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English only

**Committee on the Peaceful
Uses of Outer Space
Legal Subcommittee
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Vienna, 15–26 April 2024
Item 8 of the provisional agenda*
Future role and method of work of the Committee**

Report on the policy preparatory symposium of the United Nations/Portugal Management and Sustainability of Outer Space Activities Conference (Virtual, 11–15 March 2024)

Conference Room Paper by Portugal

I. Introduction

1. Portugal is actively contributing to the outer space dialogue and agreed with the United Nations Office for Outer Space Affairs to host an international conference on the topic of Management & Sustainability of Outer Space Activities, in 14 and 15 of May 2024.
2. This conference will be an important moment for all United Nations Member States to actively contribute in an open forum to the discussions on the topics to be addressed in the Summit of the Future, and beyond, and it will address the need for the international community to come together and discuss ways to reinforce space governance and further strengthen the sustainability of human space activities, in which the Secretary-General Policy Brief on Outer Space could provide a guideline for discussion.
3. In preparation of the Conference Management & Sustainability of Outer Space Activities, two virtual symposiums were held, one centred on technical challenges in November 2023, and other focused on policy in March 2024, both aimed to consult international experts from industry, academia, and Member States. The main topics for discussion are Space Traffic Management, Space Resources and Space Debris, as set out in the Policy Brief 7 “For all humanity: The future of Outer Space governance”.
4. The outcomes of the technical symposium were presented during the Scientific and Technical Subcommittee in February 2024 through Conference Room Paper A/AC.105/C.1/2024/CRP.34.
5. The summary in section IV draws out insights and main themes discussed in the policy symposium, aimed to support the discussions risen in the technical symposium

* A/AC.105/C.2/L.326.



and to provide further elements to be assessed and addressed in the upcoming conference in May 2024.

6. To the extent practicable, the original language was retained to better capture the views expressed.

II. Programme and Attendance

7. The policy symposium aimed to have a participation as wide as possible. As such, it was design around three different time zones, with nine sessions in five days.

8. The symposium brought together speakers, moderators and rapporteurs from a wide range of countries such as Austria, Australia, Brazil, Canada, France, Greece, India, Japan, Kenya, Netherlands (Kingdom of the), Philippines, Portugal, South Africa, United Arab Emirates, United Kingdom, United States and, as well as from circa twenty international organizations such as European Space Agency, European Commission, International Institute of Space Law, European Centre for Space Law, Space Generation Advisory Council, Committee on Space Research, National Aeronautics and Space Administration, European Space Policy Institute, Milo Institute, Secure World Foundation, National Oceanic and Atmospheric Administration, American Institute of Aeronautics and Astronautics, Moon Village Association, International Astronomical Union, Karman Project, International Space University, Lunar Policy Platform and Inter-Agency Space Debris Coordination Committee.

9. The policy symposium had more than 970 live attendees, and all the sessions are available on YouTube.

10. Portugal would like to thank the contribution of all moderators and rapporteurs for their excellent work and all the speakers for the interesting point of views and live debate provided.

11. The schedule, speakers, moderators, and rapporteurs can be found in Annex 1 to this document.

III. Summary of the Forum exchanges

(a) Regional and national approaches on Space Sustainability

12. The global consensus on sustaining space activities for future generations was underscored.

13. It was acknowledged that global initiatives and guidelines like the 2019 long-term sustainability (LTS) guidelines are crucial to ensure space's peaceful and cooperative use. The importance of understanding and implementing sustainability measures and recognizing diverse interpretations and approaches across nations was highlighted, stressing the need for government and multilateral cooperation to establish unified guidance for sustainable space activities.

14. Discussions highlighted the importance of multi-sector and multi-stakeholder engagement in rulemaking and norm-building for space activities. Regional platforms were recognized as valuable venues for such discussions, emphasizing the need for consistency and common ground across various forums and initiatives, such as LTS guidelines.

15. Participants stressed the necessity for common standards, data sharing, and contact information for operational operators to enhance space sustainability. Moreover, the significance of the space economy in achieving sustainable development goals was underscored, emphasizing the importance of strengthening national policies to facilitate multilateral collaboration.

16. The panellists emphasized the urgency of international cooperation and action in addressing space sustainability challenges. Key themes included the need for alignment of regulations, deeper international cooperation, and strengthening multilateral and regional platforms for inclusive governance.

17. Reflections also emphasized timely action, holistic approaches combining technology, collaboration, and public awareness efforts.

18. Panellists further highlighted the importance of creative and collaborative solutions in policy and law, emphasizing practical implementation.

19. The identification of key notions of sustainability and key actions, in particular the kind and the role of national and regional cooperation poses in this context, were set as one of the main outlines of the session, based on the United Nations Secretary General Space Policy Brief that points out where the key issues are and how the Member States have to prepare in order to reach the objectives of maintaining, and even strengthening, the sustainable use of outer space.

