



# TBM Introduction

TBM Co., Ltd.

2023.5

T B M

# T B M

Times Bridge Management

## We will realize the “Sustainability Revolution”

Our future we want doesn't just come.  
No matter how we predict the future, the future we want will not come.  
Only when we take on a challenge with strong will to create the future, we can reach the future we want.

We have experienced the agricultural revolution, industrial revolution, and digital information revolution. The AI revolution is coming next. So, what is coming after these?  
We believe, the “Sustainability Revolution” is coming ... moreover, we have to make it happen. It is our mission to lead the next coming revolution.

Nobuyoshi Yamasaki,  
Representative director, CEO

# Company Overview

Company Name	TBM Co., Ltd.
Established	August 2011
Address	15F Toho Hibiya Building, 1-2-2, Yurakucho, Chiyoda-ku, Tokyo, JAPAN
CEO	Nobuyoshi Yamasaki
# of employees	310 (as of Feb. 2023)
Capital Stock	Approx. \$200 million (Including legal capital surplus)
Business	Develop, manufacture, and deliver ecological materials, and material circulation business
Foreign subsidiaries	<ul style="list-style-type: none"> <li>· USA: Times Bridge Management Global, Inc. 8605 Santa Monica Blvd. 80071, West Hollywood, CA, 90069-4109</li> <li>· Vietnam: TBM VN Co., Ltd</li> <li>· Korea: SK TBMGEOSTONE Co., Ltd (JV with SKC)</li> </ul>



**Shiroishi Factory, Japan**  
(R&D and production)



**Tagajo Factory, Japan**  
(Mass production)

Both factories are subsidized by  
Ministry of Economics, Trade and Industry of the Japanese government.

## Awards

- Plug and Play 2016 “New materials and package” (US)
- Stevie Awards Asia Pacific 2017 (ASIA REGION)
- COOL JAPAN AWARD 2017 (JAPAN)
- US Japan Innovation Award 2017 ” Innovation Showcase company “ (US)
- Red Dot Design Award 2018 (GERMANY)
- EY Entrepreneur Of The Year 2019 Japan (JAPAN)
- 100 Best Industrial Innovations for International Technology Transfer (CHINA)
- Golden Pin Design Award 金點設計獎 2021 (TAIWAN)

# Business area - Material & Circular

Development and manufacturing of ecological new material LIMEX.

Develop the material circulation platform to collect and recycle used materials.

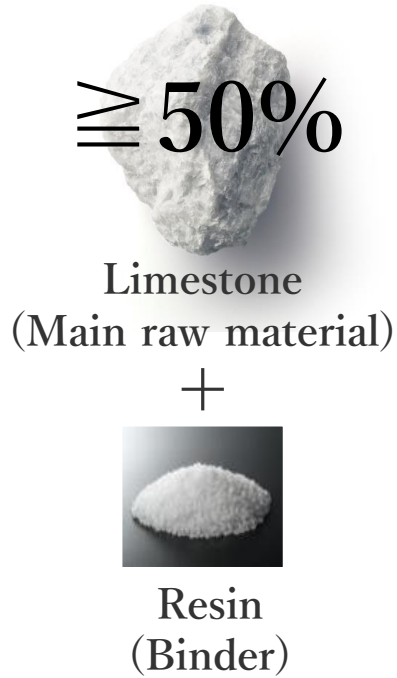
## Business area of TBM



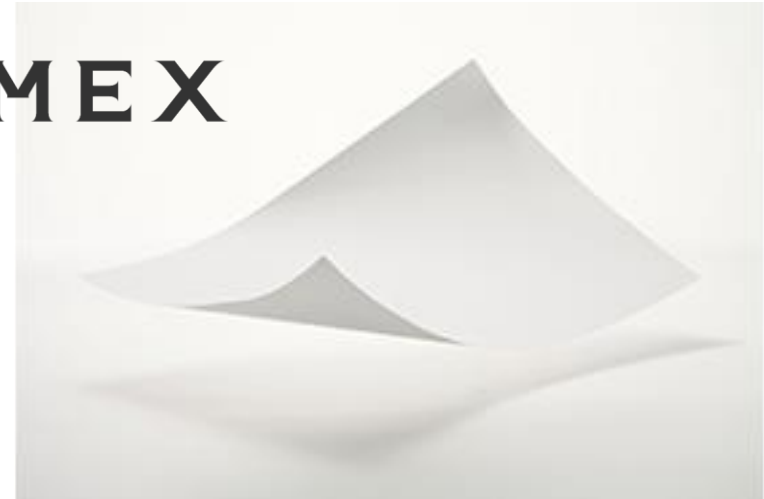


# What is LIMEX?

LIMEX is an inorganic filler composite material. It can be used as plastic and paper alternatives.



