

”From **Waste** to **Worth**”

International Cooperation
for
T2T Circularity Program



HYOSUNG TNC



1. Why Choose Hyosung TNC for T2T Recycling

HYOSUNG

Hyosung at a glance in 2024

Founded in

1966

Foundation of Dongyang Nylon, in South Korea

employees

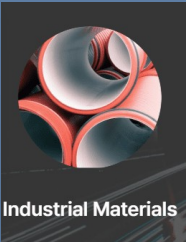
Over 20,000

Worldwide

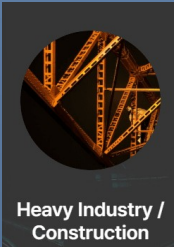
Global Network

29 Countries
77 Cities
119 Business Sites

Group Afflitates



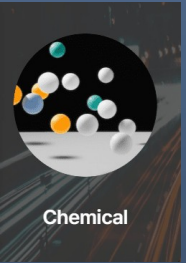
Industrial Materials



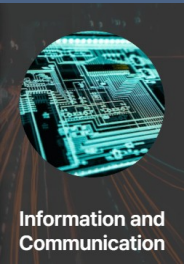
Heavy Industry /
Construction



Textile / Trade



Chemical



Information and
Communication

Annual net Sales in USD **17.4 billion**

Hyosung TNC 6.9billion

Hyosung Advanced Material 2.9billion

Hyosung Holding 2.8billion

Hyosung Heavy Industrial 2.6billion

Hyosung Chemical 2.2billion

Hyosung TNC

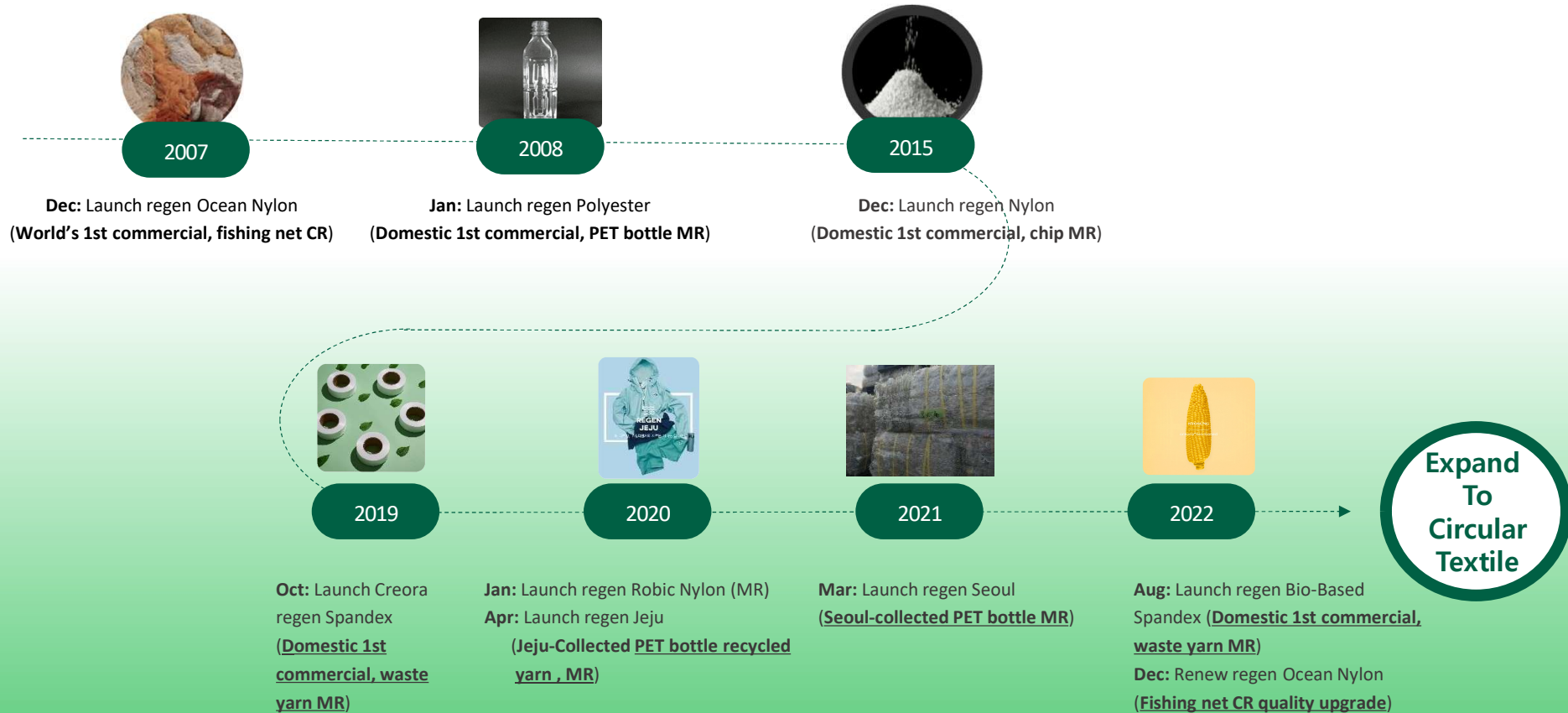
Spandex	No. 1 elastane in the global market share
Nylon Yarn	World-class product that leads the textile
Polyester Yarn	Specialty with high functional yarn
Fabrics	Vertical Integrated Production in Korea and China
Dyeing	A leader in South Korea's Dye-Processing industry

