Paper ID: 72847
student

IAF SPACE POWER SYMPOSIUM (C3)
Interactive Presentations - IAF SPACE POWER SYMPOSIUM (IP)

Author: Mr. Thomas CHRETIEN
International Space University (ISU), France

THE UTILIZATION OF DYE-SENSITIZED SOLAR CELLS AS SATELLITE SUBSYSTEM AND FOR FUTURE LUNAR AND MARS BASE

Abstract

The need of finding renewable energy for space that would have a neutral carbon footprint process and recycling procedure is a necessary step toward a greener future and orbital protection. This and having 20-times cheaper and 2-times lighter solar generation systems could be combined into one by using plant-derived solar cells named Dye-Sensitized Solar Cells (DSSCs). Today new LEO megaconstellations aims to send more than 40,000 satellites, the planet and its people would benefit from greener processes. This would perfectly fit into the eco-friendly initiative Greensat from ESA that aims to provide more environmentally friendly space missions. Furthermore, this technology displays much better stability with temperature variation than other solar generation technologies and is even more efficient at cold temperatures. Besides, there is no limit in theoretical maximum efficiency other than the photon-to-electron conversion efficiency at about 95