

## The Great Fuel Race



**John Addison**

Clean Fleet Report  
[cleanfleetreport.com](http://cleanfleetreport.com)

### Customer Goals

- **Save Money**
- **Lower Emissions**
- **Energy Independence**
- **Range**
- **Convenience**
- **Reliability**
- **Safety**

# Choices



**Biodiesel**



**PHEV**



**EV**



**Ethanol**



**Hydrogen**



**CNG**

# USMC Camp Pendleton Fleet



**300+ Solar Charged EV**



**5 Million Gallons B20**



**Hydrogen Future**



**JP8 Tactical**

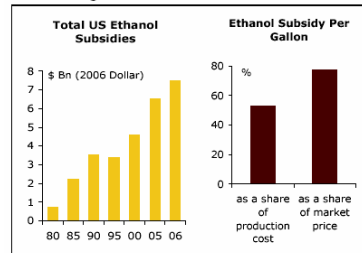
## Market Leadership

<b>Google</b>	<b>Yahoo</b>	<b>Microsoft</b>
<b>DVD</b>	<b>On Demand Cable</b>	<b>Streaming Internet</b>
<b>Gasoline Blend</b>	<b>Diesel Blend</b>	<b>Biofuel Electricity Hydrogen</b>

## Biofuels

- 2000 = 1 billion gallons
- 2020 = 30 billion gallons
- E10 Momentum in US
- Biodiesel growth in Europe
- Competitive when oil \$ high
- Flex-Fuel Vehicle (FFV) = easy compliance Federal EPAC & other “green”
- E100 Success in Brazil
- Future wildcards – algae, negative CHG
- Fuel from wood and waste not food and haste

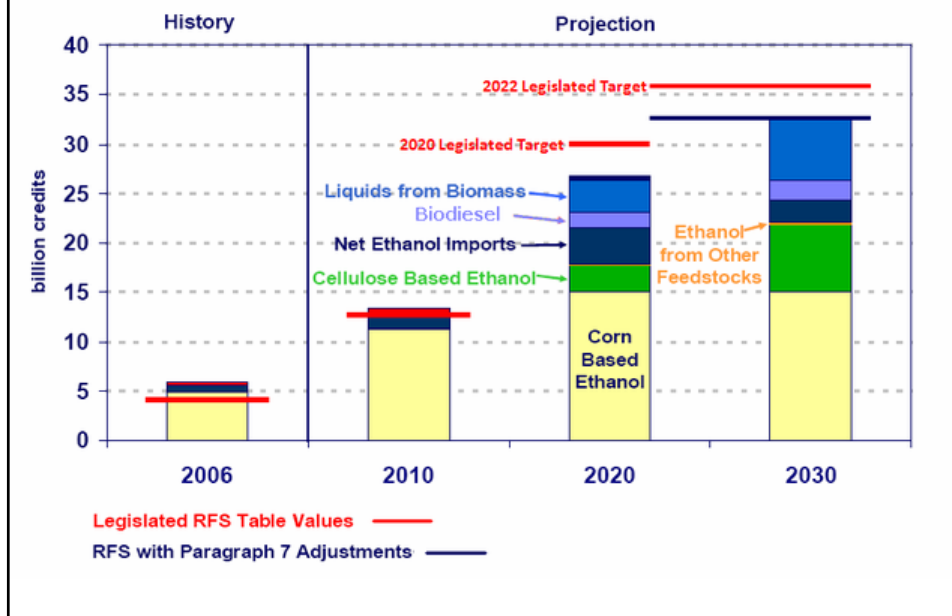
Subsidizing Ethanol



Source: GSI, ISD, Earth Track, CIBCWM



## EIA Revised AEO 2008 Projection of Renewable Fuel Quantities



## Electric Vehicles

- Light-rail
- High-speed rail
- 40,000 EV is USA Today
- 25 miles & 25 mph limits for inexpensive
- Tesla Freeway speed & 240 mile range
- 2010 Freeway Speed Offerings
  - Nissan
  - Renault
  - Mitsubishi
  - Chrysler
  - BYD
  - Miles
  - ZENN
- Over 3,000 Models (Alibaba search)
- Garage infrastructure for 12 to 25% market
- Fast charging alternatives
- New charging infrastructure plans



## Asian Electric Vehicles

40 to 80 Million Battery Electric Vehicles

Electric Two Wheelers (ETW)

