

# JTurbo Engineering and Technology

Pioneering the Future of  
Hydrogen & LNG Liquefaction

World's Most Energy-Efficient  
Liquefaction Technology





# Global Decarbonization Requires Next-Generation Liquefaction Solutions

- **Green hydrogen** is essential for decarbonizing heavy industry, transportation, and energy storage.
- Current liquefaction technologies are inefficient (11+ kWh/kg) and costly.
- Renewable energy intermittency demands efficient storage solutions.
- **JTurbo Advantage:** Patented technology achieves **50% lower energy consumption** than industry standards.



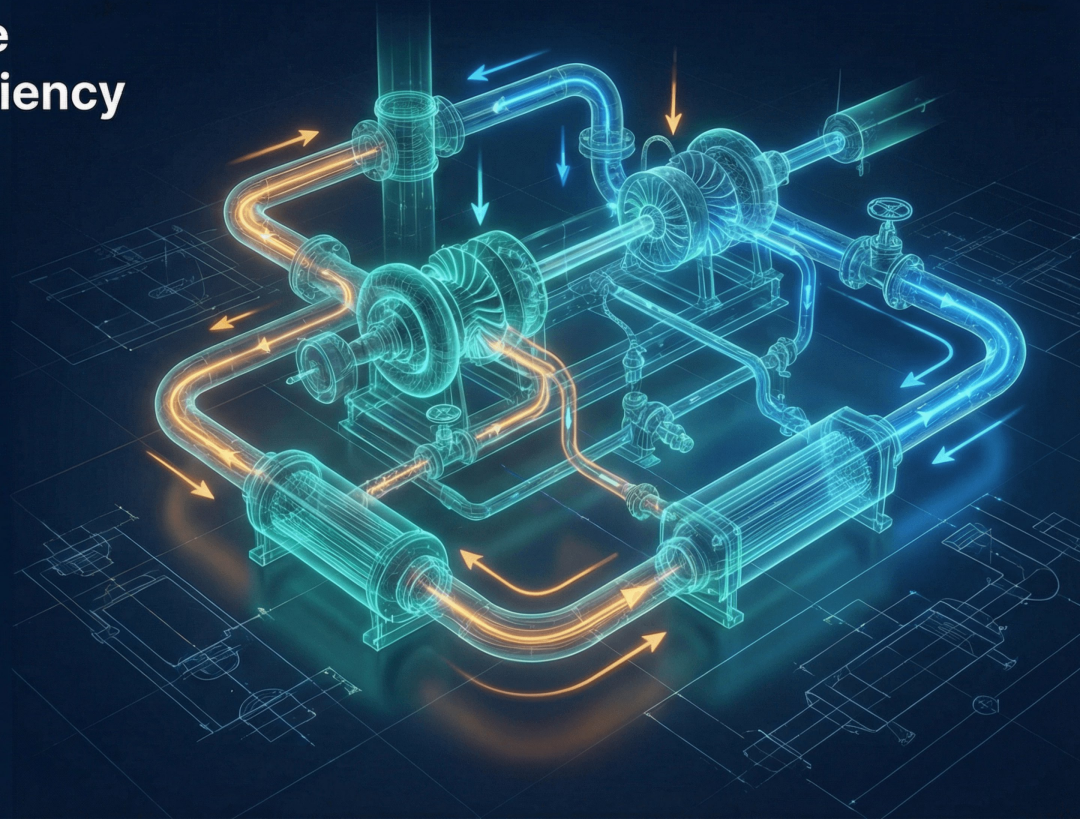


# JTurbo's Proprietary Twin Turbo Expander Technology



## Patented Reverse-Brayton Cycle Achieves Industry-Leading Efficiency

- **2 US Patents:** US 11,391,511 B1 (Hydrogen) & US 12,181,214 (LNG)
- **Twin Expander Design:** Maximizes thermodynamic efficiency through dual-stage expansion
- **Reverse-Brayton Cycle:** Proven foundation with innovative enhancements
- **Flexible Refrigerants:** Nitrogen, Hydrogen, Helium, or Neon mixtures





# Hydrogen Liquefaction Performance That Redefines the Industry

50% Lower Energy Consumption & 50% Lower Capital Cost



Enabling large-scale hydrogen liquefaction (50-150 TPD) at competitive costs.



