

SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Systems and Infrastructures to Implement Future Building Blocks in Space Exploration and Development
(2)

Author: Mr. Seyed Ali Nasser

Space Generation Advisory Council (SGAC), Canada, ali.nasser@utoronto.ca

APPLICATIONS OF AIRBORNE WIND ENERGY SYSTEMS IN SPACE EXPLORATION

Abstract

Airborne wind energy systems are one of the novel inventions of this century, which rely on wind to generate energy while also reducing the cost and complexity of energy generation compared to conventional wind turbines.

The future of human space exploration stands on utilizing small habitats on planetary bodies. One of the important needs of such habitats is the need for power. One solution is the use of solar panels; however, on a planet like Mars solar panels of drastically large surface area will be needed to meet the power needs of a habitat. The best solution considered at this point is in-situ resource utilization which is under development.

However, other alternative do exist, one of which is currently under large research and development for its applications on earth. This solution is modifying airborne wind energy systems based on wind patterns on planetary bodies.

This work will assess the feasibility of using airborne wind energy systems on other planetary bodies and identifies the challenges that exist in this area.