



**Transportation Energy and Space Technology Hub  
(TEST Hub) at NASA Kennedy Space Center -  
Advanced Transit Technology  
Demonstration Projects**

**FESC Workshop – Orlando, FL  
May 21, 2015**

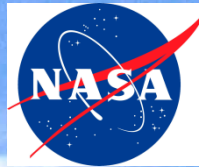


# Proterra Gen2 Fuel Cell Electric Bus at KSC

- Mobile educational and testing platform for Hydrogen or Transit-based technology

## PROPOSED TECHNOLOGY TESTING AND USE

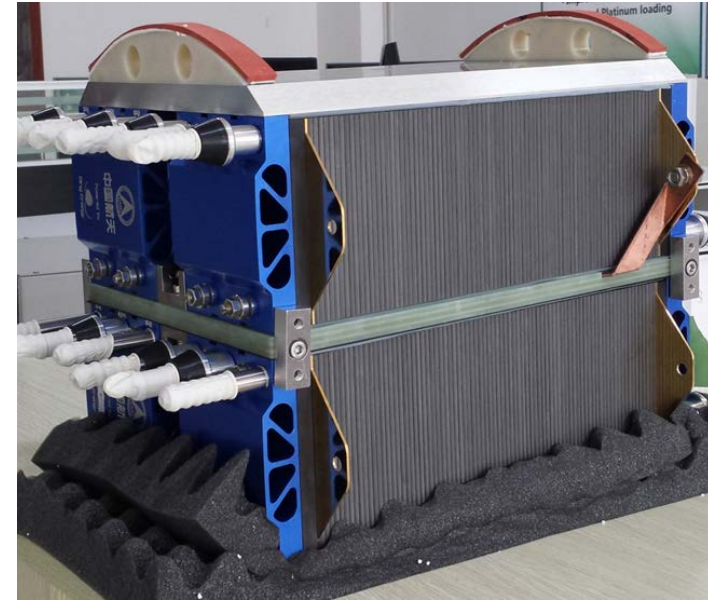
- Energy Generation and H<sub>2</sub> Storage (fuel cells)
- Vehicle to Vehicle Communication
- Inductive Charging and Storage (batteries)
- Transit Safety Technologies



# Dual-Fuel Fuel Cell Development and Demonstration Project

The Transportation, Energy and Space Technology Hub provides pathway to commercialization via a real-world demonstration of Bing Energy's *EnerFuel2* system

- Innovative Hydrogen/Oxygen fuel cell unit
  - High performance, high power density observed in lab results vs. traditional Hydrogen/Air architecture
  - Derived from graphene membrane technology developed at Florida State University
- Leverage NASA experience and expertise in design and evaluation of gas handling systems
- Demonstration of fuel cell's value as a range-extender for battery-electric transit buses
- **Ultimate Goal: Enable Florida-based manufacturing of fuel cell units for transit bus market**

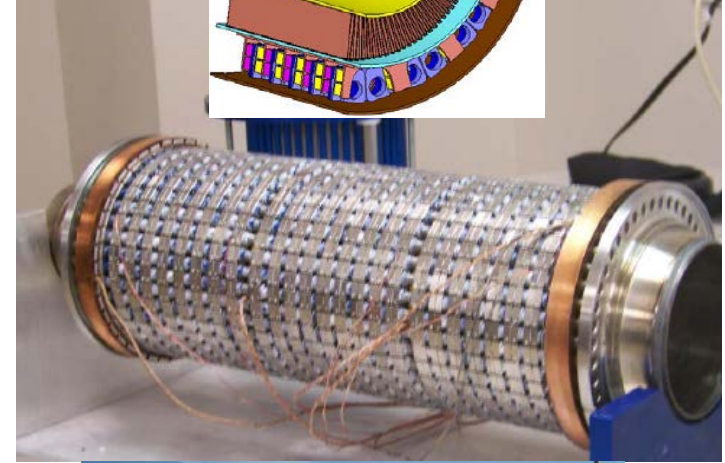
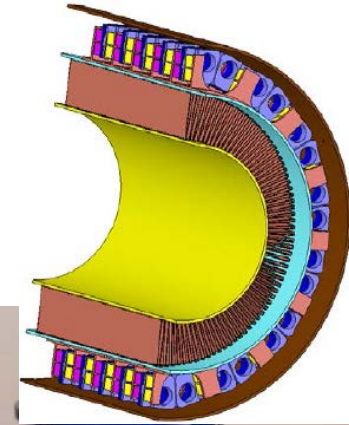


*Funding provided by Space Florida and Florida Dept of Agriculture & Consumer Services' Office of Energy, with match from Bing Energy and in-kind equipment use*



# Thermo-Electric Generation Transit Bus Demonstration

- Develop, install and test a prototype 1kW, 24V Thermal Waste Heat Recovery (TWHR) system on a diesel transit bus donated by LYNX (Greater Orlando transit authority), and monitor system performance in regular transit operations over 6 months
- First application in transit environment
  - TWHR originally developed for spacecraft, adapted for military vehicle (tank/Humvee) and diesel truck applications through research funded by US DoD, Dept of Energy and NSF
- National coalition of partners
  - California (technology), Florida (testing & evaluation), Georgia (coordination)
  - Funding from US Department of Transportation, Federal Transit Administration; match funding from Florida Department of Transportation



# Energy Florida = Technology Partnerships

Energy Florida is the industry-led nonprofit association of businesses and communities gathering resources and developing partnerships to grow Florida's energy sector and related industries

***We are Building Florida's Energy Economy***

For more information:  
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