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Hydrogen Project

PSE&G is aggressively pursuing opportunities to provide customers with a lower-carbon future. PSE&G has a history of evolving how it delivers gas to customers and being at the forefront of industry innovation.

On March 1, 2023, PSE&G submitted a \$28.8 million hydrogen project, which would reduce CO₂e emissions by an estimated 1,000 metric tons annually, as part of its proposal for the third phase of its Gas System Modernization Program, which would run into 2027.

The Hydrogen Project

The hydrogen project would use a 1 MW-rated electrolyzer to supply 2% hydrogen to the gas distribution system for the majority of the year. The electrolyzer would produce approximately 40 lbs/hr of hydrogen. The project would call for a flexible design to accommodate increased blending in the future.

Hydrogen is a cleaner alternative to fossil natural gas that has been proven safe in small concentrations. One strategy for combating climate change is introducing lower-carbon fuels, including hydrogen, into existing gas distribution systems.

This project would provide PSE&G with valuable hands-on learning and experience with hydrogen production and distribution, that it would share with other gas distribution companies. It would allow PSE&G to assess opportunities for large-scale hydrogen blending in the future, which would further reduce its carbon footprint and elevate its capacity to provide low carbon energy solutions.

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Hydrogen facility highlights

The project would be located at a site at PSE&G's Central M&R Station in Edison, and serve approximately 40,000 residential, commercial and industrial customers. The station is an ideal site to locate the project with no connections to cast iron pipes. The facility would be connected directly to the electric distribution grid and supplied by 100% clean electricity through a Power Purchase Agreement (PPA). The site would also contain a storage tank fed by a compressor to supplement the blend during the higher gas demand days of the year. The site can accommodate future development of a solar installation to satisfy the facility's electricity needs and sunset the PPA and allow the project to produce 100% green hydrogen.

Innovation highlights

- PSE&G would use a 2% blend, as a starting basis with potential to increase in the future.
- PSE&G has sponsored hydrogen research and development studies, through two industry associations, to prepare for strategic decarbonization planning and to validate safety protocols.
- PSE&G is participating in seven studies under NYSEARCH, and has a partnership with the Gas Technology Institute related to hydrogen research. These partnerships strengthen PSE&G's knowledge base within the hydrogen industry and its ability to deploy hydrogen on a larger scale.

What is a hydrogen power-to-gas facility?

A power-to-gas facility involves several components that can convert electricity and water into hydrogen, which can be blended into the natural gas system as a low carbon fuel. The primary component is an electrolyzer, which converts supplied electricity and water into pure hydrogen gas and oxygen.

The system requires two major inputs: electricity and water. Electricity can be generated onsite or connected to the grid and the water is typically supplied from the nearby municipal water supply or a well.

The generated oxygen can be released into the atmosphere or stored for other uses. The generated hydrogen gas can then be compressed and stored in a tank for usage later or directly blended into the natural gas system.

The blending occurs through a pipe skid that mixes the hydrogen into the outgoing gas stream. The blend percentage is monitored via instrumentation to ensure it does not exceed an established threshold.