



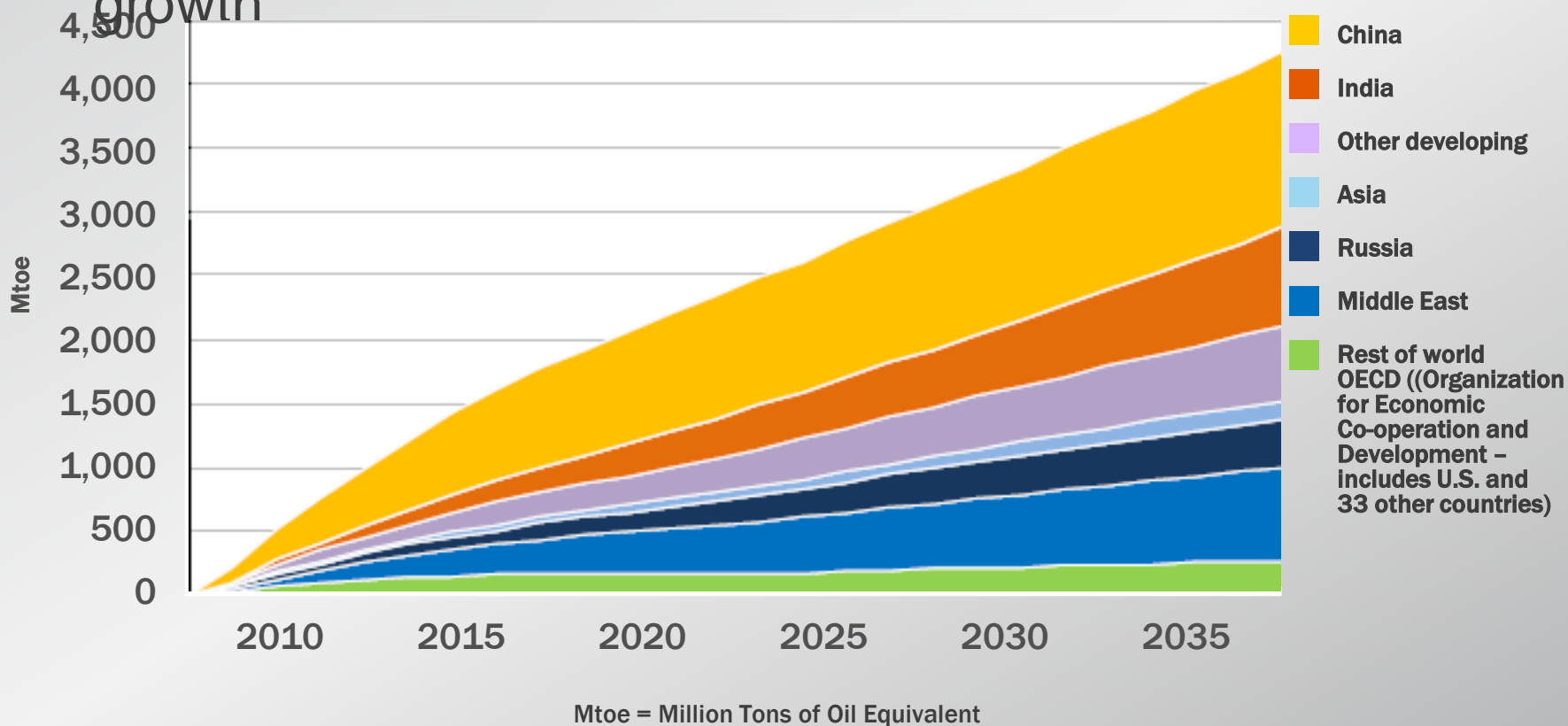
General Motors CNG Product Offerings

*Clay Okabayashi
Fleet Account Executive*



Global Energy Demand

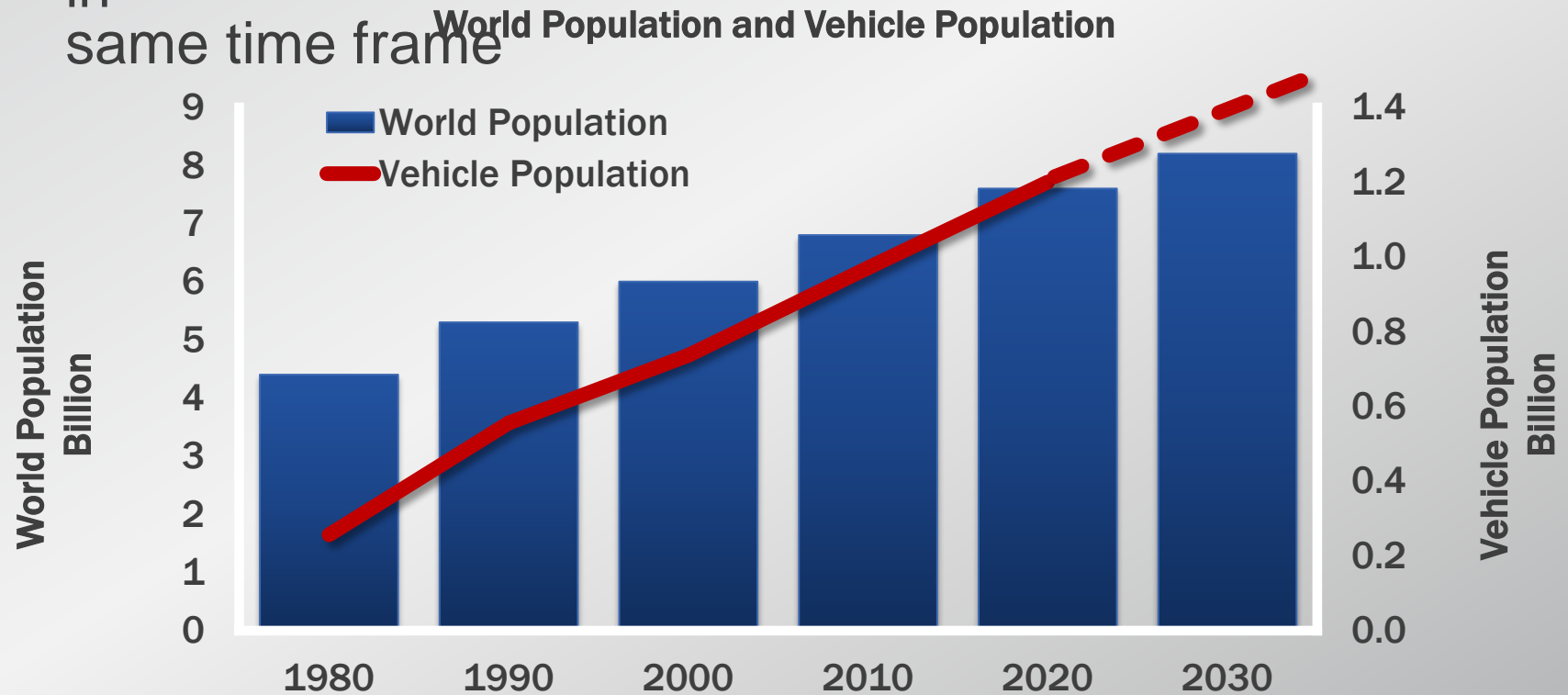
- Energy demand is forecasted to increase dramatically from 2010 to 2035
- China and India are expected to account for 50% of the growth



