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Committee on the Peaceful Uses of Outer Space

Report on the United Nations/Austria World Space Forum on the theme "Space 4 climate action"

(Online, 7–9 December 2021)

I. Introduction

1. The Office for Outer Space Affairs of the Secretariat and Austria jointly hosted the World Space Forum on the theme "Space 4 climate action" online from 7 to 9 December 2021.

2. The forum provided an opportunity for space community representatives to discuss current and future activities on the topic of space for climate action and facilitated the exchange of best practices and cooperation among relevant stakeholders in support of Sustainable Development Goal 13 (Take urgent action to combat climate change and its impacts).

3. Owing to the coronavirus disease (COVID-19) pandemic, the forum, originally scheduled to take place in Vienna, was held online. The event was co-organized by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology and the Federal Ministry for European and International Affairs of Austria.

4. The present report contains a description of the background to and objectives and programme of the forum, a summary of the sessions and the observations made and recommendations reached.

II. Background and objectives

5. Launched in Vienna in November 2019 (see A/AC.105/1219), the World Space Forum is an event series hosted by the United Nations that is built on the recommendations generated at four high-level forums held from 2015 to 2018. That sequence of forums demonstrated the growing interest of an increasing number of actors in discussing the future of space and international cooperation across the pillars of space economy, space society, space accessibility and space diplomacy.

6. Through the World Space Forum, the United Nations aims to leverage innovative solutions and technological developments to achieve the Sustainable Development Goals. Attention has increasingly been focused on the unique potential of space technologies in this endeavour. Building on the outcomes of the fiftieth anniversary of the United Nations Conference on the Exploration and Peaceful

Uses of Outer Space (UNISPACE+50) and taking advantage of the momentum it generated, the forum was aimed at ensuring that the current dialogue among stakeholders in the space field fully captured the political, legal and capacity-building elements of international cooperation in space for climate action.

7. As agreed at the United Nations/United Arab Emirates High-level Forum on the theme "Space as a driver for socioeconomic sustainable development", held in 2017 (see A/AC.105/1165), the High-Level Forum series, renamed the World Space Forum in 2019, continues to serve as a driver for dialogue between Governments, international organizations, industry, the private sector, academia and civil society, to connect the four pillars of UNISPACE+50 and the "Space2030" Agenda.

8. The present forum sought to address specifically the role of the space sector in contributing to the achievement of Sustainable Development Goal 13 and allow for discussions on global activities aimed at maximizing the impact of space assets. By facilitating the exchange of best practices and increased inter-agency collaboration in support of climate action, space science and technology could finally become more commonly used as key tools in addressing the climate crisis.

III. Attendance

9. The forum was held online and brought together participants from national, regional and international public and private organizations and institutions, including decision makers from government agencies, high-ranking officials from regional and international agencies, representatives and experts from the United Nations bodies, experts from the space community, academic communities and international centres of excellence, policymakers, researchers involved in the use of space technologies, representatives of the private sector in the space and non-space fields, and civil society leaders.

10. A total of 540 individual participants, 42 per cent of whom were women, registered to attend the forum and were granted access to the Internet-based communication platform.

11. A number of participants were members of the diplomatic community, including representatives of permanent missions to the United Nations at Vienna. Representatives of the following space agencies were also present: Austrian Research Promotion Agency, Brazilian Space Agency, Canadian Space Agency, Egyptian Space Agency, European Space Agency, Ethiopian Space Science and Technology Institute, Geo-Informatics and Space Technology Development Agency of Thailand, German Space Agency, Iranian Space Research Center, Israel Space Agency, Italian Space Agency, Japan Aerospace Exploration Agency (JAXA), Kenya Space Agency, National Aeronautics and Space Agency of the United States of America (NASA), National Institute of Aeronautics and Space of Indonesia, National Space Research and Development Agency of Nigeria, National Space Science Agency of Bahrain, Norwegian Space Agency, Mexican Space Agency, Paraguayan Space Agency, Philippine Space Agency, Portugal Space Agency, Rwanda Space Agency, Turkish Space Agency and United Kingdom of Great Britain and Northern Ireland Space Agency.

