# Open Seminar 【Event Report】

# Recent Trends in Science, Technology, and Innovation Policies by the OECD

## Dialogue with Andrew Wyckoff, Director and Alessandra Colecchia, Head of the Science and Technology Policy Division, OECD Directorate for Science, Technology and Innovation (STI)

**Date and time:** Friday, June 23, 2023, 14:00-17:00
**Venue:** JST (Japan Science and Technology Agency) Tokyo Headquarters① Science Plaza, B1 Main Hall
**Format:** Open to the public. In-person meeting. Simultaneous Japanese-English interpretation provided.
**Host:** Center for Research and Development Strategy (CRDS), JST

**Purpose**

The landscape surrounding science, technology, and innovation (STI) is currently undergoing significant changes due to rapidly shifting global circumstances and the rapid development and increasing impact of emerging technologies such as Artificial Intelligence (AI). In the Organisation for Economic Co-operation and Development (OECD), comprising 38 member countries, discussions are underway on the future direction of next-generation STI policies.

The OECD has consistently provided guidance on the direction of STI policies in response to changing times. “STI Outlook 2023: Enabling Transitions in Times of Disruption," published in March 2023, presents critical issues such as the transition to a sustainable society, lessons learned from the COVID-19 pandemic, and the governance of emerging technologies, in the context of the global crisis and strategic competition among major countries. As a new initiative on the governance of emerging technologies, the OECD Global Forum on Technology, a high-level multi-stakeholder dialogue forum involving OECD and non-OECD countries that share common values, has been launched. In addition, the S&T Policy 2025 initiative is ongoing to comprehensively examine STI policies and systems for a new era and the way of international collaboration, with the aim of transitioning to a green and resilient society through STI.

The outcome of these efforts will serve as a premise for discussion at the CSTP (Committee for Scientific and Technological Policy) meeting at the Ministerial level to be held in April 2024, and will also be an important pillar of the Ministerial Declaration, which will have a significant impact on the direction of STI policies in each country. Therefore, it is important for us to consider the direction of STI policy based on such international trends.

In this seminar, Mr. Andrew Wyckoff, Director of the OECD’s Directorate for STI, and Dr. Alessandra Colecchia, Head of the Science and Technology Policy Division of the OECD Directorate for STI, will be invited to introduce their specific efforts and discuss future prospects and issues to be resolved with stakeholders in Japan.

**Program**

14:00-14:05 **Opening Remarks**
Kazuhito Hashimoto, President of the JST

14:05-14:55 **Presentation 1: STI policies for transitions in times of disruption and the role of technology governance**
Andrew W. Wyckoff, Director for Science, Technology and Innovation, OECD

14:55-15:40 **Presentation 2: OECD Science and Technology Ministerial 2024: Shared challenges, transformative actions**
Alessandra Colecchia, Head, Science and Technology Policy Division, Directorate for Science, Technology and Innovation, OECD

15:40-15:50 **Break**

15:50-16:50 **Panel Discussion（Short presentation by panelists and discussion with participants）**

【Panelists】
- Andrew W. Wyckoff, Director for Science, Technology and Innovation, OECD
- Alessandra Colecchia, Head, Science and Technology Policy Division, Directorate for Science, Technology and Innovation, OECD
- Yoichi Iida, Chair, Committee on Digital Economy Policy, OECD/ Assistant Vice Minister for International Affairs, Ministry of Internal Affairs and Communications
- Takashi Kiyoura, Deputy Director General for Science and Technology Policy, Ministry of Education, Culture, Sports, Science and Technology
- Naoko Ogawa, Director, Industrial Technology Bureau, Keidanren（Japan Business Federation）
- Yutaka Hishiyama, Vice President, Tokushima University

【Moderator】
- Kana Asano, Fellow, JST CRDS

16:50-17:00 **Summary and Closing Remarks**
Takao Kuramochi, Deputy Director-General, JST CRDS

(Master of Ceremony: Tateo Arimoto, Senior Advisor to the President, JST)

**Speaker Profile**

Mr. Andrew W. Wyckoff

Andrew W. Wyckoff is the Director of the OECD's Directorate for Science, Technology and Innovation (STI) where he oversees OECD's work on innovation, business dynamics, science and technology, information and communication technology policy as well as the statistical work associated with each of these areas.

