



Equitable use of space resources

Embedding due diligence standards into space mining

Key Policy Recommendation

Create a framework that incorporates due diligence standards into the licensing regime for space mining.

The proposed due diligence framework will build on **an industry-friendly tool for embedding due diligence considerations into business practices**. Created in 2023 by University of Leicester experts, this consists of a proportionality test for equitable benefit sharing based on widely accepted general principles of international law.

The impact of due diligence in space mining

Embedding due diligence standards on equitable uses of space resources:

- **enhances the competitiveness of space mining companies.**
- **creates an inclusive commercial environment while preserving free market competition.**
- **enriches legal certainty and transparency.**

Due diligence standards on equitable benefit sharing are **underpinned by general principles of international law** and take the form of **a flexible proportionality test tailored to the needs and capabilities of individual space mining companies**, thus avoiding recourse to a rigid, impracticable one-size-fits-all approach.

The proportionality test:

- **requires space actors to make optimal use of available resources**, both technical and financial, **and to act responsibly** by taking concrete steps to foresee and avoid any detrimental effects (environmental, societal) that their space activities may cause to the outer space environment and on Earth.
- **contributes to the harmonisation of state practices** in the absence of a multilateral treaty on space mining through its inclusion in national licensing regimes.
- **informs the debates currently taking place at the United Nations** with a view to the **adoption of a declaration on the legal principles governing space resource activities by the UN General Assembly in 2027**.

The case for due diligence standards

The commercial exploitation of space resources remains largely unregulated. **Only four countries have adopted dedicated legislation and governance frameworks – namely, the United States, the UAE, Luxembourg and Japan.** This indicates that there is an urgent need for pragmatic, evidence-based frameworks guiding the lawful conduct of states in this field.

Given the complexity and costs of manufacturing and operating space mining technology, **only a handful of states are likely to be able to extract space resources and to take advantage of the related market opportunities.** This is a potentially new source of conflict among states.

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The introduction of space-extracted resources on Earth **may affect strategic markets and influence the relationships and competition among economic blocks and individual states.** To be sustainable, human missions of long duration on celestial bodies require the use of *in situ* space resources.

The technology required for resource extraction and processing in outer space in support of scientific missions is currently being developed by private companies.

Hence, it has both scientific and commercial applications.

Space mining technology can be used to extract rare materials on Earth – such as gold and platinum. Their unique properties **enable greater efficiency and miniaturization of high-tech devices,** thus conferring competitive advantages.

Evidence base

Research shows that managing the transition from extraction in support of scientific missions to extraction for commercial purposes requires the development of due diligence standards by the space mining industry. It also demonstrates that commercial profit and equitable sharing of the benefits deriving from space mining are not incompatible.

The UK Space Agency is investing in the development of space mining technology, including through its membership in the European Space Agency (ESA), thus nurturing the growth of a new commercial ecosystem. Yet neither the UK nor ESA have adopted legal frameworks for *in situ* resource utilisation.

At the international level, there is no multilateral treaty on commercial space resource utilisation and the Outer Space Treaty does not regulate their equitable uses.

The COPUOS Working Group on the Legality of Space Resource Activities is currently drafting the text of a non-binding declaration of principles on space mining, to be adopted by the UN General Assembly by 2027.

By developing techniques for space resource extraction in support of scientific

missions, some States are creating the conditions for their future commercial exploitation. Others lack relevant technological and financial capabilities.

Implementation

A framework could be created, incorporating due diligence standards into the licensing regime for space mining. This framework would be based on the industry friendly tool developed by experts from the University of Leicester.

Economic estimates suggest that the space mining industry will be worth \$1.8 trillion by 2035 (McKinsey & Company, April 8th 2024 report)

The framework would be developed through the following stages:

1. Host roundtables with the space industry

This would make private space companies **aware of the industry-friendly tool for embedding due diligence considerations into business practice**. Industry representatives could then be invited to voluntarily trial it and provide feedback on its functionality (especially the proportionality test).

2. Organise follow-up workshops with the space industry

These workshops would **adjust and calibrate** the individual components of the proportionality test in the light of the feedback provided.

3. Convene roundtables with policymakers, consultancy and law firms

These roundtables would serve to **acquaint them** with the aim and content of the proportionality test for equitable benefit

sharing as well as its pilot use by the space industry.

4. Host workshops with policymakers and the space mining industry

Through these workshops, **the framework on how to facilitate the inclusion of due diligence standards into the licensing regime for space mining** would be devised. This is essential for states to be able to continuously supervise the activities of space mining companies.

5. Draft a shared position paper for interested states

This would **feed their views** in support of the inclusion of due diligence standards in the space mining licencing process **into the ongoing work of the COPUOS Working Group on the Legality of Space Resource Activities**.

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