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Sustainability
Initiative

Workshop of the Working Group on the Long-term Sustainability of Outer Space Activities

Professor Joanne Wheeler MBE

6 February 2024



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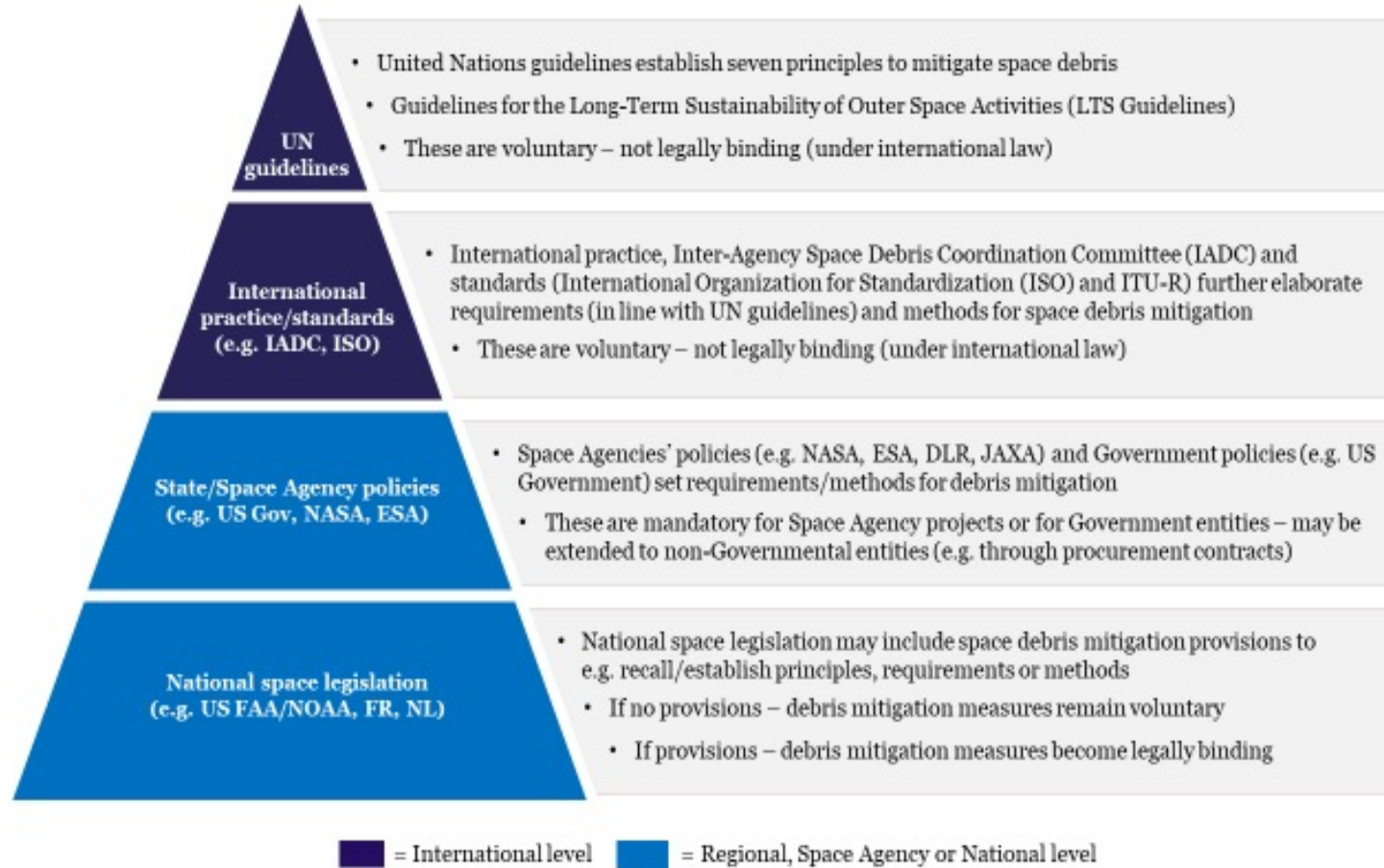
“We must develop a sustainable way, a durable way, of benefiting from space, just as we must here on the Earth.” King Charles III

Recognition of shared responsibility

- Recognising our shared responsibility for the Earth and space ecosystem.
- The orbital population in low Earth orbit increased by 50% from November 2018 (14,625) to November 2023 (21,750); driven primarily by deployment of large constellations by commercial operators.
- States have registered radio frequencies with the ITU for more than 1.7 million non-geostationary satellites that may be launched into orbit by the beginning of 2030.
- We are at a critical juncture - we must act to ensure space is sustainable, safe and accessible for future missions across nations and generations unborn.
- A juncture where we need to put aside competitive differences, come together to produce an international, multi-disciplinary, multi-stakeholder response – enabled by clear and transparent goals, standards and incentives.
- We need to consider new ways of managing space sustainably – **applying greater stewardship.**



Lack of binding international rules and consistent national implementation of current guidelines



States are encouraged by UNCOPUOS to take measures to implement the LTS Guidelines nationally

– but we cannot assume that States will do this homogeneously and create incentives to ensure responsible behaviour by their commercial operators.

