



December 7, 2021

Toray's Approach to Sustainability

- Development of “&+®”

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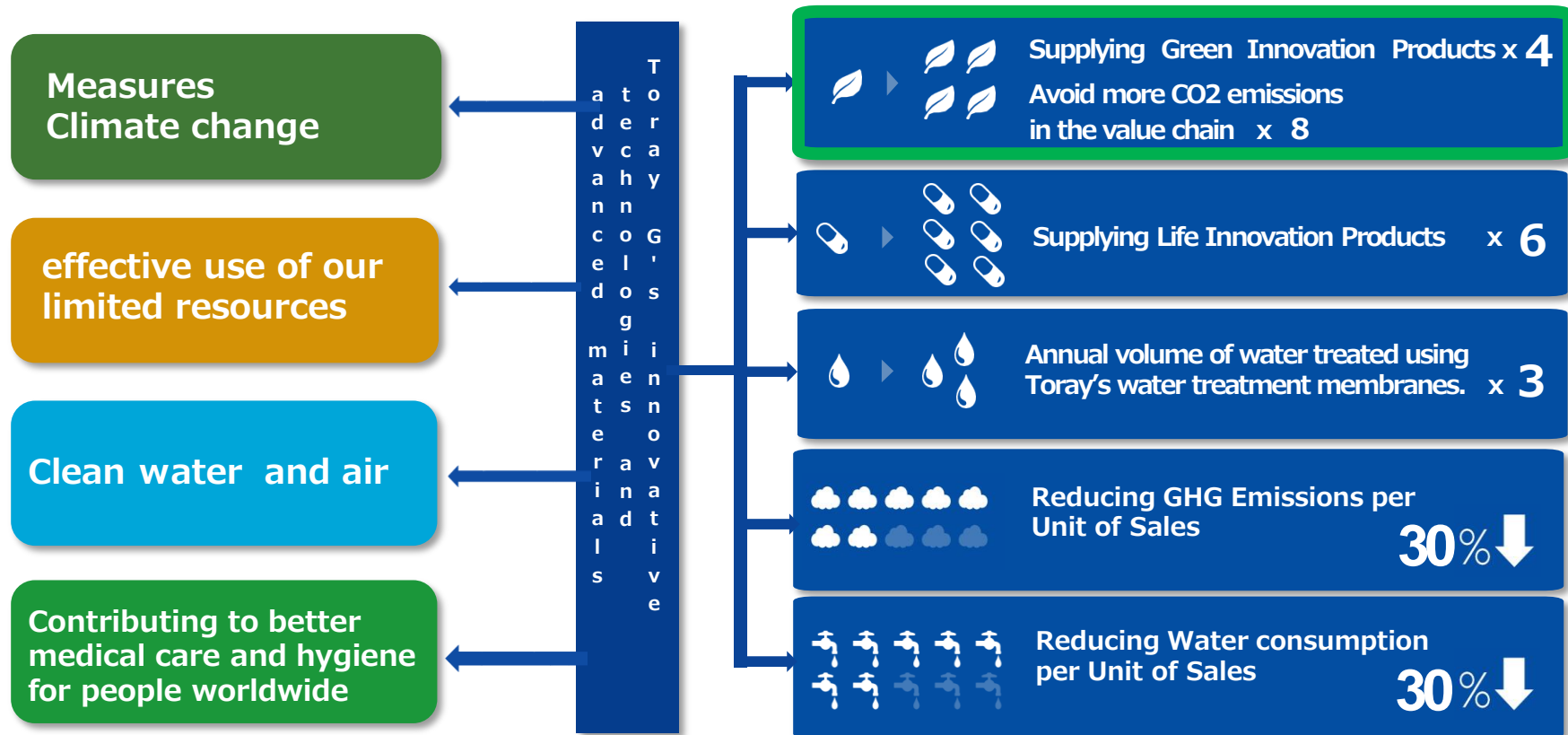
