

THE SPACE RESOURCES FUND: A PROPOSAL FOR BENEFIT SHARING AND INVESTMENT IN SPACE RESOURCE UTILISATION. B. McKeown¹, A.G. Dempster², S. Saydam³, J. Coulton⁴

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Space Resource Utilization (SRU) has emerged as a key factor for expanding a human presence and commercial activity in space. By harnessing resources such as water on the Moon or asteroid minerals, SRU could lower mission costs, catalyze in-space manufacturing, and foster a robust space economy. However, alongside its transformative potential, SRU faces significant challenges. One such challenge is ensuring that the benefits of SRU activities, as required by the Outer Space Treaty (OST), are shared equitably among all humankind. The other is securing the substantial investment necessary to build a capital-intensive, high-risk industry that has yet to be demonstrated at scale. This study proposes a novel financial mechanism, the Space Resources Fund (SRF), to address both challenges by combining benefit-sharing obligations (in the form of monetary benefit sharing) with a proposal for a sustainable investment model to help address some of the financing challenges faced by an emerging SRU industry. The study builds on previous work examining royalties as a potential benefit sharing mechanism [1], and work exploring potential requirements for prospective investors in commercial SRU activity [2].

The SRF is proposed as a bespoke financial vehicle with the Double Bottom Line (DBL) mandate of both facilitating global monetary benefit sharing and providing investment capital for the development of the SRU industry. While the study determined that no one existing terrestrial fund type could meet the mandate and objectives proposed, such objectives could be met by synthesizing key elements from various existing fund types. The SRF therefore leverages principles from different fund (and finance institution) models including sovereign wealth funds (SWF), Strategic Investment Funds (SIF), Development Finance Institutions (DFI), and Venture Capital / Private Equity Funds (VC/PE), while tailoring its structure to the unique challenges of space (see Figure 1.).

The objectives of the SRF include supporting the growth of the SRU sector, facilitating monetary benefit sharing whilst ensuring intergenerational equity, and minimizing fiscal burdens on SRU projects. It is proposed that the initial capitalization for the SRF would come through national governments or multilateral organizations, with contributions potentially weighted toward high-income countries to promote equity among participating nations. This approach avoids

overburdening a nascent SRU industry with royalties or similar mechanisms during its early stages, when economic and technical risks are highest.

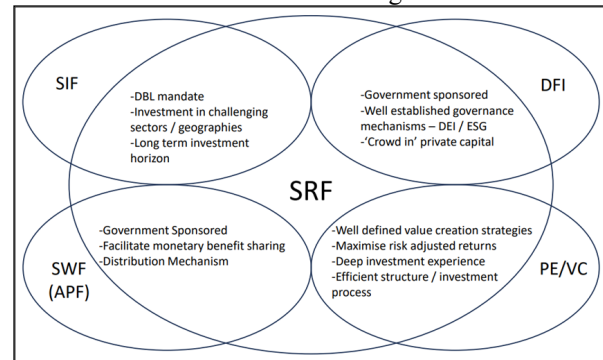


Fig. 1: Combining components of different fund types for the SRF.

The SRF would employ an evergreen structure, re-investing returns to grow the fund value over time. This structure would be complemented by an active, but flexible investment strategy targeting a broad range of SRU-related opportunities, including core SRU projects (e.g., lunar ice mining, asteroid resource extraction), service providers (e.g., logistics, technology development) and infrastructure companies supporting the SRU ecosystem. Targeting a wide range of potential investment opportunities could enhance both the quantity and quality of fund dealflow, helping maximize the potential for fund outperformance. The SRF's flexible investment strategy includes the use of diverse financial instruments, such as equity, hybrid instruments, and debt, allowing the fund to adapt to the evolving maturity of the SRU industry. It is proposed that the SRF could target a portfolio-level internal rate of return (IRR) of 10–12% over a multi-decadal time period, which although potentially conservative compared to some PE/VC fund expectations, is intended to reflect the SRF's DBL mandate and its evergreen nature. This target IRR, together with a moratorium on distributing benefits until certain time or fund size distribution triggers are met, along with prescribed limits on annual distributions once these triggers are met, could allow the SRF to achieve material benefits for global distribution while ensuring its own sustainability over the long term (see Figure 2.).

