BOURGOGNE-FRANCHE-COMTÉ

HYDROGEN

TERRITORY

hydrogen starts here
RÉGION BOURGOGNE-FRANCHE-COMTÉ

aer
regional economic agency of bourgogne-franche-comté

PROJECT FUNDED BY

RÉGION BOURGOGNE FRANCHE COMTE

A STRATEGIC POSITION IN EUROPE

With its business parks, infrastructure and business services, Bourgogne-Franche-Comté creates ideal conditions for the successful completion of your projects.

AN EASILY ACCESSIBLE REGION

14 TGV stations

1H34 Dijon-Paris by TGV

1330 km of navigable waterways

6 international airports nearby

9 motorways forming a strategic intersection in the heart of Europe

POPULATION

2.8 million inhabitants
42 million inhabitants within 4 hours' reach

EDUCATION

85,000 students
30,000 young apprentices

BUSINESSES

420,000 businesses
21,400 industrial establishments

JOBS

1.3 million people in employment
30% of managerial employees working in industry

87.5 billion euros GDP

2nd ranked region for share of industrial added value

2nd largest exporting region

21.3 billion euros of exports

For more details on the numbers in this chapter, you can flash this QRCode

REGIONAL SUPPORT FOR HYDROGEN

The objective of Bourgogne-Franche-Comté is to become a Positive Energy and carbon neutral region by 2050. The Hydrogen roadmap, developed in conjunction with all those involved in the hydrogen ecosystem, confirms the Bourgogne-Franche-Comté region's commitment to embracing the challenge of ecological and energy transition. The projects and territories committed to hydrogen in Bourgogne-Franche-Comté have received support from both the State and the Region.

SUPPORT FROM THE REGION

- research
- businesses' R&D projects
- regional ecosystems (Auxerre, Belfort)
- acquisition of H2 TERs (regional express trains)

STRONG PRESENCE OF BUSINESSES ALONG THE ENTIRE H2 VALUE CHAIN, FROM PRODUCTION TO USES

As part of its regional strategy, Bourgogne-Franche-Comté (BFC) is building an industrial ecosystem to cover the Hydrogen value chain as extensively as possible, from production and storage to the various uses (mobile or stationary, etc.).

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EDUCATION *

Université Bourgogne Europe

Université Marie et Louis Pasteur

University of Technology of Belfort-Montbéliard

Vocational and technological lycées

Lycée Raoul Follereau
Welding - speciality H2

AFPA

CNAM

FC LAB

Polytech

SupMicroTech - ENSMM

H2 School FORVIA

H2SYS
Didactic test benches - Production/ Storage/Use of H2

RESEARCH *

FC LAB
H2 Support and Research Unit

FEMTO-ST

FORVIA

H2SYS

ICB Laboratory

Drive Laboratory

General Electric

Ligier

Oreca

(find out more on pages 10 and 11)

ENERGY SUPPLIERS

Air Liquide

Avia

Clhynn
Source of hydrogen (HYSEED TM) for in-situ hydrogen generation

Engie

FluidExpert
Autonomous remote hydrogen production unit

General Electric

Hynamics

H2SYS
Hydrogen-fuelled hybrid electric generators for a power range from 5 kVA to 130 kVA

Total Energies

ENGINEERING CONSULTANCY FIRMS

Bertrandt

DYG Energy

FORVIA
Scaling of gas and liquid systems

Hivelix
H2 multiphysics simulation

H2SYS

Segula

Synops

STORAGE

fHybera
High-pressure tanks, solid storage, solutions integration

FORVIA Faurecia
Complete gaseous and liquid hydrogen storage tanks and systems, for mobile and stationary applications

Mincatec Energy
Hydride storage

Réservoirs Pauchard
Mechanical tanks

Sundyne
Critical gas compressors

SUPPORT STRUCTURES
AND COMPETITIVENESS AND PERFORMANCE MENTORING

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Cluster Pôle Véhicule du Futur
Solutions for future vehicles & mobility
Club H2 Bourgogne Franche-Comté

Vallée de l'énergie

H_2 KEY FIGURES

100 businesses
(supplying key technological building blocks and direct subcontracting services)