2. Technical History

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Sus. Tech Development

Market expansion via Sustainable Tech Development



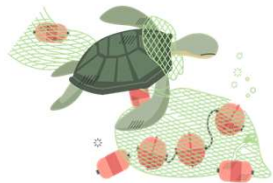
2. Technical History

Circular Textile Products (regen Ocean Nylon) **HYOSUNG**

regen
Ocean Nylon

Recycled Nylon from Ocean-Collected Fishing Nets – Post-Consumer
GRS Certified by Control Union

Collecting discarded fishing nets



150 Mt marine litter/year globally – 10% is fishing nets



Hyosung TNC runs ocean-net collection & separation campaign



Manual sorting



Remove non-nylon rope & debris



Piling on ground and plant

Pre-treatment



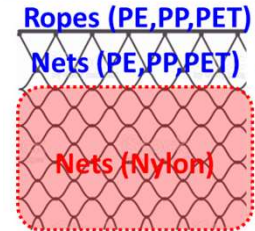
Shred to 25 mm



→ separate up to 80% PP



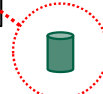
Grind to 10 mm



isolate PA6 (nylon) after PE/PP removal



Drying & chipping



Producing regen Ocean Nylon by CR



→ depolymerize to caprolactam



→ repolymerize to NY



regen
Ocean Nylon

regen Ocean Nylon from recovered nets → cuts marine waste & cleans oceans
* 300 t/month production ⇒ 1,659 t CO₂ avoided/month

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2. Technical History



100% Recycled Polyester
(Post-Consumer Waste)– Made
from consumer-collected
PET bottles → spun into yarn
– GRS Certified since 2008



Abandoned
PET bottles



Put the bottles



Sorting



Grinding



Chipping



Melting



Drying



Washing



Spinning



Produce
Bag/Apparel



2. Technical History



Circular Textile Products – regen Spandex **HYOSUNG**



GRS Certified, 100% Recycled Spandex (Pre-Consumer Waste)

regen Spandex is a GRS-certified, 100% recycled spandex made from pre-consumer waste generated during yarn production.

Compared to conventional spandex (per 1 ton), regen Spandex cuts CO₂ emissions by ~66%, creating a strong selling point for eco-conscious consumers.

[Process]



Wastes in yarn manufacturing process

Collect yarn manufacturing process waste and remove impurities through a specialized process.

regen® Spandex

Shred and melt purified waste, then manufacture via the standard spandex production process.

[Environmental Impact of regen Spandex]

- Quantified Carbon Reduction Effect



Producing 1 ton has the same carbon reduction effect as 889 mature trees absorbing CO₂ for one year.



