



January 12, 2011

Business and Capabilities Presentation
Hydrogen Fuel Cell Technologies, Scientific , Leadership Capabilities
Renewable Energy and Hydrogen Supply Chain Integration – The Answer



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The Current Energy Market Place – The Headlines are Everywhere

“CLEVELAND - A gasoline industry analyst is predicting a 20-cent hike in gasoline prices”

“Barring a major war or natural catastrophe, the average price of gasoline for 2011 probably would range between \$3 and \$3.30, according to analysts and traders.”

“OPEC targeting \$100/barrel oil as OPEC oil ministers gathered last week for a meeting in Cairo, 2011 may see oil challenge the \$148/barrel all-time high reached in July 2008.”

“Something is happening internationally that has gone almost unnoticed in the American market - electricity prices in certain regions are increasing... and fast.”

Federal Mandates, Stake Holder Pressures, and Grass Roots Movements

“Washington, DC – President Obama announced today that the Federal Government will reduce greenhouse gas pollution from indirect sources, such as employee travel and commuting, by 13% by 2020. This commitment expands beyond the Administration’s greenhouse gas reduction target from direct sources set in January, 2010, such as Federal fleets and buildings, by 2020.”

“Pennsylvania has signed a letter of agreement with 10 other eastern states to reduce greenhouse gas emissions. Vehicles using low carbon transport fuels include cars powered by hydrogen fuel cells; electric cars such as plug-in hybrids; cars fueled with ethanol, especially cellulosic ethanol made from non-food plant materials; and cars fueled with biodiesel.”



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The Market Opportunity

- Hydrogen and Hydrogen Fuel Cell Technology combined with Renewable Energy
 - Not new technology – a new approach to supply chain integration of the technologies.
- Rising fuel and energy costs make viable fuel cell integration.
- Hydrogen as battery storage coupled with innovations in high efficiency Lithium battery storage extend renewable energy and grid capacity.
- Investor supported ESP contracts provide a vehicle for hydrogen fuel cell integration with ROI potential.
- Grant dollars and venture capital funds are active for fuel cell technology development, improvement, and common market integration.

Hydrogen Fuel Cell Expertise and Leadership

- Mike Strizki
 - Personal Accomplishments and Credentials working with hydrogen fuel cell technologies.
 - Past Project Profiles integrating hydrogen into common industry.
 - Proto type hydrogen fuel technologies currently operating and/or designed.



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The Opportunity is **Now!**



Every Day Capacity
Hydrogen Residential
Scale Fuel, Heat, Electricity



Every Day Capacity
Utility and Grid
Storage Capacity



The Hydra
Perpetual Power, Fuel,
And Water – Disaster Recovery



Transportation
Fossil
Fuel Intensive Transportation



Fuel
Fuel Stations for GHG
Reduction



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Hydrogen Fuel Cell Development and Supply Chain Expertise and Leadership

- Mike Strizki
 - **Credentials Working with Hydrogen Fuel Cell Technologies**
 - 2000 Presidents Award for the Environment – Private presentation for George W. Bush.
 - 2000 Engineering Excellence Award
 - First Fuel Cell Vehicle Produced
 - World Record Holder – Alternative Vehicle – 470 Miles in Single Charge.
 - Personally has Constructed the Most Fuel Cell Vehicles in the World
 - 2010 South Carolina 2nd Place – Fuel Cell Challenge
 - Constructed Fuel Cell Vehicles for Every Major Auto Manufacturing Organization in the World
 - Currently Holds 8 Patents



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Every Day Capacity
Hydrogen Residential
Scale Fuel, Heat, Electricity

Hydrogen Home Energy Specifications

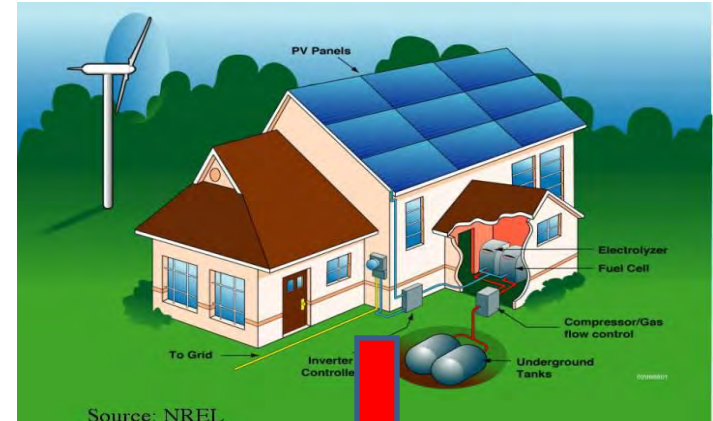
Solar PV	10 kW
Daily Output	50 kWh Summer 30 kWh Winter
Battery Storage	6 kWh – Lead Acid
Electrolyzer	5 kW input – 40 cu. ft./hr.
Hydrogen Storage	19,000 cu.ft. @ 200 psi
Fuel Cell	5 kW output

The Asbury Press 2-18-07

"This is disruptive stuff: not having an electric service, not having a fuel delivery, never going to a gas station . . . never changing oil," said Strizki, an engineer. "That's pretty disruptive . . . to American business" because it is built on repeat business.

