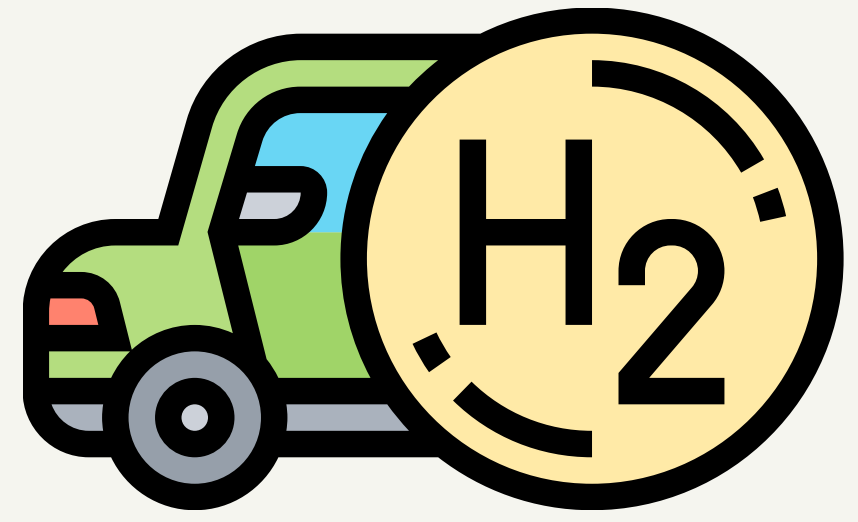
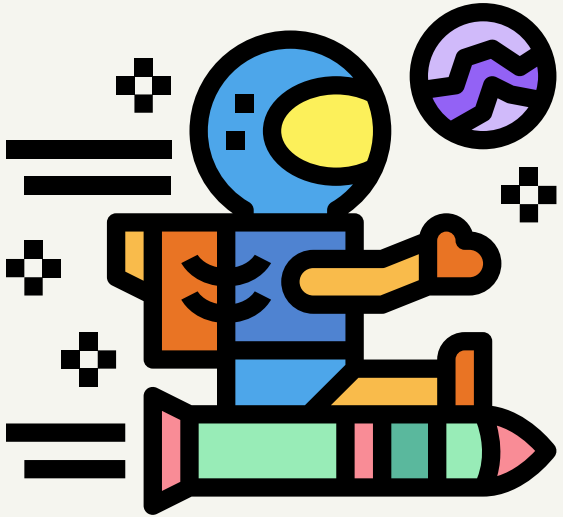


Hydrogen safety kit



Is hydrogen safe?



Yes! Hydrogen has been safely used and transported for over a century. For instance, NASA has relied on hydrogen gas as a fuel for its rockets to carry crew and cargo into space! As a bonus, fuel cells produce water as a by-product that can be consumed by astronauts [1]. Hydrogen by itself is not explosive; it is not self-igniting, decayable or oxidising [2]. Plus, hydrogen is non-toxic, so when it leaks or spills, it does not contaminate the environment.

Does hydrogen explode?

In the rare event of hydrogen release, hydrogen dissipates rapidly as it is 14 times lighter than air, which minimises the probability of ignition. If the hydrogen ignites (which requires the presence of oxygen, e.g. from ambient air), the flames generate low radiant heat due to the absence of carbon and the fire is quickly extinguished. A potentially explosive atmosphere can occur if the hydrogen accumulates in enclosed spaces and is thus prevented from escaping. Hydrogen is, therefore, stored either outdoors or, if indoors, with good ventilation [3].



In many cases, hydrogen is safer than the fuel we currently use to power our vehicles because carbon-based fuels tend to spread in liquid form [4]. When it burns, conventional fuels generate a lot of radiant heat at high temperatures. In other words, if handled correctly, hydrogen is safer than the fuels we generally use for mobility.

Hydrogen is a colourless and odourless gas: how will operators know if a leak has occurred?



Proven and well-established safety measures govern the operation and refuelling of hydrogen-powered vehicles, limiting the risk of leaks and potential ignition [5]. Leaks are detected by sensors at concentrations far below the ignition point and thus the operator is informed. Technical measures guarantee that the valves are closed and the hydrogen already released is vented so that no explosive mixture can occur.