2 electrolyser gigafactories

1 fuel cell gigafactory

BUSINESSES *

COMPONENTS AND SPECIALITIES

Adhex
Pressurer sensitive adhesives / thin film processing

fHybera

FluidExpert
Energy-efficient H2 compressors

FourData
H2 supply chain sensors and supervision

Gen-Hy
Patented membranes/ electrodes

Laser Cheval
Bipolar plate prototype

Presse Etude
Bipolar plate pressing

SON SAS
Nanoproduct design and manufacture

Suntec
H2 gas/natural gas mixer

HYDROGEN FUEL CELLS

Clhynn
Mini- and 1-10kW hydrogen fuel cells (and components) AEM technology

H2sys
Open-cathode and closed-cathode PEMFCs, 5 to 130 kVA generator sets

Inocel
High-power fuel cells (300 kW and over)

JR Automation
Automated assembly lines

ELECTROLYSERS

Gen-Hy
AEM electrolysers

John Cockerill
Alkaline electrolysers

JR Automation
Automated assembly lines

VEHICLE INTEGRATION AND SOLUTIONS

Alstom
Development of an H2 version of its new Prima H4 locomotive

Avions Mauboussin

Danielson
Development of H2-ICE

Fruehauf
H2-powered autonomous trailer

H2Sys
Special vehicles

Ligier
H2 racing vehicles

Oreca
H2 combustion engines

Packmat System
Refuse collection vehicles

RH2
H2-ICE retrofitting

Texy's Group
H2 motorbikes

Vaison Sport
H2-powered buggies

TESTBEDS, TESTS AND CERTIFICATION

Clhynn
H2 studies and testbeds

Emitech Groupe
Combustion emissions testing, H2 and H2 derivatives

FCLAB
Fuel cell, electrolyser and system components testing

FORVIA
Gas cylinder hydrostatic testing
Cryogenic systems and components characterisation

Gen-Hy
Service life and operating point testbeds

Ligier

Oreca

Belfort Hydrogen-Energy Facility

MECATEAMCLUSTER

POLYMERIS

agronov
PÔLE D'INNOVATION EN AGROÉCOLOGIE

* non-exhaustive list

HYDROGEN IS IN OUR DNA!

The earliest work on hydrogen fuel cell systems in Bourgogne-Franche-Comté began in 1999 with the members of the FC Lab research federation (later known as UAR FC LAB), associated with the CNRS (National Centre for Scientific Research).

In 2016, the region was certified as a "Hydrogen Territory" following a number of major demonstration projects putting the Hydrogen energy vector into practice in the region.

1999

1st research activities into hydrogen energy and fuel cells

2002

1st research facility dedicated to Hydrogen Fuel Cell systems

2011

1st French registration of an approved hydrogen vehicle: the F-City H_2

2014

1st MobyPost and MobiHy experiments conducted in Bourgogne-Franche-Comté

2015

Creation of the 1st Master of Engineering course in Hydrogen Energy and Energy Efficiency at UFC, the only such course in France

2016

"Hydrogen Territory" certification obtained for Bourgogne-Franche-Comté with ENRgHy

2017

Creation of the H2SYS spin-off

Market launch of 1st H2 gensets by H2SYS

2019

HYBAN project: France's only testbed for high-power hydrogen fuel cells, realised by FC LAB

Nord-Franche-Comté wins prize in Territoires d'Innovation call for projects as part of the Programme d'Investissements d'Avenir

2020

Inauguration of the **centre of global expertise** in H2 tanks

Forum Hydrogen Business For Climate

2021

Inauguration of new premises at H2SYS: transition to industrial phase

Announcement that **McPhy is to open a site** at Fontaine (90), France's 1st alkaline electrolyser factory

Inauguration of Auxerre's AuxHyGen station and introduction of 1st H2 buses

1st edition of Hydrogen Business For Climate Forum in Belfort

2022

Establishment of GEN-HY at Technoland, 1st H2 electrolyser plant to feature its AEM technology

2023

Inauguration of the FORVIA plant for the mass production of hydrogen tanks in Allenjoie