After Strizki's 4 1/2-year fight to get permits, his home was dedicated on Oct. 20, when all of its systems were turned on. Now he and Renewable Energy International Inc., a company he co-founded, are seeking financial backing to be able to mass produce the hydrogen system.

"I overcame the hardest obstacle, which was getting through the permitting process," said Strizki, chief technology officer of REI.



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The Hydra
Perpetual Power, Fuel,
And Water – Disaster Recovery



Customers' needs (prioritized)	The Essential Element's capabilities
Operating Cost	Lowest cost per gallon
Power Consumption	Low power consumption, Self powered
Power Generation	Highest electricity generated per area
Water Purity	Meets Stringent Standards (EPA, NSF)
Water Volume	Scaleable, 20,000 Gallons Base Unit
Maintenance	Modular sub components
Reliability	Each component field tested
Ease of Use	User Friendly Design, set up in 20 minutes
Portability – Size & Weight	Easy to transport

Table 1 Summary : The Essential Element's Capabilities to Meet Customers' Needs



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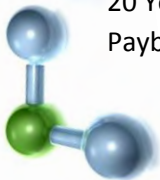


Fuel
Fuel Stations for GHG
Reduction

Fuel Cell Car Filling Station Economics Using Commercial 750 kW H₂ + O₂ Electrolyzer

Estimated Capital Cost	\$2,000,000
KiloWatts Electricity Consumed	750
Cost @ .07 c/kW-Hr	\$413,910.00
Operations and Maintenance	\$117,000.00
Net Cost of Capital	\$180,541.00
Annual Revenues H ₂ + O ₂	\$1,542,670.00
Annual Costs	<u>\$711,451.00</u>
Annual Net Revenues	\$813,219.00

20 Year IRR	39%
Payback	3 Years



**UNLV Hydrogen Fueling Station
Las Vegas, NV**



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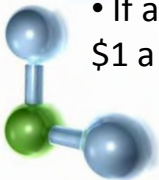


Transportation
Fossil
Fuel Intensive Transportation

How much will Hydrogen fuel cost?

The U.S. Department of Energy's Hydrogen, Fuel Cells & Infrastructure Technologies Program is working to achieve the following goals:

- By 2005, the technology will be available to produce hydrogen at the pump for \$3.00 per gallon gasoline equivalent, and DOE wants to validate this technology by 2008.
- By 2010, the price goal is \$1.50 per gallon of gasoline equivalent (untaxed) at the station.
- Even \$3 a gallon would save most of us money, since FCVs will be two to three times more efficient than internal combustion engine (ICE) vehicles.
- If all the goals are met, FCVs offer the promise of energy at \$1 a gallon - or less!



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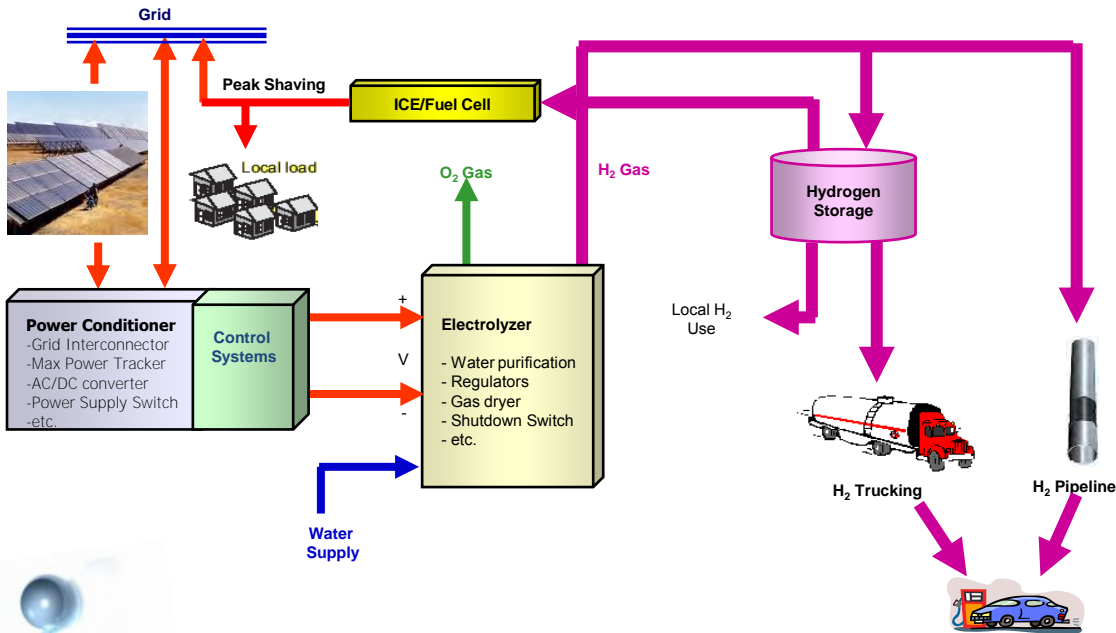
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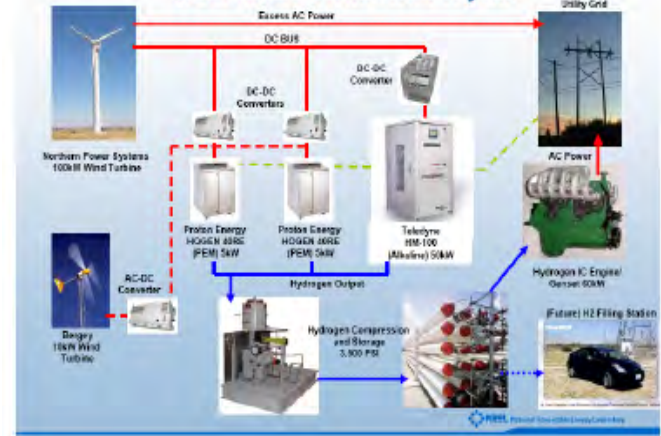
The Opportunity is **Now!**



