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***A Social License to Operate for Lunar Resources Activities:
Towards a Fair and Sustainable Era of Space Exploration***

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Abstract

Five years ago, soon after his nomination as ESA Director General, Jan Wörner announced the concept of a Moon Village as “an environment where both international cooperation and the commercialization of space can thrive”. Today, this concept is more alive than ever and is rapidly moving to its implementation through a series of lunar resources missions planned for as soon as 2021. In line with the spirit of cooperation and sustainability of the Moon Village, this paper addresses how lunar resources activities can become a model for fair and sustainable space exploration through the development of a Social License to Operate (SLO). SLO is defined as the efforts made by a company or entity in order to give back part of the wealth it produces to the community where it operates. On Earth, this is usually done through environmentally friendly practices, information disclosure and a various range of activities aimed at community support such as job creations, educational activities and technology transfer. Mutatis mutandis, current Earth practice on SLO can be implemented in lunar resources activities in order to ensure that they are conducted “for the benefit and interest of all Countries”, as required by Article I OST. Building on the research conducted by the Socio-Economic Panel of The Hague International Space Resources Governance Working Group, this paper explores how the development of a Social License to Operate for Lunar activities can shape a new era of fair and sustainable space exploration. Guided by the principle of adaptive governance, the paper presents the benefits of Lunar SLOs as tailored for the early stages of lunar activities. To this end, Chapter 1 presents the definition of SLO, how it is used on Earth, the experience of some countries, and the way it is granted. Following, Chapter 2 discusses the rationale for implementing SLOs for lunar activities, and how they can contribute to the early development of lunar activities. Based on the above, Chapter 3 discusses three basic features for Lunar SLOs, arguing that they should be multigoverned, multipurposes and multi-incentives. Finally, Section 4 provides a practical example of how a Lunar SLO could be structured in practice, and then the paper draws the final conclusions.

Keywords: Moon Village, Social License to Operate, Lunar Activities, Sustainability

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Introduction

Five years ago, soon after his nomination as ESA Director General, Jan Wörner announced the concept of a Moon Village as “an environment where both international cooperation and the commercialization of space can thrive”.¹ In its essence, the Moon Village is a continuing, inclusive, and cooperative effort aiming at fostering diverse and sustainable activities on the surface of the Moon.² At the time, Wörner’s announcement came as a surprise since the space community was focusing on Mars as the next step for human-driven exploration.³ Five years later, we can safely argue that the Moon Village concept produced a tremendous impact, bringing the Moon once again at the core of all major space exploration programs.⁴ When presenting the new *Artemis* program,⁵ almost fifty years after the last Apollo mission, NASA Administrator Jim Bridenstine solemnly stated that “we are going back to the Moon and this time we are going *to stay*”.⁶ This means designing a new type of space missions that are meant to sustain a continuing (robotic or human) presence on the lunar surface.⁷ To achieve their complementary goals, both the Moon Village and the *Artemis* program inevitably rely on the utilization of lunar resources. Given the high costs of space transportation, the only way to ensure sustainable and continuing operations on the Moon is through the use of the (many) resources available there.⁸ This tendency has been well understood by the private sector, which is rapidly responding through a series of lunar resources missions planned over the next decade.⁹ The first entity to begin operations may be the Japanese company *ispace*, which in 2019 has booked a launch with the US company *SpaceX* to bring its prospecting rover near to the south pole of the Moon in 2021.¹⁰ According to Article VI of the Outer Space Treaty,¹¹ private companies performing space resources activities on the Moon will have to be previously authorized and continuously supervised by a State.¹² Compliance with this fundamental provision of international space law will likely be ensured by setting up a new licensing system for space resources activities, either at the national or international level.¹³ However, while legally necessary, a licensing system would not be sufficient to capture and realize the vision of a Moon Village. The social significance of the Moon for all humankind requires a broader approach that goes beyond compliance with fundamental legal requirements.¹⁴ The question, therefore, becomes how lunar resources activities can foster the development of a better society, not only on the Moon but also on Earth. In this respect,