LIMEX Pellet  
 ✓ Plastic alternative



LIMEX Sheet  
 ✓ Paper alternative  
 ✓ Plastic sheet/film alternative

Save water and forest,  
 precious oil reserve

Reduce CO2 emission

Recyclable\*

LIMEX is a unique technology of TBM, patented worldwide including US, Europe, China and Japan.

# Why limestone?

Abundant natural  
resource worldwide



Advantages in  
CO<sub>2</sub> emissions

Economical and  
low volatility

Limestone

# Advantages of LIMEX

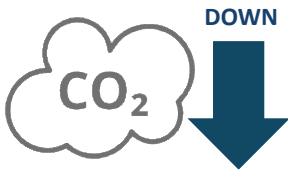


As alternative to plastic

Reduce oil consumption



Reduce GHG emissions



As alternative to paper

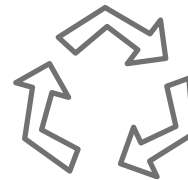
Reduce water consumption



Manufactured using  
100% renewable energy



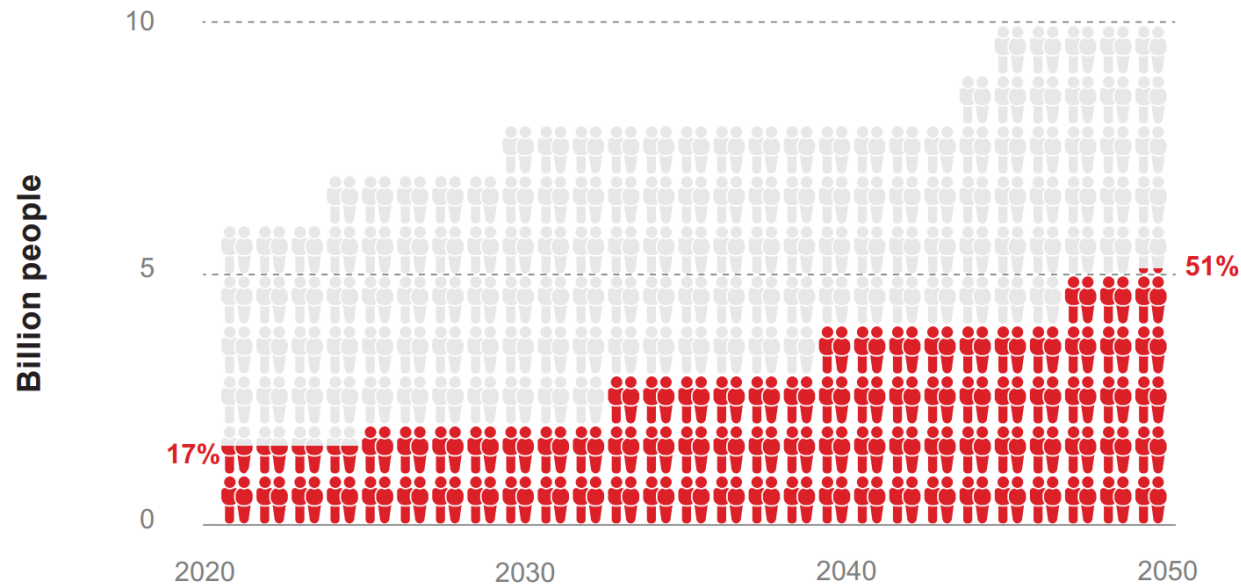
Mechanically Recyclable\*





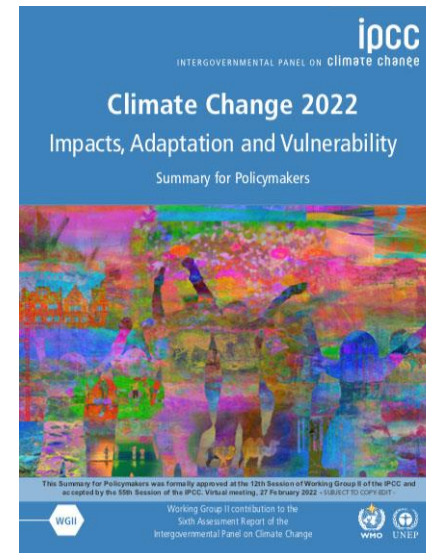
