

# THINGS ARE LOOKING BRIGHT: THE FACTS ABOUT SOLAR ENERGY



The Climate  
Reality Project<sup>®</sup>

# INTRODUCTION



**Did you know scientists estimate that more than enough solar energy strikes the Earth every hour to power the whole world for a whole year? Yes, really.**

Solar power technology changes the energy of the sun's rays into electricity or heat we can use. There are many different types of solar energy technologies – including photovoltaic (PV), concentrated, passive, and thermal – but at the end of the day, each is about harnessing the sun's virtually inexhaustible energy to power our lives.

Photovoltaic solar (PV) is the best known the most widely recognized (and what this e-book will focus on most).

Those solar panels you see on a neighbor's house or in a field? That's PV solar. According to the [National Renewable Energy Laboratory](#), the name comes “from the process of converting light (photons) to electricity (voltage), which is called the PV effect.”

Using solar energy has a long history. After all, thousands of years ago, the Greeks and Romans harnessed the sun with mirrors to light torches. A lot happened between then and 1954, when PV cells were developed at Bell Labs in New Jersey. And more than 60 years after their invention, solar energy is rapidly becoming one of the best ways to keep the lights on around the globe.

But, thanks to Big Polluters, there's a lot of misinformation out there. In this e-book, we set the story straight and give you the facts so you know what to say the next time you hear a Big Polluter talking point about solar power.



Solar panels floating on an irrigation pond.  
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## FIRST, LET'S LOOK AT SOME NUMBERS

- China is far and away the world's leader in solar power. Not only are [more than 60 percent of panels produced there](#), but the nation accounted for 40 percent of the solar installed around the world.
- California is the American leader in solar energy – with enough solar installed [to power over 6 million homes](#).
- Did you know solar farms can float on water? Japan has more than 60 installations (and more than any other nation in the world). In fact, "[a 2018 World Bank report estimated the global potential for floating solar arrays on artificial water surfaces would exceed 400 gigawatts.](#)" *That's enough to power as many as 76.4 million average US homes.*

# THE FACTS

## 1. FACT: SOLAR ENERGY IS A POWERFUL WAY TO HELP STOP CLIMATE CHANGE

Here's the reality: Burning fossil fuels is the *number one cause of climate change*.

When we burn fossil fuels, we release greenhouse gases (like carbon dioxide) into our atmosphere. This extra carbon pollution traps heat, causing global temperatures to rise and our climate to change over time. Dirty energy forms like coal, oil, and natural gas also release dangerous pollutants into our air and water when we burn them.

Solar energy, on the other hand, is a clean and renewable way to power our world—because it doesn't release more carbon pollution into our atmosphere. It's a win-win-win: good for our climate, good for our health, and good for keeping the lights on.

Better yet? When there's a massive oil spill from a tanker or gas leaks from a pipeline, it's a disaster. When there's a huge solar energy spill, it's just called a nice day.