- More Details: https://www.oecd.org/sti/andrew-wyckoff.htm

Dr. Alessandra Colecchia

Alessandra Colecchia is Head of the Science and Technology Policy Division of the OECD Directorate for STI. She oversees the work on STI policy, including work on emerging and converging technologies, the Global Science Forum, the Space and Ocean programmes, as well as measurement standards and empirical analysis in the S&T area.

- More Details: https://www.oecd-events.org/ai-wips-2021/speaker/91b36a51-f654-eb11-b9ed-000d3a20e9aa/alessandra-colecchia

**開催概要**

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| **Opening Remarks** | Kazuhito Hashimoto, President of the JST |

Facing the recent major geopolitical changes, there will be issues that need to be addressed through international cooperation with like-minded countries, as well as issues that necessitate a global response. Science is now intricately linked to social transformation. For instance, quantum computers and genome editing technologies are commonly utilized in our daily lives, and the impact of generative AI are quite huge. The key point is that cutting-edge science and evolving social challenges are increasingly interconnected. As a scientist, I am truly amazed by the rapid changes over the past decade. Furthermore, there have been significant shifts in the relationship between science and politics/policy. The OECD was repeatedly mentioned in the outcome documents of the recent G7 summit, highlighting its tremendously influential role. I have high expectations for today's presentations by Mr. Wykoff and Dr. Colecchia.

**Presentation 1: STI policies for transitions in times of disruption and the role of technology governance**
Andrew W. Wyckoff, Director for Science, Technology and Innovation, OECD

In Mr. Wyckoff's presentation, "STI policies for transitions in times of disruption and the role of technology governance," he talked about the OECD's flagship publication, "STI Outlook 2023 - STI in times of disruptive change" and trends in technology governance.

"STI Outlook 2023" is the most widely read OECD's STI output and has been published every two years since the mid-1990s, asking us "What's new in the field of science, technology and innovation policy?". The 2023 edition focuses on STI for sustainability transitions in times of disruptive change and provides an international review based on latest policy information and indicators, which is based on the work of the Committee for Scientific and Technology Policy (CSTP) and its working parties. OECD's STI statistical and qualitative data are utilized for this review.

According to Mr. Wyckoff, the latest edition is situated in an extremely interesting – but also challenging – context for STI policy: 1) Disruptive shocks and 'polycrises' are placing a greater emphasis on the resilience function of STI; 2) Meeting the climate change challenge at the necessary pace and scale calls for greater directionality in STI policy and international co-operation; 3) Mounting geo-political tensions, including strategic competition in key emerging technologies, are resulting in a growing 'securitization' of STI policy. The Outlook outlines how these key drivers of change are creating a new operating environment for STI policy. It highlights the need for a rethink of STI policy goals and instruments.

Rather than covering each chapter of the Outlook, his presentation focused on the STI Outlook's central three issues:

— **The climate crisis and its implications for STI policy:** Larger investments and greater directionality in research and innovation activities are needed, but these should coincide with a reappraisal of STI systems and their supporting STI policies to ensure they are "fit-for-purpose" to contribute to sustainable transitions. The OECD is promoting the STI Policy 2025 for the purpose of reforming STI itself.

— **Mounting geopolitical tensions, particularly centered on technology, and the (STI) policy response:** China's growing ascendancy raises three main areas of concern for liberal market economies: 1) Rising competition in critical technologies that will underpin future economic competitiveness and national security; 2) Diverging values and interests that could undermine the international order; 3) Growing vulnerability from technology supply-chain interdependencies, for example, in semiconductors and critical minerals such as rare earth elements.

— **The governance of technology to manage risks and embed 'shared values':** The STI Outlook refers to

three functional groups of policies that it labels ‘Protection’, ‘Promotion’ and ‘Projection’. Protection includes measures to restrict technology flows and reducing dependency risks, e.g. through regulatory policies like export controls and supply-chain diversification measures. Promotion includes measures to enhance domestic innovation capabilities and performance, e.g. through mission-oriented innovation policies and national industrial policies. Projection includes measures to extend and deepen international STI linkages, e.g. through international technology alliances and active participation in international standards setting bodies. (One of the general participants asked how the OECD's economic security policy differs from that of the EU. Mr. Wyckoff responded that "the OECD's projection also points out the importance of a global perspective, which is similar to that of the EU," and that "the OECD has a close relationship with EU member countries, so it is no surprise that they share a common way of thinking.)

