

Toray Group Fibers & Textiles Business

January 11, 2018

**Toray Industries, Inc.
Senior Vice President
General Manager, Fibers & Textiles Division
Mitsuo Ohya**

- I. Toray Group Profile**
- II. Business Environment**
- III. Outline of Toray Group Fibers & Textiles Business**
- IV. Basic Policy and Issues of Toray Group
Fibers & Textiles Business in “Project AP-G 2019”**
- V. Future Direction of Toray Group Fibers & Textiles
Business**

I. Toray Group Profile

Established : January 1926

Capital Stock : 147.9 billion yen
(as of March 31, 2017)

Consolidated Net Sales : 2,026.5 Billion Yen
(FY March/2017)

Number of Consolidated Companies : 255
(Japan: 99, Overseas: 156)
(FY March/2017)

Number of Employees : Toray	7,220
(As of March 31, 2017) Japanese Subsidiaries	10,657
<u>Overseas Subsidiaries</u>	<u>28,371</u>
Total	46,248



Akihiro Nikkaku
President

<Corporate Philosophy>

Contributing to society through the creation of new value with innovative ideas, technologies and products

<Corporate Missions>

For our customers	To provide new value to our customers through high-quality products and superior services
For our employees	To provide our employees with opportunities for self-development in a challenging environment
For our stockholders	To provide our stockholders with dependable and trustworthy management
For society	To establish ties and develop mutual trust as a responsible corporate citizen

Sales and Operating Income by Business Category and Segment

Position Core Growth Driving Businesses and Strategically Expanding Businesses as the drivers of revenue and profit growth. Nurture Intensively Developing and Expanding Businesses to be the next profit base.

(Mar/ 2017)

Basic Categories	Segments	Major Products	Net Sales Billion yen	Operating Income Billion yen
Core Growth Driving Businesses	Fibers & Textiles		856.1 (42%)	66.8 (39%)
	Strategically Expanding Businesses	Performance Chemicals		724.6 (36%)
		Carbon Fiber Composite Materials		161.6 (8%)
Intensively Developing and Expanding Businesses	Environment & Engineering		212.5 (10%)	11.7 (7%)
	Life Science		54.2 (3%)	2.1 (1%)
Others			17.4	2.6
Adjustment				▲22.1
Total			2,026.5	146.9

Long-term Corporate Vision and Medium-term Management Program

Long-term Corporate Vision

AP-Growth TORAY 2020 (Vision 2020 (abbr.))

Medium-term Management Program

AP-G 2013
Reform and Proactive Management
 - A New Growth Track -

AP-G 2016
Innovation and Proactive Management
 - Implementation of Growth Strategy -

AP-G 2019
Innovation and Proactive Management
 - To Achieve the Vision 2020 Goals -

2011
April

2014
April

2017
April

2019
March

AP-G 2016

8 Basic Strategies

1. Business expansion in growth business fields
2. Business expansion in growth countries and regions
3. Bolstering competitiveness
4. Strengthening sales and marketing
5. R&D strategies / intellectual property strategies
6. Capital investment strategies
7. M&A and business alliance strategies
8. Human resources strategies

AP-G 2019

3 Basic Strategies

1. Business expansion in growth business fields
2. Expansion and advancement of global business
3. Strengthening competitiveness

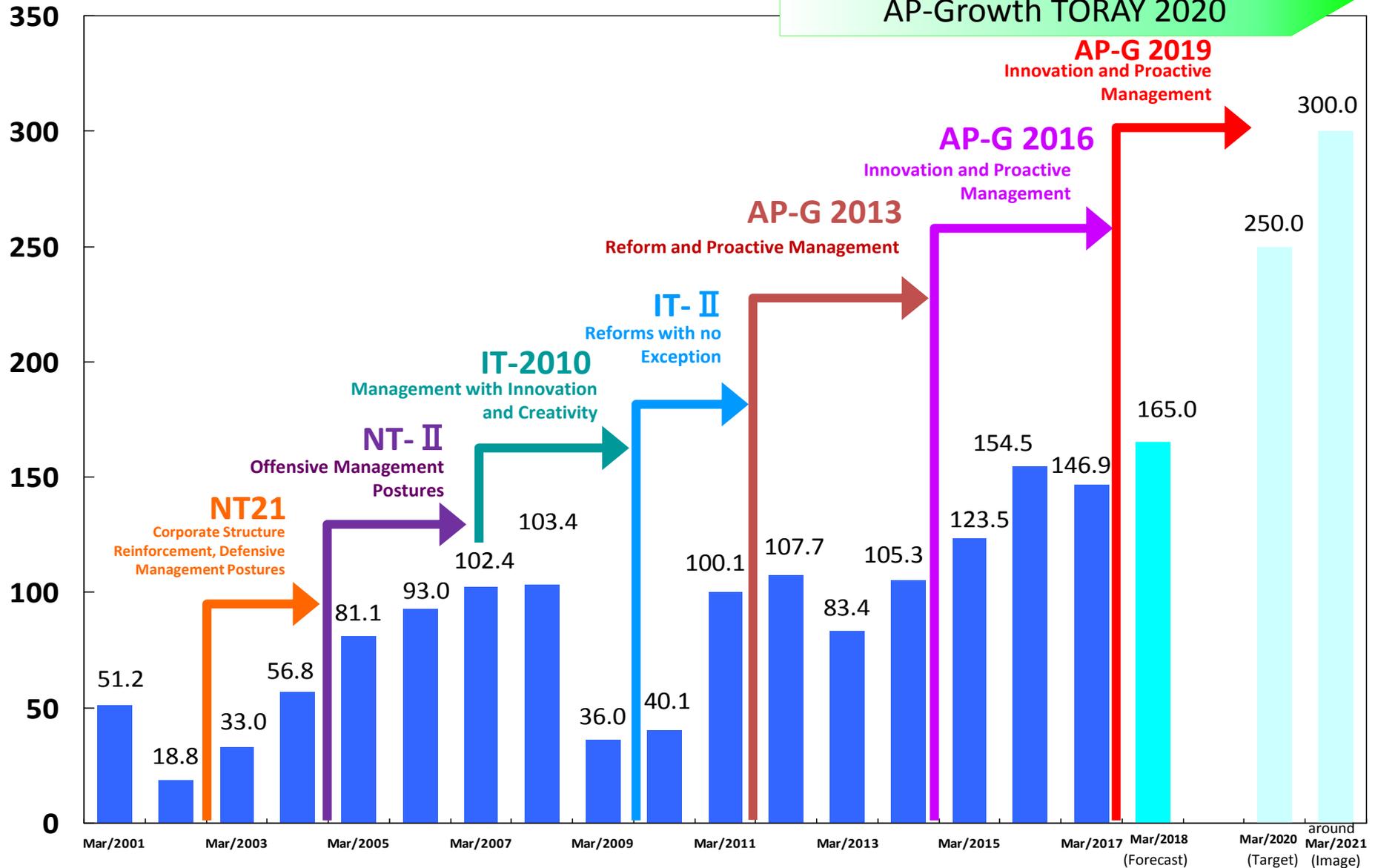
5 Key Initiatives

1. New business creation
2. R&D and intellectual property
3. Capital investment
4. M&A and business alliances
5. Human resources



Medium-term Management Program and Trends in Consolidated Operating Income

Billion yen



Long-term Corporate Vision
AP-Growth TORAY 2020

II. Business Environment

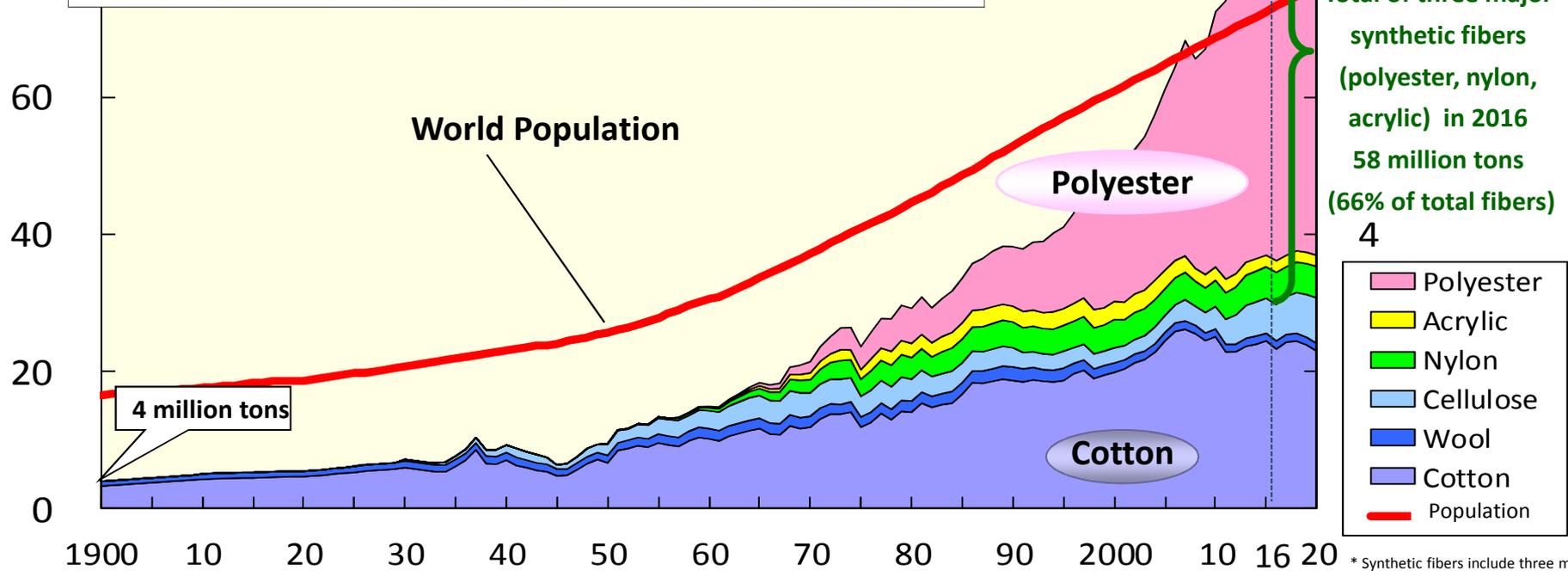
Fibers & Textiles is Still a Growth Industry in the 21st Century

Million tons/year

Population (Billion)

- Fiber production volume increased by more than 20 times from 4 million tons to 88 million tons.
- Synthetic fibers have accounted for over 50% of total fibers since the late 1990s.
- Synthetic fibers (polyester, nylon, acrylic) totaled 58 million tons in 2016 (66% of total fibers)
- Further growth expects mainly in polyesters.