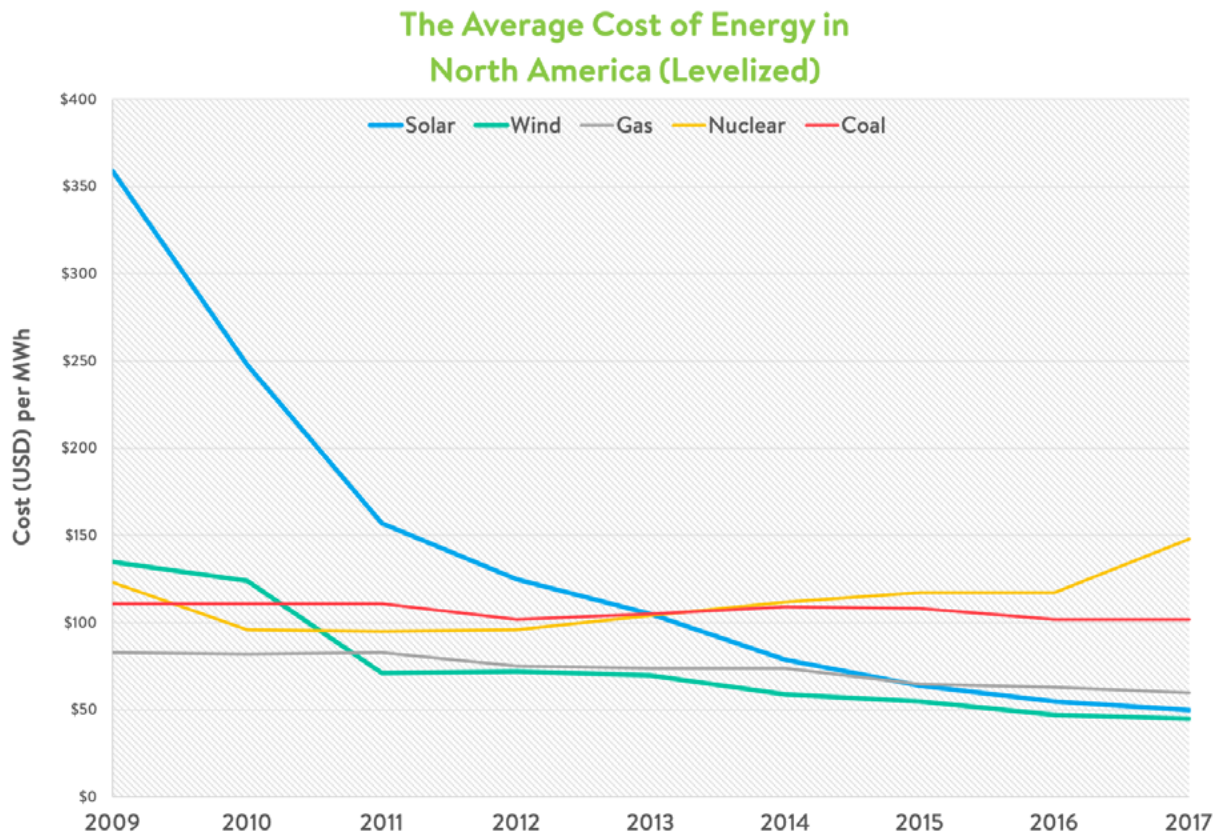


***Tweet this fact!***

**#Fact: Solar energy is a powerful way to help stop climate change. Better yet? When there's a huge solar energy spill, it's just called a nice day.  
[climaterealityproject.org/solarfacts](http://climaterealityproject.org/solarfacts)**

## 2. FACT: SOLAR ENERGY KEEPS GETTING MORE AFFORDABLE AND JUST MAKES ECONOMIC SENSE

The sun keeps rising and the costs keep falling! According to the financial advisory firm Lazard, the cost to produce one megawatt-hour of solar fell an incredible 86 percent between 2009 and 2017. Better yet, that means the cost of solar in 2017 was less than *half* the price of coal the same year.



Data Source: [Lazard Levelized Cost of Energy Analysis 2017](#)  
“Levelized” refers to the lifetime costs of a source divided by its energy production.

Bottom line? Solar is a technology, not a fuel. And as technology develops, it becomes cheaper – unlike finite fossil fuels.

And it’s important to remember that the market price of fossil fuels does not reflect the price we all pay as they’re burned. It doesn’t account for the medical costs to treat asthma, the tax dollars to rebuild after a flood, or the human cost of a hurricane strengthened by climate change. This tells Big Polluters that they can dump unlimited carbon pollution into the atmosphere without any consequences.

But when we use clean, renewable solar energy to power our homes and businesses, we protect our health *and* our climate.



### ***Tweet this fact!***

#Fact: Solar energy is affordable and just makes economic sense. The cost to produce solar power fell an incredible 86 percent between 2009 and 2017.  
[climaterealityproject.org/solarfacts](http://climaterealityproject.org/solarfacts)

### **3. FACT: SOLAR POWER WORKS EVEN ON CLOUDY AND COLD DAYS**

When it's cloudy outside, we can still see, right? We can even get a pretty bad sunburn on an overcast day. That means light from the sun is still reaching the Earth's surface, and solar panels can still harness that energy to make electricity.

While direct sunlight is ideal, solar panels can still produce between [10 and 25 percent of their typical output](#) on a cloudy day. In fact, as our friends at CleanTechnica note, Portland and Seattle are two of the United States' cloudiest cities and each is seeing solar power steadily grow.

And as for cold days? Solar panels create electricity with the sun's *light*, not its heat (though solar heating systems obviously work differently). And it might surprise you to learn that solar panels [actually perform better in cooler temperatures](#).

*"I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."*

**THOMAS EDISON**

As *BBC Focus* notes, it's because, "Solar panels work by using incoming photons to excite electrons in a semiconductor to a higher energy level. But the hotter the panel is, the greater

the number of electrons that are already in the excited state. This reduces the voltage that the panel can generate and lowers its efficiency.”



