Advances in Chemical Hydride Based PEM Fuel Cells for Portable Power Applications

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Who Is Jadoo Power

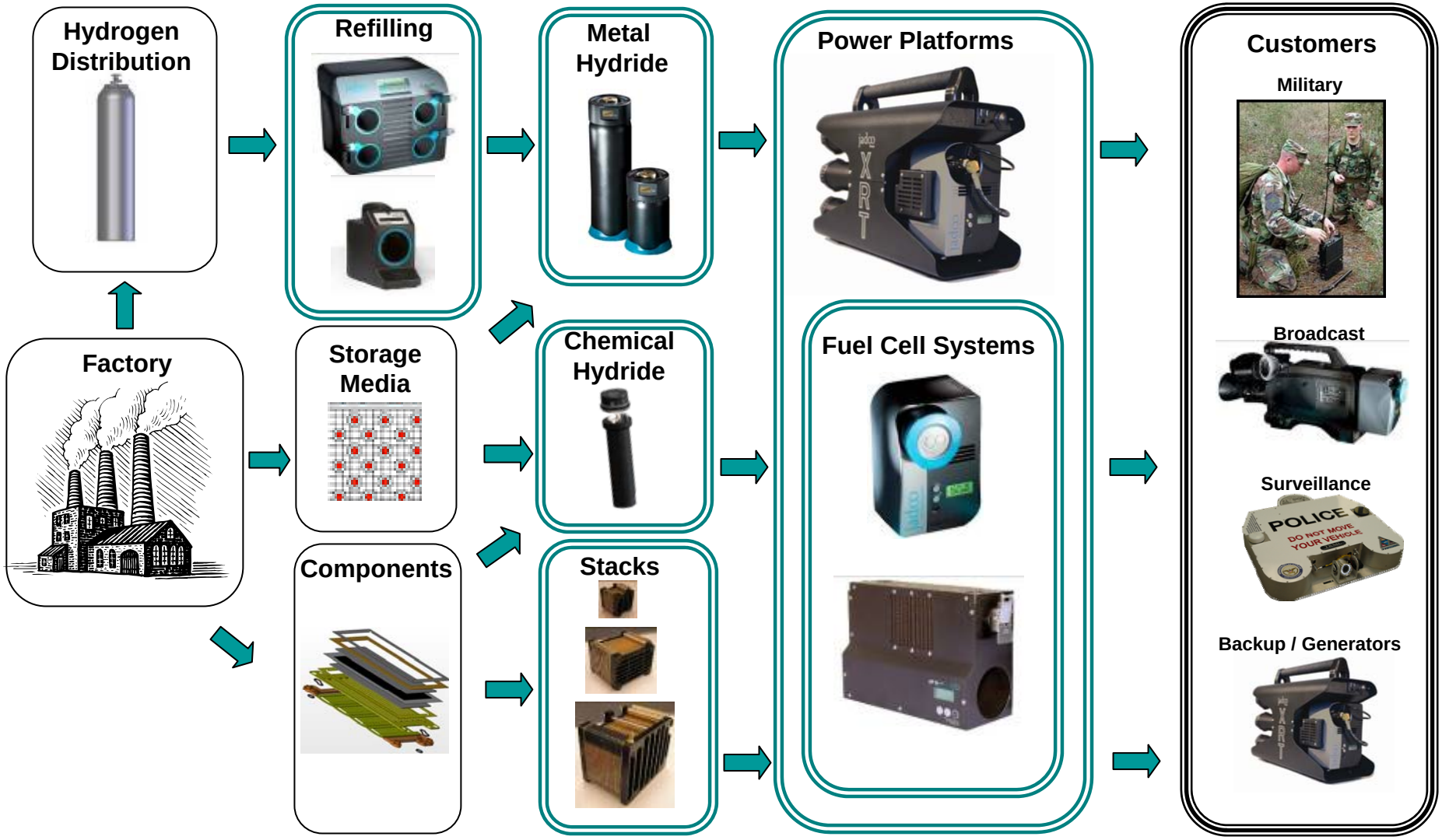
- **#1 Fuel Cell Systems Integrator**
  - Complete Portable Power Solutions Commercially Available
  - Market Focus: 20 to 5kW
  - 75,000 hours cumulative runtime over 100's of systems
- **Private Company**
  - Founded November 2001
  - Folsom CA
  - 32 Employees
- **Twenty Six Patent Applications**
- **Investors:**