the “2030 Agenda for Sustainable Development”,¹⁵ adopted by the members of the United Nations in 2015, defines seventeen objectives to stimulate actions towards the transformation of our world. Those SDG’s implement the Agenda for the benefit of all humans, for today’s generation and future generations. In doing so, it reaffirms the commitment to international law and emphasizes that the Agenda is to be implemented in a manner that is consistent with the rights and obligations of States under international law.¹⁶ In addition to the evolution of space exploration, Lunar resource activities can also contribute to achieving many SDGs. Developing and conducting sustainable practices on the lunar surface will in fact benefit both emerging space countries while also guaranteeing the use of the lunar environment for future generations. To achieve these goals, the “Space2030” Agenda seeks to strengthen international cooperation in the exploration and peaceful uses of outer space and its use in pursuit of the achievement of the Sustainable Development Goals. Because of recent technological and scientific developments, this opens a window of opportunity for the UN Commission on the Peaceful Uses of Outer Space to define the global governance of outer space activities, in line with international law.¹⁷

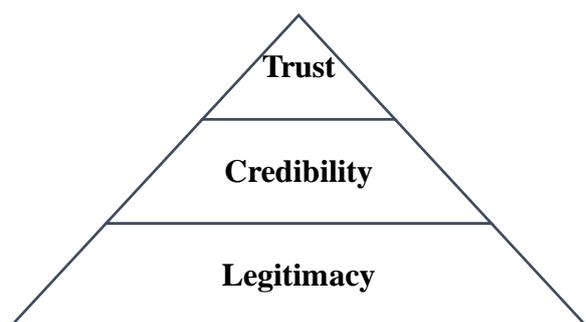
On Earth, mining companies undertake additional efforts to tackle the environmental and social impact of their legitimate operations. One means to this end is identified in the development of a “Social License to Operate” (SLO),¹⁸ which summarizes a series of measures agreed between a mining company and the community where it operates. Social license to operate has been defined as an ongoing acceptance of a project by the community and other important stakeholders.¹⁹ In this way, the development of an SLO could establish the legal basis necessary to regulate the first steps in space resources activities and, in turn, contribute in an equitable manner to the inclusion of developing countries. In line with the spirit of cooperation and sustainability of the Moon Village, this paper addresses how lunar resources activities can become a model for fair and sustainable space exploration through the development of dedicated Lunar SLOs. To this end, the paper has been structured as follows. First, Chapter 1 will present the definition of SLO, how it is used on Earth, the experience of some countries, and the way it is granted. Following, Chapter 2 will discuss the rationale for developing an SLO for lunar resources activities, and how it can contribute to their early development. Based on the above, Chapter 3 will

propose three basic features for Lunar SLOs: multigoverned, multipurposes and multi-incentives. Finally Section 4 will provide a practical example of how a Lunar SLO could look like in practice, and then the paper will conclude.

What is a Social License to Operate (SLO)?

Throughout history, humankind has relied on natural resources for its survival first, and for the development of the economy then. In this way, resource extraction practices such as mining, agriculture, and energy production have been most useful for the regional development of the community where the extraction site is located. At the same time, these activities have also a significant impact on both the lives of local communities and the environment in which they live. Accordingly, local communities are demanding more involvement in decision-making around such operations. *Inter alia*, these communities expect to receive a greater share of the benefits from extraction operations and require assurances that the industries involved are appropriately regulated. The combination of increasing pressures on industry performance and the related societal acceptance of such operations has been described as ‘social license to operate’ (SLO).²⁰ An SLO is determined by the relationship between local community and extraction industries, to establish guidelines for a win-win approach at the social, environmental, and operational levels. Due to their high activity in the extraction of natural resources, States such as Australia, Canada, Ghana, New Caledonia, Bolivia, and Colombia are some of the major supporters of communities granting SLOs. Figure 1 shows the normative components of SLO: the community/stakeholder perceptions of the social legitimacy and credibility of the project, and the presence or absence of true trust. These elements are acquired sequentially and are cumulative in building towards an operational SLO.²¹

Figure 1. Pyramid Model. Adapted From Boutilier and Thomson 2011.