# LNG Liquefaction Excellence for Modular and Offshore Applications

Safe, Efficient, and Scalable  
LNG Solutions (50 - 3,000 TPD)



**Efficiency:** 300 kWh/ton LNG (Industry best)



**Safety:** Pure Nitrogen Refrigerant (Non-flammable)



**CAPEX:** ~\$400/ton LNG capacity (50% savings)



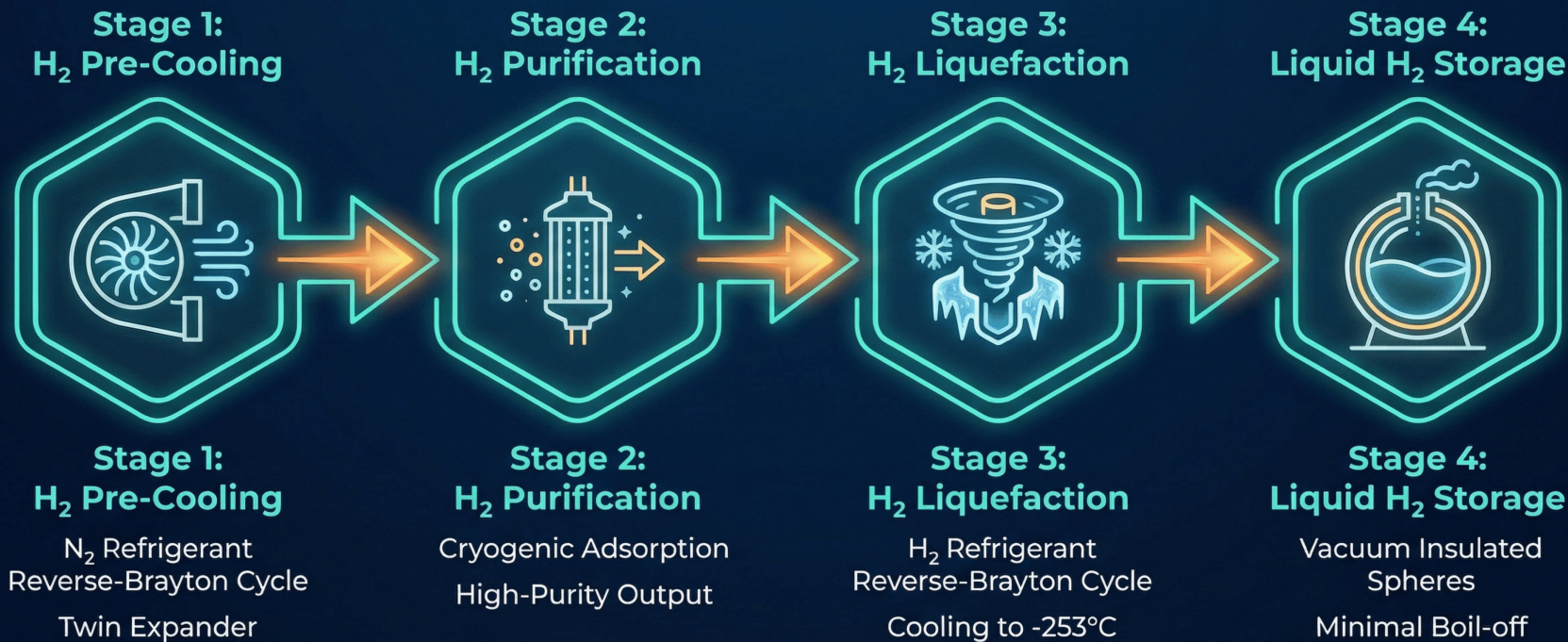
**Applications:** FLNG, Bio-LNG, Modular Plants





# The Four-Stage Hydrogen Liquefaction Process

Proven Process Architecture with Industry-Leading Components





# Liquid Hydrogen as the Ultimate Energy Buffer

Solving Renewable Energy Intermittency with Efficient Storage

## Key Concepts



- **Challenge**

Solar & Wind are intermittent;  
Grid limitations restrict continuous production.



