STI for SDGs Roadmaps

– Expert Group Meeting International Workshop

(May 8-9, 2018)

Conference Room “Mars”, Miraikan, Tokyo, Japan

Report of the Meeting

(Draft as of May 29, 2018)

Index

Summary and Recommendations

UN DESA, World Bank, UNCTAD and UNESCO, in cooperation with the Government of Japan, organized an Expert Group Meeting (EGM) on Science, Technology and Innovation Roadmaps for the SDGs in Tokyo, May 8-9, 2018, in the lead-up to the third STI Forum in June 2018. The meeting was attended by around 70 experts and practitioners, representing IATT member agencies and 12 UN Member States presenting country level STI roadmaps. The meeting discussed countries' visions and practices in designing and implementing STI policies and action plans, with special attention to the SDGs' fundamental principle of leaving no one behind and challenges related to moving from plans to actions, and reviewed international cooperation mechanisms and instruments to support countries' efforts toward STI roadmaps. The following conclusions and recommendations emerged from the discussions:

Overall, the EGM reconfirmed previous discussions at the first two STI forums and related Workshops on value addition of STI for SDGs Roadmaps as a powerful multi-stakeholder engagement tool to plan, communicate and facilitate actions, track progress, and foster a learning environment for harnessing STI to achieve the SDGs. It is also emphasized that STI for SDGs Roadmaps should be in line with the concrete visions and philosophies for national sustainable development, yet be flexible to adjust to new scientific knowledge and rapid technological changes. STI for SDGs Roadmaps as integral elements of national sustainable development strategies can be TFM's major output over the next two years by elevating the STI agenda to the highest political level of respective countries' decision makers. IATT in partnership with Japan proposed an inter-sessional work program toward 2019 STI Forum and UNGA to pilot and scale adoption of country level roadmaps, develop common principles of STI for SDGs Roadmaps based on lessons learnt, and strengthen international cooperation. Countries participating in the EGM expressed strong interests in pilot implementation.

Countries' presentations at the EGM and responses to the questionnaire provided useful insights to the diversity of circumstances and realities, including cultural and historical contexts and capacity constraints, and varying awareness, political will and level of engagements among government entities (head of states and cabinets; national development or planning commissions;

ministries of finance, industry or economy, science and technology; line ministries; research institutes) as well as private sector, civil society and academia, on which respective countries efforts toward STI for SDGs Roadmaps should be grounded. The discussions highlighted opportunities and challenges in effectively facilitating national actions through STI for SDGs Roadmaps, along the tentatively proposed three-tiered approaches:

- Foundation: while most countries have legislative and institutional frameworks to strengthen STI, less countries have adequate capacities for execution; cross-ministerial coordination and budgeting mechanisms; robust culture of evidence and experimentation.
- Adaptation: while awareness is rising on impact of rapid technological changes and early experiences are emerging on forward-looking regulatory frameworks, policy responses are yet to be formulated in most countries to tackle inequity, maintain social cohesion, boost firm capabilities and find new industrial development pathways.
- Integration: while new diagnostic tools are becoming available to understand the interlinkages, trade-offs and synergies within/across economic, social and environmental development objectives, most countries are yet to move from SDGs as a relabeling exercise to coherent, consistent and continuous policy actions between national and subnational levels, with strengthened science-policy interface and measures to track progress to leave no one behind.

The meeting also discussed bilateral donors' and international organizations' programs and instruments to support developing countries' efforts on STI for SDGs Roadmaps and spur STI contributions, through research collaboration, capacity development, strengthening of innovation ecosystems, facilitation and matchmaking between known problems and existing technological solutions, with a view to raise awareness, potentially increase synergies and improve fit for countries' needs and gaps as well as formulate international or global roadmaps once country level STI for SDGs Roadmaps expanded and advanced.

The EGM discussions will inform the third STI Forum's session on country level roadmaps and action plans to build a global momentum for development of STI for SDGs Roadmaps. Also, countries participating in the EGM will be invited to participate in the inter-sessional work program on STI for SDGs Roadmaps for further discussions to develop common principles of STI for SDGs Roadmaps. As an immediate next step, countries will submit responses to questionnaire for IATT to complete the background paper, as an input to the third STI Forum as well as to inform the inter-sessional work program on STI for SDGs Roadmaps toward the fourth STI Forum.

Introduction of the Meeting

The 2030 Agenda for Sustainable Development, unanimously adopted by all member states, reaffirmed Science, Technology and Innovation (STI) as key means of implementation and launched the Technology Facilitation Mechanism (TFM) to support the 17 Sustainable Development Goals (SDGs). The TFM is composed of the collaborative Multi-Stakeholder Forum on STI for the SDGs (STI Forum), Online Platform, and the United Nations Inter-Agency Task Team on STI for the SDGs (IATT-STI) together with a group of 10 high-level representatives from civil society, the private sector and the scientific community (10-Member Group). The past two STI Forums in 2016 and 2017 highlighted that *"… the STI roadmaps and action plans are needed at the subnational, national and global levels, and should include measures for tracking progress. These roadmaps incorporate processes that require feedback loops, evaluate what is working and not working, and produce continual revisions that create a real learning environment*," for further discussions at the 2018 STI Forum.

With a view to producing action-oriented outcomes in line with previous discussions, and orchestrating an effective inter-sessional work toward cumulative impact, the UN IATT-STI, in cooperation with the Government of Japan, organized the Expert Group Meeting (EGM) on STI for SDGs Roadmaps in Tokyo on May 8-9, 2017. This EGM aimed to cultivate peer-learning environment, strengthen the capacities and shape consensus and partnerships among developing and developed countries and UN System on STI for SDGs Roadmaps, action plans and strategies.