VENROCK ASSOCIATES

MDV MOHR, DAVIDOW VENTURES

SBG SINCLAIR VENTURES

Customers Buy Complete Solutions



Published Pricing

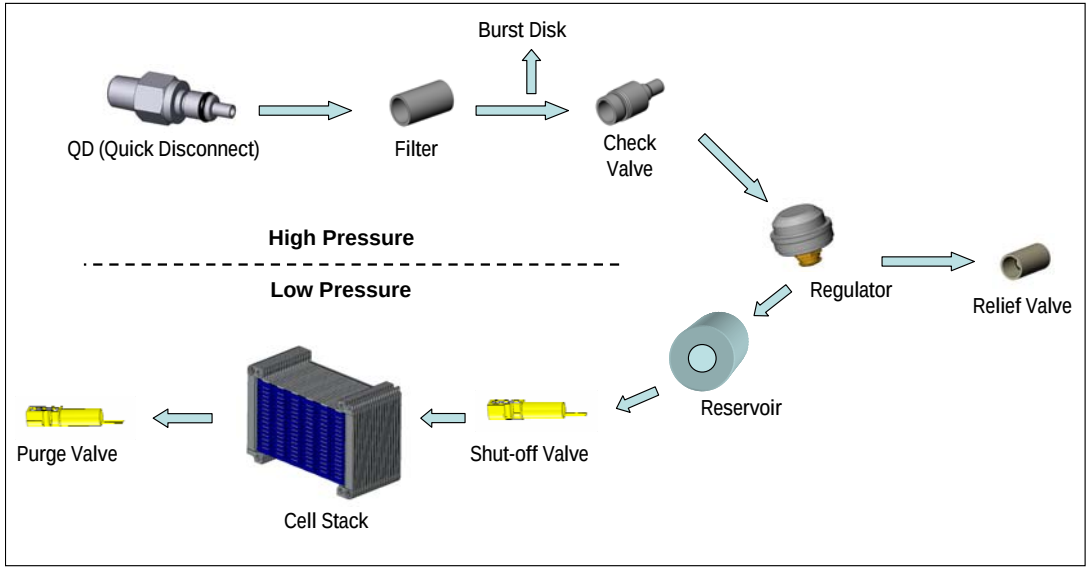
- Fuel Canister (N-Stor130 / N-Stor360) $449 - $849
- Fuel Cell Power Unit (N-Gen) (100W) $999
- Refill Stations (FillOne / FillPoint) $599 - $1,799
- Runtime Extension (XRT) $1,999
- Cables and Accessories $79

Available on website TODAY!

>>BUY NOW!