In practice, the absence of legitimacy leads to the immediate rejection of a project, while the presence of minimum legitimacy and credibility can bring to its acceptance. However, only a project with a high level of legitimacy and credibility can generate the necessary trust which is the basis for approval. In fact, studies show that the most significant form of SLO, co-ownership, can only occur when a high level of trust is present.²² It is important to note that SLO is linked to the development of dedicated Social Management Plans and, in certain States, is required to grant mining titles. Some of the benefits of granting a SLO are:

- Strength and maintain positive relations among project’s stakeholders and local communities.
- Develop social and economic opportunities in the project’s area and spread its benefits, with the participation of the community.
- Prevent, mitigate, and attend social impacts that may arise from the development of the project.
- Decrease unemployment rate.
- Protection of ethnic groups’ rights.
- Fostering equality among those who benefit from extracting natural resources and those who feel (tangible and intangible) disadvantages from such activities.

Just in the State of Australia, approximately 79 SLOs related to mining have been granted. Specifically, in Pilbara, Western Australia region, commonly known for its iron reserves and oil, the extraction of natural resources has significantly contributed to the regional economy. According to the Western Australian Department of Mines, Industry Regulation and Safety, the Pilbara region produced approximately \$62.4 billion worth of minerals and petroleum in 2017-18. The following are direct contributions from mining to the Pilbara region in 2015-16:²³

- 13,140 direct employees living in the region;
- \$2.7 billion paid in wages and salaries;
- \$743 million in business purchases, community contributions and local government payments; and
- 395 local businesses supported

Another example for Latin America is Colombia. In this Country the mining sector represents approximately 2% of the national GDP, directly creating 350,000 jobs and

indirectly creating one million more through its production chains. In 2018, Colombian’s Foreign Direct Investment (FDI) flows reached USD 11.5 billion - of which 34% corresponded to the energy and mining sector, with an annual growth of 21%. At present, 7,652 mining titles are currently granted in Colombia.²⁴ To summarize, an SLO represents a shared plan between a local community and mining companies for the fair redistribution of the wealth generated through extraction activities. Additionally, SLOs are also developed to minimize the negative consequences of mining activities at both social and environmental levels. If developed properly, an SLO is ultimately structured to achieve a win-win outcome for the benefit of both the local communities and the companies operating therein.

Why Developing a Social License to Operate for Lunar Resources Activities?

According to the first paragraph of Article I OST, “the exploration and use of outer space, including the Moon and other celestial bodies, shall be conducted for the benefit and in the interest of all Countries [...] and shall be the province of all mankind”.²⁵ Pursuant to this provision, space activities are of natural and inherent interest for the entire global community, which according to Article I OST itself is composed not only of States but also of “mankind”. On the one hand, it is true that the term “mankind” does not refer to any specific legal person, which in turn complicates the exercise of legal actions. At the same time, the “province of all mankind” clause has been included in the text of Article I OST to signify the global relevance of space activities for humanity as a whole.²⁶ Precisely because of that, SLO could work as an alternative scheme to protect and defend the interests of (hu)mankind in accordance with Article I OST. Such a scheme would be particularly needed in the case of lunar activities, in light of the special role that the Moon has for our species for biological, cultural, and spiritual reasons. Affording some protection to these interests is also in the best interest of lunar resources operators, insofar as it could increase the level of trust and support from the general public, exactly as it already happens for terrestrial mining. Even if it may seem counter-intuitive, a Lunar SLO would in fact ultimately protect a range of interests that are very similar to those covered on Earth. The first of those interests is related to the protection of certain features of the lunar environment. Despite the fact that there is no local community *on* the Moon, one could perhaps argue that alterations to certain features of its environment would adversely affect many of us on Earth. For instance, the far side of the Moon is known for its complete radio silence, which enables