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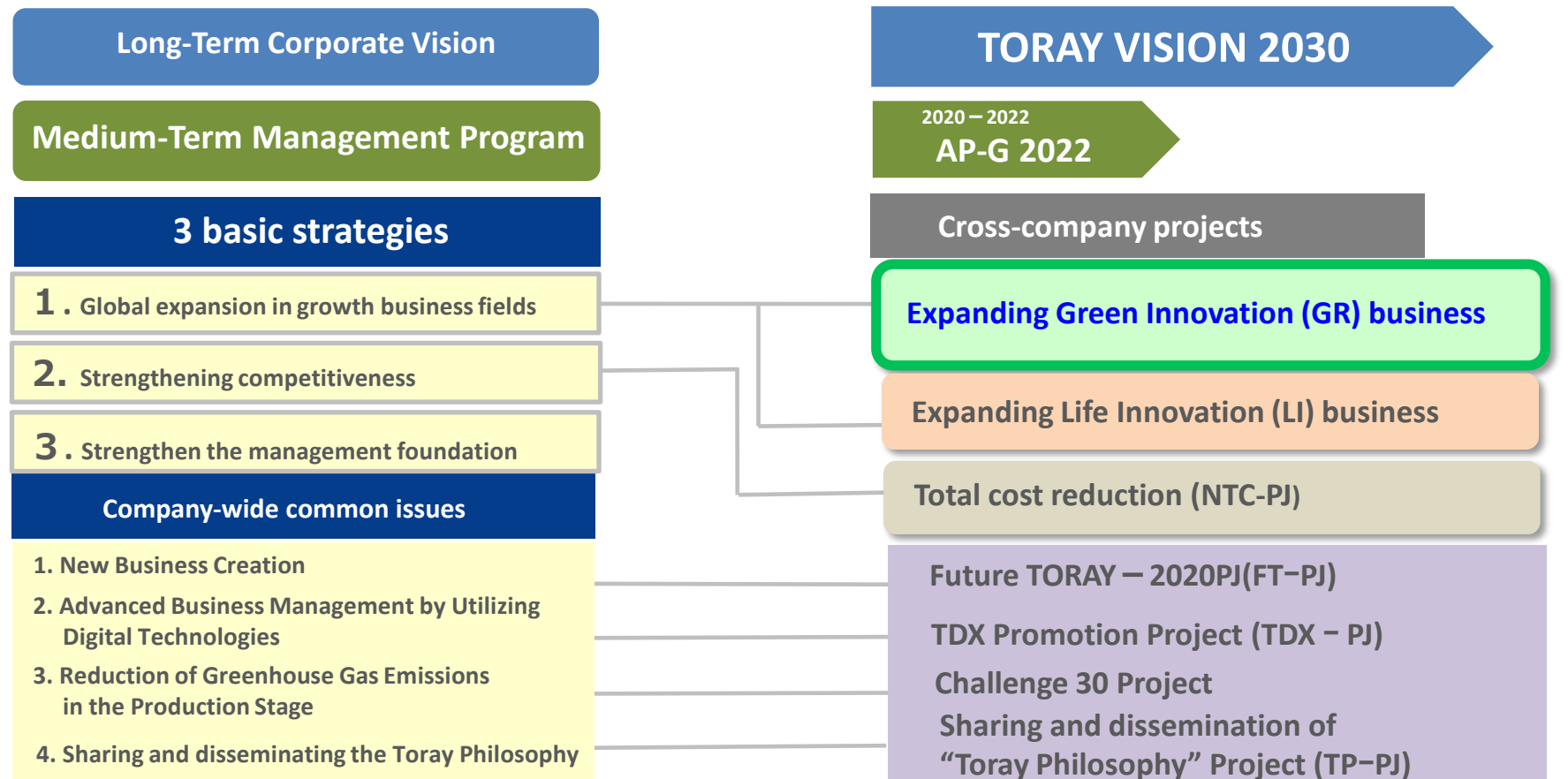
About Toray's Green Innovation Business

