

# PEI Wind-Hydrogen Symposium Hydrogen Energy Stations: The Value Proposition

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# **Randall MacEwen, Vice President, Corporate Development**

# Introduction to Stuart Energy

- Who we are:
  - Pioneer and world leader in design, marketing and delivery of on-site hydrogen infrastructure solutions based on water electrolysis
- What we do:
  - We design, build, integrate, sell and service Hydrogen Energy Stations – revolutionary products that use water and electricity (renewable or off-peak) to produce, store and deliver hydrogen on-site for high-value, emission-free fuel and power applications

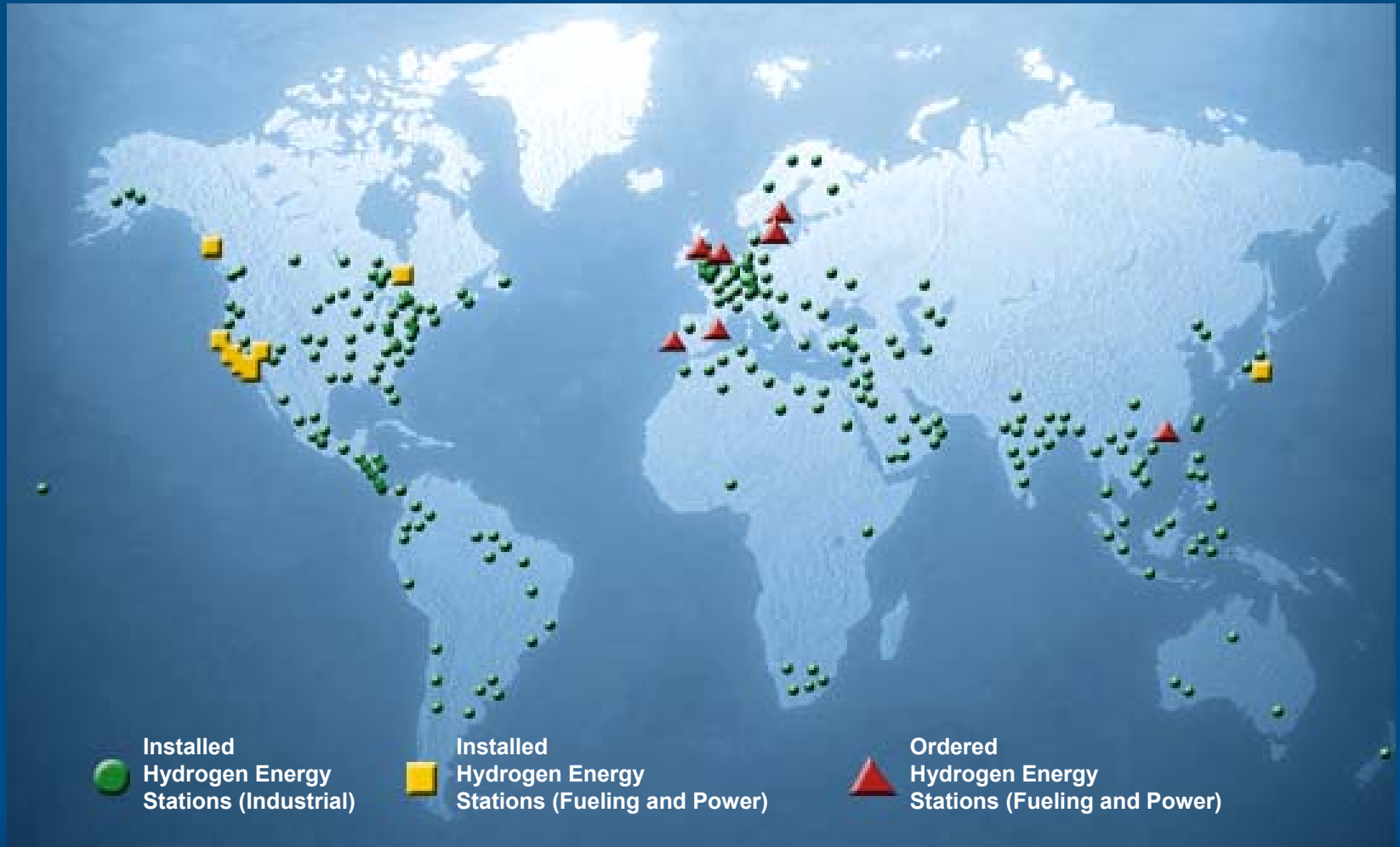
# Stuart Energy Overview

- Pioneered water electrolysis hydrogen generation technology and infrastructure concept in 1905
- Founded Company in Toronto in 1948
- Created world's first solar-powered hydrogen fuel station in California in 1995
- Built world's first commercial hydrogen fuel station in 1998 for Vancouver's Ballard fuel cell bus project
- Raised \$150M in IPO on TSX in 2000 – ticker symbol HHO

