

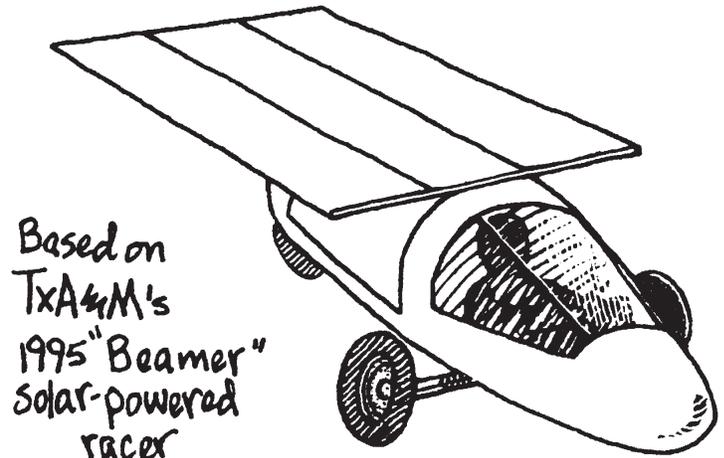
# Solar and Electric Cars



**RENEWABLE ENERGY**  
THE INFINITE POWER  
OF TEXAS

## HIGHLIGHTS

- Renewable energy for transportation
- Solar-powered model cars: The Junior Solar Sprint Project
- Electric- and gasoline-powered cars and air pollution



**POWERED BY THE SUN** A solar car has a solar panel that changes sunlight into electricity.

## RENEWABLE ENERGY AND TRANSPORTATION

Renewable energy was used for transportation long before any other energy source.

For hundreds of thousands of years, humans used only their own energy to get around, like walking and running. Later, they learned to use animals to get around like riding horses, camels, donkeys, or even elephants! People and animals get their energy from food. Since the energy in food comes from sunlight, food is a form of renewable energy.

We eat plants, and plants are sometimes called biomass. Biomass is plants or garbage that can be used for energy. Biomass can also be used to make fuels to power our cars.

A few thousand years ago, people discovered that they could use the wind to get around. Think about how fast sailboats can move on a lake or the Gulf of Mexico. Wind is another type of renewable energy.

But less than 200 years ago, people started using fossil fuels like coal and oil

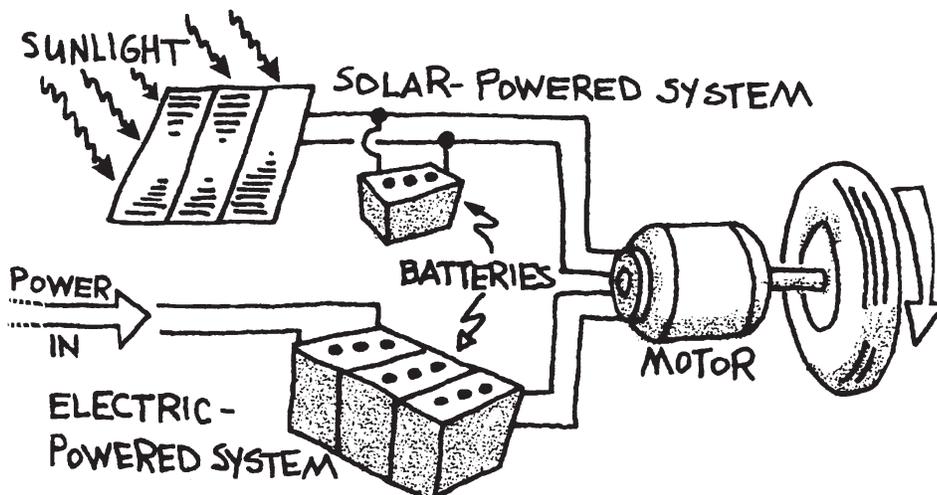
for transportation. These fuels cannot last forever, so they are not renewable. And they cause air pollution.

Today with new technology, there are many ways we can use renewable energy to help us get around and reduce air pollution.

## MODEL SOLAR CARS

Just like toy and model cars, you can also build model solar cars. Solar cars have some parts that are like your family car, but solar cars do not use gasoline. Here is how they work:

- a solar panel changes energy from sunlight into electricity
- electricity travels to the motor by a wire that makes the drive shaft turn
- when the drive shaft turns, the wheels spin
- the spinning wheels move the car forward



**SOLAR AND ELECTRIC-POWERED CARS** Sunlight or electricity can be used to power a car's motor instead of gasoline or diesel.

## THE JUNIOR SOLAR SPRINT PROJECT

In this project, students form small teams to design and build model solar-powered cars. Teams then compete to determine the fastest car. For more information, check the internet at

[www.wattwatchers.org/pages/jss.htm](http://www.wattwatchers.org/pages/jss.htm) - Texas or

[www.nrel.gov/education/jss\\_hfc.html](http://www.nrel.gov/education/jss_hfc.html) - National

## SOLAR RACE CARS

Solar cars also come in large sizes that a person can drive and even race. Since a race car is much larger than a model car, it needs a larger solar panel than a model car would use. Therefore, it can make more electricity. Solar cars use batteries to store the sun's energy when the car does not need it, like when it is stopped or driving slowly.

If the car is driving fast, the motor uses all of the power from the solar panel. In some cases, the car may need more power than the panel can provide. Then the motor uses energy stored in the batteries.

## ELECTRIC AND HYBRID CARS

Electric cars are like solar cars. But instead of using a solar panel for energy, electric cars get their energy from batteries. When the batteries run out, they must be recharged by plugging the car into an electric power outlet like the ones in your classroom or at home. If you drove an electric car, you would recharge its batteries overnight while you slept.