Issues and Goals of Toray Sustainability Vision

5 Commitments for 2030 (Compared to 2013)



Long-Term Corporate Vision and Medium-Term Management Program



Green innovation (GR) business for textiles

Green
Innovation

Aiming for sustainable growth while reducing environmental impact through innovative technologies with the concept of LCA at the core of our business.

Energy Saving

Reduce energy consumption through product LCA

ex Warming fabric ,Cooling fiber

New Energy

Components, materials and technologies for new energy-related industries

ex PPS bunding fiber for EV

Biomass-Derived

Products derived from non-fossil raw materials

ex Bio-PET, PLA, 3GT

Water Treatment

Components, devices, systems, etc. related to water purification

ex Substrate for RO membrane

Air Purification

Components, devices, systems, etc. related to air purification

ex for air filter PPS,PET SB

Low Environmental Impact

Non-Halogenated noncombustible materials

ex Non fluorine water, Non halo

Recycling

Use of recycled materials
Recycling system

ex 「 & +」, Eco use, etc.

Process Innovation




Innovative manufacturing technologies that can reduce the environmental impact of manufacturing processes

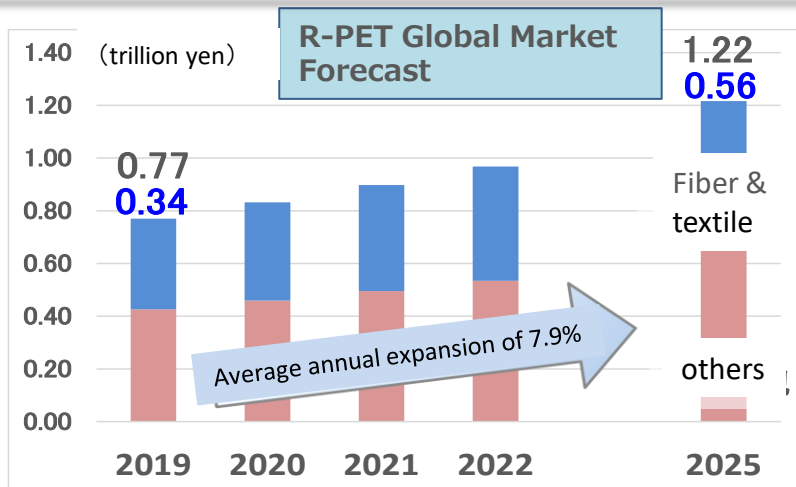
ex Innovative twisted process

What is recycling brand "&+" ?

Expansion of recycling market

Sustainable goals for apparel companies

	Limit 100% of products to raw materials derived from renewable resources or sustainability materials.(2030)
	Use only renewable, recycled, or reclaimed materials for all apparel products (2025).
	Use more than 1 billion plastic bottles annually for recycled yarn (2030)

