

G E N E R A L



M O T O R S

Ron Dixon

Manager- GM Government Sales
GM Fleet and Commercial

The Global Energy Challenge



Meeting the Energy Challenge

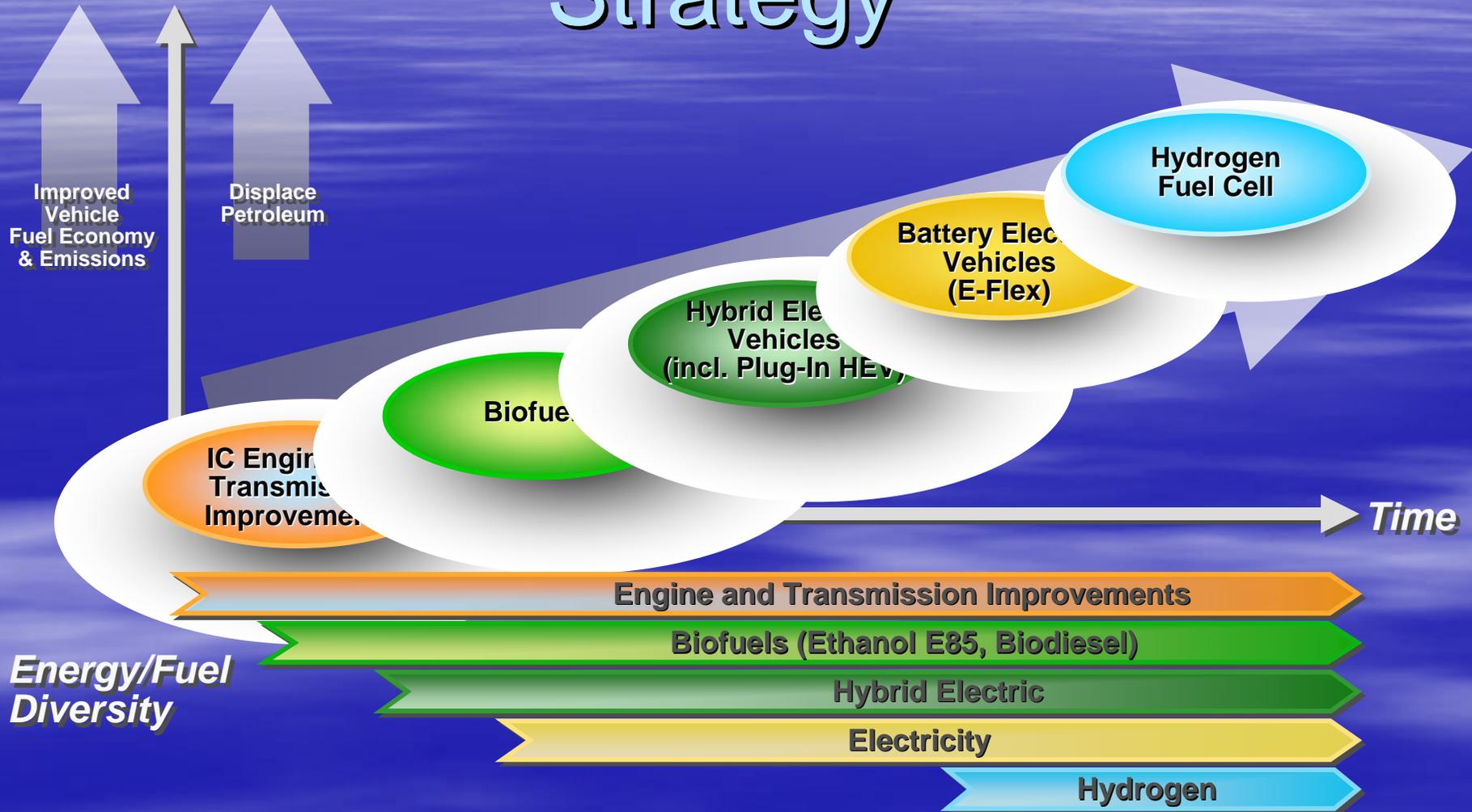


GM's Advanced Propulsion Technology Strategy

- Broad range of clean, efficient vehicles
- Powered by different sources of energy
- Meet local consumer needs around the world