20. The discussion proceeded regarding the mentioning of the private sector space activities in the UN Secretary General Space Policy Brief and the nexus between government and private activities and how they can go together, either by top-down regulations, by private initiatives, by incentives and administrative compulsory measures, just by incentives or any other.

21. The need for a balance was mentioned, also given the fact that for some private operators some of the standards can be hard to meet, so they must rely on support from the public sector until completion.

22. The involvement of the private sector is fundamental, and the challenge is to accomplish this at the international level in a way to really have all the stakeholders around the table.

23. At a regional level the private sector engagement is, perhaps, easier and it can take diverse forms, such as involvement, fostering, incentivize and promotion, having in mind that when the regulators have an action it has consequences to the companies, so the work must be done hand-to-hand.

24. Attention was brought to one difficulty amongst private operators that is the use of many different protocols and the lack of standardized communication lines between the operators themselves.

25. It was said that it's very difficult to cope with all the different entities from different countries and several governmental entities, so it would be good to have an authority on this, public or private but mandated by the governments, for example an worldwide authority for space safety, or at least fast communications protocols. To a certain extent, the regulation will have to be top down, and that can be a good solution because it will make all the operators to cope with the same rules independently of their country, region or supply chain.

(b) Space Traffic management

26. All panellists agreed with the importance of international cooperation in ensuring safety, security, and sustainability in space.

27. The establishment of an international STM body was discussed, as well as the need for consensus-based guidelines and standards.

28. A proposal was set forth regarding a polycentric model of governance to address known space law challenges related to STM, emphasizing the role of industry and multi-stakeholder collaboration.

29. Remarks were made focused on the need for global governance and a centralized system for space traffic management, along with a mention of the future role of collision avoidance and re-entry services.

30. The importance of developing space surveillance and tracking capabilities to detect and catalogue all space objects in orbit was agreed and participants converged on the need for a gradual approach towards the operational aspects of STM, acknowledging the existence of technical and regulatory hurdles.
31. The significance of considering the use of military sensors in space traffic management was also mentioned, as well as the importance of an open and transparent approach that involves the participation of all states and the industry.
32. Furthermore, it was said that establishing trust among spacecraft operators and space surveillance systems was a crucial challenge, recalling the importance of ensuring that policy keeps pace with technological advancements.
33. The crucial role of space traffic management in ensuring safe operations was stressed, meeting sustainability goals, and fostering new businesses' growth while preserving the environment and keeping pace with a rapidly evolving ecosystem.
34. The long-term sustainability of outer space depends upon recognizing it as a unique domain, distinguished from anywhere else on Earth and subject to a specific body of rules.
35. Space activities imply actions taking place not only in outer space, but also through air space for space objects to be launched into and or returned from outer space, terrestrial airspace must be traversed. Nevertheless, one should acknowledge that international law currently does not specify or grant automatic passage rights for space objects during launch or re-entry.
36. It was noted that the absence of a multilateral delimitation of outer space solutions consequently authorizes the unilateral delimitation of the frontier between air and outer space through domestic legislation and that the international community may soon face a challenging situation whereby the border between airspace and outer space may differ from one country to the another.
37. Space traffic management requires a holistic approach as well as coordinated actions by the international community involving different stakeholders and it should be considered a possible international regulation supporting the limitation of Outer Space through multilateral negotiations, considering STM mechanisms, and regulating passage rights for launching and return of space objects.
38. It was considered a necessary a set of coherent technical and regulatory provisions that will not only assure that the space operations are conducted safely, but that the return to Earth is safe as well.
39. The proactive formulation of equitable frameworks is significantly more difficult than the measurement per se of the existing and the future capacity, and it requires some type of normative decision and international cooperation.
40. There is a private ecosystem that is growing, accompanied by a space policy momentum with massive increase of space sustainability, space safety and space related elements. However, the most important phenomena is the proliferation of space sustainability initiatives. The fragmentation of these initiatives is not realistic in the long-term, especially if the objective is to keep the balance between the regulatory advancement and the technological development.
41. It was considered important to find this right balance, pursuing driven technology, the policy vision, the impact vision, and the policy impact and that the blend of purpose, driven technology development and the policy direction are key to ensuring the safety and sustainability of the space environment.
42. The use of the word coordination rather than the word management related to space traffic was considered more adjusted because, at the present, there is a lack of regulatory tools to carry out active management or control.
43. Although it was considered that the international environment for data sharing was already very good, it was, however, noted that there is not as much precision in

the science of space traffic management and space traffic control as would be expected and that is necessary to be consistently excellent at it.

44. Space governance as a polycentric system was reminded, meaning that there is not one single centre of power that controls everything but is a multi-layered system with power distributed among the international, national and sometimes even regional, provincial or local levels. Sometimes there is a debate between whether STM should be done at the national level through nation state regulation, or whether there needs to be some new international treaty or global regime. The answer from a polycentric framework is neither and both: neither of those approaches will solve this problem by themselves, but we need elements of both.

