

Appendices

Appendix A: Top Ten Myths about Rooftop Solar Busted

*Facts are stubborn things; and whatever
may be our wishes, our inclinations, or
the dictates of our passions, they cannot
alter the state of facts and evidence.*

—JOHN ADAMS

If you have solar on your home, you already know that it's affordable, practical, and clean. But too many Americans still believe that solar isn't ready for prime time or that it actually hurts the environment. This list of solar myths, with answers for each, will help you bust these myths as you talk to people you know about solar power. If you decide to step up as a citizen-lobbyist for solar policy, the list will also help you talk to public officials.

Myth #1: Solar Power is Too Expensive: Traditional sources of electricity such as natural gas and nuclear power are cheaper.

Fact: The price of solar decreased 80 percent between 2008 and 2013, according to the GW Solar Institute. As more people go solar, mass production will cause the costs of solar to fall even further. Meanwhile, the cost to buy electricity from utilities that sell a mix of power primarily

from fossil fuels and nuclear power has remained nearly steady for the last decade. Regulations on pollution are sure to raise the cost of dirty energy in the future. Removing high taxpayer subsidies for coal, oil, gas, and nuclear power would further raise the price of dirty energy and make solar relatively cheaper.

Myth #2: Solar Power isn't Practical Yet: A large industrial economy like that of the United States cannot rely yet on solar power as its main energy source.

Fact: At the turn of the 21st century there were only a thousand solar installations across the country. Today, that number has grown to more than a million. In its best-case scenario, the International Energy Agency projects the U.S. could install 305 gigawatts of solar by 2030 and 737 gigawatts by 2050.¹⁹ That's more than a 1,000 percent increase over 14 years from today's capacity of 27.2 gigawatts. While ambitious, Bloomberg New Energy Finance projects that the country will have 288 gigawatts of solar by 2030, which would put us well on the way to reaching the IEA's ambitious goal. Meanwhile, the Solutions Project and other activist groups are campaigning for the United States to use 100 percent clean energy by 2050. More than half of that clean energy could come from solar power.

Myth #3: Solar Power Can't Provide Energy 24/7: Just as wind turbines only produce power when the wind

is blowing, so solar panels only generate electricity when the sun is shining. On cloudy days, solar panels don't work well and at night, they don't work at all. So, we need to turn to traditional energy sources for reliable electricity that's always on.

Fact: It's true that solar panels only generate power when it's light outside. But with new battery technology that's more powerful and more affordable than in the past, it's now practical to store solar power produced during the daytime for use at night. Every year, more people install solar + battery storage. In the state with the most expensive electricity, Hawaii, it already makes financial sense to use batteries instead of buying power from a utility. And if homeowners and small businesses with solar + storage are fairly compensated for the benefits that storage brings to the grid in the future, then more people will install batteries to store their solar power.

Myth #4: America's Electric Grid Can't Handle More Solar Power: To operate reliably, the grid requires a large supply of "baseload" power from large power plants that's always on, the electric grid can only accept a small portion of power from home producers of solar.

Fact: Even without any upgrades, today's Eastern U.S. grid could safely handle up to 30 percent renewable energy, according to the National Renewable Energy Laboratory.²⁰ In the future, "smart grid" technology that

that can effectively handle power flows not just from the power company to our homes, but also back from our homes to the power company, will be able to accept a majority of its power from renewables including solar.

Myth #5: Solar Panels are Bad for the Environment:

Solar panels take up valuable land that can be used for farming or open space. Making solar panels pollutes air and water, while both making and shipping solar panels emits greenhouse gases.

