

# **Establishing Resource Circulation Systems for Textile Products in Japan**

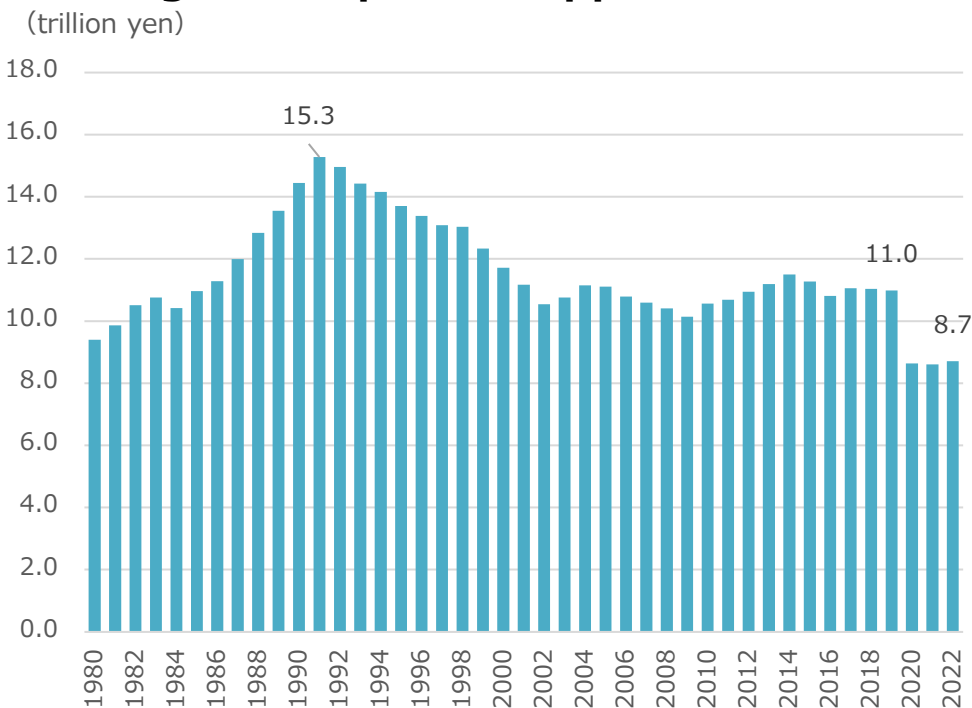
**February 29<sup>th</sup>, 2024**

**Lifestyle Industries Division, METI**

# Changes in Market Size and Production in the Textile Industry in Japan

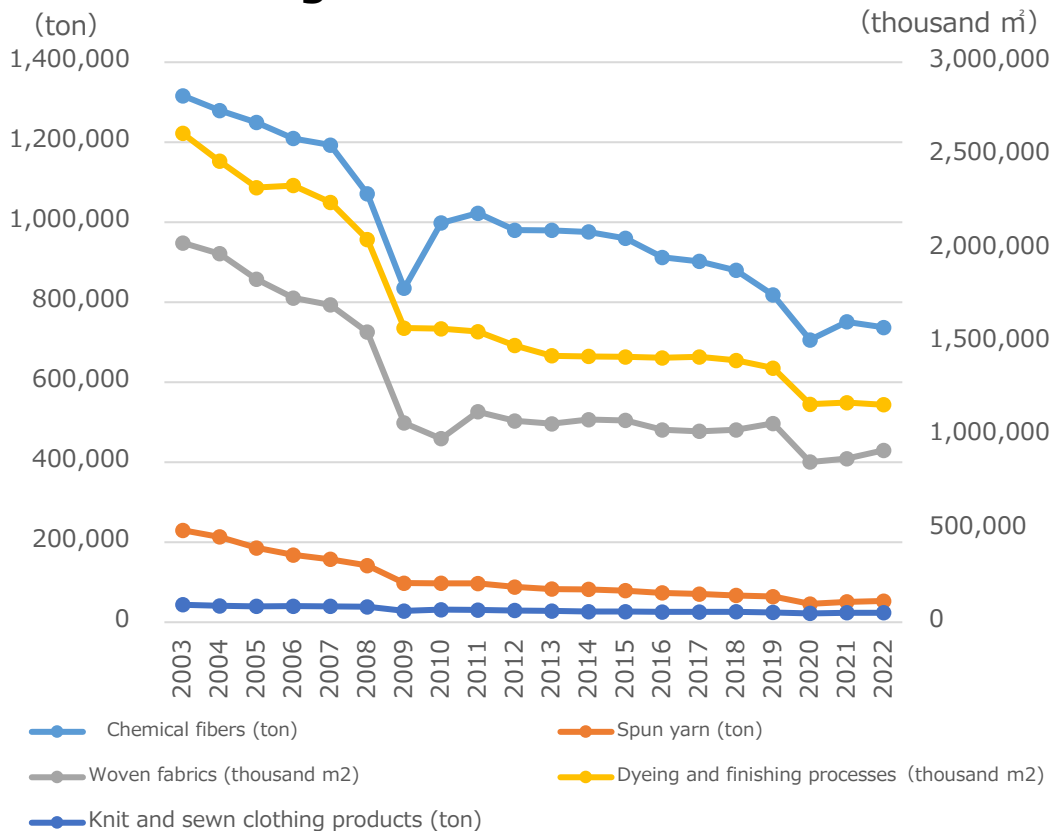
- The size of the Japanese apparel market has been declining since the 1990s, but has shown no significant fluctuations since the 2000s.
- The size of the Japanese market has declined since 2020 due to the impact of stay-at-home requests in response to the COVID-19 pandemic. Even in 2022, the size has not recovered to the same level as the pre-COVID-19.

