MAXIMIZE YOUR MILEAGE

Hybrid vehicles are more sensitive to aggressive driving than conventional vehicles because the effect of decreased fuel economy is more pronounced in a vehicle that gets better fuel economy. For example, a hybrid that averages 45 MPG may only achieve 41 MPG with an aggressive driver, while a careful driver can gain 10% and achieve up to 50 MPG—creating a 9 MPG spread.

SMART DRIVING TIPS:

- **WHEN DRIVING:** After accelerating, release the accelerator pedal and then gently accelerate again. This increases use of the electric motor.
- **WHEN BRAKING:** Depress the brake pedal lightly and in good time. This allows a larger amount of electrical energy to be recharged while decelerating.
- **WHEN IN HEAVY TRAFFIC:** Use the accelerator pedal as little as possible, releasing the brake instead to progress forward slowly. Source: Toyota
- **AVOID “JACKRABBIT” STARTS AND STOPS.**
- **INCREASE YOUR FOLLOWING DISTANCE.** Traffic often speeds up and slows down like a slinky. By using a longer following distance, it’s easier to maintain a more constant speed.
- **WATCH YOUR SPEED:** Gas mileage drops rapidly with speeds over sixty.
- **MAINTAIN A STEADY SPEED:** Remove your foot from the accelerator and coast when possible.

HYBRID ELECTRIC VEHICLES

**ADVANCED ENERGY:** [www.NCGetReady.com](http://www.NCGetReady.com)
**ADVANCED TRANSPORTATION ENERGY CENTER/NC STATE UNIVERSITY:** [www.atec.ncsu.edu](http://www.atec.ncsu.edu)
**CENTRALINA CLEAN FUELS COALITION:** [www.4cleancfuels.com](http://www.4cleancfuels.com)
**HYBRID CENTER:** [www.hybridcenter.org](http://www.hybridcenter.org)
**LAND-OF-SKY CLEAN VEHICLES COALITION:** [www.CleanVehiclesCoalition.org](http://www.CleanVehiclesCoalition.org)
**NC SOLAR CENTER/NC STATE UNIVERSITY:** [www.cleantransportation.org](http://www.cleantransportation.org)
**PALMETTO STATE CLEAN CITIES:** [www.palmettocleanfuels.org](http://www.palmettocleanfuels.org)
**PLUG IN CAROLINA:** [www.plugincarolina.org](http://www.plugincarolina.org)
**TRIANGLECLEANCITIESCOALITION:** [www.trianglecleancities.org](http://www.trianglecleancities.org)
**U.S. DEPT OF ENERGY ALTERNATIVE FUELS AND ADVANCED VEHICLES DATA CENTER:** [www.afdc.energy.gov/afdcv](http://www.afdc.energy.gov/afdcv)
**U.S. DEPT. OF ENERGY FUEL ECONOMY GUIDE:** [www.fueleconomy.gov](http://www.fueleconomy.gov)

**ABOUT THIS PROJECT**
The Carolina Blue Skies and Green Jobs Initiative is a Clean Cities project awarded by U.S. Department of Energy to Triangle J Council of Governments, in Research Triangle Park, NC. [Award # DE-EE0002491]. Support for alternative fuel vehicles and infrastructure projects is facilitated through the collaboration of five principal partners in the Carolinas.

**PROJECT PARTNERS**

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**IDEAL APPLICATIONS**
- Suburban low-speed driving and short city trips
- Stop-and-go driving
- All passenger vehicles, and medium-and heavy duty vehicles such as utility and delivery trucks.

**FACTOID #1**
Hybrids can boast better low-end torque than comparable conventional vehicles; the gasoline-electric drive will actually deliver better acceleration at low speeds.
WHY ARE HEVs AN IMPORTANT CONSUMER CHOICE?

U.S. CARS AND TRUCKS ARE 94% RELIANT ON PETROLEUM.

OVER 60% OF THE PETROLEUM USED IN THE U.S. IS IMPORTED.

FOSSIL FUELS USED IN U.S. TRANSPORTATION REPRESENT OVER 30% OF THE GREEN HOUSE GAS EMISSIONS RESPONSIBLE FOR GLOBAL CLIMATE CHANGE. (SOURCE: EIA 2009)

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BENEFITS

- **FUEL EFFICIENCY** with HEVs can be substantially better than conventional vehicles. A HEV will generally see a 30-50% increase in fuel economy.

- **EMISSIONS CAN BE LOWER** in an HEV because engine operation is controlled more precisely and the electric motor shoulders some of the work.

- **LONGER LIFE AND LOWER MAINTENANCE** on the engine is expected because the combustion engine is assisted by the electric motor, allowing the engine to run at more optimal operating points.

- **LONGER BRAKE LIFE** can be achieved because the electric motor absorbs a large portion of the braking energy from the vehicle.

- **EASY TO USE**: HEVs are not plugged in to recharge the batteries.

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FACTOID #2

Diesel HEVs provide up to a 19% gain in fuel economy as compared to gasoline HEVs. Diesel engines are more efficient and diesel fuel has more energy per gallon than gasoline.

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FACTOID #3

According to the U.S. Environmental Protection Agency, burning one gallon of gasoline creates 19 lbs of CO₂. Since hybrids often have double the fuel economy and therefore half the CO₂ emissions of a traditional vehicle, a hybrid that travels 12,000 miles can reduce CO₂ emissions by up to 4.75 tons annually.

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FACTOID #4

In a typical gasoline engine, only 33% of the energy in the fuel is used to drive the car with over 30% of the total energy lost in exhaust emissions alone! Hybrids improve upon these inefficiencies.

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FACTOID #5

Diesel HEVs provide up to a 19% gain in fuel economy as compared to gasoline HEVs. Diesel engines are more efficient and diesel fuel has more energy per gallon than gasoline.

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www.carolinablueskies.net

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FEATURES

- **BATTERIES** - Nickel-metal hydride batteries, used routinely in computer and medical equipment, are widely used in hybrid vehicles. They have a much longer life cycle than lead-acid batteries, are safe, and can withstand abuse. These batteries typically have a 6-10 year life and cost $1,000 to $4,000 to replace.

- **ELECTRIC MOTOR** - The extra power provided by the electric motor allows for a smaller internal combustion engine (ICE), providing the hallmark of an HEV- better fuel economy with equal performance. The result is engine downsizing: smaller ICES with fewer cylinders.

- **REGENERATIVE BRAKING** - Captures energy normally lost during braking by using the electric motor as a generator and storing the captured energy in the battery. The energy from the battery provides extra power during acceleration.

- **TRANSMISSIONS** - The transmissions in many hybrid vehicles are planetary gear transmissions that require less maintenance and have a longer life. As a result, battery replacement costs can be offset by the $1,000 to $4,000 savings on a complete transmission rebuild after 8 to 12 years.