Source: World Energy Outlook, Nov. 9, 2011

Key Reasons for Growing Energy Demand

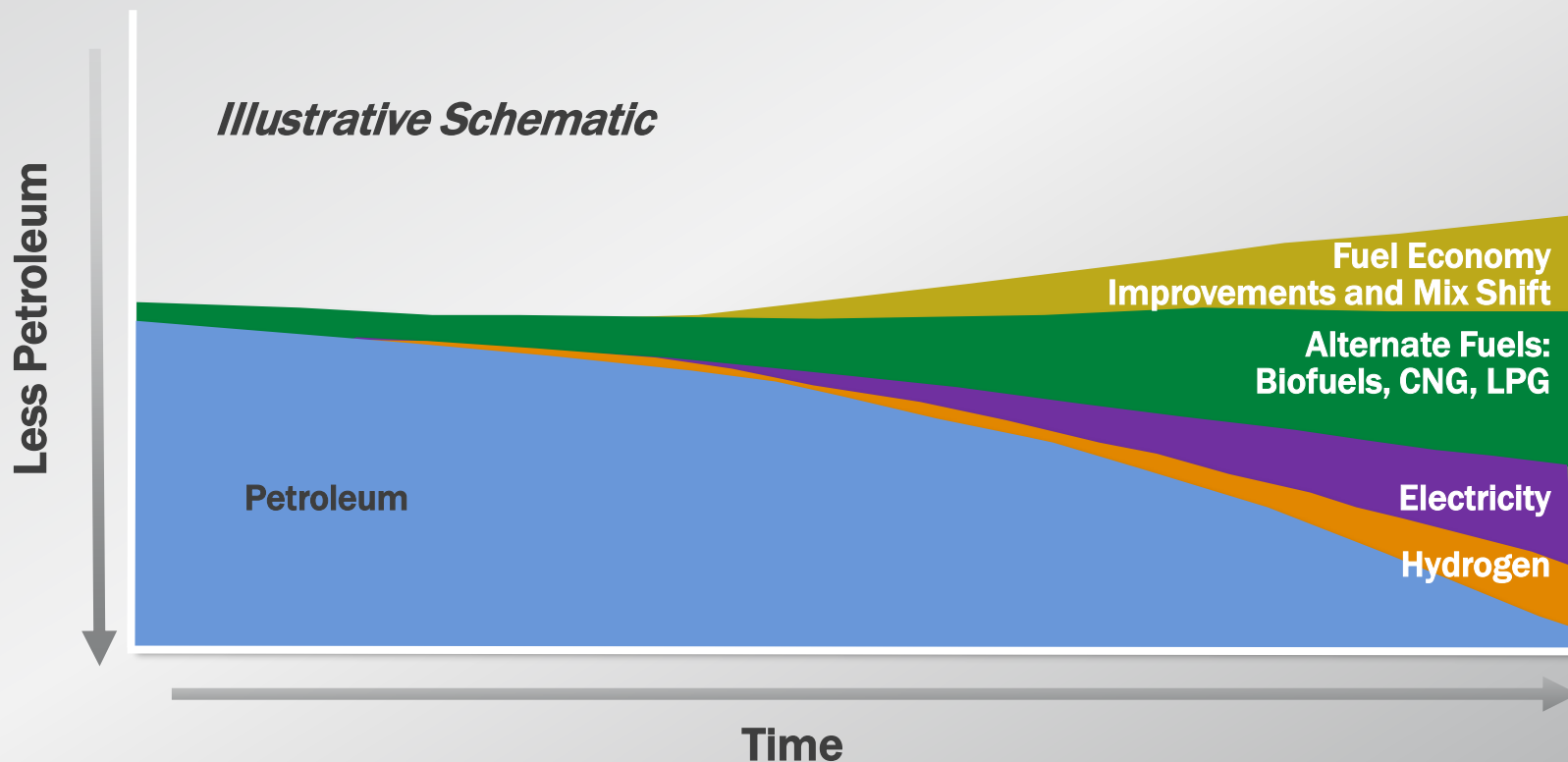
- Global population expected to grow from 6.8 billion in 2010 to 8.2 billion in 2030
 - More than 20% growth
- Global vehicle population expected to grow by over 30% in same time frame



Source: U.S. Census Bureau and GM Government Relations and Public Policy

Auto Industry Challenge

- 96% of the cars and trucks on the road today operate on petroleum-based fuels
- Auto manufacturers are moving to other energy sources to reduce use of petroleum and exhaust emissions



GM's Propulsion Strategy

It's all about Energy Diversity!



FUEL EFFICIENCY

Engine and Transmission Improvements



BIOFUELS

Ethanol-blend and Biodiesel



CNG & LPG

Compressed Natural Gas & Liquefied Petroleum Gas



HYBRID

eAssist Full-Hybrid Electric



ELECTRIC

Extended-Range Electric Battery Electric



FUEL CELL

Hydrogen Fuel Cell



General Motors CNG Strategy- Putting the Customer First

- What customers told us they wanted.
 - A full OEM warranty
 - No question as to who covers the warranty
 - No dual warranty complications or grey areas
 - Ease of ordering
 - Check the box
 - Arrives at dealership fully complete
 - Easy to obtain Parts and Service
 - GM Part Numbers
 - GM Dealer Network
 - Quality and peace of mind
 - GM Tested & Validated



