GLOSSARY

BIOMASS
Organic matter, especially plant matter, that can be converted to fuel and is therefore regarded as a potential energy source.

HYBRID TECHNOLOGY
An automobile that combines a conventional internal combustion engine (ICE) propulsion system with an electric propulsion system.

PHOTOVOLTAICS
A semiconductor technology involving the direct conversion of sunlight (electromagnetic radiation) into electricity.

AIR FOILS
A structure having a shape that provides lift, propulsion, stability, or directional control.

FUEL CELL
A device that produces electricity by combining a fuel, usually hydrogen, with oxygen. In this reaction, electrons are freed from the hydrogen in the fuel cell by a catalyst and gain energy from the chemical reaction binding hydrogen and oxygen; this provides a source for electric current. The exhaust of hydrogen fuel cells consists of only water. Fuel cells are currently used in spacecraft and increasingly in ground transportation.

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Show Me Science

ENERGY Transforming Renewable Resources ~ Photovoltaics ~

Exploring the World Of Science for High School and Beyond

***Advanced* Teachers Guide**

SYNOPSIS:

Learning to incorporate a variety of eco-friendly energy sources into our businesses and homes will make Earth a better place to live. This program explores photovoltaics, the design behind wind turbine technology and the creative processes behind vehicles in the American Solar Car Race. Zero energy houses of the future will use many of these technologies to produce more energy than they consume. Renewable energy technologies are important for the future of our planet. This program shows how people in different areas are doing their part to explore the potential of several promising renewable energy technologies.

CURRICULUM UNITS:

- Ecology
- Engineering
- Environmental Science
- Physical Science
- Physics

CAREER OPPORTUNITIES:

- Civil Engineer
- Electrician
- Engineer
- Environmetal Engineer
- Physicist

PROGRAM OVERVIEW:

Both scientists and engineers are working on ideas to bring various sources of renewable energy (solar, wind, hydroelectric and biomass) to market as a replacement for fossil fuels.

Scientists are also working with housing developers and utility companies to create sustainable communities and zero energy homes. These homes will include advanced solar power and a community renewable energy power plant. The homes will also offer owners the ability to charge plug in electric or hybrid cars.

ISSUES & CRITICAL THINKING:

1) How will your life be influenced by the theory of “Peak Oil”, and the eventual changes in U.S. oil resources and supply?

2) Evaluate the reliability and accessibility of renewable energy sources available in the U.S. Which energy sources are most realistic to explore further for implementation in your region of the country?

3) Discuss the possibility for wind turbine energy production in your community. What factors are most important in deciding where wind turbine energy might be most efficiently used?

4) Have students research the idea of a “green community” to see what criteria are used in developing a green community. After getting some background information you can have students engage in one of two projects: evaluate their own community to see how “green” it is; or design their own green community, what characteristics would be present.