Towards a holistic approach for Sustainable Development for the space sector

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ESA’s holistic approach to SD

Space for SD on Earth

- Resource management
- Meteorology / Climate change monitoring
- Disasters management
- Telecommunications / Telemedicine
  Telehealth / Telelearning
- Navigation and positioning

SD in space

- Space debris mitigation
- Space debris remediation / removal
- Codes of conduct for space operations / Space traffic management

SD in the space sector

- Responsible use of energy / Care for the environment at space sector sites
- Use of hazardous goods
- Good management and social responsibility
- Transfer of space technologies for SD innovation and products
- Ecodesign and Life Cycle Assessment

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Actions ahead

- Anchoring Sustainable Development in the corporate strategies of all actors in the space sector (agencies, research establishments, industry)
- Development of shared Key Performance Indicators and associated goals
- Joint approach to dealing with relevant regulations (REACH, RoHSS)
- Establishment of Environmental Management Systems in the sector (e.g. certifications ISO 14001, BREEAM)
- Support to SD relevant programmes (e.g. Clean Space initiative prepared for ESA’s Council on Ministerial Level 2012)

- Presenting the European sector in relevant global organs promoting the use of space applications for SD (e.g. Rio +20)
- Further developing of SD in space through space debris mitigation and remediation as well as space traffic management (e.g. in UNCOPUOS, ITU or ICAO)

- Introducing of an SD related award under the patronage of the European Interparliamentary Space Conference (EISC)
One concrete example for SD technology transfer and innovation from space: The MELiSSA Project

MELiSSA (Micro-Ecological Life Support System Alternative) has been conceived as a tool to gain understanding of the behaviour of artificial ecosystems, and for the development of the technology for a future regenerative life support system for long term human space missions - for example: a lunar base or a mission to Mars.

The driving element of MELiSSA is the recovering of food, water and oxygen from waste, carbon dioxide and minerals.

MELiSSA goes further than other recycling systems used on the International Space Station, which purify water and recycle exhaled carbon dioxide but do not attempt to recycle organic waste for food production.

MELiSSA technology can also be used in daily on-Earth issues, such as site management and water recycling. In order to reduce water consumption and pollution with untreated water evacuation, dark and brown waters can be treated and re-used in gardening, toilets and bathrooms, for example.