Total of major fibers in 2016
88 million tons



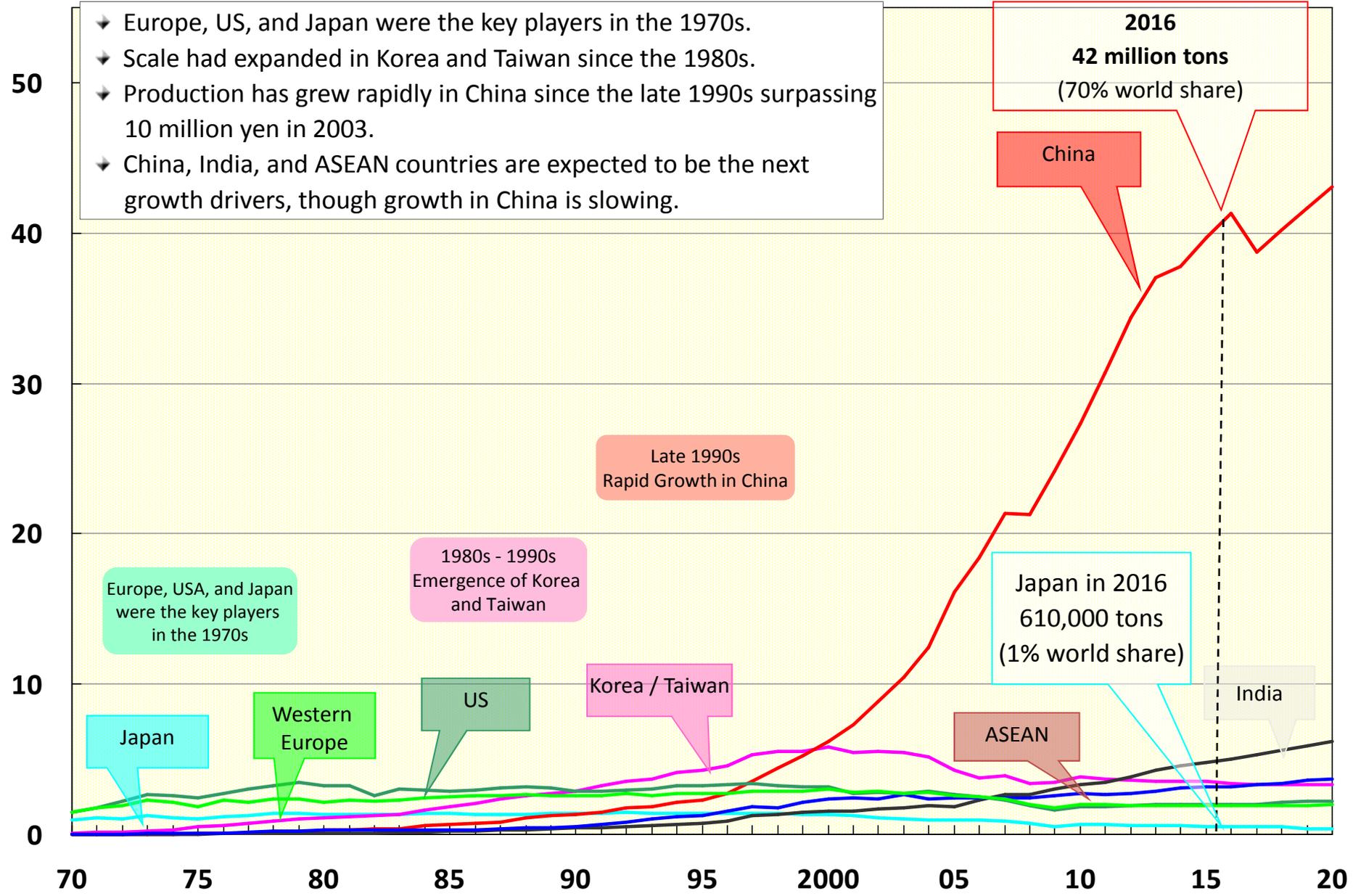
* Synthetic fibers include three major synthetic fibers.

Demand for fibers and textiles is expected to continue to grow as long as there are needs for improving life and culture and the prosperity of humankind

Source: Production volume of 1900~2016 is based on the estimation by the Japan Chemical Fibers Association, Fiber Organon, and estimation of the production volume from 2017 and onwards is based on the PCI Supply/Demand Report 2016. World's population trend is from the US Bureau of the Census International DB

Production Volume of Synthetic Fibers in Major Countries and Regions

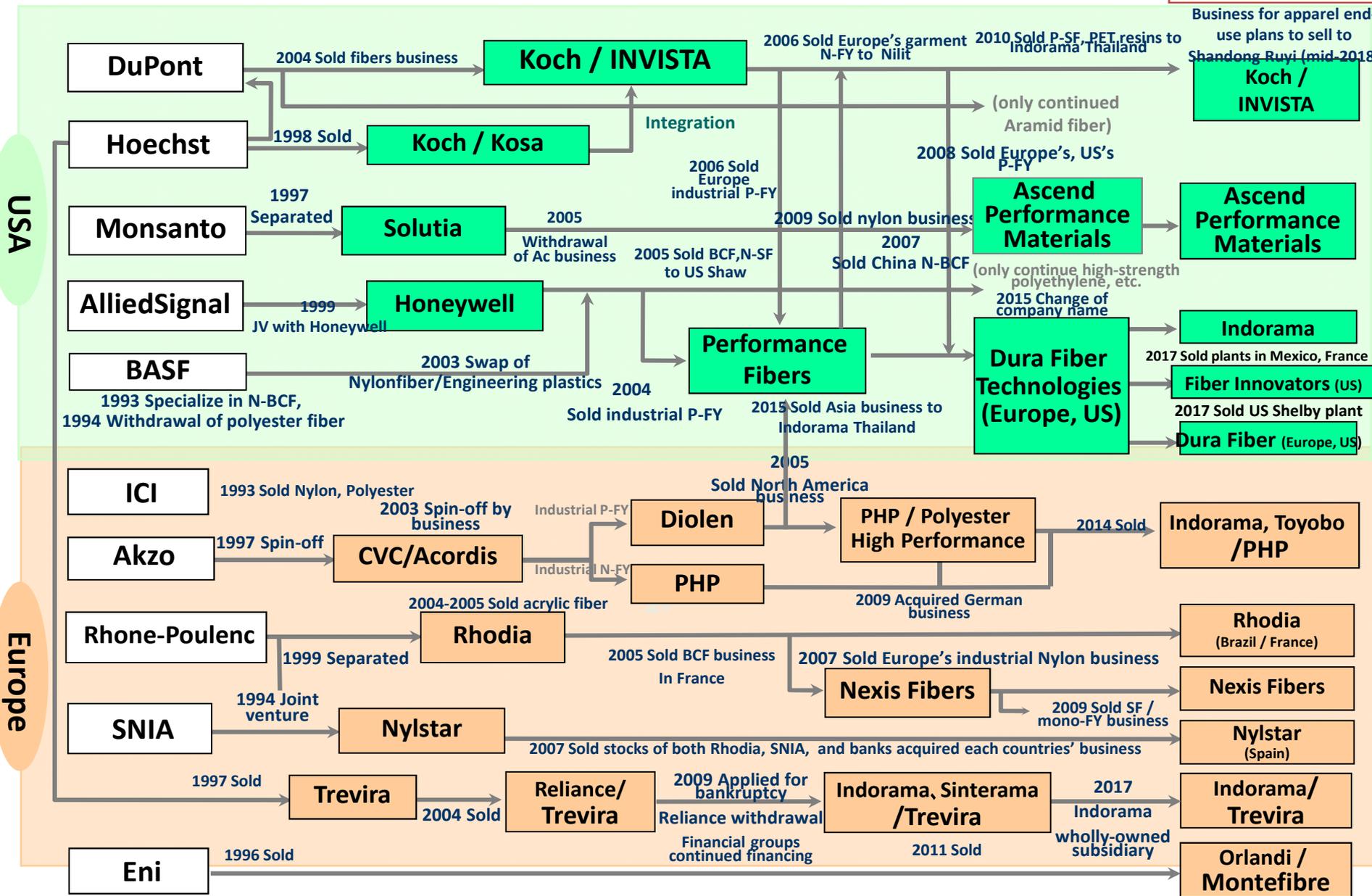
Million tons / year



Restructuring of Fibers & Textiles Business at Major Synthetic Fibers Manufacturers in Europe and the US

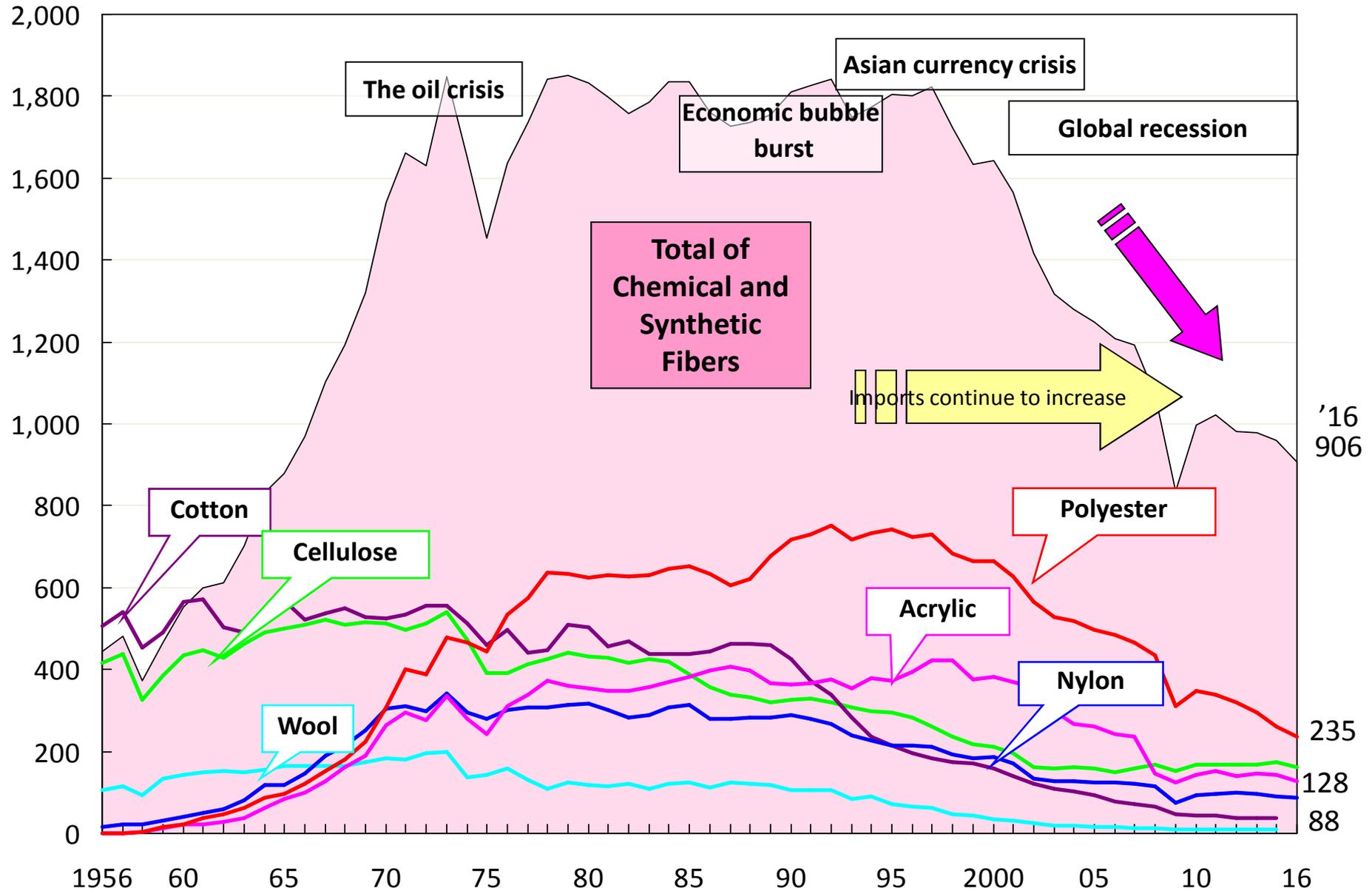
As of December 2017

Business for apparel end-use plans to sell to Shandong Ruyi (mid-2018)



