



# COMMERCIAL VEHICLES

2013

# ALTERNATIVE FUEL BUYERS GUIDE



Drive green.



COMPRESSED  
NATURAL GAS



LIQUEFIED  
PETROLEUM GAS



BIODIESEL



ETHANOL



HYBRID



PLUG-IN HYBRID



ALL-ELECTRIC



# Why **ALTERNATIVE FUEL** Is Important To You And Ford.



## Reduced Carbon Footprint

For many businesses, operating a fleet is the single largest contributor to their carbon footprint. When business leaders demand a reduction in carbon, their fleet managers need to know how to identify which alternative fuel will make the biggest difference.

## Reduced Dependence On Foreign Oil

Most of the world's oil reserves are concentrated in the Middle East. Since most alternative fuels are available in the U.S. from U.S. sources, switching to alternative fuels can limit how much money is transferred offshore to support our domestic energy demands.

## Ford Offers Customers A Complete Selection



	<b>Transit Connect Van/Wagon</b>	<b>E-150/250/350 Cargo Van/Wagon</b>	<b>E-350/450 Cutaway Chassis</b>	<b>E-350/450 Stripped Chassis</b>
<b>Fuel Type</b>				
Ethanol (E85)		Ethanol (E85)	Ethanol (E85)	Ethanol (E85)
Biodiesel (B20)				
CNG/LPG	CNG	CNG/LPG	CNG/LPG	CNG/LPG
Hybrid				
<b>GVWR (lbs.)</b>	4,965 (Wagon); 5,005 (Van)	8,520 - 9,500	10,050 - 14,500	11,500 - 14,500
<b>GCWR (lbs.)</b>	N.A	11,500 - 18,500	13,000 - 22,000	13,000 - 22,000
<b>Payload (lbs.)</b>	1,426 - 1,600 lbs.	2,780 - 4,050	5,152 - 9,040	6,927 - 9,747
<b>Engine</b>	2.0L Gas	4.6L Gas V8 FFV 5.4L Gas V8 FFV 6.8L Gas V10	5.4L Gas V8 FFV 6.8L Gas V10	5.4L Gas V8 FFV 6.8L Gas V10
<b>Transmission</b>	4-Speed Automatic with Overdrive	4-Speed Automatic Overdrive (4.6L, 5.4L) 5-Speed Automatic TorqShift® Overdrive (6.8L)	5-Speed Automatic TorqShift® Overdrive	5-Speed Automatic TorqShift® Overdrive



## Lower Cost Of Ownership

All fleet managers should consider the combination of acquisition costs, fuel prices and residual values to determine the total cost of ownership of the vehicles in their fleet. Although acquisition costs for alternative fuel vehicles may be higher, these costs are often offset by the lower costs of the alternative fuels. In addition, the lower volatility of alternative fuel prices reduces risk of future price shocks.

## Blueprint For Sustainability

“Ford has tripled production capacity for electrified vehicles in North America compared to 2011. This includes hybrids, plug-in hybrids and pure electric vehicles, with most sales coming from hybrid electric vehicles... This is part of the Ford strategy to offer customers a number of powertrain options – both conventional gasoline technologies and electrified options – within existing vehicle lines. We call this the power of choice, and it’s an important part of our vision to further evolve our fleet and our company.”

*Excerpted from the William Clay Ford Jr. “Year in Review” Executive Message in the 13th annual nonfinancial report of Ford Motor Company*

## Of Alternative Fuel Commercial Vehicles



F-250/350/450 Super Duty Pickup	F-350/450/550 Super Duty Chassis Cab	F-650/F-750 Medium Duty Chassis Cab	F59 Commercial Stripped Chassis
Ethanol (E85) Biodiesel (B20) CNG/LPG (Gasoline only)	Ethanol (E85) Biodiesel (B20) CNG/LPG (Gasoline only)	Biodiesel (B20) CNG/LPG (Gasoline only)	CNG/LPG
9,900 - 14,000	9,800 - 19,500	Hybrid (Diesel only) Gas: 20,780 - 30,000 Diesel: 20,500 - 37,000	16,000 - 22,000
19,000 - 33,000	19,000 - 35,000	26,000 - 50,000	23,000 - 26,000
2,310 - 7,260	2,524 - 12,666	13,485 - 28,872	10,126 - 15,655
6.2L Gas V8 FFV	6.2L Gas V8 FFV	6.8L Gas V10 (F-650 only)	6.8L Gas V10
6.7L Power Stroke® V8 Turbo Diesel	6.8L Gas V10	6.7L Cummins® ISB Diesel	
TorqShift® Heavy Duty 6-Speed SelectShift Automatic™	6.7L Power Stroke® V8 Turbo Diesel TorqShift® Heavy Duty 6-Speed SelectShift Automatic™	TorqShift® Heavy Duty 6-Speed SelectShift Automatic™	5-Speed Automatic TorqShift® Overdrive
	5-Speed Automatic TorqShift® Overdrive (6.8L)	Allison Automatic (Diesel only)	

# Ford Provides COMPLETE CUSTOMER SUPPORT.



## Nationwide Dealer Network

Ford has a nationwide network of over 3,200 dealers that provide sales, finance and service support. Ford is a well established leader in commercial sales and has a long history of providing vehicles that are Built Ford Tough.



## Specialized Commercial Vehicle Dealers

Ford Business Preferred Network (BPN) dealers understand the needs of business owners. A BPN dealer knows that vehicles used in everyday operations are critical tools for financial success and your ability to provide for customers. Similarly, Ford makes sure BPN dealers have the tools they need to get the job done for businesses, from Commercial Truck Tools to Quality Fleet Care.



## Financing Source

Ford Credit provides financial support for commercial customers with fleets of any size. Our broad range of products from traditional financing to Commercial Lease accommodates many alternative fuel options including upfits from Qualified Vehicle Modifiers (QVMs). Find more information at <http://credit.ford.com/comlend>



## Gaseous Engine Prep Package

CNG and LPG are increasingly popular choices for cutting fuel costs and reducing greenhouse gas emissions. Ford offers a CNG/LPG Gaseous Engine Prep Package on five engines that includes hardened components such as valves and valve seats to withstand the higher operating temperatures and lower lubricity of gaseous fuels.



## Detailed Engineering Requirements

The Qualified Vehicle Modifier (QVM) Program is intended to help modifiers achieve greater levels of customer satisfaction and product acceptance through the manufacture of high quality vehicles. This program assures vehicle modifiers have the capability and processes in place to maintain the integrity of the Ford systems while meeting Federal and Ford Motor Company required standards.



## Established Truck Equipment Upfitters

To get the equipment your business needs to get work done in an efficient, cost effective manner, Ford has established Pool Accounts. These equipment specialists assist Ford dealers to ensure you have the right truck for the right job every time.



