*The 15th ACFIF Conference, Penang, Malaysia*

JCFA
Japan Chemical Fibers Association

## *Special Theme 5*

# *Future Plans for a Sustainable Chemical Fibers Production and Its Supply Chain*

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1. Global Fiber Demand

2. Challenges Facing the Chemical Fiber Industry

3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain

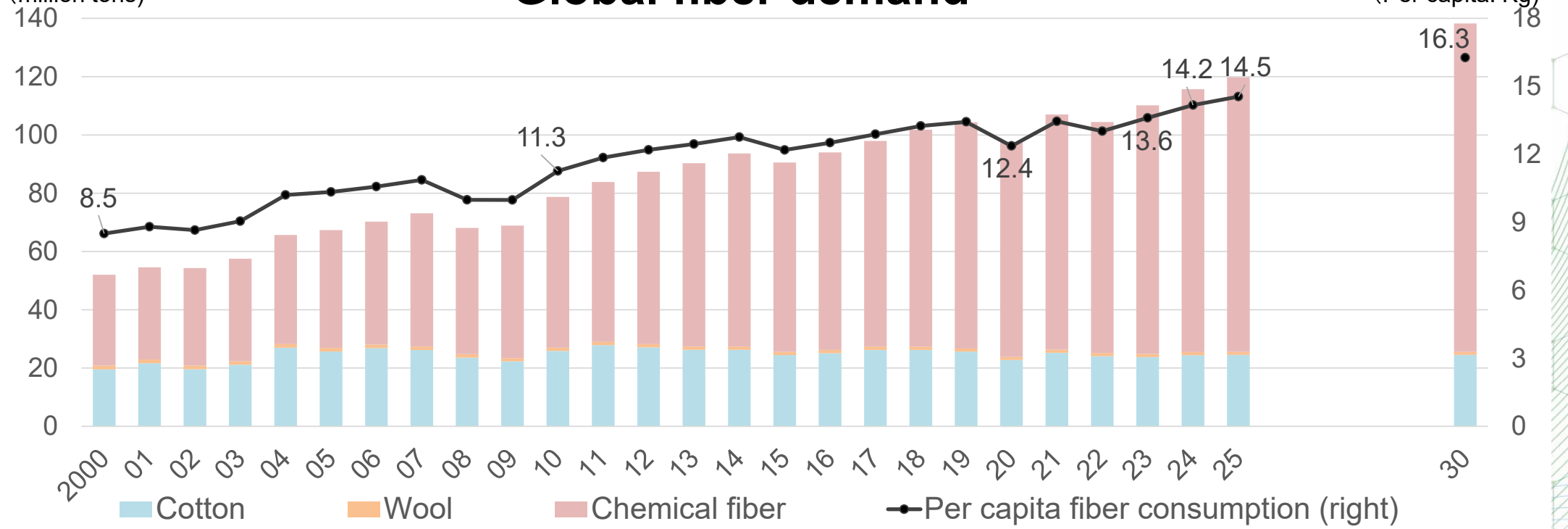
4. Future Directions

# 1. Global Fiber Demand

# 1. Global Fiber Demand (1)

- Global fiber demand is **expected to grow in the mid-long-term period.**
- **Chemical fibers account for 80%** and their share continues to rise.
- Emerging markets, especially in Asia, are the primary drivers of the growth.