# Ref.) Global water risk is as critical as GHG emissions

## Global population exposed to high water risk (WWF, 2020\*1)



Global population exposed to high water risk by 2050 is expected to reach **51% of the world population**.

## IPCC Sixth Assessment Report warns water risks due to global warming



“About **800 million to 3 billion people** at 2° C and about 4 billion at 4° C warming are projected to experience different levels of water scarcity (medium confidence) leading to increased water insecurity.”

Page30, Technical Summary of the IPCC Sixth Assessment Report, "Climate Change 2022: Impacts, Adaptation and Vulnerability", 27 February 2022\*2

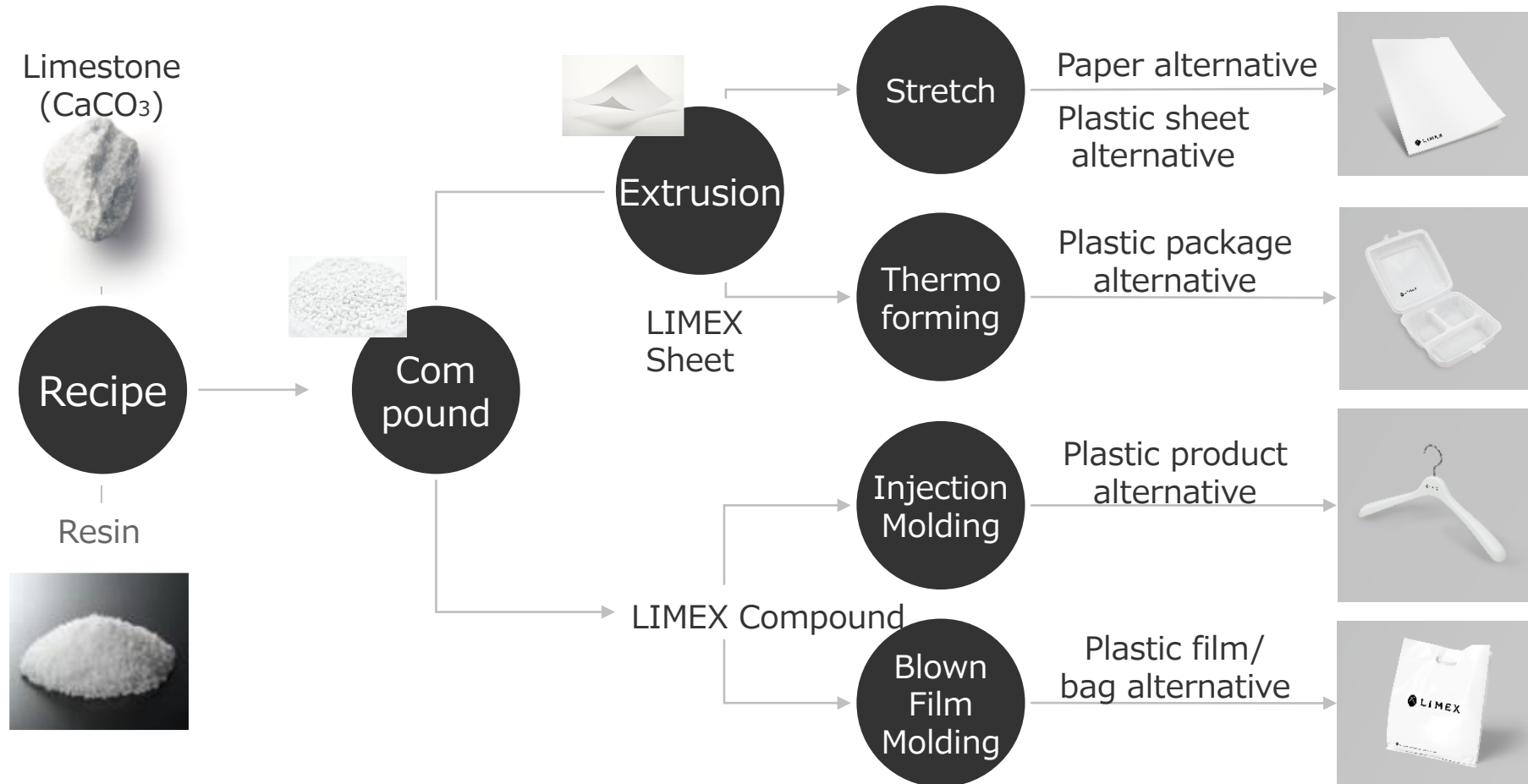
More and more investors and companies care about water consumption – in 2020, **>3,000 global companies disclosed the water security activities** via CDP, an international NGO that requests companies to disclose ESG information,