45. The need that every launching state puts in place a national framework for how they are going to exercise their article six oversight obligations over their own space traffic was stressed, as well as the need of an international agreement on space traffic rules, enforced by those national regimes to avoid different sets of rules.

46. A coordination between the various national and regional SSA hubs that have cropped up is necessary.

47. It is important not to let the pursuit of the ideal scenario get in the way of making at least some incremental progress, as progresses are urgent due to the quick change of the reality of space activities.

(c) Space Debris

48. The main recommendations and outputs, specifically regarding space debris, of the Technical Symposium were recalled, namely the post mission disposal, the need for harmonized national regulatory framework, the absolute need for international coordination, where COPUOS and its working groups have a prominent role, the tracking of space objects, their tracking and data and access to the data, and the topic of active debris removal.

49. It was shared how a structured participation in the policy chain and active involvement in government engagement actions can contribute to the shaping of national and global policies and to technical and policy recommendations.

50. A clarification on some international obligations deriving from the Space Treaties, in a way that simplify and enables missions to take place, was noted as much welcomed.

51. It was noted that some of the policy innovation relies on the industry, so the governance in space sustainability must involve the industry and catch up with the policy gaps at the international level. The LTS guidelines were viewed as, somehow, a treaty replacement for space sustainability, and there is a growing trend of a much larger stakeholders participation including industry, industry associations and academia, in a common collective space debris and space sustainability governance progresses.

52. It was also stated that the progresses already achieved, should be recognized in the Pact for the Future as already commonly shaped aspects of space governance.

53. As main obligations of an operator or applicant, it was pointed the fact that the national norms regarding sustainability can be considered in all the life cycle of the space object, including launch and disposal and specifications design, and the respective reports to be presented to the public authorities.

54. The Zero Debris Charter was mentioned as one of the examples of what space agencies can do, in a proactive way, towards space sustainability and leading by example.

55. Circular economy can help space debris mitigation, as the number of debris is increasing dramatically and societies are getting more and more reliant on space infrastructures, not only raising the probabilities of some accident but also raising the consequences of that accident. It was then presented how in orbit servicing can be one

of the solutions to it, also changing the way of planning, designing and operating space missions. First, it has to be accomplished that the waste can be removed through active debris removal systems, afterwards the life of the assets can be extended, for example through refuelling, station keeping or altitude control, followed by other step-by-steps towards a more circular space economy, such as transport logistics or repair and constructions, including inspection, component replacement or even in-space manufacturing or recycling.

56. The current regulatory framework on sustainability was presented, including national licensing and industry best practices at the lowest of the pyramid, note being given that this does not flow from the top to the bottom, but that there are many activities from the bottom that will influence, for example, the development of international standards, then used by regulators and licensing authorities.

57. Note was given that there are no instruments to address legacy objects.

58. It was mentioned that many of the policy innovation in framing sustainable behaviours, best practices guidelines or some declarations has come from the private actors, and therefore a new platform, under COPUOS, that remains with a fundamental role in all this discussion, that could encompass them is really justified.

59. The intrinsic value and acknowledgement of the direct inputs from industry to policy makers was highlighted, also abiding all the players in an achievable way. The benefits of industry and the private sector as enablers for future regulation were pointed out, and the note was made of the growing experience of commercial operators in dealing with the risks and consequences from relict objects and decades of space use and the countless interactions between governmental owned objects and commercially owned objects.

60. It was highlighted as one of the objectives of the Summit of the Future the need of modernization of space governance and the fostering of dialogue with the private sectors within the United Nations, and the youth and gender contributions. Note was given on the High-level Advisory Board to the SG that, circa 2022, looked into more effective governance and multilateralism in the future.

(d) Space Resources

61. Space Resources were flagged by the UN Secretary General who recommended Member States, and particularly the Committee on the Peaceful Uses of Outer Space, to develop an effective framework for sustainable exploration, exploitation and utilization of the Moon and other celestial bodies with binding and non-legally binding aspects building upon the 5 United Nations treaties and other instruments.

62. Some key takeaways from the technical symposium were highlighted related to the need for regulation to answer legal uncertainty without being too restrictive to allow economic growth while ensure availability of space for future generations and the fact that technological developments are accelerating and are challenging current legal boundaries.

63. It was mentioned that in situ resources utilization should be considered more as space commodities rather than consumables made.

64. The focus of in situ resources utilization is the production of water, oxygen, and propellant, and in the long term also manufacturing (e.g. use of regolith).

65. Consideration was given on the requirements for sites, not just in terms of existence of resources but also on power availability, terrain, and other elements.

66. A mention to responsible in-situ resources utilization (ISRU) was also made from an end-to-end viewpoint, with indication to the fact that ISRU will reduce mission and architecture mass and costs, increasing safety of crew and enhance mission capabilities as well. Furthermore, the fact that the use of space resources can help humans on Earth and that planetary preservation is also important were also highlighted.