Production Volume of Major Fibers in Japan

Thousand tons / year



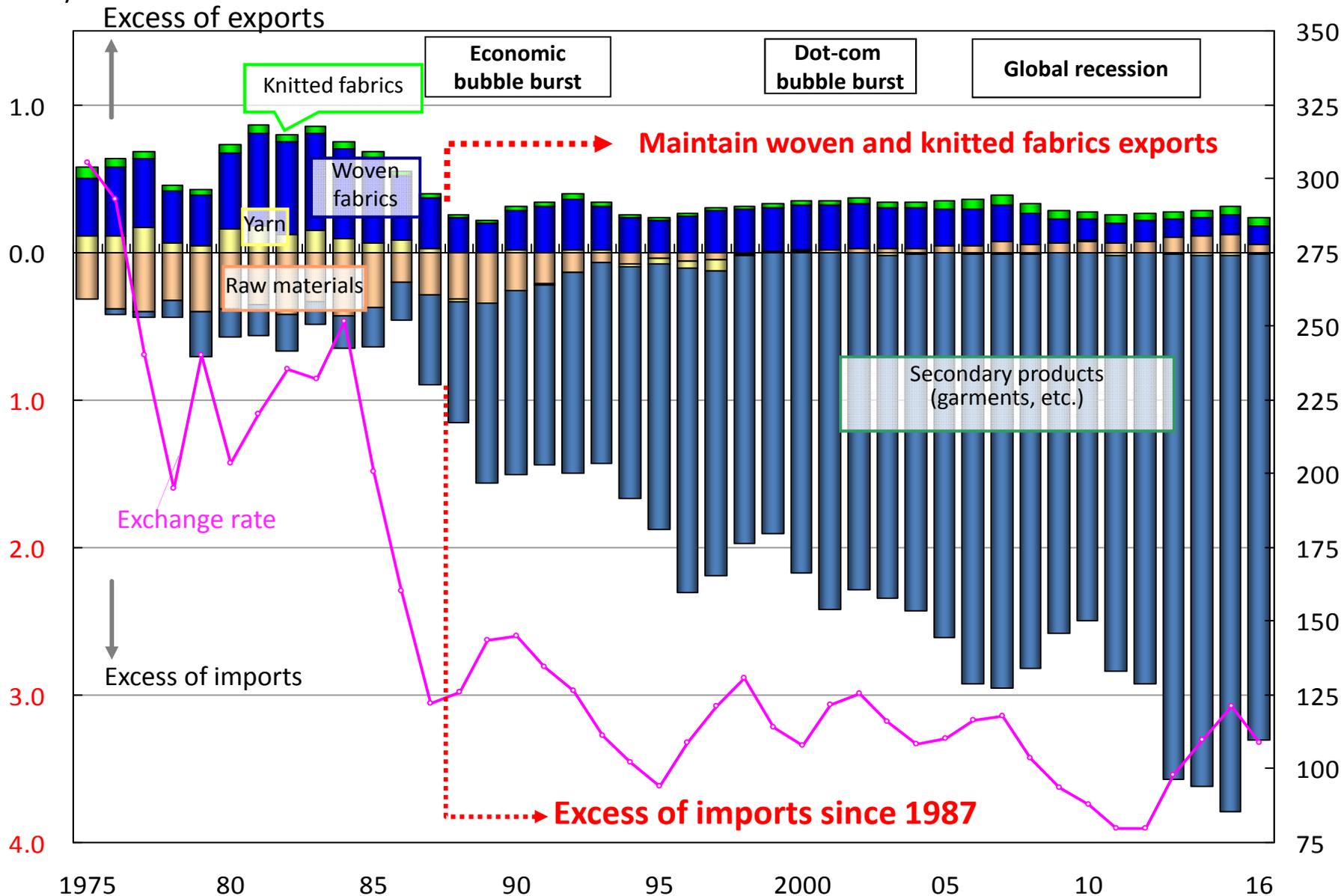
* Acrylic: Only staple fibers from 2001. Nylon: Only filament yarns from 2010.

Source: :Japan Chemical Fibers Association "Chemical Fibers Handbook", METI "Current Production Statistics Textiles and Consumer Goods."

Changes in Japan's Trade Balance of Fibers Products

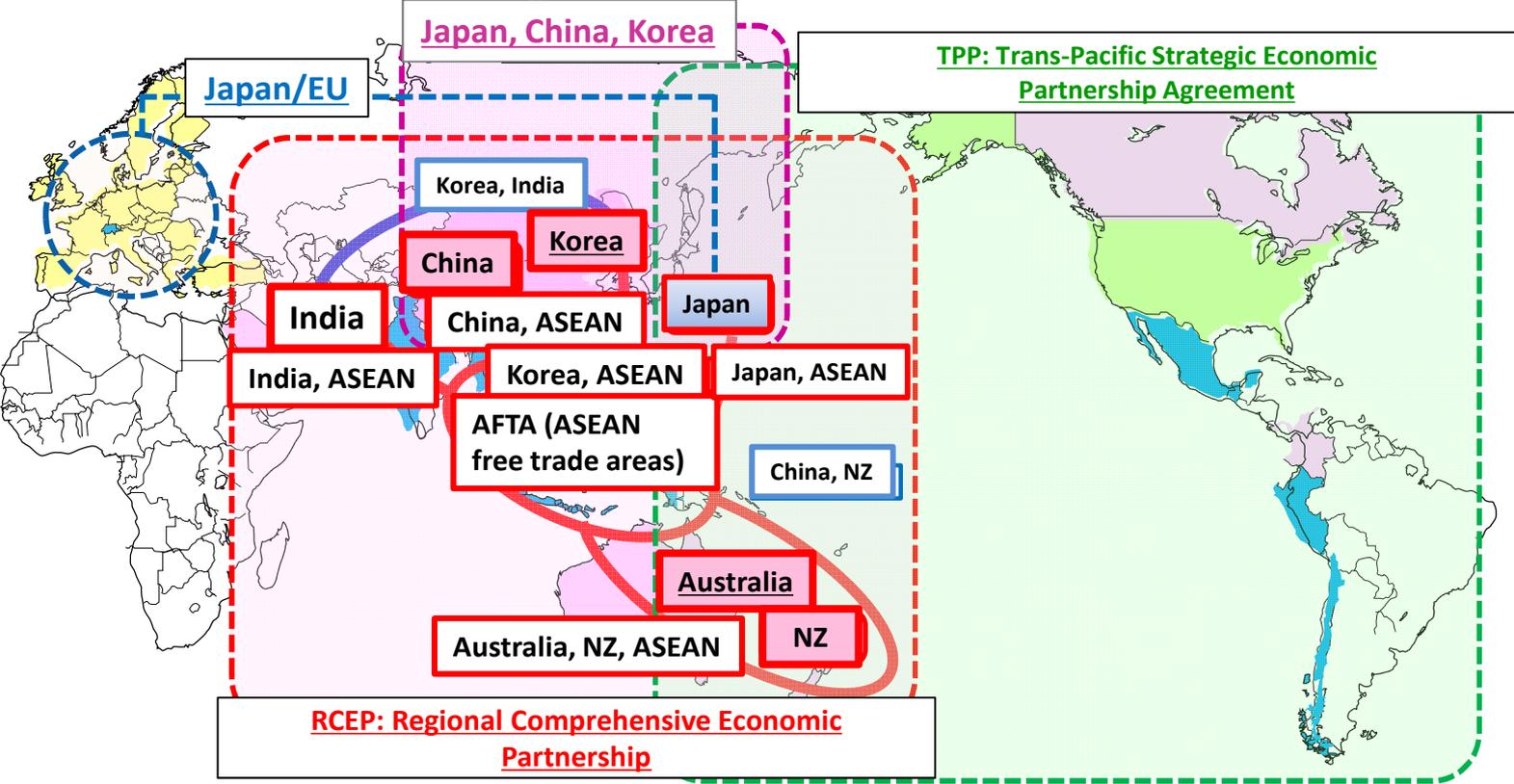
Yen /US\$

Trillion yen



Asian / Trans-pacific Economic Partnership

(As of December 2017)



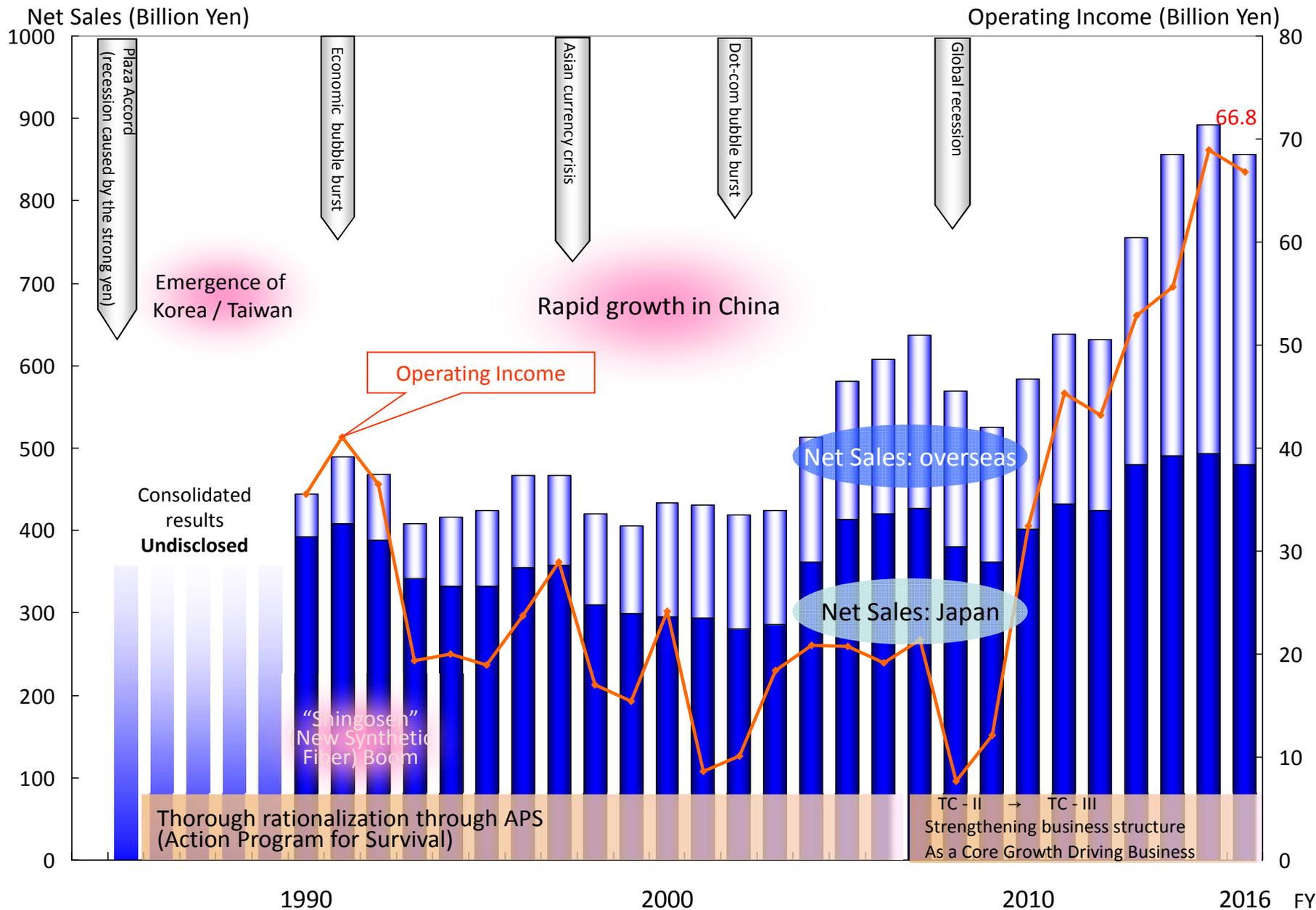
<Status of Initiatives of Japan's Economic Partnership (FTA)>

- Entered into force (14 countries, one region): Singapore, Mexico, Malaysia, Chili, Thailand, Indonesia, Brunei, ASEAN, Philippines, Switzerland, Vietnam, India, Peru, Australia, Mongolia
- Agreed (3 countries): TPP11 (agreed outlines), EU (negotiation settled), ASEAN investment service negotiation (agreed substantially)
- Under negotiation: Japan, China, Korea, RCEP, Turkey, Columbia
- Negotiation postponed or suspended (2 countries, one region): Canada, Korea, GCC (Gulf Corporation Council)