Summary of the Presentation and Discussions

Day 1: STI for SDGs Roadmaps – EGM International Workshop

Opening

1. Dr. Teruo Kishi, Science Advisor to the Minister of Foreign Affairs, Japan, highlighted the huge potential of science technology and innovation (STI) to contribute to the realization of the Sustainable Development Goals (SDGs), and the importance of the STI Roadmaps for organizing this potential into actions.

2. Mr. Shantanu Mukherjee, Chief, Policy and Analysis Branch, Division for Sustainable Development, UNDESA, explained that the Technology Facilitation Mechanism (TFM) is a vital way to accelerate progress towards the achievement of the SDGs and that STI can play a unique role in minimizing the tradeoffs and maximizing the potential of sustainable development. To that end collaboration among multiple stakeholders, international cooperation and the convergence of different technologies are vital.

3. Dr. William Colglazier, Senior Scholar, Center for Science Diplomacy, American Association for the Advancement of Science believed that the 2030 Agenda is aspirational, has longevity, and is an important framework. At the same time, careful thinking and planning is required to ensure that the Agenda inspires actions. Developing STI Roadmaps is essential for that purpose. This work will involve not only governmental actors but also non-governmental actors and stakeholders at all levels.

4. Dr. Michiharu Nakamura, Former President and Advisor, Japan Science and Technology Agency (JST), stated that the implementation of the SDGs has begun but the rate of progress is currently inadequate. There is also a lack of roadmaps and insufficient gathering of data to monitor progress. The SDGs offer scientists an unprecedented opportunity to contribute to social transformation but it is necessary to develop Roadmaps that are executable, are multidisciplinary and incorporate past experience. Additionally, the implementation and development of the Roadmaps should be cyclical and interlinked.

Session 1: Introduction to the STI for SDGs Roadmaps

5. Moderator opened the session with the short remarks. In order to execute actions for achieving the SDGs, governments, science and technology community, and other stakeholders need to develop STI Roadmaps and to strengthen the science-policy interface by sharing visions and building trust through combination of top-down and bottom-up approaches.

6. Kenya shared its experience in developing and implementing STI Roadmaps in Kenya. STI has been humankind's best method of achieving major goals. For example, STI has helped to increase financial inclusion in Kenya from 4% to 90% in the past 10 years. STI contributes greatly to development, but the STI Roadmaps for the SDGs must be linked to each country's National Development Plans. At the same time, such development must be sustainable. Furthermore, trust is essential for ensuring the effectiveness STI. Prioritization of STI areas is also important. The challenges, particularly in the case of Kenya, include coordination among various stakeholders, inclusion of academia, balancing short-term and long-term goals, and penetration to the local level.

7. Ghana began by emphasizing the fundamental importance of the SDGs and the role that STI can play to address the challenges to achieving SDGs. STI Roadmaps provide the detailed plans for this. They should highlight clearly the foci for specific actions. Additionally, they should lay out how particular technologies can be applied. Common elements include priorities, institutional responsibilities, governance structures, etc. The challenges include ensuring full stakeholder participation and buy-in, and the actual implementation itself. Ghana has yet to develop an explicit STI Roadmap for SDGs, but has various legislation, policies and committees in place towards achieving this.

8. Japan presented its concept of ''Society 5.0'', which is in line with the SDGs, and the general idea of national STI for SDGs Roadmap. Japan has experimentally analyzed its existing national policies and strategies related to 17 SDGs goals and integrated the elements to draft the roadmap. With the SDGs Initiative, consisting of Prime Minister as a leader and multi-stakeholders including ministries, local government, NGO/NPO and universities, Japan is aiming to specify the SDGs-related milestones in the relevant national policies and strategies at the timing of revising or newly drawing up. Through the continuous peer learning among various countries, Japan is aspiring to formulate and present its national STI for SDGs Roadmap at STI Forum 2019.

9. The World Bank spoke about the difficulty and complexity of developing STI Roadmaps. Each country's situation is different and it is necessary for each to assess its own progress. Among countries, there seems to be convergence over the need to adopt frameworks for national STI policy, engage diverse stakeholder groups, and coordinate across ministries/departments, among other points. There are also constraints and shared challenges such as implementation capabilities, STI financing policy, and preparing for technological disruption. There are also opportunities for joint STI action, including positioning STI in the context of SDGs, emphasizing inclusiveness, and developing transition programs and policies.

10. The participants engaged in an open discussion and touched upon the following points: ways to reinforce trust in STI as part of the STI Roadmaps, how to aggregate national plans into joint actions, methods for assessing and comparing the progress of different countries, growing cooperation among international organizations, ways to break out of the STI silo, and the convergence of technology push and demand pull.

Session 2: Countries' Visions and Practices: Foundation

11. Moderator introduced the guiding questions of the session and raised issues that STI Roadmaps by themselves and inclusiveness/diversity, including gender issues, reflect the way we do science not only at the political but also in laboratory, Also, capacity building should be brought up and discussed more to make Roadmaps be sounds.

12. Jamaica presented its STI policy foundation. Jamaica recently formulated a long-term development plan, Vision 2030. The integration of STI is essential to realizing this plan. Jamaica also has an SDGs Roadmap, which mentions technology, but does not include specific STI-related actions. In recent years, Jamaica has promoted various policies to better integrate STI and scientists, and to develop an STI ecosystem, highlighted by the ST&I Policy. Challenges for implementing STI policy include fragmentation, using STI as a cross-cutting tool, engaging the productive sector, and advocacy.