## Global fiber demand



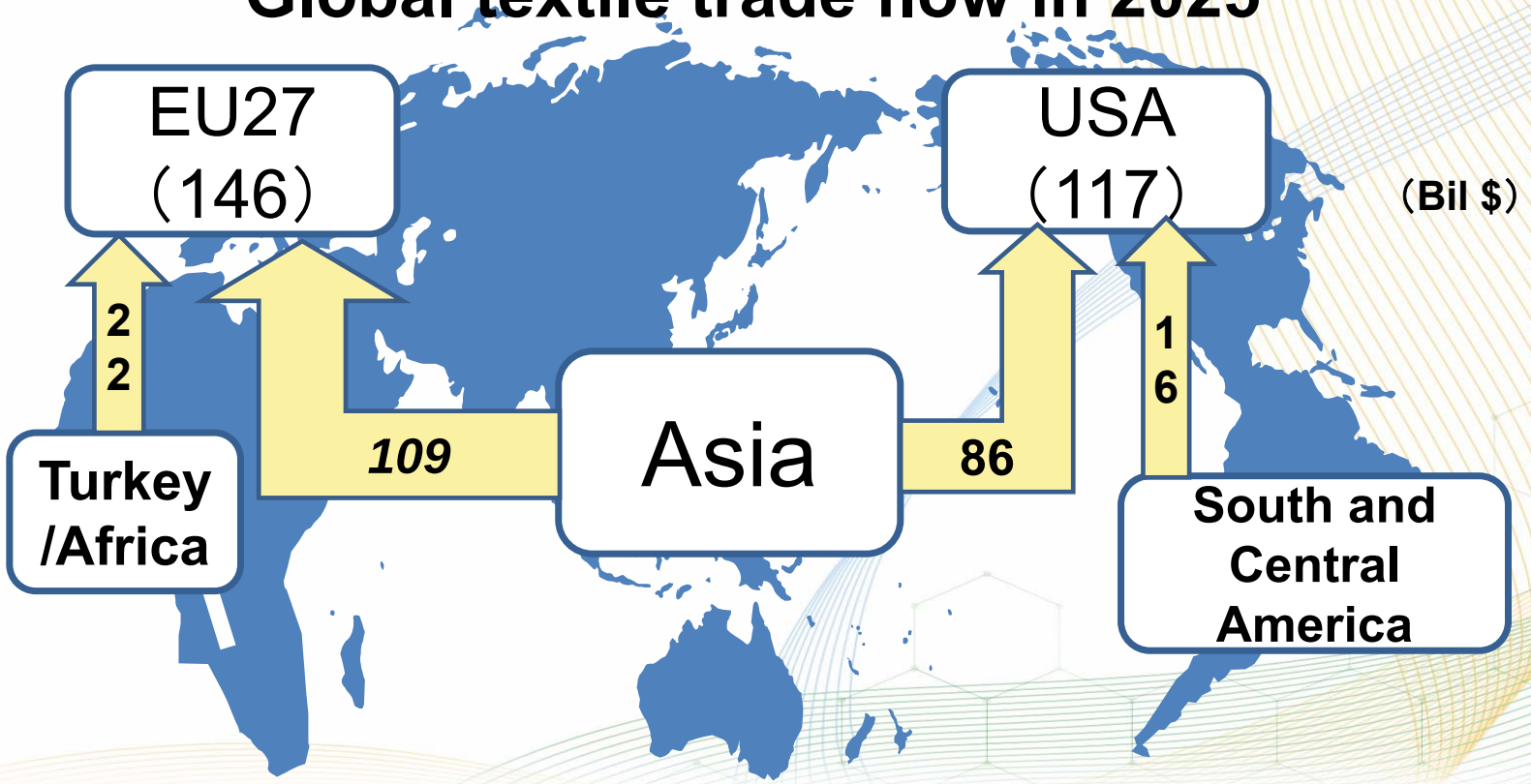



(Source: JCFA estimates)

# 1. Global Fiber Demand (2)

- Asia is not only the hub of chemical fiber production but the **major global supplier of textile products**.
- Supply chain resilience and global regulatory compliance are key to competitiveness.

## Global textile trade flow in 2025






(Source: Compilation by JCFA)

# 2. Challenges Facing the Chemical Fiber Industry

# 2. Challenges Facing the Chemical Fiber Industry (1)

## Gap remains in global chemical fiber industry

- **Low circularity** (Recycled fibers: 7.6%): Mostly from PET bottles; textile-to-textile recycling remains below 1%.
- **Minimal bio-based synthetic fiber**: Polyester (0.01%) and Nylon (0.4%) face high costs and supply limits.
- **Fossil fuel dependency**: 62% of all fibers are fossil-based.
- **Scalability gap**: Sustainable alternatives struggle to compete with low-cost conventional materials.