Fact: It's true that large ground-mounted solar plants, as favored by utilities, do use up land. But most small-scale solar is placed on rooftops that aren't being used for anything else. Solar can even help insulate those roofs from sun, rain, and snow, making roofs cooler and helping them last longer. Some solar is also installed in canopies over parking lots or decks, turning unused space into valuable shaded parking. As to their materials, at the end of their lifespan of 25-40 years, 90 percent of the materials from solar panels can be recycled. The clean energy from solar panels offsets their carbon footprint in four years, according to Greenpeace.²¹

Myth #6: Solar Power Can't Survive on Its Own without Government Subsidies: When Solyndra went bankrupt in 2011, the federal government had to write off \$139 million of the \$192 million loan that the

U.S. Department of Energy made to the solar panel manufacturer. This shows that solar can't compete with traditional energy sources in a free market.

Fact: The loan program involved was actually a success overall. Most of the other companies successfully paid back their loans. Solyndra was also not a typical solar company, but a high-risk startup. Hundreds of other solar companies have found profitable markets making equipment and installing solar panels across the country. Meanwhile, traditional energy sources also heavily rely on government subsidies, and long have. Over the period of time they've been subsidized, fossil fuels and nuclear power have gotten many times more subsidies over time than solar has, according to a 2011 study by DBL Investors. And when you average that out per year, all renewable energy (including solar with wind and others) has cost about \$395 million per year. Nuclear power, subsidized for a much longer period, has averaged \$3.57 billion annually. But the winner by far for government subsidies is oil and gas, getting an average of \$4.91 billion in government subsidies *per year*.

Myth #7: Solar Power Doesn't Work in Cold Climates: Solar panels only produce enough power in sunny places like Arizona, California, or Florida. In northerly states, there's just not enough sun to make solar power worthwhile.

Fact: There's enough sun in every U.S. state to make solar power practical. As proof, consider that the world's fourth-ranking country for solar in 2016, Germany, has sunshine comparable to the state of Alaska. Yet, Germany had more solar capacity installed than the whole United States. So, more important than sunshine is good public policy to encourage the spread of solar, as in the case of Germany. Good solar policy has helped to make some northern states, including New York and New Jersey, leaders in solar, actually helping them to long outrank sunny Florida, which has superior sunshine but has suffered from weak support for solar from state government.

Myth #8: Nuclear Power is Cheaper than Solar: America's coming "Nuclear Renaissance" will build power plants with new technology that will be cheaper than solar.

Fact: After much fanfare, the long-promised nuclear renaissance has never materialized and doesn't look likely to. Several utilities, especially in Georgia and South Carolina, have put plans to expand existing nuclear plants or build new ones on hold after massive cost overruns. Like all traditional sources of energy, nuclear power receives much more money in government subsidies than solar. Even so, nuclear power plants are too expensive to build in today's economy. And when you take out subsidies for both nuclear and solar, nuclear is a much more expensive way to generate electricity. Per megawatt hour, the

average utility company can produce electricity with solar as low as \$49, while it costs at least \$97 to produce the same amount of electricity with nuclear power, according to a 2016 report by investment bank Lazard.²² That makes nuclear about twice as expensive as solar.

Myth #9: The Best Power Stations Are Big Ones:

The cheapest and most reliable electricity will be produced as it has for more than a century, by big power plants run by electric utilities. Solar plants built by utilities can produce power for half the cost of solar panels located on the rooftops of homes. That makes utility solar better.

Fact: It's true that utilities benefit from bulk discounts to buy solar panels cheaply to build large solar farms. But home solar systems offer benefits to their owners and to their neighbors not available from big solar plants. Big centralized solar plants offer tempting targets for terrorists who wouldn't bother targeting thousands of small arrays distributed on homes over a large area. You also lose energy sending power from big solar farms over power lines to the homes who use that power. Finally, solar panels on their own rooftops offer homeowners energy independence that they don't get by relying on their utility company to sell them solar power. Through solar cooperatives run by such organizations as Solar United Neighbors (sometimes also called Solarize programs), homeowners can save 15% or more on the cost of a solar installation by

banding together with their neighbors to qualify for a bulk discount.