\*1 WWF, "[Water Risk Filter Brief](#)"

\*2 IPCC, <https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/>

# Various molding methods

LIMEX can be processed with existing traditional plastic molding machinery, without installing special equipment just for LIMEX.



# Delivered to over 10,000 companies in Japan



G20 Osaka Summit  
(trash bag)



Haneda International Airport  
(shopping bag)



Toyota Mobility  
Tokyo  
(Carrier Bag)



Tokyo Marathon  
(drinking cup)



Rock Field,  
a major deli brand  
(rigid food tray)



BANDAI SPIRITS  
(Plastic Toy model)



IRIS OHYAMA  
(construction material)



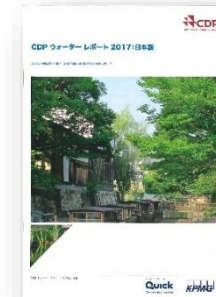
THE KAHALA  
HOTEL & RESORT  
(Flower pot)



POLA,  
A major cosmetic brand  
(backlit signage)



Ministry of  
Environment  
(National park guide)



CDP Japan  
(report)




World Blind Soccer  
Grand Prix  
(Banner)

# Case Study: Cosmetic packaging

LIMEX is used for the cosmetic container of KENDO, an LVMH brand




# LIMEX




Made from limestone, a natural material



Luxury texture



Reduce use of plastic



Reduce CO2 emissions

# Case Study: Food tray

@Rock Field, a major Japanese deli brand



## A-PET → LIMEX

- Reduce plastic by approx. **38%** per year
- Greenhouse gas emissions by approx. **22%** per year
- Can be microwaved

# Case Study: LimeAir Bag

@DCM, a major Japanese retail chain



Bio plastic 25% bag (A-PET)  
→ Bio LimeAir Bag  
(limestone 25% + bio plastic + plastic)

- Reduce plastic by approx. **41%** per year
- Reduce greenhouse gas emissions by approx. **27%** per year
- Light Weight

# Track records in Japan – alternative to plastic sheet

Backlit signage


<p><u>POLA</u> (cosmetic brand)</p> 	<p><u>KOSE</u> (cosmetic brand)</p> 	<p><u>MOS FOOD SERVICES</u> (fast food chain)</p> 
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Safety Signs

<p><u>Takasago Thermal Engineering</u></p>  	<p><u>NAKAMURA CONSTRUCTION</u></p> 
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Safety Instructions

Peach Aviation  
(airline)




Member card

Daiei  
(Retail Chain)



Stick in tag for plants

Watahan  
(Retail Chain)



# Pick up – LIMEX labels (just launched recently)



- OSAKA SEALING PRINTING, the largest label converter in Japan, announced the launch of LIMEX label starting from autumn 2022
- KANEMATSU, a major supplier of printing machines and printing media, announced launch of “LIMEX Aqua Jet Label”, compatible with water based ink
- TAKAYOSHI, a printing company, announced the launch of LIMEX label products from Aug. 2022, and that they realized same price level as synthetic paper labels