unprecedented studies on the origins and evolution of the Universe. Accordingly, the unbalanced proliferation of electronic and radio communications on this side of the Moon could undermine or even jeopardize these unique radio-astronomy studies, which rely on the maintenance of a noise-free environment. Truth to be told, in principle these interests could be protected by the principle of due regard under Article IX OST.²⁷ However, the application of this principle lacks any State practice when it comes to the utilization of another celestial body, thus creating a high degree of uncertainty.²⁸ *Mutatis mutandis*, there is a similar risk for the protection of culturally significant sites on the lunar surface, such as Armstrong’s footprint. Not by chances, both these issues have already been addressed by NASA within the main principles developed for the negotiations of the *Artemis Accords*, a series of international bilateral agreements between the United States and the various partners of the Artemis program.²⁹ However, the commitments eventually taken under the Artemis Accords will only be binding for its partners, thus leaving uncovered other lunar actors outside the Artemis group. On the contrary, a Lunar SLO could offer a flexible way to ensure that certain interests, representative of the various facets of humankind, could be defended for the benefit of all actors operating on the lunar surface. Another reason to develop a Lunar SLO is that it could represent a good compromise for the implementation of the principles of non-discrimination and equality as laid down in the second paragraph of Article I OST.³⁰ According to this provision, “outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law”.³¹ During the negotiations of the OST, the Soviet Union insisted repeatedly on the above formulation as a necessary mean to foster international cooperation.³² Through the SLO model, entities conducting Lunar activities could commit to ensure diversity in the composition of their lunar missions in terms of human resources, capital participation and payload development. Accordingly, this would satisfy the OST requirement of international cooperation without placing an unsustainable burden over Lunar operators. From a strictly operative viewpoint, a Lunar SLO could also be adopted to ensure fair and equitable access³³ to the “most wanted” areas of the Lunar surface: the permanently shadowed craters and the peaks of eternal light. Through SLO, Lunar operators reaching those areas first could be obliged to preserve a certain portion for international uses, or alternatively to share their infrastructure with future interested actors. On the same line of reasoning, SLO could serve to place a limit over the deployment of

safety zones, thus preventing monopolist behaviors³⁴ especially if directed to special areas of the Moon. The same concept can also be applied with specific reference to extraction activities, insofar as a Lunar SLO may include provisions obliging operators not to spoil certain lunar resources that could be either commercially or scientifically valuable. This is particularly significant since the natural resources of the Moon are non-renewable, meaning that every misuse of resources will never be compensated in the future. For instance, operators mining lunar ice for the purpose of obtaining hydrogen should also account for the preservation of the oxygen which will be freed in the process. Obviously, SLO requirements imply additional costs which should not be exclusively borne by operators. Acting otherwise would make lunar operations unfeasible, while also being unfair towards those actors who are already taking significant risks and sustaining enormous costs to break the initial barriers of lunar operations. Not by chance, the greatest merit of SLO is its suitability to work as a reasonable compromise between society and operators.

Three Fundamental Features for Lunar SLOs

As discussed in the previous section, the SLO model presents a lot of potential to address the many challenges raised by upcoming Lunar activities. Accordingly, we believe that every Lunar SLOs should include the following three fundamental features. First, in compliance with the global relevance of lunar activities, the governance of Lunar SLOs should be both multilevel & multi-stakeholder. Second, given the many interests involved in the utilization of the Moon, Lunar SLOs should be multi-purposes, i.e. sufficiently flexible to achieve different goals. Finally, to preserve the economic feasibility of pioneering lunar activities, Lunar SLOs should also include proportionate incentives for operators. To begin with the first feature, we believe that governance tasks for Lunar SLOs should be divided between the national and international levels and distributed among different actors. First, to foster the development of standardized types of Lunar SLOs, their design should happen at the international level.³⁵ Following the efforts recently promoted by the Moon Village Association,³⁶ this could be part of a broader global efforts for the development of recommended best practices for sustainable lunar activities. Those best practices can then serve as a shared ground from which each State can then tailor its own licensing requirements, including the SLO ones. Following, because lunar extraction activities will be likely conducted by commercial entities, we propose that the actual implementation of Lunar SLOs should primarily take place at the national level, as per the tenets of Article VI

