



**Online Courses for High School Students**  
1-888-972-6237

## **Introduction to Renewable Technologies**

Cars that run on used vegetable oil. Electricity produced from your garbage. A windmill made from spare bicycle parts that pumps water to crops. Energy is life. So, how do we address the world's growing concerns about energy sources? Where will it come from in the future? How can energy be something sustainable, renewable, and accessible? Introduction to Renewable Technologies begins to uncover the development of new energy technologies and explores how recent approaches to generating, storing, and creating this precious resource have evolved. By gaining a larger understanding of this challenge, we, as thoughtful people, can implement real change and unlock the solution needed for a safer, cleaner, and more enduring world.

### **Course Highlights**

- Explore the different types of alternative, renewable technologies.
- Discover how consumer behaviors and government policies influence energy production around the world.
- Investigate how different technologies can be used to produce electricity.
- Compare the advantages and disadvantages of traditional and alternative energies.

**Prerequisite:** None

**Course Length:** One Semester

**Required Text:** There are no required textbook for this course.

**Materials List:** There are no required materials for this course.

## Course Outline

### **Unit 1: Introduction to Renewable Energy Technologies**

How are your lights, cell phones, and water heaters powered? Every time you turn on a light or make a call, you may be using power from a limited source that emits pollutants. Or perhaps the power comes from a clean, replenishable source. In the United States, there is a 93 percent chance you are using energy from a nonrenewable energy source. Nonrenewable energy sources include coal, oil, and natural gas. Eventually they run out. Renewable energy sources come from sources that will not run out. They either replenish through a natural process or come from a source with an infinite supply. These might be sunlight, wind, rain, tides, waves, and the earth's natural heat. In this unit, you'll learn about renewable energy technologies and why they are important. You'll also learn about the history of renewable energy technologies. Finally, you'll look at some of the countries making a difference by using renewable energy.

### **Unit 2: Climate Change & Energy Policies**

You've probably heard of global warming. You might understand that it is a slow temperature increase all over the world. You might also know that this temperature increase somehow harms the environment. But how? In this unit, you'll learn about global warming and how it causes climate change. You'll also learn how climate change harms wildlife, natural resources, and humans. Consumers' use of electricity and cars are the main causes. But changing consumer habits is not as easy as it seems. Several countries have implemented successful policies to stop global warming. By examining these success stories, we'll look at how we can use these examples to build a framework for future climate change policies.

### **Unit 3: The Electric Power System & Fossil Fuels**

Why do we continue to use nonrenewable energy sources? We answer the question by looking at how electricity gets from Point A to Point B. The history of electricity explains how we built this system. In this unit, you'll explore the infrastructure and history of electricity. You'll learn about the tradeoffs in using nonrenewable sources, specifically fossil fuels, for generating power. You'll also look at the new technologies we could use.

### **Unit 4: Nuclear Power**

If all you know about nuclear power comes from *The Simpsons*, you're about to find out that there's a whole lot more to nuclear power than what happens at the fictional Springfield nuclear power plant. Nuclear power is a chemical process of splitting atoms. It is very efficient and has the potential to power the entire world. However, it does have some disadvantages. Nuclear meltdowns can be devastating to the surrounding environment and can even cause widespread death if not managed responsibly.

### **Unit 5: Solar Energy**

Solar energy is getting a lot of attention. The sun provides lots and lots of energy, and we can use it in our homes and offices without having to use the local power company. Technologies that harness solar energy are varied and sophisticated. The sun's heat can be used in many ways, including providing steam for traditional power plants. However, these technologies are still immature. So large-scale solar power continues to be expensive. It can also be unreliable when the sun is not shining. In this unit, you'll learn about solar energy and the exciting ways we can use it to power our lives.

### **Unit 6: Wind Energy**

Wind energy has been around for centuries, as early as 5000 BCE. But it's been getting a lot of attention lately as a renewable energy technology. It's clean and sustainable, but wind turbines take up a lot of land and make a lot of noise. In addition, harnessing wind energy requires an area where the climate is optimal, and the land is preferably flat and rural. In areas with a lot of wind, this renewable technology is inexpensive and ideal, especially for homeowners who want to power their own homes. In this unit, you'll learn more about how wind energy is created and the advantages and disadvantages of using it as an energy source.

### **Unit 7: Biomass & Biofuels**

Amongst sources of energy, biomass is the oldest. When humans first set a fire using wood, biomass energy was born. In this unit, you'll learn about how we get electricity from biomass and biofuel. You'll also learn about the process of converting biomass to biofuels. Finally, you'll look at the different options for using biofuels and the pros and cons of both biomass and biofuels.

### **Unit 8: Geothermal & Hydroelectric Energy**

By now you know that energy is everywhere. And we could get it from anywhere. It's just a matter of finding out how to convert it so we can use it for electricity. In this last unit, you'll learn about geothermal and hydroelectric energy. Both of these renewable energy technologies use the earth's natural energy. One uses the heat deep in the earth's crust; the other uses the power of water.