## Changes in Japanese Apparel Market Size



Source : Current Survey of Commerce (2022), METI  
 \*Trends in the textile, apparel and accessories retail industry

## Changes in Domestic Production

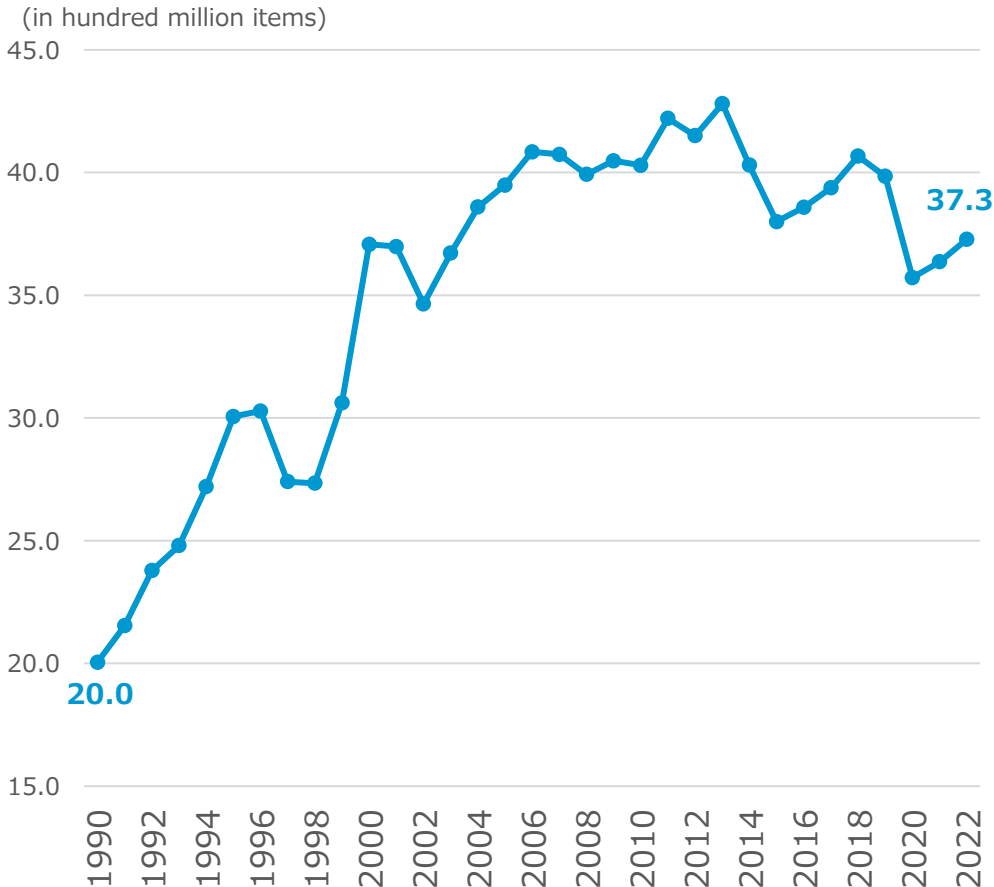


Source : Current Production Statistics Survey (2022), METI

# Changes in Domestic Supply and Import Penetration

- The number of apparel items supplied in Japan increased from about 2 billion in 1990 to more than 1.8 times in 2022.
- The import penetration rate in 2022 was 98.5% in terms of volume. The proportion of overseas production (imports) is high.