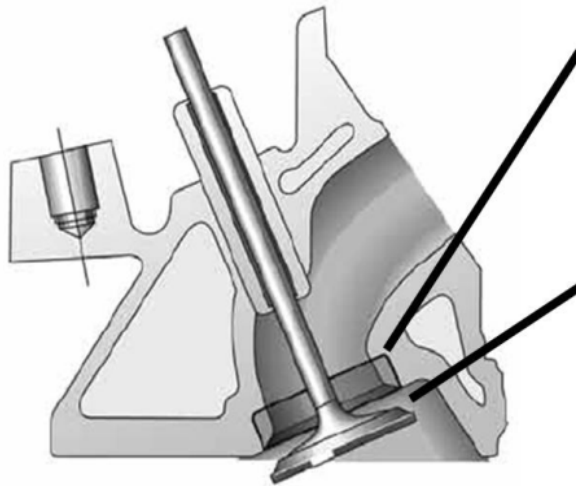
GM's CNG Strategy

- Customers asked...we delivered
- Decision made to go forward in May 2010
 - Brought CNG to market in 2011
- CNG Cargo Van, our first CNG Product Launch
- Businesses using cargo van applications are largely return-to-base
 - Cable TV
 - Delivery and Courier Services
 - Plumber
 - Electrician
 - Local Gas or Electric Utility
 - Municipal Fleets



GM Gaseous Fuel Components

- 6.0L V-8 – gaseous fuel-ready engine with hardened exhaust valves and hardened intake and exhaust valve seats



Exhaust valve seat inserts ensure an excellent seal between the valve and valve seat.

Exhaust valves made of special materials resist the higher temperatures and corrosive nature of propane and natural gas.