67. A summary of the main aspects related to in situ resources utilization was made. There was mention to some articles of the Outer Space Treaty (OST) and to the fact that the OST does not specifically address issues related to in situ space resources.
68. Moreover, an overview of the Moon Agreement was made, particularly to article 11, where it is mentioned that the Moon and its resources are common heritage of mankind and there is also a reference to the establishment of an international regime to explore and use the Moon.
69. Furthermore, a reference to four national laws related to in-situ space resources utilization was also made with an indication that this might not be the ideal path in the future since it may lead to fragmentation. National laws have been very useful to kick off the debate on this topic, but the preference will be to have an international regime agreed by all.
70. Legal certainty on this topic is needed and a suggestion to consider adaptative governance was made, indicating also that the Committee on the Peaceful Uses of Outer Space should be favoured as the main forum to discuss an international framework.
71. A reflection was made to start with a small set of principles (since the domain is evolving very fast) that reflect an international consensus targeting in the long term the achievement of an international legal framework.
72. There was also a mention of a perception that once private actors jump onto this topic there is a tendency for international governance rather than international conventions. Nonetheless, industry is interested in having a legal framework to give confidence to activities and investments. following a check list and roadmap approach to work towards an international framework.
73. Some important topics to address are the legality of space resource activities or space being considered a Global Commons.
74. Finally, a reflection was made on how a benefit sharing mechanism could be framed, such as an international fund.
75. Another topic discussed was the fact that, legal and policy wise, the space ecosystem may be in a sort of “bubble”, needing to get visibility on other sectors and how in-situ resources utilization will benefit them as well (e.g. the case of EUMETSAT for meteorology). There was also a mention of the validity of a small level approach (national level) in the short to mid-term to trigger the discussion.
76. Reference was made on the high-quality science that can be obtained from mining operations.
77. Following the discussion on current international laws and treaties, a proposal on a way forward was made suggesting that this is still farfetched and that for the time being the focus may be the use of space resources in space.

(e) Youth Track

78. A document has been issued outlining several policy positions on key topics relevant to the younger generation, such as Lunar governance and climate actions, and, at the start of this year, on space sustainability, aiming to e foster synergy between space stakeholders and intergeneration’s and raise awareness on the necessity of achieving space sustainability.
79. The “Intergenerational Pact for Space Sustainability” objectives regards the establishment of a collaborative and more inclusive global space community that upholds principles of sustainability, equity, and shared responsibility, and nurture a future generation that is knowledgeable, engaged, and capable of advancing sustainable space exploration and stewardship and create fora to effectively voice their concerns within the space community, focused in priority areas such as multilateral governance of space issues, inclusivity and youth participation in space, international collaboration and cooperation in the exploration and use of space, space

traffic management, including Dark & Quiet Skies, space debris and sustainability beyond Earth Orbit.

80. Finding a common understanding among emerging and emerged space faring nations for achieving intergenerational space sustainability was considered of great importance, highlighting the benefit of not reinventing what already exists but the need to building upon the work that has been conducted and experienced gained by space faring nations.

81. Cooperation is key, as far as possible; notwithstanding that States have different interests and different levels of development, if the rules are commonly produced, it should be able to gain a benefit according to what each Nation needs know.

82. Intergenerational equity could be ensured through progressive interpretation of article I of the Outer Space Treaty, designed to be foundational as a treaty on principles. Those are sufficiently generic to be evolved and interpreted according to the needs of time.

83. Managing space sustainability, that also means working or aligning with international guidelines, involves the contribution of different stakeholders, including all the employees and the customer to integrate their priorities by defining some impactful strategies and actions.

84. Life cycle assessment brings a unique quantified approach of addressing space sustainability across various segment like the LEO segment and the space segment. When space segment is addressed, it is Orbit segment but also the manufacturing of the satellite and the ground segment including the user's equipment.

85. Providing fora for the next generation to come into the sector was considered very important, allowing them to show them what they can do with technical skills in such an exciting field as Aerospace, even if they are quite young, as they are very much creative.

86. A very diverse background from technical experts, including women, was considered fundamental, as well as the need to raise awareness for the role of space for society.

87. It was identified the need for common ground at international level, also bursting the space bubble as highlighting the benefits of space for all.

88. The use synergies, the encouragement in the implementation of space debris mitigation guidelines, all leading for a shared stewardship for the environment were mentioned.

89. It was considered that the establishment of a Youth Advisory Board at the Committee on the Peaceful Uses of Outer Space could become part of the solution, namely because today, youth can only participate through SGAC or as part of national delegations (this not being very accessible).

90. The Importance of awareness-raising activities, such as UNOOSA Events, Conferences, Network Groups or a Model United Nations Committee on the Peaceful Uses of Outer Space in Vienna was raised, as well as the need to invest youth-led organizations and activities through, for example, paid internships at UNOOSA, educational programs, events, scholarships, amongst others.

(f) Civil Society Organizations

91. The importance of the role and the active participation of the civil society in a multilateral open discussion was highlighted at the beginning of the session.