Every Day Capacity
Utility and Grid
Storage Capacity



Technical Accomplishments
Xcel-NREL Wind2H2 Project



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The Opportunity is **Now – The Supply Chain Integrators are Present – The Market is Prime**



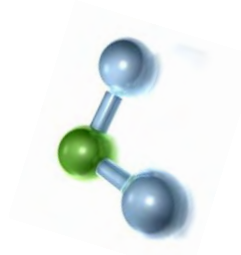
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Teaming Partnerships, Funding Sources, Business Plans, & Investment Opportunities

- Townsend Capital – 2008 Focus on the Emerging Energy Sector
 - Presentation Teams Innovative and Proven Hydrogen Supply Chain Integration Offer an Early Opportunity in an Emerging Market – Opportunity to Gain Market Share and Brand Recognition.
- Kokam – Developing Advanced Battery and Power Technologies
 - Presentation Team Provides Complementary Hydrogen Technologies Proven Effective with Electric, Battery, and other Power and/or Power Storage Devices.
 - Presentation Team Offer Potential to Integrate New Strategic Business Units and Complementary Product Lines for 1000's of Power and Energy Consuming Equipment.
- Dow Kokam and Townsend Advanced Energy
 - Presentation Team Provides Opportunity to Integrate Patented Hydrogen Technologies with Traditional Product, Service, and Energy Supply Chains from Residential Scale to Utility Grade Distributed Energy.

“Fuel cell technology and renewable energy is not new science. The technology is available, off the shelf...the problem is no one has put the supply chain together and driven toward an economy of scale. This technology is disruptive. It changes our concept of energy, power, and dependence. A small price to pay for our next generations and their clean and assured future”.



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Current Federal Grant Opportunities

- Research and Development of Fuel Cells for Stationary and Transportation Applications
 - DE-FOA-0000360
 - Application Due Date – 3-3-11
 - \$65 M Available
- Fuel Cell and Hydrogen Storage System Cost Analysis Funding Opportunity
 - DE-FOA-0000420
 - Application Due Date – 2-18-11
 - \$ 9 M Available
- FY 2011 Vehicle Technologies Program Wide Funding Opportunity Announcement
 - DE-FOA-0000239
 - Application Due Date – 2-28-11
 - \$184 M Available
 - ***Program Exact Synergy Between Presentation Team, Townsend Advanced Energy, and Kokam***



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Tribal Opportunities – Will be disclosed upon administration of proper agreements.

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Federal Market Opportunities

Application Area	Electrolyzer Requirements
Hydrogen Fueling <ul style="list-style-type: none"> • Clandestine combat vehicles • Electric utility vehicles • Fuel canisters for portable 	<ul style="list-style-type: none"> • High output (>100 kg/day?) • High pressure desirable • Renewable interface option
Backup Power / RE Storage <ul style="list-style-type: none"> • Tent City microgrid • Remote sensors • Critical backup 	<ul style="list-style-type: none"> • High pressure • High conversion efficiency • High reliability • Low maintenance
Air Independent Energy Storage <ul style="list-style-type: none"> • Space and high altitude • Underwater systems 	<ul style="list-style-type: none"> • Lightweight and/or low volume • May need very high pressure • Very high reliability
Life Support (O2 generation) <ul style="list-style-type: none"> • SSN submarines • Manned space platforms 	<ul style="list-style-type: none"> • Very tight leakage allowances • Highest reliability

- *Executive Orders*
- *GHG Reduction Requirements*
- *Minimize Dependence on Foreign Oil*
- *Reduce Energy Consumption*
- *Micro Surety Grid Requirements*



**United States
Merchant Marine Academy**

**“America’s First
Solar Hydrogen Home”**



**Energy Secretary Bodman
views the hydrogen energy
storage system**



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Conclusion

“Hydrogen is the enabling technology for Independent energy storage, renewable fuel production, and off-grid backup power systems.”

“Fuel cell electric generation is clean, with Little or no air emissions.”

“Once the hydrogen system is complete, generation and storage equipment life cycles are significantly longer than other energy storage technologies.”

