



2008 Toyota Prius gas-electric hybrid

# Alternative Energy Cars

Gas is going up—alternatives are few—but growing

**T**he price of gasoline keeps going up. Those big SUVs and pickups guzzle more gas than many people can afford. The market for these vehicles has tanked, so to speak. Even filling up a smaller sedan can cost a day's wages for many people.

There has to be a better and cheaper way to get around. There are some practical new options available today and many more are in development. The ride of the future is on its way.



1969 Chevy Camaro—Indianapolis 500 pace car

## A New Age of Alternative Energy Cars

### It might just be fun!

If your definition of a good time is to roll out your 69 Chevy Camaro with its 427 cubic inch big block, 350-horsepower engine and burn rubber down the street, then you're in trouble. Even if you can get a good deal on one of those "muscle cars" from yesteryear, you probably can't afford to drive it.

It will probably get less than 10 miles per gallon (23 liters per 100 km). Of course if you can afford the \$45,000 plus that these babies go for, then maybe you can afford to fill it up once in a while.

The rest of us may need to get our kicks from new alternative fuel vehicles. This is a car or truck that runs on anything other than traditional gasoline or diesel fuel.

### Kinds of Alternative Energy Cars

**Hybrid Electric:** The best selling alternative energy cars today are the Hybrid Electric cars, such as the Toyota Prius shown on the cover. These cars use batteries to power electric motors to drive the car at slower speeds. The cars shift over to a gasoline engine for better acceleration and higher speeds. These cars operate very much like standard fueled cars. The batteries are charged while the gasoline engine is running. There is no limit to their range and performance.

**Plug-in Electric:** These cars are driven entirely by electric batteries. Like your cell phone, they must be plugged in to recharge. For decades, golf carts have been powered by

batteries and that's pretty much how we imagine all-electric vehicles: slow with a very limited range.



But, then there's the **Venturi Fetish**. It's acceleration is similar to a high powered sports car. It goes 0-100 km/h (0-60 mph) in under 5 seconds. However, its top speed of 160 km/h (100 mph) is somewhat less than a traditional sports car. It goes up to 250 km (155 miles) on a fill-up—of electricity that is. Then it takes one to three hours to recharge. It's a beauty, but at around \$400,000 each, you're not likely to see one in your neighborhood soon.

The plug-in electric Chevy Volt, priced at over \$30,000 is targeted for sale in 2010. It may not be a fetish, but it will seat five adults and go 64 km on a charge. Using its onboard gasoline power generator, it can go over 1,000 km before needing a recharge.

**Biofuel/Biodiesel:** The "bio" in their titles is the clue to these alternative fuels. Regular gasoline or diesel fuel is combined with biological products, such as corn or sugarcane, that make alcohol. This mixture is called ethanol. Because ethanol comes from things that can be grown, it is hoped that it will provide a renewable source of fuel as opposed to oil, for

instance, that comes from fossil fuel, which is running out.

Biodiesel fuels substitute vegetable oils for diesel fuel. Some diesel engines can work directly with biodiesel fuels, but most require significant modification. This limits the number of vehicles that might use biodiesel fuel.

**Compressed Natural Gas:** Over 5 million vehicles in the world operate on compressed natural gas (CNG). CNG is comprised mostly of methane, which releases the least amount of CO<sub>2</sub> of any fossil fuel, and that's a good thing for the environment.

**Hydrogen/Fuel Cell:** Hydrogen can be used to fuel traditional automobiles and it can be used as part of a fuel cell to drive electric motors. It's big advantage is that when used in a vehicle, it can reduce greenhouse gasses. However, today, the production of hydrogen is still polluting. Decades of research and development may be needed to make hydrogen a viable alternative, if at all.

**Compressed Air:** You may never have heard of Tata Motors, but you may soon. They are India's largest auto maker and they have a reputation for innovation. One of their latest is the Air Car to be driven by compressed air. One version of the car is said to have a top speed of 68 mph and a range of 125 miles. A compressed tank fill-up would take only a few minutes and cost around \$2. Other models will include a standard engine that can take over when the air runs out. This is not just a pipe dream. Tata is preparing to ship these vehicles to over a dozen countries.

## Alternative Energy Cars | Vocabulary List

bio-fuel	Fuel that combines biological products, such as corn or sugarcane, with gasoline or diesel fuel.
gas-electric hybrid	A vehicle that uses both electric batteries and gasoline engine for power.
innovation	Something that is new and different from what came before.
methane gas	A colorless, odorless gas used for fuel in the form of Compressed Natural Gas (CNG).
plug-in electric	A vehicle that runs only on electric power. The vehicle is plugged in to charge batteries. The range of the vehicle is based on how long the batteries will hold a charge.
renewable source	Fossil fuels (from coal, oil, methane) cannot be replaced when used. Renewable sources (biological products, wind, solar) will not run out.
Tata Motors	The largest car manufacturer in India, noted for designing innovative vehicles.

## Discussion Points

1. It's likely that the cost of gas will continue to go up. Do you think this will result in fewer purchases of SUVs and more reliance on smaller, more efficient cars? Is this a good or bad thing?
2. Which of the various types of alternative fuels do you think will be most used in the future? Why?
3. The plug-in electric car, Venuri Fetish, costs around \$400,000. If it cost \$20,000., would you like to drive one? Look at its performance specifications. Would these work with your lifestyle?