In addressing the above issues, the STI Outlook 2023 offers the following four pieces of advice: 1) Governments need to treat these issues as cross-departmental ones and co-ordinate; accordingly, 2) There is a lot of variety on the nature and levels of interdependency vulnerabilities and national security risks across sectors, technologies and countries. So governments should avoid blanket measures and consider strategic competition on a case-by-case basis, weighing up their options and implementing measured responses; 3) Governments need ‘strategic intelligence’ – including horizon scanning, foresight, technology assessment, and evaluations – to make evidenced-based decisions in a turbulent and uncertain environment; 4) It is also important that like-minded governments co-ordinate in their responses, to avoid things like inefficient ‘subsidy races’.

Additionally, Mr. Wykoff introduced developments in technology governance and the OECD Global Forum on Technology (GFT). Technology lies at the heart of the growing geopolitical tensions we’re witnessing. This is about more than just technological competition. The liberal democratic community is increasingly asserting that ‘shared values’ of democracy, human rights, sustainability, openness, responsibility, security and resilience should be embedded in technology. Furthermore, while emerging technologies carry great promise for sustainability transitions, they also carry risks for individuals, societies and the environment. These concerns bring the governance of technology to the fore as an increasingly important policy concern. Mr. Wyckoff said, “how can governments shape the governance of technology when technology trajectories are set by developments in firms and public labs that are widely distributed across the globe in a variety of governance contexts? What ‘guardrails’ can governments put in place?”

Thus, the Global Forum on Technology was initiated with the mission of facilitating strategic dialogue and enabling international cooperation on topics at the forefront of technology policy discussions. After the high-level launch event, the GFT activities will continue this year with the development of communities of experts around the three technologies of initial focus: immersive technologies, synthetic biology and quantum technologies. This year’s next event of the Forum will be hosted by Israel in November and will focus on quantum technologies. Mr. Wyckoff concluded his speech by saying, “We are looking forward to the active participation of Japan in the activities of the GFT.”

**Presentation 2: OECD Science and Technology Ministerial 2024: Shared challenges, transformative actions**

Alessandra Colecchia, Head, Science and Technology Policy Division, Directorate for Science, Technology and Innovation, OECD

In Dr. Colecchia's presentation, “Science and technology policy: Shared challenges, transformative actions,” she introduced the OECD Science and Technology Ministerial 2024.

“Why is a Ministerial Meeting necessary?” asks Dr. Colecchia. In a changing geopolitical context, the crisis of climate change and biodiversity loss, in addition to the lessons learned from the COVID19 pandemic, calls for a rethinking of STI policy frameworks, practices, and multilateral cooperation. We are facing a destructive moment in which the assumptions we have made may no longer correct. However, we can turn this moment into a great opportunity, and now is the perfect time to discuss international cooperation, Dr. Colecchia said.

According to Dr. Colecchia, the CSTP Ministerial 2024 is organised along 3 pillars:

— Engagement：Engage society and strengthen multi-sectoral and multi-lateral dialogue in science and innovation.
— Action：Implement transformative science and innovation policies (S&T Policy 2025).
— Value: Support the responsible development of science and emerging technologies.

While emphasizing these pillars, the Ministerial Declaration will also likely to endorse deliverables such as:

— An Action Plan for S&T Policy 2025.
— A policy framework for anticipatory governance of emerging technologies.
— Potential launch of initiatives at the OECD: A Research and Innovation Careers Observatory (ReICO); A Technology futures programme (strategic intelligence for anticipatory governance of technology).