## Warranty-Parts-Service

Ford dealers are equipped to provide any necessary service repairs. They stock Ford Authorized parts, and service technicians are factory trained. Ford service departments are backed by computerized diagnostic equipment and access to national hotline support.



## Roadside Assistance 24 Hours-Seven Days

Ford provides roadside assistance 24 hours a day, seven days a week on all Ford commercial vehicles. By dialing 1-800-241-3673, Ford commercial alternative fuel vehicle customers also have access to: flat tire change, locksmith service (if locked out), and towing.

# Ford Is EASY TO WORK WITH.

## Simplified Ordering To Delivery

### From dealer order through customer delivery

- 1 Dealer and customer determine appropriate vehicle based on application, payload and range
- 2 Dealer places vehicle order, and vehicle is delivered to modifier
- 3 Modifier installs alternative fuel components and system
- 4 Vehicle is delivered to dealer and dealer delivers vehicle to customer

The commercial truck market is comprised of many unique vocations and vehicle requirements. One size does not fit all! That's why Ford is collaborating with reliable and qualified modifiers to deliver completed alternative fuel vehicles. Most Ford commercial vehicles can be ordered with a CNG/LPG Gaseous Engine Prep Package.

Although vehicles with Gaseous Prep Engines can be driven as delivered on gasoline, most vehicles are transported to qualified modifiers that install the CNG/LPG tanks and hardware.

Ford has released Modifier Guidelines and our engineers work with modifiers to help ensure consistent, reliable performance and customer service.

Ford maintains the Engine and Powertrain Limited Warranty (5 years or 60,000 miles\*) and the modifier is responsible for the system component warranty.

Given the number of unique applications, this strategy provides the greatest flexibility of commercial applications.

\* See dealer for details

## Warranty And Service SUPPORT.

Service is similar to other commercial vehicles. Warranty on the modified components is the responsibility of the modifier. The rest of the vehicle is covered under the Ford warranty. This is similar to other commercial vehicles (ambulances, motorhomes, shuttle buses, service trucks, etc.). Ford stands behind the engine warranty (as described in the 5 year/60,000 mile Limited Powertrain Warranty) when engine modifications are performed and comply with QVM Bulletin Q-185R1.

The modifiers provide service training programs for dealership technicians. This training ensures your dealership has trained technicians to accurately diagnose and safely

repair modified vehicles. The modifiers also provide Technical Hotlines to assist in diagnosing component or driveability issues.

Engine calibration and emission certification and compliance are part of the QVM supplied CNG or LPG modifications to your vehicle. The Powertrain Control Module (PCM) is reflashed with the appropriate calibration when the system is installed. In the event service is needed on the PCM, the QVM will provide a new or replacement calibration.

Contact information is provided at the time of delivery and can be found in the QVM's Supplemental Owner's Guide.

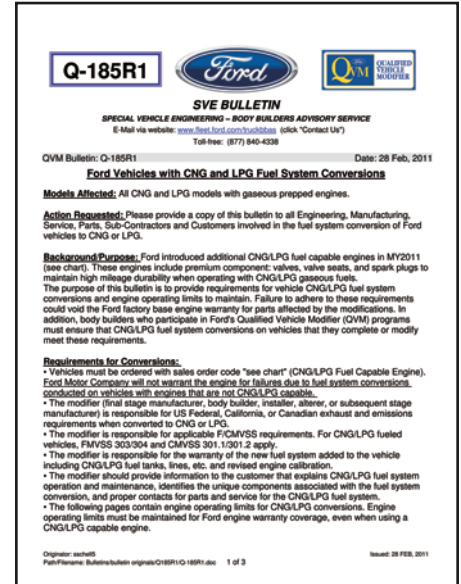
# Ford Engineering SUPPORT.

## Gaseous Fuel Qualified Vehicle Modifiers (QVM)

Ford has established a rigorous qualification program for alternative fuel vehicle modifiers. These guidelines are intended to provide guidance, modification recommendations and engine operating specifications required to ensure customer satisfaction and reliability in line with Ford Motor Company standards.

Onsite assessments at each QVM location assures conformance to a high standard of manufacturing, assembly, workmanship and customer service.

Modifiers that have demonstrated compliance to the Ford QVM guidelines and validation of the Q185R1 engine operating parameters are listed on page 7.



## Bulletin For Gaseous Fuel Modification

Ford has released a Qualified Vehicle Modifier (QVM) Bulletin Q-185R1 that provides guidance on modifying Ford Gaseous Prep Engines. The bulletin is updated as required and contains the following information:

- Proper engine order codes required for CNG/LPG conversion
- Calibration requirements to maintain factory limited warranty on the base engine
- Modifier responsibilities for required government emission and safety (FMVSS) certification
- Modifier responsibilities for warranty of the new or modified fuel system components
- Modifier required information to the customer to explain CNG/LPG fuel system operation and maintenance, identify unique components associated with the CNG/LPG conversion, and provide contacts for parts and service of the CNG/LPG fuel system

QVM Bulletin #Q-185R1 can be found on Ford's Fleet website: [www.fleet.ford.com/truckbbas](http://www.fleet.ford.com/truckbbas), refer to Bulletins Tab.




































Engine dynamometer and calibration tests.

# Broad Portfolio Of Gaseous Fuel SOLUTIONS.

## Engine and Vehicle Modifiers

Ford is working with seven gaseous fuel qualified modifiers. Together they provide QVM-qualified packages for the vehicles and engines shown below. These companies provide finished, ready-to-use vehicles through Ford dealerships. Modifiers may also provide and install other equipment, bodies and accessories necessary for your business.

		GASEOUS FUEL MODIFIERS						
VEHICLE	Engine	ALTECH-ECO	BAF	IMPCO	LANDI RENZO	ROUSH CLEANTECH	VENCHURS	WESTPORT
Transit Connect	2.0L							
E-Series Cargo Vans	5.4L/6.8L				 <sup>(2)</sup>			
E-Series Wagons	5.4L/6.8L				 <sup>(2)</sup>			
E-Series Cutaway & Stripped Chassis	5.4L/6.8L				 <sup>(2)</sup>	 <sup>(1)</sup>		
F-Series Super Duty Pickup & F-350 Chassis Cab	6.2L							
F-Series Super Duty Chassis Cabs F-450/550/650	6.8L							 <sup>(3)</sup>
F53 & F59 Stripped Chassis	6.8L							

(1) E-450 6.8L School Bus Package available through ROUSH CleanTech and Micro Bird.

(2) 5.4L engine only.

(3) F-450/F-550 only.

