Hybrid Cars

A hybrid car uses more than one power source, almost always a combination of an internal-combustion engine (petrol or diesel) and an electric motor.
Some early hybrid designs tended to use the electric motor for all driving needs. The combustion engine would only charge the batteries with the electric motor then drawing power from these batteries. The combustion engine would only run when it was needed to charge them back up.

However, more modern designs reverse this to some degree; they use the petrol engine for primary power, but use an engine that is a smaller size than would otherwise be needed. As the electric motor can combine its power with the combustion engine at any time, the total available driving power is comparable (or possibly greater) than the combustion engine alone. The electric motor additionally acts as a generator during braking or rolling down hills, using the momentum of the car to generate electricity. In this way, the energy that would normally be wasted when stopping is used to power the electric motor and speed the car back up again.

One of the main benefits of this system is that it needs a much smaller battery than earlier models. Designs such as the Honda Insight and Toyota Prius were released in the late 1990's, but didn't see wide consumer acceptance. Newer designs are considerably more conventional, and often look and perform identically to their non-hybrid counterparts while delivering a very attractive reduction in fuel consumption and tail-pipe emissions.

Environmentally, hybrids emit significantly less carbon dioxide compared to conventional combustion (only) engine vehicles. And it is worth noting that the hybrid engine is likely to be more environmentally friendly than a fully electric car design for the near future. This is because most of our household electricity is generated from polluting power sources such as coal.

Toyota was the first car-maker in the world to mass-produce and sell hybrid cars, introducing the Prius in 1997. This Toyota "Hybrid Synergy Drive" technology has since been delivered to well over seven million vehicle customers world wide. However, the list of hybrid-vehicle manufacturers continues to grow.

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Some questions about hybrid technology

Question: Aren't hybrid vehicles underpowered?

Answer: No, Hybrid vehicles feature a petrol engine working together with an electric motor, so in fact we have two power sources compared to just the one found in most vehicles. This means that you have the total power output of a much larger engine, with the emissions and economy of a much smaller one.

Question: Don't you need to plug your hybrid in somewhere to charge it up?

Answer: No, you won't need to plug your hybrid in. A combination of braking/rolling and the combustion engine generates all the electricity the hybrid system ever needs to keep the battery charged. This stored electrical energy is then used to power the electric motor to drive the vehicle along with the petrol engine.

Question: Doesn't the battery run out quickly and need replacing?

Answer: Batteries used in hybrid vehicles have been engineered to last for many years, in some cases potentially as long as the life-span of the vehicle.

In summary, hybrid vehicles:

- Have multiple power sources, usually in the form of a conventional combustion engine and an electric motor
- Are able to convert and store energy usually wasted during braking and deceleration.
- Usually store energy in a battery that is often located lower in the vehicle for best weight distribution and vehicle cornering. (handling)
- Drive no differently to conventional, 'every day' vehicles featuring only an internal combustion engine.
- Don't require special transport infrastructure - such as special roads or recharge stations and instead fit into current infrastructure - such as highways, freeways and petrol stations with no difficulty.