***(Source: Textile Exchange, Materials Market Report, September 2025)***

| Current situation | Future direction |
|---|---|
| Focus on fossil-based raw materials | Recycled/biomass materials |
| Mass production | Sustainable production system |
| Incineration of waste | Sorting/collection and recycling |

# 2. Challenges Facing the Chemical Fiber Industry (2)

## Not only chemical fiber producers, but the entire supply chain must respond

—Sustainability policies accelerate in Europe ahead of 2030

| | |
|---|---|
| **Design/ product phase** | **Eco-design for Sustainable Products Regulation(ESPR)**<br>**→ Requires investment in high-performance, durable fibers and non-fossil-based materials.**<br>**Ban on disposal of unsold goods**<br>**→ Necessitates more advanced production management and accurate demand forecasting across the supply chain.** |
| **Lifecycle** | **Digital Product Passport (DPP)**: Requires lifecycle data disclosure<br>→ Data management needed across the entire supply chain, including Asia. |
| **End of Life** | **Extended Producer Responsibility (EPR)**: Producers bear recycling costs<br>→ Requires collection systems and collaboration with recycling partners. |

# 2. Challenges Facing the Chemical Fiber Industry (3)

## Challenges in Japanese Textile Industry

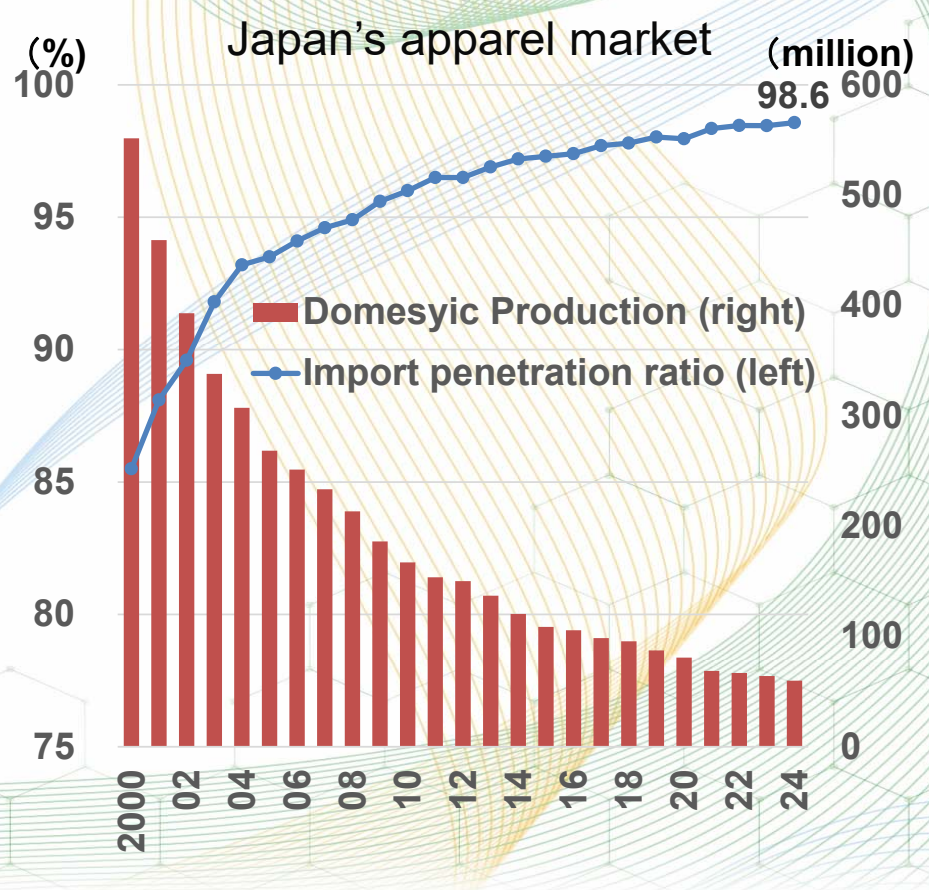
| | |
|---|---|
| (1) Adoption of eco-friendly fibers | • High costs compared to virgin materials<br>• Maintaining functionality and quality<br>• Clarifying definitions of bio-based/recycled fibers |
| (2) Technology development & economic viability | • High capital investment needed for advanced recycling<br>• Commercial scale chemical recycling<br>• Improving quality and expanding applications |
| (3) Recycling infrastructure | • Expanding wide area collection networks for used textile products<br>• Building automated sorting & resource recovery facilities |
| (4) Entire supply chain | • Establishing traceability throughout the value chain<br>• Data management & information sharing for effective resource circulation |

# 2. Challenges Facing the Chemical Fiber Industry (4)

## Characteristics of the Japanese Textile Market

(1) Market Structure: High Import Dependency
- Nearly 100% Import Rate
- Shrinking Domestic Production: Specialized in high-value-added products.