12. The following 87 Member States were represented: Algeria, Argentina, Armenia, Australia, Austria, Bahrain, Bangladesh, Belgium, Bolivia (Plurinational State of), Botswana, Brazil, Brunei Darussalam, Canada, Chile, China, Costa Rica, Côte d'Ivoire, Czechia, Denmark, Dominican Republic, Egypt, Ethiopia, Finland, France, Germany, Greece, Honduras, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Italy, Japan, Jordan, Kenya, Latvia, Lebanon, Luxembourg, Malaysia, Mali, Mexico, Mongolia, Morocco, Myanmar, Namibia, Nepal, Netherlands, Nicaragua, Nigeria, Norway, Pakistan, Paraguay, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Rwanda, Saudi Arabia, Serbia, Sierra Leone, Singapore, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syrian Arab Republic, Thailand,

Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela (Bolivarian Republic of), Zambia and Zimbabwe.

IV. Programme

13. The programme of the forum was developed by the Office for Outer Space Affairs in cooperation with the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology and the Federal Ministry for European and International Affairs of Austria.

14. The forum opened with a high-level segment that included introductory remarks from the Federal Minister for Climate Action, Environment, Energy, Mobility, Innovation and Technology of Austria, the Minister for Science, Research and Innovation of the United Kingdom, and the Director of the Office for Outer Space Affairs. The opening session concluded with a video message from a representative of the Directorate-General for Defence, Industry and Space of the European Commission and former NASA astronaut, Nicole Stott.

15. The opening session was followed by a panel discussion on the key role of space agencies in a unified approach to address climate change that was attended by representatives of the European Space Agency, JAXA, NASA, the National Space Research and Development Agency of Nigeria, the Philippine Space Agency and the United Kingdom Space Agency.

16. The expert exchanges on space for climate action on the following three days comprised sessions on partnership, coordination and cooperation; the youth perspective on space-based climate action; space-based solutions for climate action from the providers' perspective; the needs and perspective of the user of space-based solutions for climate action; examples and successful initiatives; and recommendations, and innovative and new approaches. The final session provided an overall summary and outlook.

17. Thanks to support from the Austrian Economic Chamber, it was possible to offer online networking sessions. Facilitated by a dedicated online platform, individual meetings were scheduled to allow for an exchange of views and ideas with the aim of identifying networking opportunities and finding new partners for possible future cooperation.

18. The closing session of the forum comprised a summary of the panel sessions, a high-level statement from the Director of the Center for Sustainable Development at Columbia University, United States, and a United Nations Sustainable Development Advocate, Jeffrey Sachs, and concluding remarks from the Head of the Innovation and Technology Directorate General from the Ministry for Climate Action Environment, Energy, Mobility, Innovation and Technology of Austria and the Director of the Office for Outer Space Affairs.

19. Video recordings of all the sessions and presentations can be found on the website of the Office for Outer Space Affairs (www.unoosa.org).

V. Summary of the forum programme

20. The session on the key role of space agencies in a unified approach to address climate change built on the Secretary-General's assessment that the climate crisis was a multilateral challenge and solving it required coordination and cooperation on a scale never seen before. Participants explored how to strengthen collaboration among space agencies and how space agencies could support the Office for Outer Space Affairs in future activities to achieve Sustainable Development Goal 13.

21. The space agency representatives highlighted various activities in the area of climate action and stressed that, although the advantages of using space-based technology for climate research, monitoring and policy implementation were

recognized, the technology remained underused. The participants also highlighted the need to go beyond monitoring and observation and to place more attention on action.

22. Building on the fact that a large number of multilateral cooperation projects and initiatives already existed in the space sector, session one, entitled “Partnership, coordination and cooperation international cooperation”, presented examples of well-established international partnerships and cooperation initiatives that were leveraging the benefits of space technologies for climate action.

