

What is Hydrogen Gas?

Hydrogen (H) is known as the most abundant element in the universe. While it is present in nearly all living things, in order to obtain hydrogen as a usable gas for energy, we have to use energy to split chemical compounds containing hydrogen. These compounds are usually known substances such as water (H₂O) and methane (CH₄). Methane is a fossil fuel and a major accelerator of climate change. In the United States, 99% of hydrogen used for energy comes from fossil fuels such as gas and coal.

Where does it come from?

Hydrogen is labeled based on what materials it is made from and how it is produced.

BROWN hydrogen is produced through coal gasification by applying heat under pressure



Problem: very high greenhouse gas emissions

GRAY hydrogen is produced from methane gas, a.k.a. fracked gas, using high temperature steam



Problem: very high greenhouse gas emissions

BLUE hydrogen is produced like gray hydrogen, from methane, but is paired with carbon capture and storage technology (CC&S).



Problem: does not address the production and transportation issues with methane. As natural gas is often used to power CC&S, [research](#) has shown that the greenhouse gas footprint of blue hydrogen is more than 20% greater than burning natural gas directly

GREEN hydrogen is produced by using renewable energy to break down water, currently only accounts for only 1% of the hydrogen available in the US

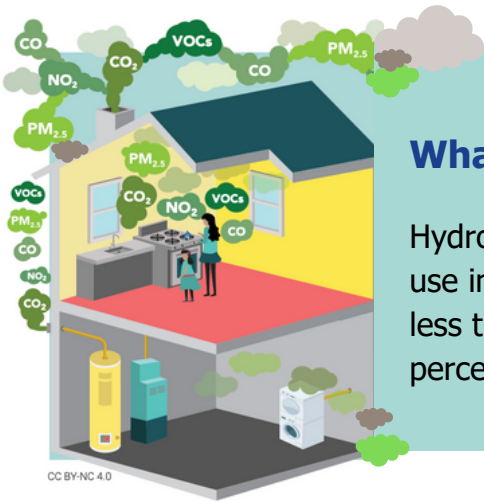


Problem: uses large amounts of water, and water is a very valuable resource

Key Points



- Use of hydrogen means continued use and dependence on fossil fuels
- Hydrogen blending perpetuates reliance on methane, increases risk of accidents and fires, maintains gas stove indoor air pollution, maintains or expands health inequities
- Electric appliances are healthier, safer, more efficient, and readily available



What is Hydrogen Blending?

Hydrogen blending is the proposed mixing of hydrogen and methane for use in homes such as gas stoves and furnaces. Hydrogen gas is likely to be less than 20% of the mixture, with methane gas being the remaining percentage.

How does it impact health?

Safety Risk - Hydrogen ignites more easily and is more explosive than methane. A risk assessment study predicted that the number of explosions per year and the risk of injuries from in-home explosions would be four times higher with a 20 percent blend of hydrogen compared to methane alone. Hydrogen can also exacerbate pipeline cracks and cause embrittlement, increasing leakage and explosion risks.

Nitrogen Oxides - When hydrogen and methane are burned, they emit nitrogen oxides. Nitrogen oxides can cause eye, nose, and throat irritation. It can exacerbate asthma symptoms leading to increased ER visits and hospital admissions. Even short term exposure to nitrogen oxides can cause negative health impacts for those suffering from respiratory or cardiovascular illnesses.

Indoor Air Pollution - Hydrogen blending would continue the use of methane for stovetops and other indoor appliances. These contribute to indoor air pollution by emitting volatile organic compounds, particulate matter, known carcinogens such as benzene, and other harmful pollutants into the air that can have an impact on health.

Methane - Hydrogen blending continues our reliance on methane. Drilling for methane gas (aka fracking) can cause water contamination and air pollution. It can lead to serious public health harms, such as cancer, asthma, and preterm birth, as the state-funded studies through the University of Pittsburgh have demonstrated.

Climate Change - Most hydrogen production creates greenhouse gas emissions, contributing to global warming. There are negative health consequences to climate change's extreme weather patterns, such as severe storms that destabilize communities, contaminate clean drinking water, affect food supply, cause injuries and fatalities, and reduce access to essential healthcare. Rising temperatures impact cardiovascular and respiratory systems, as well as increasing vector borne diseases.

Health Inequity- Black, indigenous, and people of color are already more likely to suffer negative health impacts from air pollution. Producing hydrogen from methane is likely to increase pollution in environmental justice communities, and cause harm to already vulnerable populations.