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**OPINION
COMMENTARY**

Brigitte Bren: Here's the case for the US leading the harvesting of solar energy in space



Wind turbines are silhouetted against the sky at sunset on May 15, 2026, near Cimarron, Kansas. (Charlie Riedel/AP)

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The United States is fast approaching an inflection point in energy policy. Artificial intelligence, advanced manufacturing, cloud computing and advanced defense systems are driving electricity demand at a level that the existing grid cannot reliably meet. The next generation of data centers will require ever more constant large-scale power measured in gigawatts, not megawatts. Without change, energy is becoming the limiting factor in American economic expansion.

This urgency explains the renewed interest in nuclear energy and the continued interest in fusion. Both may play important roles. Yet even under optimistic timelines, they alone will not close the near-term gap. Expanding conventional nuclear capacity requires long permitting cycles, complex financing and fuel supply chains that are often unreliably global. Fusion remains commercially unproven.

Providentially, a technology long considered theoretical and speculative has crossed a meaningful threshold: [Space-based solar energy](#) uses orbiting satellites to capture sunlight in space, where it shines continuously and without atmospheric interference. That energy is converted and transmitted wirelessly to receiving stations on Earth, feeding directly into the grid as steady electricity. Unlike ground-based renewables, orbital solar is not constrained by when the wind blows or sun shines. A power satellite can flexibly transmit energy to earth-bound receiving stations based on local needs, strengthening strained regional grids, supporting dense data infrastructure or supplying electricity after natural disasters.

This is not a pipe dream. [Scientists at the California Institute of Technology](#) have demonstrated wireless power transfer in orbit and successfully transmitted measurable energy to Earth. Their experiment confirmed the viability of the approach outside of laboratory conditions. The system transmits power using [nonionizing microwave energy](#) rather than lasers, operating at frequencies that do not alter molecular structures and remain within established safety standards.

The economic case for space-based solar energy is strengthening. A recent [report in the journal Joule](#) outlines a pathway toward a 10-gigahertz orbital power station capable of delivering electricity at roughly 9.4 cents per kilowatt-hour. In many states, consumers and businesses pay significantly more. Commercial plausibility for this new technology is not a distant aspiration.

China, Japan, the European Space Agency and the United Kingdom are all aware of this budding technology and are investing with long time horizons. The risk to the United States if it fails to act is structural lock-in. The nation that establishes large-scale orbital power platforms will influence standards, control key transmission architecture and anchor manufacturing ecosystems around its own industrial base. Once orbital infrastructure and supply chains are embedded, they are difficult to displace. If

the United States hesitates, it may find itself operating in an energy system designed and scaled elsewhere.

Moving space-based solar energy from proof of concept to scalable commercialization will require a commitment from the federal government. Congress has a clear role to play. A well-funded multiyear demonstration program stewarded by NASA and the Department of Energy could move the technology forward. Directed funding for orbital transmission systems and ground-receiving infrastructure could validate performance under real operating conditions. Clear statutory authority for space-based power transmission would reduce regulatory uncertainty and unlock private investment.

A structured public-private commercialization framework is equally essential. Federal support for private projects should be robust and milestone-based and designed to catalyze, not replace, private capital. Launch providers, advanced manufacturers, utilities and large electricity purchasers should be collaborating among themselves and government in scaling up this new technology.

The implications extend beyond energy generation. Scaling orbital solar would require American-built satellites, American launch services, American robotics and American receiving infrastructure. It would support high-skilled manufacturing jobs across multiple states and strengthen supply chains at a moment when resilience has become a public priority. It would reinforce leadership in both space systems and the next generation of power technology.

Access to orbit is no longer the constraint it once was. Reusable launch systems developed by SpaceX have significantly reduced costs. Advances in modular assembly and lightweight materials continue to narrow technical barriers. The conditions that once made orbital solar implausible no longer exist.

Congress does not need to determine whether the science works. Its decision is whether the United States will build, deploy and control this infrastructure or depend on systems shaped elsewhere. Energy has always underwritten American economic strength and national security. The next era of that strength will depend on abundant, constant and redirectable electricity.

The power race is moving to orbit. The United States should win it.

Brigitte Bren is a trustee of Caltech, a lawyer and a producer of [Bright Harvest: Powering Earth from Space](#).