Governance of the SRF could be structured along similar lines to existing SIFs such as the Marguerite

Infrastructure Fund in Europe or the Asian Climate Partners Fund, which blend public policy objectives (e.g. green energy investment) with private sector best practices in oversight and portfolio management [3]. In this case, Government sponsors would act as limited partners (LPs), with a separate fund management company (FMC) responsible for day-to-day operations (see Figure 3.).

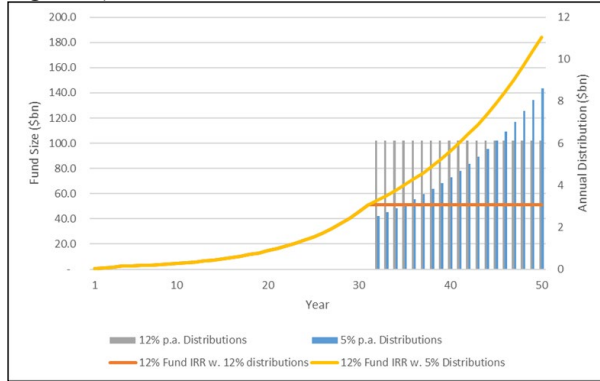


Fig. 2: Annual distributions and cumulative fund size for a \$50bn fund size distribution trigger at a Fund IRR of 12%

Oversight would be provided by a fund supervisory board, comprising independent professionals tasked with aligning fund activities with its objectives. The FMC would employ a team of experienced investment professionals, responsible for sourcing, executing and managing investment transactions and ongoing portfolio management. There would be a focus on ensuring adherence to environmental, social, and governance (ESG) principles by portfolio companies as is currently the case with most terrestrial DFIs such as the IFC (e.g. [4]). This active management approach not only enhances investment returns but also promotes sustainable practices within the SRU industry.

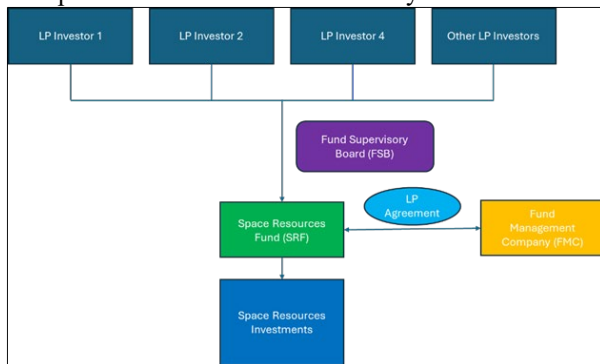


Fig. 3: Indicative SRF structure (adapted from [3])

Benefits of the SRF model proposed could include:

- (i) **Scalability and sustainability:** By focusing on investment returns, the SRF could generate substantial benefits over time, enabling meaningful global benefit distribution without imposing unsustainable fiscal burdens on SRU activity.

- (ii) **Alignment with industry needs:** The SRF's investment strategy could support the economic viability of SRU projects, fostering industry growth while minimizing financial barriers.
- (iii) **Flexibility and adaptability:** The SRF's hybrid structure would allow it to evolve alongside the SRU industry, adapting to changing market conditions and technological advancements.
- (iv) **Intergenerational equity:** the evergreen nature of the SRF could ensure benefits are preserved and distributed across generations, aligning with the principles of the OST.

Conversely, challenges for the SRF could include:

- **Securing initial funding:** Gaining political and financial support from governments and international organizations would be critical to the SRF's success.
- **Global governance:** Establishing a universally accepted governance framework for the SRF may prove difficult, given the divergent interests of spacefaring and non-spacefaring nations.
- **Risk management:** The SRF would need to carefully manage investment risks to ensure long-term returns and fund sustainability.

This presentation draws on findings in our published research article titled "The Space Resources Fund: A Solution to the Space Resources Benefit Sharing Dilemma?" [5].

References:

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