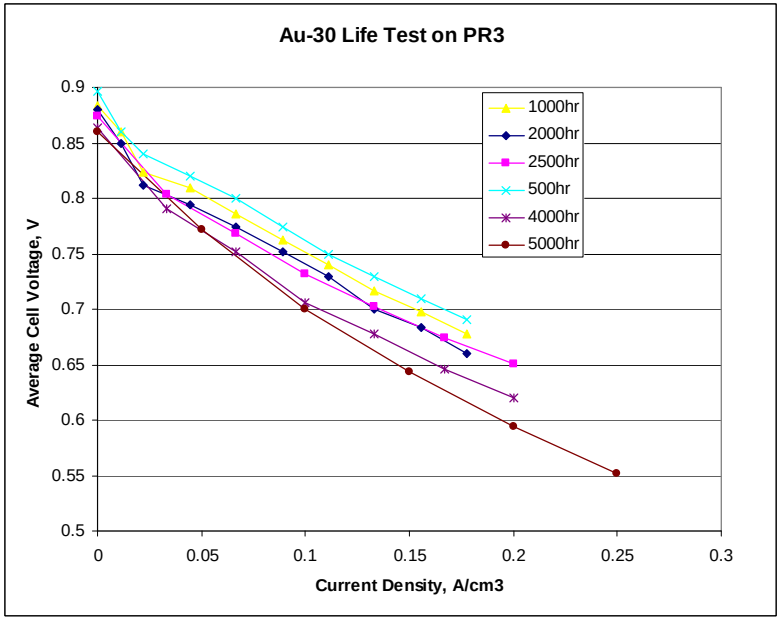
Jadoo Fuel Cell Architecture

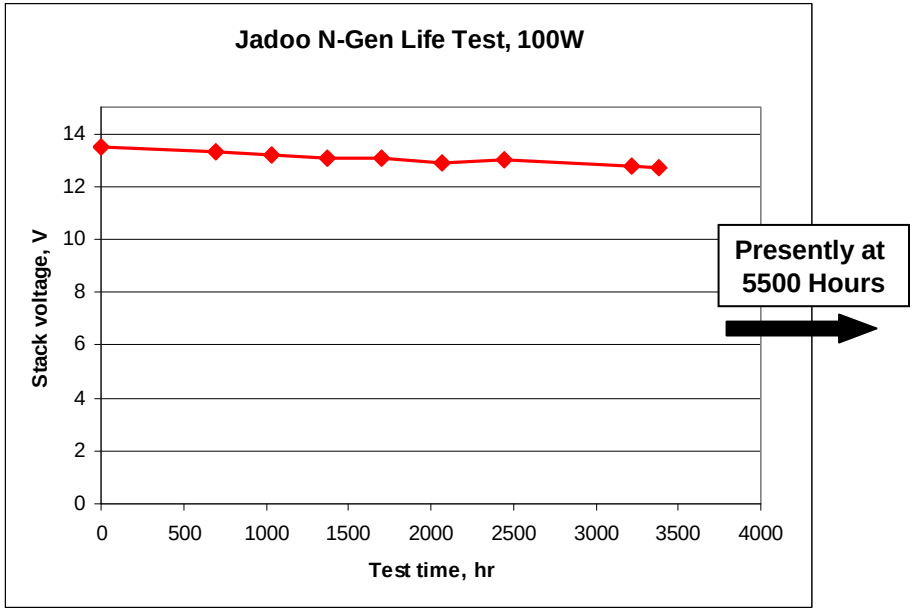
- **Approach: Dead-Ended Anode With Open Cathode**
- **Core Fuel Cell Components: Stack, Fan, Regulator**
- **Key Challenge: Stack Dry-out At High Temperatures**
  - Solution: Passive Self-humidification Structures



Jadoo Stack Performance and Design

- **>7,000 startup/shutdown cycles**
- **>5,000 hrs of life in continuous power tests.**
  - Voltage decay rate <10 uV/hr/cell.
- **>10,000 vacuum/pressure cycles**





The Hydrogen Economy of Portable Systems

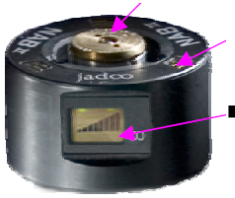
	Metal Hydride	Sodium Borohydride	Ammonia Borane
Supplier/Partner	Ovonics	Millennium Cell	General Atomics
Energy (5lb / 2.27kg of fuel + packaging)	400 W-hr	>1360 W-hr	>2270 W-hr
Energy Density	150 W-hr/kg	>600 W-hr/kg	>1000 W-hr/kg
Availability	Now	2008	2009
Status	Production	Functional Prototypes	Laboratory Development
			

Standardized Interfaces Provides Customer Options

Metal hydride

Chemical hydride

Ammonia Borane



N Stor Interface

N Stor interface provides universal connectivity to multiple fuel options through standardized connection of power, data and fluids

Analogous to USB interface provides universal connectivity to multiple wireless communications options through standardized connection of power and data