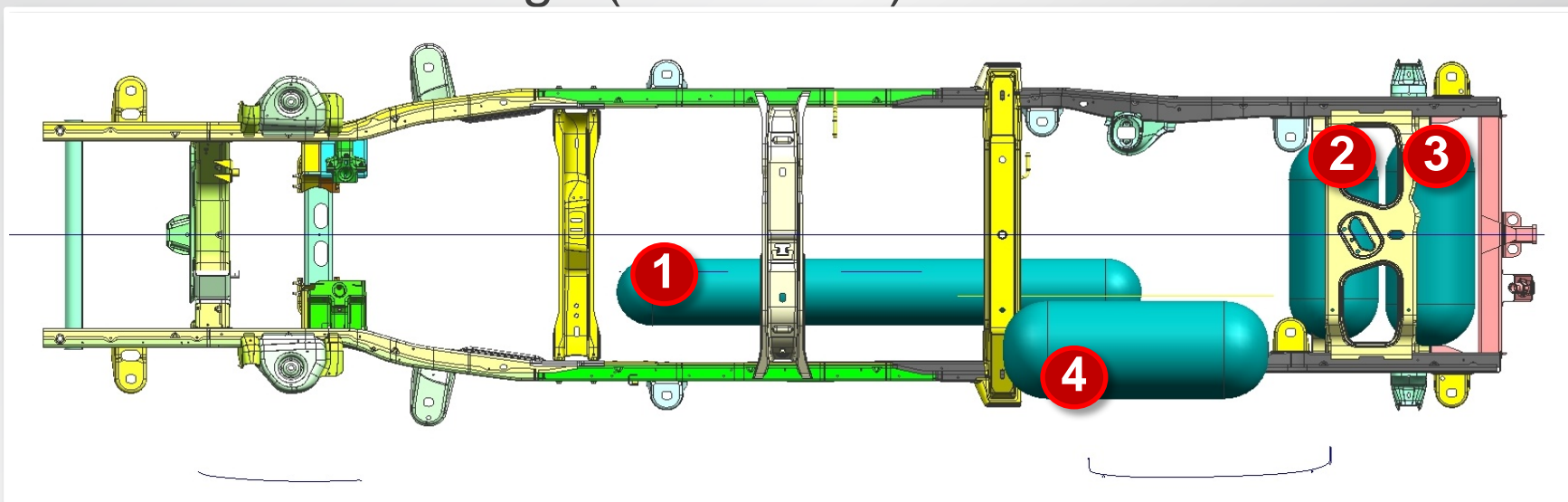
- Bosch Injectors



Cargo Van CNG Fuel Storage Options



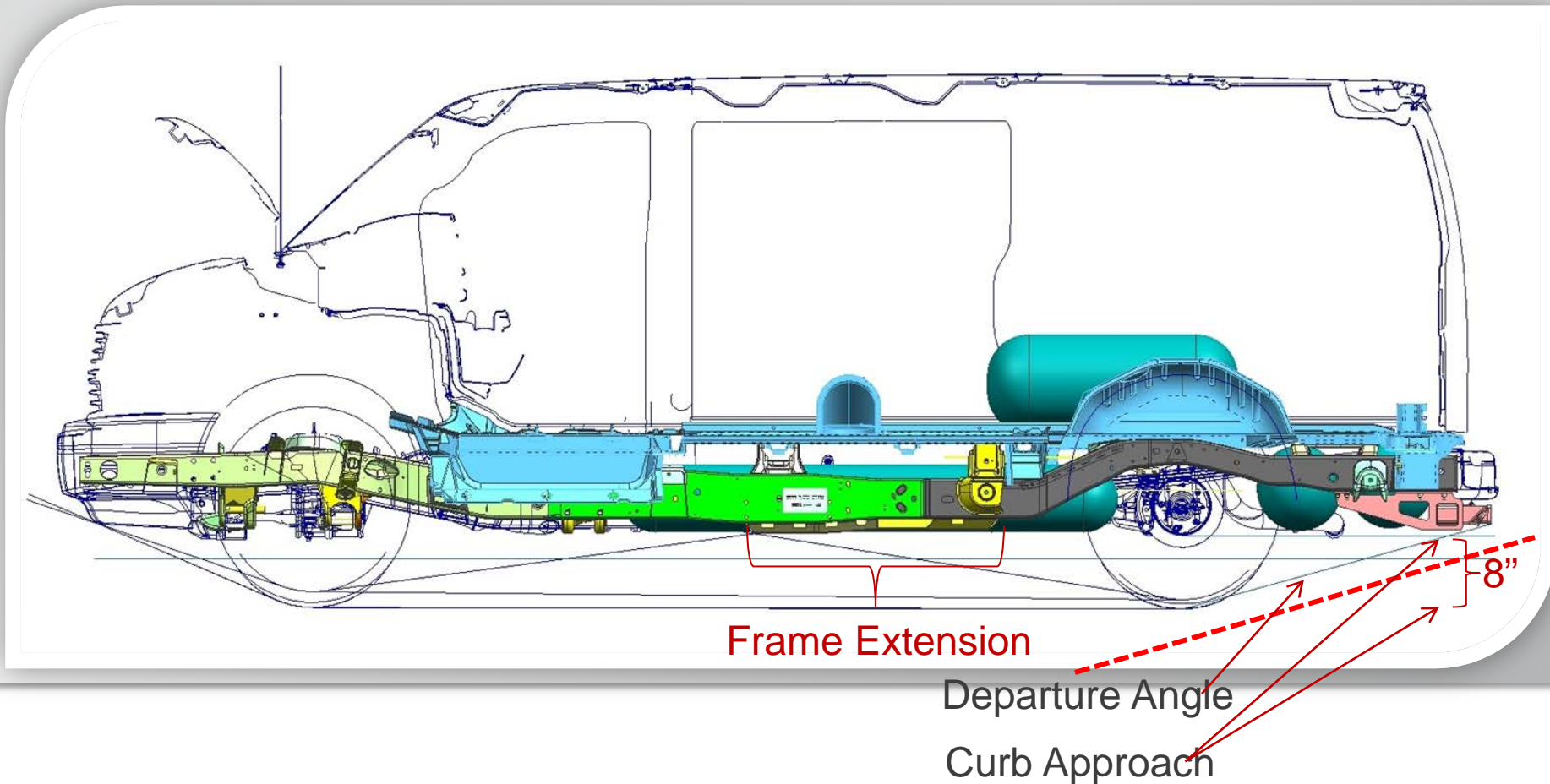
- CNG fuel system available on $\frac{3}{4}$ -ton and 1-ton cargo vans with a 135" wheelbase (RPO FHZ)
- Four-tank design holds 23 GGE (gas gallon equivalent)
 - 300+ mile range (RPO UFP)
- Three-tank design holds 16 GGE
 - 200+ mile range (RPO UFM)



Cargo Van CNG Fuel Storage Integrity



Approach and Departure Angles and General Ground Clearance provides level of safety not typically seen in the after market



The New Bi-Fuel Pickup- The next logical Portfolio step

- Utility, Gas and Electric companies are expanding their fleet
 - Age
 - Cost
 - Politics
- Range Anxiety as some vehicles need to go a little further especially in case of emergencies or non-regular service area
- Interest moving from larger fleets to smaller fleets and small business (retail) customers
- Infrastructure starting to grow with semi-public and public CNG stations

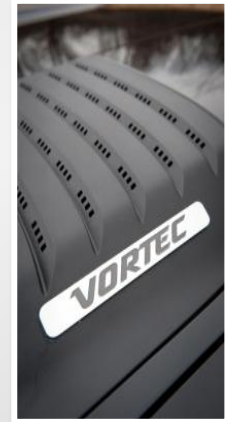


Bi-Fuel CNG Full-size Pickup



GMC

- Models:
 - Chevrolet Silverado and GMC Sierra
 - 2500HD Extended Cab
 - 2WD and 4WD
 - Standard and Long Box
 - 6.0L Gaseous Fuel Ready Engine