13. UNCTAD presented its experience with national STI policy reviews and similar exercises at OECD and World Bank. STI efforts and policies are embedded in larger institutional and societal systems that determine their nature and efficiency. The key factors for successful STI policies are integration in a national vision, systemic approach, focused priorities, and visible achievements. Voluntary leadership, societal preparedness, and learning from international experience also help. Rwanda and Finland are successful examples. STI policies can be further strengthened by joint domestic and international actions, such as national policy reviews, innovation obstacle audits, pilot projects, and global innovation programs. The key target groups for effecting STI policy change are champions at the top of government, heads of operational agencies, sector or local change makers, the public at large, and academics.

14. UNESCO briefly explained its contribution to the STI Roadmaps. UNESCO expects that through this process Member States strengthen their capacity to govern themselves in an inclusive and diverse manner. UNESCO touched upon the need to house STI policy in societal contexts so that they contribute to the SDGs; gender and science, particularly the STEM and Gender Advancement (SAGA) project; and the Global Observatory of STI Policy Instruments (GO-SPIN) which combines capacity building, standard setting, data collection and a multilingual platform.

15. The participants discussed the importance of scientific literacy in society for implementing the STI Roadmaps, and time-lags of data and surveys for incorporating into STI policies (including science advice). Mechanisms such as leaderships, resources, capacities and trusts in data and technologies are intensively emphasized for ensuring the continuity of STI policies.

Session 3: Countries' Visions and Practices: Adaptation

16. Moderator opened the session with the overview of emerging concerns on risks and positive impacts of rapid technological changes such as AI, IoT and biotechnology to the society and asked panelists to share experiences related to this issue.

17. Rwanda presented on its experience. Rwanda has very actively employed STI policies and strategies for its sustainable national development. Nevertheless, a number of issues remain, including the lack of a coordinated research agenda, a shortage of qualified researchers, low levels of funding, and the lack of mechanisms to valorize indigenous knowledge. With Vision 2020 and beyond, Rwanda is now taking action to tackle these issues, such as strengthening training for scientists and engineers with private partners, empowering and funding STI organizations and agendas, and implementing forward-looking regulation such as performance-based regulation for drones, for strengthening the Rwanda's innovation ecosystem.

18. UNU-MERIT spoke about technology and innovation, and the experience of Oman. Developing technological and innovation capabilities at the firm level is as critical to achieving the SDGs as it is to develop STI. Challenges to this include the pace of technological change, narrow productive structures, poor access to knowledge and technology, low R&D investment, limited innovation capability, lack of skills especially at the production level, outdated capital stock, and concentrated ownership. Oman has taken various actions to promote STI, including raising the profile of innovation, developing long-term plans, making large investments, cooperating and coordinating within the government and with the private sector, and focusing on implementation.

19. IIASA presented on technology and innovation strategies. There are deep uncertainties around STI, but we can be sure that STI can be advanced and renewed over time through investment, accumulation of experience, and supply and demand. STI transforms both incrementally and abruptly. The abrupt changes are unpredictable but require investment to be realized. Advances in STI can also have negative impacts on the environment, but it can also mitigate or solve these impacts. Longer-term plans and roadmaps, as well as investment, are required to manage all this.

20. Japan/NEDO explained how the combination of visions and roadmaps is an effective tool for managing social impact and consequence of rapid technological change. Japan's "Society 5.0" concept is an example of this. Japan is aiming to achieve this while incorporating technologies in industrial and social activities. There are also roadmaps in various sectors connected with the vision that reflect the SDGs. Additionally, while each country should design its own national vision and STI Roadmaps, they should also learn from each other, and accumulate knowledge and experience together.

21. The presentations were followed by a discussion spanning topics such as brain drain, serendipity in innovation, reversing past damage by humankind, balancing pressure to deliver with experimentation, enabling greater competition among the private sector, policies at the supra-national level, and developing roadmaps for an uncertain future.

Session 4: Countries' Visions and Practices: Integration

22. Moderator emphasized that the session would focus on two points; first, how to identify the pathways to minimize tradeoffs and to maximize synergies, by analyzing interlinkages among the SDGs and their targets, for example; and second, how to make science-policy interface to realize evidence-based policy, by integrating national development plans, STI policy and SDGs, etc.

23. Thailand explained the contribution of its STI policy to achieving the SDGs. It has long had a sustainable development approach known as the "Sufficiency Economy Philosophy (SEP)", which emphasizes moderation, balance, and respect for the environment. SEP shares common principles

and objectives with the SDGs. Thailand recently formulated long-term development strategies and the Thailand 4.0 concept, whereby it will transform into a value-based economy and smart society. Thailand is seeking to promote the SDGs through national, regional and global mechanisms, and is partnering with various countries to do so. Additionally, Thailand has made efforts to integrate STI into society and gain the understanding of the public through three pillars: STI for People, STI for Prosperity, and STI for Power.

24. INGSA/ICSU presented a science policy-practice approach to national priority-setting, implementation and review. In light of the difficulty of aligning national plans with the SDGs framework, ICSU analyzed whether the interaction between SDGs can be the driver for their implementation. ICSU has launched a pilot project which will first identify interactions that need to be considered at the national level for four pilot countries. It will also create a digital tool for visualizing the interactions. Three focus groups will use the tool to identify and weight interactions. The groups will compare their results and seek to build consensus. This process will then be expanded to a broader scope. The exercise is expected to engage multiple stakeholders and clarify pathways to policy decisions.

25. IGES gave a presentation on the SDG Interlinkages and Data Visualisation web tool for SDG integration. The indivisible nature of the SDGs requires a systematic approach based on SDGs interlinkages to scale up the synergies and mitigate the trade-offs. IGES is operating a project, involving nine countries, to analyze and visualize SDG interlinkages. IGES also analyzed and ranked various centrality metrics based on Social Network Analysis techniques to identify strategic targets for each country. In the created network of SDG interlinkages, different targets have varying degrees of leverage based on how much they influence other targets. This tool can be used to support SDG integration at different stages of the policy cycle, including planning, institutional arrangement, financing, and monitoring and reporting.

