Fuel Cell Vehicles
Zero Emissions, Zero Compromise

Morry Markowitz, President
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Fuel Cells 101

Fuel cells generate electricity and heat using hydrogen and oxygen to drive an electro-chemical reaction, not combustion – the only byproduct is water.

Fuel Cell Vehicles

Zero Emissions, Zero Compromise

FCVs are the only electric vehicle that replicates today’s drivers experience of traveling 300-400 miles on a single tank and refueling in just three to five minutes, while having zero tailpipe emissions.
Advantages of Fuel Cells and Hydrogen for Transportation

- Zero emissions
- Resilient, reliable, and scalable
- Fuel flexible – operation on conventional or renewable fuels
- Can partner with batteries, solar, wind, and other renewable technologies
- American innovative technology
Automotive Developments

Toyota Mirai FCV
• Began selling and leasing to customers in California in October 2015

Hyundai Tucson Fuel Cell
• Began leasing to customers in Southern California in June 2014
Automotive Developments

Mercedes-Benz B-Class F-Cell

• Daimler FCV Pilot that began in 2010
• Launching GLC Fuel Cell in 2017

Honda Clarity

• Will be sold to customers in the United States in the very near future
Automotive Fuel Cell Collaborations

Toyota / BMW
- Working on joint next-generation FCV platform for 2020

Ford / Nissan-Renault / Daimler
- Jointly Developing a FCV stacks and systems targeting 2017

General Motors / Honda
- Co-developing a next generation fuel cell and hydrogen storage system for 2020 timeframe
Hydrogen Fueling

Hydrogen Fueling

• Pressurized hydrogen is used to fuel FCVs
• Hydrogen can be produced a number of ways, from natural gas to renewables
• Hydrogen fueling is as safe as gasoline vehicles, and meets NHTSA’s strictest safety standards
• Hydrogen has been safely stored, transported, and utilized in America for 50 years
State Progress

California
- A.B 8 provides $20 million per year to build 100 hydrogen fueling stations through 2024

Eight State Zero Emissions Vehicle MOU
- 3.3 million ZEVs on the road by 2025
- Several NE states have FC rebates in place

Automakers and Hydrogen Infrastructure Companies investing in station rollout
Northeast Progress
H$_2$ Station Rollout

New York
New Jersey
Connecticut
Rhode Island
Massachusetts
Overseas

European Union
- Fuel Cell and Hydrogen – Joint Undertaking (FCH-JU)

Germany
- H2 Mobility, Hydrogen NOW

United Kingdom
- UKH2Mobility, London Hydrogen Network Expansion (LHNE)

Japan
- Research Association of Hydrogen Supply/Utilization Technology (HySUT)

Korea
- Korean Hydrogen and New Energy Society
What can you do to help?

Support state/local fuel cell and hydrogen energy policies…

✓ Provide financial and non-financial incentives
  Incentives for infrastructure
  Consumer incentives
  HOV lane access, and others

✓ Station siting & permitting
  Harmonization of codes, standards, and safety regulations

✓ Development of FCV fleets

✓ FAST Act
Thank you.

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