

A Brief History of Solar Power in the US

By John Benson

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1. Introduction

This post started when I found a brief chronology of Solar Power by the author listed in the footnote below.¹ Your author (above) spent most of a couple of days, going through this chronology and made many edits and additions. I thought the resulting content was important enough to share with my Energy Central readers, and thus this post.

Note that this paper is a chronology of mainly photovoltaic (PV) technology from the invention of the PV-cell in 1954 to the present, but also includes some early solar-thermal panel and concentrated solar thermal technology.

2. The Chronology

The Solar Industry started the first silicon solar cells developed in 1954 in Bell Labs in New Jersey. Much research followed release of the prototype.

The first Earth Day on April 22, 1970. Three years later the first solar home, Solar One, debuted at the University of Delaware.

The Solar Energy Industries Association (SEIA), launched 50 years ago in 1974 with the idea that the trade association should support the “prompt, orderly, widespread and open growth of solar energy resources now.” SEIA led the way to integrate solar energy into the policies of the Carter Administration. In 1978, Congress passed the Public Utility Regulatory Policies Act, which promoted renewable energy sources.

In 1979, President Carter installed solar modules (solar-thermal collectors used for water heating) on the White House.

Author’s comment: Before the invention of solar cells mentioned at the beginning of this section, there was just one type of solar energy: concentrated solar-thermal power (CSP). CSP required a huge infrastructure and perfect weather conditions to generate a useful amount of power (bring large buckets of \$millions). Although the first small-to-medium applications facilitated by solar cells were on really small devices, like calculators, these quickly started graduating to larger appliances and other loads:

Fifty years ago, in 1976, NASA-affiliated Lewis Research Center (LeRC) commenced photovoltaic system installations for application on Earth, which continued until 1985 and later, from 1992 until 1995. These systems powered refrigerators, telecommunication equipment, medical equipment, lighting and water pumping, and other applications.

NASA LeRC introduced several demonstration projects. The first amorphous silicon solar cell was developed by RCA Laboratories (hydrogenated amorphous silicon thin-film solar cell) in 1974.

¹ Anne Fischer, PV Magazine. Note that much of the content originated from Ms. Fischer of PV Magazine, and was posted to PV Magazine on October 23, 2026 (link below). John Benson of Microgrid Labs researched all of the entries, including those that originated with Ms. Fischer, and added to or edited much of this paper’s content. https://pv-magazine-usa.com/2026/10/23/a-brief-history-of-solar-in-the-us/?utm_source=newsletter_us&utm_medium=email&utm_campaign=daily&utm_content=20261023

In 1977, the world production of photovoltaic modules exceeded 500 kW. NASA LeRC commenced implementing photovoltaic systems in six meteorological stations in different locations within USA. LeRC also introduced additional trial demonstration projects.

On December 16, 1978 engineers from NASA's Lewis Research Center activated a new photovoltaic system that provided reliable electricity to Schuchuli, Arizona on the lands of the remote Papago Indian Reservation. See image below.



Schuchuli village in southern Arizona with solar panels on the left in November 1978.

This first “solar electric village,” which was 17 miles from the nearest power lines, had previously relied on kerosene lamps, a diesel-powered well, and hand-washed laundry. Over the next year, hundreds of domestic and foreign officials as well as media members trekked to the site to view the groundbreaking power system.

In 1979, 32 solar-thermal collectors are installed on the roof of the White House by President Jimmy Carter. He predicted that solar could “be a small part of one of the greatest and most exciting adventures ever undertaken by the American people.

Also in 1979, ARCO Solar of Camarillo, California, built the biggest solar cell and photovoltaic systems production plant at that time.

A few years later, in November 1982, Atlantic Richfield Company subsidiary ARCO Solar began operating the first utility-scale solar photovoltaic power plant in the United States at the Lugo substation site near Hesperia, California. This 1.1 MW facility marked a historic milestone — it was the world's first solar installation to exceed one megawatt of capacity and the first true grid-connected utility-scale solar farm.