(2) Supply Chain: Global Operations
- Cross-border Dependencies: No longer be resolved by domestic efforts alone.
- Global Regulatory Alignment: Transitioning to international standards is essential for competitiveness.




(Source: Japan Textile Importers Association)

# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain

# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain (1)

## Initiatives in Japan's Textile Industry

| Initiative | Description & Impact |
|---|---|
| **(1) Resource Circulation Strategy** | • **"Roadmap for Textile Resource Circularity"**<br>⇒Establish clear goals for 2030 and 2040.<br>• **Standardization of "Ecodesign for Textile Products"**<br>⇒Performance/requirements of eco-design for textiles will be defined |
| **(2) Sustainable Raw Material Production** | • **International standardization** of eco-friendly fibers<br>⇒Define and establish evaluation methods for recycled and bio-based fibers. |
| **(3) Recycling System Infrastructure** | • **CFT2** (Realization of textile to textile recycling)<br>⇒Realize an integrated circulation system from raw materials to production and collection. |
| **(4) Establishing Traceability** | • Standardizing/developing **information distribution platforms**<br>⇒Integrate whole supply chain data. |

# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain (2)

## (1) Resource Circulation Strategy:
## “Roadmap for Textile Resource Circularity” by METI published in June 2024

Milestone **2030**: Achieve interim KPIs for each category
Target **2040**: Realize resource circularity and optimal production/consumption

2030 KPIs of the Roadmap

| Strategy / Action Area | Main KPIs for 2030 |
|---|---|
| **Collection & disposal** | **25% reduction** in household clothing waste (vs. FY2020). |
| **Recycling technology** | **50,000 tons** of “textile-to-textile" recycling |
| **Eco-design** | **80% adoption rate** of eco-design guidelines among companies. |
| **Information disclosure** | **100% disclosure rate** by major domestic apparel companies. |

# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain (3)

## (1) Resource Circulation Strategy: “Standardization of Eco-design for Textile Products”

**Background**

- Environmental impact matters across the entire lifecycle
- Eco-design at the development stage is essential for a circular economy

**Purpose of the Standard**

- Define eco-design requirements and evaluation criteria for textiles
- Promote efficient implementation and clear communication to global users

**How to Use**

- Textile companies select relevant eco-design items based on product characteristics
- Apply appropriate measures from defined criteria

**References (Annexes)**

- Certifications & benchmarks, evaluation/test methods
- Global trends & GHG reduction practices
- Principles for environmental information disclosure

# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain (4)