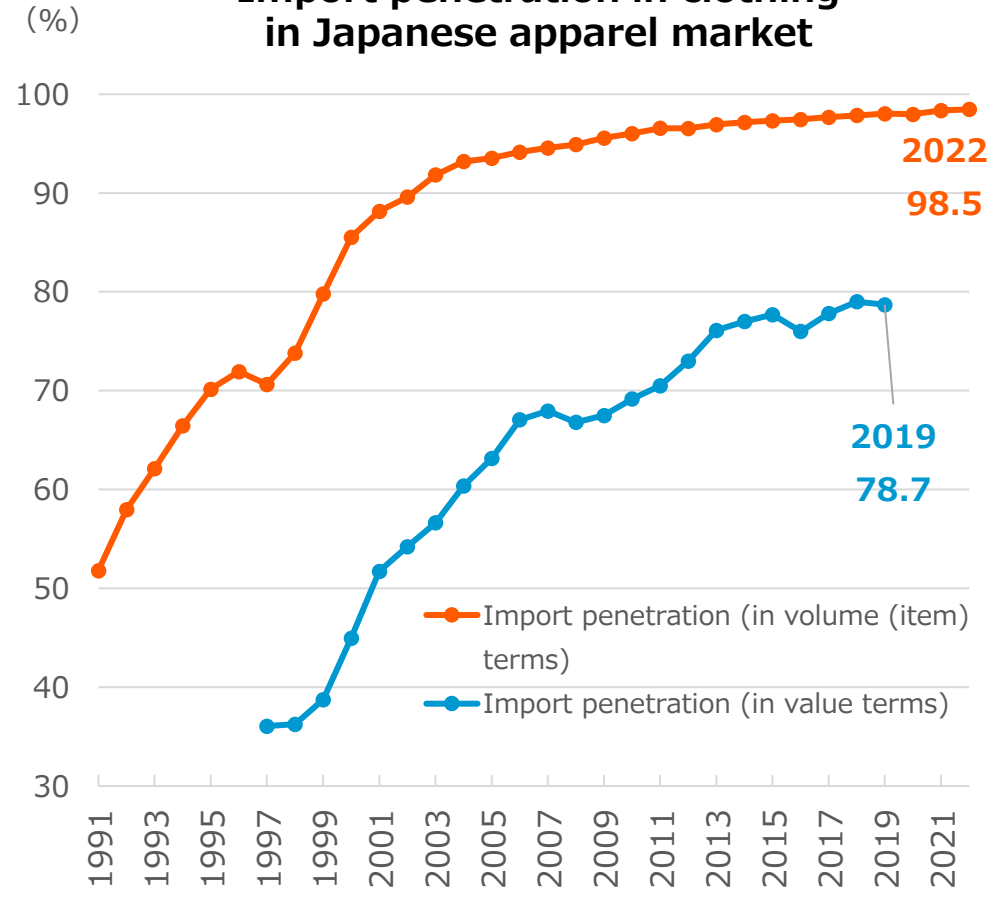
## Total number of apparel items supplied in Japan



Source : Apparel Industry in Japan: Overview of Market and Imported Products(1991-2023), Japan Textiles Importers Association

\*Of the domestic supply, only for some domestic production by companies with 30 or more employees are included.