92. Regarding space traffic coordination, the increasing number of simultaneous operating systems orbiting Earth was signalized and making mission critical to all to have accurate orbital elements accurate and timely conjunction analysis. An international agreement to make and keep outer space sustainable and usable by all users was recommended.

93. Orbital debris poses an urgent multinational challenge, threatening the sustainable use of LEO by all users. So far, prevention is not universally practiced, and remediation is not practical, but debris prevention is essential. A multinational ban on destructive anti-satellite operations was advocated for and binding multinational standards that prevent launch vehicles stages and defunct satellites on causing more debris. Implementation of remediation must be technically feasible, economically workable, and politically acceptable to the multinational community.
94. The active cleaning of legacy debris whose orbital lifetime exceeds 10 years was advocated for, also being mentioned that remediation must not increase environmental damage in the upper atmosphere and that cost should be equitably borne by the parties whose actions have caused and continue to cause debris risks.
95. An effective, and comprehensive bidding multinational policy, that includes prevention, detection, tracking, modelling and remediation was supported.
96. Deorbiting was recognized as the standard procedure; however, the rapid growth in satellite constellations and the unprecedented number of objects re-entering and their mass that disperses debris around Earth surface and atmosphere were identified as topics that need scientific studies, being emphasized the importance of environmental stewardship which includes the utilization of space resources and planetary protection measures on celestial bodies.
97. The requirement for guidelines and regulatory frameworks, also on the cislunar region, was considered urgent, with the harmonization of economic interest with imperatives of safeguard of scientific integrity of space exploration.
98. An assessment of the current status of space environment after the partial complying with the UN accepted space mitigation guidelines was made and there are undergoing studies on decision criteria for collision avoidance manuals, formulating space debris mitigation measures for lunar orbits and on the benefits and risks associated with the different disposal options or for objects in medium orbit.
99. Three types of space resources were identified: 1) special locations, such as sun synchronous orbits, GEO belt, lunar poles and Lagrange points; 2) solar energy and 3) planetary materials, such as oxygen and volatiles or asteroid compound, that are all limited.
100. For special locations, the top priority identified was deconfliction, namely with the quantification of constraints by multiple users in these locations. Then, it was suggested to consider equitable allocation, of limited orbital locations in particular.
101. For the other two types of resources, they were considered as speculative fields and governing policies were considered premature and unnecessary as the technical feasibility and the economic viability of them are still unproven, whilst being identified the demonstration priorities for them, such as power wireless transmission or resource abundance distribution, origin replenish mechanisms and planetary protection factors, followed by demonstration of end to end technique for accessibility, extraction and use.
102. The economic benefit was thought as one of the primary aspects of the new space economy, and that new space actors were becoming increasingly active, even substituting and outclassing national and international agencies. As this was taught as positive and inevitable progress, the speed of it might cause risks, one example of it could be the deployment of low Earth orbit of the large satellite constellations that, undoubtedly provide good services but at a high price regarding astronomy that was not adequately considered, as a very large number of satellites are illuminated at night and at any time transmit intentionally microwaves and unintentionally electromagnetic noise towards the Earth.
103. A paper has been issued regarding recommendations for the mitigation of satellite constellations impact on astronomy, such as the less brightness of the satellites, the public release of their real-time accurate position or that the microwaves emission is deviated away when the satellites are over the radio quiet zones around

major radio astronomical facilities. Hope was raised that those recommendations could reach a compromise at an international level and become in force, both at a United Nations legislative level and at a practical voluntary level. In the view of the Summit of the Future, what has happened to astronomy should be considered a lesson to be learned, a case study for the future: there was no time, neither to the constellation designer nor to the astronomer nor to the policy maker to evaluate all the consequences and adequately control them.

104. Education is a fundamental tool for space management and sustainability, as it provides the understanding on the issues at hand, where common ground is fundamental.

105. The purpose of the involvement and official participation of civil society and stakeholders is not to replace executive or decision-making roles of States but to complement it and to provide information, knowledge and understandings, in and out relevant fora. The necessity of a more systematic and multilateral engagement has been highlighted on multiple occasions, as informed dialogue will facilitate informed policymaking.

106. The topics under discussion requires interventions in the both regulations and incentives and diverse input is necessary to ensure that such policy is successfully framed. As it comes to action, increased awareness and transparency among non-state actors will increase their ownership and responsibility and instil a sense of urgency in existing roadmaps and work streams. The power of incremental progress should not be underestimated, especially when there may be a lack of political will at an executive level and that's when civil society organizations and non-state players can come in and actually lead the way. Regarding trust, this involvement can greatly improve legitimacy and effectiveness of decision making where concerted a recognizable effort towards a stakeholder inclusion have been made, and civil society institutions are particularly well placed to facilitate such efforts from the ground up.

107. Engaging in multi-stakeholder dialogue can gain very useful and critical bottom-up expert perspectives regarding, for example, technical and geopolitical threats to space operations and understanding how these can be mitigated or about behaviours that can be considered helpful or harmful or key priorities. And divergence of views or perceptions is, in itself, very useful for policy makers in identify potentials for misunderstanding and escalations, especially regarding safety and security.

