

Enabling Our Low Carbon Future



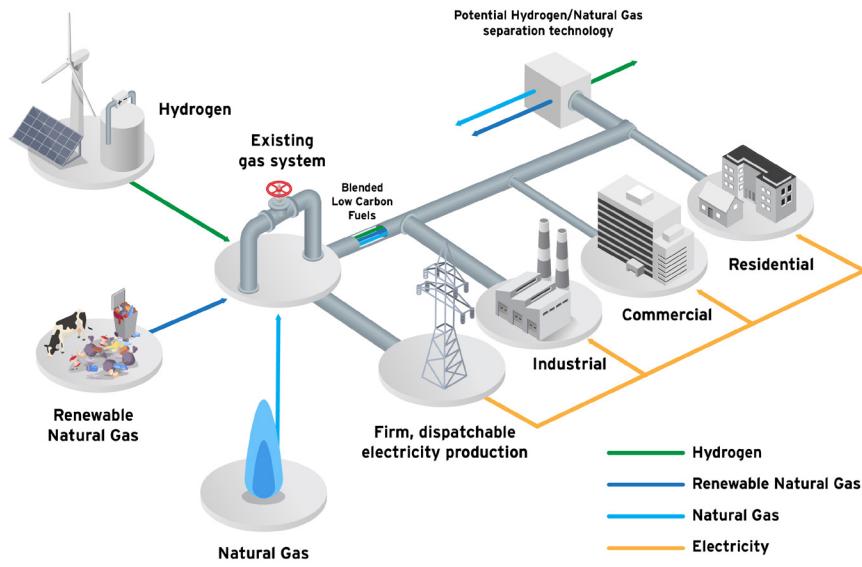
As part of SDG&E's sustainability strategy, we are exploring the potential of clean hydrogen to help advance California's goal to be carbon neutral by 2045. We are working to bring pilot projects online that will test hydrogen for long-duration energy storage, electric generation and vehicles, as well as for blending into the natural gas system.

Our region and state are well-suited to pioneer clean hydrogen due to the abundance of solar energy that can be leveraged to produce this carbon-free, gaseous energy carrier.

SCAN ME



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Clean hydrogen is poised to become an integral component of the global low carbon economy of the future through the reduction of greenhouse gas (GHG) emissions on both the electric and gas grids.

HYDROGEN AT SDG&E®

Hydrogen pilot projects are essential to filling knowledge gaps that cannot be addressed through modeling or lab experiments. Findings from our pilot projects will help advance industry knowledge.

- **University of California San Diego - Hydrogen Blending**

In September 2022, SDG&E® submitted a proposal to the California Public Utilities Commission (CPUC) to demonstrate hydrogen blending with UC San Diego. If approved by the CPUC, the project will study the feasibility of injecting up to 20% clean hydrogen into an isolated section of a gas line serving common building equipment in a graduate and family housing complex.

- **Borrego Springs Microgrid - Long-Duration Hydrogen Storage**

At our Borrego Springs Microgrid, SDG&E will test hydrogen for long-duration (eight hours or more) energy storage, which can be made available for dispatch by the microgrid or the California Independent System Operator (CAISO) to support grid reliability.

- **Palomar Energy Center - Electric Generation and Fleet Fueling**

At our Palomar Energy Center in Escondido, an electrolyzer and solar panels will be installed to produce hydrogen onsite and blend it with natural gas for electric generation. This hydrogen will also be used to fuel the first hydrogen vehicles in our fleet, and as a cooling gas at the facility.

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HYDROGEN 101

Hydrogen is the simplest and most abundant element in the universe. Many stars, including the sun, are primarily hydrogen combined with other gases like helium. On earth, hydrogen is rarely found in its pure form; instead, it's typically found in compounds such as water (H₂O) or fossil fuels like methane (CH₄).

For decades, hydrogen has been used as a fuel in industrial, manufacturing, and technology operations, including the production of ammonia for agriculture, oil refining, and electronics manufacturing. But hydrogen is also a carbon-free energy carrier, which means that it can be used to store, move and deliver energy produced from other sources. When used as a fuel, it produces water vapor instead of GHG emissions.

Due to its unique characteristics, experts and policymakers across the globe acknowledge that clean hydrogen will play a major role in achieving carbon neutrality goals.



How is hydrogen produced?

Currently, most of the hydrogen produced in the U.S. is made from natural gas, through a chemical process called Steam Methane Reforming (SMR). This process releases CO₂ as a byproduct.

But hydrogen can also be produced through other "clean" pathways. One of those pathways is electrolysis, the process of using electricity to separate oxygen and hydrogen atoms in water. If renewable electricity (such as solar or wind) is used for electrolysis, then hydrogen can be produced carbon free.

How is hydrogen stored?

Since hydrogen is a gas, it is typically stored in pressurized containers such as small cylinders, large tanks or underground. It can also be stored as a liquid at very cold temperatures. Like natural gas, hydrogen can be stored for long periods of time and transported to different locations. Large-scale hydrogen storage can be especially useful because it provides a steady energy source even if production is irregular.



How can hydrogen be used?

Hydrogen is described by some as the "building block of the clean energy economy" in that it has many uses to help create a more sustainable future. Because it can be efficiently stored and transported in different forms, hydrogen can be produced where and when clean energy is abundant to help decarbonize hard-to-electrify sectors such as steel or aluminum production or long-haul transportation.

Some of the many uses currently being explored include longer-duration storage that could be used to power regions or buildings, zero-emissions fuel cell vehicles, and blending with natural gas to help decarbonize our existing energy system.

At SDG&E, we are committed to exploring how clean hydrogen can help us meet California's Net Zero objectives, and at the same time, address energy reliability, affordability and equity.

Learn more about our hydrogen projects at sdge.com/hydrogen.