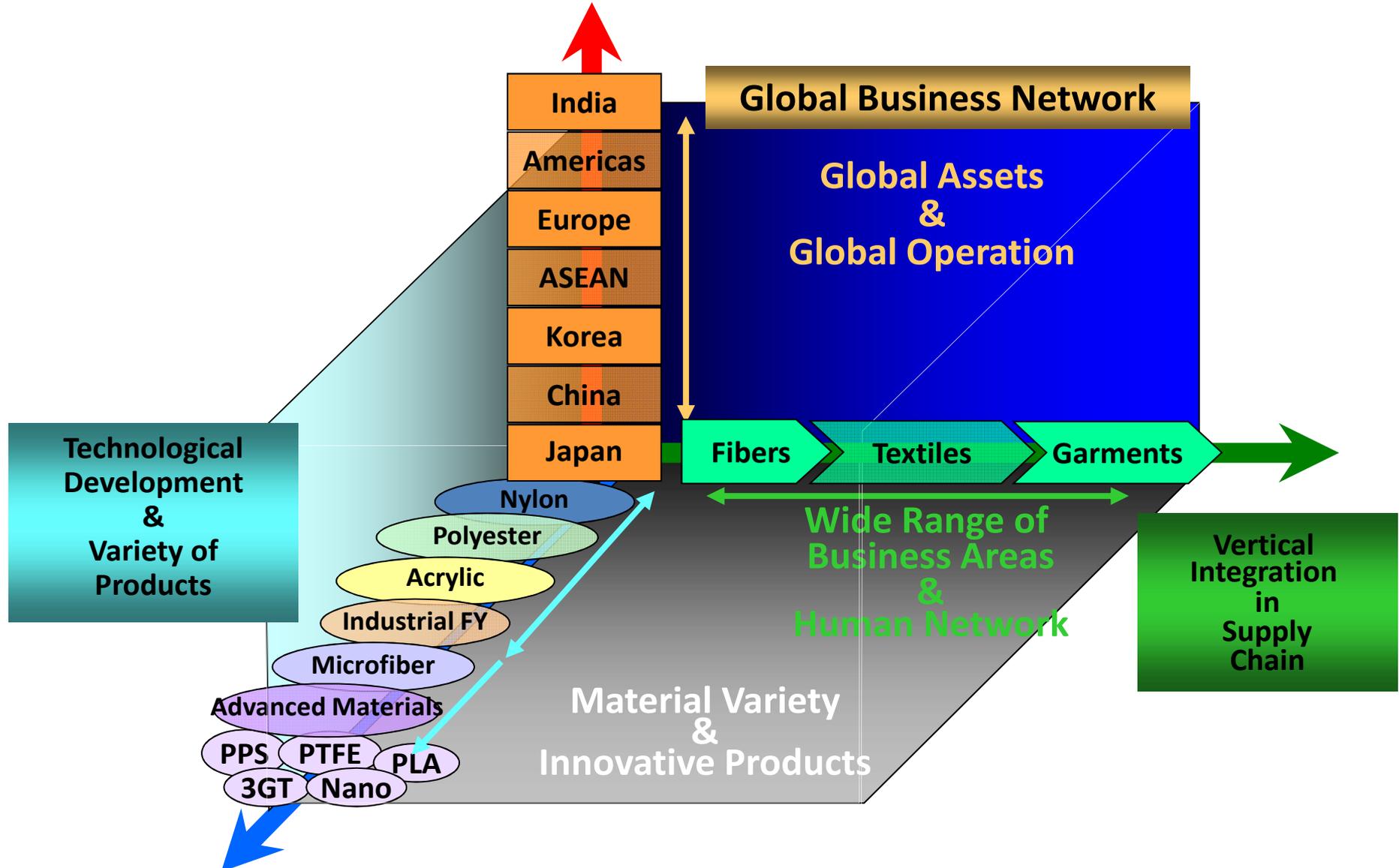
III. Outline of Toray Group

Fibers & Textiles Business

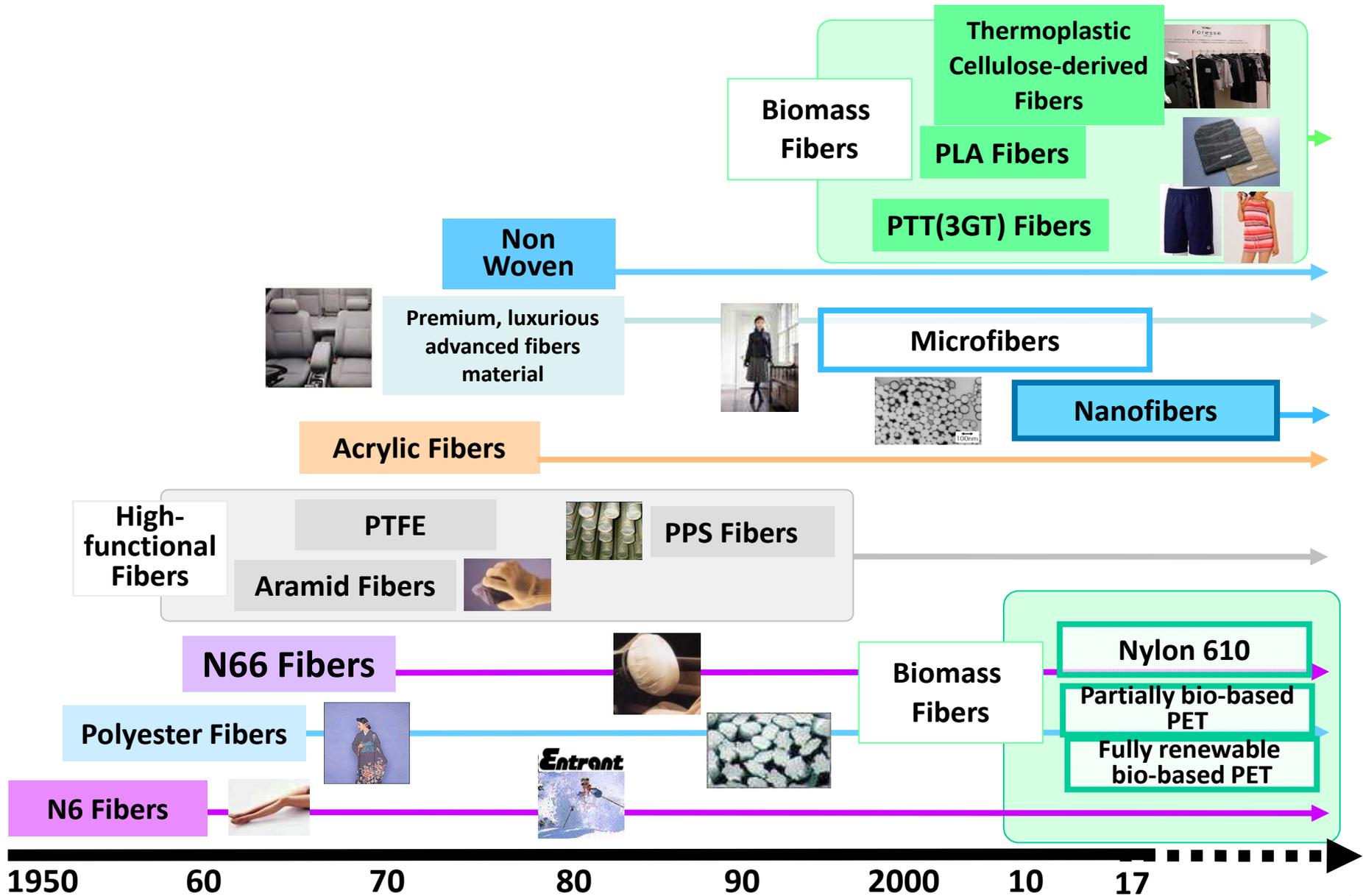
Long-term Performance of Toray Fibers & Textiles Business



World's Only Three Dimensional Business Model



Long-term Technological Development and Variety of Products



50 years of Accumulated Expertise: Toray “Sillook” 50th Anniversary (Year 2013)

Toray “Sillook” Kimono



Adopted in Europe’s Top Brands



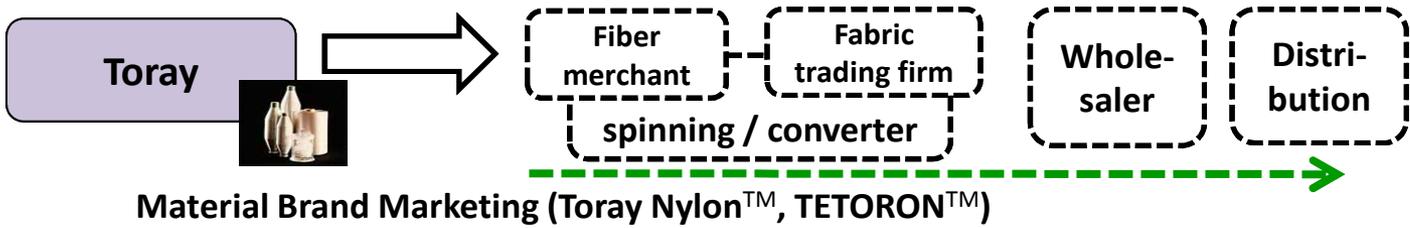
“Sillookduet-μ”



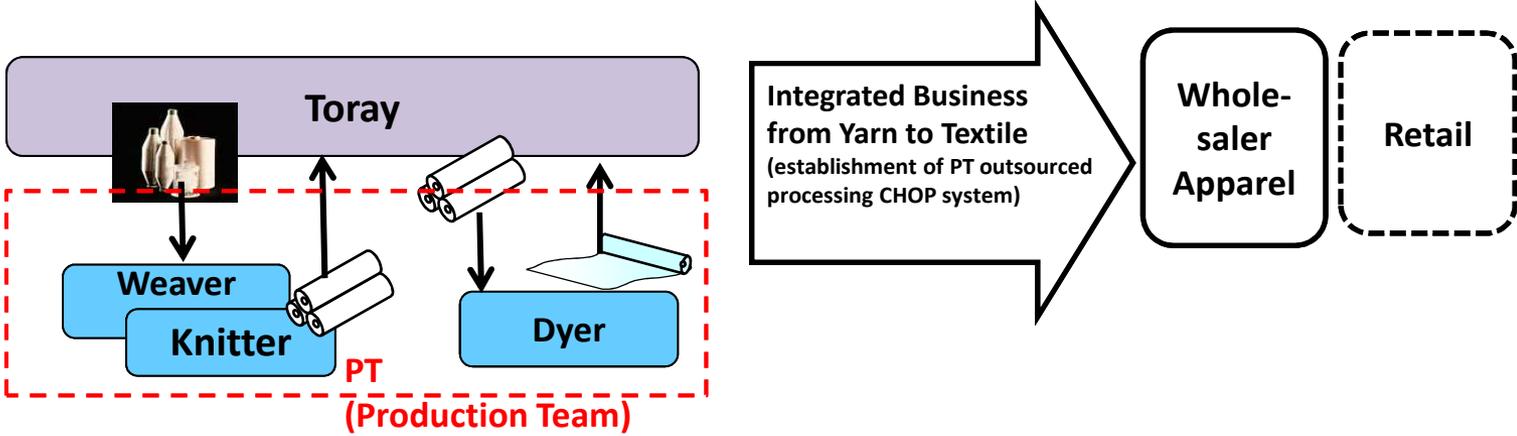
Since the development in 1963 to emulate the structure of natural silk and introduction to the market in 1964, Toray “Sillook” has been a leading synthetic fiber both in the Japanese and Western clothing style, and celebrated its 50th anniversary. Toray “Sillook” is continually evolving, and Toray will continue to propose new styles of the “Sillook” series as well as Toray “Sillook” Kimono for the next era.

