

Science and Technology in Society *forum* (STS *forum*)
16th Annual Meeting
Kyoto, Japan, October 8, 2019
STATEMENT

1. The 16th Annual Meeting of the Science and Technology in Society *forum* took place from October 6 to 8, with the participation of more than 1,400 global leaders in science and technology, policymaking, business, and media from nearly 80 countries, regions, and international organizations.
2. The world is experiencing some negative changes. Not only world trade and security but also international collaboration in science and technology are facing major challenges as the multilateral global system is being called into question. At the same time, we are increasingly called upon to address the negative aspects of prevailing technologies and lifestyles, ranging from climate change and biodiversity loss to cybersecurity challenges to plastic debris in the oceans in order to ensure sustainable development for humankind and our planet earth. In this context, the role of the STS *forum*, where not only scientists but also policymakers, business executives, and other leaders gather and discuss the “lights and shadows” of science and technology as their own problems, continues to grow in importance and relevance.
3. This year we highlighted “Energy and Environment,” which directly affects our lives. We discussed options for maintaining economic development, while controlling the shadows resulting from technological development. Other principal topics of our Annual Meeting included AI (artificial intelligence) and society, healthcare, financing of basic science, innovation, and international as well as academia, business, and government collaboration in science and technology.

Energy and Environment

4. The urgent necessity to address ever-increasing energy needs with minimum environmental impact requires transformative energy shifts from high- to low-carbon energy sources at unprecedented speed. In this context, nuclear energy remains a critical source for stable large-volume electricity generation, under strict conditions of safety, security, and non-proliferation. Investments must be made in advanced technologies for low-emission energy sources, reliable energy storage, massive electrification, and negative carbon emissions such as carbon capture and utilization. IT-based smart grids are essential for efficiently balancing sustainable energy supply and demand with minimum damage to the environment.
5. Climate change poses a threat to human lives, by causing extreme weather events such as hurricanes and forest fires, as well as extreme heat events. Erratic rainfall patterns cause floods, storms or droughts, which negatively affect water supply and agricultural production, impacting food security. We must continue to adapt to and mitigate climate change by utilizing scientific knowledge and data on Earth and the oceans collected through ocean monitoring and satellite observations. We also need to mobilize the tools of the biological and ICT revolutions to promote genetically modified plant breeding with desirable traits like salt and drought resistance and short growing season. This should be combined with precision farming, to increase efficiency of water use and minimize loss between farms and markets. Also, water and sanitation services should be available to all citizens.

Life Sciences and Healthcare

6. Rapid progress in life sciences has brought the promise of advanced and personalized medicine, such as gene therapy and regenerative medicine, along with the application of advanced analytics to

biological data. That implies that discussion and guidelines on the ethics of applying these technologies to human beings must constantly be updated, especially as we seek new treatments for diseases for which current therapies are inadequate.

7. Supporting healthy aging is a primary issue, to improve quality of life and reduce the cost of social security and the burden on younger generations. Research is needed to assess if lifestyle changes and preventive and personalized medicine are to play an important role in keeping older people healthy.
8. Meanwhile, climate change brings the potential spread of infectious diseases through shifting climate zones. Sustained efforts are also needed to build an international system to help nations deliver good healthcare to all parts of the world, with the cooperation of WHO and other organizations.

Information-Driven Society

9. Through innovations such as robotics and machine-human interaction, AI, IoT (Internet of Things), and Big Data analytics, our societies are being changed at an unprecedented rate. While research and development to make our lives more pleasant and comfortable, safer and even smarter should continue, efforts should be made to address concerns that the progress of AI-driven society is having a negative impact, including job loss, on human society. In an ICT-centric society, cybersecurity is key to preserving individual freedom, respecting privacy, and guaranteeing a certain degree of anonymity. Social networking services must make stronger efforts to eradicate erroneous and inappropriate information from their platforms.

Basic Science and Innovation

10. Basic research has led to ground-breaking discoveries that have resulted in breakthrough technologies and expanded human horizons. The most important innovations have resulted from new scientific knowledge. Appropriate funding for basic curiosity-driven research is essential. Moving from scientific insight to usable technology requires collaboration among academia, government, and industry. Such collaboration is the basis for building a thriving innovation ecosystem, where scientific discoveries are translated into practical applications and industrial innovations are generated under the appropriate legal framework, including respect for intellectual property rights.

International Cooperation in Science and Technology

11. It is important to promote international science cooperation and collaboration to strengthen science and enhance science diplomacy to build bridges to developing nations.

Society and Science and Technology

12. Finally, if we are to effectively address climate change and the challenges that we face with growing populations and expanding economies, we must achieve considerable changes in our current energy mix and eliminate dependence on fossil fuels. Drastic action is needed that will require rapid political decision-making, new commercial strategies, and the development of new technologies. The STS *forum* is intended to provide the opportunity for dialogue between the actors to develop a consensus on how we can address the challenges of putting the world on a sustainable path for the future.
13. We look forward to meeting here again next year and have agreed to hold the 17th Annual Meeting of the STS forum in Kyoto from Sunday, October 4 to Tuesday, October 6, 2020.