26. The participants engaged in a discussion on ways in which the proposed visualization tools could be improved, the influence of scientific evidence compared to political leadership and public engagement, balancing quantitative and qualitative information, and the tension between equality and competition.

Day 2: STI for SDGs Roadmaps – EGM International Workshop

Session 5: Re-cap of Emerging Messages and Discussion Questions from Day 1

27. Moderator thanked all participants for their contribution to the first day of the EGM and emphasized the importance of “synergies” for the sustainable development as well as for implementing the STI Roadmaps.

28. Moderator summarized and presented keywords such as importance of building trust among stakeholders, strengthening science-policy interface, sharing concrete philosophy and visions, and identifying tradeoffs and synergies of the SDGs etc. from the first day of discussions, as well as priority actions for the next 30 days and coming year.

29. The participants held further discussions based on the presentation. They covered the following points: the need to emphasize synergies, the publication of a paper on the discussions to raise awareness, engagement of previously-neglected stakeholders, the importance of strong involvement of political leaders at the local level, knowledge management, the need to identify sectors where collaboration is necessary and where it would be less effective, reconfirmation that the emphasis of the group's work is on science for policy more than policy for science and that the correct terminology should be "STI for SDGs Roadmaps", the lack of research on policy road-mapping, the risk of emerging technologies widening the technological gap between countries, the struggle of developing countries to keep up with the diversification of knowledge, the lack of participation of the private sector in developing countries, aligning STI for SDGs Roadmaps at all levels from local to global, using science to visualize tradeoffs and identify methods to minimize those tradeoffs, mainstreaming the SDGs in the education system and incentivizing young scientists to solve SDGs-related issues, inclusion of social scientists, the need for greater engagement of heads of states such as by including STI for SDGs Roadmaps in voluntary national reviews, the need to raise awareness that this is not an issue of fighting for more resources but understanding how wisely existing spending is occurring, acceleration of the implementation of pilot programs, strategic selection of pilot countries to maximize momentum, promotion of new interdisciplinary activities that support the SDGs, the importance of including indicators of impact in Roadmaps, and the recognition of the genuine difficulty of communicating across different fields.

Session 6: Leaving No One Behind – facilitating STI roadmaps at national and sub-national levels and addressing the needs of the most vulnerable

30. Moderator shared Japan's experience developing a roadmap for SDG 7. In formulating the roadmap, Japan placed importance on consistency with official documents, engagement by various stakeholders, and appropriateness for dissemination to the world. Based on analysis, the roadmap was co-designed with the relevant stakeholders. To ensure that no one is left behind, it is important for each country to develop its own roadmaps.

31. Brazil presented on its experience and views related to the pursuit of the SDGs. SDGs can be seen as a health system and health systems themselves are important to achieving the SDGs. Economic development can be defined as social change whereby a growing number of human needs are satisfied through differentiation in the productive system by the introduction of technological innovations. Inequality in Brazil runs along the axes of socioeconomic level, gender, race and ethnicity,

age, and territory. It relates not only to income but access to basic rights, goods and services. Scientific knowledge and social technology are significant for tackling social inequality. It is worthwhile measuring countries not only by income but also innovativeness. Recent pandemics also illustrate the distribution of risk pathways.

32. Guatemala spoke about its STI policy and how it relates to the SDGs. STI investment is a miniscule percentage of GDP. The number of researchers and level of research productivity are also low. However, although Guatemala has the worst gender gap in its region, almost half of scientific researchers are women. It also has a strong legal framework for STI. Guatemala participated in the UNESCO GO-SPIN Study, which has been invaluable. Guatemala has created a national fund for STI and works to ensure that its STI policy contributes to the SDGs. Its STI policy is focused on tackling gender and disability-related issues and technological innovation is focused on digitalization of government and transformation of small businesses.

33. UCL "inno4sd" network introduced its work and addressed the guiding questions. It aims to reduce fragmentation and support collaboration on innovation for sustainability. The network has developed a Sustainability Transition and Innovation Reviews (STIR) framework for policy evaluation and research, public debate and policy learning, and international collaboration. inno4sd also reviews STI for SDGs Roadmaps and produces policy guidelines. Vertical policy coherence can be viewed as a shared direction. Knowledge gaps exist, such as distributional impacts and context-sensitive technology risk assessments. Challenges include uncertainty about impacts on vulnerable groups, and balancing the needs of the vulnerable groups of today and those of tomorrow. The regional level may be appropriate to address many STI and social challenges.

34. The participants then discussed ways to connect the governance of different stakeholders, mechanisms for mitigating the unpredictability of innovation, the need to understand who exactly is being left behind and identify negative trends that need to be corrected, matching existing technologies to existing local needs, the need for truly multi-stakeholder dialogues to really ensure that no one is left behind, the mobilization of international cooperation to respond to national crises, weaknesses in policy formulation and execution ecosystems, and taking a holistic approach to all the SDGs.

Session 7: Plans to Impact – coordination, data/indicators, accountability and results frameworks, and spending efficiency and effectiveness

35. Moderator spoke about how good policy intentions can have unintended consequences. Policymakers often mobilize funding and expect the desired outcome to be automatic, without understanding the processes in between. Backward deduction can be done, from defining the final outcome to identifying intermediate objectives and necessary sufficient conditions, to increase the

likelihood of the desired outputs. The World Bank Public Expenditure Review supports countries to improve the efficiency and effectiveness of STI programs through a modular approach.