Continuous Promotion of Marketing Innovation: Supply Chain Innovation

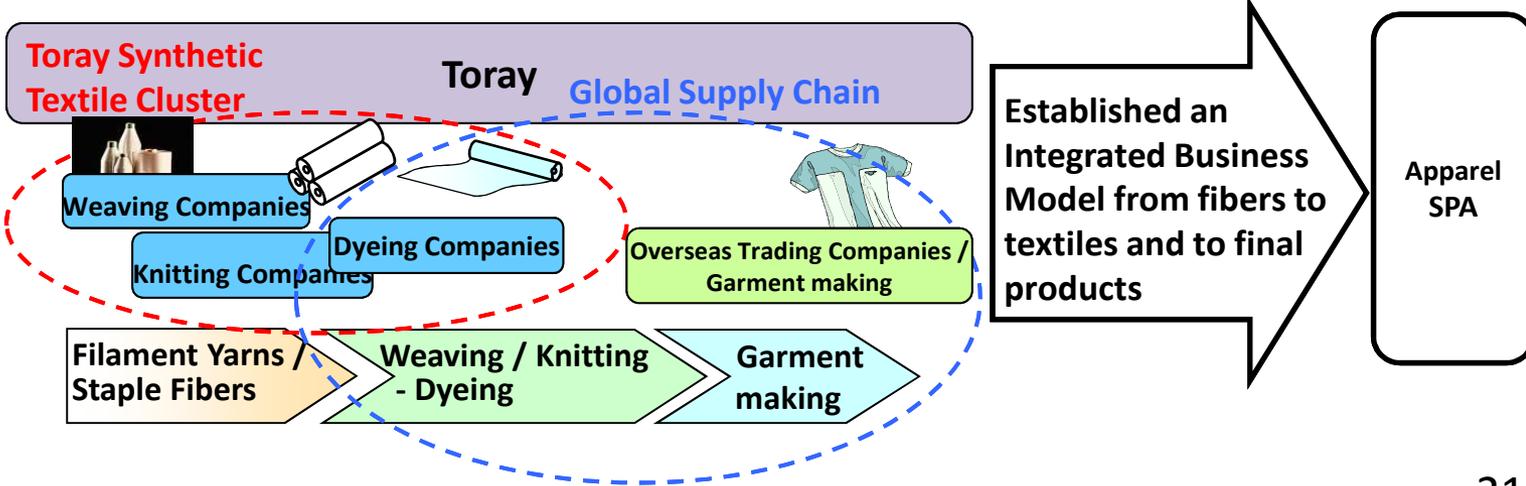
Dawning of the Market
↓
Introduction of Synthetic fibers Materials



1960s - 1970s
Establishment of the Ready-made Clothing Market
↓
Response to the Brand Apparel Market

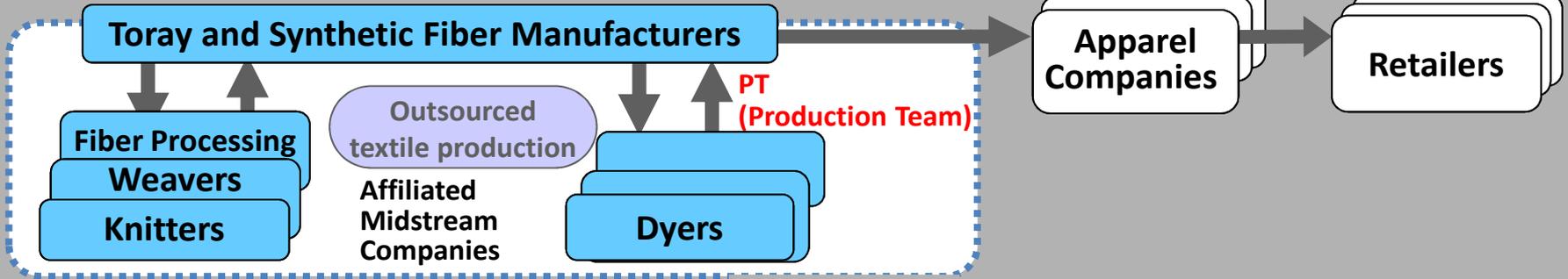


1990s – 2000s
Distribution Reforms
↓
Response to the expansion of First Fashion SPA Market

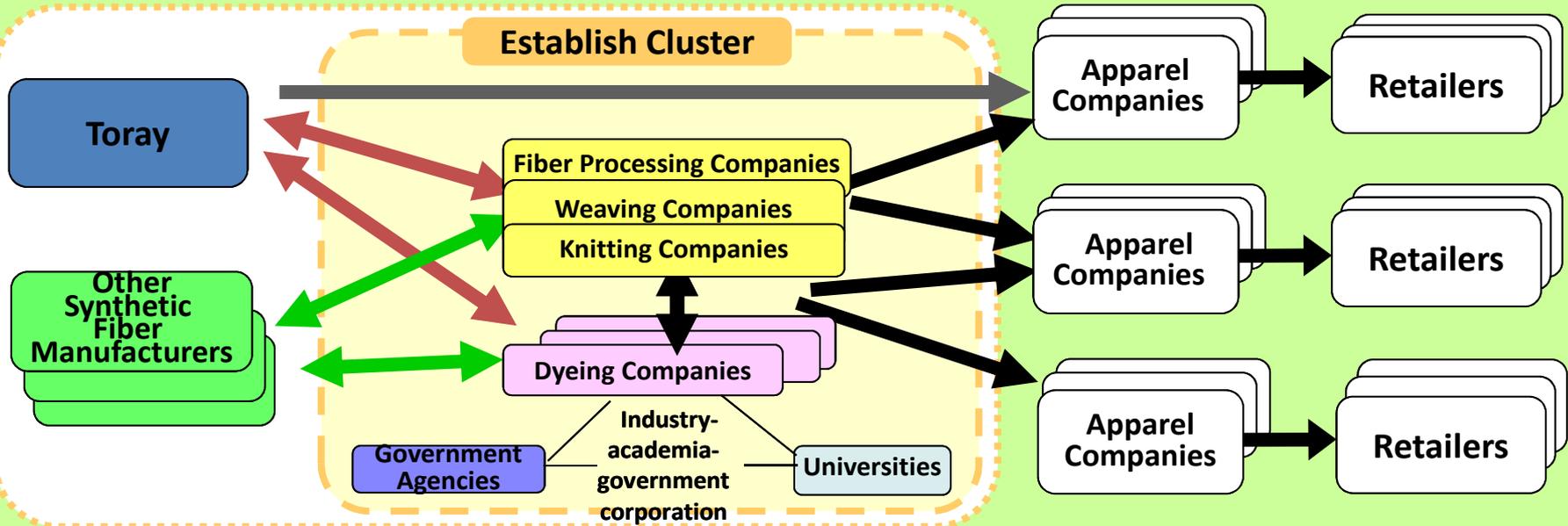


Business Model of Toray Synthetic Textile Cluster

Traditional Business Model



An Opened Business Model



Toray Synthetic Textile Cluster: Innovative business model for the next generation, transformed from the traditional outsourced textile production model

- A New Business Model Unique in the World -

Realizes “Total Industry” which integrates designing, developing, producing, and distributing of products from materials to final goods.

Filament Yarns /
Staple Fibers

Weaving / Knitting –
Dyeing

Garment
making

Retail

An integrated joint development and production system from materials to final products.

June 2006

“First Stage Strategic Partnership”
Agreement

Start of Next
Generation Material
Development Project



Created a 200 billion Yen scale business by
supplying materials and products
(5 years from 2006 to 2010)
<Achieved 250 billion yen>

July 2010

“Second Stage Strategic Partnership”
Agreement

Expand Global
Initiatives



Created a 400 billion Yen scale business by
supplying materials and products
(5 years from 2011 to 2015)
<Achieved 600 billion yen>

November 17, 2015

“Third Stage Strategic Partnership”
Agreement

Develop innovative new products
utilizing core technologies
Promote reasonable global operations



Created a 1,000 billion Yen scale business by
supplying materials and products
(5 years from 2016 to 2020)

Long-term Overseas Investment and Expansion of Global Business

Response to Industrial Development Programs in the Developing Countries: Established local production to maintain the export markets

Established	Country	Company Name	Business	Established	Country	Company Name	Business
1963 -	Thailand	TTTM	P/R spinning, weaving, dyeing	1970 -	Indonesia	ISTEM, CTX	P/R-P/C spinning, weaving, dyeing
		TNT	N-FY	1971 -		ITS	N-FY, P-FY, P-SF
				1973 -		ACTEM	A spinning

Response to the Strong Yen after the Nixon Shock and Export Regulations of Fibers & Textiles to the US: Established local production bases in ASEAN

1972 -	Thailand	LTX	P/C spinning, weaving, dyeing	1988 -	Thailand	LTX	P-FY weaving, dyeing (increased capacity)
1973 -	Malaysia	PFR	P-SF	1991 -		TFL	P-FY
	Indonesia	PAB	P/C spinning, weaving, dyeing				
		ETX	P/C spun, woven				

Response to the Opening of the Chinese Market

1994 -	China	TSD	FY weaving, dyeing, knitted (later: airbag fabric)
1995 -		TFNL	N-FY, P-FY

Response to the Strong Yen after the Plaza Agreement and the Economic Bloc in Europe and the US: Established local operational bases (Europe and US market)

1989 -	England	TTEL	FY weaving, dyeing
1995 -	Italy	Alcantara	Ultra-microfiber non-woven fabric with suede texture (acquired management rights) *2017 – capacity increase
1997 -	Czech	TTCE	FY weaving, dyeing (later: airbag fabric)
2002 -	America	TFA	Flurofiber

Response to the Growth Market ☆Further investment for capacity increase, advancement of business and upgrading of overseas bases

1999 -	Korea	TAK	P-FY non-woven (increase in '16-'18)	2009 -	Indonesia	TPJ	Non-woven (increased in '15-'16)
2003 -	Thailand	TTS/LTX	Yarn and fabric for airbag	2013 -	Korea	TCK	P-SF, P-FY
2006 -	China	TPN	Non-woven (increased in '12-'15)	2014 -	India	TKAT	Fabric for airbag
2009 -	Bangladesh	TMBD	Knitted, dyeing, garment	2015 -	Mexico	TAMX	Yarn and fabric for airbag
				2017	Hong Kong	PTHL	Knitted, dyeing (investment)

50 years History of the ASEAN Business

50th Memorial Ceremony in Thailand

March 20, 2013



40th Memorial Ceremony in Malaysia

April 10, 2013



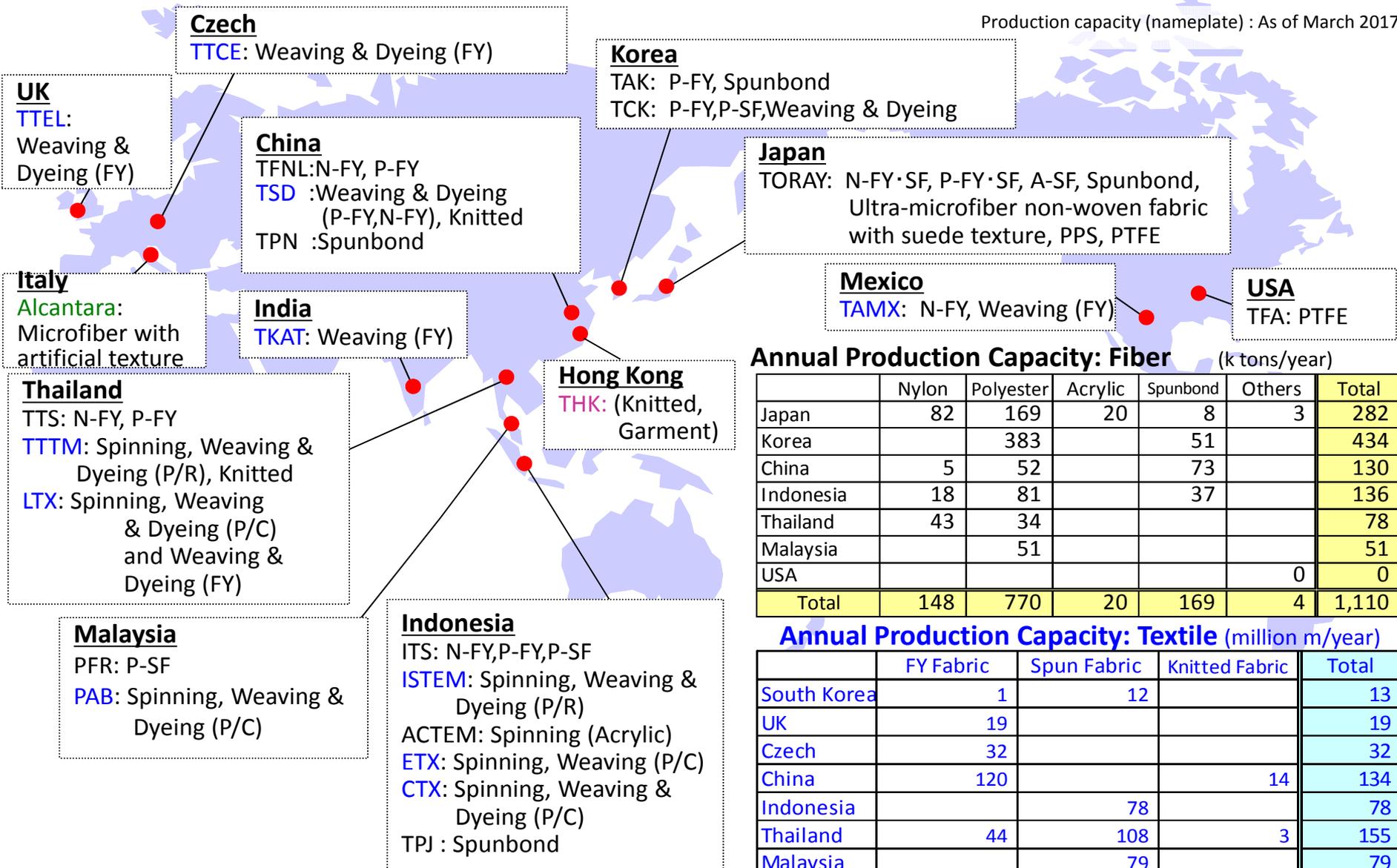
40th Memorial Ceremony in Indonesia

March 18, 2013



Toray Group's Global Network (Fibers & Textiles)