Blue tooth

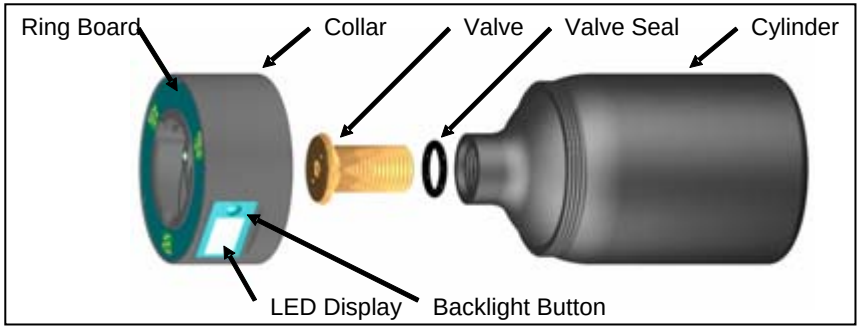
3G Cellular Modem

Wireless Adapter

USB Interface

Metal Hydride Canisters

- **Unqiue Achievements**
  - Only state-of-fill solution for portable hydrogen/fuel storage
  - Only Department of Transportation air cargo exempt hydrogen canister
  - >10,000 Cycles
  - -55 to 150°F

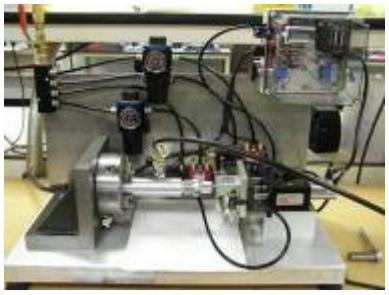


Ballistics

Thermal

Drop

Cycling



Bonfire

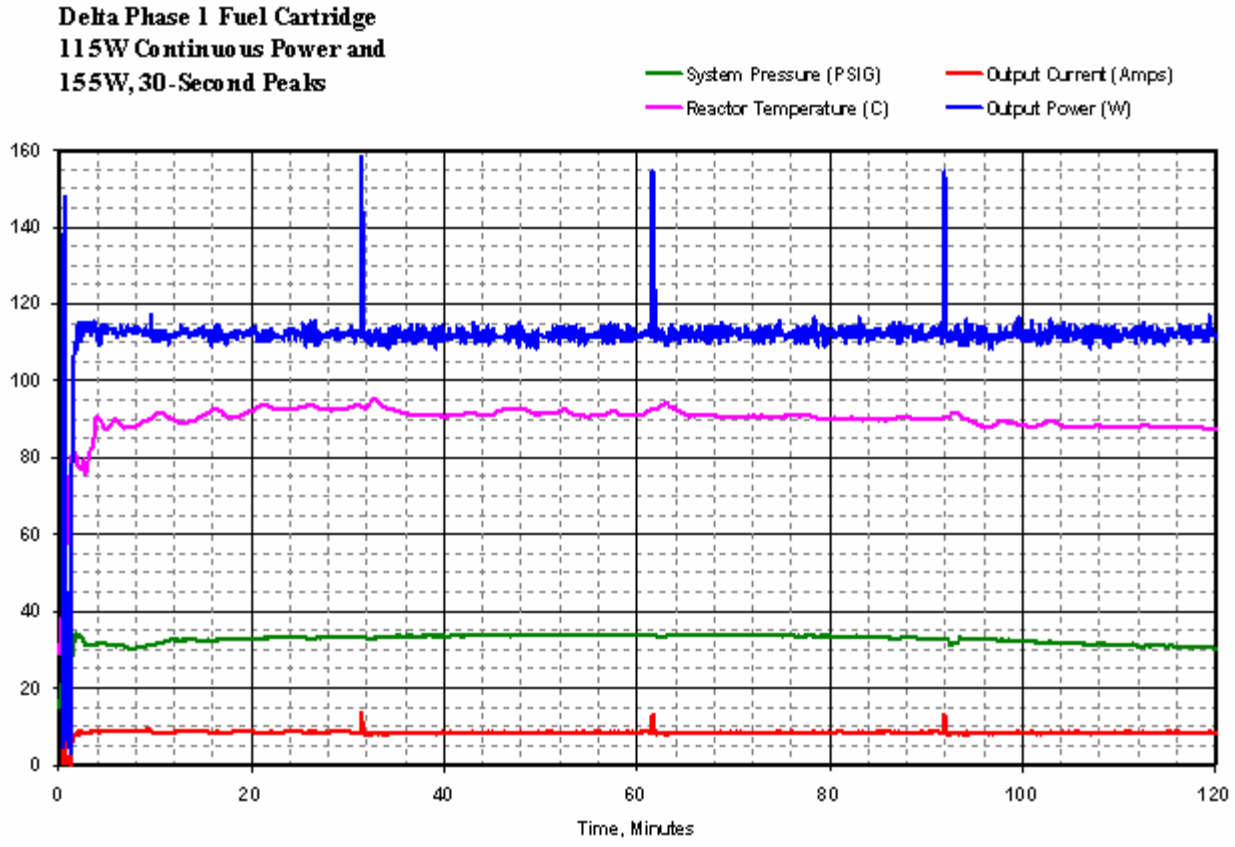
Sodium Borohydride Development Activities