36. Colombia presented on the evidence-based mechanisms it uses to link STI plans to national development challenges. Colombia has adapted the Global Innovation Index to create its own local innovation index as a tool to prioritize policies and allocate resources. Colombia has also conducted a public expenditure review on STI to identify issues such as flawed design, narrow focus, problems of scale, and overlap. Based on this a deeper spending efficiency review was conducted for a number of the most important policy instruments. Additionally, Colombia has evaluated the impact of its technology extensions services for small- and medium-sized enterprises. Colombia has also shaped national policy to measure, track and ensure SDGs achievement.

37. The EC introduced the role of its Joint Research Centre (JRC). SDGs are at the heart of the JRC's actions. SDGs are a major EU policy priority and the JRC creates various tools to support related work. For example, the JRC worked with Google to create the Global Surface Water Explorer, an interactive map that tracks changes in surface water. The JRC has also developed the Global Human Settlement Layer, a free and open data set on human settlements. This can be used to monitor land use efficiency and population trends. Other tools the JRC has developed include an interactive urban data platform and an atlas of land degradation. The JRC is also working to identify interlinkages between the SDGs to maximize synergies and minimize tradeoffs.

38. Japan/ CRDS, JST presented lessons learned from trials to develop the STI for SDGs Roadmap and reference cases. Japan has done trials to create STI for SDGs Roadmaps for SDGs 7 and 11. Japan employs a development and implementation cycle consisting of five steps of mission identification, analysis, co-design, collaborative actions, and monitoring/review, which can be combined with an online platform. Based on the trials, Japan recognized the importance of political leadership, competition and collaboration, multi-stakeholder involvement, promotion of voluntary initiatives, standardized procedures that have a degree of flexibility, localized indicators, integration into official processes, deeper understanding of SDGs interlinkages, and diagnostics of effectiveness of roadmaps and policy tools. Japan also noted that developed countries can assist less developed countries in addressing these challenges while also learning from the international community to avoid being trapped in existing systems.

39. Following the presentations, the participants held a discussion on various topics, including protecting societies from the abuse of technologies that are originally intended for good, the culture around seeking and using evidence related to policy effectiveness, and the importance of SDGs literacy, including creation of the monitoring sand assessment system, using upgrading indicators.

Session 8: Collective action – multilateral and international support to STI policy capacity, addressing countries' needs and gaps and maximizing complementarities

40. Moderator discussed the roles of inter-governmental organizations (IGOs) in the provision of multilateral support. IGO activities are mandate-based. Technical assistance is demand driven. Countries request technical assistance for various reasons. They are not necessarily always for foundational reasons and can sometimes be for universality.

41. Australia spoke about its experience leveraging STI to increase impact. In 2015 Australia launched an innovation for change lab experimenting with international aid. Early experiments include work related to tackling unregistered deaths, fighting mosquito-borne diseases, managing healthcare supply systems, and safe ride-sharing. Australia is now rolling this out to other areas, not only in aid but also foreign affairs and trade, such as helping apply technology for development and creating innovation hubs, with a focus on the Indo-Pacific region. This work has supported a number of entrepreneurs among the local communities in the region, and Australia is working with them to promote and find investment for their solutions.

42. The UK presented on its experience forging practical international partnerships to use STIs to achieve the SDGs and address shared global challenges. The UK has two primary research and innovation ODA funds, aimed at reducing poverty and increasing wellbeing in developing countries, maximizing the practical impact of research and technology on people's lives, and increasing the research and technology capacity of developing countries. In the UK's experience, key principles for capacity building are involving real partnership, transferring knowledge, tackling global challenges, and supporting the continued excellence of UK research. It has also been effective to have multiple delivery partners and set up in-country teams. Furthermore, discussions should be followed by substance and real science. Scientific excellence and rigor must also not be compromised. Finally, efforts should encompass people, research and translation.

43. Serbia discussed its involvement in multilateral and international STI efforts. Serbia is still in the lower half of the Global Competitiveness index but has improved its scientific research potential in recent years. Serbia has also been promoting open science and the promotion of women in science. It also has a Strategy of Scientific and Technological Development Strategy, which supports excellence in science and its relevance to the economy, and is aimed at developing innovation that contributes to economic, social and cultural progress. As part of efforts to develop innovation ecosystem, Serbia developed an innovation fund. Serbia is engaged in various international and multilateral cooperation, including as part of EUSDR and the EU's Horizon 2020 program. In Serbia's view the EU's JRC and the Horizon 2020 Policy Support Facility could be models of multilateral support.

44. The participants engaged in a discussion that touched upon ways to find local entrepreneurs, roadmaps for entrepreneurship, private sector support for STI for SDGs innovation ecosystems, ways to maintain scientific integrity, and lessons learned from Serbia's application of smart specialization as a development strategy.

Session 9: Wrap-up and Step Forward

45. Moderator opened the session informing the days to the STI forum and importance of this meeting as a momentum for articulating STI Roadmaps, and then asked panelists for their comments and lessens taken away to homes.

46. Dr. Bill Colglazier shared its views. STI for SDGs Roadmaps are frameworks for action. They are very complex and involve multiple levels. They need to be integrated into national plans. Japan's integration from the Prime Minister down to the citizens is impressive. Very serious efforts are being made to support STI capacity and use STI to promote the development of middle income countries. There is real momentum for mobilizing STI for SDGs Roadmaps. These Roadmaps do not need to only involve innovation and can also link existing technologies to existing needs. There is also much that social scientists could contribute to this process, including social safety nets. It is necessary to minimize tradeoffs and maximize synergies, the latter of which may be more difficult. It is necessary to look at the global-level constraints, especially in relation to environmental challenges. There is a need for the group to clearly articulate its ideas. Science should contribute to national policy and mechanisms are necessary for ensuring this, one of which is the STI for SDGs Roadmaps. The background paper needs a one-page summary for better presentation. It is necessary to identify the opportunities over the next year.