Is hydrogen a clean fuel?

Hydrogen is a clean fuel because it produces no emissions when used in a fuel cell. However, its overall, well-to-wheel cleanliness depends on the energy source from which it is produced. Hydrogen is green and emission-free when it is produced from environmentally friendly, renewable energy sources. Although the production of hydrogen from fossil fuels produces emissions, these are lower than those of petrol or diesel. It is also easier to control this pollution because it is limited to the process of fuel production.



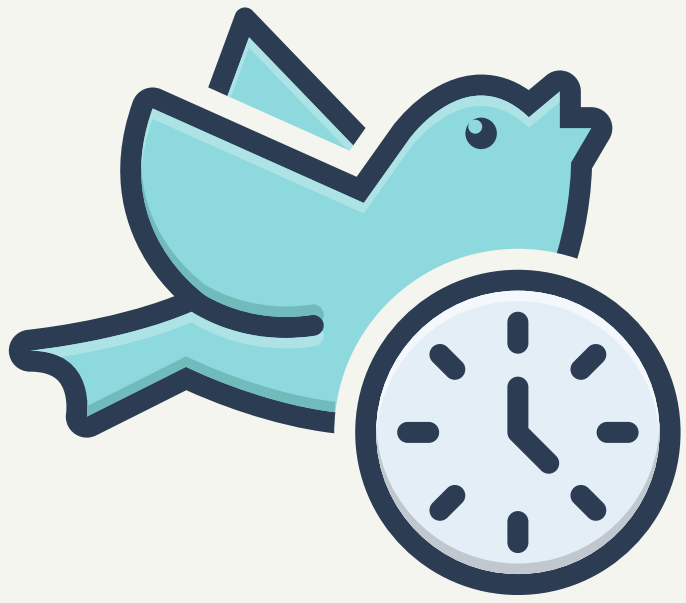
[1] <https://www.nasa.gov/content/space-applications-of-hydrogen-and-fuel-cells>

[2] [3] https://epub.wupperinst.org/frontdoor/deliver/index/docId/6786/file/6786_Hydrogen_Study.pdf

[4] https://hydrogeneurope.eu/hydrogen-safety#_ftn3

[5] <https://blog.ballard.com/hydrogen-fuel-safety>

Top 5 Incident Communication Tips



Communicate early

Quickly acknowledge the issue, briefly summarise, promise further updates and, if available, alleviate any concerns about safety.

Communicate often

Provide updates every 30 minutes (or whatever cadence is appropriate for the situation) to keep users out of the dark until resolution. Make sure that you include statements from impartial third parties (e.g. firefighters).

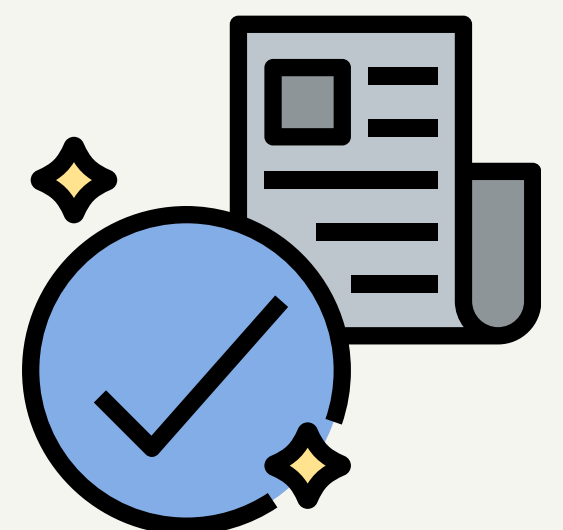


Be consistent

Make sure you are delivering consistent (and relevant) updates across all communication channels you are using (Twitter, LinkedIn, Instagram, etc).

Be transparent

When it comes to incident updates, be honest, clear, and transparent. Make sure to explain the issue and how it impacts different stakeholders and the public.



Say sorry

Acknowledge the issue, empathise with those affected and apologise.