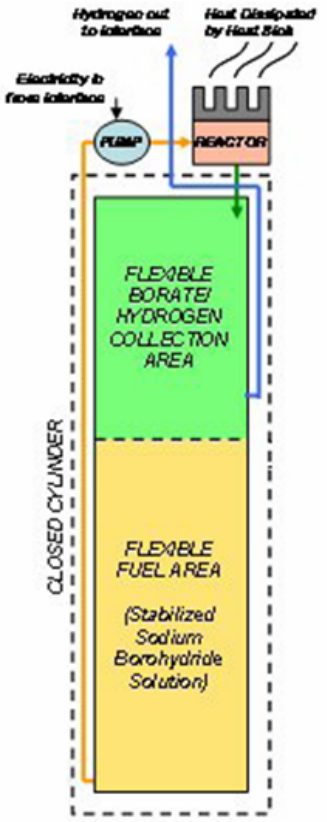
- **Direct Metal Hydride Replacement**
  - Funded by Jadoo, Millennium Cell, and Kuchera Defense Systems
  - 100 W Continuous
  - >300 Whrs
  - >300 Whrs/kg
  - Commercial Evaluation Program 2008

- **Custom System for 300W Aeromedical Evacuation**
  - Funded by Air Force Research Lab
  - 300W Continuous
  - >3600 Whrs
  - >600 Whrs/kg
  - Demonstration 2007

Sodium Borohydride

- >100W Capability Demonstrated
- Orientation Independent
- Auto-Starting
- Full Power Available in ~15 Seconds

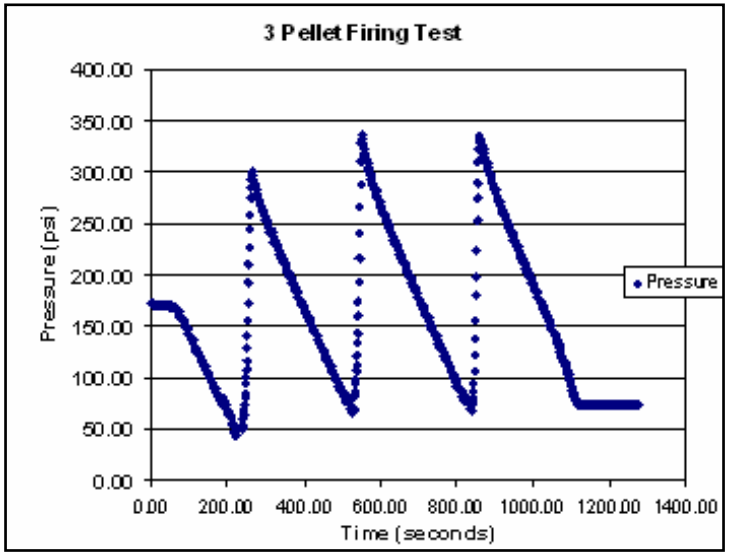




Ammonia Borane

Core Attributes

- **Pellet Based Ammonia Borane**
- **12-14% Hydrogen Well Demonstrated**
- **System Packaging Under Development**



Significant Opportunity for Hydrogen Storage Options

Surveillance Robotics

Un-manned Aerial Vehicle

Military Communications

Professional Broadcast