## Import penetration in clothing in Japanese apparel market

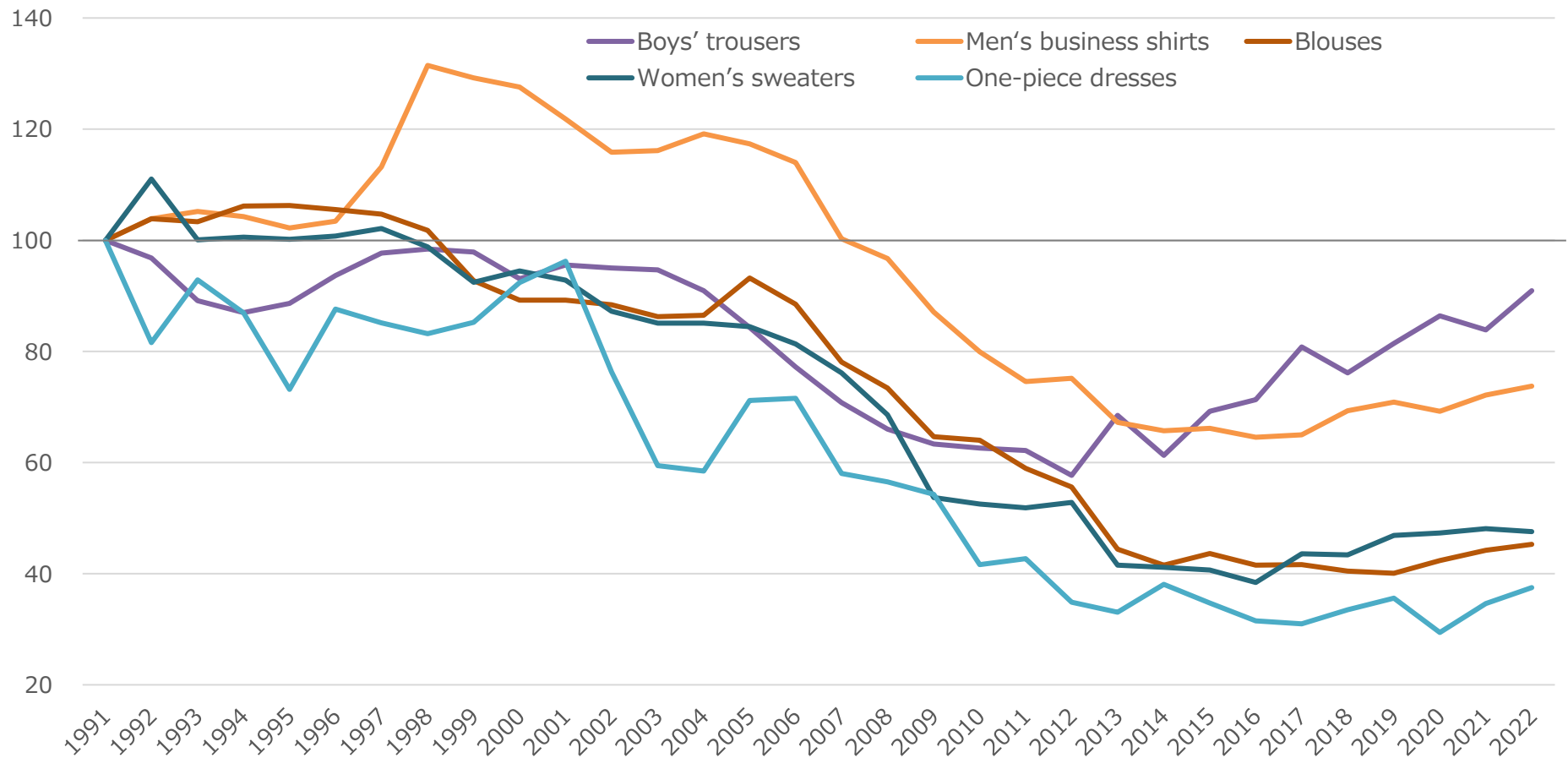


Source: Apparel Industry in Japan: Overview of Market and Imported Products(1992-2022), Japan Textiles Importers Association

# Changes in Retail Clothing Prices in Japanese Market

- When prices in 1991 are set at 100, the **retail clothing prices** in the Tokyo metropolitan area **have fallen significantly over the past 30 years**. In particular, women's clothing (blouses, sweaters, and one-piece dresses) price fell greatly.

## Changes in Retail Prices of Major Clothing Products in Tokyo Metropolitan Area



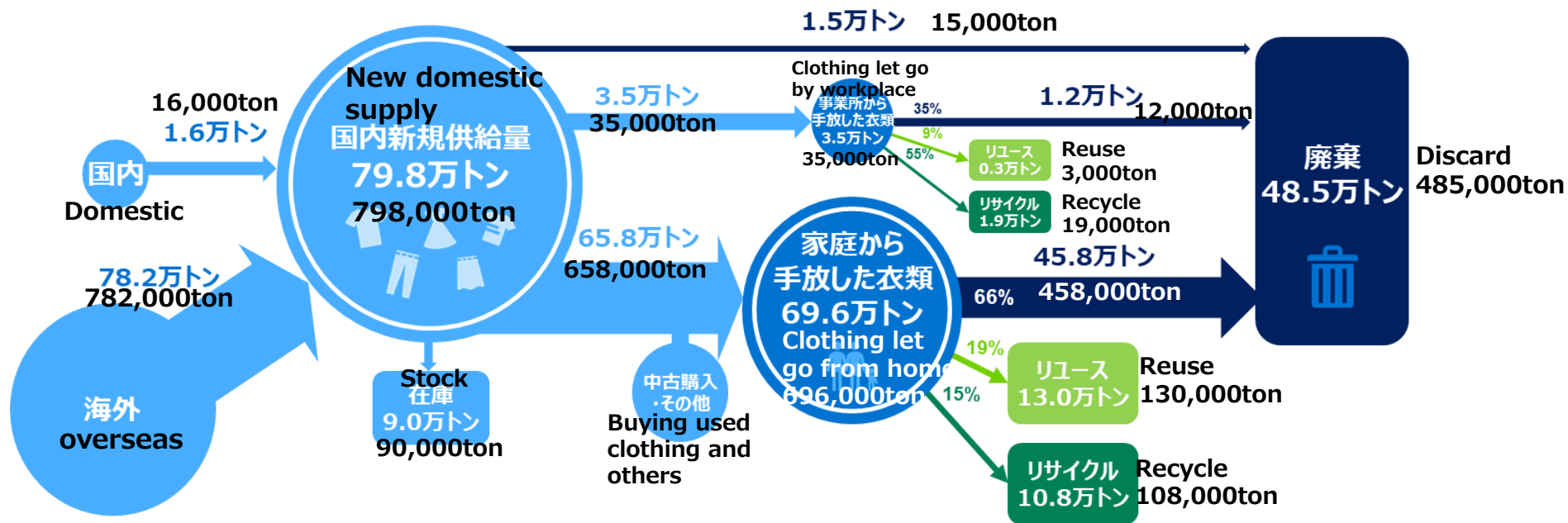
Source : Retail Price Survey, MIC

\*Changes when prices in 1991 are set at 100.

