

[NPHyCo]

[Nuclear Powered Hydrogen Co-generation]

● OBJECTIVES

NPHyCo addresses the need of large “green” hydrogen production by investigating realistic scenarios for large scale low-carbon hydrogen production in Nuclear Power Plants (NPP).

- Assessment of the feasibility of H2 production at an existing NPP
- Assessment of the added value of H2 production at an existing NPP
- Identification of suitable pilot project locations.

● EXPECTED IMPACTS

The successful achievement of the NPHyCo objectives could have the following positive impacts for the European nuclear industry and the transition into a green H2 driven future.

- Lowering of maintenance costs of the coupled NPP due to optimized operation mode of the NPP by less transients to the material
- Improvement of NPP fuel usage by omitting “load follow” operations or part load operation but using the surplus electricity for H2 production instead
- Production of comparable large amount of green H2 for further use and storage for mobility, heating, reforming
- Reduced CAPEX/ OPEX costs due to use of existing auxiliary systems, infrastructure
- Fulfilling the expected European demand of low-carbon H2 with alternative production methods

● HIGHLIGHTS

H2 generation is widely acknowledged as a key technology for power-to-gas sector coupling. NPHyCo sets up business case scenarios for the H2 generation at NPPs which consider cost and earning scenarios. The value-add for H2 production is demonstrated for specific plant designs and for specific locations. Also, the attempt is made to investigate and possibly demonstrate non-monetary value, such as smoothening NPP operation profiles or cross-sectoral learning.

One explicit ambition of the outreach activities is to foster cross-sectoral collaboration and partnerships with other industries to form alliances which work towards the decarbonisation goals of the EU. The project results will be interesting not only for the NPP operators and related associations worldwide, as it offers methods and proceedings, which can be used as reference and blueprints for similar ideas in countries also outside the EU.

In fact, the project delivers blueprints for planning and implementing hydrogen generation projects in close proximity to NPPs. Those blueprints could be realized at suitable power plant sites within 5 years time frame and could therefore significantly contribute to EU’s supply with green hydrogen.

● PARTNERS

Framatome GmbH, Ansaldo Nucleare SPA, CEA, CVR, ES Group LLC,
Nuclear Europe, GRS, NRG, Tecnatom S.A., TU Dresden, Hunatom

● DURATION & BUDGET

09/2022 – 02/2025 – 2.5 years
2,400 k€

● CONTACTS

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● EVENTS

[Name of the event]

