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The Standard Hydrogen Corporation (SHC) is pleased to announce the conclusion of work enabled by a new collaboration with the Pacific Northwest National Laboratory (PNNL). In 2023, thanks to an expansion of an existing engineering project at SHC funded by the New York State Energy Research and Development Authority (NYSERDA), and new support from the US Department of Energy (DOE), this new collaboration between PNNL and SHC was launched to help accelerate deployment of clean energy infrastructure for power and fuel based on renewable hydrogen. That work is now wrapping up, with critical accelerating effect to deployments of renewable hydrogen installations in SHC's pipeline.

SHC's Energy Transfer System™ (ETS) leverages commercialized components for rapid deployment, while establishing a novel business model that generates multiple value and revenue streams from a single installation. The results are potent emissions reductions, economical and versatile electrical energy storage, and rapidly driving down the cost of renewable hydrogen for customers.

In 2021, NYSERDA [announced](#) an award to SHC under its Electric Power Transmission and Distribution High-Performing Grid program. SHC's project, "Economical Long-Duration and Multi-Modal Energy Storage: Engineering Study of Standard Hydrogen Corporation's Energy Transfer System", steadily progressing since then. Standard Hydrogen has established the site agnostic engineering designs for the ETS Standard Plant, along with the scalable revenue model for SHC's ETS. In early 2023, with increased support from NYSERDA, SHC and PNNL established a Cooperative Research and Development Agreement (CRADA) to bring enhanced modeling expertise and techno-economic analysis to this development of the ETS Standard Plant.

Phase 1 of the CRADA has been funded by contributions from SHC, enabled in part by the expansion of the NYSERDA-funded project, as well as by contributions from the US DOE Office of Electricity, and the US DOE Hydrogen and Fuel Cell Technologies Office within the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE).

PNNL has brought advanced modeling and valuation capabilities to this project. The collaboration with PNNL has enabled SHC to model and assess innovative hydrogen energy deployment options toward multiple energy delivery pathways and grid applications, considering economic, resilience, and environmental benefits.

**Bill Dailey**, VP and cofounder of SHC, said "The ETS provides both Economic returns and community benefits; we're proud of that and PNNL's work will help us introduce ETS in a manner that accelerates both economic and community returns."

"Our team has developed advanced modeling and optimization tools to maximize the potential benefits of energy storage from stacked value streams. We are excited to work with the SHC team to customize and enhance the tools we have built for hydrogen energy storage, and in turn, help

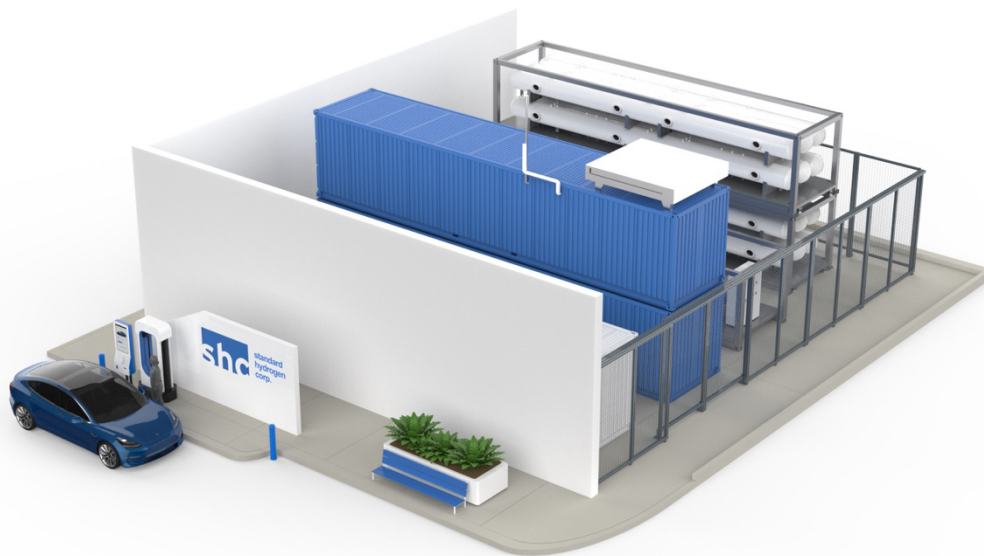
SHC optimize ETS operations and better understand its techno-economic performance,” said **Dr. Di Wu**, Chief Research Engineer at PNNL.

**Scott Egbert**, Program Manager for Renewable Optimization and Energy Storage Innovation at NYSERDA said, “NYSERDA is pleased to support the expansion of this high-performing grid project to further advance innovation in renewable hydrogen. Through their strategic partnership with Pacific Northwest National Laboratory, Standard Hydrogen Corporation is leveraging the expertise and experience needed to assess and model economical hydrogen deployment, which supports New York’s commitment to explore all technologies that could aid in the transition to a zero emissions electric grid.”

**Dr. Imre Gyuk**, Chief Scientist for Energy Storage in the US DOE Office of Electricity, stated “Dispatchable electrical energy storage is critical to our future zero emission power grid. This project will advance early commercial evaluation of hydrogen infrastructure as a means for providing that necessary complement to solar and wind power and help better inform future grid planning and operation models.”

“This project, and this partnership, has helped us uncover a big stretch of the path to lower cost renewable hydrogen,” said **Dr. Paul Mutolo**, CEO and cofounder of SHC, “which is helping SHC accelerate our ETS network, so we can all benefit from that hydrogen.”

The key to SHC’s approach is looking beyond hydrogen as a molecule, and more as a means for rapidly diminishing the carbon intensity of our transportation and power generation systems. SHC’s first installed project is in development in New York State, and is expected to be quickly followed by other regional installations in development.



*SHC’s Patent-Pending Energy Transfer System™ (ETS)*