# Current Status of Resource Circulation of Textile Products in Japan

- At present (2022), about 730,000 tons of clothing are let go after use per year, and about 35% of the clothes let go are reused (17%) and used for industrial materials such as automobile interiors and industrial waste cloth (18%), while the rest (about 65%) are discarded.

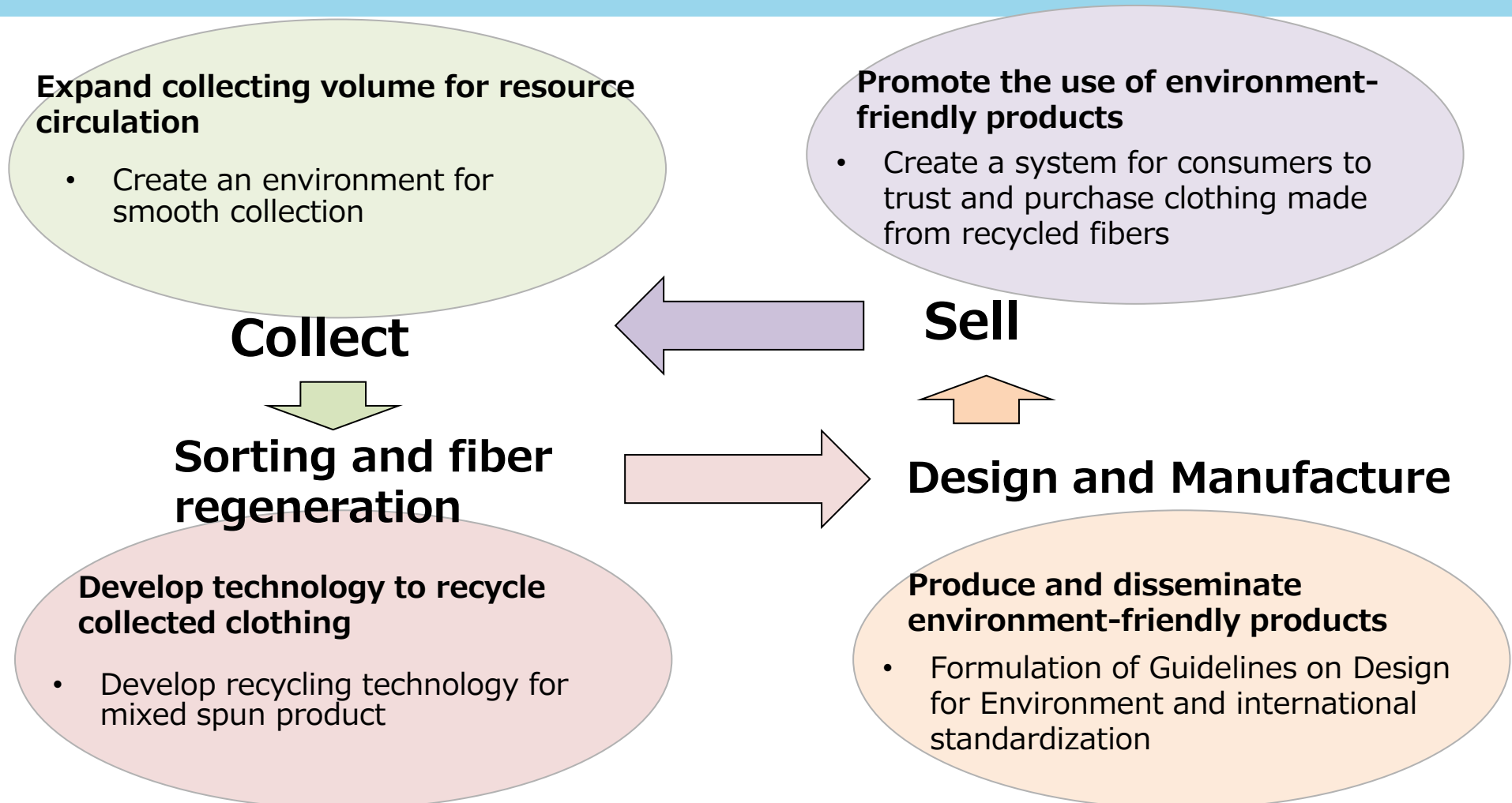
Clothing Material Flow in 2022  
(in ten thousand tons)



Source : FY2022 Survey on Measures to Promote Circular Fashion(2023), MOE

# Issues and Directions of Initiatives for Building Resource Circulation Systems for Textile Products

- For textile companies in Japan to maintain, secure, and expand competitiveness in overseas markets where demand is expected to grow in the future, Study Group on Resource Circulation System for Textile Products was launched in January 2023. The Group has identified issues and directions of initiatives to build a resource circulation system. After seven discussions, the report was compiled in September 2023.