108. A report on lunar policy priorities has been issued, outlining common ground amongst thirty different stakeholders around ten key issues to be addressed for safe and sustainable lunar development, at the ending of several years of discussion. And following the sequence of these discussions, it can be identified an adaptive governance, a concept that has been established in the Hague working group, and that civil society can provide expert inputs for informed discussions.

109. The step ahead is to going from expert inputs to organizational alignment to stakeholder alignment on common grounds in order not only to enable informed deliberations at a multilateral, domestic and regional level, but also to focus discussions and this was believed as a possible next step of civil society engagement in relation to the Summit of the Future, as these institutions can really be the connecting tissue among Member State but also among other institutions within the UN system. The Committee on the Peaceful Uses of Outer Space example was given, an important platform to foster this alignment and common ground among different organizations.

110. Looking ahead the Summit of the Future, it was considered the importance of a multi-stakeholder discussion and bringing stakeholder together around common grounds and common priorities and issues and share solutions.

111. It was issued a recommended framework and key elements for a peaceful and sustainable lunar activity as a foundation tool encouraging delegations of the Committee on the Peaceful Uses of Outer Space to engage a discussion on

international lunar coordination and to identify an efficient and prompt reply to urgent needs for mitigation risk.

112. There is nothing more close to the future than the Moon, expressed as the next destination for humankind, so it should be made certain that in the Moon mankind will not damage the Moon as they did on Earth, also meaning the three topics in discussion should also be addressed from the Moon perspective.

113. The need for inclusive approaches to outer space governance was highlighted as it was mentioned that the sustainable future in space very much depends on effective institutions that take in consideration all the needs and concerns from across all stakeholders, and not only those of state actors. Given the importance of the topic of sustainability, it was noted that a multitude of initiatives were on the way which, at large, could make more difficult for a wide range of actors to provide substantive and useful inputs, also being noted the need for a more effective engagement in cross organizational information sharing, as the lack of it could result in overlapping approaches but also in gaps in the proposed solutions.

114. As civil society can bring many different inputs, it was found critical to continue to evolve new and improved pathways for its contribution, bring in non-traditional viewpoints.

115. It was noted that international policy coordination should be better aligned and bringing down the gap between technical, policy and the public at large, as there is a lot of messaging that must be done as an aligned information is a very powerful instrument.

116. Engagement of society at large with space and space related topics is also of fundamental importance, because this is also that affects the workforce, the resources allocation and policy ability by policy makers.

117. Global policy answers must be structured in a timely manner, giving consideration of the very fast pace on industry and civil institutions, in order to be effective.

118. It was stated that the space sector could engage more with the traditional media, because it's their job to communicate with the general public, and the space media platforms should be encouraged to be more open to other than not only the space sector and be more far-reaching with the space public, as also the topic of space has to be demystified as too complex because it can and should be understandable at large.

119. It's still a long way to go to effectively communicate the key enabling role of space technologies, and this was viewed as fundamental in order to constituents engage in the problem solving elements of space, also because the lack of a mean to close the gap, as for instance SDG's has been doing at large, and for a non-use of relatable imagery that can relate space with everyday life and economy.

120. To burst the space bubble was viewed as important and equally important is also to burst the civil society bubble within the space bubble and affectively provide a wider a diverse and new exchange of views, also by making discussions accessible in the UN and by providing new forms for this exchange to happen, that can be more or less formal but that they provide a place in which organizations can talk to each other and try to synergize. There are sectors that can really be looked to for effective modelling, such as the Global Alliance for the Future in sharing information, strengthen evidence and research.

IV. Main observations and recommendations

(a) General

121. A sustainable space sector means not only caring about sustainability in outer space but also caring about how space related activities are managed on Earth.

122. Profoundly linked with the sustainability of space is the equitable burden sharing on space debris mitigation and space debris remediation and the prospective of it as a common mission, a very important element in international cooperation.

123. The Committee on the Peaceful Uses of Outer Space continues to be the right forum to discuss all these questions at an international level and to reach consensus amongst States, including on commonly accepted international legal regimes, regardless of some constraints or challenges it may pose.

124. To a certain extent, regulations will have to be top down to make all the operators cope with the same rules and national space laws are a direct and useful instrument of action to mandatorily address space debris mitigation and the compliance with international standards.

125. The involvement of the private sector is fundamental, and the challenge is to accomplish and structure this participation also at the international level.

126. Fast and standardized communications protocols between operators are of fundamental importance, and it could envisaged the existence of an authority - public or private, dully mandated - for worldwide space safety.

127. Foster international collaboration, enhance capacity building and global awareness, bringing together the different actors and providing a platform, not only for civil society organizations exchange, but also to enhance opportunities of collaboration between various actors overall.

