

LUXHYVAL

LUXEMBOURG HYDROGEN VALLEY DELIVERING INTEGRATED FULL-CHAIN SUSTAINABLE HYDROGEN ECOSYSTEM WITH TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL BENEFITS AND SUPERIOR REPLICABILITY



Project ID	101111984
PRR 2024	Pillar 6 – H ₂ valleys
Call topic	HORIZON-JTI-CLEANH2-2022-06-02: Hydrogen valleys (small-scale)
Project total costs	EUR 39 108 677.50
Clean H ₂ JU max. contribution	EUR 7 999 998.64
Project period	1.11.2023–31.1.2029
Coordinator	Université du Luxembourg, Luxembourg
Beneficiaries	Autocars Sales-Lentz SA, Centre national de la recherche scientifique, CERATIZIT Luxembourg SARL, Encevo SA, Enovos Luxembourg SA, Green Power Storage Solutions SA, Institute of Higher Education King Danylo University, IZES gGmbH, Luxembourg Institute of Science and Technology, LuxEnergie SA, LuxMobility SARL, Paul Wurth SA, R2M Solution Spain SL, S.L.A. SA, SLG SA, Syndicat des tramways intercommunaux dans le canton d'Esch, Université de Bordeaux, University of New South Wales, Vysoká škola chemicko-technologická v Praze

<https://www.luxhyval.eu/>

PROJECT AND GENERAL OBJECTIVES

Luxhyval is launching a flagship hydrogen valley to boost the penetration of hydrogen ecosystems in Luxembourg by deploying green hydrogen initiatives across the entire value chain from local production to utilisation, including storage and distribution for a range of applications targeting industry and mobility, while also aiming to connect with existing/planned infrastructures. Several end-use applications in the mobility (i.e. private and public buses, light-duty industrial vehicles) and industry (i.e. metal and glass) are included, with the support of key commercial actors along the entire value chain and political support in line with the Luxembourg hydrogen strategy, which aims to fully decarbonise the industrial sector before 2030. Digital twinning for optimal planning and operation is delivered to support upscaling and replication, while public perception and professional upskilling deliver social benefits and equip the workforce with the competences needed. Finally, the lessons learnt and solutions are replicated in two follower valleys in central (Czechia) and eastern (Ukraine) Europe.

Luxhyval aligns its work with the vision that hydrogen is a key piece of any decarbonisation strategy, especially for energy-intensive industrial and mobility applications, enabling energy sector integration and sector coupling. Specifically, Luxhyval underpins the Luxembourg hydrogen strategy to locally generate and supply hydrogen to fulfil Luxembourg's hydrogen needs – which are currently covered by imported grey (i.e. from fossil origin) hydrogen – including a plan to replace fossil fuels with green hydrogen. This is achieved using comprehensive planning and a progressive approach to get the roadmap in motion, while providing evidence and confidence to local users, citizens and stakeholders for progressive upscaling. To achieve these overarching objectives, Luxhyval's specific objectives, with corresponding key performance indicators and targets, are defined. Specific objectives are measured quantitatively using the targeted key performance indicator metrics.

NON-QUANTITATIVE OBJECTIVES

- Social impact.
 - Increase public understanding of H₂ technologies.
 - Upskill professionals and students in terms of H₂ and provide associated jobs.
- Technological impact.
 - Fully integrate the H₂ technology ecosystem.
- Economic impact.

- Establish a functioning green H₂ market in Luxembourg.
- Validate the multistakeholder business model and governance.
- Environmental impact.
 - Enhance the environmental profile with zero-emission and low-noise buses.
- National impact.
 - Provide a local supply of green H₂ and energy independency.
 - Reduce dependence on imported fuels.
 - Boost the economic resources remaining in Luxembourg.
- Policy and regulatory impact.
 - Overcome bottlenecks delaying rapid H₂ market expansion.
 - Contribute to policy and regulation instruments.
 - Explore potential synergies with international markets.

PROGRESS AND MAIN ACHIEVEMENTS

- The extended feasibility study is actively progressing.
- Business models for hydrogen-integrated ecosystems, governance and agreements for operation are under investigation and evaluation; the business cases are currently being drafted.



PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives	Replication plans for hydrogen valleys in Czechia and Ukraine	-	Feasibility studies done	
	Define and execute a roadmap with upscaling and replication strategies both within Luxembourg and the Greater Region	-	Roadmap specifies share and scale of future industry and mobility use of green H ₂ in Luxembourg for 2030–2050	
	Skill development	-	Three university courses and two professional training modules, with 60 professionals and 300 students trained	
	Clean hydrogen production with electrolysis	t/year	650	
	Hydrogen end use	t/year	650 (indicatively 70 % for industry and 30 % for transport)	