



# TAKE A STANCE

COULD WE RELY ON SOLAR POWER AS  
OUR ONLY SOURCE OF ENERGY IN  
THE FUTURE?



# FLORIDA'S SUN IS BRIGHT AND SHINING MOST OF THE TIME!

Read the information and  
article provided about the  
sun and solar panels; then  
complete the chart to  
help you develop your  
opinion; before you  
**TAKE A STANCE!**

# WHAT WE KNOW ABOUT THE SUN TODAY



**Did you know that the Sun is the largest object in our solar system? As we gaze onto our sky during the day we see a large glowing sphere.**

**This sphere seen from the surface of the Earth is actually only one of millions of stars shining in our galaxy. The Sun is about 93 million miles (149.5 million km) from Earth. If you think about it; that's a really long distance to have light energy travel.**

**However, as far as this is, the sun's light and heat only takes about eight minutes to reach. That energy helps supply light and heat to our planet.**

**Look at a second hand of a clock or a watch and you'll be amazed to learn that within a seconds time about 695,000,000 tons of helium & 5,000,000 tons of energy convert into gamma rays.**

**As the energy travels out toward Earth's surface, it is continuously absorbed and re-emitted at lower and lower temperatures so that by the time it reaches the Earth's surface, it is primarily a visible light.**

**The Sun gives life to Earth from all the energy the Sun makes and provides . This energy could be similar to 40,000 times the power needed by the United States.**

**That's a lot of energy!**

A large orange semi-circle is positioned in the bottom-left corner of the slide. To its right, there is a smaller, solid orange circle.

**How do humans use all this source of energy? In recent years we've heard about solar panels being added to many homes around the United States and abroad.**

**This renewable source of energy has the ability to harness the sun's power and provide homes with some of the energy it needs to become self sufficient.**

**But will this work in all areas of the country?**

**There are many states and countries that see many months of cold weather, cloud covered rain storms, and even a bare glimmer of the sun. What happens to solar panel usage in those places?**



**Can they use them? Are you able to harness any energy in these conditions? A lot of people would think that there wasn't anything coming through that overcast day; but the reality of it is that although they wouldn't receive 100% of the sun's energy; solar panels can capture about 60% .**

**As our technology is ever changing ;can there be a time that we only use the sun as our only source of power?**





# TAKE A LOOK AT HOW OTHER STATES ARE USING SOLAR PANELS

## SOLAR AT A GLANCE

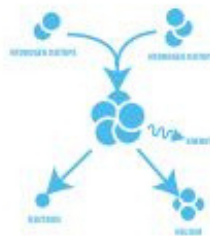


### WHAT IS SOLAR?

Solar energy is radiant energy that is produced by the sun. Every day the sun radiates, or sends out, an enormous amount of energy. The sun radiates more energy in one second than people have used since the beginning of time!

### NUCLEAR FUSION

The process of fusion most commonly involves hydrogen isotopes combining to form a helium atom with a transformation of matter. This matter is emitted as radiant energy.



### PHOTOVOLTAIC CELLS

Photovoltaic cells turn the work photo meaning "light" and volt, a measurement of electricity. Semiconducting photovoltaic cells are called PV cells or solar cells for short. Here are the four steps that show how a PV cell is made and how it produces electricity.

1. DESIGN 2. FABRICATION 3. ENERGY GENERATION 4. DISTRIBUTION AND EXPORT TO THE GRID

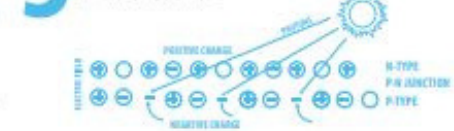
**1** A slab (or wafer) of pure silicon is used to make a PV cell. The top of the slab is very thinly doped with an "n" dopant such as phosphorus. On the base of the slab a small amount of a "p" dopant, typically boron, is doped. The base side of the silicon is 1,000 times thicker than the phosphorus side. The phosphorus has one more electron in its outer shell than silicon, and the boron has one less. These dopants help create the electric field that motivates the energetic electrons out of the cell when light strikes the PV cell. The phosphorus gives the wafer of silicon an excess of free electrons; it has a negative character. This is called the n-type silicon (n = negative). The n-type silicon is not charged—it has an equal number of protons and electrons—but some of the electrons are not held tightly to the atoms. They are free to move to different locations within the layer. The boron gives the base of the silicon a positive character, because it has a tendency to attract electrons. The base of the silicon is called p-type silicon (p = positive). The p-type silicon has an equal number of protons and electrons; it has a positive character but not a positive charge.