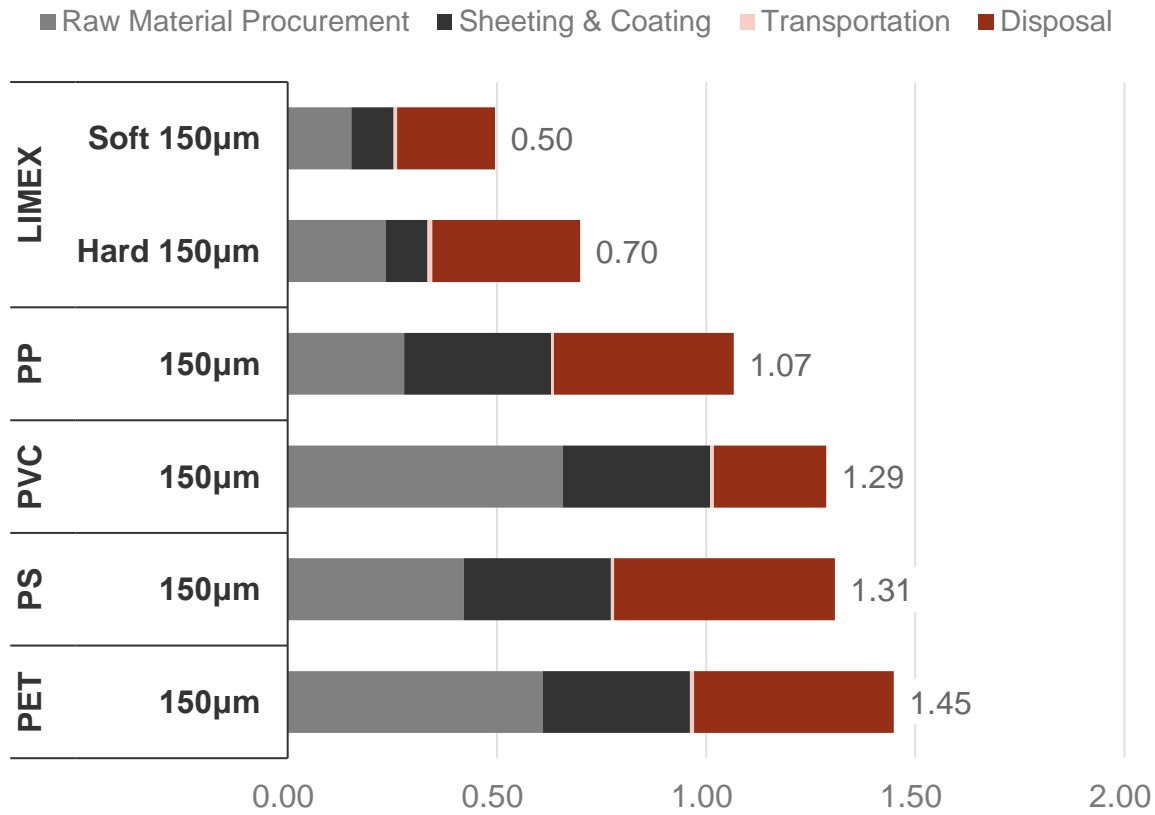
- Replacement of synthetic paper and plastic film labels
- Less CO2 emission and less plastic use



# Pick up - LIMEX Sheet | GHG Emissions

## Use in Japan

### GHG Emissions [kg-CO<sub>2</sub>e/sqm]



### Calculation Conditions

- Functional Unit: 1 sqm of Sheet
- Scope:  
[Raw Material Procurement] -> [Sheeting & Coating] -> [Transportation\*] -> [Disposal\*\*]
- \* 300 km by 10-ton Truck
- \*\* Assuming incineration as the worst case for disposal method after use
- Manufacturing conditions are based on FY2020 performance data of TBM's Shiroishi Factory in Japan. Coatings are applied for printing.
- LIMEX Sheet: Manufactured using zero CO<sub>2</sub> emissions electricity
- Sheets made of other materials: Assumed to be manufactured using Japan's average electricity
- Evaluating the simplified process flow with the key points of the supply chain in the scope

