



# Ford's Electrification Future

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.

Ford's near-term electrification plan calls for the company to triple production capacity of its electrified vehicle range by 2013. Among the highlights:

Fusion Hybrid will be all-new for 2013 and it's anticipated that the car will be able to deliver up to 47 city mpg and 44 highway

Ford's all-new Focus Electric is now officially America's most fuel-efficient five-passenger car with an EPA-certified 110 miles per gallon equivalent (MPGe) city rating, 99 MPGe highway and 105 MPGe combined. C-MAX Hybrid and C-MAX Energi plug-in hybrid will join Ford's electrified vehicle lineup in the second half of 2012

## Full Hybrid Vehicle



The hybrid electric vehicle combines an internal combustion engine with an electric motor and battery. Electric power is used for vehicle launch and lower-speed operation. The internal combustion engine takes over for higher-demand operation and charges the battery

About 70 percent better than comparable non-hybrid models

## Plug-in Hybrid Electric Vehicle



Plug-in hybrid electric vehicles combine hybrid electric technology with a high-voltage storage battery like that used in an all-electric vehicle. The vehicle operates via battery power when started. Once the battery power is depleted, the vehicle switches to charge-sustaining hybrid mode for continued optimal fuel economy

Fusion Energi is anticipated to deliver more than 100 miles per gallon equivalent (MPGe)  
C-MAX Energi is expected to deliver a 500-mile overall driving range and best the Toyota Prius plug-in hybrid in fuel economy equivalent in electric mode

## All-Electric Vehicle



An all-electric vehicle does not use a drop of fuel. Instead of an internal combustion engine, it features a high-voltage electric motor, which takes its power from a battery pack charged by plugging in to a 120- or 240-volt outlet

The U.S. Environmental Protection Agency has certified the Focus Electric as America's most fuel-efficient five-passenger car. Focus Electric can offer the equivalent of 110 miles per gallon (MPGe) while driving in a city, 99 MPGe highway and 105 MPGe combined.

Focus Electric also has been certified to provide a range of 76 miles on a single charge, besting Nissan's Leaf by three miles.

### Fuel economy/range

### Engine

High-efficiency Atkinson cycle in combination with motor

### Motor

High-voltage electric motor-generator

### Emissions

Partial Zero Emission Vehicle (PZEV)

### Battery type

**Current Fusion Hybrid:** Nickel-metal-hydride  
**Future hybrids:** Lithium-ion (li-ion)

### Regenerative braking

Yes

### Charging time

Requires no electrical infrastructure connection

### Customer usage

Flexible for a wide range of customer use, with excellent urban fuel economy

### Ford electric vehicle experience

Five years of production experience:  
• Ford Escape Hybrid - the world's most fuel-efficient SUV  
• Ford Fusion and Lincoln MKZ Hybrids - America's most fuel-efficient midsize cars  
• C-MAX Hybrid production begins in 2012

High-efficiency Atkinson cycle in combination with motor

High-voltage electric motor-generator

Partial Zero Emission Vehicle (PZEV)

Lithium-ion (li-ion)

Yes

C-MAX Energi and Fusion Energi will feature Ford's innovative on-board charging station to allow for full battery charge quicker than Chevrolet Volt

Real-world city driving for optimal fuel economy and more ideal for longer commutes than an all-electric vehicle

• Today's plug-in hybrids benefit from analysis of more than 500,000 miles of data collected from Ford's Escape plug-in hybrid test fleet, which helped engineers understand how plug-in hybrid vehicles are driven and charged and how parts perform under certain conditions  
• C-MAX Energi production begins in 2012

N/A

High-voltage electric motor-generator

Zero Emission Vehicle (ZEV)

Lithium-ion (li-ion)

Yes

Focus Electric is the first all-electric vehicle to offer faster charging technology that allows it to charge in four hours using 240-volt outlet – nearly half the time of a Nissan Leaf. Focus Electric also can be charged using a standard 120-volt outlet.

For customers with shorter, predictable daily trips of less than 100 miles total

• Prior development and demonstration fleets, including Ford Ranger electric vehicle  
• Transit Connect Electric commercial van is available