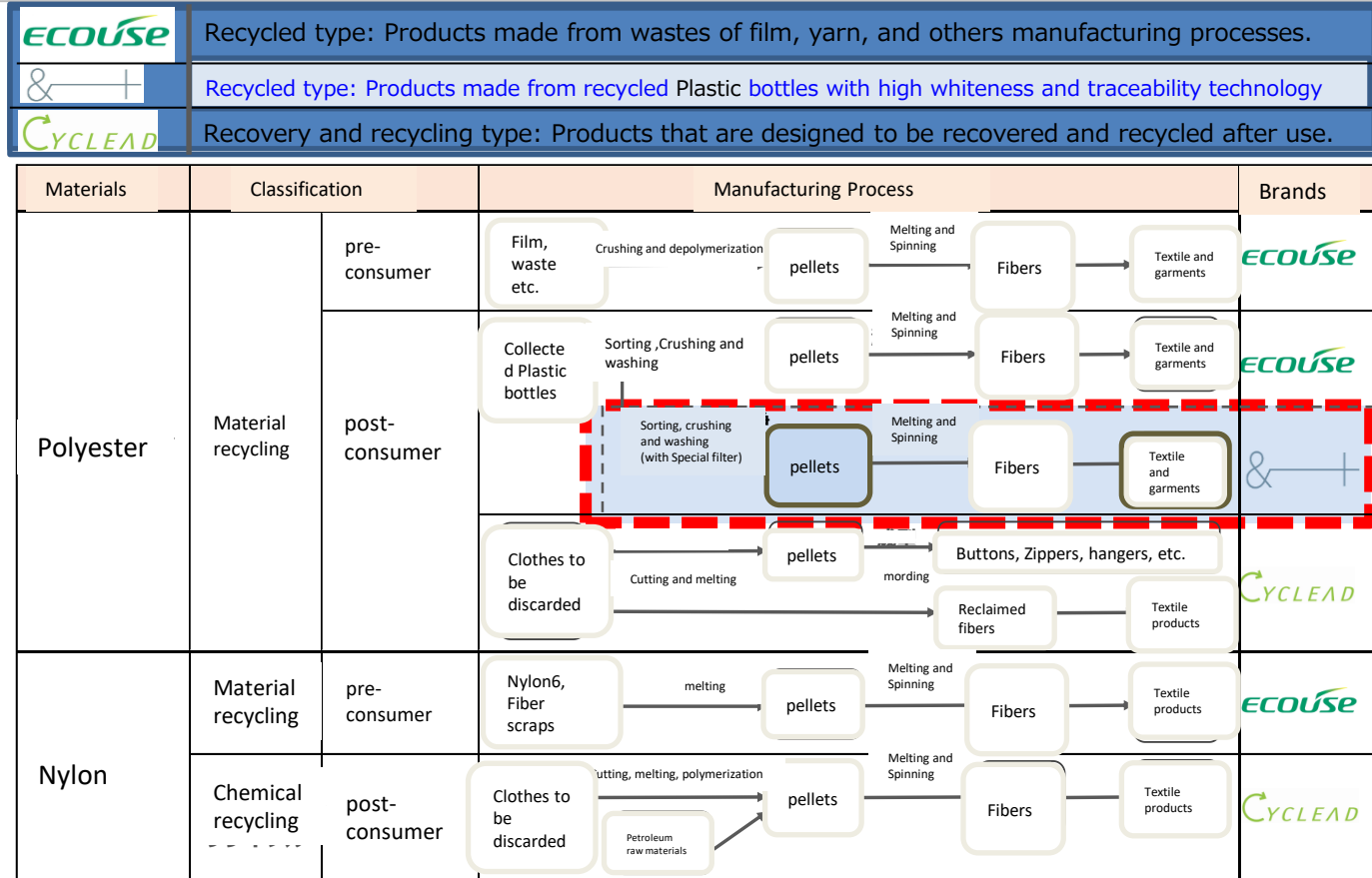


- Responding to Critical Global Environmental Issues
- Take a social responsibility as a company
- Young people who are interested in social and environmental issues

Market expected to grow steadily around the world

Promoting sustainability is the responsibility of the company and the demand of society.

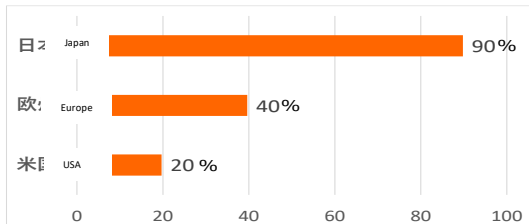
Toray's recycled fiber brand



Characteristics of "&+" (1) High whiteness

One of the World's highest level of Plastic bottle recycling rate

(2019)



<https://www.petbottle-rec.jp/data/comparison.html>

Self-Design Guidelines of Plastic bottles in Japan

No colored bottles
Easy-to-peel labels



<https://www.petbottle-rec.jp/guidebook/pdf/all.pdf>

Japanese common consciousness of Plastic bottles are a resource

Washing and Sorting Culture
Japanese people's awareness for recycling resources



<https://www.city.kita.tokyo.jp/rseiso/kurashi/gomi/bunbetsu/documents/wakekatasasireiwa3.pdf>

Sorting plastic bottles

Color Check by Visual checking and camera



<http://www.kyoei-rg.co.jp/recycling/flow.html>

- Persistence to material
- Focus on sorting technology
- Commitment to washing technology



Realization of overwhelmingly high whiteness from waste plastic bottles

Cleaning Technology With Alkalic

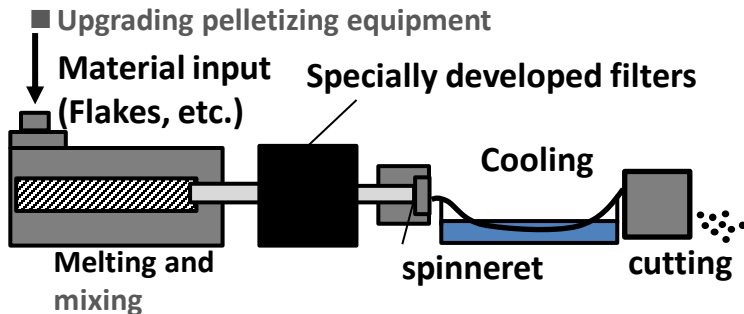
Thoroughly remove dirt from the surface.



<http://www.kyoei-rg.co.jp/recycling/flow.html>

Features of "&+" (2) Low foreign matter

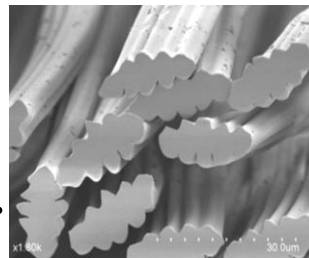
Enhancing contaminated materials removal



Thorough removal of contaminated materials by special filtering

Further upcycling development

■ Flat cross section "Pentas α" ■ Hollow cross section "airlet"



under development



under development

Started development of special cross section
Verification of effectiveness in yarn production tests

High quality and high performance fibers can now be manufactured, which was not possible with the original recycled fibers.

