

SPACE POWER SYMPOSIUM (C3)
Space-Based Solar Power Architectures / Space & Energy Concepts (1)

Author: Mr. Nikolai Joseph
Space Policy Institute, George Washington University, United States

ISSUES IN SPECTRUM ALLOCATION FOR PROPOSED SPACE BASED SOLAR POWER SYSTEMS

Abstract

Space-based solar power (“SBSP”) has the potential to supply vast amounts of clean solar energy to Earth from space. Unfortunately, there are many legal and policy hurdles to overcome before SBSP can become a reality. While many technical studies exist to realise an SBSP system, very little study has been devoted to assessing the regulatory and policy constraints that may arise from actual wireless power transmissions from space. The prevailing literature on SBSP has yet to address the issue of spectrum allocation; instead, it defers this fundamental component to the purview of regulatory bodies. Since wireless power transmission would occur with microwaves, there is a need to identify suitable frequencies and to assess how they are presently allocated. This study presents a theoretical demonstration scale solar power satellite system of roughly 100 kW, and identifies several legal mechanisms for utilizing and securing access to the necessary frequencies. A comparison with a microwave transmission system provides a starting point for examining the license acquisition process. An outline of the process of the US and other international regulatory bodies – the Federal Communications Commission (“FCC”) and the International Telecommunications Union (“ITU”), respectively – identifies the necessary steps and potential challenges that an institution sponsoring a demonstration system will face. Next, an assessment of potential international and interagency partnerships which could be developed to share technical, financial, and political burdens is presented. Subsequently, consideration is then given to which entity will own the actual licenses for the transmission frequencies. Finally, the necessary steps identified, and lessons learned, from this study will serve as a guide for future license acquisition and frequency allocation of utility scale space solar power systems.