47. Brazil spoke that it is important to recognize that Roadmaps are very powerful instruments, but they are merely instruments. We must ensure they reflect the right values in them. The most important objective of the group is to generate recommendations to the high-level forum and this must be reflected in the background paper. It should contain clear and objective conclusions. There remain some questions about the interaction between SDGs. It is necessary to engage heads of state to make this exercise feasible. The pilot programs should be exemplars that lend momentum to the scaling up of the Roadmaps.

48. Japan expressed its thoughts. An important question is how to share knowledge and win the universal and inclusive Goals. Roadmaps are necessary tools to consolidate multi-stakeholder efforts. We should start with national or sub-national Roadmaps. We need to encourage greater engagement of the scientific community to implement and follow up on the Roadmaps. Another question is who should be responsible for gathering and accumulating information about each country's Roadmap? Roadmaps should be executable, because if we fail to achieve them, we will lose trust. Countries

should be ready to present at the upcoming STI Forum. Confirmation of work streams for preparation for the STI Forum is needed. Countries would likely appreciate a common framework for the Roadmaps. It is necessary to emphasize multi-stakeholder engagement, particularly the science community and the private sector. The SDGs are asking us to develop new norms for creating a sustainable society without leaving anyone behind, which is a serious challenge and requires hard and careful work.

49. Jamaica shared some comments. In the short-term, it would be useful to have some kind of terms or conceptualization for developing countries to develop their capacity to develop Roadmaps. Some countries may not have STI roadmaps, let alone STI for SDGs Roadmaps. CARICOM can learn a lot from the EU model of a regional innovation system. There is a need to engage policymakers more and better articulate the SDGs to all players.

50. Guatemala commented that developing countries need to fully implement all the 169 SDGs targets. In the systems in these countries, we need to engage the policymakers and the people and convince them that STI is essential to development. The international community needs to influence these countries. Greater participation by developing countries would be welcome.

51. Colombia expressed its views. The SDGs need to be embraced at the highest levels of government and, to that end, it would be useful to think about ways to generate more buy-in by top-level leaders. Synergies are very attractive, but actually achieving them can be very difficult. They are only possible with support at the highest levels.

52. Rwanda shared its observations. Rwanda is enthusiastic about its participation in this exercise. Programs to increase the capacity of countries to develop STI for SDGs Roadmaps would be highly welcome.

53. Kenya commented that STI for SDGs Roadmaps are the perfect link. Kenya does not have such a Roadmap but intends to do so as soon as possible. The “leave no one behind” concept is key and it is essential to raise awareness among the future generations. There is a need to broaden the stakeholder base even further, including stakeholders from unexpected places.

54. Ghana shared its thoughts. Participants should report to their countries the commitment to the STI for SDGs Roadmap. Political will at the highest level is very important, and efforts to promote this can come from both within and outside countries. The countries and organizations championing this exercise need to think of themselves as a team.

55. Serbia expressed some comments. Mutual learning exercises could be very useful for mobilizing STI for SDGs Roadmaps. One size does not fit all but there could be areas of shared interest or concern. A peer review of achievements could also be useful. It may be beneficial for the EU's JRC to provide consultation to non-EU countries as well on the development of Roadmaps.

56. Thailand shared its thoughts. All countries could incorporate some form of the Sufficiency Economy Philosophy. Political leadership is very important for ensuring the success of this exercise. Co-creation is essential as well.

57. The EC commented that the Agenda 2030 is transformational and essential. These are goals of primary importance. The convergence of the participants is a sign that this endeavor will be successful. The JRC would be very happy to share its knowledge, expertise and experience for the continuation of this process.

58. INGSA/New Zealand suggested that INGSA is very much trying to help developing countries gain the capacity to develop their own STI for SDGs Roadmaps. There is increasing inclusion and convergence among scientists, particularly the social scientists. This is very visible in New Zealand.

59. World Bank gave remarks. We have been successful in establishing a community and team of experts and practitioners who will move this exercise forward and hopefully far. Regarding the questionnaires on STI for SDGs Roadmaps, six countries had responded so far, and the UN IATT could wait for other responses by the end of next week to prepare the background paper for the STI forum 2018. About five pilot member states will develop STI for SDGs Roadmaps by 2019, which could encourage other countries to join this exercise after the STI forum and HLPF 2019.

60. IIASA commented that the meeting was successful in achieving a high level of clarity. One point that needs to be added is the importance of technological disruptions. Roadmaps should also be viewed as giving direction to technology. The group should consider publishing the report of the meeting as an editorial in a scientific journal.

Concluding Remarks

61. Dr. Michinari Hamaguchi, President, Japan Science and Technology Agency (JST), gave closing remarks. He expressed his gratitude to the UN IATT and the Government of Japan for organizing and hosting the meeting, and to all the participants for their fruitful discussions. The SDGs offer good opportunities for all stakeholders to think about how STI can contribute to solving the problems in the world, particularly at a time of uncertainty. STI can be the key to achieving the SDGs. However, the SDGs are diverse and complicated. Roadmaps are necessary for determining the

pathways to realizing the goals, connecting stakeholders in the process, and ensuring the effectiveness of STI for achieving the SDGs.