Features of "&+" (3) Establishment of traceability

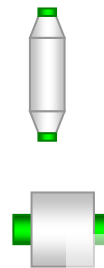


<https://www.city.fujisawa.kanagawa.jp/kankyo-j/petsikou.html>

palletization



spinning



Knitting and
weaving
Dyeing

Sewing/
Products

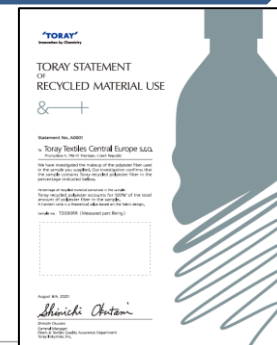


Use of third-party audit systems such as GRS certification

History management of waste
plastic bottles

Certificate issuance using Toray Footprint technology

Certificate issuance procedure



About the branding of "&+"

Naming the "&+" brand

Thoughts behind the naming and logo

Recycling business is made possible by involving the people around us.
When everyone's thoughts and actions for the future are connected with "&", "+" (plus) value is created.

Connect
Our thoughts and actions.

And

Recycled materials
+ Possibilities
(= Upcycling)

Plus



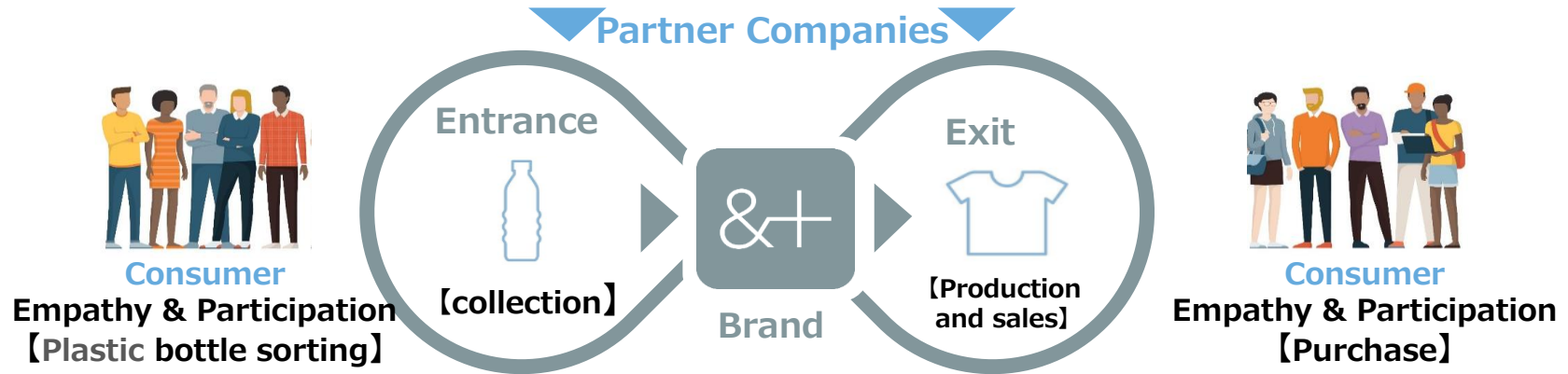
The need for brands

From "selling products" to "providing brands"

	[Conventional method] Sale of goods	[What &+ aims for] Brand Providing
Goal	<ul style="list-style-type: none"> Supply high quality goods with low prices Acquisition of Customers 	<ul style="list-style-type: none"> Empathy for the social value of things Acquisition of Brand fans
Value to be provided	<ul style="list-style-type: none"> Quality, performance, price, etc. Achieving goals 	<ul style="list-style-type: none"> Owning increases your own value in some way.
Motivation for purchase	<ul style="list-style-type: none"> Because it's valuable price/convenient 	<ul style="list-style-type: none"> Because it increases your self-worth. There's an element of empathy.
Value as an object value	<ul style="list-style-type: none"> Maximum at time of purchase, then declines 	<ul style="list-style-type: none"> The more brands expands, the more valuable they become.
Relationships with Customer	<ul style="list-style-type: none"> Only occurs when you make a purchase. <div>One Time Customer Philosophy</div>	<ul style="list-style-type: none"> Repeats and continues to last <div>Lifetime Customer Philosophy</div>

Creating a story from collection to production and sales

Place the brand at the center of the flow from the entrance (collection) to the exit (production and sales) and We will expand the entire Brand business.
Strategies that involve consumers = movement building

