green recovery
- A package: energy system integration, hydrogen strategy, Clean Hydrogen Alliance
- Puts the priority on the deployment of renewable hydrogen, through a phased approach: **6 GW of renewable H2 electrolysers by 2024 and 40 GW by 2030.**
- Two main lead markets: industrial applications and mobility

Promoting R&I on hydrogen

- **Fuel Cells and Hydrogen Joint Undertaking:** Finances R&D on FC and hydrogen with EU contribution of EUR 646 million (H2020, 2014-2020)
- **Clean Hydrogen Partnership:** EC proposal under HE (2021-2027), main focus on renewable hydrogen production, distribution and storage, alongside selected FC end use technologies. Potential budget ~EUR 1 bn
- **ETS Innovation Fund** (DG CLIMA): at least EUR 10 billion
- **Targeted support to key pilot projects:** to support H2 value chains, in coordination with the SET Plans (e.g. Hydrogen Valleys Partnership, Interregional Innovation Investment Instrument, InnovFin, etc.)
- **The H2020 Green Deal call:** Develop and demonstrate a 100 MW electrolyser upscaling the link between renewables and commercial/industrial applications

The H2020 Green Deal call

- A direct contribution to the European Green Deal, this call responds to the need to **confront the climate crisis** and, at the same time, addresses the challenge of **aiding Europe's recovery**, contributing directly to the Recovery Plan for Europe.

- The call aims for **clear, discernible results in the short- to medium-term**, embedding them in a perspective of long-term change. Interventions are more targeted, resulting in fewer, but at the same time **larger and more visible actions,** with a focus on rapid **scalability, dissemination and uptake**.

The Call on the 100 MW electrolyser

Objective: demonstrate energy system integration through hydrogen: produce hydrogen from RES and use it in a commercial/industrial application

Added value & challenge:

- To help achieve the climate neutrality objective, hydrogen needs to be produced at large scale, mainly through electrolysis powered by RES.
- Today the technology is only available at multi-MW scale (a 20 MW electrolyser project is being implemented under FCHJU 2018 call)
- In order to reach the GW scale, the development and demonstration of a 100MW electrolyser is key. It will help create economies of scale, thus leading to further cost reductions

NOTE: Funding rate at 50% (EU funds: EUR 25-30 million per project; two projects can be financed)

The call on 100 MW electrolyser: main activities

1. **Develop larger modules** with reduced balance of plant, managing efficiently the input power, the output hydrogen and oxygen streams and the heat flows, while ensuring the reliability of the system and reducing the footprint

2. **Assemble the modules into a 100MW electrolyser system**, test and demonstrate it in real life conditions, operating flexibly to harvest maximum renewable power and provide grid-balancing services, and supplying renewable hydrogen to a commercial/industrial application

3. **Demonstration of the future economic viability** of the technology depending on cost of electricity and hours of operation of the electrolyser

4. **Assess the performance and the durability** of the electrolyser operating dynamically and address potential safety issues

5. **Evaluation of the environmental performance** of the system and of other ecological and **societal benefits** along the **EU value chain**

The Call on 100 MW electrolyser: additional activity

- **Cross border dimension and knowledge sharing within Europe**: as part of mandatory activities, organise 3 workshops, out of which at least 2 in European countries, outside of the beneficiary's main implantation, involving policy makers and energy stakeholders, to share knowledge on experience gathered and replication of experiences.
- Contribute to addressing common challenges, information (like reporting on impact indicators) and dissemination activities through **cooperation with other relevant projects** funded by the European Commission in the context of this call.

The Call on 100 MW electrolyser: targeted impacts

1. Establish a European industry capable of developing a novel 100MW electrolyser using a European value chain
2. Increase the efficiency of the electrolyser reaching an energy consumption of 49 (ALK) to 52 (PEM) kWh/kg H2 at nominal power
3. Increase the current density to 0.5A/cm2 (ALK) or 3A/cm2 (PEM) and delivery pressure to 30 bar
4. Reduce the plant's footprint by 30% thanks to the larger modules and the plant layout as well as the higher current densities
5. Reduce the electrolyser CAPEX by 20% down to €480/kW and €700/kW for Alkaline and PEM electrolysers respectively
6. Improve the overall efficiency valorising also by-product heat and oxygen

Thank you

European Commission