## (2) Sustainable Raw Material Production:
## ISO Standardization of environmentally conscious fibers

**1) Current Status & Challenges**

**Market Expansion**: Rapidly increasing use of recycled and bio-based fibers.

**Lack of Uniformity**: No global standards for blend ratios, evaluation methods, or labeling.

**Reliability Risk**: Growing concern over inaccurate information provided to consumers (e.g., greenwashing).

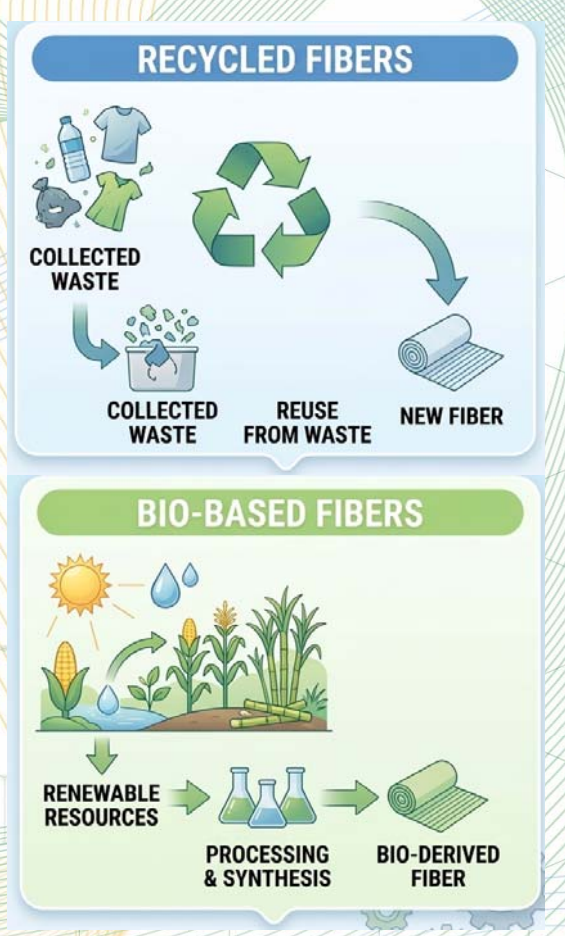
**2) Objective:**

**Goal**: Establish global reliability through objective measurement and transparent labeling.

**Key Standard Areas**: Requirements for specifications, evaluation, and labeling.

**3) Roadmap**

**By 2027**: Target for **finalization and publication** of the ISO standards.

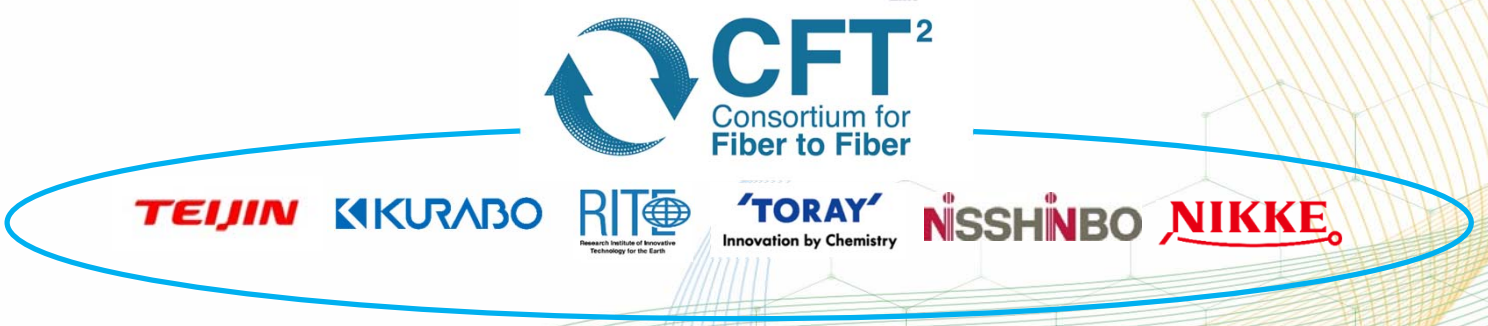


# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain (5)

## (3) Recycling System Infrastructure:Brief introduction of CFT2

## CFT2 (Consortium for Fiber to Fiber)

- Alliance between Five Leading Textile Manufacturers and the Research Institute of Innovative Technology for the Earth (RITE) to Promote the Social Implementation of Textile-to-Textile Recycling
- These six partners will combine their expertise to develop advanced recycling technologies and evaluation methods, aiming to build the most pioneering “textile-to-textile" resource circulation system.

