



## Energy to go further

The world is now facing a dual challenge: regarding environment as well as the energy

In this context, access to **sustainable mobility is a major issue** if greenhouse gases and local pollution in cities are to be reduced and our dependency on oil-based fuels is to be cut.

Used in the fuel cell, hydrogen combines with oxygen from air to produce electricity, **with water as the only by-product.**

Hydrogen can be produced from a various range of energy sources, natural gas, in particular, but also renewable energy sources. Hydrogen thus has great potential to provide clean energy and ensure reliability of supplies.

Air Liquide is present across the entire hydrogen energy chain (production, distribution, high-pressure storage, fuel cells and hydrogen filling stations).

As world leader in gases for industry, health and the environment, Air Liquide intends to facilitate access to this **clean and renewable energy.**



Air Liquide takes a commitment to produce at least 50% of the hydrogen necessary for these applications through carbon-free processes by 2020, by combining:

- ✓ renewable energy sources, water electrolysis and biogas reforming,
- ✓ carbon capture and storage technologies during the hydrogen production process based on natural gas.

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## Hydrogen refuelling stations

Guided by sustainable mobility



# How does a hydrogen refueling station work?

- 1 Source of hydrogen**  
Low pressure hydrogen ( $H_2$ ) is stored in bottles ("cylinder racks"), tanks or tube trailers.
- 2 Boosters**  
 $H_2$  is compressed using boosters.
- 3 Buffers**  
Once the pressure has been increased (700 bars),  $H_2$  is stored in bottles known as buffers.
- 4 Exchanger**  
Before it is distributed,  $H_2$  is cooled using the exchanger and the refrigeration unit.

- 5 Dispenser**  
It enables distribution of  $H_2$  to the vehicle's tank, filling it in a few minutes!
- 6 Air compressor**  
It increases air pressure and sends it to the buffer tank.
- 7 Buffer tank**  
It regulates and supplies the air needed to make the boosters function.
- 8 Refrigeration unit**  
It supplies cooling fluid to the exchanger, and is made up of a buffer tank that stores and regulates the flow of the liquid, the pumps and the electrical control cabinet.
- 9 General control cabinet**  
The station's electrical control cabinet.