Inauguration of Bel'Hynov H2 station in Belfort

INOCEL gigafactory set up to manufacture fuel cells in Belfort

2024

Inauguration of Dijon station

"Journées H2 dans les Territoires" days comes to Dijon

GEN-HY selected as Important Project of European Common Interest (Hydrogen)

2025

BFC project École de l'Hydrogène prizewinner in Compétences et Métiers d'Avenir call for projects

McPhy becomes John Cockerill

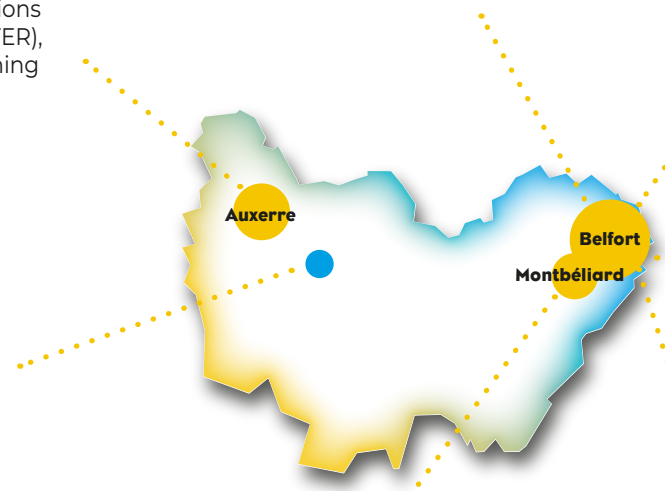
MAJOR OPERATIONAL PROJECTS AND LEADING INDUSTRIES

Following the introduction in 2020 of the Hydrogen Roadmap, many projects have been funded and deployed across the region, including the following*...

BELFORT E-START
Creation of France's largest renewable energy community and number one in office buildings, with a photovoltaic production capacity of 3.3 MWc, combined with energy storage solutions based on batteries and green hydrogen

AUXHYGEN
Development of an ecosystem focused primarily on mobility applications (Bus, HGV, LV, RCV, TER), retrofitting and training

BEL'HYNOV STATION (BELFORT)
Multimodal H2 production, storage and distribution station, to power buses in the Greater Belfort area as part of an industrial ecosystem



TES - ENERGY TRANSITION OF THE SCHIEVER GROUP
First private ecosystem for H2-powered heavy mobility: production, storage and distribution station + fleet of H2 refrigerated lorries

FC LAB
Open platform for testing PEM electrolysers and fuel cells up to 120 kWe

HYDROGEN THIRD-PLACE PROJECT (MONTBÉLIARD)
Welcoming community space focused on raising Hydrogen awareness and providing career guidance to young people, students and so on
Events and activities organised

A MAJOR INDUSTRIAL ECOSYSTEM
Alstom
FORVIA Faurecia
Gen-Hy
General Electric
Inocel
John Cockerill, etc.

* non-exhaustive list

RÉGION BOURGOGNE FRANCHE COMTÉ

INDUSTRIAL EXPERTISE ESSENTIAL TO THE SECTOR

The local presence of an industrial network specialising in metals and materials processing, and local expertise in surface treatment, are valuable assets when it comes to providing complete manufacturing solutions for the hydrogen systems of tomorrow.

RESEARCH & INNOVATION

In Bourgogne-Franche-Comté, there is a very high level of synergy between research and businesses. This close connection is maintained by those involved therein.

COMPETITIVENESS CLUSTERS INVOLVED IN HYDROGEN PROJECTS

This competitiveness cluster for vehicles and mobility solutions supports projects and their deployment in the hydrogen field (stationary, mobile, energy, industrial decarbonisation), coordinates the H2BFC Club and organises the H2BFC Forum

Cluster of industrial and academic stakeholders involved in the design and manufacture of low-carbon solutions (hydrogen, renewable energy, nuclear, etc.) and the reduction in the carbon intensity of industrial activities and uses

MECATEAMCLUSTER

Cluster specialising in the design, development and maintenance of heavy-duty railway machinery and infrastructure, studying electrification solutions

Competitiveness cluster dedicated to rubber, plastic and composites supporting H2 storage and transport reduction solutions as well as innovative new materials for electrolysers