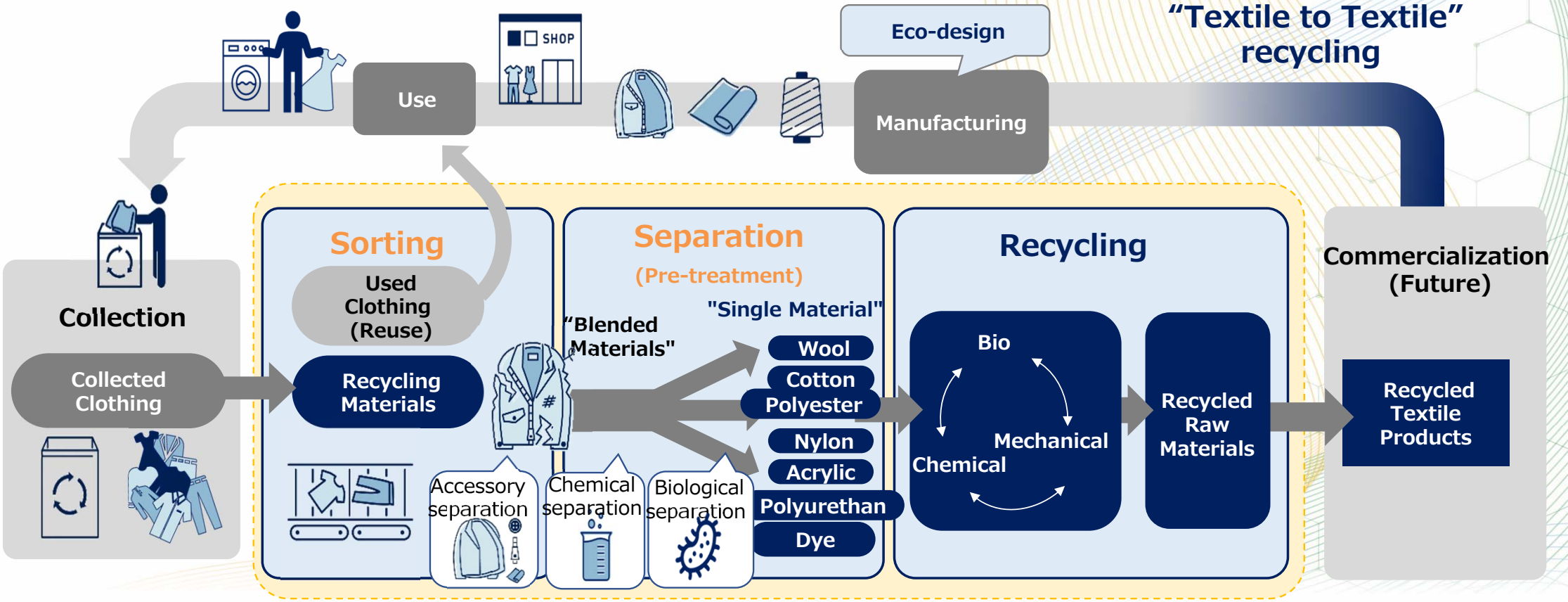



*This project was selected under the “Research and Development of Technologies to Promote Biomanufacturing” by the New Energy and Industrial Technology Development Organization (NEDO)

# A. Technological innovation for advanced sorting & separation

---The technical challenges in establishing a textile-to-textile recycle lie in the development of sorting and separation technologies

---Collaboration that leverages the strengths of each partner is essential for developing separation processes tailored to chemical/natural fibers, respectively



# B. Social implementation of the circular economy

## Theme 3: Promoting Clothing Collection Initiatives and Recycling

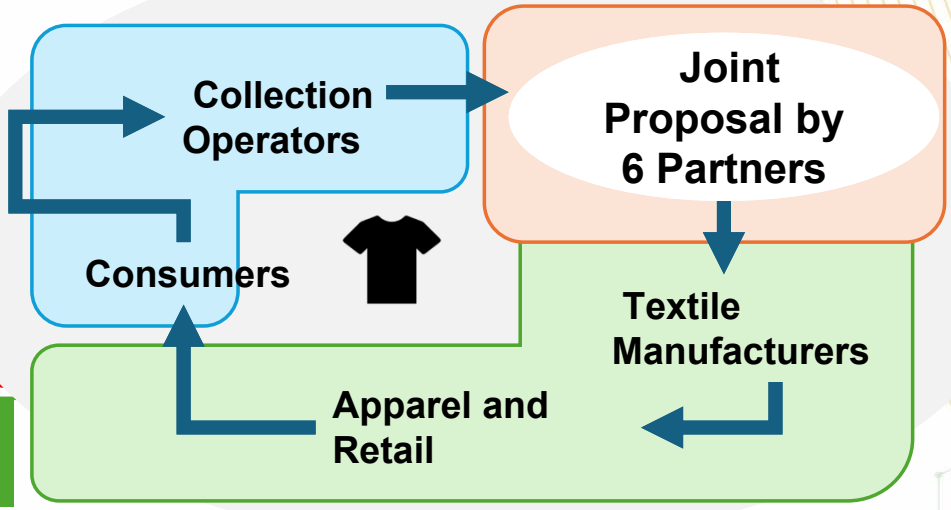
- Ensuring a stable supply of collected clothing