23. The panellists stressed the importance of international cooperation and highlighted various current activities in the area of monitoring, observation and measurement. It was noted that any space for climate action activity or policy would need to be anchored in existing mandates stemming from the Paris Agreement or the Sustainable Development Goals and it would be important to ensure that any such efforts did not duplicate existing actions.

24. In recognition of the fact that the world was currently home to 1.8 billion people aged between 10 and 24, the largest generation of youth in history, the forum included a session on the youth perspective on space-based climate action. During the session, youth representatives discussed how space-based data and space technology could be used for climate monitoring and for efficient solutions to support climate neutrality, and how young people could be involved in space for climate action activities.

25. Furthermore, participants noted that climate issues were not stand-alone issues, as they had severe impacts on society and politics, and even more so on the youth. The session provided an opportunity to present youth-led work in the space sector and the potential for satellite data to connect environments and societies to facilitate climate action. The panellists highlighted the importance of inclusion of the voice of the youth and stressed that representatives of indigenous peoples and local communities should be invited to conference forums to strengthen cooperation.

26. One of the overarching goals of the forum was to bridge the gap between the provider and user communities and shed light on the different needs and requirements from distinct perspectives. Sessions two and three, on the providers’ perspective on space-based solutions for climate action and on the needs and perspective of users on space-based solutions for climate action, respectively, not only showcased specific examples of the contribution of space to climate action but also provided an opportunity to look closely into climate action from the point of view of users.

27. In session four, successful initiatives were used to highlight examples of best practice in order to illustrate how space assets could contribute to the achievement of Sustainable Development Goal 13.

28. Session five, on recommendations and innovative and new approaches, concluded with specific references to potential future approaches, highlighting opportunities to drive cooperation and partnership in space to address challenges to humanity and sustainable development issues.

29. The forum also included four dedicated networking sessions, which allowed participants to schedule one-on-one meetings to discuss potential partnerships and opportunities for future cooperation.

VI. Observations and recommendations

30. The following observations were made, and recommendations proposed, during discussions at the forum.

31. Climate action required a clearer picture of the status and different drivers of climate change, which could essentially be supported worldwide through satellite-based technology. In that regard, the Office for Outer Space Affairs was regarded as a central coordinator in the efforts to advance the use and application of space technology in addressing the measures to achieve Sustainable Development Goal 13.

32. Given the importance of evidence and science-based information derived from space infrastructure to climate action, participants called for an acceleration of cooperation on greenhouse gas monitoring and the development of new applications built on knowledge generated from space technology. Furthermore, transparency and interoperability of data and accessible data platforms were identified as key objectives for the successful coordinated global use of space for climate action.

33. Panellists also noted the importance of building capacity for the application of space data to climate action, including strengthened knowledge transfer among different sectors to make it possible to take advantage of synergies at the national and international levels.

34. Participants called for the promotion of joint projects between the Office for Outer Space Affairs and youth groups to facilitate a stronger inclusion of the voice of youth. In that regard, participants commended in particular the Space for Youth project of the Office for Outer Space Affairs. Furthermore, they recommended investing more in developing space and data skills, in particular in the careers that were supporting efforts to mitigate climate change.

35. Participants recommended the creation of dedicated working groups that included youth representatives to allow contributions, collaboration and research on topics reflecting their specific interests and needs.

36. Panellists called for increased knowledge transfer, coupled with support for and collaboration on the implementation of activities focused on space for climate action, including by facilitating stronger multisectoral engagement to encourage synergies among different sectors at the national and international levels. In that regard, participants expressed appreciation for the networking opportunities during the forum and recommended that similar opportunities be organized at future events.

37. Several participants highlighted the importance of an open data structure, which was essential to drive on-the-ground solutions. The role of the United Nations, as an impartial actor in facilitating negotiations on improved interoperability of space for climate action data and formats, was highlighted.

38. Furthermore, participants stressed the importance of facilitating the establishment of an impartial and accurate space for climate action database and the need for additional support both to access the data and to develop training on its application to and inclusion in climate action-related projects.