GM's Bi-fuel Trucks



- GM established the parameters
- GM did all of the validation work to ensure system meets all GM standards:
 - Cold Start Validation — Down to -40° F
 - Hot Start Validation — Up to 122° F
 - Altitude Validation — No performance degradation thru 10,000 ft.
 - Corrosion Validation — Minimum of 10 yrs.
 - Safety Testing — FMVSS and GM standards
 - Full Vehicle Durability — Simulating 2 lives up to 200,000 miles
- GM is mandating 6 tests for crashworthiness
 - 2 frontal tests
 - 1 side impact test
 - 1 rear test
 - 2 side impact pole tests
- Fully compliant with applicable motor vehicle safety standards



How the System Works:



- Truck always starts with gasoline
- System switches to CNG when engine reaches pre-determined operating temperatures
- Driver can switch fuels at any time
- When CNG tank becomes empty, the system automatically switches over to the gasoline tank
- Fuel gauge is installed directly on the dash
 - Simple and reliable



Superior Performance



- Combined range of 17 GGE CNG tank and 36 gallon gasoline tank is more than 650 miles
- Horsepower and torque “feel” are same when driving on gasoline
- Comparable towing capability
- Payload is only reduced by weight of CNG system (450 lbs)
- Drivability tests conducted throughout development
- Meets all Government FMVSS and emission requirements
 - Federal & CARB certs

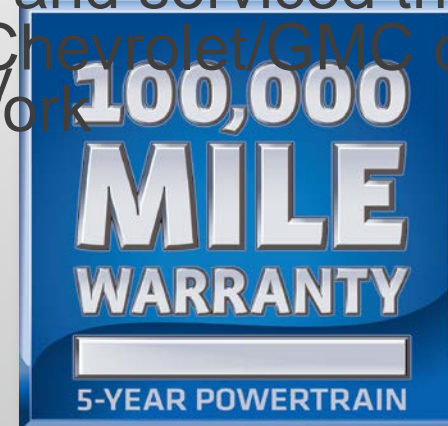
3030 South Susan Street Santa Ana, CA 92704 (714) 656-1200 www.linpacosautomotive.com	Vehicle Emissions Control Information Conforms to 2012 MY
Vehicle Emission Control Information This vehicle is equipped with a clean alternative fuel conversion system. This Dedicated CNG system has been certified to meet EPA Tier 2 Bin 7 MDI/MDPI emission standards applicable to model year 2012. This vehicle was manufactured and installed consistent with the principles of good engineering judgment and all US EPA regulations. OBD: CA II	Conforms to US EPA and California regulations and is certified for sale in California: 2012 MY MDV/MDPV
	US EPA: T2B7 OBD: CA II
	CA: SULEV II OBD: CA II
	Fuel Capacity: 16-24 GGE Fuel: CNG
	2TWC / TWC / 2HO2S(2) / SFI
GM Group: CGMXT06.0396 Group: CZ9XT06.0CDA 6.0L CNG Evap: CZ9XR0000CDA No Adjustments	Group: CZ9XT06.0CDA 6.0L No Adjustments Evap: CZ9XR0000CDA
2TWC/TWC/2HO2S(2)/SFI	L3-33528-010 ARB

GM offers "Peace of Mind"



- GM's gaseous fueled vehicles carry GM's new vehicle warranty ... including the 5-year/100,000 mile transferable GM powertrain warranty

- Fully validated to GM strict, quality, reliability, durability and safety standards
- Fully compliant with applicable motor vehicle safety standards
- Sold and serviced through the Chevrolet/GMC dealer network



Vehicles and Propulsion for Every Purpose

- CNG plays a key role as a fuel source in GM's product offerings
- Additional entries are coming...stay tuned!!

					
FUEL EFFICIENCY	BIOFUELS	CNG & LPG	HYBRID	ELECTRIC	FUEL CELL
<i>Engine and Transmission Improvements</i>	<i>Ethanol-blend and Biodiesel</i>	<i>Compressed Natural Gas & Liquefied Petroleum Gas</i>	<i>eAssist Full-Hybrid Electric</i>	<i>Extended-Range Electric Battery Electric</i>	<i>Hydrogen Fuel Cell</i>
					