OST.³⁷ However, in accordance with MVP principle 2, such national implementation should also make sure that lunar activities are conducted “in a manner that takes into account the interests of other actors and benefits all countries and humankind”.³⁸ Accordingly, we propose that the management of nationally granted Lunar SLOs should be entrusted to representatives of the broader international community, to be chosen among the non-governmental entities admitted to observe the work of the UNCOPUOS committee.³⁹ While each State should remain free to choose the specific entity it prefers, we believe that selected Lunar SLO Managers should coordinate with each other at the global level for the collective exercise of their national SLOs responsibilities. Following the principle of adaptive governance, this collective exercise could initially be structured on a case-by-case basis, through open multi-lateral and multi-stakeholder consultations with interested parties. Later on, in parallel with the growing scale of lunar operations and global involvement, these consultations could then be institutionalized under the umbrella of dedicated global consortiums. Finally, we propose that also the enforcement of Lunar SLOs should involve both the national and international dimensions. Every year, each SLO Manager should present to its national regulator a Report assessing the observed level of compliance and the initiatives taken during the year. When necessary, the Report should also include a section with proposed sanctions in case the operator has breached its SLO conditions. Significantly, in this scheme the power to enact sanctions and take actual enforcement measures will always remain with the national licensing authority, thus avoiding legitimacy problems. At the same time, SLO Managers will also be free (and maybe even encouraged) to pursue alternative routes for maintaining a good level of compliance. Measures of this kind should be essentially based on derivatives of the *name & shame* technique, which is meant to publicly embarrass non-compliant operators.⁴⁰ The *name & shame* technique has proven to be quite successful in sectors whereby reputation and trust guide the allocation of public funds, the subscription of private debts as well as the market choices of both other operators and end-users.⁴¹ Since those elements are also typical of the space industry, the idea is that the fear of losing trust from the general public will push operators to voluntarily meet their SLO obligations without having to resort to sanctions. Ultimately, our proposed governance for Lunar SLOs is based on a multi-level and multi-stakeholder distribution of governance tasks. Under this scheme, international NGOs would act as representatives of the global community, interacting with both private companies and national regulators within different national jurisdictions.

Table 1 Proposed governance system for Lunar SLOs

Governance task	Proposed level
Design	International best practices
Implementation	National licensing procedures
Management	International managers picked from NGOs observers in COPUOS
Enforcement	Annual reporting of the international managers with recommendations for national sanctions + <i>name & shame</i>

Concerning the second feature, we identified five potential purposes for the development of Lunar SLOs. These purposes are: release of main scientific data on the lunar environment; adequate protection of lunar heritage sites; continuous monitoring of substantial alterations to both the lunar environment and the Earth-Moon system; inclusiveness in the access and use of highly strategic infrastructure on the lunar surface (such as those producing energy from the peaks of eternal light or mining the ice at the south pole); and mitigation strategies for the preservation of both scarce or perishable lunar resources (such as the hydrogen or oxygen freed during extraction processes). Depending on the circumstances, these goals can also be combined with each other to cover the scale of broader activities. Considered altogether, these five purposes account for the essential requirements of any sustainable lunar settlement: an open international environment fostering a shared and rational utilization of the Moon for exclusively peaceful purposes. Finally, in order to meet the needs of commercial operators, each Lunar SLO should be completed by a third feature: a system of proportionate incentives for achieving Lunar SLO purposes. Such incentives will vary according to the efforts and the burden placed on the operators, and are meant to preserve the economic feasibility of lunar operations. Based on the five purposes described above, we designed the following incentives: fair compensation for data release; administrative privileges for the protection of heritage; costs sharing for environmental monitoring activities; fair compensation for the shared use of strategic infrastructure; costs sharing for the preservation or stocking of scarce lunar resources.

