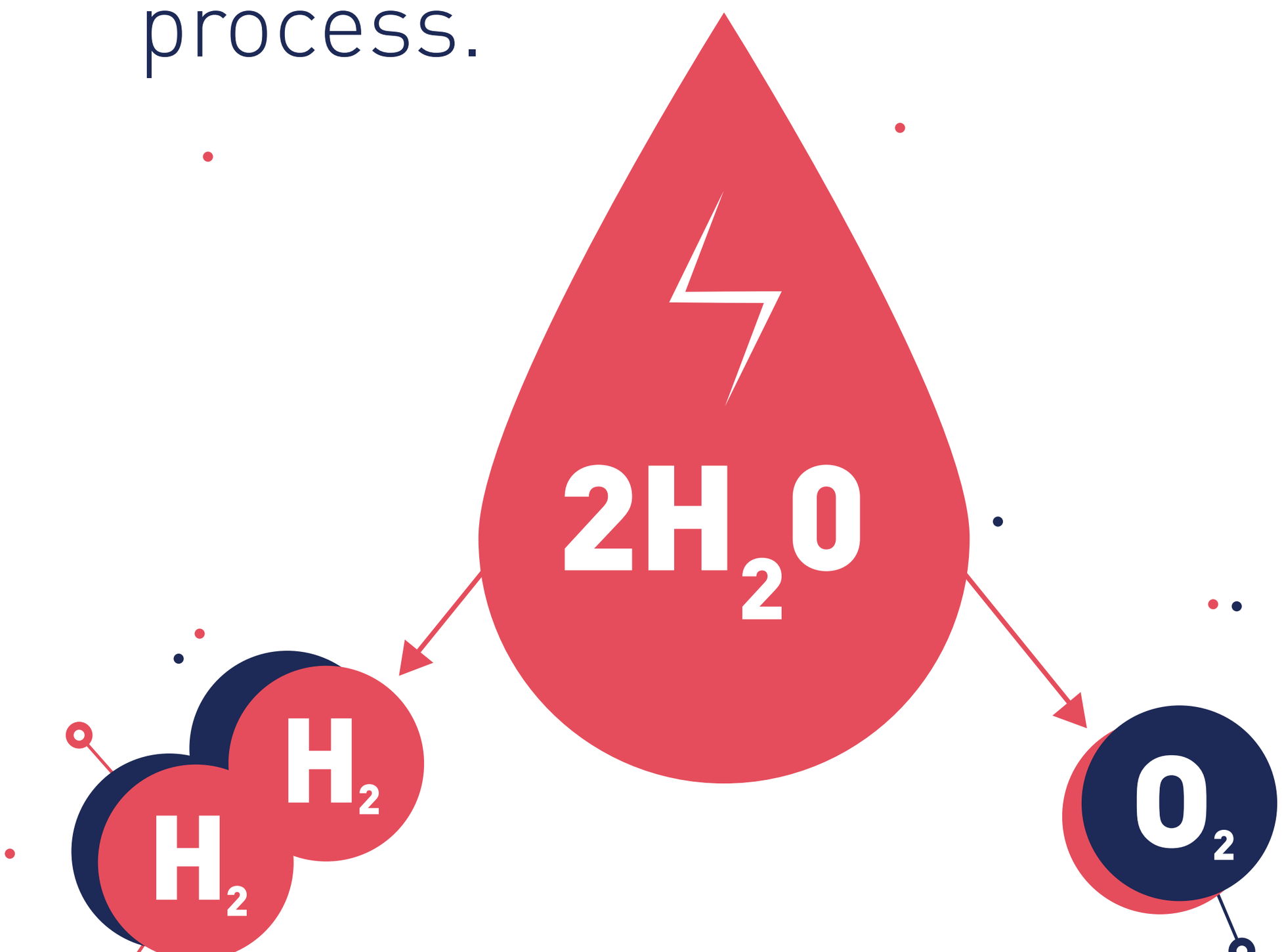
DECARBONATED HYDROGEN: FROM PRODUCTION TO USE

WHAT ARE THE COMPONENTS OF THE ECOSYSTEM?

THE PRINCIPLE

"Clean" hydrogen is produced by separating the **hydrogen (H_2)** and **oxygen (O)** that make up water molecules by electrolysis.
A carbon-free emissions process.



Green hydrogen now accounts for **2%** of total hydrogen production worldwide.

