

# Florida's Hydrogen Program

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## State of Florida Governor Jeb Bush

Fuel Cell Summit, Miami, Florida

Presented by Allan Bedwell  
State of Florida

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# Florida's Hydrogen Vision

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*“Florida is one of just a handful of states making a significant commitment to this cutting-edge ‘next generation’ energy technology. Today’s investment in pollution-free hydrogen technology will guarantee a stronger, healthier environment and economy for future generations.”*

Governor Jeb Bush



# Florida's Hydrogen Goals

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- Demonstrate & Commercialize Hydrogen Energy Technologies
- Establish Public-Private Partnerships
- Recruit and Support Hydrogen Technology Companies in Florida
- Demonstrate New Business Models for Corporate Revenue and Profit
- Diversify Florida's Economy
- Increase Energy Security & Independence
- Keep Florida's Air Clean



# Florida's Hydrogen Program

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## Objectives

- Provide risk capital for select projects
- Provide financial incentives for companies to test, demonstrate and commercialize hydrogen technologies
- Provide non-regulatory environment for hydrogen technology testing & demonstration projects



# Areas of Focus for Hydrogen

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- **Fuel Cells**
  - Mobile Fleets, Stationary & Integrated Systems
- **Internal Combustion Engines**
  - Mobile Fleets
- **Fueling for Fuel Cells & IC Engines**
  - Photovoltaic Electrolysis and Natural Gas Reforming
- **Storage**
  - Mobile and Stationary; Gaseous & Solid State
- **Grid Optimization**
  - Generation, Storage & Redistribution



# Areas of Focus for Hydrogen

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## Technical Goals:

- Reduce material costs;
- Increase durability of systems;
- Increase the efficiency of hydrogen production;
- Increase storage and range;
- Improve integration with existing power delivery systems; and
- Minimize “well to wheel” environmental emissions.



# Current Hydrogen Projects

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- **Ford Motor Company, BP America and Progress Energy**  
Hydrogen Fuel Cell Fleet Automobiles & Fueling (PV/NG)
- **Commercial Fleet**  
Hydrogen IC Engine-Powered Delivery Vehicles & Fueling (PV)
- **Airport Ground Support Vehicle Fleet**  
Hydrogen IC Engine-Powered Vehicles & Fueling (PV)
- **University of Miami and Florida Power & Light**  
Residential Complex - 5 kW PEM Fuel Cell (NG)
- **Tyndall Air Force Base**  
3-5 Stationary PEM Fuel Cells (NG)



# Current Hydrogen Projects (cont)

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- **North Port High School and Florida Power & Light**  
5kW-20kW PEM Fuel Cell (PV/NG)  
Nation's 1<sup>st</sup> H<sub>2</sub> Education Site
- **Hugh Taylor Birch State Park and Florida Power & Light**  
Visitor Center - 5 kW PEM Fuel Cell (PV/NG)
- **WCI Communities, Inc.'s Venetian Golf & River Club and Florida Power & Light**  
Electric Golf Cart Charging - 5 kW PEM Fuel Cell (NG)
- **Homosassa State Wildlife Refuge and Progress Energy**  
Wildlife Care Center - 5kW PEM Fuel Cell (PV)



# Phase II Hydrogen Projects

- **Entertainment Park Visitor Bus Fleet**  
Hydrogen-powered IC Engines and fueling station (PV)
- **Grid Optimization – Residential Stationary/Mobile**  
Residential & Mobile Power Generation and Storage integrated with Electrical Grid - 20 home hydrogen systems with 20 hydrogen IC cars (PV)
- **Expansion of Mobile Hydrogen Fueling Stations in Orlando**  
Fuel Cell & IC Engine Fleet applications (PV)
- **Hydrogen Generation from a Clean Coal Power Plant**  
Study of Hydrogen and CO2 capture; Solid Oxide Fuel Cell Study (Syngas)
- **U.S. Military Projects (5 - 8 projects)**  
Mobile and Stationary Fuel Cell & IC Engine Fleet Projects (PV/NG)
- **2<sup>nd</sup> Auto Manufacturer**  
Mobile Fuel Cells (PV)
- **Residential Development**  
Stationary 1MW-2MW SOFC FC (HC)