## Gaseous Fuel Modifier Contact Information\*

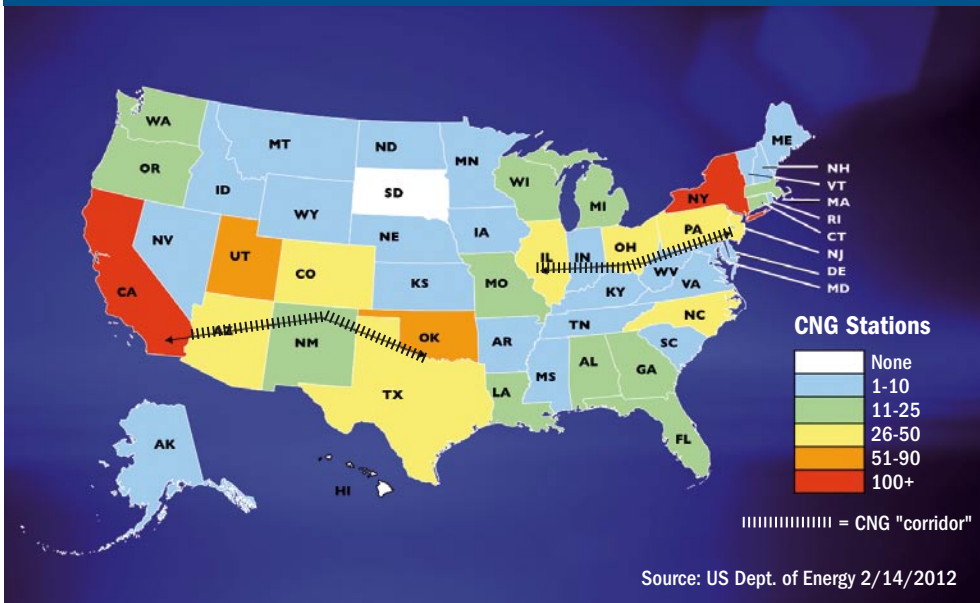
COMPANY	WEBSITE
Altech-Eco	<a href="http://altecheco.com/pages/CNG_Conversions.htm">http://altecheco.com/pages/CNG_Conversions.htm</a>
BAF®	<a href="http://www.baftechnologies.com">www.baftechnologies.com</a>
IMPCO®	<a href="http://www.impcoautomotive.com">www.impcoautomotive.com</a>
LandiRenzo®	<a href="http://www.landiusa.com">www.landiusa.com</a>
ROUSH® CleanTech	<a href="http://www.roushcleantech.com">www.roushcleantech.com</a>
Venchurs	<a href="http://www.venchurs.com/venchurs-vehicle-systems">www.venchurs.com/venchurs-vehicle-systems</a>
Westport	<a href="http://www.wingpowersystem.com/">www.wingpowersystem.com/</a>

\* For additional Gaseous Fuel Modifier contact information, go to [www.fleet.ford.com/truckbbas](http://www.fleet.ford.com/truckbbas) and click on the "Other" tab. From the drop-down menu, select "QVM Participants" then click on "Alternative Fuel."

# CNG INFRASTRUCTURE.

## CNG Infrastructure

Number of Compressed Natural Gas Stations by State



The United States has over 1,100 operational CNG service stations and hundreds more are planned.

CNG stations can be found in almost every state with high population densities in addition to states having high levels of energy production.

The industry forecasts the emergence of CNG corridors from CA to OK and IL to NY.

There are also 57 Million homes heated by natural gas – a potential CNG filling point with installation of a compressor.



## GE CNG Fueling Supply System

GE's CNG In A Box™ is a fully integrated commercial CNG fueling supply system offering cost-effective plug and play simplicity for fleet and retail fueling. It can provide CNG fueling at a rate of up to 7.66 gasoline gallons equivalent (GGE) per minute and a pressure of 3,600 psi. This flexible technology is available with a credit card reader and can be used by a number of fleets or customers. For additional information, refer to the "Contact" tab at [www.ge-energy.com](http://www.ge-energy.com)

## Resources

Current refueling stations can be found at one of the following internet sites:

[www.drivealternatives.com](http://www.drivealternatives.com)

Online database of CNG/LPG and Ethanol (E85) refueling stations.

[www.cleanenergyfuels.com](http://www.cleanenergyfuels.com)

One of the leading providers of natural gas fuel in North America.

[www.cngnow.com](http://www.cngnow.com)

Provides a "Locator" for CNG refueling stations, as well as a great source for CNG information.



# LPG INFRASTRUCTURE.

Already the third most widely used engine fuel behind gasoline and diesel, propane has a national infrastructure in place. Thousands of refueling stations, up to 56,000 miles of pipeline, an established distribution process, and more than 6,000 retail propane dealer locations makes propane readily available throughout the U.S., with fueling stations in every state. For propane refueling station locations, visit the Department of Energy's website listed below.

In addition to the thousands of propane autogas fueling stations found throughout the U.S., there are two additional options for propane refueling — skid-mount and permanent stations. With skid mount, above ground refueling stations typically come pre-assembled and are easy and inexpensive to have installed. Permanent stations feature underground propane storage tanks. Both have dispensers for ease of use similar to conventional refueling. There are many different federal and state tax incentives for installing new propane fueling structures and fueling with propane.

For a list of propane companies that will install a skid-mount or permanent station, refer to the ROUSH® CleanTech website below.



## Resources

[www.afdc.energy.gov/afdc/locator/stations](http://www.afdc.energy.gov/afdc/locator/stations)

With more than 2,500 fueling stations across the United States, propane is easily accessible. To find a location, visit the Department of Energy website.

[www.propanecouncil.org](http://www.propanecouncil.org)

The Propane Education & Research Council (PERC) promotes the safe, efficient use of propane as a preferred energy resource through research and development, training and safety programs.

[www.roushcleantech.com/content/propane](http://www.roushcleantech.com/content/propane)

Provides a “locator” for propane refueling stations, as well as a great source of propane information.

**INFORMATION  
at your  
FINGERTIPS.**

## Smart Phone Apps

Google “Smart Phone Apps Alternative Fuels”. Search engine provides dozens of smart phone applications that locate CNG/LPG/E85 refueling stations and electric vehicle recharging stations.



# Ford Gaseous Fuel Vehicle TESTIMONIALS.



Lynn Lyon and other members of the Pioneer Natural Resources team.



## Pioneer Natural Resources

Pioneer Natural Resources is a large independent oil and gas exploration and production company located in Irving, Texas. Recently, Pioneer added 225 bi-fuel, Westport WiNG natural gas powered Ford F-250 Super Duty trucks to their fleet.

Pioneer has begun transitioning a number of its fleet vehicles from gasoline and diesel power to those able to run on more cost-effective compressed natural gas (CNG).