# Advancement of RFID Technology in Textile Products (traceability)

- To build a resource circulation system for textile products, it is necessary to promote digitalization of traceability information in each process in the supply chain.
- Registration and acquisition of traceability information using RFID is one of the effective methods.
- Chakyu Dyeing Co., Ltd. has developed fibers containing RFID.

## Chakyu Dyeing Co., Ltd. Flexible RFID tags in the form of threads



Chakyu has developed FurFilo, in which an electronic chip with RFID as a core is equipped in the form of threads. With its flexible thready shape, it can be used for weaving, knitting and sewing. RFID can also be read in a state of winding, bending, or tying.

# Promotion of Technology Development by Japanese Government

- To build a resource circulation system for textile products, it is necessary to develop technologies to solve recycling problems particular to textile products.
- For this reason, the Ministry of Economy, Trade and Industry and NEDO (New Energy and Industrial Technology Development Organization) are supporting the development of technologies that contribute to textile recycling.

NEDO Feasibility Study Program / Feasibility Study Program on Energy and New Environmental Technology

R&D Theme	Starting in FY	Implementation system	R&D contents	Issues to be solved
Circularity of Plant-based Fibrous Resource	2022	Shinshu University Nisshinbo Holdings Inc. Nisshinbo Textile Inc. Nakamura Service, Inc.	Development of technology for recycling plant-based fibers such as cotton by chemical treatment	<ul style="list-style-type: none"> <li>• Development of ionic liquids capable of dissolving, recovering and reusing cellulose</li> <li>• Technology for producing high-strength regenerated cellulose fibers</li> <li>• Optimization of spinning process</li> </ul>
Water-free and no CO <sub>2</sub> -emission dyeing and finishing technology	2022	SUSTAINA TECH Co., Ltd. University of Fukui KIWA Chemical Industry Co., Ltd. HISAKA WORKS, LTD. URASE CORP.	Development of dyeing and decoloration technology using supercritical carbon dioxide instead of water	<ul style="list-style-type: none"> <li>• Process development applicable to a wide variety of textile materials</li> <li>• Development of dyes and establishment of decoloration technology</li> <li>• Zero water consumption and energy saving</li> </ul>
Sorting and separation technology for resource circulation of textile products	2023	Toray Industries, Inc. TEIJIN FRONTIER CO., LTD. Kobe University	Development of efficient sorting technology for collected textile products and pretreatment technology for mixed spun products	<ul style="list-style-type: none"> <li>• Development of automatic material sorting technology</li> <li>• Development of technology for separating and extracting textile materials from mixed spun products</li> </ul>



# Textile Companies Engaged in Design for Environment (Easy-to-recycle Design)

- To build a resource circulation system for textile products, it is important to design products that are easy to disassemble and recycle.

## Towa Co.,Ltd.

Developed thread which dissolves in hot water for efficient disassembly of textile products



Developed sewing thread "Ameltis" which dissolves in hot water.

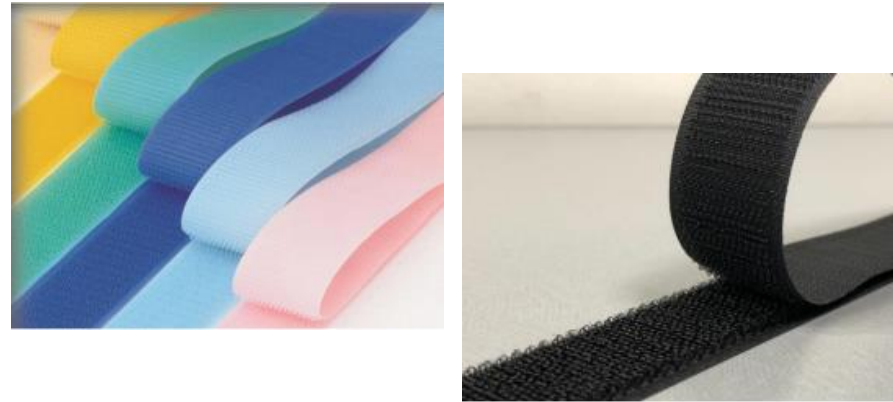
Secondary materials are unpicked by manual cutting, but with Ameltis which dissolves by immersing it in hot water of 95°C for 30 minutes, the product including secondary materials can easily be disassembled.

## Kuraray Co.,Ltd.

(Kuraray Fastening Co., Ltd)

<MAGICTAPE™>

Material recyclable 100% polyester fastener



Developed 100% polyester hook and loop fastener.