Innovation hub for agro-ecology, driver of agricultural transition
Decarbonised tractor project, projects to make isolated agricultural sites independent

CUTTING-EDGE PUBLIC RESEARCH

FEMTO-ST INSTITUTE
Internationally renowned research laboratory (CNRS, uFC, SUPMICROTECH-ENSMM, UTBM)
=> 120 researchers in H2 energy

FC LAB UAR
European Support and Research Unit for PEM fuel cells and electrolysers

HYDROGEN-ENERGY PLATFORM
One of the largest European public facilities devoted to research, testing and the industrial transfer of H2 systems

ISAT'S DRIVE LABORATORY
Optimisation of thermal and hybrid propulsion energy, composite materials and durability, vibratory and acoustic behaviours

ICB LABORATORY
Research into materials for hydrogen fuel cells, high-temperature electrolysers and solid storage

SPECIALIST TRAINING

ÉCOLE DE L'HYDROGÈNE IN BOURGOGNE-FRANCHE-COMTÉ

The École de l'Hydrogène is the result of work by 17 regional partners to promote innovation and employment in the hydrogen sector. The aim is to help transform opportunities for study, providing a comprehensive response to the needs of industry and improving prospects for students. Its role therefore will be to operate via a network of regional hubs and ensure the conformity of proposed courses.

Partners: Région Bourgogne-Franche-Comté (leader), Université Marie et Louis Pasteur, Regional Education Authority, France Travail, UIMM BFC, CMQ Agroéquipements, CMQ Automobiles et Mobilités du Futur, CFAI FC, CFAI 21-71, PF UIMM 58-89, PVF, Pavillon des Sciences, Danielson, Forvia, GEN'HY, H2SYS, Totalenergies.

This project was a prizewinner of the France 2030 Compétences et Métiers call for expressions of interest operated by the Caisse des Dépôts.

From BUT (University Bachelor of Technology) to Master's degree, UMLP delivers courses focused on renewable energies and energy efficiency.
26 "hydrogen-focused" courses and 1 Hydrogen-Energy and Energy Efficiency (H3E) Master's engineering degree course

UBE schools of engineering deliver courses focused on the physics of materials, civil engineering, mechanics (POLYTECH Dijon) and courses on the design, production and operation of vehicles (ISAT)

VOCATIONAL AND TECHNOLOGICAL LYCÉES
Vocational Baccalauréats and BTS (senior technician diplomas) with a focus on hydrogen (renewable energy installer, electrical and related environments professions, energy efficiency and maintenance, maintenance of production systems, vehicle maintenance, motor drives, chemical and water processes, etc.)

Specialised Master's in Hydrogen Energy
Energy courses: Energy production, Networks, conversion and storage, Transport and embedded energy systems, Electrical engineering by apprenticeship

Since 2023, a training module dedicated to risks of explosion (ATEX) has been delivered to all jobseekers trained by the Region in industrial professions: welding/ boiler-making/pipe assembly, industrial production and maintenance operator

2 BTS courses in maintenance of H2 systems
Master's degree in Quality, Health, Safety, Environment with a focus on Hydrogen maintenance

CNAM vocational bachelor's degree in maintenance of H2 energy systems

H2-related "Skills incubator"
Training courses dedicated to the installation and maintenance of hydrogen equipment
Senior Industrial Maintenance Technician speciality H2

Studies in mechanical, industrial, and energy engineering

School of engineering specialising in mechanics and microtechnology

YOUR HYDROGEN SECTOR CONTACT

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**Local
economic development specialists
in all 8 of the region's departments**

www.aer-bfc.com

THE BOURGOGNE-FRANCHE-COMTÉ REGIONAL ECONOMIC AGENCY

The Regional Economic Agency cooperates closely with stakeholders in business development, innovation, training, and employment in terms of:

- Business project engineering by strategic sector and by region
- Financial engineering
- Engineering for innovative projects focusing on ecological transition and energy recovery
- Economic changes
- Promotion and communication

AER BFC - 2026 - Cover photo of fuel cell: H2SYS ©Laurent Cheviet)

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