- Calculation Method: Life Cycle Inventory
- Inventory Database: LCI Database IDEA version 2.3 (2019/12/27)
  - › National Institute of Advanced Industrial Science and Technology, Safety and Scientific Research Department and Society and Research Laboratory for IDEA
  - › SuMPO (Sustainable Management Promotion Organization)
- Impact Assessment Method: Climate change IPCC 2013 GWP 100a

# Track records in Japan – alternative to paper

menu

Yoshinoya  
(fast food chain)



Label

American Spirit



Product tags

snow peak  
(outdoor brand)



Map

Tokyo Marathon



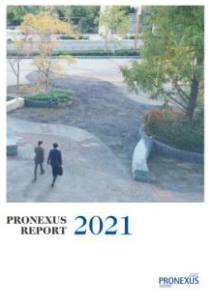
Hotel Equipment

SHANGRI-LA Hotel



Booklet

PRONEXUS  
(IR report)



UN workshop



Point of purchase advertisements

NTT Docomo



Calendar

Sunshine City



Package

DIANA



Shopping Bag

yoshie inaba  
(fashion brand)



# Pick up – LIMEX booklets



## <Compared to traditional paper product>

- ✓ Save water and trees
- ✓ Waterproof, strong tear resistance and durability
- ✓ High printing quality and Premium feel

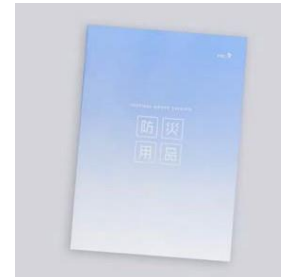
National park guide  
(Ministry of Environment)



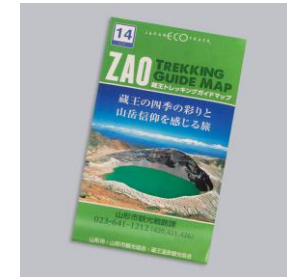
Partner book  
(IWAKIFC, professional soccer team)



Product catalogue  
(Endo Risk Reduction Services)



Trekking map  
(Yamagata City)



# Case Study: Mitsuuroko Group

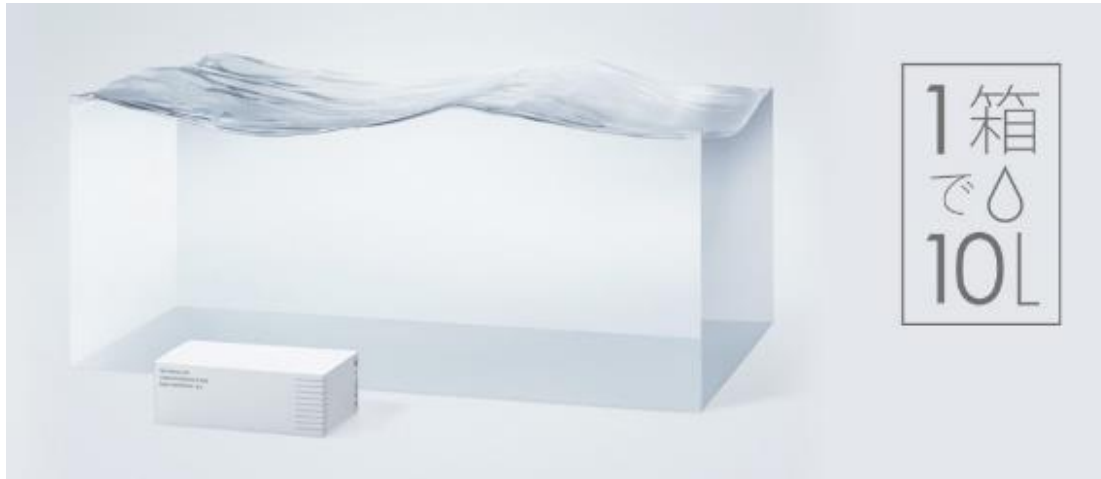


この冊子10,000冊制作時の  
温室効果ガス排出量は **約9,070 kg**です。  
(1冊あたり907g)