Production capacity (nameplate) : As of March 2017



Annual Production Capacity: Fiber (k tons/year)

	Nylon	Polyester	Acrylic	Spunbond	Others	Total
Japan	82	169	20	8	3	282
Korea		383		51		434
China	5	52		73		130
Indonesia	18	81		37		136
Thailand	43	34				78
Malaysia		51				51
USA					0	0
Total	148	770	20	169	4	1,110

Annual Production Capacity: Textile (million m/year)

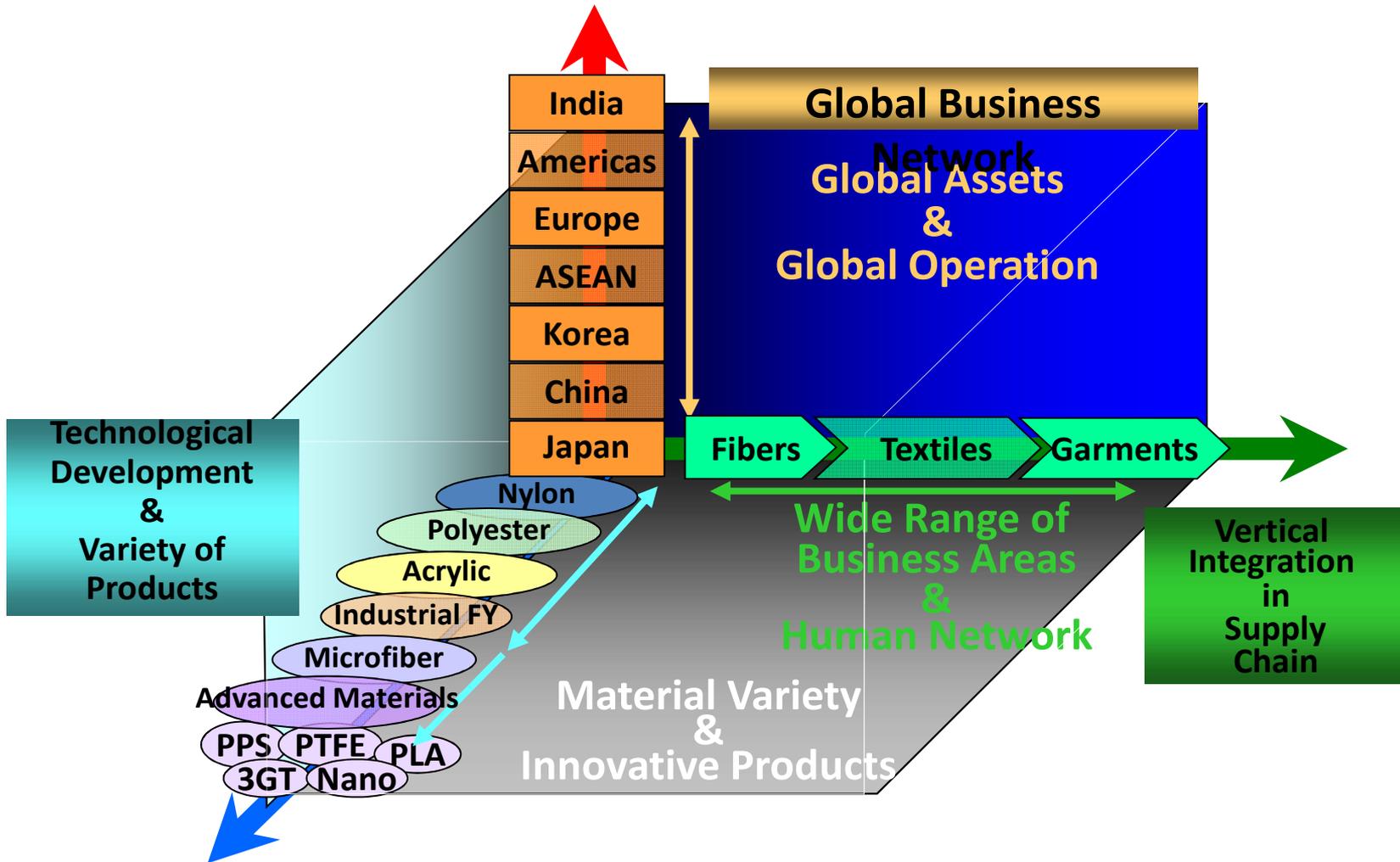
	FY Fabric	Spun Fabric	Knitted Fabric	Total
South Korea	1	12		13
UK	19			19
Czech	32			32
China	120		14	134
Indonesia		78		78
Thailand	44	108	3	155
Malaysia		79		79
Total	216	277	18	510

N: Nylon, P: Polyester, A: Acrylic, C: Cotton, R: Rayon
 Others: PPS (polyphenylene sulfide) and PTFE (polytetrafluoroethylene) fibers
 FY: Filament Yarn, SF: Staple Fiber P/C: Polyester/Cotton, P/R: Polyester/Rayon

* Others: microfiber with artificial texture: 6 million square meters/year (Japan) and 10 million square meters/year (Italy).

* Textile capacity includes TCTI (Indonesia) and does not include fabrics for airbag.

World's Only Three Dimensional Business Model



Provide solutions to customers by combining three elements : Variety of products based on technical development (Material domain), Supply chain, and Global business .

World's only business model that offers a global supply chain management integrating fibers and textiles to final products, and creates value-added products from the value chain of synthetic fibers.

IV. Basic policy and issues of Fibers & Textiles in “Project AP-G 2019”

Basic policy of Fibers & Textiles in “AP-G 2019”

Challenges to significant growth by strengthening the profit structure as the Core Growth Driving Business, expanding business in growth business fields and regions , and enhancing global operations

Japan: Maintain domestic business foundation and strengthen competitiveness

- Maintain and reinforce business foundation
- Maintain and reinforce partner fabric manufactures
- Further strengthen competitiveness

Overseas: Reinforce overseas production bases and expand new sites

- Reinforce business foundation of existing sites and businesses
- Expand business in growth business fields and regions

Functional enhancement of HQs as a comprehensive controller : Strengthening of global operation

Expand business domain

- Expansion of material domain
- Creation of new business models
- Strategic M&A, alliance

Creation of new business domain

Extend and diversify global supply chain

- Equip multi-layered supply chains
- Establish strategic supply sources

Multilevel business development and expansion by combining the three elements of Material domain, Supply chain, and Global business development

Expand Toray Group Fibers & Textiles business by enhancing global SCM from fibers and textiles to final products and value chain of strategic materials and by extending new business domain

Major issues of Fibers & Textiles in “AP-G 2019”

Main Issues	Themes
1. Structural & competitiveness improvement	<ul style="list-style-type: none"> Strengthen business structure Strengthen competitiveness
2. Expansion in growth fields	<ul style="list-style-type: none"> Expand GR business Expand LI business
3. Expansion and advancement of global business	<ul style="list-style-type: none"> Expand business in growth regions and markets Pursue global brand strategy
4. Strategic creation of new business	<ul style="list-style-type: none"> Extend business domain by expansion of non-woven fabric businesses Extend and diversify global supply chain
5. Advancement of business model	<ul style="list-style-type: none"> Strengthen cooperative relationship with Major SPAs & Apparels Expand integrated business from fiber to fabric in non-apparel fields
6. Organization and Human resources	<ul style="list-style-type: none"> Reinforce organization responding to enhanced global operation Optimize headcount and securement and education of global HR

Major businesses and products supporting growth



Integrated business from fiber and textile to final products

PP-SB for hygiene application

Fibers & textiles for airbags

Premium, luxurious advanced fibers material



Strengthening business structure and cost competitiveness as the core growth driving business

1. Continually strengthen business structure

(1) Business foundation in Japan



Maintain domestic production bases of all filament yarns and staple fibers

i) Improve sales efficiency

- Further improvement of asset efficiency by continued cost and inventory management
- Enhancement of sales and marketing (including further expansion of interpreted business) and optimization of headcount

ii) Improve production efficiency

- Continual reduction of variable and fixed costs (Unit cost improvement, value analysis, optimization of headcount)

(2) Japanese partner fabric manufactures

- Enhancing prioritization and reorganization of textile production sites
- Strengthening integrated operation between Toray Group fabric companies and partner fabric manufacturers



Maintain and enhance the world's highest level of textile production bases that support Toray's textile business

- Strengthening activities of Toray Synthetic Textile Cluster



Revitalize partner fabric manufactures

2. Strengthen competitiveness

(1) New product development, and new customer/application cultivation

- Optimum use of resource for high priority development themes
- Drastic speed-up of development / marketing

(2) Innovative production process

- Speeding up and simplifying of fiber production processes
- Efficiency improvement of textile production utilizing fiber/textile integrated operation

(3) Total operating cost reduction

- Utilizing EPA / FTA and optimizing production sites (especially garments)

(4) Reformation of operating infrastructure system

- Building shared systems among Toray Group companies and customers
- Information sharing of market and production by utilizing ICT and big-data
 - Reduction of time and cost for development/production and enhancement of capability to meet customer requirements

Business expansion in growth fields

1. GR business expansion

(1) Energy-saving and low environmental impact

Expansion of functional innerwear



Expansion of water repellent products without fluorinated compounds



Water repellent finish without fluorinated compounds (under development)

(2) Biomass

Expanding partially BIO-PET products and 100% BIO-PET business



Examples of suede-texture artificial leather Ultrasuede® PX, using partially plant-based raw materials

2. LI business expansion

(1) Improvement in quality of healthcare, and ease burden on medical professionals

Establishment of service business and overseas development of the bio-electrode conductive textile hitoe®



Picture: Obayashi Corporation

(2) Contribution to health and longevity

Expansion of non-woven fabric for hygiene application (PP-SB, specialized SF)



Expansion of chemical protective clothing (LIVMOA®)



Major issues of Fibers & Textiles ③

Expansion and Advancement of Global Business

- Advancement in China as the largest consumer market and expansion in ASEAN as world's sewing sites
- Increase in exports to North America and emerging countries(India, Mexico, etc.) mainly in automotive use

(1) China

【Fibers & textiles for apparel use】

- Advancement of business in Chinese subsidiaries (TSD, TFNL) and business expansion by increased domestic sales

【Nonwoven fabric】

- Advancement of business in Chinese subsidiary (TPN) and enhancement of further business expansion

(2) ASEAN

【Textiles for apparel use】

- Re-strengthening existing textile business footing
- Considering new dyeing site in Vietnam

【Fiber and fabric for Airbags】

- Business expansion, based on integrated production from fibers to fabrics in Thailand (TTS, LTX)

【Nonwoven fabric】

- Indonesian subsidiary(TPJ): Full operation of the new 2nd facility at an early stage, feasibility study for the next ramp-up
- Indonesian subsidiary(ITS): Secure launch of PET/PE staple fiber for hygiene applications

(3) Emerging countries

【Fiber and fabric for Airbags】

- Secure launch of Indian subsidiary(TKAT) and Mexican subsidiary(TAMX)

【Nonwoven fabric】

- Continued feasibility study of PP-SB business in India

【Garments】

- Expansion of sites in Bangladesh and Africa

(4) Other regions

Korea

- Expansion of domestic business of nonwoven products
- Increasing value-added products of polyester staple and filament fiber

Europe

- Sales expansion in automotive and industrial use
- Alcantara: Business expansion in automotive upholstery use

Pursuing global brand strategy

ultrasuede®

Made in Japan

<Toray Industries Inc.(Japan)>

Japanese advanced material brand with wide variety of products made by leading technology of Toray and Japanese features

Enhancing & expanding both premium brands of advanced fibers material, to be used for all applications around the world.