# Stuart Energy Overview

- Formed Stuart Energy-Cheung Kong Infrastructure (CKI) joint venture company in Hong Kong in 2001
- Introduced new Hydrogen Energy Station product line in 2002
- Completed \$42M acquisition of Belgian electrolysis company Vandenberg Technologies in 2003
- Offices in Canada, United States, Belgium, Hong Kong, China and India
- Install base of 1,100 systems in 100 countries

# Global Install Base



# Strategic Partners

- Product and market development partners:
  - CKI for Asia Pacific hydrogen infrastructure
  - Ford for transportation and distributed power products
  - United Technologies for PEM electrolysis
  - Toyota for transportation products
  - World's largest merchant gas companies for global industrial markets



# Convergence of Opportunities

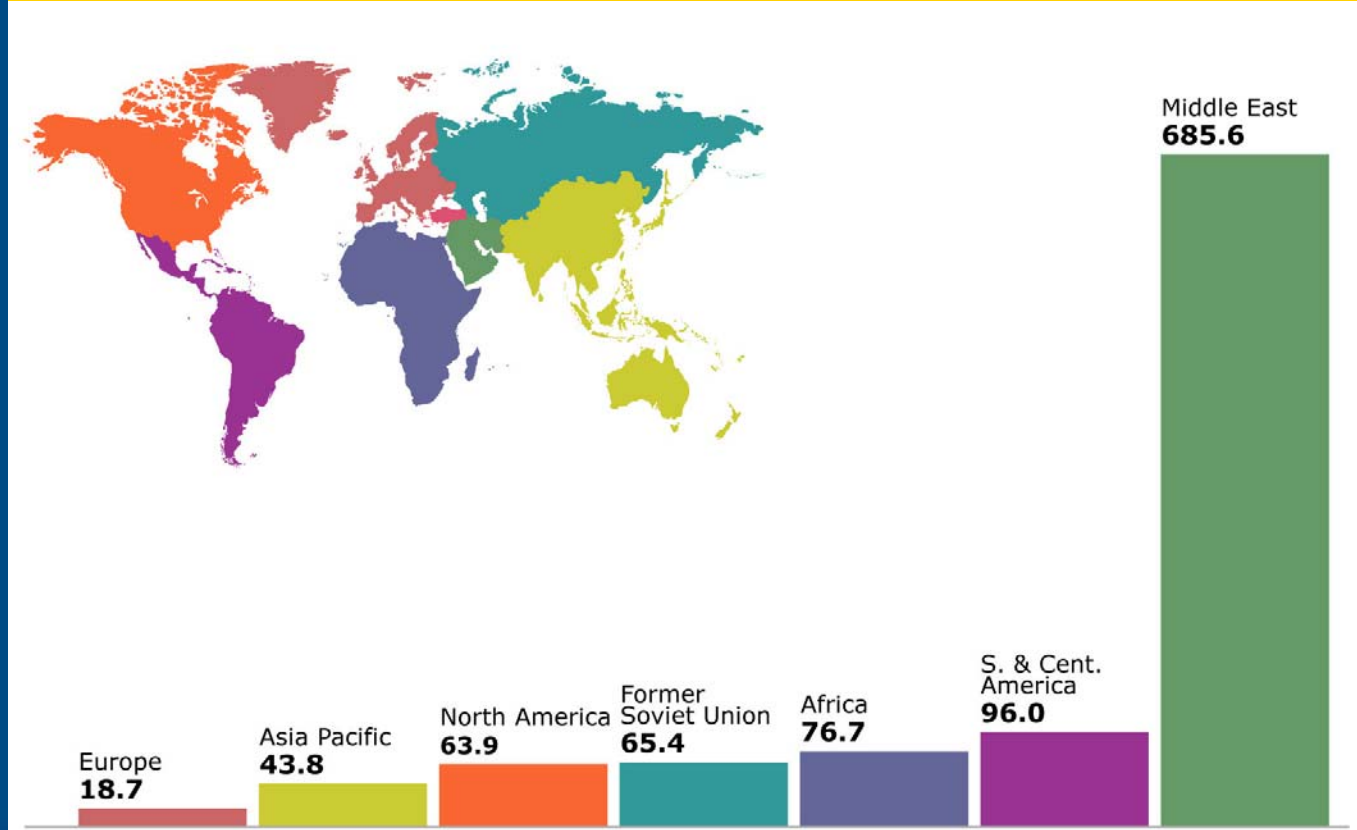
- Global Drivers
  - Energy security
  - Climate change
  - Air quality
  - Consensus: Hydrogen is energy “end game”
- Stuart Energy
  - Viable mission & strategy
  - Strategic partnerships
  - Trusted brand & products
  - Global market leader
  - Strong IP position





