Hydrogen Facts

Hydrogen may seem to be a clean, green energy source. It's carbon-free at the point of use, and it can store energy for long periods of time. It's safer than nuclear power, and doesn't create major environmental impacts like hydroelectric projects. But it's not as sustainable as it appears.

Hydrogen Is Not a Clean Fuel

Currently most hydrogen is made using fossil fuels, so much so that producing it has similar overall emissions to using coal, oil, or gas directly. In atmospheric chemistry, hydrogen also exacerbates the effects of methane and breaks down ozone in the stratosphere. Closer to the ground, it also produces hazardous nitrogen oxides when burned in an open flame exposed to oxygen, raising asthma rates and other health concerns.

The production of hydrogen can be extremely carbon-intensive unless produced using clean renewable energy sources.

Hydrogen does have potential uses in hard-to-decarbonize industries such as steel making and chemical manufacturing, but currently its use as a general purpose energy carrier is inefficient.

What About "Green" Hydrogen?

"Green" hydrogen is produced using electricity generated exclusively with renewable energy in a process called electrolysis. However, with current electrolyzers, green hydrogen's efficiency — from production back to energy through combustion — is around 30%, which means 70% of the renewable energy put into producing green hydrogen is lost.

In contrast, battery storage has a "round trip" efficiency of over 80%.

No matter which type of renewable energy is used, the production of green hydrogen fuel is still far less efficient than directly using the renewable energy itself.

Scan for more information on hydrogen.

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