新素材を使用することにより、  
通常の紙と比べ水の使用量を **約259,000ℓ**  
削減しています。

- Environmental effect is quantitatively stated on the back of report
- 10,000 booklets saves approximately 259,000 liters of water

# Pick up – LIMEX business cards



Save 10 L of water  
by 1 box (100 pieces)



reddot design award  
winner 2018



GOOD DESIGN AWARD 2017

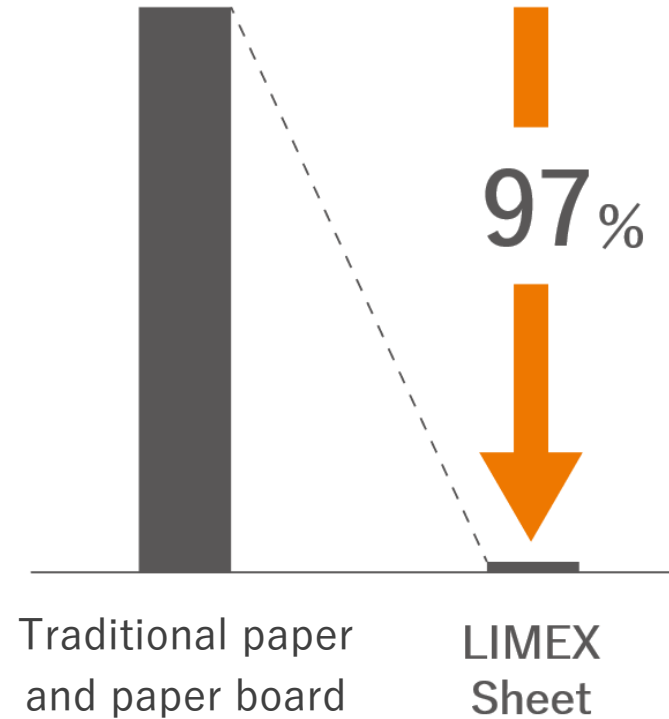
**BEST 100**



GOOD DESIGN AWARD 2017  
**特別賞 [ものづくり]**

# Pick up - LIMEX Sheet | Water footprint

Water usage in the manufacturing process  
[m<sup>3</sup> of water per ton of paper/sheet, in case of Japan\*]



\* It is a calculated value for reference, not a guaranteed value. Numerical values may change depending on the application, recipe, manufacturing conditions, and data acquisition status.

Source of new water consumption per ton of paper and paperboard production: Japan Paper Association

Source of new water consumption per ton of LIMEX sheet: TBM Tagajo Factory (The water consumption divided by production volume at trial production in 2021)

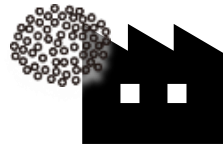
# Upcycle of LIMEX

Upcycle: To **add new value** to the recycled product, not like traditional recycling.

