

Business Roadmap for Utilizing Hydrogen in Houston

This project jumpstarts the hydrogen economy now, using technology that is deployable at scale today and reinvesting profits into hydrogen technology that is at TRL 7 or higher. The winning team consisted of a visionary CEO (Cody Johnson), an energetic consulting VP (Sabine Brueske), an industry manager (Saalya Rickhi), and an industry process engineer (Thien Nguyendo).

The Business Case

Decarbonization and increased capacity utilization of existing industrial H₂ production along the Houston Ship Channel using amine capture technology. Production of ammonia as a liquid carrier, using the Haber-Bosch process, and utilizing the existing maritime ammonia tanker fleet to ship to markets in Western Europe. Northeast Asia was recognized as a similarly lucrative market.

The Existing Technologies (see image on page 2)

- ✓ Grey to Blue Hydrogen – retrofitted steam methane reformers (SMR) and autothermal reformers (ATR) with carbon capture and storage (CCS).
- ✓ CO₂ Capture – supplier-side capture (amine adsorption), and storage
- ✓ Ammonia Synthesis – port-located production (Haber-Bosch) and distribution
- ✓ Transportation – 40+ ammonia tankers
- ✓ Ammonia Cracking – point of use ammonia crackers

The Economics

Levelized cost of hydrogen analysis was used to demonstrate the project business case. The presentation outlined profits of \$1.8 billion over the contract life with \$180 million in green H₂ investments. Contracted obligations of reinvestment of company profits into renewable and natural hydrogen technologies in Western Europe with TRL > 7 is a key economic driver for consumption country buyers.

The Next Steps

A Board of Directors, Executive Leadership Team, Houston-based investment bankers and attorneys as well as an EPC firm are identified as part of this roadmap. The team's name, BRUHH, is a nod to the future generation of technology developers and leaders who will carry us through to our 2050 goals for a clean energy economy, fueled by hydrogen.

Technology Roadmap

