

Solar Energy Technologies Office Overview

The U.S. Department of Energy (DOE) Solar Energy Technologies Office (SETO) funds early-stage research, development, and demonstration projects to improve the affordability, reliability, and domestic benefit of solar technologies on the grid. The office works to advance photovoltaic (PV), concentrating solar-thermal power (CSP), and systems integration technologies to drive U.S. leadership in innovation, reduce solar electricity costs, enable solar to support grid reliability, and increase resilience by pairing solar with storage. SETO has provided the energy industry with the technological foundations necessary to continue growth and preserve American energy choice, independence, and security.

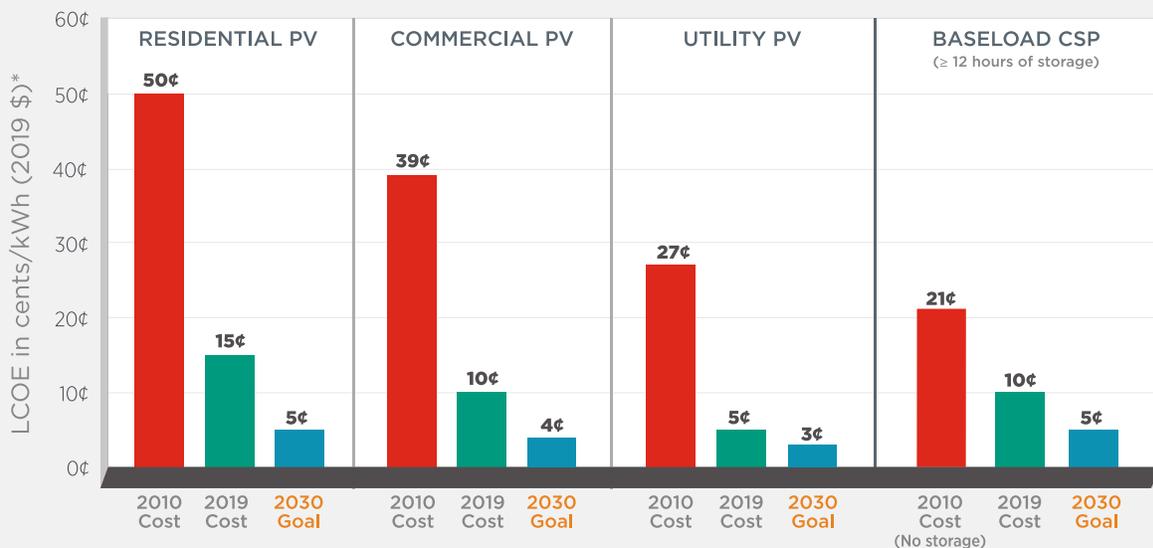


The AES Lawai Solar Project in Hawaii consists of a 28-megawatt solar photovoltaic system with a 100-megawatt-hour battery energy storage system. Photo courtesy of Dennis Schroeder / National Renewable Energy Laboratory.

Solar Energy Goals

According to the U.S. Energy Information Administration, solar provides about 3% of U.S. electricity; in some states and regions, solar represents over 10% of annual electricity generation. As solar generation becomes a key contributor to the power system, it must actively support the operation of it. DOE invests in innovative research and development that will enable solar to contribute to the reliability and resilience of the nation's electricity grid in concert with energy storage and other energy resources. Additionally, By 2030, DOE aims to lower the levelized cost of solar energy to \$0.03 per kilowatt-hour (kWh) for utility-scale PV, \$0.04 per kWh for commercial rooftop PV, and \$0.05 per kWh for residential rooftop PV. For CSP, the goal is a levelized cost of solar energy of \$0.05 per kWh for baseload plants. All projects funded by SETO work to ensure solar energy can provide safe, reliable, secure, and cost-effective electricity.

Solar Energy Technologies Office Progress and Goals Photovoltaics (PV) and Concentrating Solar-Thermal Power (CSP)



*Levelized cost of energy (LCOE) progress and targets are calculated based on average U.S. climate and without the Investment Tax Credit or state/local incentives. The residential and commercial goals have been adjusted for inflation from 2010-19.

Key Activities

SETO projects encourage collaborative partnerships among industry, universities, DOE National Laboratories, federal, state, and local governments, and nongovernment organizations. Projects fall into five research categories:

- **Photovoltaics (PV):** Improving efficiency and reliability and lowering manufacturing costs of PV panels; driving down the cost of electricity from PV through innovative technology concepts and experimental designs.
- **Concentrating Solar-Thermal Power (CSP):** Developing novel CSP technologies that help to lower costs, increase efficiency, and provide more reliable performance so the sun's heat can more effectively generate and store energy for on-demand use; advancing new applications for CSP, from solar desalination to thermal industrial processes.
- **Systems Integration:** Enabling the safe, reliable, and cost-effective integration of solar energy on the nation's electricity grid; developing solutions that ensure compatibility with existing infrastructure while enabling a smooth transition to a secure and resilient grid of the future.
- **Strategic Analysis and Institutional Support:** SAIS supports the development of analysis, tools, and data resources to reduce the non-hardware (soft costs) of solar energy and accelerates learning through technical assistance programs and national partnerships.
- **Manufacturing and Competitiveness:** Investigating and validating groundbreaking solar technology in order to strengthen innovative concepts and move them toward readiness for greater private-sector investment and scale-up to commercialization.

Funding Mechanisms

SETO funds projects at the DOE National Laboratories, universities, for-profit and nonprofit businesses, and government agencies. The office awards most of its funding through competitive solicitations:

- **Funding Opportunity Announcements (FOAs):** FOAs solicit projects from across the research, industry, National Laboratory, and stakeholder community to achieve the office's goals. On average, these projects operate for two to five years and range from \$250,000 to \$5 million in

funding. Projects must meet aggressive milestones to receive funding.

- **Prizes and Challenges:** These competitions establish goals that teams must reach and reward those that perform the best. Prizes help spur innovation while encouraging private-sector engagement by lowering the barrier to entry for government funding.
- **Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs:** DOE's SBIR/STTR programs encourage U.S.-based small businesses to engage in high-risk, innovative research and technology development with the potential for future commercialization. Small businesses can also receive funding through FOAs.
- **National Laboratory Funding:** Specific funding for labs is provided via lab calls, which are similar to FOAs and are issued every three years. Additionally, funding is provided via programs and initiatives that enable labs to provide expert information and technical assistance to stakeholders. SETO is also able to directly initiate projects with labs.

Why It Matters

SETO-funded research benefits every American by making clean, low-cost, and reliable solar energy more accessible. Solar energy, in combination with energy storage, increases the resiliency of our energy distribution systems and the reliability of the electric grid. Establishing U.S. leadership in clean energy innovation will continue to create jobs in our country through domestic manufacturing of solar materials and equipment, financing, installation, and maintenance.

Follow SETO's Progress

- For more information on SETO's work and to sign up for our newsletter, visit energy.gov/eere/solar
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