ALCANTARA®

Made in Italy

<Alcantara S.p.A.(Italy)>

Global luxury brand with Italian management, unique positioning at crossroad between technology and emotion, and strong commitment to sustainability

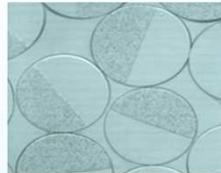
sembism™



「seni (fiber) +bi (beauty) +ism」
Comprehensive brand of fashion textiles for overseas market with sophisticated texture and comfortability which are unique to synthetic textiles.
Expansion in high-fashion markets in Europe, USA and others, as the best materials made in Japan.

Primeflex®

Comprehensive brand of comfortable textiles, characterized by softness & elasticity, which are realized by the bimetallic fiber structure. Expanding globally (including Japan) for sports & casualwear.



Bimetallic fiber

ENTRANT™

Prestige brand of comfortable materials having both characteristics of water proofness and moisture permeability at high levels.

Pursuing global expansion of textiles with highly engineered garments not only for outdoor use but for lifestyle market.



Sembism™ is a registered trademark of Toray Industries, Inc.

New business creation strategy

■ Extending business domain by expansion of non-woven products business

- Establishing a business framework covering both spunbonded fabric composed of filament yarn and staple fiber nonwoven fabric
- Implementing comprehensive development project using Toray Group materials in hygiene applications
- Expanding business domain by creation of new businesses



➔ Establishment of an unique business framework covering both spunbonded fabrics composed of filament yarn and staple fiber nonwoven fabrics

■ Creating new business model

- Establishing and expanding service business of IoT using the bio-electrode conductive textile hitoe®



■ Extending & diversifying global SCM

- Pursuing multi-level enhancement of supply chain from fibers and textiles to garments among Toray Group production sites
- Developing strategic supply sources

➔ Enhancing capability responding to global clients

■ Expanding protective products

- Developing and expanding industrial and apparel protective clothing (e.g. chemical proof, anti-virus/-bacterial, cut resistant, flame proof) and other protective products



■ Enhancing strategic M&A and alliance

Major issues of Fibers & Textiles ④

Extension of the business domain by sales expansion of nonwoven products

(1) Establishing a business framework covering both SB and staple fiber nonwoven products

【Filament yarn (PP-SB, PET-SB)】

- Continuing business expansion in Asia and emerging countries mainly by TAK-G
- Developing value-added products and improving productivity by installment of development machines in Japan



【Staple fiber】

- Strengthening specialized SF business for nonwoven products (e.g. P-SF, PPS-SF)
- Establishing SF nonwoven product supply chain in cooperation with nonwoven fabric customers

【Establishing business framework】

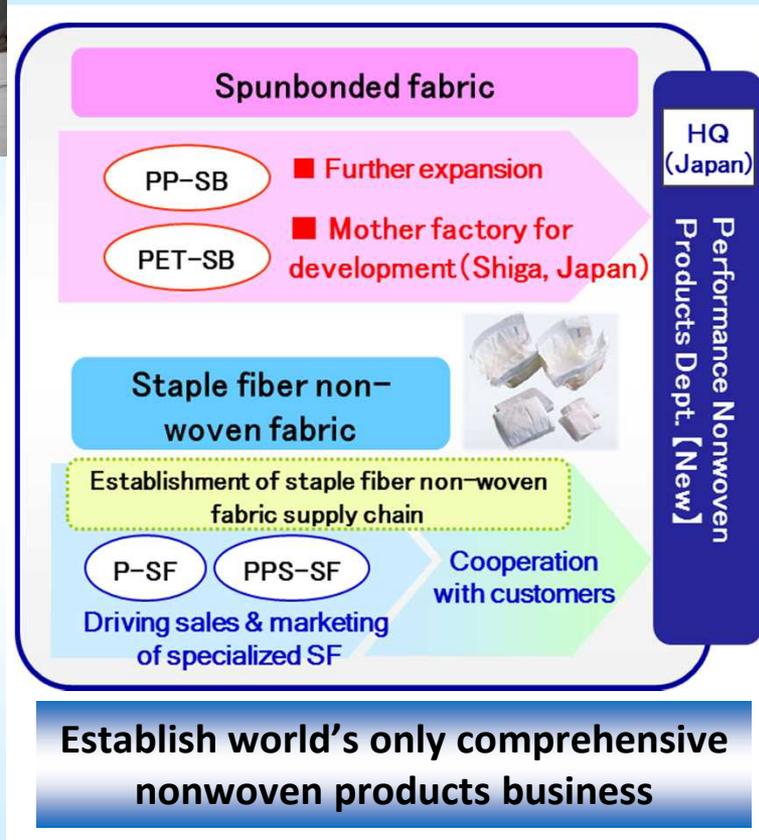
- Establishing “Performance Nonwoven Products Department” in Toray Japan as the HQ
 - Strengthening capability responsible both for SB fabric and SF nonwoven products, responding to the end customers

(2) Promoting development of Toray group-wide materials in the hygiene materials field

- Developing the most appropriate products by combining materials in Toray Group (PP-SB, PET/PE-SF, SAP, and spandex)

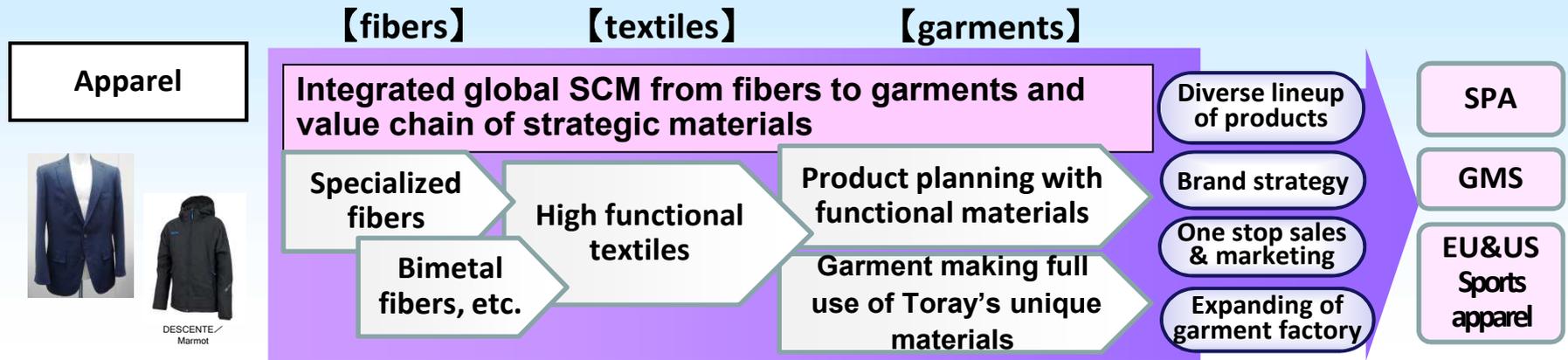
(3) Business expansion by new businesses

- Expanding new supply chain for nonwoven fabric business by cooperation with Japan Vilene
- Expanding business in growing fields (e.g. air filters), using M&A as an option

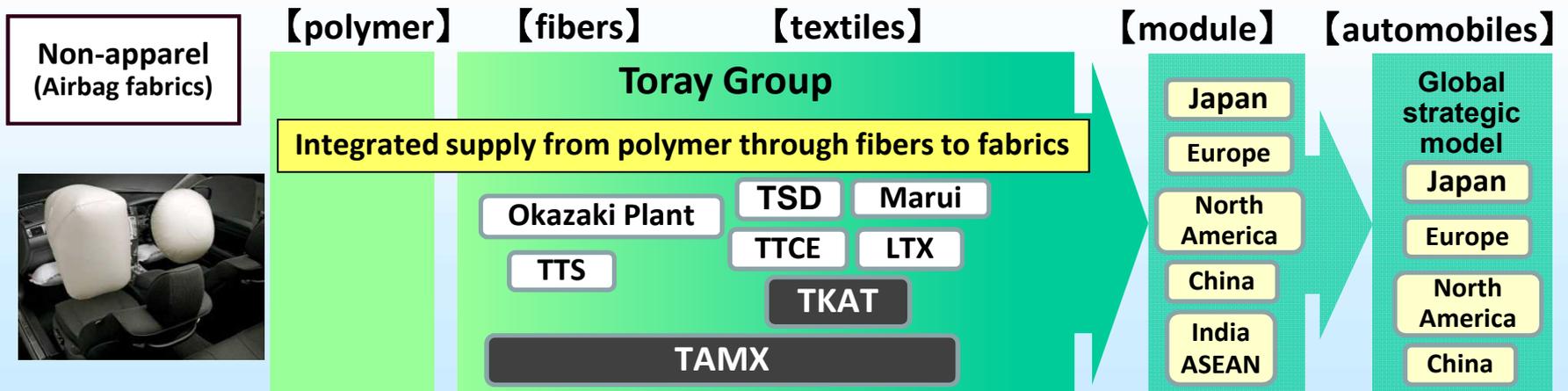


Advancement of business model (further expansion of integrated business)

- Expand integrated supply chain by strengthening cooperative relationships with major SPAs and Apparels

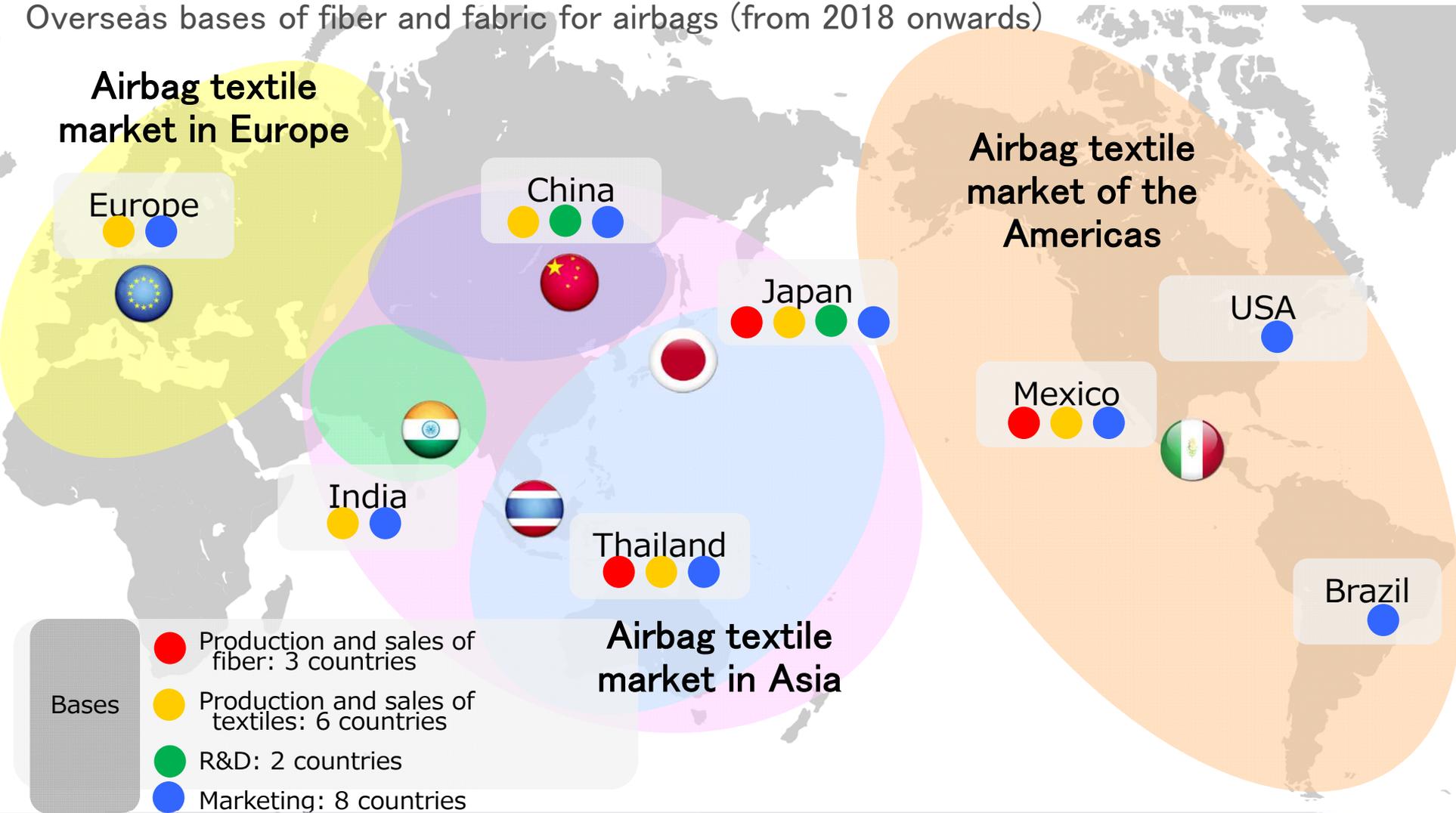


- Expand integrated business in non-apparel fields



Non-apparel: Fiber and textile supply chain for airbag

Overseas bases of fiber and fabric for airbags (from 2018 onwards)



