H2Glass	

Sectors involved	*Glass, Aluminium*
Funding (e.g. RFCS, FP6, FP7, H2020)	*Horizon Europe*
Title	*advancing Hydrogen (H2) technologies and smart production systems TO decarbonise the GLass and Aluminium SectorS*
Acronym	*H2Glass*
Key words	*Hydrogen, Digital Twin, Smart Production, Energy Intensive Industry*
Start date - End date	*1 January 2023 - 31 December 2026*

Short Description:

Glass and aluminium manufacturers are searching for sustainable alternatives. Carbon emissions related to the production of glass mainly stem from the combustion of natural gas. In this context, the EU-funded H2GLASS aims to create a new technology stack that glass and aluminium manufacturers can use to achieve complete hydrogen combustion. Specifically, the project will address the challenges related to emissions of nitrogen oxides and high flame propagation speed, process efficiency and supply of hydrogen for on-site demonstrations. Digital twin techniques will be used to assess risk-based predictive maintenance. Another project feature is the demonstrator in the aluminium industry to prove the transferability of underlying models to similar energy-intensive industries.

Industrial Symbiosis (YES or NO):	*YES*
Energy Efficiency (YES or NO):	*YES*

Energy/Material flows exchanged:

Objectives:

The glass industry will have to be completely decarbonized in the next 30 years. The lifetime of a glass furnace is about. 12-15 years. So it is urgent to start innovating because the year 2050 is only 2 furnaces away. H2GLASS aims to create the technology stack that glass manufacturers need to (a) realize 100% H_2 combustion in their production facilities, (b) ensure the required product quality, and (c) manage this safely. H2GLASS will address the challenges related to NOx emissions and high flame propagation speed, process efficiency, and supply of H2 for on-site demonstrations. Digital Twin techniques will be critical for risk-based predictive maintenance, optimized production control, and combustion system control. Hydrogen will be supplied by a portable electrolyser co-funded by the industrial demonstrators, and the oxygen produced will be reused in the process. The H2GLASS technologies and design solutions will be validated up to TRL 7 on 5 industrial demonstrators from 3 segments (container glass, flat glass and glass fibre), which together represent 98% of the current glass production in the EU. A demonstrator for the aluminum industry (HYDRO) will prove the transferability of the basic solutions and underlying models to energy-intensive industries that have similarities with the glass manufacturing process, thus strengthening the impact of the project. In EU the Glass and Aluminium industries employ >400.000 people in Europe, generate > 3.5B€ and emit ca.21.5 Mt CO_2e. The innovations generated by H2GLASS will potentially create 10.000 new jobs and unlock 1 - 5B€ revenues for glass technology deployment, >17B investments and 200.000 new jobs for green H2, and cut emissions by ca.80%.

Meaningful outcomes[1]: *Developing the technology stack that will enable 100% H_2combustion in the glass industry; Raising public understanding on H2 technology as solution for decarbonising industrial processes; Transferring technology to other EU energy-intensive industries.*
Available on: URL (e.g. link to EU bookshop): *https://cordis.europa.eu/project/id/101092153* *https://h2-glass.eu/*

[1]technical (e.g.by-products recycling, digitalization, etc.), regulatory (e.g. environmental legislation), economic (e.g. new business models) and social/organisational (e.g. impact on the workforce) aspects should be highlighted.