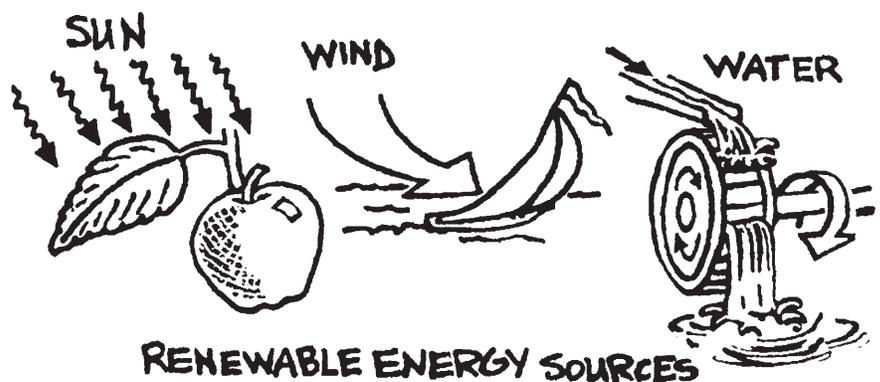
Because electric cars do not have to carry the fragile solar panels, they can be larger and can carry more people. Just like solar cars, electric cars do not burn gasoline, so the car does not make air pollution. If the electricity from the outlet comes from a power plant that does not pollute, like a wind farm, then the electric car does not make any pollution.

There are also cars that use both gasoline and electric

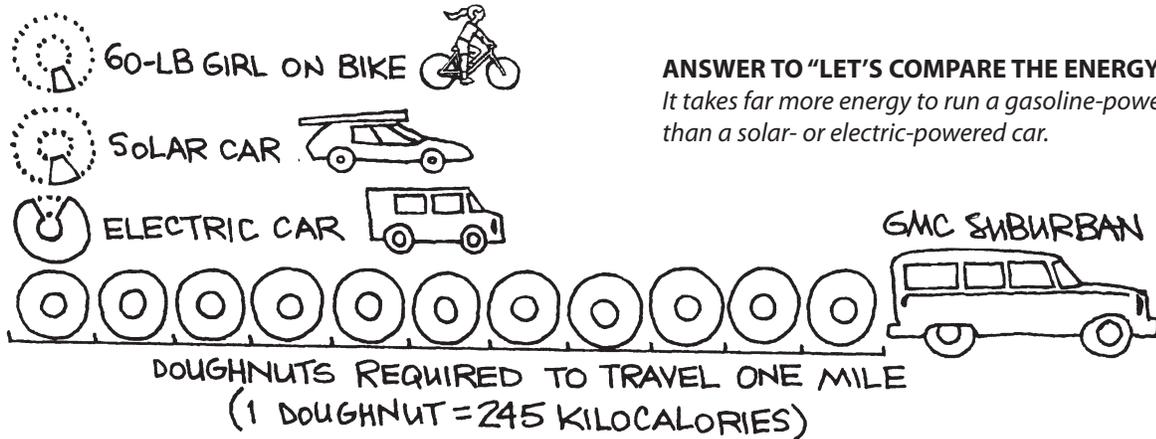
batteries. These are called "hybrid cars." A hybrid car uses gasoline to power an engine, and it uses batteries that power an electric motor. When the batteries are not being used, running the gasoline engine charges them. Hybrid cars have the best mileage rating of all cars. There are many hybrid cars available to buy today.

## GASOLINE, CARS AND POLLUTION

Gasoline-powered cars are much less efficient than electric cars. And since gasoline comes from a non-renewable energy source, such as oil, it cannot last forever. They also make air pollution, such as smog. Air pollution can be harmful to your health. It also can make the air become and look dirty. Air pollution can make it hard to see pretty sights like city skylines and mountain ranges.



**RENEWABLE ENERGY SOURCES**  
**CLEAN POWER SOURCES FOR ELECTRIC CARS** Many renewable energy sources can be changed to electricity to power electric cars.



**ANSWER TO "LET'S COMPARE THE ENERGY USED"**  
*It takes far more energy to run a gasoline-powered car than a solar- or electric-powered car.*

## RESOURCES

### FREE TEXAS RENEWABLE ENERGY INFORMATION

For more information on how you can put Texas' abundant Renewable energy resources to use in your home or business visit our website at [www.InfinitePower.org](http://www.InfinitePower.org) or call us at 1-800-531-5441 ext 31796. Ask about our free Teacher Resource Guides and CD available to teachers and home schoolers

### ON THE WORLD WIDE WEB:

Junior Solar Sprint Project  
[www.nrel.gov/education/jss\\_hfc.html](http://www.nrel.gov/education/jss_hfc.html)

Solar Race Events  
[www.formulasun.org](http://www.formulasun.org)

High School Solar Car Race  
[www.winstonsolar.org/challenge/](http://www.winstonsolar.org/challenge/)

Texas Commission on Environmental Quality Air Quality Lesson Plans and Data  
[www.tceq.state.tx.us/assistance/education/k-12education/lessonplans.html](http://www.tceq.state.tx.us/assistance/education/k-12education/lessonplans.html)

New Car Fuel Economy  
[www.fueleconomy.gov](http://www.fueleconomy.gov)

Rocky Mountain Institute's Hypercar® Vehicle  
[www.rmi.org/sitepages/pid386.php](http://www.rmi.org/sitepages/pid386.php)

Fun Energy Conversions  
[www.wattsonschoools.com](http://www.wattsonschoools.com)



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# InfinitePower.org

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**State Energy Conservation Office**  
 111 East 17th Street, Room 1114  
 Austin, Texas 78774  
 Ph. 800.531.5441 ext 31796  
[www.InfinitePower.org](http://www.InfinitePower.org)

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