Advanced Propulsion Technology Strategy



Advanced Propulsion Technology Strategy

Gas-Friendly to Gas-Free



FUEL EFFICIENCY

BIOFUELS

HYBRID

ELECTRIC

FUEL CELL

Advanced Propulsion Technology Strategy



FUEL EFFICIENCY

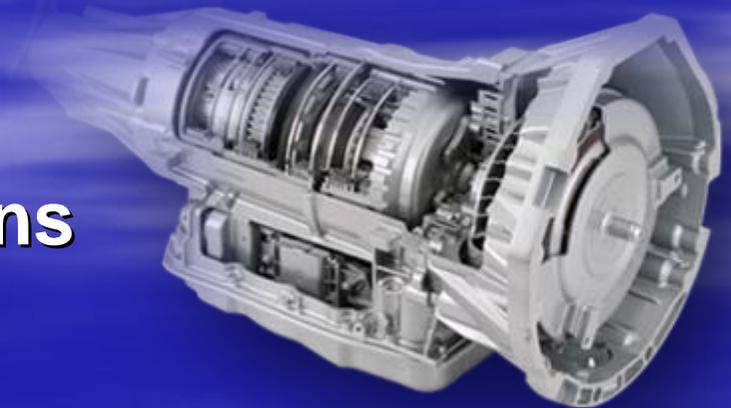


**IC Engine and
Transmission
Improvements**



Powertrain Advances

- Variable valve timing
- Active Fuel Management
- Direct fuel injection
- Engine downsizing
- Cylinder deactivation
- Turbocharging
- And 6-speed transmissions
- Cleaner, more powerful diesel engines





30MPG+ Vehicles

Subcompacts

Chevrolet Cobalt	31 mpg
Chevrolet Cobalt XFE	36 mpg
Chevrolet Aveo5	32 mpg
Pontiac G5	31 mpg
Pontiac G5 XFE	35 mpg



Compacts

Chevrolet Aveo	32 mpg
Pontiac G6	30 mpg
Saturn Astra 3D	30 mpg
Saturn Astra 5D	30 mpg





30MPG+ Vehicles

Midsized

Chevrolet Malibu	30 mpg
Chevrolet Malibu Hybrid	32 mpg
Saturn Aura	30 mpg
Saturn Aura Hybrid	32 mpg

Small Station Wagons/SUV

Pontiac Vibe	31 mpg
Chevrolet HHR	30 mpg
Chevrolet HHR Panel	30 mpg
Saturn Vue Hybrid	32 mpg



Advanced Propulsion Technology Strategy



BIOFUELS



**Ethanol E85
Biodiesel**



Biofuels

GM is the world leader in providing customer choice through Biofuel and FlexFuel availability

- **More than 4 million ethanol-capable vehicles on the road worldwide**

BioPower^{Saab}

FLEXFUEL
E85 ETHANOL

Flexpower



Biofuels

In the U.S., GM has 3 million FlexFuel E85-capable vehicles on the road

Committed to have 50% of annual volume E85-capable by 2012

Working with others to help expand infrastructure





Why Biofuel?

Biofuels, like ethanol, offer the best near-term solution to reducing our dependence on petroleum

By 2030, Ethanol will reduce oil demand 40%

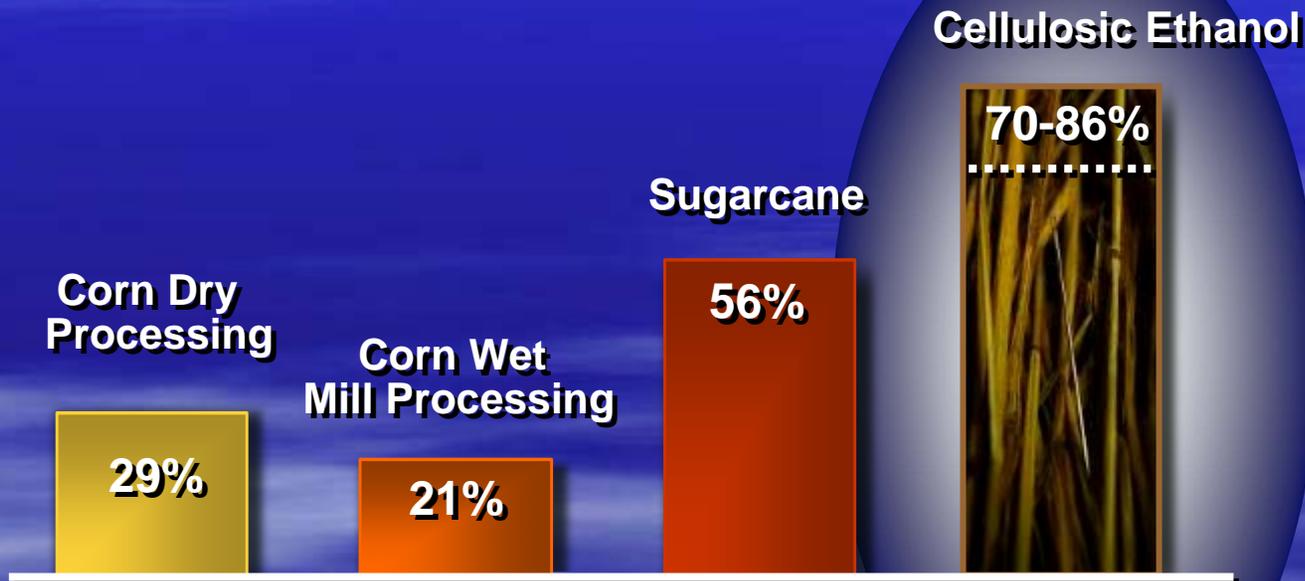
Ethanol will also reduce greenhouse gas emissions