Dr. Colecchia introduced the initiatives that she hopes to launch at the CSTP Ministerial, and endorse via the Ministerial Declaration: The S&T Policy 2025 Action Plan would comprise (1) an “overarching vision” which contains a number of “guiding principles” that STI policies for sustainability transitions should consider to commit to; (2) specific guidance on what reforms are needed in a certain area and why; (3) a toolkit consisting of a step-by-step online policy guidance on defining the policy challenge, mapping the system, and sequencing actions around specific STI policy challenges. The CSTP Ministerial would also possibly endorse a policy framework for the anticipatory governance of emerging technologies, building on chapter 6 of the STI Outlook. Challenges from emerging techs are common, but the governance of emerging technologies is not one-size fits all. The governance needs for advanced nanomaterials will differ from new digital platforms, will differ from synthetic biology. However, given that there are common challenges, there is utility in applying a common framework at a national and

international level as these emerging technologies share certain characteristics, e.g. uncertainty in trajectory and impacts, the enabling of broad areas of follow-on work, the potential to raise issues of public trust, and the need for value-based reflection.

The OECD Research and Innovation Career Observatory, a joint endeavor with the European Commission, would aim at monitoring R&I talent development, deployment and circulation across OECD and EU countries and partners; and drive co-ordinated action towards filling data gaps and facilitate policy engagement in building and using effectively an evidence base on careers for policies to foster R&I systems.

Dr. Colecchia highlighted that STI policies for transitions, such as mission-oriented and transformative innovation policies, target complex systemic problems with high uncertainty requiring countries to integrate complex data from a variety of sources with very different formats and natures. Crises, such as pandemics, require rapid response and scaling of solutions beyond a single science or technology area, requiring intelligence on portfolios of science and technology options as well as on the value chains that will produce solutions at scale. The OECD could be tasked to build technology governance capacity by facilitating coordination and collaboration in the area of technology assessment, technology foresight, anticipatory impact assessment, tech data analytics and tech mining communities.

Finally, Dr. Colecchia said, “At the OECD Science and Technology Policy Ministerial Meeting 2024, chaired by France, we would like to promote multi-stakeholder dialogue and international cooperation on STI for sustainability transitions and for the responsible development of science and emerging technologies, and we look forward to Japan's active participation.”

**Panel Discussion（Short presentation by panelists and discussion with participants）**

【Panelists】

- Andrew W. Wyckoff, Director for Science, Technology and Innovation, OECD
- Alessandra Colecchia, Head, Science and Technology Policy Division, Directorate for Science, Technology and Innovation, OECD
- Yoichi Iida, Chair, Committee on Digital Economy Policy, OECD/ Assistant Vice Minister for International Affairs, Ministry of Internal Affairs and Communications
- Takashi Kiyoura, Deputy Director General for Science and Technology Policy, Ministry of Education, Culture, Sports, Science and Technology
- Naoko Ogawa, Director, Industrial Technology Bureau, Keidanren（Japan Business Federation）
- Yutaka Hishiyama, Vice President, Tokushima University

【Moderator】

- Kana Asano, Fellow, JST CRDS

The panel discussion focused on "How should the global trends created by the OECD be taken into account in STI policy-making and implementation in Japan?" Starting with comments from Mr. Wyckoff and Dr. Colecchia, each panelist shared their views on the issues. A summary of the comments is as follows:

**Andrew W. Wyckoff**: He expressed high expectations for Japan and specifically mentioned four things: 1) The majority of OECD member countries are in Europe, with Japan and Korea being the only Asian members. Cooperation with the Indo-Pacific region, including ASEAN, is crucial for the OECD, and I hope that Japan will bring them closer to the OECD member countries. 2) Asia is an especially significant region due to escalating geopolitical tensions. Japan, with its scientific and technological capabilities, should share its knowledge with other Asian countries to foster a strong sense of unity within the community. 3) Japan is too modest. Despite playing a major role in international discussions (e.g., AI) from an early stage, it has not received adequate recognition. Japan's diplomacy efforts deserve more appreciation. I encourage Japan to make stronger diplomatic appeals. 4) In 2024, Japan will celebrate the 60th anniversary of its OECD membership and will chair the Ministerial. I hope that Japan will achieve great outcomes and carefully consider its goals as the chairing country.


