

Topics (T)

Space Technology for Climate Adaptation and Mitigation [1] (6A)

Author: Dr. Azita Valinia

NASA Engineering and Safety Center (NESC), United States, Azita.Valinia@nasa.gov

KEY SPACE TECHNOLOGIES NEEDED FOR MONITORING AND MITIGATING CLIMATE CHANGE

Abstract

Tackling global climate change requires advanced space technologies for monitoring key parameters of the Earth system as well as novel mitigating technologies to offset the harmful anthropogenic effects of climate change. This paper gives an overview of some of the current and emerging space technologies for monitoring and mitigating climate change, specifically focusing on technologies developed at NASA for infusion on various NASA missions. We discuss monitoring remote sensing technologies for measurements of global greenhouse gases (focusing on CO₂ and Methane), land cover and land change, and sea level rise. We highlight the role of distributed spacecraft and information system technologies to translate data into knowledge needed for action by decision makers. The powerful knowledge gained by the monitoring systems enables us to chart a course of action for a mitigation plan. We give an overview of novel emerging space technologies needed to mitigate harmful effects of climate change. Some of these technologies are being developed by NASA for space exploration purposes but can potentially also have game-changing applications for tackling global climate change. Specifically, we highlight solar sail technologies that can be used to develop orbital Earth sunshades as well as space solar power technologies to enable the goal of carbon net-zero energy.