

Engineering, Procurement, and Construction Management (EPCM) Services for Green Hydrogen Production Facility



AECOM's design, engineering, and construction management work on this project is helping to advance the availability of green hydrogen, which is experiencing rapid demand for its outstanding sustainability and versatility.

Project Overview

Plug Power, a domestic leader in green hydrogen, has announced they plan to design and construct 500 TPD of green hydrogen production facilities in the US in the next 3-5 years. Project Gateway is one of the first sites and it will be used as a template for future facilities. AECOM initially served as the engineer of record but was awarded EPCM services to complete this new facility.

Production Process

In the green hydrogen production process, electrolyzers break down deionized (DI) water from a combined reverse osmosis/DI water treatment process into hydrogen and oxygen. The bulk oxygen is vented and the wet hydrogen gas from the electrolyzer is de-oxygenated, cooled, and dried. Hydrogen gas is sent to the hydrogen liquefier units where it is pre-cooled with refrigerated nitrogen. The N2 re-liquefaction system is integrated within N2 refrigeration, N2 expander compressors, and pre-cooling perlite cold box system. The pre-cooled hydrogen undergoes ortho-para conversion to minimize boil-off in the liquid product. Hydrogen gas is liquefied using a hydrogen gas compression/expansion refrigeration loop. Hydrogen is also used as a refrigerant in a closed loop within the vacuum insulated cold box exchanger to achieve desired temperature for hydrogen liquefaction. Liquid hydrogen is moved to storage for transportation. Hydrogen flash gas is captured and recycled to minimize loss.

Client Benefits

- **100% SUSTAINABLE:** green hydrogen does not emit polluting gases either during combustion or during production.
- **STORABLE:** hydrogen is easy to store, which allows it to be used subsequently for other purposes and at times other than immediately after its production.
- **VERSATILE:** green hydrogen can be transformed into electricity or synthetic gas and used for commercial, industrial or mobility purposes.
- **DEMAND:** the demand for domestic green hydrogen is forecasted to quickly outpace production capacity.

Work Performed

AECOM is providing EPCM services for the completion of this new facility. Project Gateway will be a new, grassroots green hydrogen production facility in Alabama, New York. This new facility will include electrolysis, liquefaction, water treatment, storage/loadout, and all utilities for a 74 TPD facility. AECOM's engineering scope includes design of the production trains comprised of substations, rectifiers, electrolyzer arrays, H2 deoxo-dryer unit, liquefaction system, and N2 systems. The project is being executed on a fast-track basis with a targeted startup date of Train 1 in the summer of 2024.

From this project, AECOM is getting firsthand design experience for commercial scale green hydrogen production from electrolysis. This project employs Plug Power-owned technologies (electrolyzers and liquefaction) which are being implemented in green hydrogen production facilities around the world. In the US, this is one of the first commercial applications to be installed.

Client

Plug Power

Location

New York, USA

Contract Value

Confidential

Years

2022-present

More Information: AskEnvironment@aecom.com