- **Solution**

Liquefy & Store  $H_2$  during peak production -> Use when renewable energy is unavailable.



- **Efficiency**

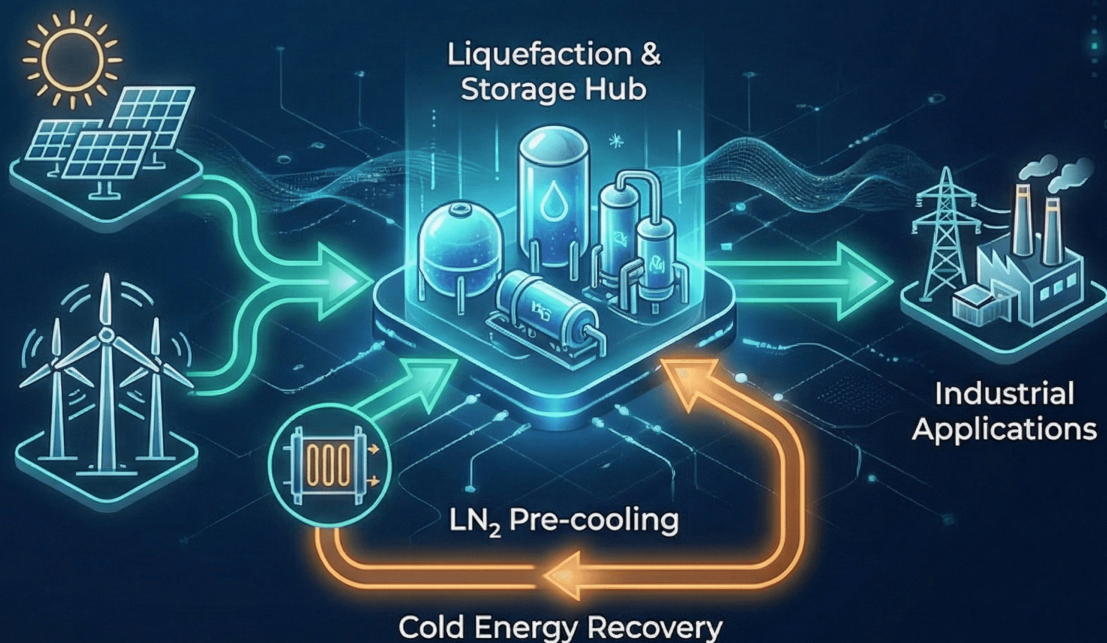
Recover cold energy from  $LH_2$  vaporization to produce  $LN_2$  for precooling.



- **Impact**

No loss of cold energy = Lower OPEX & Cost-effective Storage.

## Energy Ecosystem





Global Reach and Proven Market Demand

# Serving Clean Energy Projects Across Six Continents

## KEY APPLICATIONS

- ⚡ Green Hydrogen Liquefaction
- ⚡ Green Ammonia Production
- ⚡ Industrial Decarbonization
- ⚡ LNG & Bio-LNG





# Partnership and Execution Model

Technology Licensing with World-Class Engineering Delivery







# Contact JTurbo

## Let's Build the Future of Clean Energy Together

### Company Details

JTurbo Engineering and Technology LLC

Location: Houston, Texas, U.S.A.

### Contact Information



Jacob Thomas - Principal



Office: +1. 713.838.2375



Mobile: +1. 281.851.9598



Email: [JThomas@JTurbo.com](mailto:JThomas@JTurbo.com) | [Info@JTurbo.com](mailto:Info@JTurbo.com)



Website: [www.JTurbo.com](http://www.JTurbo.com)