The difference will come when standards are implemented consistently at national level – there is a level-playing field – and when industry are incentivised to adopt responsible behaviour.



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Driving more responsible behaviour

- How is that achieved – to influence and enable (without hindering) commercial activities and innovation - allowing us to expand and not stifle future uses, innovation, progress and science?
- How do we drive the “race to the top” in sustainable practices?
- We need to create the correct incentives at national level - to encourage commercial activities while meeting international responsibility, liability, safety and sustainability requirements.
- The recent focus on space sustainability has magnified the importance of the **private sector** availing itself of licences from well-respected, balanced, transparent regulatory systems that take space sustainability seriously.
 - Good regulation, leading to sustainability goals is industry and investment-enabling.
 - Good regulation is increasingly deemed to need to include Environmental, Social and Governance (ESG) criteria.
- Investors are increasingly demanding a compelling ESG plan as a core driver of financial value.



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Earth∞Space Sustainability Initiative (ESSI)

ESSI is dedicated to enhancing and developing the benefits of space for all life and future generations.

- UK Space Agency is currently funding work by ESSI, in collaboration with industry, academia, the insurance and finance communities and other governments and regulators to devise a set of global, transparent space sustainability standards.
- Collation of all existing standards, guidelines (over 1,700), analysis of gaps, whether they need to be filled (what works and does not work) and applying a practical approach.
- The standards will be published by the British Standards Institute (BSI), involving the International Organization for Standardization (ISO).



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Key objectives for the establishment of the Space Sustainability Standards

- Seek to ensure the sustainable use of outer space covering the lifecycle of a satellite.
- Enforceable through licensing criteria, access to insurance and market access requirements.
- Compliance with standards could lead to lower tiered insurance requirements and lower liability caps in licensing, through the new variable liability approach which the UK Space Agency has just consulted on.
- The standards will take into account social and cultural perspectives.
- Aim to attract greater and wider investment into the space industry through:
 - robust sustainability criteria – unlocking ESG investment;
 - providing transparency and confidence to investors; and
 - through the certification of innovative technology not otherwise certified, allowing companies with such products/practices to raise investment.
- Allowing market access in other states by establishing objective space sustainability criteria.
- Ensuring a better insurance risk through objective due diligence criteria, verified data, greater focus on reliability and sustainability.



ESSI Space Sustainability Principles – forming the standards

Framework	Umbrella document setting out the scope of the main space sustainability principles and definitions
Spacecraft design, manufacture and propulsion	Design, procurement and supply chain; quality assurance and product assurance Automation and robotics in manufacturing and testing; testing and approvals processes Orbital selection, spacecraft, size, geometry, attitude, visual brightness, retroreflectors; propulsion and fuel
Launch	Launch environmental impact; launch safety approval process, Launch system propulsion and fuel; disposal of upper stage
Supporting operations in space and space weather	Operations, trackability, methods for tracking satellites, collision avoidance Space Situational Awareness; space weather monitoring and effects Space traffic management, international coordination, traffic modelling Data, AI, information sharing, tracking analysis, establishing probability of risk CNI, direct and effective control, control of distributed architecture
Rendezvous and Proximity Operations	Rendezvous and proximity operations (RPO) (in-orbit servicing, active debris removal, re-purposing and re-use) Capture technologies, power interfaces between servicer and client
Supporting end of life and disposal	Re-entry, end of life, 'design for demise', graveyard orbit in GEO Environmental impacts of satellite and debris re-entry
Space debris mitigation	Space debris mitigation (single satellites and constellations); satellite passivation, effectiveness of drag
Dark skies	Cultural significance of the night skies; indigenous community engagement Minimising impacts on astronomical science, planetary defence
Quiet skies and spectrum sustainability	Sustainable use of spectrum and RFI co-ordination Minimising impacts on astronomical science
Earth monitoring	Monitoring Earth on all timescales and spatial resolutions; environmental regulations monitoring
Resource management	ISRU planetary sampling; planetary protection

Vertical bars representing cross-cutting themes:

- Finance
- Insurance
- Law and regulation
- Environmental, social and governance





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The Earth∞Space Sustainability Initiative

- Outer space has been our constant from our very beginning; influencing our cultures, our life, inspiring science; engaging our creative and adventurous personalities – embracing our imagination.
- It is part of our ecosystem – we depend on.
- Objective standards linked to access to finance, insurance, licensing and market access will help ensure the integrity and useability of space for future generations and preserve Earth’s green mantle which protects our life in the Earth ∞ Space ecosystem.
- Without decisive, collective, international and multi-disciplinary action, sustainable outcomes for the space environment may not be realised long term.



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