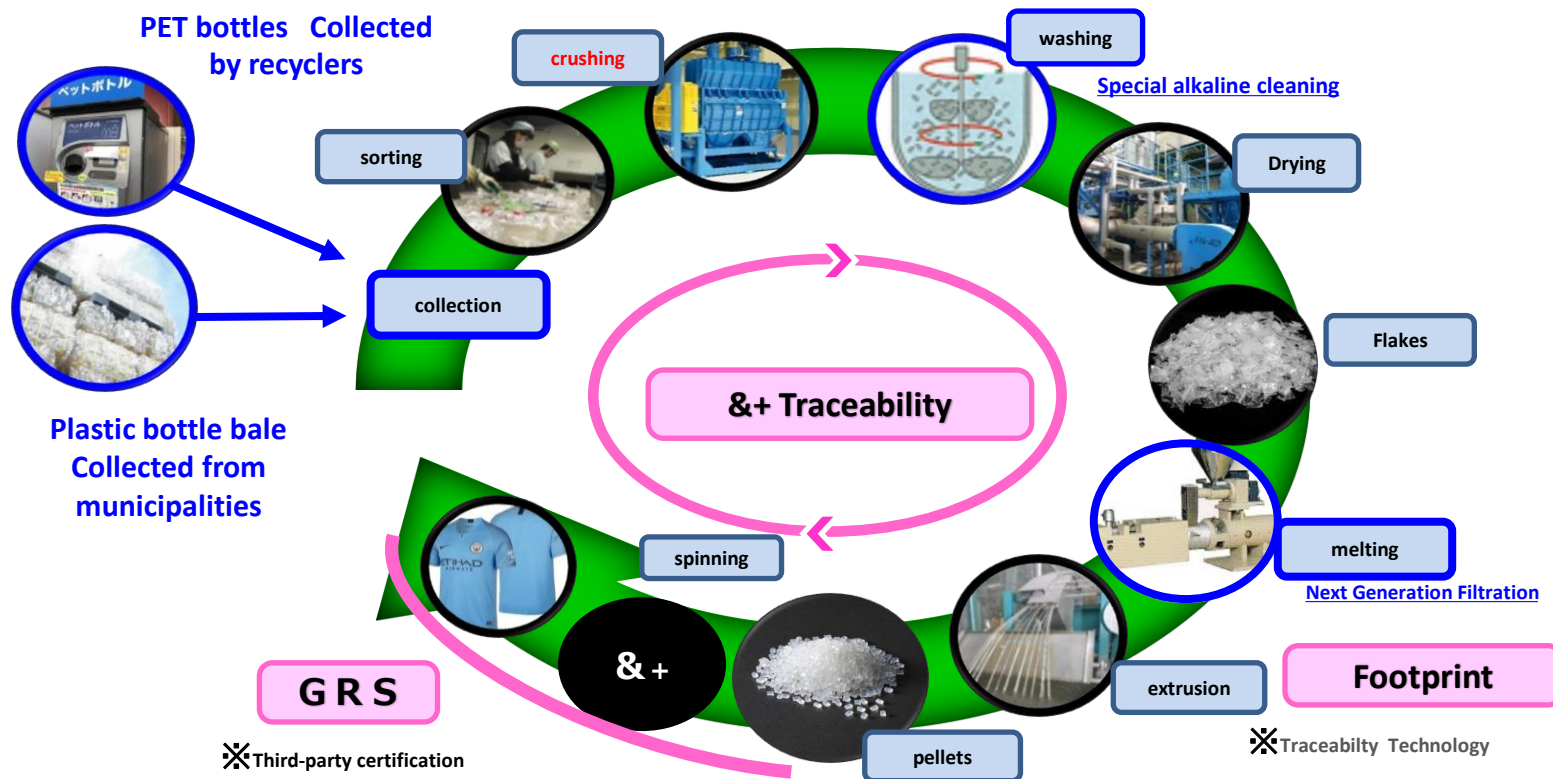


"Empathy for the story of "&+"

Participate in the "story of solving social issues
By sorting, collecting, producing, selling, and purchasing

**Toward a future in which "I chose what I wanted, and it
was a sustainable goods.**

Production process of &+



Summary: Examples of "&+" adoption

【Official Uniform for Attendants of the Japanese Pavilion at the Dubai Expo】



【underwear】



【denim】



【business shirt】



【Padded jacket】



【pumps】



【wiping sheet】



【sewing thread】



'TORAY'

Innovation by Chemistry