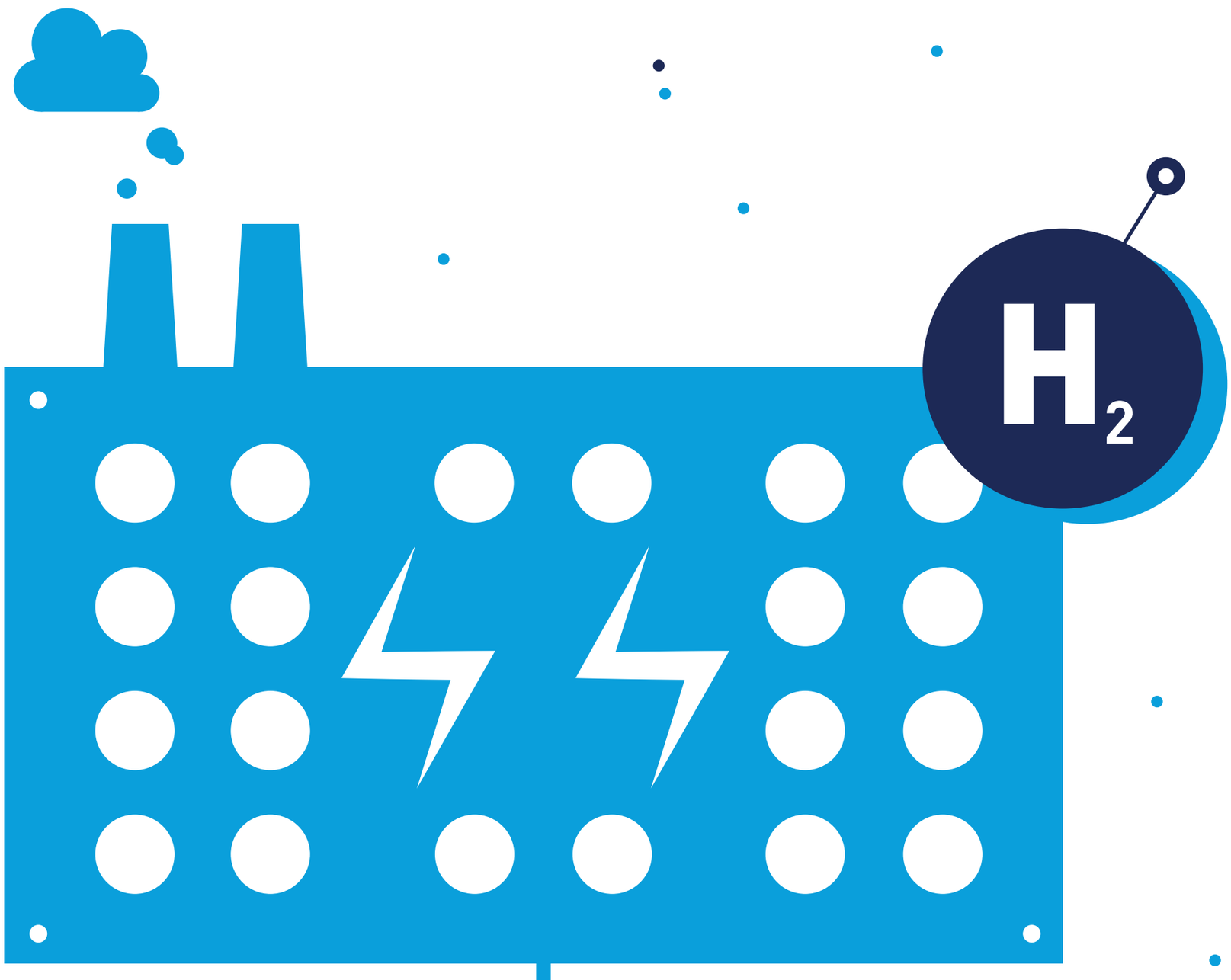
GREEN ELECTRICITY

To be "**green**" the process uses electricity from **renewable energy** sources such as solar, wind, hydro, geothermal and biomass.

For many years, SPIE has been a major player in the construction and maintenance of photovoltaic and wind power facilities
(2 GWP installed in photovoltaic installations in France e.g.).