- Outreach activities and communication activities

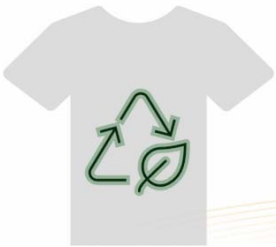

## Theme 1: Conducting LCA and Developing Guidelines

- Conducting LCA for bio, mechanical, and chemical elemental technologies
- Organizing LCA calculation rules of blended materials


### Social Implementation of Clothing Resource Circulation




## Theme 2: Standardization of Eco-Design



- Examination of product specifications suitable for the recycling technologies to be developed
- Domestic and international research on sustainability trends

# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain (6)

## (4) Establishing **Traceability**: Standardization of Traceability Information Items for Resource Circulation in Textile Products

### 1) Challenges & Goals

- Issues: Mass waste, stagnant recovery, and data gaps.
- Strategy: Bridge the supply chain with a unified data system.
- Global Fit: Align with EU standards (ESPR/DPP).

### 2) JIS Standard Development

- Launch (FY2024): Drafting JIS based on European trends.
- Alignment: Ensure compatibility with domestic platforms.

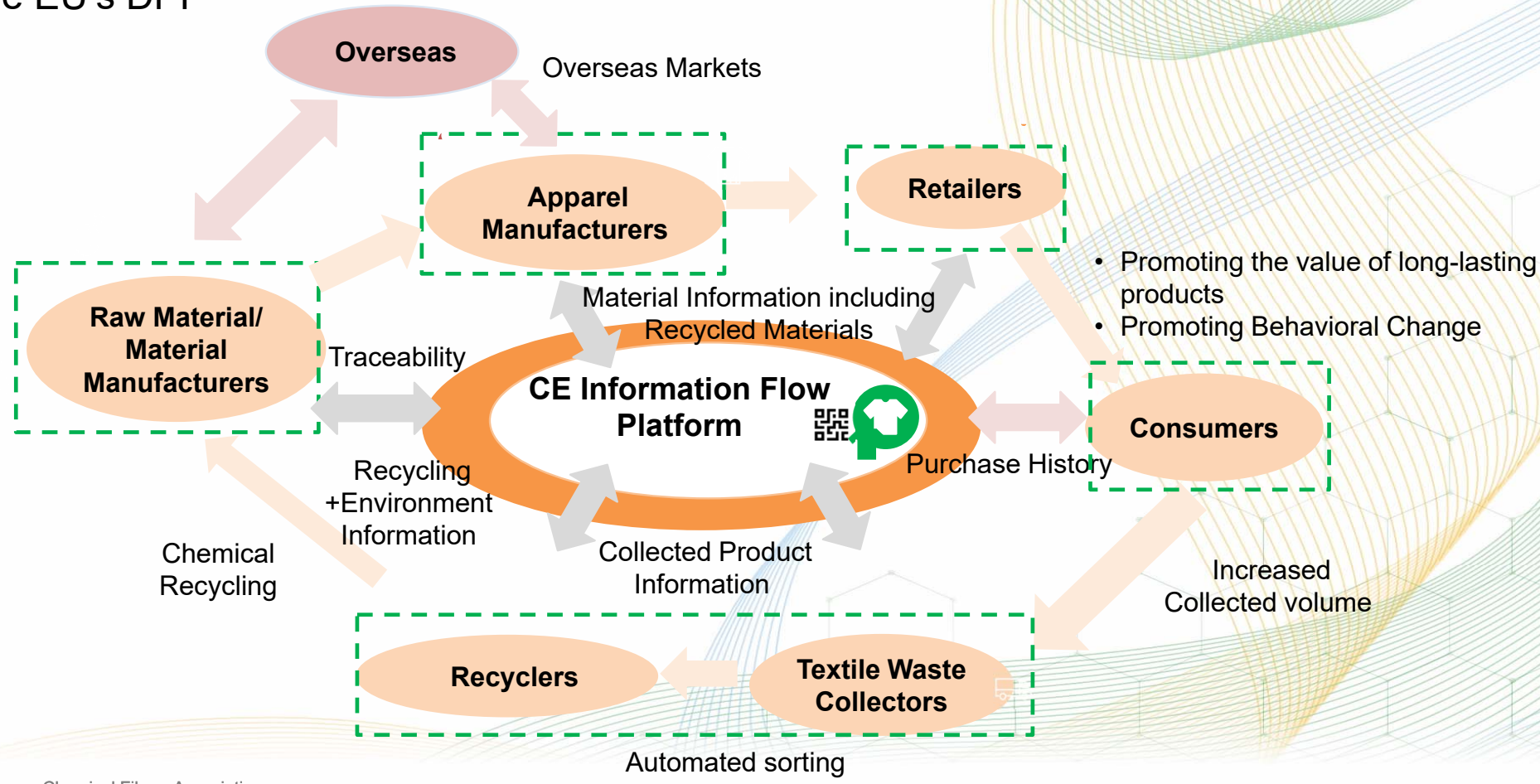
### 3) Timeline

- Status: Formulating high-impact domestic standards.
- Target: Completion by the end of FY2026.