128. For a meaningful youth participation, it was suggested the inclusion of the youth concerns regarding space sustainability in Pact for the Future, the establishment of a youth advisory board at UNOOSA, the incorporation of youth delegates in all delegations to Committee on the Peaceful Uses of Outer Space and the investment in youth-led organizations and activities through a diverse range of instruments such as paid internships at UNOOSA, educational programs, events and scholarships, amongst others.

(b) Space Traffic Management

129. It is necessary a clarification of certain aspects to make them more consistent with the reality and the development of space activities, as limitation and definition of Outer Space and passage rights.

130. It is crucial to situate the broader issues at play when considering international cooperation and discussing Space Traffic Management in that context, including, for example, space environment.

131. It is important to reinforce cooperation between member states and non-state expertise in the dialogue to support the discussion at the Committee on the Peaceful Uses of Outer Space level regarding STM. The role of observers can be complementary to the whole committee because it brings up new perspectives.

132. The Committee on the Peaceful Uses of Outer Space do not have an easy way for the commercial sector to inject thoughts, information and provide guidance on the changing marketplace. For the organization to grow and strengthen, it does really need to consider how it will do that in the future.

133. While there is a need of some level of international consensus on the core rules about STM, the way that is implemented at the national level can be different from country to country.

134. STM should not be foreseen as a blockade or difficulty for developing nations to gain access to outer space.

135. The community should try to focus on what is really needed to start and what can feasibly get done, starting now, because the longer it will take to try to figure out what the exact best fully fledged system that has everything worked out is, the longer it is going to take.

136. Communication is the key, namely the communication between the systems, of course, but mainly a global communication of the main issues regarding Space Traffic Management.

137. There is the need for a global framework for information sharing and collision avoidance, and also for the development and adoption of global standards for space object tracking and data sharing, with interoperability and exchange of transparent information.

(c) Space Debris

138. The progresses already made in the definition and consolidation of public policies in space sustainability, including on space debris, should be recognized.

139. National public recommendations and national space laws are direct and effective instruments to enforce space debris mitigations measures in the authorized national space activities, whilst pursuing the international commitments of the States.

140. A comprehensive step-by-step approach aimed to minimize debris, co-developed by a pro-active community has already supported the definition of technical standards and common norms towards sustainability.

141. Circular space economy is a fundamental aspect to consider in the diminishing of space debris.

142. The remediation of space debris, and not only its mitigation, should also be addressed either on industry best practices or regulation, national or international.

143. Active industry participation in the policy chain and in the drafting of global best practices, norms and guidelines, binding or non-binding, should be encouraged and, as policy innovation relies grandly within the private sector, it is amply justified the development of a new international governance platform that can encompass it, within fundamental role of the Committee on the Peaceful Uses of Outer Space, as the joint work between government and industry is fundamental to space sustainability.

144. The funding of active debris removal, with a combination of a multitude of financial instruments - such as a global fund to support the costs of active removal of legacy objects – and the involvement of the private sector is of paramount importance and should also be addressed in the future.

145. There is a need for binding rules on prevention, investments for reusability & removal.

146. It should be established more norms and principles for active space removal and in orbit servicing, with improved models and techniques of space debris characterization, guiding debris mitigation effectively.

(d) Space resources

147. Legal certainty on this topic is needed and a suggestion to consider adaptative governance was made.

148. The Committee on the Peaceful Uses of Outer Space should be favoured as the main forum to discuss an international framework. The framework could begin with a small set of principles that reflect an international consensus, targeting in the long term the achievement of an international legal framework. One way forward could be a check list and roadmap approach to work towards an international framework.

149. Industry is interested in having a legal framework to give confidence to their activities and investments.

150. There is a need of foundational principles for intergenerational sustainability and of the development of a regulatory framework for exploration.

Annex 1

Policy Symposium Agenda

1. Monday, March 11

Opening

Regional and national approaches on Space Sustainability

08:00 UTC **Opening**

Aarti Holla-Maini (UNOOSA)

Hugo André Costa (Portuguese Space Agency)

Regional and national approaches on Space Sustainability

08:15h UTC **Speakers**

Koichi KIKUCHI (JAXA, Japan)

Kritzman G. Caballero (Philippines Space Agency, Philippines)

Alexandra Seneta (Australian Space Agency)

Anil Kumar (Indian Space Research Organization)

Ray Fielding (United Kingdom Space Agency)

Moderator

Steven Freeland (Emeritus Professor of International Law, Western Sydney University; Professorial Fellow, Bond University; Vice-Chair, UNCOPUOS Working Group on Legal Aspects of Space Resource Activities)

Rapporteur

Diogo Cardoso (ISCP, Portugal)

12h UTC **Speakers**

Thomas Weissenberg (European Space Agency, ESA)

Hamda Abdulla Al Hosani (UAE Space Agency, UAE)

Ian Grosner (Brazil Space Agency, Brazil)

Rudolphe Munoz (European Commission)

Asanda Sangoni (South Africa Space Agency, South Africa)