Over 1,000 Light Electric Vehicles 3 and 4 Wheel



## Plug-in Hybrids

- Conversion momentum
  - AQMD
  - Google
  - NY City
  - Sprinter Vans
  - Utility Trouble Trucks
  - Transit Buses
- Automakers Demo Future
  - GM Volt
  - Toyota PHEV
  - Ford
- Use of existing fueling infrastructure
- High battery demands
- Complex drive system



## From Fuel Cells to HCNG



**HICE**



**Fuel Cell**



**HCNG**



**Plug-in Hybrid**

## Renewable to Byproduct Hydrogen



**Solar & REC Electrolysis**



**Onsite CNG Reformation**

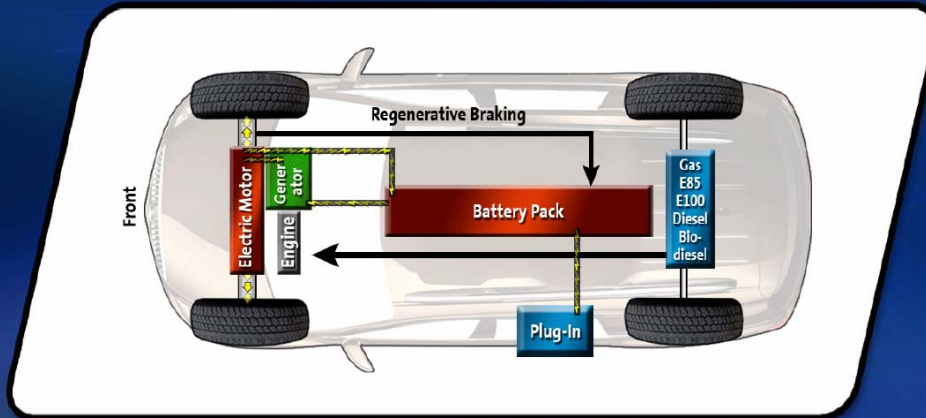


**Pipelined Byproduct**



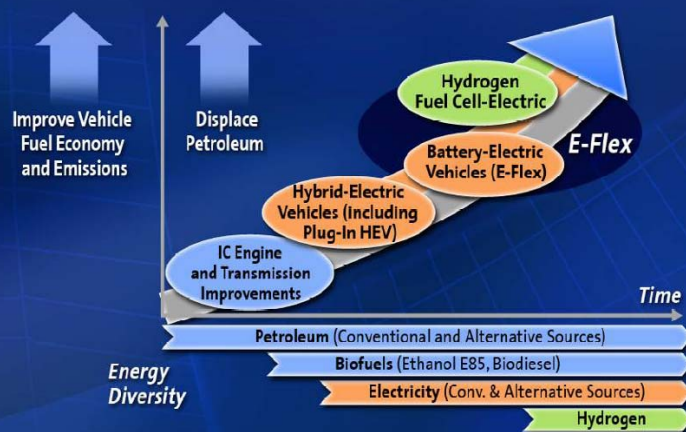
**Truck Delivered**

## E-Flex System: Engine-Generator



GM October 2007 Presentation

## Advanced Propulsion Technology Strategy



GM October 2007 Presentation

# GHG Source-to-Wheels Debate

California Global Warming Intensity at Wheel (g CO<sub>2</sub>e/MJ)

Fuel	Production	GREET
Gasoline	Oil Refined	92
Diesel	ULSD Refined	71
Diesel	Coal-to-Liquid	167
Biodiesel	Midwest Soy	30
Ethanol	Corn with Coal Electricity	114
Ethanol	Cellulosic from Poplar Trees	-12
Electricity	California Average	27
CNG	North American Pipelined	79
Hydrogen	Onsite CH <sub>4</sub> Reformed	48
Hydrogen	Biomass & Pipeline Delivery	22

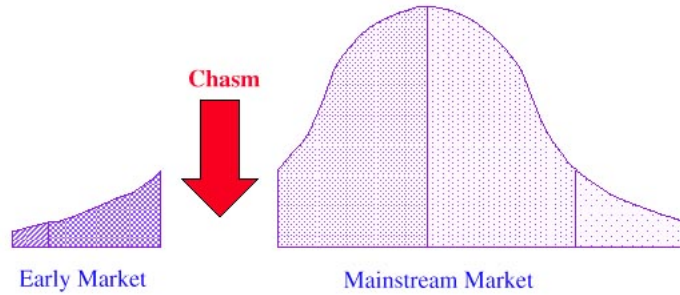
## Intermodal Passenger Transportation

- Air Travel
- Long-distance Rail
- Light-rail
- BRT
- Buses
- Corporate Fleets
- Light Trucks & SUVs
- Passenger Vehicles