# Energy Security Drivers

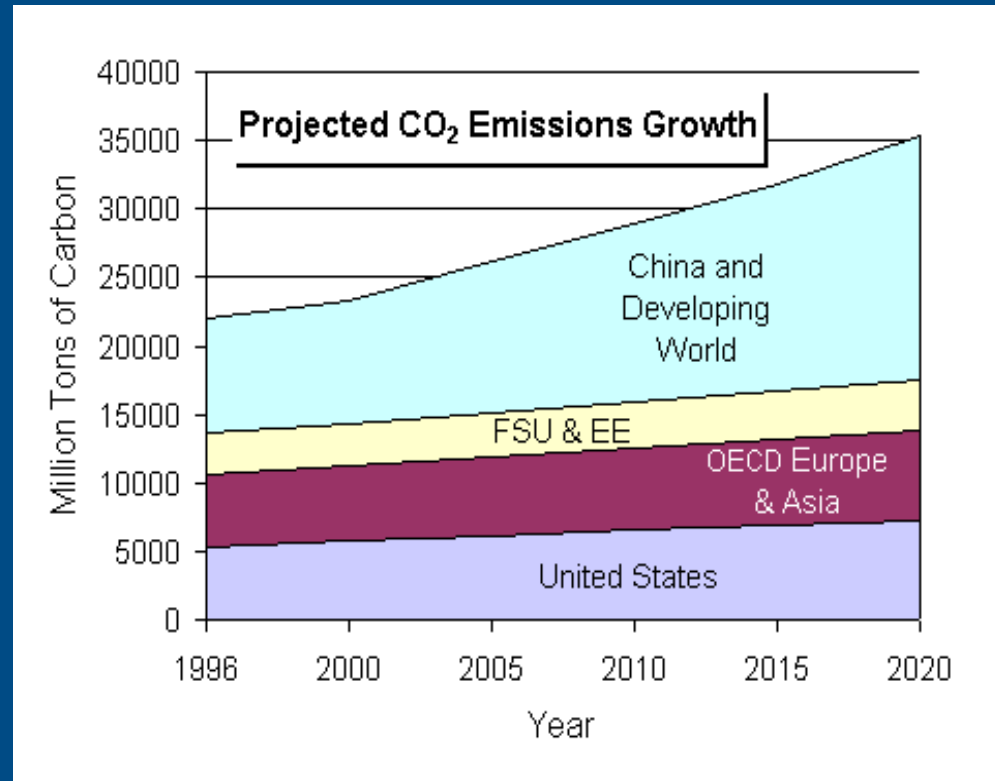
Proved oil reserves at end 2001  
(Thousand million barrels)