Producing 1 ton reduces CO₂ emissions equivalent to burning 3 tons of anthracite coal.



Recycled spandex

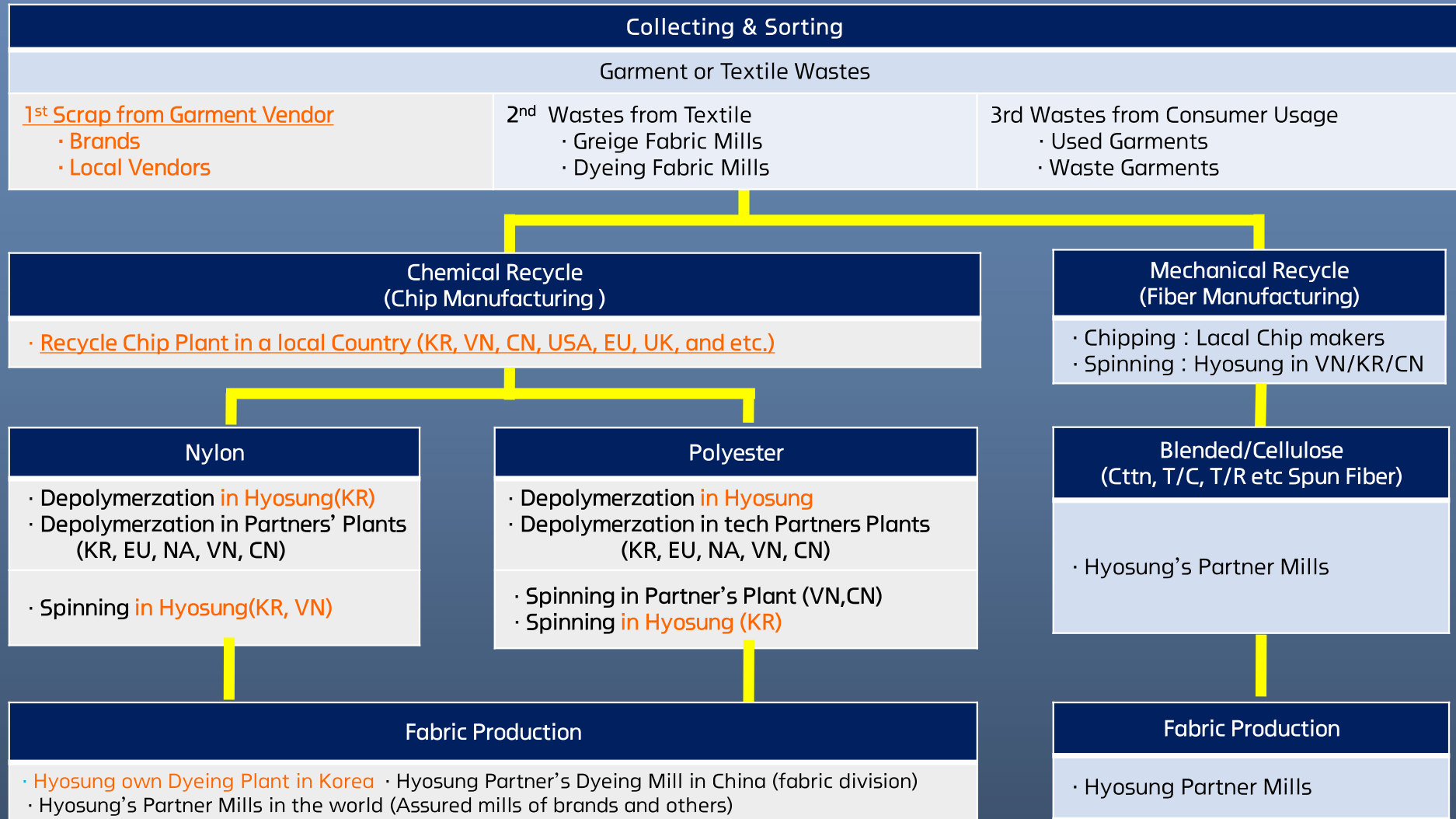


Eco Friendly

