National Security Space Office

Space-Based Solar Power as an Opportunity for Strategic Security

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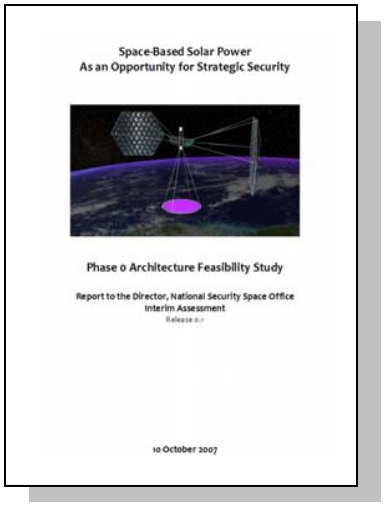
Interim Report: 'Phase 0' Architecture Feasibility Study

- In April 2007 NSSO's Advanced Concepts Office sponsored a study of the technical, political, and economic feasibility of the Space-Based Solar Power (SBSP) concept
- Study involved:
  - Review of a vast body of extant literature and current developments
  - Participation in multiple events
  - Consultation with over 170 experts
  - Extensive and novel use of Internet collaboration
- *Findings and recommendations are those of the SBSP Study Group alone and do not represent the official position of the National Security Space Office*



Study Framework

Objective Question:

Can the United States and partners enable the development and deployment of a space-based solar power system within the first half of the 21st Century such that if constructed could provide affordable, clean, safe, reliable, sustainable, and expandable energy for its consumers?

Four Focus Areas:

1. Science & Technology
2. Policy & Legal
3. Logistics & Infrastructure
4. Business Case

Overarching Findings/Themes

1. Space-Based Solar Power ***does present a strategic opportunity*** that could significantly advance US and partner security, capability, and freedom of action, and ***merits significant further attention on the part of the United States Government and the private sector***.

2. While significant technical challenges remain, Space-Based Solar Power ***is more technically executable than ever before*** and current technological vectors promise to further improve its viability. A ***government-led proof-of-concept demonstration*** could serve to catalyze commercial sector development.

Overarching Findings/Themes

3. SBSP ***requires a coordinated national program with high-level leadership and resourcing*** commensurate with its promise, but at least on the level of fusion energy research or International Space Station construction and operations.

4. Should the U.S. begin a coordinated national program to develop SBSP, it should expect to find that ***broad interest in SBSP exists outside of the US Government:***

   – ***Aerospace and energy industries***

   – ***Japan, the EU, Canada, India, China, Russia, and others***

   – ***Many individual citizens*** who are increasingly concerned about the preservation of energy security and environmental quality

   While the best chances for development are likely to occur with US Government support, ***it is entirely possible that SBSP development may be independently pursued elsewhere without U.S. leadership***.

Questions Yet To Be Answered

- Certain key questions about Space-Based Solar Power were not answerable with adequate precision within the time and resource limitations of the interim study, and form the agenda for future action. The fundamental tasks/questions are:
  - Identification of clear targets for economic viability in markets of interest
  - Identification of technical development goals and a roadmap for retiring risk
  - Selection of the best design trades
  - Full design and deployment of a meaningful demonstrator

Study Group Recommendations

- **Recommendation #1**: The U.S. Government should organize effectively to allow for the development of SBSP and conclude analyses to resolve remaining unknowns
- **Recommendation #2:** The U.S. Government should retire a major portion of the technical risk for business development
- **Recommendation #3:** The U.S. Government should create a facilitating policy, regulatory, and legal environment for the development of SBSP
- **Recommendation #4:** The U.S. Government should become an early demonstrator/adopter/customer of SBSP and incentivize its development

Report Available At:

http://spacesolarpower.wordpress.com/