Program

Day One - 8 May 2018	
9:15 – 9:30	*Welcome coffee*
9:30 – 10:00	**Opening** MC: Mr. Hirotaka Yamada, Manager, Office of STI for SDGs, Japan Science and Technology Agency (JST) • Welcome remarks by Dr. Teruo Kishi, Science and Technology Advisor to the Minister for Foreign Affairs of Japan • Welcome remarks by Mr. Shantanu Mukherjee, Chief, Policy and Analysis Branch, Division for Sustainable Development, United Nations Department of Economic and Social Affairs • Opening remarks by Dr. Bill Colglazier, co-chair of the 10-Member Group 2016/17, Senior Scholar, Center for Science Diplomacy, American Association for the Advancement of Science • Opening remarks by Dr. Michiharu Nakamura, Former President and Advisor, Japan Science and Technology Agency (JST)
Group photo (10:00 – 10:15)	
10:15 – 11:45	**<u>Session 1:</u> Introduction to the STI Roadmaps for the SDGs** *This session will take stock of the STI Forum discussions so far on STI Roadmaps for the SDGs; introduce a possible framework on common elements and approaches; provide an overview analysis of the submitted questionnaire responses from presenting countries; and reflect on early experiences of STI Roadmaps for the SDGs.* Moderator: Prof. Tateo Arimoto, Principal Fellow, Japan Science and Technology Agency Panelists: • Dr. Katherine Getao, Cabinet Secretary, Ministry of Information, Communications and Technology of Kenya • Dr. George Essegbey, Director of the Science and Technology Policy Research Institute (STEPRI), Council for Scientific and Industrial Research (CSIR) of Ghana • Mr. Koichi Akaishi, Councilor, Science, Technology and Innovation, Cabinet Secretariat of Japan

	• Mr. Klaus Tilmes, Senior Adviser to the President on Science, Technology and Innovation, World Bank Guiding questions: • Why do we care about STI Roadmaps for the SDGs? • How do STI Roadmaps for the SDGs look like? What are their possible common elements? • What are challenges and lessons from formulating and implementing STI Roadmaps for the SDGs in line with national development plans, and possible recommendations to countries to maximize STI contribution to accelerate progress toward the SDGs?
11:45 – 13:15	*Lunch Break*
13:15 – 14:30	**Session 2: Countries' Visions and Practices: Foundation** *This session will illustrate countries' STI policy frameworks, action plans and strategies as foundational enabling conditions to build on to formulate STI Roadmaps addressing opportunities and challenges to achieve all the SDGs, and learn from current state of thinking and planning to extend such foundational frameworks toward the SDGs.* Moderator: Mr. Ernesto Fernandez Polcuch, Chief of Section, Science Policy and Partnerships, UNESCO Panelists: • Dr. Aisha Jones, Director of Research, National Commission on Science and Technology, Jamaica • Mr. Jean Eric Aubert, independent expert, formerly OECD, World Bank (via video) Guiding questions: • What key elements constitutes countries' strategy, policy framework and implementation arrangements related to science, technology and innovation? • To inform, formulate and strengthen the current STI policy framework, what analytical, diagnostic or benchmarking exercises, policy reviews, and/or financial and technical support can contribute? • To formulate and implement STI policy framework, how domestic stakeholder groups can best be consulted, in which fora?
14:30 – 16:00	**Session 3: Countries' Visions and Practices: Adaptation**

	This session will illustrate how countries are anticipating rapid technological changes and their domestic and international socioeconomic implications, and discuss visions, strategies and policy mix to maximize benefits and minimize risks of technologies to growth and competitiveness, human welfare, environmental sustainability, stability and security, by building skills, renewing institutional capabilities, strengthening societal resilience and smoothing transitions. Moderator: Mr. Naoto Kanehira, Senior Private Sector Specialist, World Bank Panelists: • Mr. Gaspard Twagirayezu, Science and technology policy analyst, National Council for Science and Technology (NCST), Rwanda • Mr. Ludovico Alcorta, Research Fellow, UNU-MERIT (Former Director of Research, UNIDO) (via video) • Prof. Nebojsa Nakicenovic, 10-Member Group 2016/17, Deputy Director General and Deputy CEO, IIASA • Dr. Tomoji Kawai, Executive Director, Technology Strategy Center (TSC), New Energy and Industrial Technology Development Organization (NEDO), Japan <u>Guiding questions:</u> • What visions, strategies and/or sets of policy responses do countries have, to lead on, adapt to, and/or leapfrog with, rapid technological changes? • What trend analysis, foresights, scenario exercise, consultations or roundtables to consider policy implications of emerging technologies can usefully inform policy responses?
16:00 – 16:15	*Coffee break*
16:15 – 18:00	**<u>Session 4:</u> Countries' Visions and Practices: Integration** *This session will illustrate national strategies to achieve the SDGs, both by addressing individual Goals/Targets as well as identifying and prioritizing pathways to address trade-offs and maximize synergies, and discuss STI both as science-policy interface to provide evidence-based policy advice and as policy response through STI Roadmaps as integrated elements of national sustainable development plans.* Moderator: Mr. Satoru Ohtake, Adjunct Fellow, CRDS, Japan Science and Technology Agency

	Panelists: • Mr. Lertrit Sirisetthakarn, Director of International Relations Division, Thailand Institute of Scientific and Technological Research (TISTR), Thailand • Ms. Kristiann Allen, Secretary of INGSA, on behalf of ICSU and INGSA • Dr. Zhou Xin, Research Leader, Institute for Global Environmental Strategies (IGES) <u>Guiding questions:</u> • What sector-/domain-specific strategies or plans do countries have to advance and/or utilize STI, such as to strengthen scientific research, promote technology development, regulations or technical standards for adoption or diffusion? • What integrated assessments of countries' status against the SDGs, inter-linkages analysis of country-level Goals and Targets can help find desirable pathways and formulate policies to resolve trade-offs and maximize synergies using STI? How should scientific information be shared and incorporated into durable action plans implemented by multi-stakeholders? • What is countries' state of deliberation and policy formulation to position economy-wide STI policy framework as well as sectoral STI strategies to contribute to plans, strategies and priorities to achieve the SDGs and leave no one behind?
18:30-20:00	Speakers and Moderators Networking Dinner [Self-funded] @ Trattoria Pizzeria LOGIC Odaiba, Tokyo