"Pioneer strives to lead by example with our commitment to natural gas vehicles and engines in our own operations," said Jay Still, Executive Vice President of Domestic Operations at Pioneer. "Transitioning to natural gas for our fleet fuel is good economics, good for the environment and good for American jobs."

"Our team at Pioneer has been driving the WiNG powered Ford F-250s since they became available earlier this year, and we've been impressed with the simple order process, delivery times, product and the company," said Lynn Lyon, Director of Fuel Marketing at Pioneer. "I had a chance to visit the assembly center in June and was impressed with the team and the highly-sophisticated facility."

Westport LD recently opened the Westport Kentucky Integration Center (WKIC) in Louisville where the natural gas WiNG power systems are installed on Ford F-250 and F-350 bi-fuel pickup trucks. With the ability to run on either natural gas or gasoline, the Ford trucks offer drivers more than 650 miles of range with two full tanks, and can take advantage of a low cost, domestic fuel.

"Pioneer is one of our most important customers and we're proud that they have chosen Westport WiNG quality and our ability to deliver," said John Howell, Senior Director of Marketing and Development, Westport LD. "We're pleased with the industry recognition of Westport LD so soon after opening our new facility. It's a great vote of confidence in the WiNG product, and it's encouraging that we're able to establish a growing market for Ford Super Duty trucks that can be powered by natural gas."



## Yellow Cab of Greater Orange County

Yellow Cab of Greater Orange County, California has provided transportation services to the Southern California community for over 65 years. Founded in 1945, Yellow Cab has survived and prospered by being innovative and constantly seeking new, better and more cost effective ways to operate a successful transportation company.

Larry Slagle, Senior Vice President of Taxi Operations said, "Two of our concerns were vehicle life and fuel costs. In keeping with the theme of being a good corporate neighbor and a thoughtful community partner, Yellow Cab became a pioneer of using a dedicated alternate fuel system for both CNG and later, LPG to transport our clients in this area.

These systems made our fleet green and of course cleaned up the exhaust substantially considering we travel approximately 200 miles per taxi per day. This also brought us a more economical fuel price and a reliable supply of fuel, not to mention longer engine life due to the clean fuel use. Some of our early CNG taxis, the Ford Crown Victoria, were in service for more than 500,000 miles average per taxi. A huge cost advantage to our operation.

As the fuel systems evolved and the cars were designed to be lighter and more aerodynamic, the fuel and maintenance costs further declined. This allowed us to buy new cars to compete with other transportation providers on a different level which clearly delineated our service product.

With the phase out of the heavy duty Crown Victoria for Police and Taxi, Yellow Cab turned to the Transit Connect. While we were initially worried about a model change, we are past that fear now with over 150,000 miles on the new taxis. The Transit Connect has performed at a high level successfully satisfying our concerns about cost effective maintenance, fuel efficiency and providing an environmentally friendly CNG platform. In addition, our passengers like the unique design, the ride, and the storage area for luggage capacity for visiting tourists and conventioners.

In short, Ford continues to connect us to our passengers and our community service in a rewarding way."



*Larry Slagle - Senior Vice President-Taxi Operations-Yellow Cab*



# Ford Gaseous Fuel Vehicle TESTIMONIALS.



*Tom Armstrong (left), Fleet Director for ThyssenKrupp Elevator, and Todd Mouw, Vice President of Sales and Marketing, ROUSH CleanTech*

## ThyssenKrupp Elevator Americas

ThyssenKrupp Elevator, the largest producer of elevators in the Americas, knows the ups and downs of running a successful business.

In 2010, ThyssenKrupp Elevator's fleet department started evaluating alternative fueled vehicles to explore ways to combat rising fuel costs.

With all the alternative fuel choices available today, they needed a tool to effectively analyze and justify each fuel or alternative fuel vehicle type.

The "Five C's" protocol of analyzing alternative fueled vehicles was created:

- Is it clean?
- Does it conserve?
- Is it cost effective?:
- Does it make common sense?
- Can you commit?

According to Tom Armstrong, Fleet Director at ThyssenKrupp Elevator, the only product that qualified for all "Five C's" was propane autogas.

ThyssenKrupp runs 54 ROUSH® CleanTech propane autogas vehicles across five geographic markets. "When we first started out, we were looking to reduce the company's carbon footprint by 20 percent by 2015, and a 12 percent improvement in fuel efficiency by 2012," explained Armstrong. "We have already met both of those goals and couldn't be more pleased with how propane autogas is performing for us."

Based on the lower cost of propane vs. gasoline, Armstrong reports the company has saved over \$224,208 in annual fuel cost reductions in their Phoenix market alone. "We have found our rate of return is roughly two to four years per vehicle. With an estimated six-year vehicle life, we have at least two years of positive return on our investment per vehicle."



# Ford is an ELECTRIFICATION LEADER.

Ford's electrification strategy involves three types of electrified vehicles – hybrid electric, plug-in hybrid electric and all-electric – to provide customers with significant fuel economy improvements and reduced CO<sub>2</sub> emissions without compromising the driving experience.

Among the highlights:

**Focus Electric** is one of America's most fuel-efficient five-passenger vehicles with an EPA-estimated rating of 110 miles per gallon equivalent (MPGe) city rating, 99 MPGe highway and 105 MPGe combined.

**Fusion Hybrid** is America's most fuel-efficient hybrid sedan, delivering EPA-estimated rating of 47 mpg city, highway and combined.

**Fusion Energi** plug-in hybrid offers an EPA-estimated rating of 108 MPGe city, providing a range of up to 620 miles.

**C-MAX Hybrid** is America's most fuel-efficient hybrid utility delivering EPA-estimated rating of 47 mpg city, highway and combined.

**C-MAX Energi** has an EPA-estimated rating of 108 MPGe in the city. C-MAX Energi achieves a combined EPA-estimated rating of 100 MPGe.



