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CLIMATE CHANGE AND GREEN SYSTEMS: A REPORT FROM THE IAA 50TH ANNIVERSARY  
STUDY GROUP

**Abstract**

Over the past half-century, global space programs have made crucial contributions to the study and understanding of climate change, through the multi-decade accumulation of vast quantities of scientific data concerning the atmosphere, the oceans, the lands, and the mechanisms of exchanges between these domains. Moreover, technologies developed for space applications – such as solar arrays, fuel cells, and others – have found significant terrestrial value in diverse energy and transportation applications worldwide. And, increasingly space assets (e.g., weather observing systems, space-based navigation systems, etc.) are improving the efficiency with which energy is used. In the future, the contributions made by space activities and systems to solve the challenges of climate change and the development of increasingly green systems should be even broader and more important. As a part of the commemoration of the 50th anniversary of the founding of the International Academy of Astronautics (IAA), an IAA study group examined during 2009-2010 these challenges in Climate Change and Green Systems (CCGS), and formulated a series of recommendations for the global space community as to how better it might contribute to solving them through international coordination and cooperation. Although the study was conducted primarily by means of on-line tools, teleconferences, and selected working meetings, a critical element of the Academy's CCGS study was a major international conference on the topic of "How Can We Help Our Mother Earth", held in Nagoya, Japan at the end of August 2010.

The global space community has already done much to foster understanding of the risks of climate change and to develop and deploy new green systems and technologies that can mitigate and allow us to respond more effectively to those risks. All of these have a direct and enduring impact on global culture, on our understanding of the world and the relationship of humanity with natural systems, and on the education of future Earth scientists, space engineers and technologists, social scientists, and others.

During the coming years and decades that community can do much more to contribute to the development of sustainable green systems and the mitigation of climate change: the recent IAA CCGS study group was an important step toward that future.