Benefits of E85 Ethanol

CO₂ Savings from Different Ethanol Processes and Inputs





Cellulosic Ethanol Alliances



**Agricultural / Municipal
Waste**



Plastic



Tires



E85 FlexFuel Models in 2009MY

Chevrolet

Avalanche

Express

HHR

HHR Panel

Impala

Malibu*

Silverado

Suburban

Tahoe

GMC

Sierra / Denali

Savana

Yukon / Denali

Yukon XL / XL Denali

HUMMER

H2

H2 SUT

Cadillac

Escalade

Escalade ESV

Escalade EXT

Buick

Lucerne

Pontiac

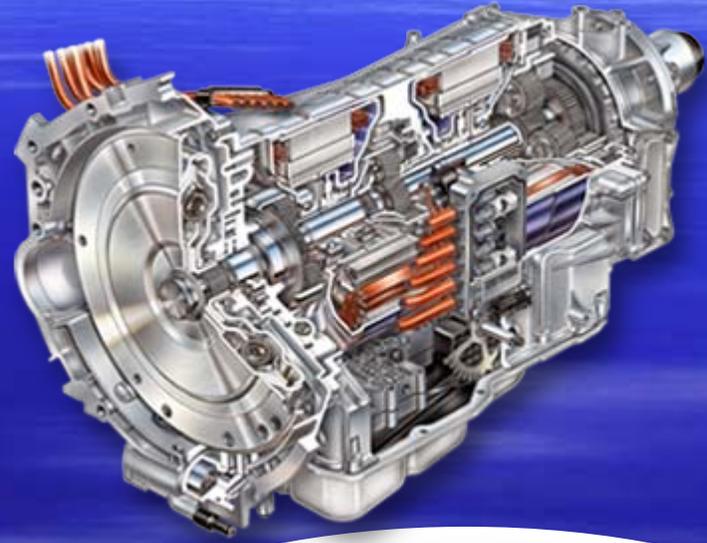
G6*



Advanced Propulsion Technology Strategy



HYBRID



**Hybrid Electric
Vehicles
(including Plug-in HEV)**



GM Hybrid System

10%-25% fuel economy gain

Global benchmark for low-cost, hybrid system





2-Mode Hybrid System



30% increase in combined fuel economy
50% improvement in city mileage

- **21 mpg city = 4-cyl Camry**
- **The difference: GM's large SUVs seat eight adults and tow 6200 lbs.**



GREEN CAR OF THE YEAR





HYBRID 2 MODE



Cadillac Escalade



Chevy Silverado



GMC Sierra



HYBRID
2 MODE

**Currently segment leaders
in fuel economy**

- **300 HP with 20 mpg
highway**

**With 6.0L V8 and Hybrid
system:**

- **25% improvement in
overall fuel economy**
- **40% improvement
in city fuel economy**