3. Direction of T2T NY6 & PET

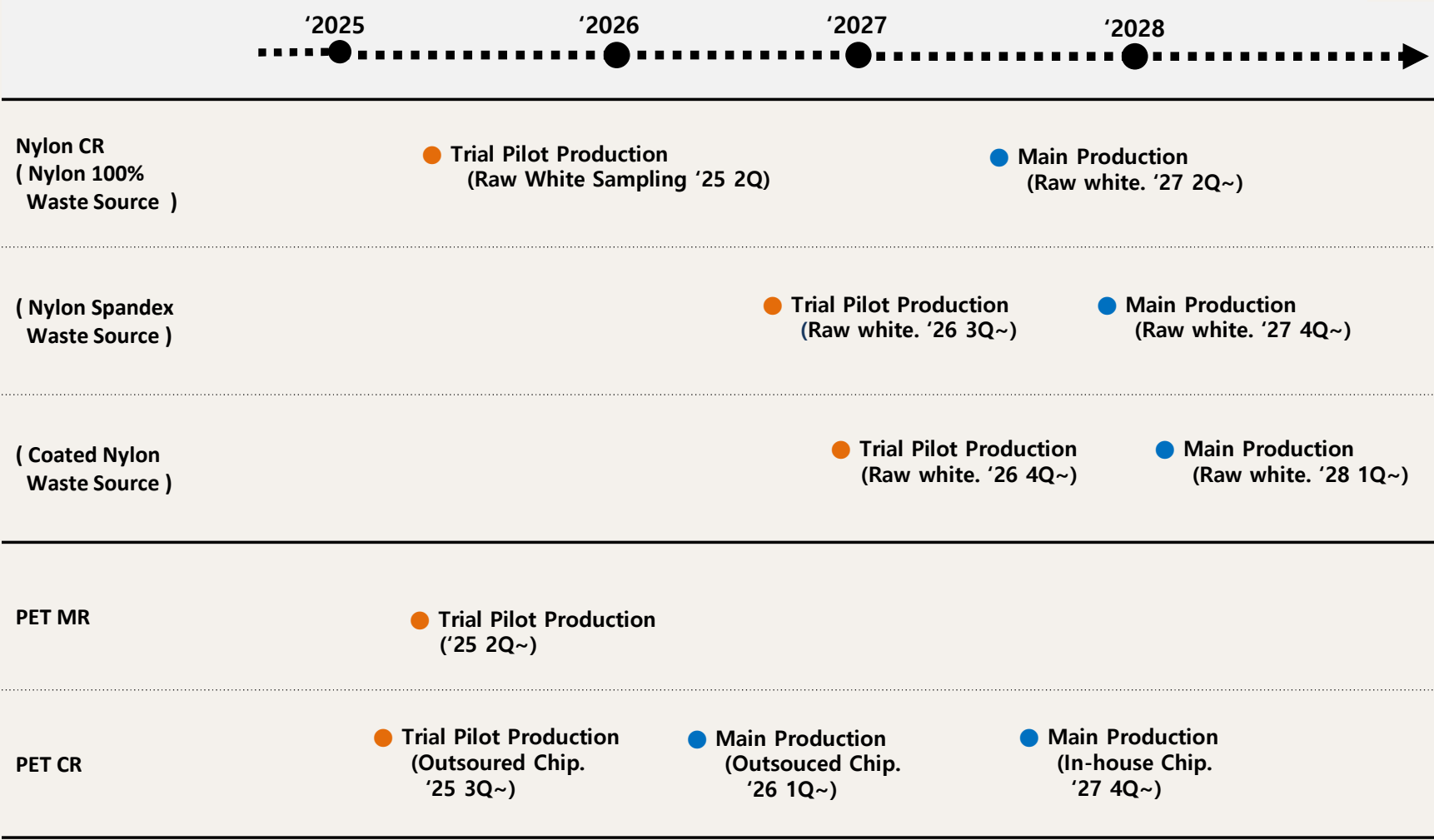
Road Map

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4. T2T Recycling Initiatives