## Focus Electric

**Mechanical:** 107-kW electric motor/23-kWh liquid-cooled lithium-ion battery

**Horsepower/Torque Equivalent:** 143 hp / 184 lb.-ft.

**Miles Per Gallon Equivalent (MPGe):** 110 city/99 highway/105 combined

**Range:** 76 miles

**Top Speed:** 84 mph

**Charge Time:** 4 hrs. (240 v); 18-20 hours (120 v)



## Fusion Energi

**Engine:** 2.0L DOHC I-4, Atkinson cycle; AC synchronous motor

**Horsepower/Torque:** Gas: 141 hp/129 lb.-ft. @ Electric: 118 hp /88kW; Total system power (sustain): 188 hp

**Miles Per Gallon Equivalent (MPGe):** 108 city/92 highway/100 combined

**Range:** 620 miles

**All-Electric Range:** 21 miles

**Top Speed:** 102 mph/85 mph electric only mode

**Charge Time:** 2.5 hrs. (240 v); 7 hours (120 v)



## C-MAX Energi

**Engine:** 2.0L DOHC I-4, Atkinson cycle; /AC synchronous motor

**Horsepower/Torque:** Gas: 141 hp/129 lb.-ft. @ Electric: 118 hp /88kW; Total system power (sustain): 188 hp

**Miles Per Gallon Equivalent (MPGe):** 108 city/92 highway/100 combined

**Range:** 620 miles

**All-Electric Range:** 21 miles

**Top Speed:** 102 mph/85 mph electric only mode

**Charge Time:** 2.5 hrs. (240 v); 7 hours (120 v)



## F-750 Hybrid\*

**Engine:**  
 · 6.7L Cummins ISB  
 · Remy HVH 250 Electric Drive Motor; 80 hp/59.2 kW  
 Plug-in Hybrid with lithium-ion 28.4 kW batteries

**Transmission:**  
 · Allison Automatic

**Upfit Weight:**  
 · 1,800 lbs.

**Range:**  
 · 300 miles with 50-gallon fuel tank

\*-Modification by Odyne



## Fusion Hybrid

**Engine:** 2.0L DOHC I-4, Atkinson cycle

**Horsepower/Torque:** Gas: 141 hp/129 lb.-ft. @ Electric: 118 hp /88kW @ 6,000 rpm; Total system net horsepower (sustain): 188 hp

**Miles Per Gallon:** 47 city/47 highway/ 47 combined

**Range:** 571 miles

**Top Speed:** 115 mph/62 mph in EV mode

**Battery Peak Power:** 35 kW



## C-MAX Hybrid

**Engine:** 2.0L DOHC I-4, Atkinson cycle

**Horsepower/Torque:** Gas: 141 hp/129 lb.-ft. @ Electric: 118 hp /88kW @ 6,000 rpm; Total system net horsepower (sustain): 188 hp

**Miles Per Gallon:** 47 city/47 highway/ 47 combined

**Range:** 571 miles

**Top Speed:** 115 mph/62 mph in EV mode

**Battery Peak Power:** 35 kW

# Electric Vehicle INFRASTRUCTURE.

## CHARGING STATIONS

### Commercial

A number of companies offer commercial electric vehicle (EV) charging infrastructure. These commercial grade Level 2 (240V) systems can recharge vehicles significantly faster than using an ordinary 110V outlet. They can fully charge a Focus Electric in less than four hours and the C-MAX Energi or Fusion Energi in less than three hours. Pictured is the GE WattStation™.

Plug your vehicle in and the charge port will illuminate to indicate the state of charge. The charging station will also show a charging icon to signal that the vehicle is in the process of charging. When charging is complete, users simply stow the cord, keeping it organized for the next user. GE WattStations are available in pedestal or wall mount configurations. Wall mount units can either be hard wired for permanent installations or plugged in to an existing 240V outlet for simple removal of the unit.



### Public

For fleet drivers to charge their all-electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) in public, charging stations are being deployed with consideration for daily commutes and typical driving habits.

Public charging stations make EVs and PHEVs more convenient to charge. Although the majority of EV and PHEV drivers will charge at home, public charging stations can increase the useful range of EVs and reduce the amount of gasoline consumed by PHEVs.

Generally public charging uses Level 2 (240V) service and are usually located where vehicle owners are highly concentrated, such as shopping centers, city parking lots and garages, airports, hotels, government offices, and other businesses.

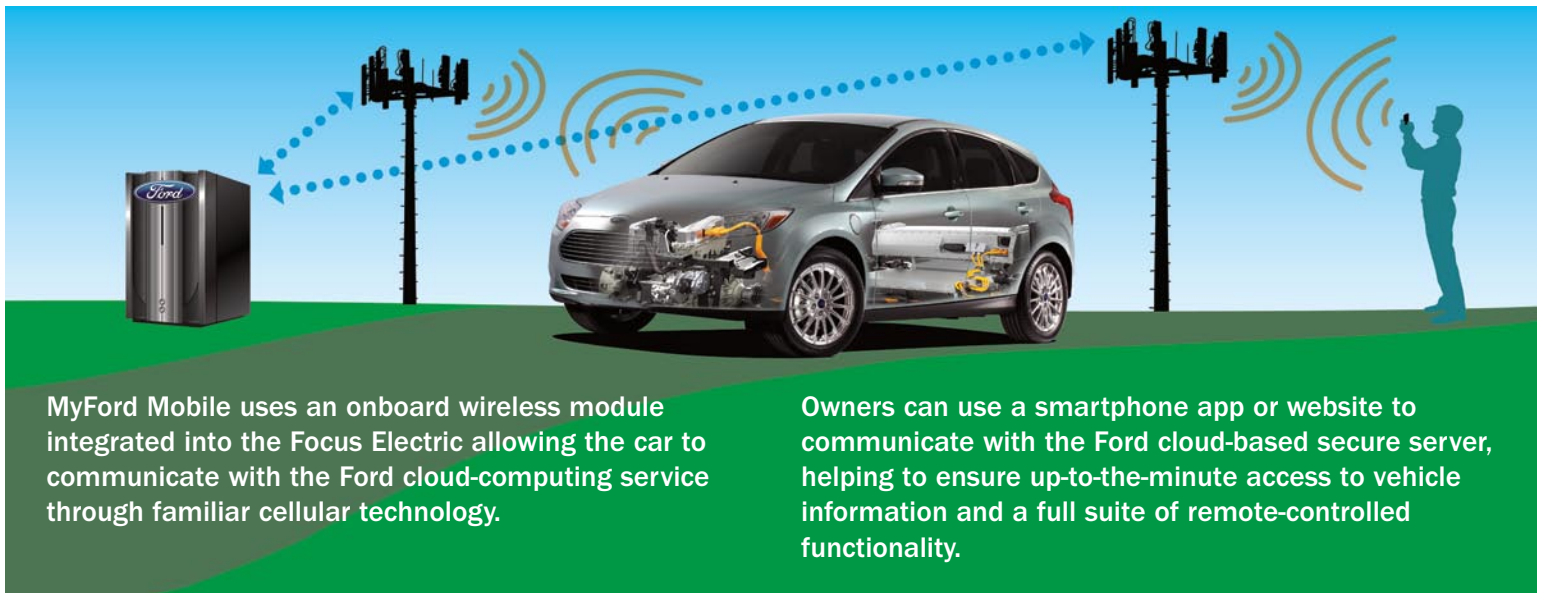


Source: [www.afdc.energy.gov/fuels/electricity\\_charging\\_public.html](http://www.afdc.energy.gov/fuels/electricity_charging_public.html)

## MyFord® Mobile Communicates with Ford Plug-in Hybrid and All-Electric Vehicles

MyFord Mobile is a smartphone app and website that enhances the electric vehicle experience. The app helps find current and projected battery state of charge information including estimated range and the amount of charge time necessary for additional EV only range. MyFord Mobile is able to optimize use of electricity from the grid with a value charging feature and get up-to-date charge station information from MapQuest® and PlugShare.