Chevy Silverado



GMC Sierra



2009 Silverado / Sierra Hybrid

Best Capability, Best Efficiency, Best Technology

2WD and 4WD models

StabiliTrak

Locking Rear Axle

Trailer Package

Dual-stage frontal air bags

Head curtain side air bags

5-star side-impact
ratings

HYBRID
2 MODE





Saturn Vue Hybrids

Vue is GM's
1st FWD use of

HYBRID
2 MODE





GM Hybrids in 2009MY

Models	2009 MPG (City/Highway)
Chevrolet Malibu Hybrid	26/34
Saturn Aura Hybrid	26/34
Cadillac Escalade 2-Mode Hybrid	N/A
Chevrolet Tahoe 2-Mode Hybrid	21/22 2WD 20/20 4WD
GMC Yukon 2-Mode Hybrid	21/22 2WD 20/20 4WD
Saturn Vue 4-cyl. Hybrid	25/32
Saturn Vue V6 2-Mode Hybrid	N/A
Chevrolet Silverado 1500 Crew Cab 2-Mode Hybrid	N/A
GMC Sierra 1500 Crew Cab 2-Mode Hybrid	N/A





Saturn Vue Plug-in in 2010 MY

**More advanced
battery**

Plug-in recharging

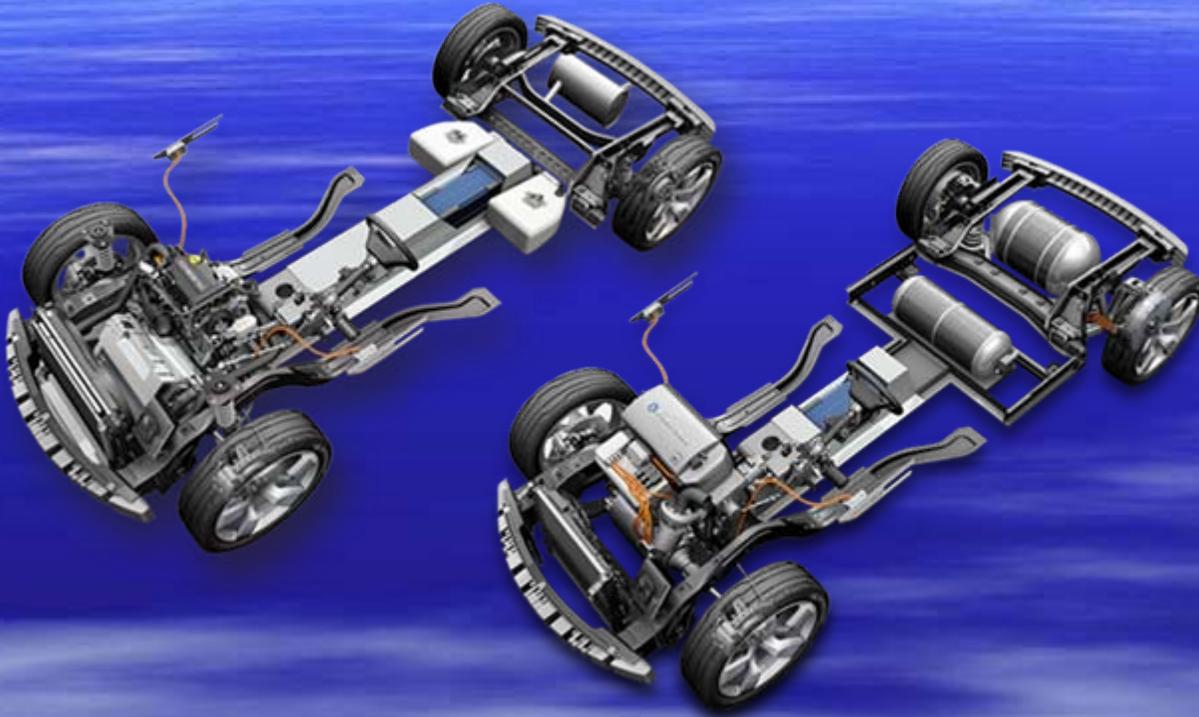
**Two-mode
technology**

**Double fuel
efficiency of any
non-hybrid SUV**





GM's E-Flex System





Chevrolet Volt

Gasoline Extended Range Electric Vehicle

- **In dealerships late 2010**

Energy stored in Lithium-ion battery

- **Charged by plug-in**
- **Charged by internal combustion engine**





Cadillac Provoq

In this application of E-Flex:

- **Fuel cell replaces the engine/generator**
- **Fuel tank stores hydrogen**
- **Lithium-ion battery pack delivers a range of 300 miles**
 - **And there are zero-emissions**





Project Driveway

100+ vehicles in the hands of customers

Largest-ever market test of fuel cell vehicles

**Launched in California, Washington D.C.
and New York**

Real-life feedback



Driving the Future

What we execute and how we execute over next 5 years...

will shape the next 50 years!

All of us play a role!

