



# A Need for Alternative Energy

## We use energy every day.

It fuels cars and powers cell phones. It cools homes when it's hot outside and warms them when the weather turns cold. It provides light through the night while the sun shines on the other half of the world.

**All this energy must come from somewhere.** Since the 1700s, people have relied mostly on **fossil fuels** such as coal, oil, and natural gas. These materials burn easily to create heat and can be turned into electricity. But they are far from perfect.

Our supply of fossil fuels is limited. Experts predict that **fossil fuels will dwindle and their cost will rise**. In addition, **burning these fuels releases harmful substances**.

Some substances trap heat within the **atmosphere**, leading to **climate change**. Others cause health problems, including heart and lung diseases.

## What Can We Do?

Experts around the world are working on safer, healthier, and renewable alternatives to fossil fuels. The best replacements would serve the world's energy needs without damaging the planet or us.

Turn the page and learn the secrets of one of these alternative energies: solar power.

## Light and Heat

Energy from the sun reaches Earth's surface in the form of light. This light provides us with heat. Since the earliest days of civilization, humans have used solar energy for its light and heat. The energy of the sun also helps plants grow and keeps animals alive.

For centuries, scientists and engineers have worked to create new technology for capturing the energy of the sun and converting it into useful heat or electricity. At present, both are being done, and new breakthroughs are being made all the time. But there is still a lot left to learn.

## Timeline of Solar Energy

**1839**

French scientist Edmond Becquerel discovers the photovoltaic effect, the creation of electrical current in certain materials when they are exposed to sunlight.

1839



1941

**1941**  
Engineer Russell Ohl invents the solar cell.



**1954**

A team of researchers unveils the first practical solar cell technology.

1954

1956–1957

**1956–1957**  
The first office building to be heated entirely by passive and active solar energy is built in Albuquerque, New Mexico.

**1958**

*Vanguard I*, the first satellite to use solar panels, is launched.

1958



**1998**

The first piece of the International Space Station is launched into orbit.

1998



2010

**2010**  
Construction begins on the Ivanpah solar power plant in California.

**2018**

About one million homes and businesses in the United States have solar power systems.

2018



THE BIG TRUTH!

# Solar Power in Space

The International Space Station (ISS) zooms around Earth 220 miles (354 km) above the surface. The ISS is a huge spacecraft where astronauts can live for months at a time. The astronauts conduct experiments to study the effects of outer space on the human body and to devise ways to improve space travel. The ISS is packed with advanced technology. Many of its functions rely on electricity. But where does the electricity come from as the station floats in space? The sun!



The ISS has four sets of solar arrays. Together, they are roughly the size of a football field.

Each array has thousands of solar cells that convert sunlight directly into electricity.



Extra energy is stored in batteries.



To absorb as much energy as possible, the arrays rotate to face the sun.

The arrays produce enough electricity to power 40 homes on Earth!