

# Materials Innovation Strategy

*by Establishing a “Knowledge Value Chain”*

**(Outline)**

---



June 4<sup>th</sup>, 2025

**Secretariat of Science, Technology  
and Innovation Policy  
Cabinet Office**



# Materials Innovation Strategy: Outline (2025.6 CSTI)

Establishing a “Knowledge value chain” -- a cycle of knowledge transfer continuously generating **innovation** that leverages Japan’s diverse strength by clarifying the roles of key stakeholders. Japan seeks to **maintain leadership in materials science, a core of its industrial base and a key enabler of innovation** in areas like semiconductors and quantum technologies.

## Area of Leadership

### Accelerating R&D of focus area

#### Short- to mid-term (focus area)

- **High-performance and -valued** materials on which Japan retains a technological advantage
- Key materials serving for **resource security** and **supply chain resilience** through realizing circular economy
- Materials for **green energy** toward realizing GX
- Key materials for **economic security**
- **Next-generation manufacturing** with sophisticated materials design and evaluation

### Innovative industry and academic area, fostering talent

#### Mid- to long-term (pioneering new frontiers)

- **Frontier of value**  
Challenge for new frontiers pinned down by backcast from social issues and forecast from new technologies
- **Frontier of science and technology**  
Challenge for the limit of performance and functionalities of current materials

## Initiative for Leadership

Building a Knowledge value chain for **converting excellent knowledge and technology to innovation by integrating Japan’s technological strengths and diverse stakeholders**. For this, recognition of value in “knowledge,” i.e., **value recognition** of technological strength and “scientific excellence” triggering the value chain are important.

## Actions we take

### Accelerating R&D and social integration of “Innovative materials”

- Boosting R&D **in priority areas**
- **Pioneering frontiers** to create new value

etc

### Driving “Innovation” forward

- Further advancing **materials DX** through Japan’s strong data platform
- Fostering **cross-sector** collaboration

etc

### Generating innovation “continuously”

- Fostering talent for research, R&D management, and engineering
- Creating **scientific excellence**
- Providing **attractive research environment**, enhancing **global impact**

etc

# Materials Innovation Strategy: Actions We Take

## Accelerating R&D and social integration of “innovative materials”

- **Boosting R&D in priority areas** *short-to mid-term*
  - Accelerating research and development (R&D) and social implementation, and providing assistance for the introduction of research equipment and facilities
  - Visualizing the value of GX and advanced technologies, and finding a market for it
  - Enhancing regulations, standards, and IP strategies for global markets, and advancing open-and-closed innovation strategies
- **Pioneering frontiers to create new value** such as **innovative industry and research area** *mid-to long-term*
  - Pushing value frontiers through maximizing performance or functionality with hybrid of known and new materials as well as innovative manufacturing ⇒ creating innovative industry
  - Pushing the limits of materials through scientific and technological frontiers  
⇒ fostering promising seeds and talent, and creating innovative research area, which are important in time consuming material developments

## Driving “innovation” forward

- **Further advancing materials DX through Japan’s strong data platform**
  - Enhancing usability and accelerating data sharing
  - AI integration and robotics fusion
  - Promoting data-driven R&D and outcomes
- **Foretelling cross-sector collaboration**
  - building systems to clarify roles of and accelerate collaboration between industry and academia, or upstream and downstream
  - Maximizing the potential of diverse regional players such as regional universities, technical colleges, SMEs, and startups.
  - Sharing and matching seeds and needs
  - Advancing open-and closed strategies

## Generating innovation “continuously”

- **Fostering talent for research, R&D management, and engineering**
  - Improving research environment and working conditions through industry-academia-government collaboration
  - Developing and securing talent for management and operations engineering of data/research infrastructures, and for cross-sector (e.g., industry-academia) management
- **Creating scientific excellence**
  - Sustained promotion of basic and fundamental research
- **Improving research environment, enhancing global impact**
  - Developing open, cutting-edge shared facilities including large-scale research infrastructure as a hub of talent and data creation
  - Promoting strategic research collaboration with global partners