**2** When the n-type silicon and p-type silicon meet, free electrons from the n-type layer flow into the p-type layer for a split second, then form a barrier to prevent more electrons from moving between the two sides. This point of contact and barrier is called the p-n junction. When both sides of the silicon slab are doped, there is a negative charge in the p-type section of the junction and a positive charge in the n-type section of the junction due to movement of the electrons and "holes" at the junction of the two types of materials. This imbalance in electrical charge across the p-n junction produces an electric field between the p-type and n-type silicon.



**3** If the PV cell is placed in the sun, photons of light strike the electrons in the p-n junction and energize them, knocking them free of their atoms. These electrons are attracted to the positive charge in the n-type silicon and repelled by the negative charge in the p-type silicon. Most photo-electron collisions actually occur in the silicon base.



**4** A conducting wire connects the p-type silicon to an electrical load, such as a light or fan, and then back to the n-type silicon, forming a complete circuit. As the free electrons are pushed into the n-type silicon, they repel each other because they are all like charges. The wire provides a path for the electrons to move away from each other. This flow of electrons is an electric current that travels through the circuit from the n-type to the p-type silicon. In addition to the semi-conducting materials, solar cells consist of a top metallic grid or other electrical contact to collect electrons from the semi-conductor and transfer them to the external load, and a back contact layer to complete the electrical circuit.



### TOP SOLAR STATES



Source: Energy Department, Department of Energy

Take a look at this chart provided by the National Energy Education Department. It shows us how solar energy is being use in a few of our states already.

# FLORIDA IS LEADING THE WAY ON THE USAGE OF SOLAR PANELS

## Florida Power & Light Unveils 'Bold' Plan To Become Global Leader In Solar Power


January 16, 2019 at 1:30 pm Filed Under: Florida Power and Light, FPL, Local TV, Solar Power

**MIAMI (CBSMiami) – Florida Power and Light is announcing details on its plan to make Florida a global leader in solar power.**

**FPL says it is planning to install 30 million solar panels across the state by the end of the next decade. Laid end-to-end, the 30 million solar panels would wrap around the Earth one and a half times.**

**It would be the largest installation of solar panels by a regulated utility in the world and provide a 67-percent fleet-wide reduction in carbon dioxide (CO2) emissions rates by 2030 as compared to the national average, according to FPL.**






**FPL is the Sunshine State's largest solar producer, generating ten times as much solar power in 2018 than it did in 2016.**

**FPL and its sister company, NextEra Energy Resources, are already the world's largest producer of renewable energy from the wind and sun and, when this plan is completed, FPL expects to be the largest utility owner and operator of solar in America.**

**“FPL is not your traditional electric company,” said Eric Silagy, president and CEO of FPL. “We’re a technology company that delivers power, and we’ve long believed in making smart, forward-thinking infrastructure investments to produce tangible, long-term benefits – cleaner air, lower electric rates and reliable service – for our customers and our state. Now we’re taking our long-standing clean energy commitment to the next level. Bottom line, this bold, innovative plan is the right thing to do for our customers and for our fast-growing state and we look forward to working with local and state officials and our regulators to make this vision a reality.”**



**“I am supportive of programs that will provide Floridians with greater access to affordable, clean energy which will help propel the State to a healthier future,” said Florida Gov. Ron DeSantis. “We live in the Sunshine State and solar energy is a natural resource that should be seriously considered. FPL’s initiative is important. As Florida’s energy needs continue to grow at a rapid pace, it is important that we diversify our energy resources. This is vital to the economic well-being of our State and quality of life for residents.”**

**FPL has studied solar technology for decades and already operates 18 large solar power plants and hundreds of other universal solar installations across Florida.**

**FPL’s first solar power plant in Miami-Dade County is scheduled to come online early this year.**

# Take A Stance!

After reading the information provided on the Sun and solar panels; Do you think we should rely solely on Solar Power in the future?

Why or Why Not?



**Look at all the facts provided then write down the reasons why you think solar power may or may not be the only source of energy used in the future. Write 3-5 reasons to support your opinion.**

## **YES, IN MY OPINION.....**

I think we will be able to rely solely on the SUN as a source of energy.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

## **NO, IN MY OPINION.....**

I think we will not be able to rely solely on the SUN as a source of energy.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_