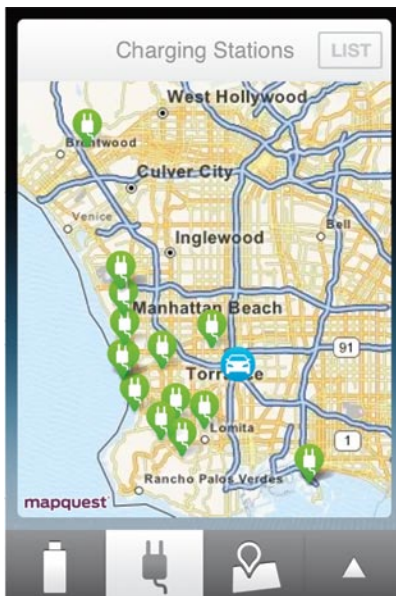
MyFord Mobile allows remote access of the car from nearly anywhere, anytime.



MyFord Mobile uses an onboard wireless module integrated into the Focus Electric allowing the car to communicate with the Ford cloud-computing service through familiar cellular technology.

Owners can use a smartphone app or website to communicate with the Ford cloud-based secure server, helping to ensure up-to-the-minute access to vehicle information and a full suite of remote-controlled functionality.

## Charging Station Locators



### Overview

MyFord Mobile displays information for over 10,000 public charge stations helping EV customers plan their daily trips and maximize their EV miles driven with confidence. With charge station information powered by PlugShare and MapQuest, MyFord Mobile will deliver up-to-date information on charge station locations with the ability to map destinations and send charge station location information to their vehicle navigation system, if equipped.

### Features

- Find charge station locations while trip planning
- View other information including number of Level 1/2 chargers
- Send charging station locations to your vehicle with Send to SYNC® , if equipped
- Includes stations across U.S. and Canada

# Lower Total COST OF OWNERSHIP.

The primary goal of most fleet managers is to achieve and maintain the lowest Total Cost of Ownership (TCO) for their fleet.

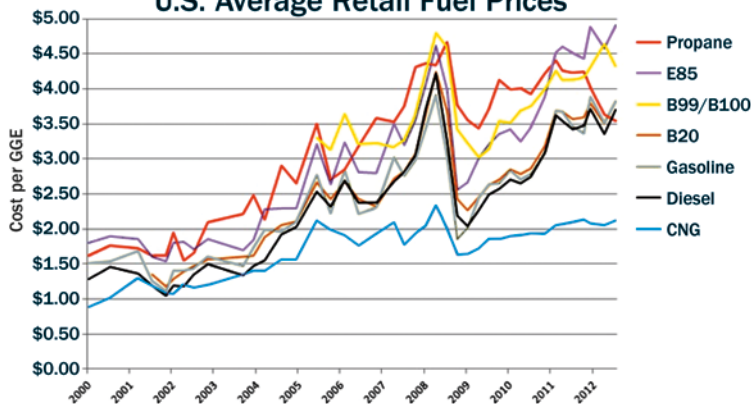
TCO calculations should include the acquisition cost of the vehicle, duty cycle, mileage traveled, fuel (or fuels) used, associated infrastructure, maintenance costs and the residual value of the vehicle, along with any other ancillary costs.

The calculations shown below address only the cost components of selecting an alternative fuel compared to gasoline assuming all other aspects are equal. Fuel prices for this brochure were extracted from [www.afdc.energy.gov/data/tab/fuels-infrastructure/data\\_set/10326](http://www.afdc.energy.gov/data/tab/fuels-infrastructure/data_set/10326).

## National Average Price Between September 28 and October 12, 2012

Fuel	Price
Biodiesel (B20)	\$4.18/gallon
Biodiesel (B99-B100)	\$4.39/gallon
Electricity	\$0.11/kWh*
Ethanol (E85)	\$3.47/gallon
Natural Gas (CNG)	\$2.12/GGE
Propane	\$2.56/gallon
Gasoline	\$3.82/gallon
Diesel	\$4.13/gallon

## U.S. Average Retail Fuel Prices



Source: *Alternative Fuel Price Report, October 2012, (PDF)*

\* Average price per kilowatt hour in 2012 (source: U.S. Energy Information Administration).

As the chart indicates, fuel prices ranged from \$2.12-\$4.39 in October 2012, but that is only half the story. The graph shows the prices of each fuel per gasoline gallon equivalent (GGE), a relative measure that captures the energy density for each fuel. When viewed this way, ethanol and some higher blends of biodiesel become significantly more expensive.

## Calculating the fuel cost payback for any alternative fuel is straightforward:

- A: Identify the base price of the vehicle you need assuming a gasoline engine
- B: Identify the price increase needed to use an alternative fuel over the base vehicle:
  - Flex Fuel (E85) is generally available at little or no upcharge
  - Diesel (up to B20) can range from \$8,000 and up
  - CNG/LPG conversions can range from \$10,000 and up
- C: Identify the price of gasoline
- D: Identify the price of your alternative fuel per GGE
- E: Determine the estimated MPG based on your duty cycle (towing, hauling, etc.)
- F: Determine the number of miles travelled per year

Then perform the following calculations:

- 1:  $(F/E) * (C-D) =$  your expected annual fuel savings over using gasoline
- 2: Divide your upfit cost for alternative fuel (B) by your annual fuel savings to determine the time period needed to payback the upfit
- 3: If the payback period is a shorter time than you plan on owning your vehicle, then you are on your way to achieving lower costs, reduced emissions and reduced dependence on foreign oil all at the same time.

**Example:** an F-Super Duty customer driving 20,000 miles per year at 12 MPG. To consider a CNG conversion at \$10,000 with gasoline priced at \$3.82/gallon and CNG at \$2.12/GGE, the calculations is:  
 $(20,000/12) * (\$3.82 - \$2.12) = \$2,833$  savings per year.  
 $\$10,000 / \$2,833 = 3.5$  years to payback the upfit cost.

Many alternative fuels have additional incentives available from states and the federal government. These incentives can significantly reduce the payback period.

Some general rules of thumb:

- The higher the annual miles driven, the more likely that alternative fuels will make economic sense.
- The lower the fuel efficiency (mpg), the more likely that alternative fuels will make economic sense.
- The more price gap widens between an alternative fuel and gasoline, the shorter the payback period.