Table 2. Combination of goals and incentives for Lunar SLOs

Goal	Incentive
Data release	Fair compensation
Heritage protection	Administrative privileges
Environmental monitoring	Costs sharing
Shared use of infrastructure	Fair compensation
Preservation of resources	Costs sharing

A Practical Example

Before concluding our analysis, one example might help to clarify. To ensure the protection of heritage sites on the Moon, the US Government could entrust the non-governmental organization known as “For all Moonkind”⁴² as international manager for all Lunar SLOs given to US companies. Following the multi-stakeholder governance system, “For all Moonkind” will have to include other potentially interested entities, such as the Space Generation Advisory Council⁴³ or the abovementioned Moon Village Association, in the exercise of its SLO powers. Under the principle of adaptive governance, such collective exercise could initially be ensured through multi-lateral consultations with representatives of these organizations. Later on, these three entities could establish a “Sustainable Lunar Consortium” for the collective exercise of their various SLO powers under a more institutionalized framework. At the end of every year of operations, For all Moonkind would prepare a report accounting for the level of compliance shown by US-licensed companies, further complemented by relevant recommendations to maintain or increase respect for Lunar SLO conditions. Lastly, on account of the efforts made, compliant companies would be granted priority within either the allocation of governmental funds or the development of public/private partnerships on future lunar activities. Obviously, the proposals developed in this paper are just a starting point within the broader multi-lateral debate on sustainable lunar exploration. Above all, we hope that this paper contributed to the understanding that we need to have this conversation now that there is sufficient time to develop a reasonable compromise. Should we wait too long, we may lose the opportunity of a lifetime.

Conclusions

In line with the spirit of cooperation and sustainability of the Moon Village, this paper addressed how lunar resource activities can become a model for fair and sustainable space exploration through the development of a Social License to Operate (SLO). To this end, Chapter 1 described the main features of terrestrial SLO and how this tool is used on Earth to reinforce the social dimension of extraction activities. Due to its flexible nature and its successful results, the chapter concluded by praising SLO as a fair tool that goes hand in hand with the spirit of the Outer Space Treaty. Accordingly, a Lunar SLO could work as an alternative scheme to protect and satisfy the main interests of (hu)mankind and all countries under Article I OST related to lunar activities. *Inter alia*, Chapter 2 showed how a Lunar

SLO could be used to protect natural or heritage sites on the Moon, as well as to ensure the fair participation of all Countries in activities thereby. Further, a Lunar SLO would also be a suitable tool to ensure equitable access to “unique” areas on the Moon, such as the peak of eternal lights, as well as to prevent the uncontrolled dispersion of scarce or perishable lunar resources. Based on these findings, Chapter 3 suggested three basic features for the development of Lunar SLOs. First, in compliance with the global relevance of lunar activities, the governance of Lunar SLOs should be both multilevel & multi-stakeholder. Second, given the many interests involved in the utilization of the Moon, Lunar SLOs should be multi-purposes, i.e. sufficiently flexible to achieve different goals. Finally, to preserve the economic feasibility of pioneering lunar activities, Lunar SLOs should also include proportionate incentives for operators. As to the first, Chapter 3 proposed a multi-level and multi-stakeholder distribution of governance tasks for Lunar SLOs. Under this scheme, international NGOs would act as representatives of the global community, interacting with both private companies and national regulators within different national jurisdictions. Concerning the second feature, Chapter 3 identified five potential purposes for the development of Lunar SLOs. Considered altogether, these five purposes would account for the essential requirements of any sustainable lunar settlement: an open international environment fostering a shared and rational utilization of the Moon for exclusively peaceful purposes. Finally, in order to meet the needs of commercial operators, Chapter 3 proposed a system of proportionate incentives, complementary to the five goals mentioned above, as the third fundamental feature for Lunar SLOs.