It does not use a back-coat agent to prevent decline in durability. However, it has excellent durability and material recyclable.

# Textile Companies Engaged in Design for Environment (Use of plant-based materials)

- The use of petroleum-based raw materials causes global warming and resource depletion, and there is a need to switch to environment-friendly raw materials. Even for natural fibers, consideration must be given to the use of agricultural chemicals and animal welfare at the production process.
- Therefore, development and production of textile products using plant-based materials are expected.

## Spiber Inc.

High performance artificial structural protein fiber using plant-based materials



Developed artificial structural protein Brewed Protein™ materials.

They are manufactured through microbial fermentation of plant-based biomass. Its biodegradability is expected to contribute to reducing microplastic emissions.

## Toray Industries, Inc.

100% plant-based polyester material



Developed 100% plant-based polyester made from ethylene glycol produced from sugarcane molasses and terephthalic acid from corn starch.

While plant-based ethylene glycol can be mass-produced, terephthalic acid is difficult to produce. Toray is collaborating with a startup to mass-produce plant-based terephthalic acid.

# Rulemaking and Standardization for Resource Circulation

- In order for consumers to purchase recycled products and environment-friendly products without worry, it is effective to ensure and spread quality by standardizing product definitions and evaluation methods.
- METI is conducting several standardization projects for resource circulation of textile products. Japan strives for international standardization to strengthen its international competitiveness in the future.

## Standardization Study on Digitalization of Traceability Information in Clothing Using IC Tags

Visualize product specific information by attaching an IC tag to a textile product. With this technology, used clothing can be automatically sorted in the resource circulation process of textile products. Efficiency improvement of textile product recycling process can be expected.

Organize the necessary traceability information items and consider methods for registering and acquiring information at each stage of the supply chain.

In addition, data carriers such as UHF RFID are examined to verify the frequency of use and durability.

### 【Traceability information】

- Month/year/place of production, and producer
- Material/mixing ratio of textile products
- Distribution history
- Repair history
- Recycling information

## Guidelines on Textile Product Design for Environment

In recent years, adopting rules for textile product design for environment has been rapidly advancing in Europe. It is an urgent issue to deal with textile product design for environment in Japan.

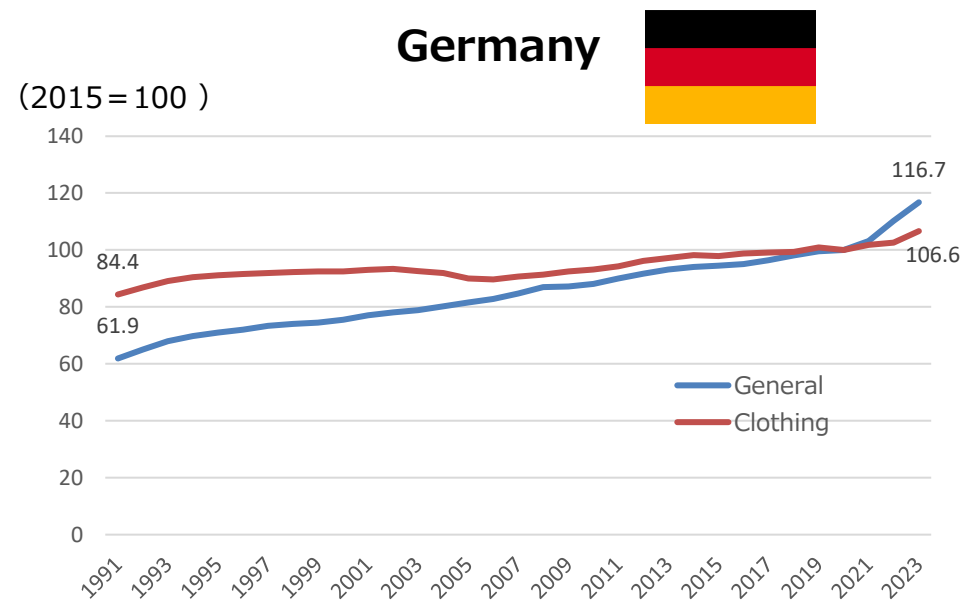
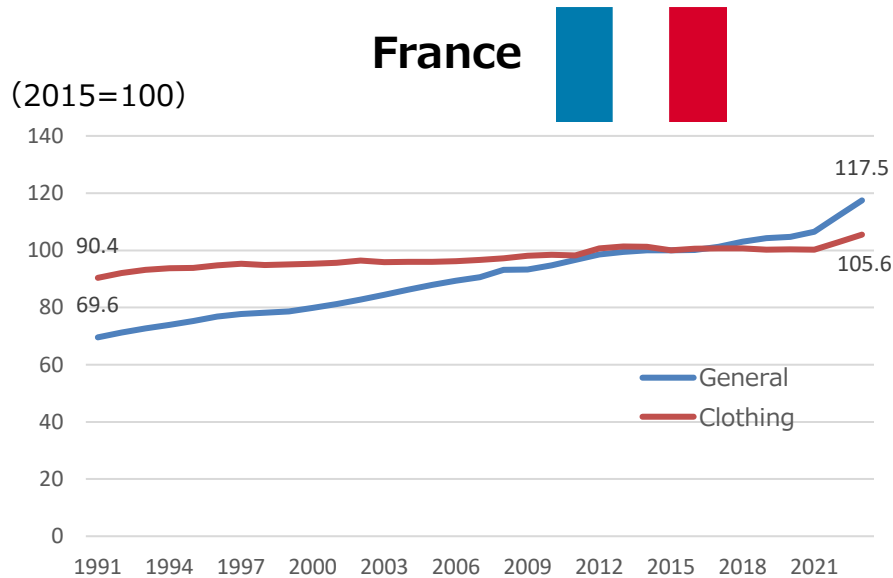
To provide users in Japan and overseas with easy-to-understand information on initiatives for design for environment, textile product design for environment items and the evaluation criteria have been compiled based on trends in textile product design for environment in Japan and overseas.