*For a detailed analysis, Ford recommends that you work with a Commercial Account Manager at one of our Business Preferred Network Dealers to address your specific needs.*



# Alternative Fuel INCENTIVES.

## Ford Incentives

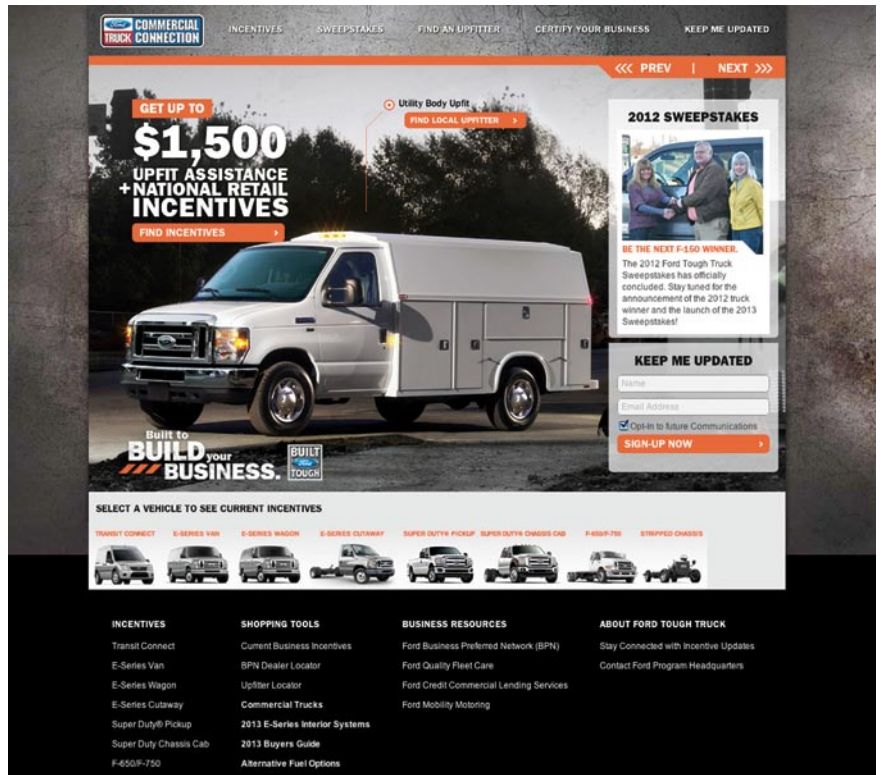


[www.fordtoughtruck.com](http://www.fordtoughtruck.com)

**Ford Truck Commercial Connection (FTCC)** is a program that provides financial incentives to upfit your Ford commercial vehicles.

Upfit savings on Ford alternative fuel vehicles help to further increase your purchasing power and reduce the total cost of ownership.

For more information about ongoing offers, upfit incentives and tax benefits, login at [fordtoughtruck.com](http://fordtoughtruck.com).



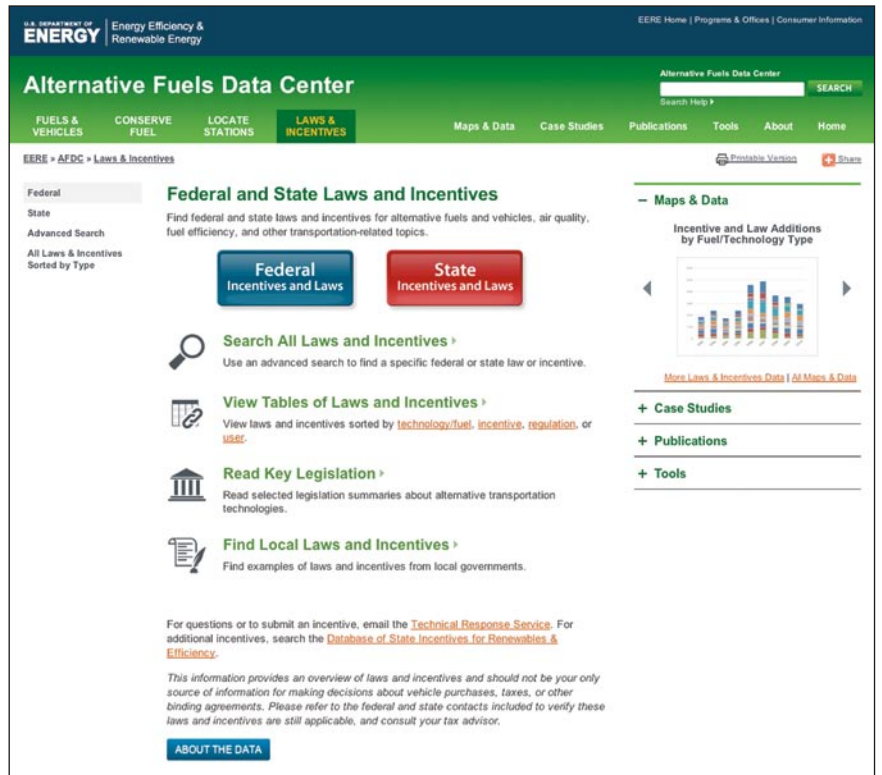
## Government Incentives

[www.afdc.energy.gov/laws/](http://www.afdc.energy.gov/laws/)

U.S. Department of Energy allows you to search its database of federal and state laws and incentive programs related to alternative fuel vehicles.

[www.fueleconomy.gov](http://www.fueleconomy.gov)

Information about federal and state tax incentives for purchasing alternative fuel vehicles.



website page shown: [www.afdc.energy.gov/laws/](http://www.afdc.energy.gov/laws/)

# Popular Alternative FUEL Sources.



**Flexible-Fuel Vehicles (FFV)** are designed to operate the internal combustion engine for a range of gasoline and ethanol blends. FFVs are capable of burning any blend ranging from 100% gasoline (E0) up to 85% ethanol/15% gasoline (E85). Fuel injection and spark timing are automatically adjusted according to the specific blend detected by electronic sensors. E85 is the most common Flex Fuel and many Ford engines are equipped to handle this fuel type.

**Biodiesel** refers to a vegetable oil-based or animal fat-based diesel fuel. Blends of Biodiesel and conventional (hydrocarbon-based) petrodiesel fuels are products most commonly distributed for use in the retail diesel fuel marketplace. A system known as the “B” factor is used to state the amount of Biodiesel in any fuel mix:

- 100% Biodiesel (B100) is referred to as B100, while
- 20% Biodiesel (B20) is labeled B20
- 5% Biodiesel (B5) is labeled B5
- 2% Biodiesel (B2) is labeled B2



**Compressed Natural Gas (CNG)** is a fossil fuel substitute for gasoline or diesel. CNG is domestically sourced and reduces our dependence on foreign oil. It is safer than other fuels in the event of a spill (natural gas is lighter than air, and disperses quickly when released). CNG is made by compressing natural gas which is mainly composed of methane. It is stored and distributed in hard containers at a pressure of 2,900–3,600 psi. CNG is used in traditional gasoline internal combustion engines that have been modified to operate on CNG.