Source: BP Statistical Review of World Energy 2002

# Climate Change

- Global issue – over 100 countries have ratified Kyoto Accord
- Carbon dioxide accounts for over 82% of global Green House Gas emissions
- Transportation is major source of CO<sub>2</sub> emissions



Source: U.S. EPA

# Air Pollution

- Air pollution and urban smog in major cities worldwide
- Transportation emissions single largest contributing factor



# HES Value Proposition

- Our Hydrogen Energy Station (HES) enables a paradigm shift in energy production, distribution and consumption:
  - HES is a fully-integrated, turn-key solution
  - Hydrogen infrastructure solutions transform low value electricity into stored, high value energy for on-demand use
  - HES product portfolio creates scalable, distributed solutions for industrial gas, vehicle fuel and power generation applications
  - Solutions specifically address the triple threat of energy security, climate change and air pollution
- Solves the “Chicken and Egg” infrastructure dilemma

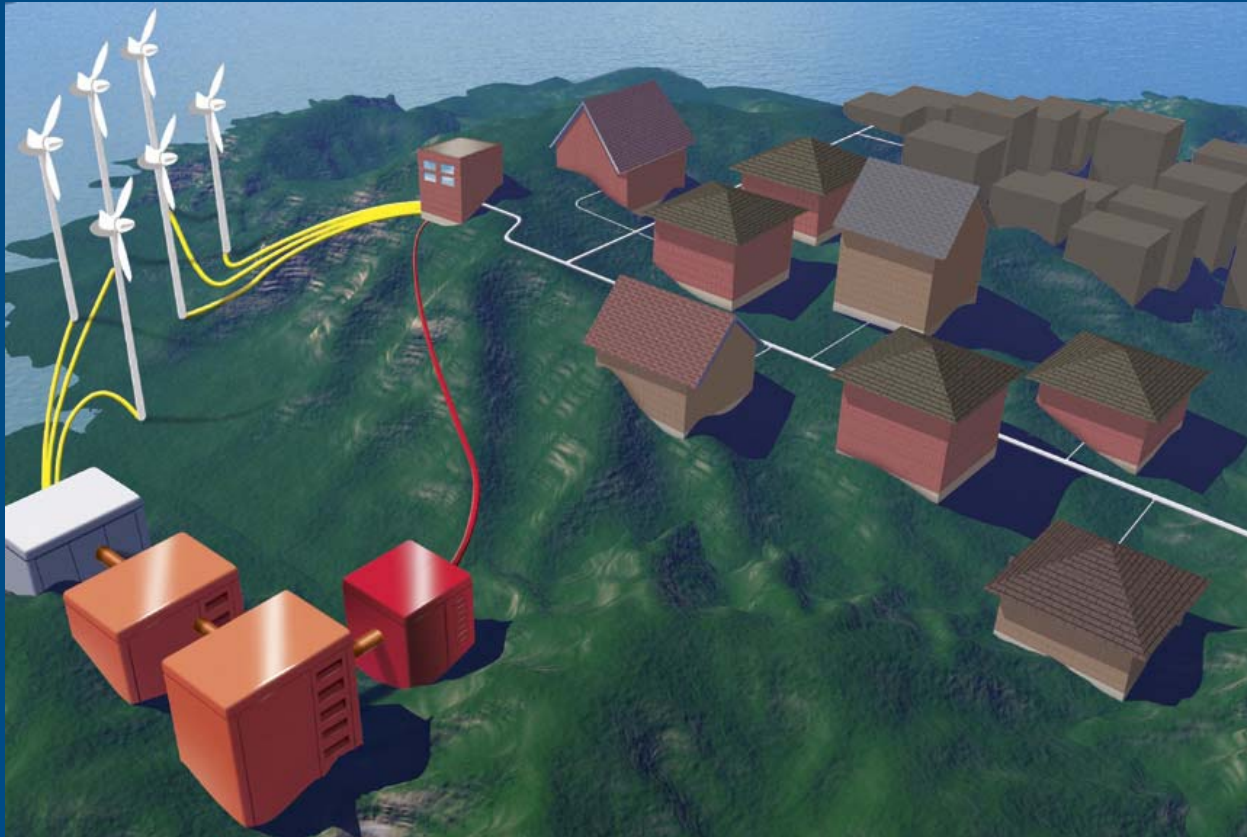


## Our Vision:

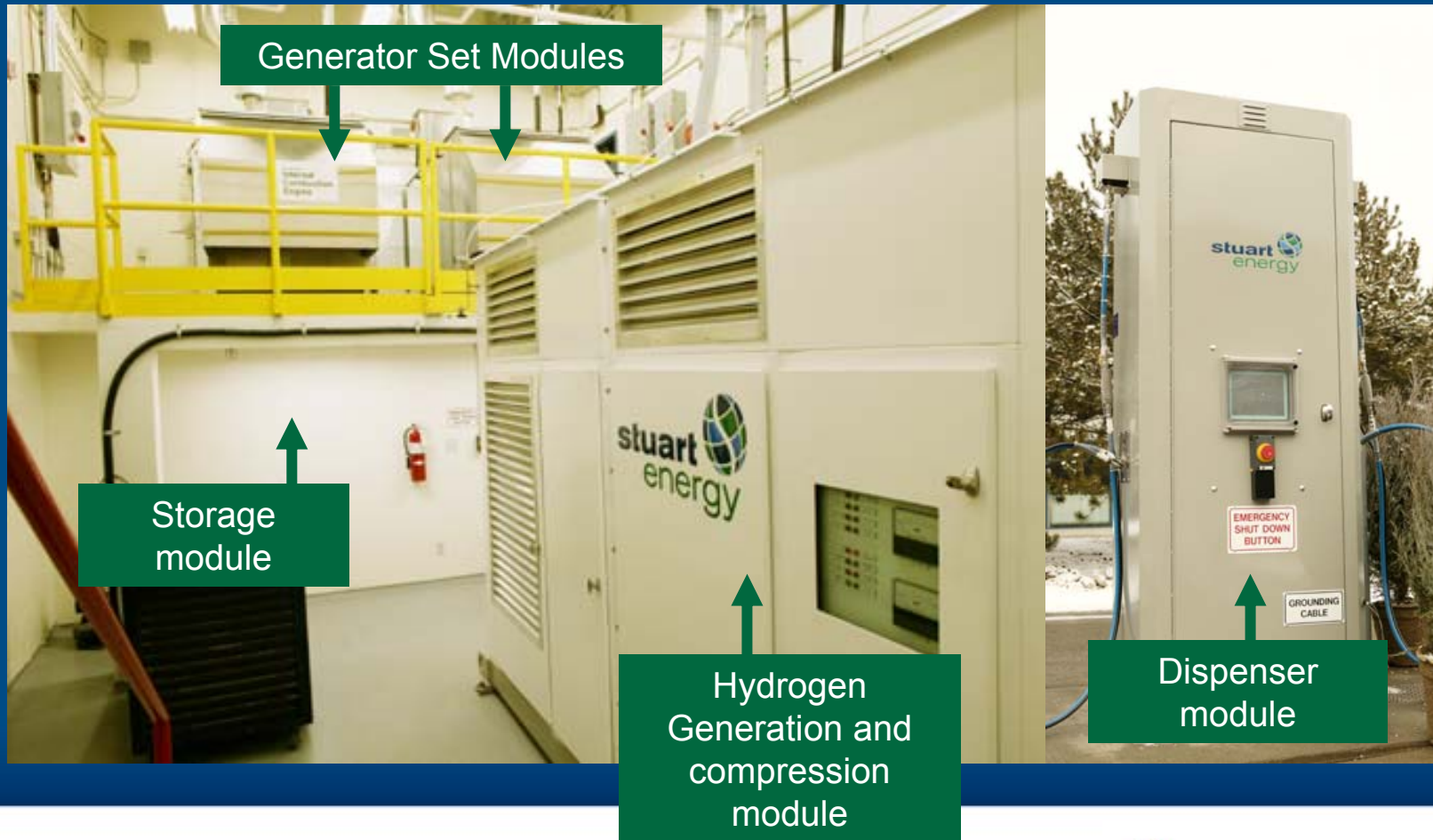
To create the world's leading distributed network of integrated hydrogen generation, storage, fueling and power solutions.