# Phase III Hydrogen Projects

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- **Expansion of Mobile Hydrogen Fueling Stations in Tampa**
- **2<sup>nd</sup> Entertainment Park Bus Fleet** – IC Engines (PV)
- **Creation of “Hydrogen Highway” between Orlando and Tampa** – Installation of fueling stations on Interstate 4 (PV)
- **30 State Vehicles** – IC Engines – Orlando & Tampa
- **City and County Governments** – Numerous stationary FCs (PV/NG)
- **Creation of the Nation’s first “Hydrogen High School” Program** – 5 high schools in Florida – (PV/NG)
- **Capital Support for Corporate Relocations**



# “One-Stop” Hydrogen Facility Siting

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- Florida will be the first state with one-stop uniform siting for hydrogen infrastructure
- Uniform code/standard that will streamline:
  - fire, safety and building codes
  - siting requirements
  - permitting
- Partners:
  - Tom Gallagher, Chief Financial Officer, State of Florida
  - State Fire Marshal and local fire marshals
  - local government
  - industry



# Hydrogen is a Florida “Target Industry”

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- State of Florida has just designated the Hydrogen Technology Industry as a “Qualified Target Industry” (QTI)
- QTI designation provides tax refunds for companies that create high wage jobs in the hydrogen industry
- The QTI incentive provides tax refunds on corporate:
  - Income,
  - Sales,
  - Ad valorem,
  - Intangible personal property, and
  - Insurance premiums.



# Florida's Corporate Incentives

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## Florida's tax & financial incentives include:

- High Impact Performance Incentives
- Capital Investment Tax Credit
- Economic Development Transportation Funding
- Defense/Homeland Security Industry Incentives
- Quick Response Training Financing
- Enterprise Bond Financing Program



# Florida's Corporate Incentives (cont)

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- NO state personal income tax
- NO corporate franchise tax levied on capital stock
- NO state-level ad valorem taxes
- NO tax on goods-in-transit
- Sales and use tax exemption on electricity used in manufacturing
- Sales and use tax exemption on manufacturing machinery and equipment for new and expanding businesses



# Florida Hydrogen Business Partnership

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Partnership between companies and the State of Florida:

**Mission:** Establish Florida as the center of hydrogen technology commercialization in the Americas.

**Goals:**

- Evaluate Florida's business climate for hydrogen technology leadership;
- Demonstrate the viability of hydrogen technology;
- Explore paths to accelerate the demonstration and commercialization of hydrogen technologies; and
- Stimulate growth and investment in the hydrogen technology sector in Florida.
- Serve as an early market for commercially available hydrogen and fuel cell products.



# Florida Hydrogen Business Partnership

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## Founding Companies

- Air Products
- Apollo Energy
- Ballard Power Systems, Inc.
- ChevronTexaco
- Cummins Westport Innovations
- Walt Disney Corporation
- DynEco Corporation
- FPL Group, Inc.
- Ford Motor Company
- Fuel Cell Energy
- Gulf Power Company
- Hydrogenics, Inc.
- Plug Power
- Praxair
- Progress Energy Florida
- Shell Hydrogen
- Siemens Westinghouse Power Corp.
- Stuart Energy Systems Corporation
- Tampa Electric Company
- Teledyne Technologies, Inc.



# Florida Hydrogen Initiative, Inc.

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The FHI is a non-profit organization launched by Florida Congressman Dave Weldon that links environmental organizations, state universities, state government and the space program:

- **Mission:** Move Florida to the forefront of the nation's hydrogen economy.
- **Goals:**
  - Broker partnerships for applied technology demonstration projects throughout the state;
  - Sponsor targeted research in the production, storage and use of hydrogen fuels;
  - Facilitate technology transfers between the public and private sectors to create, build and strengthen high-growth, high technology companies.



# Hydrogen R&D at Florida Universities

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106 Hydrogen R&D projects are currently underway at Florida universities and colleges.

Six active hydrogen engineering programs at:

- University of Florida
- University of Central Florida
- University of South Florida
- Florida State University
- Florida A&M University
- University of Miami
- Florida International University

20 years of academic hydrogen R&D expertise in catalysis, electrolysis, advanced materials, H<sub>2</sub> production, H<sub>2</sub> compression & storage;



# Hydrogen R&D at Florida Universities

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Florida is in the process of establishing a comprehensive hydrogen R&D consortium that:

- Maximizes cooperative and coordinated academic hydrogen R&D projects in Florida while minimizing duplicative and unproductive competition seen in other states;
- Identifies targeted R&D projects with corporate sponsors; and
- Coordinates government R&D funding requests by academia.



# Contact Information

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