Myth #10: Solar Homeowners Are Freeloaders Who Don't Pay Their Fair Share to Use the Electric Grid: Solar homeowners who are connected to the electrical grid enjoy the benefits of the grid to back up their solar systems on the one hand. But solar homeowners who zero out their electric bills don't pay any of the costs to maintain the grid on the other hand. Those grid costs are passed along in higher utility rates to their neighbors who don't have solar, which is unfair.

Fact: Solar homeowners provide power to the grid that's about 50 percent more valuable than the credit they get from their utility company. On average, solar homeowners get about 12 cents per kilowatt hour for power they sell to their utility company. But the solar power they produce provides about 17 cents per kilowatt hour worth of benefits to the electrical grid, according to a 2015 report by Environment America based on studies by utility regulators in a dozen states.²³

By reducing the need for utilities to purchase more traditional fuels and build new power plants, solar homeowners help make electricity cheaper for their neighbors who don't yet have solar. And by offering distributed power that's not subject to blackouts caused by the breakdown of big power plants, solar homeowners make the electricity supply more reliable for their neighbors too.

Appendix B: Solar Bill of Rights (Solar United Neighbors)

Published in 2017 by Solar United Neighbors, a national organization that has been helping solar owners and supporters fight for their energy rights since 2007.

We, the undersigned, believe we have the right to produce our own power.

- We have the right to put solar on our roofs, in our yards, or to share a nearby solar array with our neighbors.
- We have the right to manage our own electricity production and consumption so that we can all save money.
- Solar power creates local jobs, keeps money in our community, makes us more resilient, and enhances our energy security.
- Solar should be affordable and accessible for all.

We believe utilities work for the people—not the other way around.

- Utilities should enable us to take control of our energy—not prevent us from doing so.

- Utilities have an obligation to help the communities they serve transition to clean, locally-produced energy.
- Utilities should not put punitive or arbitrary charges, fees, or rules in the way of solar.

We envision a clean, equitable energy system that directs control and benefits back to local communities, with solar on every roof and money in every pocket.

We're a community of people building a new energy system, and rooftop solar is the cornerstone.

Solar equals energy freedom. Join us today!

You can sign the Solar Bill of Rights at <http://www.solarunit-edneighbors.org/get-involved-with-solar-united-neighbors/advocate-for-solar/sign-the-solar-bill-of-rights/>

Appendix C: Recommended Policies to Encourage Rooftop Solar (SEIA)

The Solar Energy Industries Association recommends policies in seven areas for state governments to encourage rooftop solar, that is, solar installed on site by homeowners, small businesses, and communities for their own use.

Net Metering
Local Permitting
Property-Assessed Clean Energy
Rebates & Incentives
Solar Access Rights
Utility Rate Structure
Grid Modernization

Find out what specific public policy ideas SEIA recommends in each area online at <https://www.seia.org/initiative-topics/rooftop-solar>

Appendix D: Resources

Groups

The groups listed below advocate for better solar policy at the national level and in various states.

SOLAR-SPECIFIC GROUPS

Solar United Neighbors: Especially for solar homeowners who want to help spread solar in their communities and beyond. Formerly the Community Power Network, SUN is a coalition of grassroots, local, state, and national organizations working to build and promote locally based renewable energy projects and policies.

Vote Solar: Vote Solar is a non-profit organization working to foster economic opportunity, promote energy security, and fight climate change by making solar a mainstream energy resource. They work at the state level all across the country to support the policies and programs needed to repower our grid with sunshine.

Solar Energy Industries Association: SEIA is the voice of the solar industry at the federal and state level, advocating for the protection and expansion of the U.S.

market for all solar technologies. They represent the entire solar industry; from the small-business owners to the multi-national companies, from the installers on the roof to the engineers in the lab.

Regional: Solar CitiSuns represent homeowners with solar panels working for better public policy in California and Colorado. Groups focusing on other regions or states can be found online.