39. International forums for climate change-related issues remained vital to showcase the importance of space technology and applications for climate action. Efforts in that regard should continue, with the Office for Outer Space Affairs providing information for policymakers.

40. Several participants stressed the need to develop new, innovative projects addressing space for climate action that built on existing structures and international efforts. In that regard, the cooperation announced at the forum between the Office for Outer Space Affairs and the United Kingdom to map global space-related climate action efforts was welcomed as an important gap analysis effort aiming to avoid duplication and parallel activities.

41. Participants were of the view that the Office for Outer Space Affairs could act as the host entity for a global space for climate action centre that would address the gaps identified in the above-mentioned analysis.

42. Capacity-building and training through the use of case studies, step-by-step guidelines or recommended practices were endorsed. The advisory support provided through the recommended practices on the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) was highlighted as a practical solution that could serve as a baseline for the development of comparable tools for space for climate action.

43. Notwithstanding their current resource constraints, international organizations, as important neutral platforms within the multilateral system, should continue to make every effort to convene all stakeholders with the goal of finding common solutions to address space for climate action-related projects. Participants recommended that follow-up activities be organized to allow discussions on specific activities and welcomed the announcement by Austria that it would host a workshop on harvesting the power of space for climate action.

44. Several panellists highlighted the importance of increased awareness-raising and strengthened outreach among Member States on the importance of space technology, in particular for climate adaptation and resilience efforts for specific projects in areas such as agriculture, land use and land use planning, biodiversity and energy.

45. In that regard, the importance of highlighting existing, successful initiatives and actions was noted. It was recommended that the creation of dedicated awards and award ceremonies be considered for initiatives in order to celebrate existing infrastructure and services for climate action.

46. Furthermore, several participants called for the organization of practical training and capacity-building events such as hackathons to showcase successful initiatives in various sectors and to apply ideas to practice.

47. Networks for experts and professionals to facilitate continuing discussion were identified as vital for advancing discussions and maintaining momentum. In that regard, the importance of existing structures and mechanisms to furthering exchanges and connections was noted.

48. Panellists recommended that, in order to make the maximum use of space applications for climate action, technology developments, such as artificial intelligence, blockchain and cloud computing, should be included in the activities of the Office for Outer Space to support innovative ways and means for data extraction services, data preparation and data provision.

VII. Conclusions

49. The United Nations/Austria World Space Forum on the theme “Space 4 climate action” provided an opportunity to make progress in discussing the future of space technology for climate action and increased international cooperation.

50. By providing high-resolution and broad-scale monitoring, the remote sensing capabilities of satellites have enabled the collection of data that are global, consistent and sustained over many years. Those were precisely the tools needed for effective, well-informed and multi-stakeholder climate action, to allow for the causes, effects and evolution of climate change to be compared across the globe. Empirical evidence for better understanding and more accurate predictions of climate evolution was a prerequisite for improved mitigation, adaptation and resilience measures and risk assessment.

51. Moreover, the added value of space assets extended beyond monitoring and modelling. Satellites and satellite-based data are critical for developing innovative solutions. Initiatives that benefit significantly from space technologies include smart cities, precision agriculture, efficient mobility systems and supply chains, global connectivity and disaster management.

52. In that regard, the forum provided an excellent platform for stakeholders to discuss current and future activities relating to space for climate action. Furthermore, it facilitated the exchange of best practices and cooperation among all relevant stakeholders in support of the achievement of Sustainable Development Goal 13.

53. The forum brought together experts and policymakers from regional, national and local institutions, private organizations, academic institutions, non-governmental

organizations and international organizations to allow for a truly inclusive, diverse and multilateral dialogue on space for climate action.

54. Thanks to the generous support of Austria and the facilitation of the Austrian Economic Chamber, the forum also allowed for online networking sessions that advanced collaborative action and provided a bridge between the user and provider communities.

55. Austria announced its continuing support for the forum and its intention to host the forum again, in 2022, in Vienna.