# 3. Initiatives to Build a Sustainable Chemical Fiber Supply Chain (7)

## (4) Establishing Traceability: Circular Economy (CE) Information Flow Platform

---A digital platform to track textile products from production to recycling, and compatible with the EU's DPP



# 4. Future Directions

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---Toward a chemical fiber industry that adapts to a new circular economy framework

## (1) Rules & System

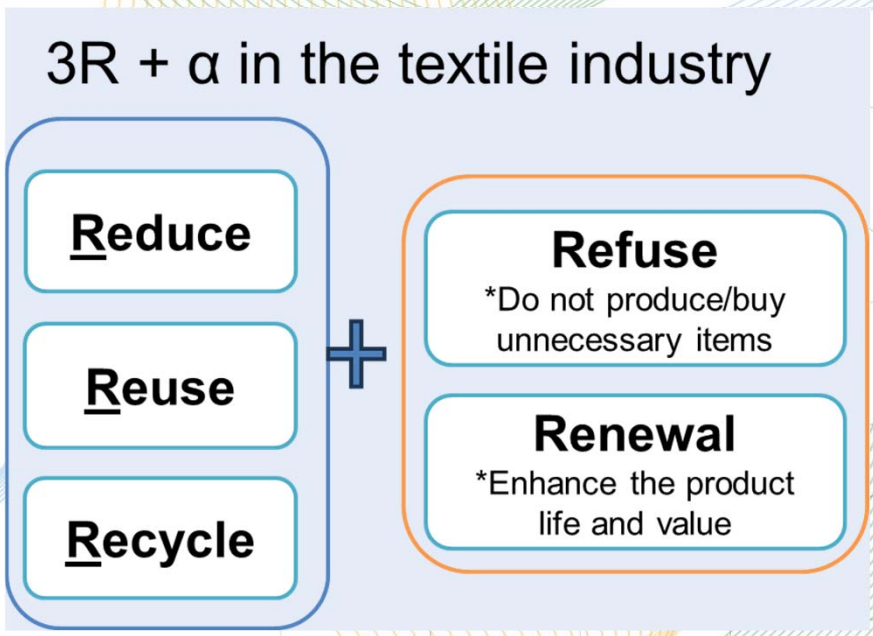
- Institutional design: Strengthening infrastructure in public-private/cross-industry/international collaborations
- Global compliance: Aligning with EU and global regulations

## (2)Technology & Implementation

- Textile-to-textile recycling: Expand large-scale commercialization in both chemical/natural fiber supply chains
- Traceability: Improve transparency across the global textile supply chain

## (3) Global Cooperation

- Harmonization: Promote common standards/rules for eco-friendly fibers and eco-design rules
- Global synergy: Strengthen cooperation in ACFIF framework




**A new paradigm is emerging**

---It's a big opportunity for our chemical fiber industry to shape policy and stimulate new business.

# Thank you