At just 1.1 MW, ARCO soon followed with a 5.2 MW plant in Carrizo Plain (southeastern San Luis Obispo County, California) that operated from 1983 to 1994. Both of these solar farms used Single-crystal silicon photovoltaic modules, derived from NASA-developed space-age solar cells.

Also, in 1982 NASA LeRC built a 1.8 kW water pumping photovoltaic system in Burkina Faso in West Africa. The system peak power was enlarged to 3.6 kW the same year.

In Mt. Laguna, California, a trial 60 kW hybrid diesel-photovoltaic system was built for radar station power supply.

In 1983, Minnesota became the first state to enact a net metering law, allowing solar consumers generating less than 40 kW to be compensated for the amount they sent to the grid. The policy was among the first to incentivize and support the installation of distributed solar energy systems.

The first Solar Power International (SPI) conference (now RE+) took place in California in 2004, attracting 1,000 attendees. The following year the federal Energy Policy Act was passed, which created the first solar investment tax credit.

In 2006 the city of Ellensburg, Washington installed the first-in-the-nation community solar facility. Two years later, in 2008, U.S. solar capacity reached 1 GW.

To increase competition in the U.S. solar industry, the Department of Energy (DOE) launched the **SunShot initiative** in 2011. The initiative aimed to lower solar energy costs by 75% by the end of the decade, bringing large-scale solar costs on par with other forms of energy.

In 2013 President Barack Obama orders the installation of 6.3-kW of PV panels on the roof of the Obamas' executive residence. The system is estimated to have an eight-year payback period (the solar-thermal Panels President Carter installed in 1979 were removed in 1986). Also, in 2013 he released a Climate Action Plan that called for an expansion of clean energy and set ambitious targets for solar power.

In 2015 the solar industry surpassed 200,000 workers; Burlington, Vermont was the first city to reach 100% renewable power; and Hawaii was the first state to set a 100% renewable goal.

In 2016, the U.S. solar industry surpassed **1 million installations**. The following year utility-scale solar costs fell below \$1 per watt and the SunShot initiative goal was achieved three years ahead of schedule – see above highlighted “SunShot initiative.”

In 2022 President Biden signed the Inflation Reduction Act (IRA) into law. The IRA was among the largest climate and energy bills in U.S. history. The IRA was the first stand-alone tax credit for energy storage. The bill also included new incentives for domestic solar manufacturing (see the final author's comment, on the next page).

According to the SEIA/Wood Mackenzie U.S. Solar Market Insight data, 75 GW of new solar capacity were added to the U.S. grid under the Inflation Reduction Act (IRA) from 2024 through 2025.

In 2023 solar accounted for over 50% of new electricity capacity added to the grid.

In the first quarter of 2026, the U.S. reached **6 million solar installations** and new solar capacity surpassed coal generation for the first time. In that same year the industry saw the return of the entire solar manufacturing supply chain with every component now manufactured in the U.S. Manufacturers now have the capacity to build over 75 GW of solar modules annually, or enough to meet the needs of the entire U.S. market.

2026 is also a landmark year for energy storage. In the second quarter energy storage dispatched 4.5 TW/h hours of electricity, the most ever for a single quarter. A report from SEIA and Benchmark Intelligence found that the energy storage industry installed 20.2 GWh of new capacity in the first half of 2026.

In the past 70 years, solar has become an integral part of the technologies feeding the U.S. grid. In just the past decade, Solar's share of U.S. electricity generation has grown seven-fold, and SEIA expects that solar will continue making up the bulk of new energy additions through and beyond 2060.

Final author's comment: battery energy storage systems (BESS) are critical for any photovoltaic (PV) system. Because the sun sets well before the end of the typical peak demand period (especially in the spring and autumn) reducing or ceasing PV energy generation, BESS can carry any load past this period. Your author has a PV System on his roof, as well as a 10 amp-hour BESS that uses lithium-ion batteries.

When the BESS product manager was setting this up, he asked me how I wanted it programmed for daily operation (beyond acting as a full-house UPS upon loss of utility-power), and I indicated that it should be programmed to cover the late-afternoon to early-evening ramp-down of the PV System. Since then, our PG&E Electric bill has been minimal to zero.