# Optimizing Wind Power



# HES: Turn-Key Solution



# Stations Delivered Worldwide





# Upcoming Stations



# HES Wind-Hydrogen Model

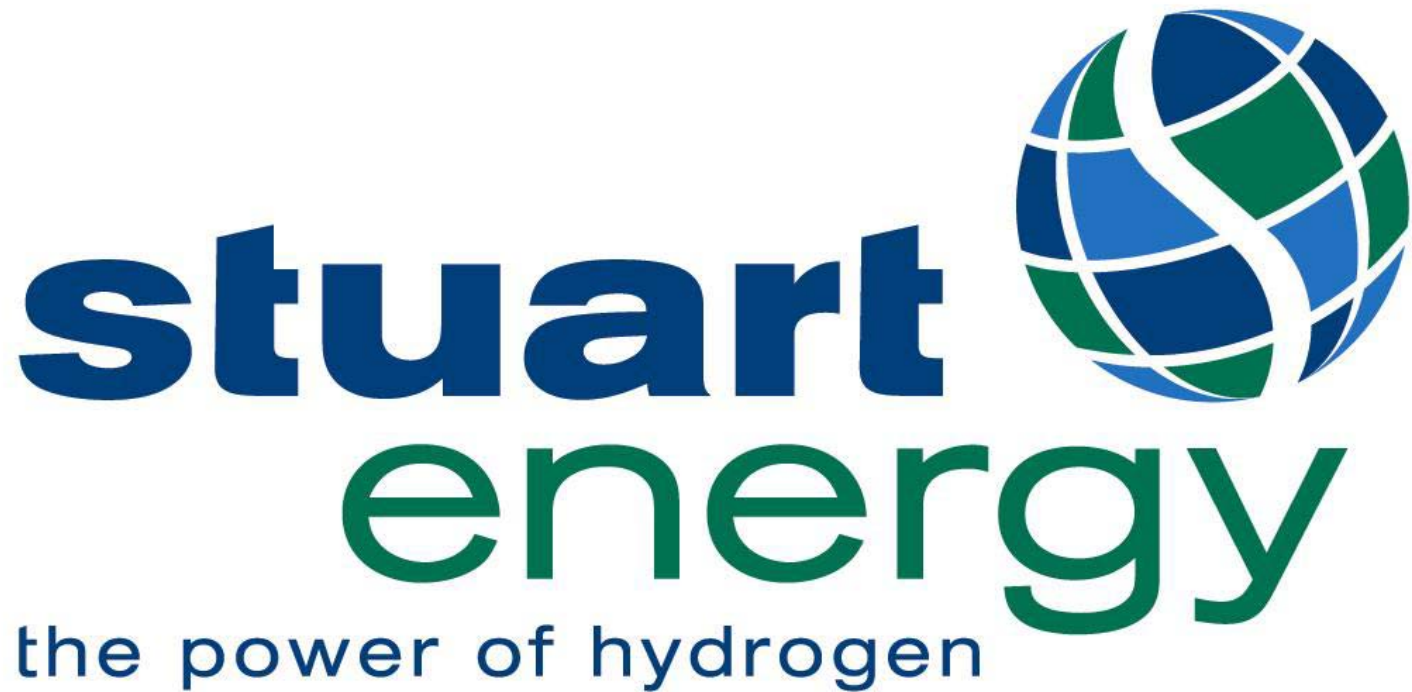


# PEI Wind-Hydrogen Economy



# PEI Wind-Hydrogen Economy

- Benefits for PEI:
  - Energy self-sufficiency
  - Reduced GHG emissions
  - Promote economic development



**stuart**

**energy**

the power of hydrogen