# Crossing the Chasm

Dr. Geoffrey Moore

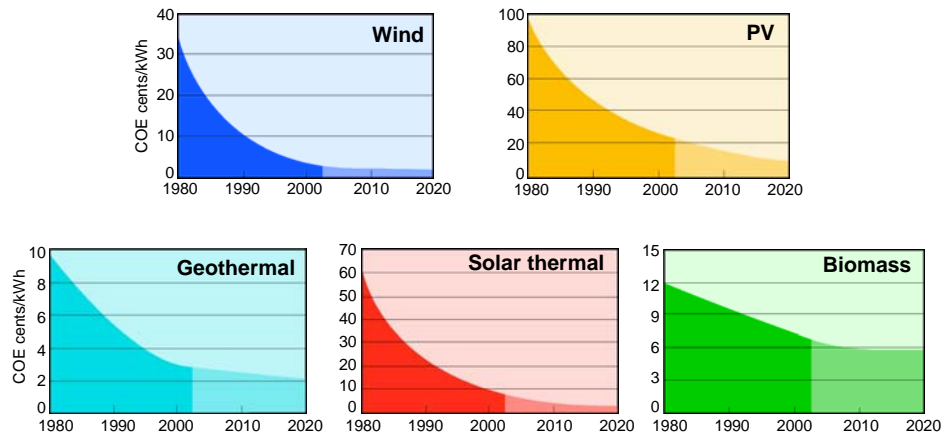


*Slides courtesy of Dr. Geoff Moore and the Chasm Group*

## Disruptive Technology: Market Segment Strategy

	Bus	Sedan	Light Trucks	Heavy Vehicles
Universities	1	2	6	10
Transit Fleets	3	5	9	
Government Fleets	4	7		
Commercial Fleets	8			

# Cost Learning Curve



Source: NREL Energy Analysis Office ([www.nrel.gov/analysis/docs/cost\\_curves\\_2002.ppt](http://www.nrel.gov/analysis/docs/cost_curves_2002.ppt))

## \$200 Oil Scenario: Electric Drive System Wins

<b>Now</b>	<b>Gasoline</b>	<b>Diesel</b>	<b>Ethanol</b>
<b>2020</b>	<b>Diesel Bioblend</b>	<b>Gasoline Bioblend</b>	<b>Electricity</b>
<b>2050</b>	<b>Electricity</b>	<b>Hydrogen</b>	<b>Bioblend</b>

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**John Addison**  
President and  
Publisher

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- Save thousands each year in vehicle costs
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- Avoid unnecessary stress when you travel
- Help the country end its dependency on oil
- Stop the climate crisis
- Make the right decision when you buy a car

"Electric vehicles, plug-in hybrids and next generation fuels are all part of the clean tech revolution. John Addison delivers the fascinating details of today and tomorrow."

**Clint Wilder, Co-Author of The Clean Tech Revolution**  
Contributing Editor at *Clean Edge*

"Read this book if you care about the future of our children. John Addison details the transportation solutions that will bring clear skies and reduce dangerous greenhouse gas emissions. It is fascinating to read about everything from miles per gallon to electric vehicles, from people oriented development to high speed rail, and from driving less to enjoying life more."

**Assemblywoman Fiona Ma**  
California State Assembly Majority Whip

"This is the best book that I have seen describing practical solutions for driving less and buying the right vehicle. John Addison offers accurate insights into the latest electric vehicles, plug-in hybrids, biofuels, and flexible work strategies. As someone responsible for the air quality for 7.5 million people, I recommend this book."

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Bay Area Air Quality Management District

Learn about the new clean vehicles including electric vehicles, plug-in hybrids, and new cars with great mileage. See how the best employers promote flexible work and commute programs. Learn how families and friends are taking new approaches to sharing gas miles, gaining free time in the process.

Be inspired. Take action.



Save Gas, Save the Planet

John Addison

## Save Gas, Save the Planet



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