

A Comparison Of A Solar Power Satellite Concept To A Concentrating Solar Power System

David V. Smitherman

NASA Marshall Space Flight Center, Huntsville, AL, 35812

Abstract

A comparison is made of a Solar Power Satellite concept in geostationary Earth orbit to a Concentrating Solar Power system on the ground to analyze overall efficiencies of each infrastructure from solar radiance at 1 AU to conversion and transmission of electrical energy into the power grid on the Earth's surface. Each system is sized for a 1-gigawatt output to the power grid and then further analyzed to determine primary collector infrastructure areas. Findings indicate that even though the Solar Power Satellite concept has a higher end-to-end efficiency, that the combined space and ground collector infrastructure is still about the same size as a comparable Concentrating Solar Power system on the ground.