Obviously, the proposals developed in this paper are just a starting point within the broader multilateral debate on sustainable lunar exploration. Above all, we hope that this paper contributed to the understanding that we need to have this conversation now that there is sufficient time to develop a reasonable compromise. Whether or not Lunar SLOs will be actually developed in the future, it is essential that States start thoroughly discussing these matters at the 2021 UNCOUOS meetings. Without prejudice to the essential goal of achieving multi-lateral consensus, States should be aware that politics, economics and technologies for lunar activities are developing at a much faster speed than international space law. In the absence of any international understanding, States remain entitled to fill the gaps of international law by means of national legislation. This is due to the simple fact that slowing down or paralyzing lunar exploration in the name of diplomacy would be a

tragic defeat for both States and humankind. The global community is finally starting to search for opportunities to develop sustainable and profitable activities on our closest neighbor, the Moon. Accordingly, the purpose of this paper was to present a pragmatic tool for spreading the benefits of these efforts having both equitability and feasibility in mind. Although Lunar SLO would not obviously solve all the problems, it can offer an entry point for those countries that, while not being currently able to autonomously engage in lunar activities, still want to take part in them. Therefore, the international community needs to come up with mechanisms to ensure the inclusiveness of lunar resources activities. At this stage, more important than the actual mechanisms which will be chosen is the simple fact of having this conversation at the multilateral level. These authors believe that we need to have this conversation now, before the tensions and the rivalries will impede any meaningful discussion. Hopefully, we are still in time to ensure that the *Moon Village* vision can one day become a prosperous reality.

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- ³³ In accordance with the language and the spirit of Article I OST.
- ³⁴ Monopolist behaviors would in fact be in violation of Article I OST. Hobe, *supra* note 26 at 40.
- ³⁵ A. Salmeri, *A Way Forward. Regulating New Space Activities Through Multi-Stakeholder Adaptive Governance*, Proceedings of the XXV International Congress of the Italian Association of Aeronautics and Astronautics pp. 3-4 (2019).
- ³⁶ *Moon Village Principles (MVP)*, available at <https://moonvillageassociation.org/moon-village-principles-mvp-issue-2-draft-public-consultation-opens/> (accessed September 2020). The Moon Village Association is a non-governmental, non-profit international organization aiming for the implementation of the Moon Village concept.
- ³⁷ Article VI OST, *supra* note 11. Under this regime, the responsible State obliged to provide previous authorization and continuing supervision will probably be the one where the operator has its principal place of business
- ³⁸ *Ibidem*.
- ³⁹ This list is updated every year by the United Nations Office for Outer Space Affairs and is available online at <https://www.unoosa.org/oosa/en/ourwork/copuos/members/copuos-observers.html> (accessed September 2020)
- ⁴⁰ A description of the main features of the *name & shame* technique is accurately provided by Behnam Taebi and Azar Safari in their recent article “On Effectiveness and Legitimacy of ‘Shaming’ as a Strategy for Combatting Climate Change”, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5636864/> (accessed September 2020).

⁴¹ An interesting analysis on the effects of naming and shaming within the context of environmental protection can be found in Tingley, D., & Tomz, M. (Working Paper). The Effects of Naming and Shaming on Public Support for Compliance with International Agreements: An Experimental Analysis of the Paris Agreement. Available at: <https://scholar.harvard.edu/dtingley/publications/effects-naming-and-shaming-public-support-compliance-with-international>

⁴² *For All Moonkind* is a non-governmental organization created to ensure the protection of human heritage in outer space. More info are available at <https://www.forallmoonkind.org/> (accessed September 2020)

⁴³ The Space Generation Advisory Council is a global non-governmental, non-profit organization which aims to represent university students and young space professionals from all over the world. More info at: <https://spacegeneration.org/> (accessed September 2020)