**Alessandra Colecchia:** There is a strong relationship between Japan and the OECD, with highly skilled individuals from Japan being seconded to the OECD and demonstrating excellent expertise, for example in STI indicators development. We would like to continue our mutually beneficial relationship. Japan plays a crucial role in Asia, and the upcoming chairmanship provides an excellent opportunity for Japan to showcase its presence. In Japan, there are notable and visionary policy programmes such as Society 5.0, other countries should get inspiration

from. It is my hope to witness greater presence and active engagement of Japan in the STI international community, as well as an increased inter-ministerial coordination on STI policies to address global challenges, transcending the boundaries of internal organizational structures.


**Yoichi Iida**：Japan takes international leadership in AI and digital rule-making. We consider ourselves lucky to have partners like Mr. Wyckoff. What Japan, not the U.S. nor the EU, says can be persuasively accepted by countries around the world from the point of neutrality. Our focus has been on the realization of human-centered AI through non-binding (soft law) principles, but there are various approaches at the stage of implementing the principles as rules. With Mr. Wyckoff mentioning Japan's upcoming role as the chairing country of the OECD Ministerial next year, which will be a good opportunity for us to further lead the discussion.


**Takashi Kiyoura:** Japan is currently in the process of implementing its 6th Science, Technology and Innovation Basic Plan and is preparing for the upcoming 7th plan. In discussions with Mr. Wyckoff and Dr. Colecchia, I received the message that we need to change our mind-set in triggering a paradigm change in STI policy. The most impressive term was "strategic intelligence," which is a vital attribute for governments. This term encompasses the idea of "how to transform society," and we intend to explore how Japanese government should address this issue. (Mr. Kiyoura also explained the details of STI related programs of MEXT.)

**Naoko Ogawa:** Industry-academia-government collaboration, including global collaboration, is essential to tackle global challenges. I expect the role of government for these collaborations. I would like the government to draw up a major roadmap, which will enable us to make long-term investments. In addition to technology, there are existing industries and companies that will be subject to "pain" in order to change the social structure, and it is impossible for companies to do this alone: the government needs to take the lead. It is also essential to improve Japan's scientific and technological capabilities in order to increase international competitiveness. As for emerging technologies, it is nonsense to stop their development and utilization; it is important for humans to use them properly so that they contribute to the realization of Society 5.0. In this situation, I am concerned that Europe and the U.S. may appear to have a large voice in the international rule making. Therefore, I hope that the OECD will take an inclusive approach in order to reflect diverse values.


**Yutaka Hishiyama:** The OECD serves as an appropriate platform for addressing issues that are difficult to solve by individual country, such as research security. It is crucial for Japan to cultivate public officials with expertise who can actively participates in international discussions. Concerning the governance of emerging technologies, predicting their development is difficult, and ethical discussions frequently ensue. As for the CSTP ministerial-level meeting, it is essential to engage in discussions among countries that share common values, and coordination with relevant international organizations is necessary. Japanese public officials may not be accustomed to policy-making guided by policy guidance.

**Summary and Closing Remarks** Takao Kuramochi, Deputy Director-General, JST CRDS


Rapid advances in science and technology are now having a significant impact on society and the landscape surrounding STI policy that is currently undergoing significant changes. This open seminar was a valuable opportunity for us to learn about the OECD's efforts and to reflect on the need to address this issue properly.

I received a message from Mr. Wyckoff emphasizing the necessity of changing our approach to policy making and managing. With regard to Japan's role as a country outside of the Big 3 (US, China, and EU), I find Mr. Wyckoff's four pieces of advice in the STI Outlook 2023 extremely significant. Dr. Colecchia introduced OECD's efforts – the OECD Science and Technology Ministerial 2024 and STI Policy 2025 – to transform a disruptive situation into a good opportunity.

During the panel discussion session, each panelist presented various viewpoints. I believe that we were able to recognize the importance of the OECD as a forum for international discussions on STI and as an influential platform among major countries. Moreover, we were able to reaffirm Japan's role in providing a different perspective on Western values. The OECD framework now serves as a valuable reference for Japan in advancing policy considerations. Cooperation with the OECD will be essential to monitor the progress of mission-oriented programs. The seminar also touched upon the topic of strategic intelligence. CRDS will continue to closely follow the CSTP Ministerial Meeting and STI Policy 2025, aiming to contribute to the strengthening of the foundation of STI policy. I would like to thank you for attending today's in-person seminar.