Garment Recycle (Textile To Textile) Schedule



MR : Mechanical Recycle
CR : Chemical Recycle

● Trial Pilot Production ● Main Production

4. T2T Recycling Initiatives

T2T NY6 Recycling – Hyosung TNC Fashion Design Center

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Compression Wear

NY40/34 FD(T2T)+SP40(H350D), 380gsm



Yoga Pants

NY40/34 FD(T2T)+SP40(H350D), 205gsm



Wind Stopper

NY20/1 SD x NY40/34 FD(T2T), 72gsm



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5. T2T Collaboration with Loop & Pleatsmama

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T2T PET Recycling

Hat

Face: T2T dope dyed mrPET 150d DTY 52%

Back: T2T dope dyed crNY 40d DTY 36% NY LMY 100d SDY 12%



Shoulder Bag

Face: T2T crPET 150d DTY 80% (Loop's Twist)

Back: regen PET 75d DTY+regen SPX 40d 20%



Poodle Bag

Face: T2T crPET 150d DTY 74% (Loop's Twist)

Back: regen PET 75d DTY+regen SPX 40d 15%



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5. T2T Collaboration with Loop & Pleatsmama

T2T Recycling – Why Loop?

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ACCELERATING THE CIRCULAR PLASTICS ECONOMY

DECARBONIZING PLASTICS

— Lower GHG Emissions —

A 70,000 tonne Loop facility could save up to **418,600 tonnes / year** of CO₂ compared to virgin PET* 

Environmental Data



80% Less**
Global Warming Potential (GHG)

* This data is for the India LCA and includes credit for avoided disposal of waste PET
** Without accounting for the avoided waste disposal

LCA OVERVIEW

Franklin and Associates a division of ERG, a firm that performs LCA for the U.S. Department of Energy, was hired by Loop Industries to conduct life cycle studies for the India project following ISO standards 14040 and 14044.



A credit for the end of life was integrated to the Loop PET LCA for the avoided disposal of waste PET based on typical plastic disposal in India (100% combustion without energy recovery)

- Virgin PET follows a linear path (make-use-dispose)



The Infinite Loop™ plant in India will use Biomass as the energy source and 80% sustainable electricity as the electricity source (hydro and solar)

5. T2T Collaboration with Loop & Pleatsmama

HYOSUNG

PLEATS
MAMA

Upcycled Materials. Low-Impact Manufacturing. Circular Design. for “0” Waste

Woven Eco-bag



Weaving Loss 10%

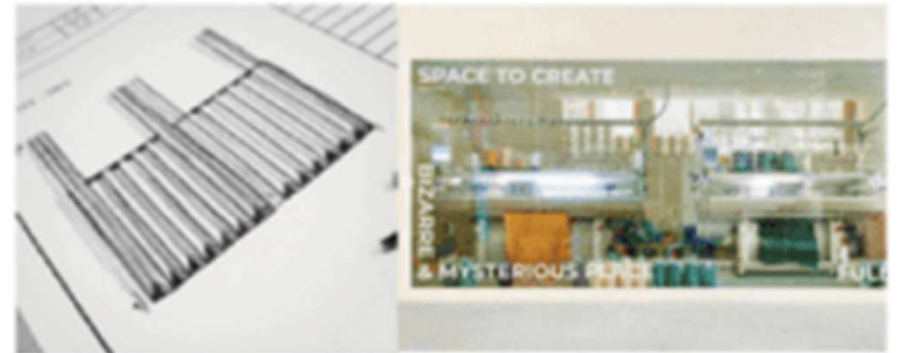
Dyeing Loss 8%

Coating Loss 2%

Cutting Loss 20%

35%

PLEATSMAMA's Knit Bag



Yarn Dyeing Loss 1%

Knitting Loss 0%
(Whole Garment Knitting Machine)

1%

6. Collaboration : From Waste to Worth

HYOSUNG



HYOSUNG TNC

PLEATS MAMA