***Tweet this fact!***

#Fact: Solar power works even on cloudy and cold days.  
Yes, really! Get the facts from @ClimateReality:  
[climaterealityproject.org/solarfacts](http://climaterealityproject.org/solarfacts)

#### **4. FACT: SOLAR PANELS ARE BUILT TO LAST AND ARE A KEY PART OF A MODERN ELECTRICITY SYSTEM THAT PROVIDES POWER 24/7**

Most solar panels produce electricity for [25 years or more](#) because the parts don't wear out easily. In fact, many of the first solar systems installed over 40 years ago are still active today.

Better yet, using solar power diversifies our energy sources, which makes the entire grid more dependable. After all, a smart grid uses many different sources of energy and technologies. This way, if a storm or other event knocks out one



source, there are plenty of others to step in and fill the gap so the lights stay on.

By using solar, other renewable technologies like wind, and energy storage in larger and more connected grids, we can create a twenty-first century energy system that provides reliable electricity 24/7 regardless of the weather. All without fueling climate change.

Which means, it's not just a case of *should* we replace aging fossil fuel infrastructure – like outdated and inefficient coal-fired power plants – but how fast *can* we do it.

Plus, switching to renewable sources of energy like the sun means we can save billions of dollars. Not only by avoiding the costs of replacing these plants, but also avoiding the increasingly higher costs of climate change – like hospital bills and damage from extreme weather.

## RENEWABLES TO THE RESCUE

In early 2019, Australia experienced record-breaking heatwaves – and it was renewable energy that delivered when fossil fuels failed. Here's what the state of Victoria's energy minister Lily D'Ambrosio [had to say](#):

*“We lost 1,800 megawatts of power capacity generation in Victoria. That is an extraordinary figure to lose. Essentially most of that was a result of failed infrastructure from coal and gas – in particular coal. The fact is that our thermal generators are ageing, they are becoming less and less reliable. Wind power came through today, it produced sufficient power generation. Our largest batteries were available last night when we needed them the most. Renewable energy is the way of the future and the here and now.”*



***Tweet this fact!***

**#Fact: Solar panels are built to last and are a key part of a modern electricity system that provides power 24/7.**  
**[climaterealityproject.org/solarfacts](http://climaterealityproject.org/solarfacts)**