Day Two - 9 May 2018	
9:00 - 9:30	Closed meeting of Co-Organizers to recap Day-1 discussions
9:30 – 10:15	**<u>Session 5:</u> Re-cap of Emerging Messages and Discussion Questions from Day 1** *This session will collect participants' reflection on the first half of the meeting, summarize the discussions so far, and examine emerging messages to inform recommendations to the STI Forum 2018 as well as identify key questions requiring further discussions and analysis, through the successive sessions as well as in the Background Paper.* Co-Moderators:

	• Mr. Shantanu Mukherjee, Chief, Policy and Analysis Branch, Division for Sustainable Development, United Nations Department of Economic and Social Affairs • Prof. Tateo Arimoto, Principal Fellow, Japan Science and Technology Agency <u>Guiding questions:</u> • What key messages and recommendations on STI Roadmaps are emerging from the EGM discussions? • What key discussion questions do the participants want to be addressed through the remaining sessions of the EGM? • What knowledge gaps need to be filled to further advance the discussions on STI Roadmaps for the SDGs?
10:15 – 10:30	*Coffee Break*
10:30 – 12:00	**<u>Session 6:</u> Leaving No One Behind – facilitating STI roadmaps at national and sub-national levels and addressing the needs of the most vulnerable** *This session will illustrate how countries are coordinating national and sub-national plans and strategies to achieve the SDGs including through using STI, with a view to harness urban centers as vibrant innovation ecosystems while effectively benefitting from indigenous knowledge, targeting the rural poor or vulnerable to assure no one is left behind.* Moderator: Dr. Akira Yabe, Director General, Renewable Energy Unit, Energy System & Hydrogen Unit, Technology Strategy Center (TSC), New Energy and Industrial Technology Development Organization (NEDO), Japan Panelists: • Dr. Paulo Gadelha, 10-Member Group 2016/17, Coordinator of 2030 Agenda, Fiocruz, Brazil • Mr. Oscar Cobar, National Secretary of State on Science and Technology, National Secretariat on Science and Technology, Guatemala • Dr. Michal Miedzinski, Senior Research Associate, UCL Institute for Sustainable Resources, U.K. <u>Guiding questions:</u> • What approaches are effective in aligning and coordinating national and subnational efforts on STI for the SDGs? • What knowledge gaps and challenges need to be addressed in

	harnessing STI to address the needs of the most vulnerable and leave no one behind?
12:00 – 13:15	*Lunch break*
13:15 – 14:30	**Session 7: Plans to Impact – coordination, data/indicators, accountability and results frameworks, and spending efficiency and effectiveness** *This session will illustrate how countries are instituting evidence-based mechanisms to link STI plans to national development challenges, define and track progress, and discuss what data, indicators and approaches are available to evaluate what is working and what is not and foster feedback loops and real learning environment.* Moderator: Mr. Paulo Correa, Practice Manager, World Bank Panelists: • Mr. Juan Sebastián Robledo, Director for Innovation and Industry, National Planning Department, Colombia • Dr. Liliana Pasecinic, Deputy Head of Unit, Interinstitutional, International Relations and Outreach, European Commission Joint Research Center • Mr. Kazuhito Oyamada, Fellow, Center for Research and Development Strategy (CRDS), JST, Japan Guiding questions: What monitoring and evaluation mechanisms are in place, and how can efficiency and effectiveness of use of STI to accelerate achievement of the SDGs be maximized?
14:30 – 15:45	**Session 8: Collective action – multilateral and international support to STI policy capacity, addressing countries' needs and gaps and maximizing complementarities** *This session will illustrate how countries utilize STI for global efforts to achieve the SDGs, and discuss possible ways to identify and address countries STI needs and gaps and maximize complementarities among bilateral and multilateral STI programs including on capacity building.* Moderator: Mr. Kiyoshi Adachi, Legal Officer, Intellectual Property Unit, Division on Investment and Enterprise, UNCTAD Panelists:

	• Dr. Sarah Pearson, Chief Innovation Officer, Department of Foreign Affairs and Trade, Australia (via video) • Mr. Jones Griff, First Secretary, Head of Science, Innovation and Global Challenges, British Embassy Tokyo • Prof. Viktor Nedovic, Assistant Minister (International Cooperation), Ministry of Education, Science and Technological Development of Serbia <u>Guiding question:</u> How can we advance international consensus and forge international partnerships, and what can countries contribute to advance international partnerships on STI Roadmaps for the SDGs?
15:45 – 16:00	*Coffee break*
16:00 – 17:00	**Session 9: Wrap-up and Step Forward** *This session will collect perspectives, develop recommendations to the STI Forum 2018, and define concrete steps over the next years to advance a global work program to forge partnerships among developed and developing countries, UN System and other stakeholders to formulate and strengthen STI Roadmaps at national and global levels to accelerate progress toward all countries achievement of all the SDGs.* Moderator: Mr. Klaus Tilmes, Senior Adviser to the President on Science, Technology and Innovation, World Bank Panelists: • Dr. Bill Colglazier, co-chair of the 10-Member Group 2016/17, Senior Scholar, Center for Science Diplomacy, AAAS • Dr. Paulo Gadelha, 10-Member Group 2016/17, Coordinator of 2030 Agenda, Fiocruz, Brazil • Dr. Michiharu Nakamura, Former President and Advisor, Japan Science and Technology Agency <u>Guiding questions:</u> • What outcomes should STI Forum produce at STI Roadmaps session? • What conclusions should Background Paper produce? What contributions can the participants make? What collective actions do we recommend through 2018-2019 milestones?
17:00-17:05	**Concluding remarks**

	• Dr. Michinari Hamaguchi, President, Japan Science and Technology Agency, Japan

List of Participants

Coming soon.