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IAF SPACE POWER SYMPOSIUM (C3)
Solar Power Satellite (1)

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A BRIEF REVIEW AND RECOMMENDATIONS FOR THE DEVELOPMENT OF SPACE SOLAR POWER SATELLITES

Abstract

Since the Industrial Revolution, electricity has become a necessity for humans on the Earth. Much of the technological developments within the last century show just how much humans have become dependent on electricity, which has become an industry essential to the global economy and sustainability. The growing global population versus demand for electricity is projected to double from 2015 to 2050, at 42,000 TWh, with the population nearing ten billion. In this context Space Solar Power Satellite (SSPS) will represent the future of power generation on the Earth. It is studied by many space agencies, and a variety of experiments are carried out from ground to space. SSPS is considered a green, clean, and cost effective technology for long-term utilization. Peter Glasser first patented the idea of SSPS and afterwards more than 29 proposed ideas are investigated from the 1960s to 2021. As for the energy aspect, many countries like the United States of America, India, Japan, Australia, United Kingdom, Russia, and China, are developing the key technology to contribute towards SSPS. Multiple approaches and designs of SSPS satellites include Energy transmission from Space to Earth with the help of Space Solar Power Satellites located in LEO, MEO and GEO via Laser beam or microwave, Satellite to satellite energy transfer and LEO based sunrays reflectors. In this paper, an enhanced review of SSPS and wireless power transmission technology is described with the recorded interviews of the SSPS scientists, engineers, and researchers from all over the world. A brief description of challenges from technology to legalization to develop the technology. The study will benefit to comprehend the importance and impact of technology for the upcoming space challenges and it is very advantageous to identify the technical and physical boundaries to fulfill future space mission requirements of SSPS satellites. Secondly a summary of recommendations from the SSPS community to develop the technology with the scientific, institutional, legal, and political based.