Materials Innovation Strategy (Outline)

April 2021

Cabinet Office

Formulation of Materials Innovation Strategy

1. Formulation of material strategy

"Integrated Innovation Strategy 2020" (Cabinet resolution of July 2020)

○ Based on a vision shared by interested parties in industry, academia and government, formulate a government strategy to enhance Japan's potential to create materials innovation. This is a priority strategy in line with the strategies already formulated for AI, bio, quantum technology and environment.

2. Role of Experts Meeting

- Establish an Experts Meeting as a subsidiary organization of the "Council for Integrated Innovation Strategy" (Chair: Chief Cabinet Secretary) for the purpose of investigating technical matters related to the implementation of the "Integrated Innovation Strategy."
- The Meeting is comprised of experts from academia (younger researchers, people with corporate experience etc.) and industry (chemicals, steel, nonferrous metals etc.).
- The purpose of the Meeting is to discuss ways to achieve the government's visions for society and industry in 2030 by enhancing "materials innovation capacity," the ability to develop innovative materials and plays a crucial role in achieving Society 5.0, meeting the SDGs, overcoming resource and environmental constraints, and building a robust social and industrial structure.
- As international competition grows more intense in the materials area, the Meeting heard opinions on the formulation of a comprehensive policy package that would include research and development, industry/government/academia collaboration, and human resources development.

3. Course of investigations

- October 2020: 1st Experts Meeting. A series of five monthly meetings were held, finishing in February 2021.
- January 2021: Interim report on points of discussion. Outcomes were reflected in the 6th Science and Technology Innovation Basic Plan.
- March 2021: Finalization and publication of the Experts Meeting's "Draft Materials Innovation Strategy."
- April 2021: Finalization of the "Materials Innovation Strategy" by the Council for Integrated Innovation Strategy.

Materials Innovation Strategy (Conceptual diagram)

The strategy to enhance materials innovation capacity was formulated under a common vision shared by interested parties in industry, academia and government as one of the government's highest priority strategies

Significance of strategy

Growing interest in ESG/SDGs

- Materials translate directly into a carbon neutrality, circular economy

⇒ Growing prominence of materials

Slow social implementation

- Materials have an essential ability to change society, but the changes do not usually seem drastic

⇒ Attitude of delivering materials to the market as quickly as possible and changing society as their use expands

International circumstances

- Increasingly intense competition for technological hegemony, frailty of supply chains, EU environmental policy etc.

⇒ Importance of securing rare resources and developing a circular economy

Differentiate on the basis of Japanese strengths (high-technology capacity, excellent workforce, excellent data, advanced research facilities and equipment, collaborative relationships among industry, academia and government etc.)

Targets

Contribute to the world by increasing materials innovation capacity, providing for both economic development and solutions to social issues, and leading the transformation to a sustainable society

- **•Achieve Society 5.0**
- **•Create social systems with the world's lowest environmental load**
- **Establish one of the world's top research environments and strengthen international competitiveness with swift social implementation**

Action plan

The Experts Meeting and other organizations will provide regular follow-up, and will continue to improve policies and strategies in a process of dialogue and collaboration among government, industry and academic experts

○ **Development and swift social implementation of innovative materials**

- Development of platforms to solve social issues that bring together the upstream and downstream of the value chain, a cross-section of industrial sectors, and interested parties in industry, academia and government (role model: CLOMA)
- Encourage the use of unused and buried technologies in the possession of startups etc.
- Encourage strategic research and development in crucial materials technologies and implementation areas

○ **Encourage data-driven research and development leveraging materials, data and manufacturing technologies**

- Collect and accumulate actual data, expertise, and non-use data on promising materials and encourage use (develop a materials DX platform)
- Integrate manufacturing technologies and data science to develop innovative manufacturing process technologies (build a process innovation platform)

○ **Sustainably enhance international competitiveness**

- Develop more robust, strategic supply chains for rare metals etc. to overcome resource constraints (support for diversification sources, technology development, and technology/equipment installation etc.)
- Develop and implement institutional enhancements and technologies to achieve the circular economy (plastic resources: 100% reuse and recycling of used plastics by 2035, etc.)
- Coordinate and collaborate among industry, academia and government to develop human resources (increase the attractiveness of the materials field, recruit talent, train target-oriented and data-oriented personnel etc.)
- Strategically deploy on the basis of international cooperation (strategically build international networks, promote strategic standardization etc.)

(Reference) Members of the Materials Strategy Experts Meeting

(As at April 2021)

<Chair>

Michitaka Sawada	Chair, Kao Corp.

<National research institutes, universities>

Kazuhito Hashimoto	President, National Institute for Materials Science Member, Council for Science, Technology and Innovation, Cabinet Office
Norimitsu Murayama	Vice President, National Institute of Advanced Industrial Science and Technology
Tsuyoshi Sekitani	Assistant President, Osaka University; professor, Institute of Scientific and Industrial Research (Sanken)
Taro Hitosugi	Professor, applied chemistry, School of Materials and Chemical Technology, Tokyo Institute of Technology; Vice President for Educational Activities and Special Assistant to the President, Tokyo Tech Academy for Convergence of Materials and Informatics

<Industry>

Shuhei Onoyama	Vice President, Nippon Steel Corp.; Director, Technology Development Division
Shizuo Sugawara	Vice President and executive officer, JX Nippon Mining & Metals Corp.; Director, Technology Division
Shoichi Nakagawa	Executive officer, Kyocera Corp.; Director, Research and Development Division
Hideyuki Yamagishi	Managing Executive Officer, Asahi Kasei Corp.; Director, Specialty Solutions Division