

# InsigH<sub>2</sub>t Consortium

## Project Newsletter #1



# InsigH<sub>2</sub>t

**Scientific insights into H<sub>2</sub> combustion under elevated pressure conditions**



Figure 1: InsigH<sub>2</sub>t Kick-Off Meeting at Baker Hughes premises in Florence, Italy on 13-14 February 2025

Eleven months passed since the official kick-off of InsigH<sub>2</sub>t. The first General Assembly of the project took place at Baker Hughes premises in Florence, Italy on 13 and 14 February 2025. The event was spread over two days, with the first day holding the Kick-off meeting and day 2 discussions on implementing the action.

Since the launch of InsigH<sub>2</sub>t a platform was established to facilitate effective internal communication and by building a collaborative environment that fosters an integrative process within the consortium. The implementation and the data management plan was also prepared.

👉 Within Work Package (WP) 1 – titled “Understanding the Turbulent Burning Rate of Premixed H<sub>2</sub> and CH<sub>4</sub>/H<sub>2</sub> Flames at High Pressure” – RWTH and SINTEF led the setup of the DNS (Direct Numerical Simulations) and the testing of high Reynolds number slot jet and the backward facing step configurations. Models for turbulence chemistry interactions that include thermodynamic effects are underway at RWTH. Next steps will include – among others – several DNS of different configurations between 1-8 bars.

👉 With regards to WP2 on “Understanding the combustion dynamics of premixed H<sub>2</sub> and CH<sub>4</sub>/H<sub>2</sub> flames at high pressure”, TU Berlin developed jet and swirl burners with improved stability using secondary air jets, and is preparing their medium-pressure rig for transfer function measurements. CERFACS focused on mixing in the flame tube, investigating subgrid scale mixing models and mesh effects before moving to high-pressure flames.

In terms of next steps under WP2, TU Berlin will commission their medium-pressure rig and begin data collection in August 2026. In parallel, CERFACS will refine mixing models and mesh, and later proceed to high-pressure flame simulations. CERFACS will perform LES of the TU Berlin burner with the aim of validating the pressure scaling laws and validate with experimental data.

👉 Work Package 3 on “Improved Single Stage Flame Stabilisation Strategies for Industrial GTs” – led by Baker Hughes (BH) – also advanced significantly. BH is already validating standard thickened flame models with DNS data, assessing mesh and thickening factor sensitivity, and implementing advanced efficiency functions from CERFACS and Aachen into their codes. Next activities under WP3 will include the test, down-selection, and validation of advanced efficiency functions. The modelling of the mixer stratification will also begin in early 2026.

👉 Under the leadership of Ansaldo Energia, WP4 on “Development of Innovative Two Stage Flame Stabilisation Strategies for Heavy-Duty GTs” is proceeding according to schedule. Current activities include LES modelling of industrially relevant geometries. A full-scale testing is planned at DR Cologne, potentially at the end of 2026.

👉 With the support of project partners, ETN Global kicked-off the activities for WP5 on “Communication, Dissemination, and Exploitation”. InsigH<sub>2</sub>t communication and dissemination materials (poster, roll-up, leaflets) were developed, whereas the [official project website](#) was launched in April 2025. Next steps will include the production of a promotional video of the project (due April 2025).

# InsigH<sub>2</sub>t in the media

## Interview with Project Coordinator, James R. Dawson (NTNU)

R&D PROJECTS

**Understanding hydrogen combustion under pressure: inside the InsigH<sub>2</sub>t Project.**  
**An interview with project coordinator NTNU**



In the recent issue of ETN Quarterly Newsletter (June 2025), NTNU briefly presented InsigH<sub>2</sub>t scope and objectives, as well as the innovative solutions that our project aims to develop.

Click [HERE](#) for the full interview!  
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## InsigH<sub>2</sub>t Consortium



The InsigH<sub>2</sub>t project is supported by the Clean Hydrogen Partnership and its members (GA 101192349) and the Swiss Federal Department of Economic Affairs, Education and Research, State Secretariat for Education, Research and Innovation (SERI).