### 【Textile product design for environment items in guidelines】

1. Use of raw materials with low environmental impact
2. GHG emission controls and energy saving
3. Safety considerations
4. Water resource considerations
5. Waste control
6. Control of packaging materials
7. Reduction of fiber waste generation
8. Long-term use
9. Utilizing repair and reuse services
10. Easy-to-recycle design
11. Recycling of textile products

# Changes in Consumer Price Index for Clothing in Europe

- Consumer price indexes(CPI) for clothing in France and Germany are rising gently. The CPI for clothing in the UK declined, but has since begun to rise from 2009.
- The increase in the CPI for clothing is smaller than the increase in general CPI.

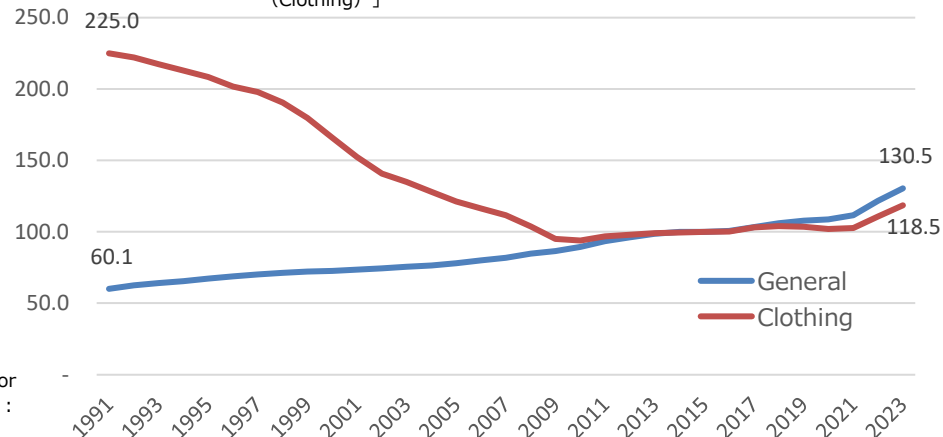


Source : Compiled by Japan Research Institute, Inc. from Insee 「Annual consumer price index - Base 2015 - All households - France - All J」, 「Annual consumer price index - Base 2015 - All households - Metropolitan France - Coicop classification: 03.1 - Clothing items」

Source : Compiled by Japan Research Institute, Inc. from Federal Statistical Office 「Consumer price index: Germany, years」, 「Consumer price index: Germany, years, individual consumption by purpose (Clothing)」

### UK

(2020 = 100)



Source : Compiled by Japan Research Institute, Inc. from Office for National Statistics 「CPI INDEX 00: ALL ITEMS」, 「CPI INDEX 03.1 : CLOTHING」

# Points for discussion

- **In light of trends in Europe**

- In Europe, there is a high level of awareness of human rights and the environment in the textile industry, and rapid progress is being made in rule formation from the perspective of sustainability considerations.
- On the other hand, is it possible to contribute to ensuring the sustainability of the textile industry in Japan and abroad by utilizing recycling-related technologies and productivity-enhancing technologies possessed by Japanese textile companies and SMEs?
- In addition, in order for Japan's textile industry to maintain and strengthen its industrial competitiveness in overseas markets, it may be necessary to appropriately understand the trend of institutional reforms in Europe, and to cooperate with European countries that have introduced regulations ahead of Japan.
- In light of this, we should accurately understand the current status of the development of rules and systems in Europe and the issues in France, where regulations have been introduced ahead of other countries, with a view to cooperation in technical aspects and institutional development.
- What actions should be taken by companies and the government so that Japanese textile companies can increase their presence overseas?