



# *HYDROGEN STORAGE & TRANSPORT*

Unlock Stranded Assets  
Open the Hydrogen Economy



**Green Fortress Engineering**



# H2US

*THE Ultimate Answer to Hydrogen Storage*



LOW-COST & SAFE  
NO COMPRESSED GAS



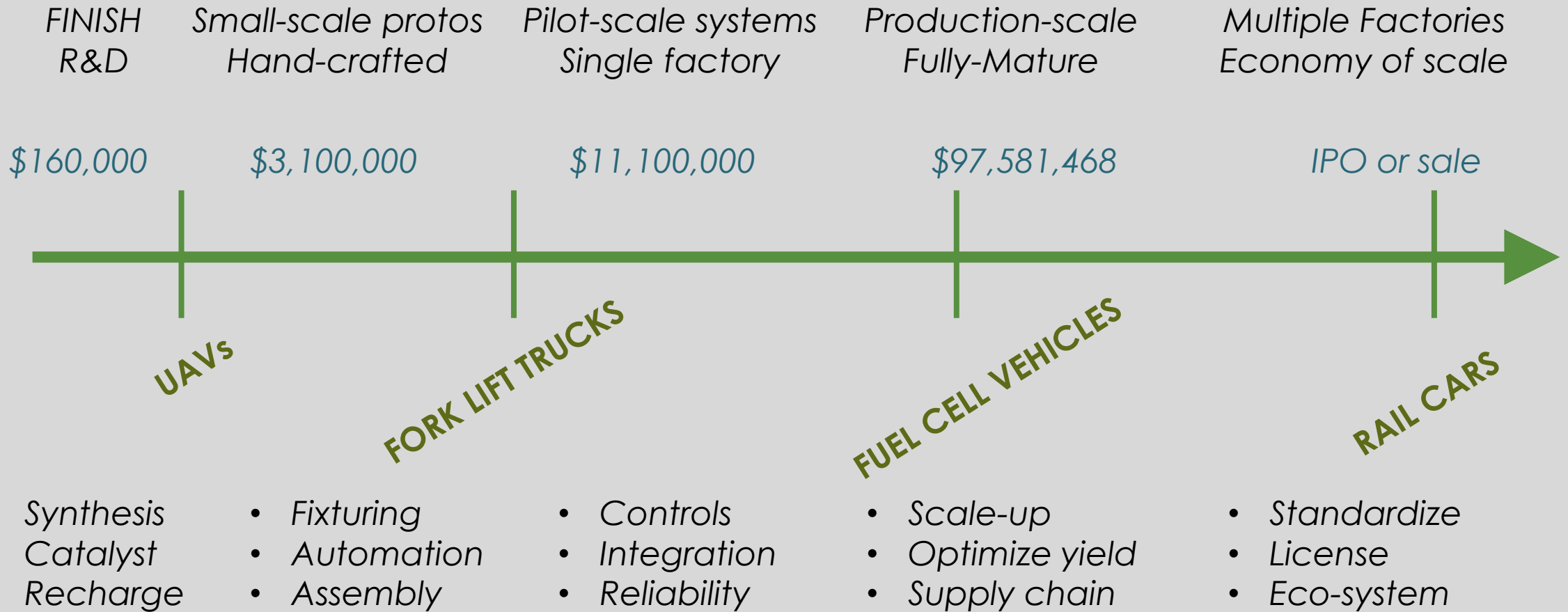
SOLID-STATE MATERIAL  
HIGH EFFICIENCY



SCALABLE & FAST  
DRONES to RAIL CARS

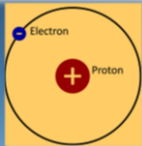
**Covered by 4 US Patents**

# TIMELINE and BUDGET





# HYDROGEN ECOSYSTEM



# FAQs

- *What do the patents protect? Four patents cover the following: (1) tank design; (2) particle formation and etch; (3) catalyst action; and (4) system design. Eleven additional IP topics pending.*
- *Need a different name. "Sponge" confuses people. H2US is the official product name, short for Hydrogen (H<sub>2</sub>) Ultra-Storage. A "sponge" is an analogy where porous material holds water, released by squeezing, while hydrogen is stored in porous silicon and release using heat. Maybe the "Hydrogen Solidifier".*
- *How does the product help in transport and storage? H2US has three advantages: (1) low energy overhead (high efficiency); (2) low cost, safe, and recyclable; and (3) fits in any shape. Neither cryo-liquid or high-pressure gas has any of these. H2US is double the storage of metal hydrides and does not suffer exothermicity.*
- *Does converting large quantities of H<sub>2</sub> into product have advantages over other conversion systems? Hydrogen is an energy carrier, so you MUST have storage and transport which has low parasitic energy. Else, it will be uneconomical versus alternatives.*
- *How costly are projections for conversion? Expensive materials? Cost of **\$7.72/kWh** is extremely low - 30% better than the DOE goal.*
- *Product can be transported by rail, truck and air in greater quantities due to density. Yes, exactly. There exist lab materials with higher storage density, but they are exotic, and ill-suited for volume production and rugged operation.*
- *Explain the bicycle pump comparison? The H2US re-charges at the pressure of a bike tire pump – it can even be manually operated. Compare to DOE composite tanks, which require huge, noisy, power-hungry compressors costing \$2M+ per re-charge station.*