Stable supply of textile fabrics to airbag manufacturers from bases in Europe, Americas, and Asia

Organization and Human Resources (securement and education)

(1) Reinforcing organization responding to expansion of business domain and enhancing of global operation

• Establishment of the Performance Nonwoven Products Department

- Act as HQ of comprehensive nonwoven products business, including filament yarn & staple fiber
- Controls entire business, including PP-SB

• Strengthening HQ functions of the airbag business

• Strengthening global management structure of the textile business

- Establish one-stop sales structure
- Strengthen converting function

(2) Strengthening the functions of staff organization

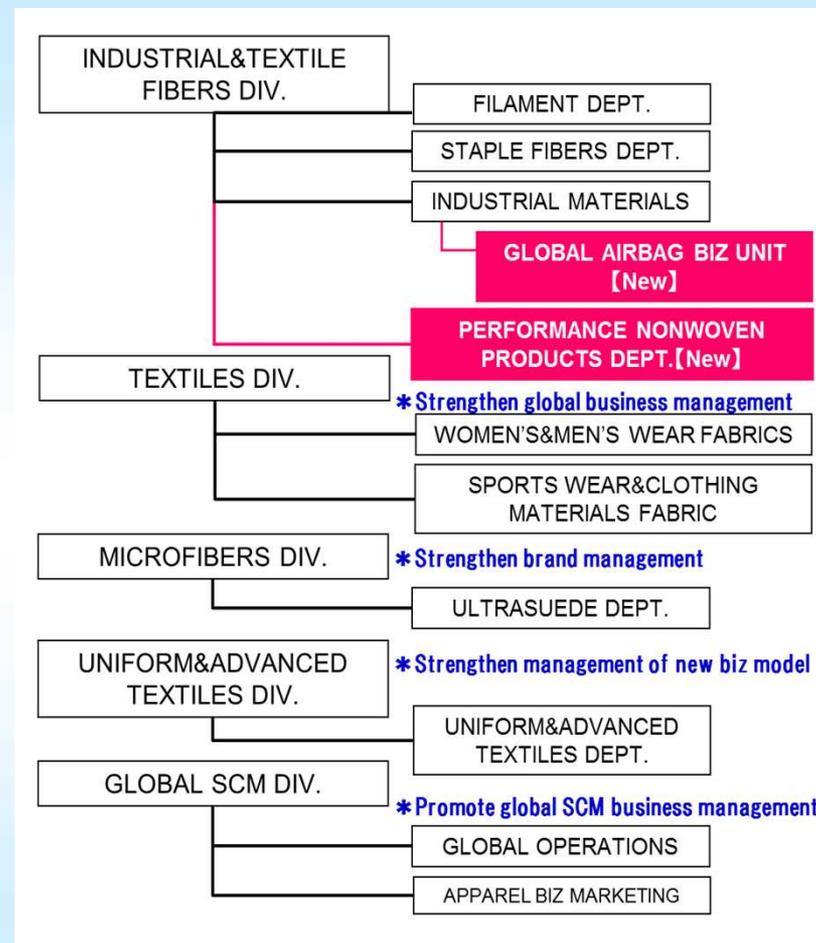
• Strengthening overseas business management and capability responsible for new projects

• Strengthening function of strategic business planning, including M&A

(3) Securing and educating human resources

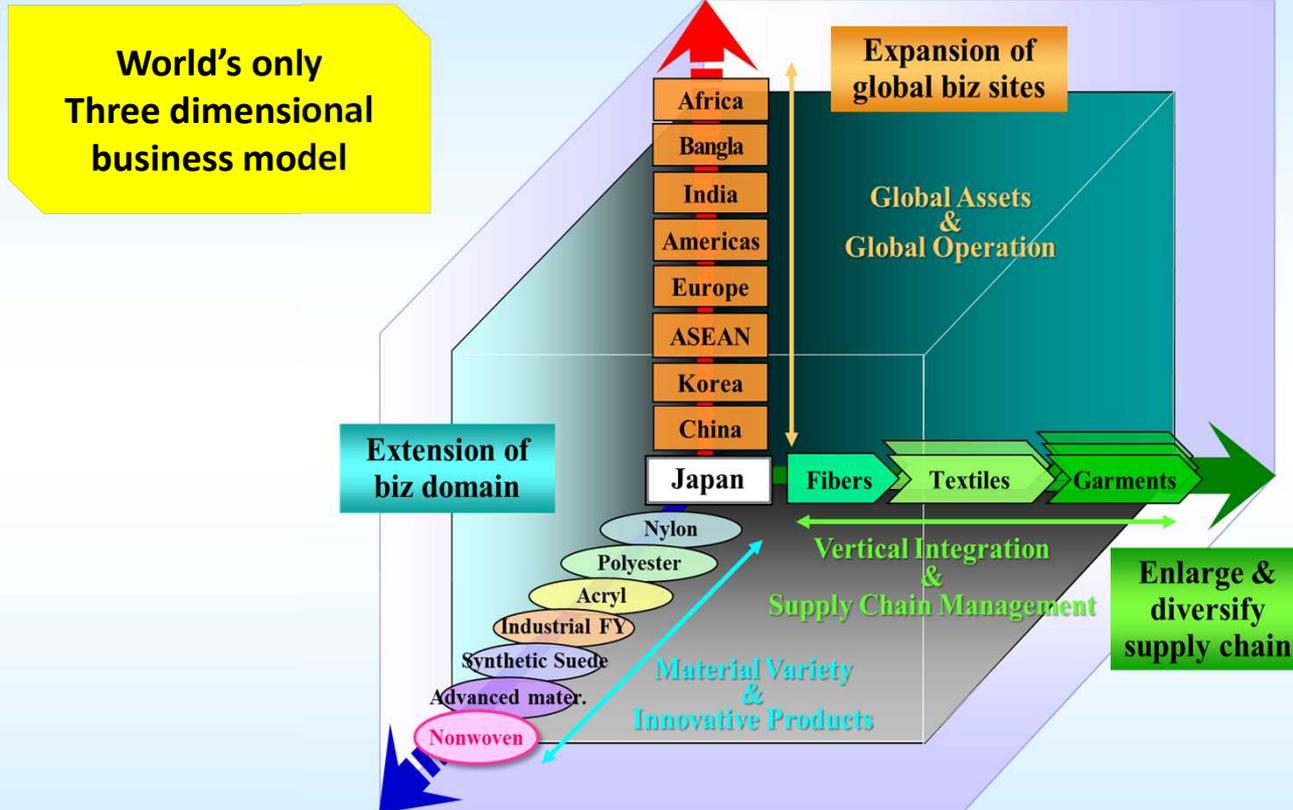
• Optimizing headcount by promoting strategic work shifts and work efficiency

• Enhancement of OJT, education and job-rotation



V . Future Direction of Toray Group Fibers & Textiles Business

Multilevel business development and expansion by combining the three axes of
Material domain/Supply chain/Globalization

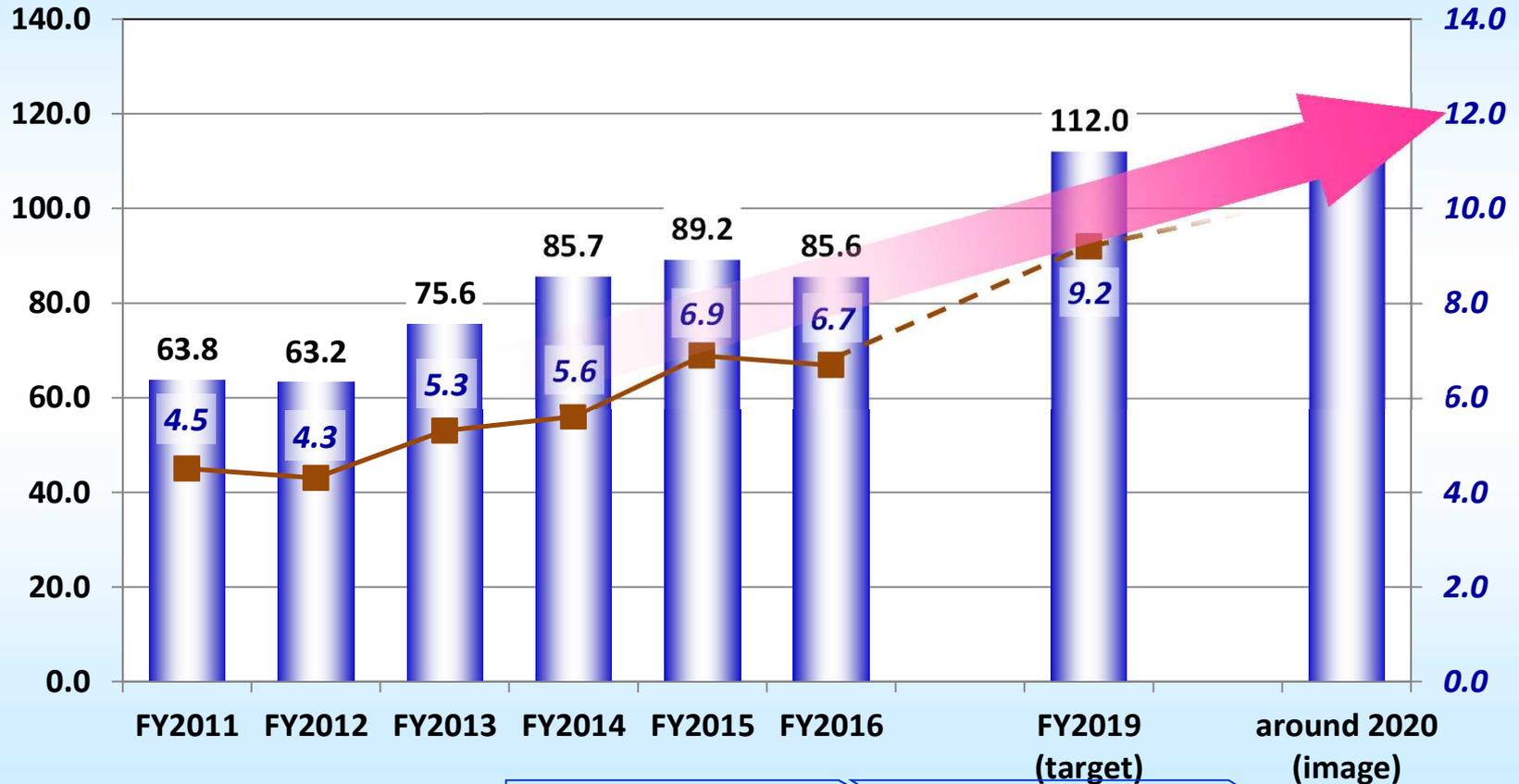


Expand significantly the Toray Group Fibers & Textiles business
by enhancing global SCM from fibers and textiles to final products
and extending new business domain

Toray Group Fibers & Textiles Segment

(Consolidated Net Sales : Billion yen)

(Consolidated Operating Income: Billion yen)



AP-G 2016

AP-G 2019

Thank you for your attention

'TORAY'

Innovation by Chemistry

Descriptions of predicted business results, projections, and business plans contained in this material are based on predictive forecasts of the future business environment made at the present time.

The material in this presentation is not a guarantee of the Company's future business performance.