

# Solar Absorbers and the Future of Electricity

by James Folta

Electricity is what we use to power things at home or at school. You can probably look around right now and see an electrical outlet or two. Everything that we plug into one of these outlets uses electricity. But where does this electricity come from? Right now we have a few ways to make electricity. Some are better than others. There are some scientists who are trying to find new ways to get electricity that are better for the planet Earth.

Most electricity is generated by machines that are run by steam. Making a lot of steam is the hard part. Water has to be heated up so that it boils and becomes steam. In the United States, a lot of different things are burned to create this steam. The most common things that are burned are oil, gas, and coal. The United States uses a lot of electricity, and so we burn a lot of oil, gas, and coal. In 2012, the United States of America used more oil and gas than any other country in the world and was number two in the world for using coal.

The problem with using these things is that burning them can be harmful and damaging to the earth. Also, there is only a certain amount of coal, gas, and oil in the world, and they are running out very quickly. We can't make more of them. What happens when they run out? How else can we get electricity?

There are some people who are trying to answer this question. There are many scientists who are developing different methods of getting electricity. One of these people is Jeff Chou, who is a scientist and researcher working on new ways of getting electricity. Jeff works at MIT, which stands for Massachusetts Institute of Technology. It is a university in Cambridge, Massachusetts. MIT is very well known, and people from all over the world go to study there. It is one of the best colleges to learn and practice science.

Jeff is at MIT working as a researcher on electricity. He decided he wanted to be a scientist in high school: "I happened to like the math and physics classes, so in college I chose to focus on electrical engineering." Electrical engineering is studying how electricity works. This is helpful for knowing how things like computers work. In fact, Jeff can build the computer chips that make computers run!

Jeff likes being a scientist because he can change the world. "I get to work on tough problems that could help out everyone on Earth," Jeff says. Jeff likes that he gets to try to "come up with new solutions by thinking creatively. In fact, in science, wild and crazy ideas are encouraged!"

Jeff has been working on how to get better solar power. Solar power, Jeff says, is "converting the light we get from the sun into usable electrical energy." You can feel this energy yourself: the sun feels hot on your skin because it is sending out energy. Solar power is different from oil, gas, or coal because it is what is called renewable energy. This means that its source is not consumed when we use the energy, as happens with gas, for instance, which burns away. Things like the wind, the sun, and ocean currents are called renewable because they won't go away anytime soon.

At MIT, Jeff has been "working on new ways to convert solar energy into electricity." He made something called an absorber. It takes the heat from something hot, like the sun, and turns it into electricity. Absorbers are very small. They are special panels made out of silicon and other materials. These panels can "absorb and convert each photon [from the sun] that comes in, into an electron." These electrons can be used to make electricity. This can power anything, like a toaster, or a TV, or even some cars.

Jeff's job as a researcher involves doing lots of experiments. Jeff says that experiments are the heart of science. You have to take your ideas and test them to see if they work or not. "Sometimes the ideas work and sometimes they don't, and that's science in a nutshell," Jeff says. These experiments involve lots of special equipment and laboratories. Jeff does most experiments in a clean room, which is a room that has no germs or dirt or anything that might damage his experiments. In the clean room, Jeff made the tiny solar absorbers. Then he shined light on them to see how much energy they could make. He took careful notes and measurements so that he could tell everyone how good or bad the device was.

Jeff likes working with solar energy because it is better for the earth. "Solar energy is very important because we can create electrical energy without polluting the earth," Jeff says. Older ways of getting electricity that use oil, gas, or coal are more harmful. They "burn toxic chemicals and release them into the sky and Earth, which are harmful to you and me," Jeff says. But the absorbers that Jeff built are cleaner. "All we have to do is point our solar silicon panels towards the sun, and we get clean energy," Jeff says.

For Jeff, his solar absorbers are very exciting because they can help us turn anything hot into electricity. Jeff is hoping that if his panels are sensitive enough, anything hot could generate electricity, not just the sun. He says, "There are a lot of hot things we encounter every day; imagine if we can now use those to help power an entire city!" This is the exciting part of science for Jeff. He is helping to make the world a cleaner and better place through his solar panels. If scientists like Jeff are successful, the world would be able to get all its electricity from clean, renewable sources. This would make our world a cleaner and safer place to live.