- *Amplify the value of the product for the hydrogen production plants such as cost, efficiency, speed of delivery, competition. H2US is best-in-class among ALL competing hydrogen storage.*
- *What is the investment required for controlling interest? Rseed is \$160k, Round A is \$3.1M. Round B is \$11.1M. Round C at \$97.4M.*
- *What does that investment cover? Product development, lab, talent, labor, testing? Each tranche of investment advances technology readiness and retires risk. No show-stoppers found. However, this is still high-risk tech, suited to savvy investors who do not shirk on due diligence.*
- *How long to bring the product to market? Time to market is under two years when funding is not the gating pace.*

# For more information

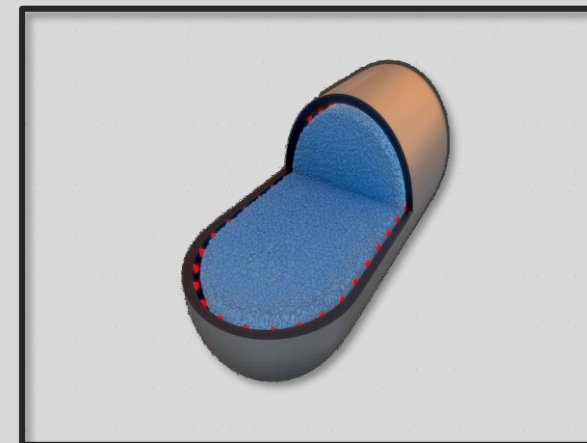
- **President & CEO:**
  - Peter Schubert
  - 630 470 7797
  - [greenfortressengineering@gmail.com](mailto:greenfortressengineering@gmail.com)
- **Company website:**
  - [www.greenfortressengineering.com](http://www.greenfortressengineering.com)
- **Technical Publications (selected):**
  - Boaks, M., and Schubert, P., "Kinetics of hydrogen storage on catalytically-modified porous silicon," *J. Cat.*, 371, March 2019, p. 81-87.
  - Schubert & Urbanek, "Hydrogen Recharge Dynamics and Vessel Design for Porous Silicon Storage Media," in Ch. 6 of *Nanotech 2014: Electronics, Manufacturing, Environment, Energy & Water*, vol. 3, CRC Press
  - Schubert, P., Wilks, A., "Thermodynamic analysis of a novel hydrogen storage material: nanoporous silicon," *Materials Innovations in an Emerging Hydrogen Economy*, G.G. Wicks, J. Simon, *Ceramics Transactions* v. 202, Eds., J.Wiley, 2009.

## Available Documents

- Executive Summary
- Business Plan
- Financial Pro Forma
- Product Performance Metrics
- Product images
- Patents

## H2US

### Hydrogen (H<sub>2</sub>) Ultra-Storage the "Hydrogen Solidifier"



*Capsule-shaped vessel for  
Materials Handling Equipment  
(e.g. fork-lift trucks)*