

Up to 5% green hydrogen can be blended with PNG, finds study

Rishi Ranjan Kala
New Delhi

The initial findings of a study by the State-run Engineers India (EIL) suggests that up to 5 per cent green hydrogen can be blended with piped natural gas (PNG).

“EIL is conducting a study on blending of green hydrogen with PNG. Around 3-5 per cent can be blended without any adverse impact on the pipeline infrastructure. It is an initial finding,” a senior government official said.

EIL and IIT Kanpur are studying the impact of green hydrogen on city gas distribution (CGD) pipelines and the initial findings of the report have been submitted to the Ministry of Petroleum & Natural Gas (MoPNG), the official added.

The development assumes significance as this will help the world’s third largest energy consumer save on fossil fuel imports. India imports roughly half of its natural gas requirement as liquefied natural gas (LNG).

The world’s fourth largest LNG importer consumed 66.63 billion cubic meters (BCM) natural gas in FY24, compared to 59.97 BCM and 64.16 BCM in FY23 and FY22, respectively.

BLENDING GREEN H₂

Hydrogen is a flexible energy carrier and can be used for many energy applications like integration of renewables and transportation.

It is produced using RE and electrolysis to split water and is distinct from grey hydrogen, which is produced from methane and releases greenhouse gases. Energy can be extracted from hydrogen through combustion or through fuel cells, which emit only water as a by-product.

However, using hydrogen has its own disadvantages.



NEED OF THE HOUR. The development assumes significance as this will help India, the world’s third largest energy consumer, save on fossil fuel imports [ISTOCK.COM](https://www.istock.com)

According to a study by the US Energy Department’s National Renewable Energy Laboratory (NREL) in 2013, “How it (hydrogen) affects the pipelines it travels in and appliances that use it. On the pipeline front, hydrogen embrittlement can weaken metal or polyethylene pipes and increase leakage risks, particularly in high-pressure pipes”.

Hydrogen embrittlement is a situation when the metal (pipeline) becomes brittle due to diffusion of hydrogen into the material. The extent of embrittlement depends on the amount of hydrogen and the material’s microstructure.

PILOT PROJECTS

The Central public sector undertakings (CPSUs) are already running pilot projects on blending green hydrogen with PNG.

For instance, State-run NTPC has commissioned a green hydrogen blending project at Kavas (Gujarat) with 5 per cent hydrogen blending on a volume basis with PNG. Hydrogen blend was increased to 8 per cent on a volume basis with PNG from December 2023 onwards.

Similarly, GAIL launched a pilot project for hydrogen blending with PNG at Avantika Gas, a JV of GAIL and HPCL, at a rate of up to 2 per

cent on a volume basis, which was increased to 5 per cent after March 2023.

GAIL has also installed its first green hydrogen plant having a capacity of producing 1.4 kilo tonnes per annum (KTPA), or roughly 4.3 tonnes per day (TPD), at Vijapur (Madhya Pradesh).

Initially, the hydrogen produced from this unit will be used as a fuel along with natural gas for captive purpose in the various processes and equipment running in the existing plant at Vijapur. This hydrogen is also planned to be dispensed to retail customers in the nearby geographies, transported through high pressure cascades.

Besides, government has also launched a study to ascertain the cost dynamics and reliability of transporting green hydrogen through pipelines from renewable energy zones (REZs) to ports for domestic consumption and exports.

A team of officials from GAIL, Indian Oil Corporation (IoCL), Central Electricity Authority (CEA) and NTPC are exploring the possibilities of setting up a pipeline to transfer green hydrogen.

An initial study on the cost dynamics for transporting from Rajasthan to the Paradip port in Odisha has been conducted.

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