ELECTROLYSE

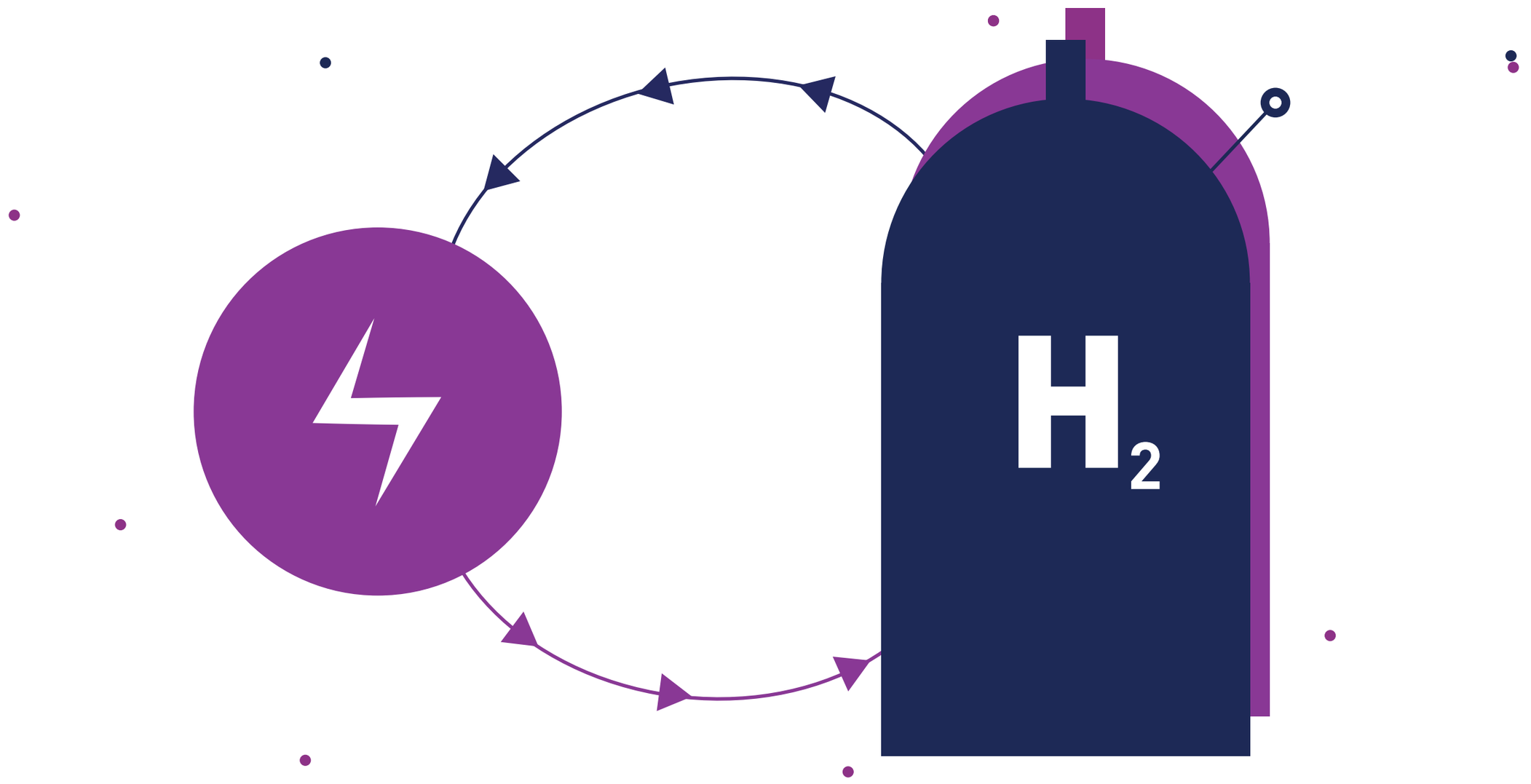
The extraction of hydrogen is carried out in power plants **with a capacity of up to 500 MW (Large Scale Electrolysing Plant)** or in smaller units closer to the end of the process.



As an integrator, SPIE offers a comprehensive approach to plant design alongside its partners in the energy industry, EPC, operators, electrolyser manufacturers and design offices.

POWER-TO-GAS USE #1

The transformation of renewable energies into hydrogen allows better management of the surplus of these "intermittent" energies. This hydrogen can be stored and then converted back into electricity: **"Power-to-gas-to-power"**. It can also be injected into the natural gas network.



In 2015, SPIE was involved in the implementation of a **Power-To-Gas** station in Mainz, Germany.

SPIE

METHANATION USE #2

By combining hydrogen with CO_2, it is also possible to obtain synthetic methane, **a gas used as a fuel**, particularly in industry, which can thus recycle its CO_2 emissions.

SPIE teams worked on the Jupiter 1000 methanation pilot project in Fos-sur-Mer, France.

TRANSPORT AND MOBILITY

USE #3

Thanks to the fuel cell process, which **converts hydrogen into electricity**, many vehicles can now use this energy as fuel.

Today: bus, train, car.

Tomorrow: truck, plane, boat.

As part of the **EasHyMob** project (European hydrogen mobility programme), SPIE has built two recharging stations in Le Havre and Cherbourg, France.

SPIE

INDUSTRY USE #4

Hydrogen is currently used as a reagent in chemical and refining processes **(desulphurisation)** but also in sectors as varied as the glass industry, the textile industry, electronics **(surface treatment)**, metallurgy and the food industry.

With a portfolio of more than 2,500 industrial customers, SPIE supports them in their projects to integrate green hydrogen into their processes.

As a member of several associations for the development of hydrogen, **SPIE** is at the heart of the production and ecosystem use. At the industrial level, we are also in the forefront of supporting our customers' **transition from grey to green hydrogen.**

Christophe Dormois

Member of the Group Industry committee
Business Development and Strategy Director
of the Industrie division of SPIE Industrie & Tertiaire,
a French subsidiary of SPIE.