



# Space Solar Power (SSP) — A Solution for Energy Independence & Climate Change

A National Security Space Office (NSSO) study<sup>1</sup> concluded in October of 2007 that “*The magnitude of the looming energy and environmental problems is significant enough to warrant consideration of all options, to include ... space-based solar power.*” This NSSO report also concluded that SSP has “*enormous potential for energy security, economic development, improved environmental stewardship, advancement of general space faring, and overall national security for those nations who construct and possess a (SSP) capability.*”

We urge the next President of the United States to include SSP as a new start in a balanced federal strategy for energy independence and environmental stewardship, and to assign lead responsibility to a U.S. federal agency.

- **SSP Falls through the Cracks as Nobody is Responsible:** No U.S. federal agency has a specific mandate or clear responsibility to pursue SSP. The U.S. Department of Energy (DOE) says SSP is a space project, and thus NASA's job. NASA says SSP is an energy project, and thus DOE's job. The NSSO-report found that SSP “*falls through the cracks' of federal bureaucracies, and has lacked an organizational advocate within the US Government.*”
- **SSP has Significant Long-Term Advantages:** SSP is unusual among renewable energy options as it satisfies all of the following criteria:
  - **Immensely Scalable** — SSP can scale to provide the energy needs of the entire human civilization at America's standard of living. Most other near-term renewable options are strictly limited in scalability. As the NSSO report states “*A single kilometer-wide band of geosynchronous Earth orbit experiences enough solar flux in one year to nearly equal the amount of energy contained within all known recoverable conventional oil reserves on Earth today.*”
  - **Safe Global Availability** — Nuclear power technology cannot be safely shared with most of the countries on this planet because of proliferation concerns.
  - **Steady & Assured** — SSP is a continuous, rather than intermittent, power source. It is not subject to the weather, the seasons, or the day-night cycle.
  - **No Fundamental Breakthroughs** — SSP does not require a fundamental breakthrough in either physics or engineering, such as those required by fusion.
  - **Highly Flexible and Optimal for Export** — SSP could enable America to become a net energy exporter. We could be the world's largest exporter of energy for the 21st and 22nd Centuries, and beyond.
- **Economics is the Key Barrier.** The extremely high-cost of space transportation and building spacecraft is the principal barrier. Some believe the cost of SSP is so high that it will never be economical for baseload power. Never is a long time and we disagree. More importantly, the NSSO disagrees. The solution to the cost challenge is straightforward: 1) Achieve cheap & reliable access to space, 2) Apply high-volume mass-production assembly-line techniques to spacecraft construction, 3) Reduce the technical risk with basic research and technology demonstrations, and 4) Adopt proven government approaches to incentivize private industry investment, development and operation.

## RECOMMENDATIONS

- **Establish Development of SSP in National Policy:** Establish in national policy the explicit goal to develop Space-Based Solar Power as an energy resource, consistent with our existing national policies to invest in other energy sources like wind, ground solar, geothermal, clean coal, advanced nuclear power, geothermal, fusion, and bio-fuels.
- **Assign a Lead Federal Agency:** Assign lead responsibility for developing SSP to a federal agency. This agency should be tasked to work with other federal agencies, private industry, and our international friends and allies.
- **Focus First on High-Value Niche Power Applications:** The federal government should focus first on very high-value energy requirements such as in-space power, emergency power services to devastated regions for humanitarian purposes, and delivering power to forward military bases.
- **Incremental Step-by-Step SSP Research Program:** The Administration should develop a program that is focused on developing and proving key technologies and a series of incrementally more challenging technology demonstrators that can be scaled to much larger systems by mass production techniques.
- **SSP Should be Funded at the Level of Fusion Energy Research:** The U.S. federal government has invested over \$21 Billion in fusion research in the last 50 years, and the DOE is currently spending \$300 million per year on fusion energy research. When choosing a lead agency for SSP, the Administration should establish an SSP research budget within that agency that grows to at least the level of the DOE's fusion energy research program.

<sup>1</sup> “Space-Based Solar Power: An Opportunity for Strategic Security”, 10 October 2007, <http://www.acq.osd.mil/nssso/solar/solar.htm>