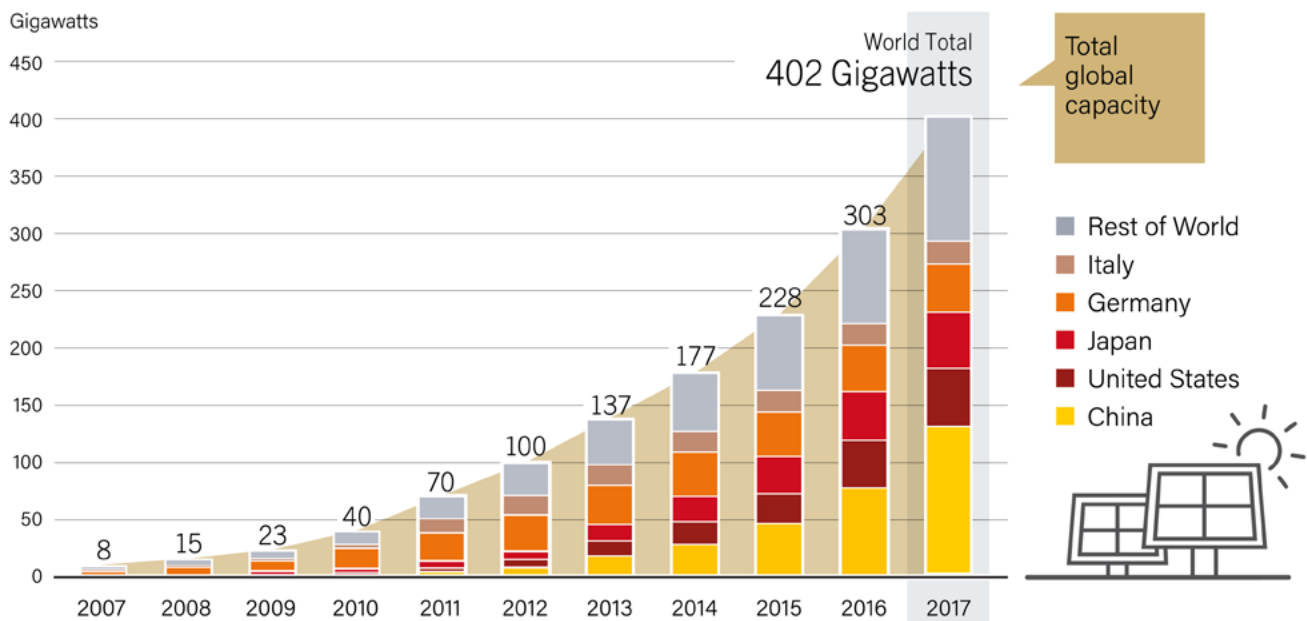




#### 4. FACT: SOLAR ENERGY IS PUTTING PEOPLE TO WORK

As costs fall, the demand for solar energy is growing. In 2017, there were a total of more than 402 gigawatts of installed solar PV around the world – up from just eight gigawatts in 2007. **That’s nearly a 5,000 percent increase in one decade alone. And that means jobs, jobs, jobs.**

Solar PV Global Capacity, by Country or Region, 2007-2017



That same year (2017), 3.37 million people around the globe were employed by the solar photovoltaic (PV) industry alone. And the outlook for the future is even sunnier.

In the US, [solar PV installer is expected to be the single-fastest growing occupation through 2026](#). These are blue-collar jobs with above-average wages – a solar PV installer in the US can expect to make just under \$40,000 a year.

Plus, solar is creating jobs and opportunities for people who don't always get a fair shot in the work force. [According to The Solar Foundation](#), a quarter of American solar jobs are filled by minorities, more than a quarter by women, and nearly 10 percent by veterans.



***Tweet this fact!***

**#Fact: Solar power presents some seriously bright opportunities. The industry employs nearly 3.4 million people around the world!**  
**[climaterealityproject.org/solarfacts](http://climaterealityproject.org/solarfacts)**

# SPREAD THE WORD ABOUT SOLAR

Copy these messages and share them on social media to spread the facts about solar energy's sunny outlook. (You can also click the graphics to share directly on Facebook.)

- Solar power is a ray of #ClimateHope. Things are only looking up as solar power gets cheaper and more efficient every day. [climateralityproject.org/solarfacts](http://climateralityproject.org/solarfacts)
- #Fact: Burning fossil fuels is the number one cause of climate change. But we can power our world with reliable renewable sources of energy like solar. [climateralityproject.org/solarfacts](http://climateralityproject.org/solarfacts)
- The sun keeps rising and the costs keep falling! Solar energy is a powerful and affordable way to keep the lights on in the 21st century. [climateralityproject.org/solarfacts](http://climateralityproject.org/solarfacts)



# WHAT ELSE CAN I DO?

## JOIN A CHAPTER IN YOUR COMMUNITY

Climate Reality has chapters across the US that are working to move their communities towards a healthier, more sustainable future powered by clean energy technologies like solar.

In fact, many of our chapters work on our *100% Committed* campaign, collaborating with towns, counties, schools, and businesses to make the switch to 100-percent renewable electricity. [Join a chapter today and help bring real climate solutions to your community.](#)

## KEEP LEARNING MORE ABOUT RENEWABLES AND CLIMATE CHANGE

This isn't our only e-book! You can download the latest information on a variety of topics:

- [It's a Breeze: The Facts about Wind Energy](#)
- [Extreme Weather and the Climate Crisis: The Facts](#)
- [The Climate Crisis: A Quick Guide to the Basics](#)

## DONATE TO CLIMATE REALITY

At Climate Reality, we work hard to create high-quality educational content like blogs, e-books, videos, and more to empower people all over the world to fight for climate solutions and stand together to drive the change we need. We are a nonprofit organization that believes there is hope in unity, and that together, we can build a safe, sustainable future.

But we can't do it without your help. If you enjoyed what you've just read and would like to see more, [please consider making a generous gift to support our ongoing work to fight climate denial and support solutions.](#)



# The Climate Reality Project<sup>®</sup>

Founded and chaired by former US Vice President and Nobel Laureate Al Gore, The Climate Reality Project is dedicated to catalyzing a global solution to the climate crisis by making urgent action a necessity across every level of society.

Today, climate change is standing in the way of a healthy tomorrow for all of us. But we know that practical solutions are right in front of us. We can create a healthy, sustainable, and prosperous future by making a planet-wide shift from dirty fossil fuels to clean, reliable, and affordable renewable energy. At Climate Reality, we combine digital media initiatives, global organizing events, and peer-to-peer outreach programs to share this good news with citizens everywhere and build overwhelming popular support for policies that accelerate the global transition to a clean energy economy.

To learn more, visit [www.climaterealityproject.org](http://www.climaterealityproject.org)