RENEWABLE ENERGY AND ENVIRONMENT GROUPS

Citizens' Climate Lobby: Aims to create the political will for climate solutions by “Enabling individual breakthroughs in the exercise of personal and political power.” By building constructive, working relationships with members of Congress they seek passage of carbon-fee-and-dividend, a climate change solution that bridges the partisan divide and promises to be more effective than traditional approaches to carbon regulation.

Climate Reality Project: Founded by Al Gore, the group's mission is to catalyze a global solution to the climate crisis by making urgent action a necessity across every level of society. Supports making countries including the United States honor our commitments under the 2015 Paris Climate Agreement.

League of Conservation Voters: LCV, in collaboration with state LCV partners, advocates for sound environmental laws and policies, holds elected officials accountable for their votes and actions, and elects pro-environment candidates who will champion their priority issues. Their top issue is climate change, including clean energy.

Sierra Club: The nation's oldest and largest environmental group, the Sierra Club runs several campaigns, including Ready for 100, promoting America's switch to 100 percent clean energy.

Local Groups: Most areas have chapters of national groups like the Sierra Club or else independent groups focused on local conservation issues or even on climate action for a certain region, such as the Chesapeake Climate Action Network in the mid-Atlantic area.

ESPECIALLY FOR CONSERVATIVES

Conservative Energy Network: CEN was launched in 2016 by conservatives, for conservatives, to support and connect state-based conservative clean energy and energy efficiency organizations throughout the nation.

Young Conservatives for Energy Reform: This new group seeks to bring together young professional,

socially conservative, leaders from across the country in a grassroots effort to influence energy reform and to build and strengthen regional and state coalitions through targeted meetings, press releases, and local media outreach efforts.

RepublicEn: Members of RepublicEn are conservatives, libertarians, and pragmatists of diverse political opinion. “Climate change is real and we believe it’s our duty and our opportunity to reduce the risks. But to make a difference, we have to fight climate change with free enterprise instead of ineffective subsidies and regulations.”

Regional: Conservatives for Clean Energy supports renewables in North Carolina and Virginia. Led by powerhouse activist Debbie Dooley, The Green Tea Coalition started in Georgia but has expanded into Florida and other southeastern states.

Books

SOLAR POWER AND PUBLIC POLICY

Let It Shine: The 6,000-Year Story of Solar Energy by John Perlin. Foreword by Amory B. Lovins, cofounder and chief scientist of the Rocky Mountain Institute.

Rooftop Revolution: How Solar Power Can Save our Economy—and our Planet—from Dirty Energy by Danny Kennedy. Foreword by General Wesley Clark, US Army (ret.).

Solar Revolution: The Economic Transformation of the Global Energy Industry by Travis Bradford.

LOBBYING AND DEALING WITH GOVERNMENT

Citizen’s Handbook to Influencing Elected Officials: Citizen Advocacy in State Legislatures and Congress by Bradford Fitch.

America The Owner’s Manual: You Can Fight City Hall—and Win by Senator Bob Graham and Chris Hand.

HISTORY OF THE AMERICAN REVOLUTION

1776 by David McCullough.

The American Revolution: A History by Gordon S. Wood.

The American Revolution 100: The People, Battles, and Events of the American War for Independence, Ranked by their Significance by Michael Lee Lanning.

Washington’s Spies: The Story of America’s First Spy Ring by Alexander Rose.

Notes

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About the Author

The Solar Patriot is Erik Curren's third book and his second one about solar power. With his wife Lindsay, known as Mrs. Solar Patriot, Erik runs the Curren Media Group, which provides marketing services to the solar industry. He is also an experienced advocate and citizen-lobbyist for climate change, clean energy, and solar power on the federal, state, and local levels. As a two-term member of the city council of his current hometown, Staunton, Virginia, Erik gained experience of how government works from the standpoint of an elected official. He's a big history buff and has enjoyed learning about the American Revolution over the last couple years. He and Lindsay enjoy wearing their eighteenth-century costumes to visit historic sites around the Old Dominion from Colonial Williamsburg to Mount Vernon and Monticello and even walking the National Mall in Washington, DC.