**Advantage** – Ethanol/E85 is clean-burning and substantially reduces CO and CO<sub>2</sub> emissions. Compared to gasoline, E85 has a higher octane rating, provides the same or more horsepower and burns cooler. Corn and other cellulosic plant sources are readily available.

**Consideration** – E85 produces less energy by volume than gasoline. One gallon of gasoline is the equivalent of 1.56 gallons of E85 used to travel the same distance. Due to the increased volume required and the fact that alcohol is corrosive, fuel system components must be upgraded.



All Ford diesels are capable of running on any blend of biodiesel up to and including B20.

**Advantage** – Biodiesel (B20) burns cleaner than petrodiesel, with reduced emissions.

**Consideration** – Biodiesel (B20) may be more expensive than petrodiesel and in low temperatures may require a special additive or fuel tank heater to flow properly.

**Advantage** – CNG is an extremely clean burning fuel and significantly reduces CO, CO<sub>2</sub> and NOx compared to its gasoline counterpart.

CNG is typically less expensive than gasoline and the fuel price is also less volatile.

CNG has an octane rating of 130 and has the potential to optimize the engine's thermodynamic efficiency by utilizing a higher compression ratio.

**Consideration** – CNG has slightly less energy than gasoline per unit volume and requires a larger fuel tank/container. Refueling time and infrastructure are also considerations.



**Liquefied Petroleum Gas (LPG)**, often referred to as autogas, is a mixture of hydrocarbon gases, most commonly propane and butane. A powerful odorant, ethyl mercaptan, is added so that leaks can be detected easily. As opposed to relying on foreign oil sources, approximately 90% of the United States propane supply is produced domestically. 70% of the remaining supply is imported from Canada and Mexico.

Propane is non-toxic and cannot get into the water table if there is a leak in the storage container.

From an economic perspective, propane is an effective alternative to conventional transportation fuels when capital cost (vehicle and infrastructure), operation and maintenance are all taken into consideration.

**Advantage** – Power, acceleration, payload and cruise speed are unchanged to an equivalent vehicle fueled by gasoline. Propane has a high octane rating of 104, in-between Compressed Natural Gas (CNG) at 130 and unleaded gasoline at 87.

**Consideration** – Because of the low vapor pressure of propane, in extremely cold conditions, starting vapor injection systems, could be an issue. Propane autogas has fewer BTU's than gasoline, which results in a loss of mpg of about 10-15 percent.

**Hybrids & Plug-In Hybrids** are vehicles that utilize both an internal combustion engine AND electric motors to propel the vehicle.

**Hybrids (HEVs)** are powered in part by gasoline and part by a battery-driven electric motor. They seamlessly switch between the gasoline engine, electric motor or a combination of both to deliver fuel efficiency and performance. The battery pack is automatically recharged by the gasoline engine and through regenerative braking. Hybrids do not plug in.

**Plug-In Hybrids (PHEVs)** are progressive hybrids that expand capability by providing the option of plugging in or not. To enhance the hybrid experience and maximize the battery capability, drivers can choose to plug into a standard 120V or available 240V outlet. By fully charging before driving, you may achieve greater fuel savings and minimize your carbon footprint. Ford PHEVs feature an electric vehicle (EV) mode button which allows the driver to choose electric-only mode (EV Now), saving plug-in

power for later use (EV Later), or driving in normal hybrid operation (Auto EV). PHEVs offer the best of both worlds, driving like an EV for short trips or like a hybrid for longer trips.

**Advantage** – Hybrids may significantly reduce fuel consumption especially if the duty cycle of the vehicle involves urban driving with lots of stop and go. By substituting grid energy for gasoline, PHEVs can offer an additional improvement in fuel savings and emissions.

**Consideration** – The vehicle essentially has two powertrains. Combining powertrains increases vehicle weight, reduces payload and towing capability.



**Battery Electric Vehicles (BEVs)** are powered completely by a rechargeable battery so you never need a drop of gasoline or an oil change. Key features are the electric motor, charge port and lithium-ion battery pack. BEVs provide a CO<sub>2</sub>-free driving experience. Drivers plug the vehicle in to fully charge the battery pack. While driving, regenerative braking also aids in charging the battery.

**Advantage** – Vehicles that run solely on electric power require no warm-up, run almost silently and have excellent performance. Electric vehicles can be recharged at night when generating plants are under utilized. Electric vehicles produce zero tailpipe emissions.

**Consideration** – Pure electric vehicles have limited range. For example, the Focus Electric has an EPA range of 76 miles. Charge time is also important to assess. Depending on voltage, charging overnight may be needed to fully recharge a depleted battery.



# COMING SOON TRANSIT and TRANSIT CONNECT



## All-New Transit and Redesigned Transit Connect

### TRANSIT

The all-new Ford Transit lineup will eventually replace the legendary E-Series, the best-selling vans in history. Adding capability, fuel economy and improved driving dynamics, Transit sets the new standard for full-size commercial vans.

The Transit will be offered with the standard 3.7L V6 (Flex Fuel capable), the same 3.5L EcoBoost engine proven in the F-150 and an all-new 3.2L Power Stroke® diesel option (B20 capable). The 3.7L V6 engine is available with a Gaseous Engine Prep Package for conversion to CNG/LPG.

The full-size Transit will be built in Kansas City and customers can expect to see it arriving in dealerships in early 2014.



### TRANSIT CONNECT

The popular Transit Connect is all new for 2014 and will be available with a number of new features and models. Available as a commercial van or passenger wagon, Transit Connect will be available in two wheel-bases, XL and XLT series trim and a choice between two fuel-efficient engines. Standard equipment will be the four cylinder 2.5L engine and optional will be the 1.6L EcoBoost four cylinder estimated to deliver 30+ mpg on the highway.

Transit Connect's 2.5L engine will be available with a Gaseous Engine Prep Package for conversion to CNG/LPG operation by a Ford recognized modification company.



*Pre-production vehicles shown*



Ford encourages you to please recycle this document.

**Commercial Vehicle Sales & Marketing  
North American Fleet, Lease and Remarketing Operations**

*Data from multiple industry sources.*

*Information for this publication was correct at the time at which the material was being prepared for printing. Specifications and availability shown are subject to change without notice and Ford Motor Company assumes no liability for such changes.*