Emmanuel Bourdoncle (Directorate General for Enterprise (MEFIDS), France)

Moderator

Kai-Uwe Schrogl (President, International Institute of Space Law)

Rapporteur

Carolina Rêgo Costa (Portuguese Space Agency, Portugal)

2. Tuesday, March 12

Space Debris

08:00 UTC **Speakers**

Aya Iwamoto (Vice President, Policy and Government Relation, ASTROSCALE JAPAN Inc, Japan)

Giovani C. Concepcion (Attorney V, Space Policy and Legal Affairs Division, Philippine Space Agency, Philippines)

Hristina Talkova (Executive Officer at European Centre for Space Law)

Hamza Hameed (Chair of the Space Generation Advisory Council)

Moderator

Umamaheswaran R. (Former Director, Human Space Flight Centre and Former Scientific Secretary, ISRO)

Rapporteur

Portuguese Space Agency

12:00 UTC Speakers

Vini Aloia (Head of Legal, Regulatory Affairs, and Space Policy at Astroscale)

Aurelie Trur (Independent Space Diplomacy and International Relations Expert)

Tiago Soares (European Space Agency's Clean Space initiative)

Fatheyah Ali Al Sharji (Legal Principle Researcher, UAE Space Agency, UAE)

Romain Buchs (Space Policy and Strategy at ClearSpace)

Moderator

Niklas Hedman (Vice-Chair COSPAR Panel on Planetary Protection)

Rapporteur

Carolina Rêgo Costa (Portuguese Space Agency, Portugal)

3. Wednesday, March 13

Space Resources

12:00 UTC Speakers

Tanja Masson-Zwaan (Assistant Professor and Deputy Director, International Institute of Air and Space Law, Leiden University, Kingdom of the Netherlands)

Gerald Sanders (Lead for In-Situ Resource Utilization at NASA National Aeronautics and Space Administration, EUA)

João Azevedo, (Co-coordinator and Researcher at SPARC, NOVA School of Law, Portugal)

Thomas Hrozensky (Senior Researcher and lead on European Engagement at ESPI European Space Policy Institute)

Moderator

Artemis Papanthassiou (Head of the International Law Department of the Ministry for Foreign Affairs of Greece)

Rapporteur

Joan Albart (Portuguese Space Agency, Portugal)

4. Thursday, March 14

Space Traffic Management

12h00 UTC Speakers:

Ruvimbo Samanga (Ambassador – Milo Space Science Institute)

P.J. Blount (Lecturer in Law, Cardiff University)

Tim Flohrer (Head of the Space Debris Office ESA)

Rudolphe Munoz (EU SST and EU SSA at European Commission)

Pascal Faucher (Program manager, Defense and security, Centre National d'Études Spatiale, CNES)

Moderator

Alexander Soucek (European Space Agency)

Rapporteur

Bruno Reynaud de Sousa (Minho University & JusGov Centre for Research)

16:00 UTC **Speakers**

Brian Weeden, (Director of Program Planning, Secure World Foundation)

Richard DalBello (Director, Office of Space Commerce, NOAA, USA)

Olavo Bittencourt Neto (Space Law Professor, Catholic University of Santos, Brazil)

Maruska Strah (Space Traffic Management Working Group Co-Chair International Institute of Space Law – IISL)

Sara Dalledonne (Research Fellow and Lead on Regulatory Affairs, European Space Policy Institute (ESPI))

Moderator

Sarah Pacey Parker (Manager, International Relations at Canadian Space Agency, Canada)

Rapporteur

Paula de Castro Silveira, Nova University, Portugal

5. Friday, March 15

Youth track

Civil Society Organizations

Youth track

13h00 UTC **Speakers:**

Giuliana Rotola, Intergenerational Pact for Space Sustainability, SGAC,

Charles Nzeussi, ESG Compliance and External Engagement

Merve Erdem Burger, Post doctoral researcher, Dept. of Public International Law, Faculty of Law, University of Neuchâtel.

Marianne Röchling, TU Wien Space Team

Joan Chesoni, Kenyan Space Agency

Moderator:

Antonino Salmeri (Space Generation Co-Chair)

Rapporteur:

Gina Petrovici (SGAC Policy & Advocacy Coordinator)

Civil Society Organizations

15h00 UTC **Speakers**

Brent Sherwood (American Institute of Aeronautics and Astronautics, AIAA, USA)

Pascale Ehrenfreund (Committee on Space Research, COSPAR)

Giuseppe Reibaldi (Moon Village Association)

Piero Benvenuti (International Astronomical Union, IAU)

Hannah Ashford (Karman Project)

Nicolas Peter (International Space University, ISU)

Antonino Salmeri (Lunar Policy Platform)

Krystal Azelton (Secure World Foundation)

Anil Kumar (Inter-Agency Space Debris Coordination Committee IADC)

Moderator

Markus Woltran (UNOOSA)

Rapporteur

Inês d'Ávila, Portuguese Space Agency
