



RENEWSTABLE® HYDROGEN POWER PLANT

Non-intermittent
supply of renewable
energy, day and night



Across many regions of the world, weak or isolated power grids struggle to keep pace with rising energy demand and remain heavily dependent on polluting fossil fuels. While wind and solar energy offer clean and cost-competitive alternatives, their intermittency can create grid instability when deployed at scale.

Today, grid operators are seeking reliable baseload power, while Governments and communities aspire to access affordable, clean and locally produced electricity—without emissions or fine particles.

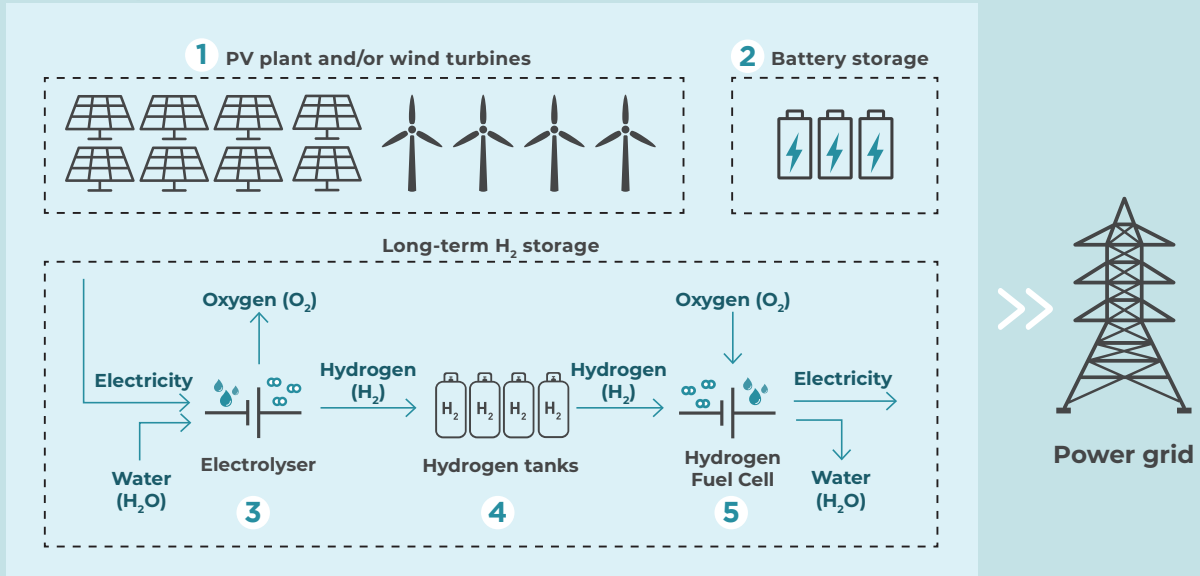
HDF Energy addresses these critical needs with its groundbreaking solution: **the Renewstable® hydrogen power plant.**

These multi-MW facilities combine **intermittent renewable energy sources with substantial on-site energy storage in the form of green hydrogen.** This innovative approach ensures the continuous generation of green, baseload power **24/7**, or provides peak shaving services, ensuring **grid stability and optimal performance at all times.**



How it works:

RENEWSTABLE®



2 Batteries
Short-term energy storage using batteries

1 Solar park
Carbon-free electricity production by the PV park when the sun is shining



5 Fuel Cells
manufactured by HDF
 $O_2 + H_2 = H_2O + e^-$

3 Electrolyser
 $H_2O + e^- = O_2 + H_2$

4 Hydrogen Storage
Long-term H₂ based mass energy storage

- 1.** The solar park and/or wind turbines produce carbon-free electricity when the sun is shining and/or when the wind is blowing. One part of this energy is injected directly into the power grid, while another part is stored in batteries and in the form of hydrogen.
- 2.** Battery storage enables energy to be restored to maintain the power plant's production over a short period of time, for example when a cloud passes overhead.

- 3.** Hydrogen is produced from water via an **electrolyser** (water electrolysis).
- 4.** The produced **hydrogen** is stored as a gas in large tanks.
- 5.** Electricity is generated from the stored hydrogen using high-power **fuel cells**, developed and manufactured by HDF Energy. It is injected in the power grid when the sun isn't shining or the wind isn't blowing over the long term (long cloud cover, night, long periods without wind).

This integration is made possible through HDF's advanced **energy management system**, which orchestrates when to charge or discharge the batteries and when to generate or consume hydrogen. The result is an uninterrupted supply of cost competitive green electricity available 24/7, guaranteeing optimal capacity, perfectly tailored to meet grid requirements and saving thousands of tons of CO₂ annually.

Key benefits

Ensure baseload profile

Power profile guaranteed while increasing renewables penetration

Deliver key grid services

Sustain grid stability
Avoid costs of grid expansion

Build energy independence

Locally produce electricity that is consumed locally
Reduce dependence on fossil fuel imports

Ensure cost stability

Benefit from a stable and competitive set price for 20+ years

Boost the local hydrogen economy

Create local jobs and develop hydrogen skills