## Paper alternative LIMEX

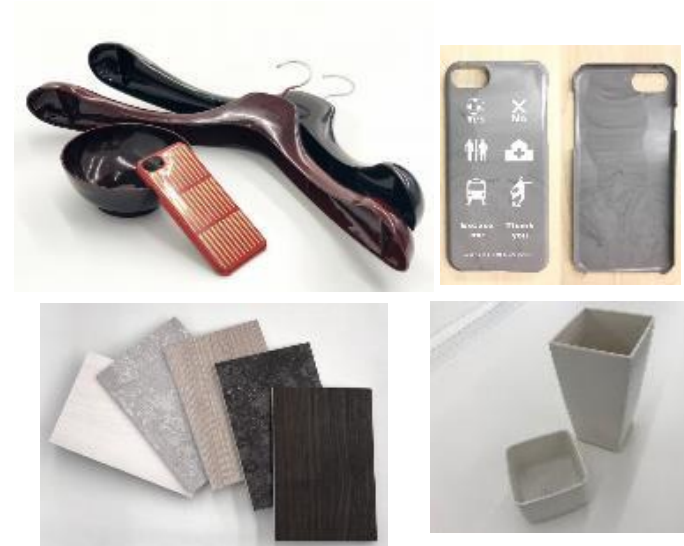


Collect



Pelletize+  
mold

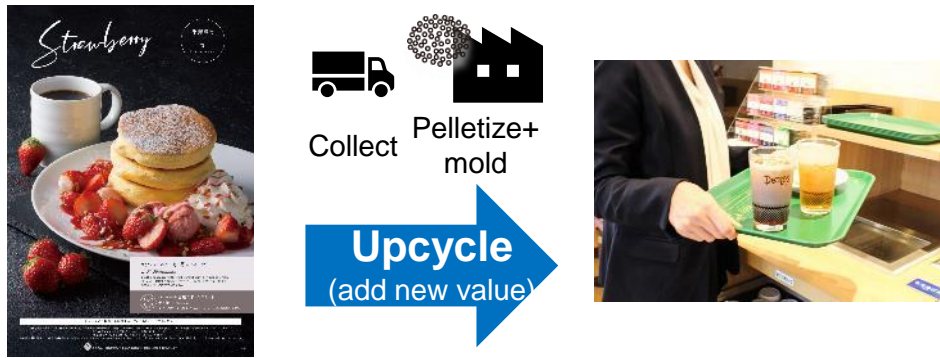
## Plastic alternative LIMEX



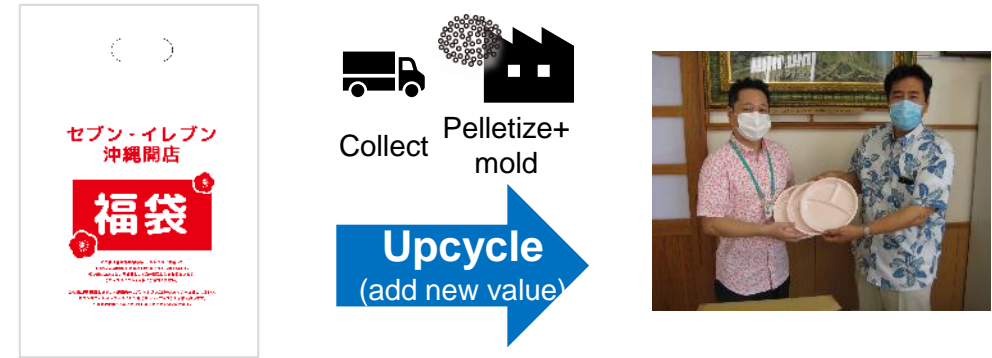
- Plastic alternative LIMEX can also be upcycled or recycled.
- LIMEX can be recycled with traditional PP / PE recycling infrastructure.
- LIMEX can be automatically sorted from other plastics using optical sorting technology.

# Track records in Japan - Upcycle

Café Menu to food tray at restaurant  
 (Seven & i Holdings, a major retail brand)



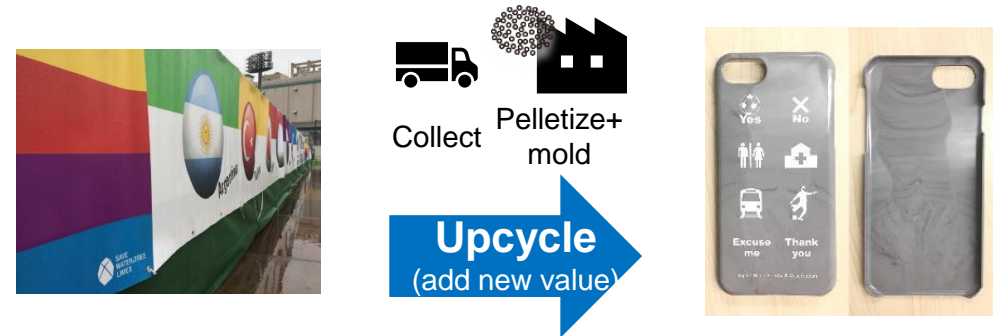
Gift bag at convenience store  
 to Lunch Plate at orphans house  
 (Seven Eleven in Okinawa prefecture)



CSR report to coaster (as a gift for employees)  
 (TANAKA Holdings)



Banner at IBSA\* Football World Grand Prix 2018  
 to official smartphone case for fans



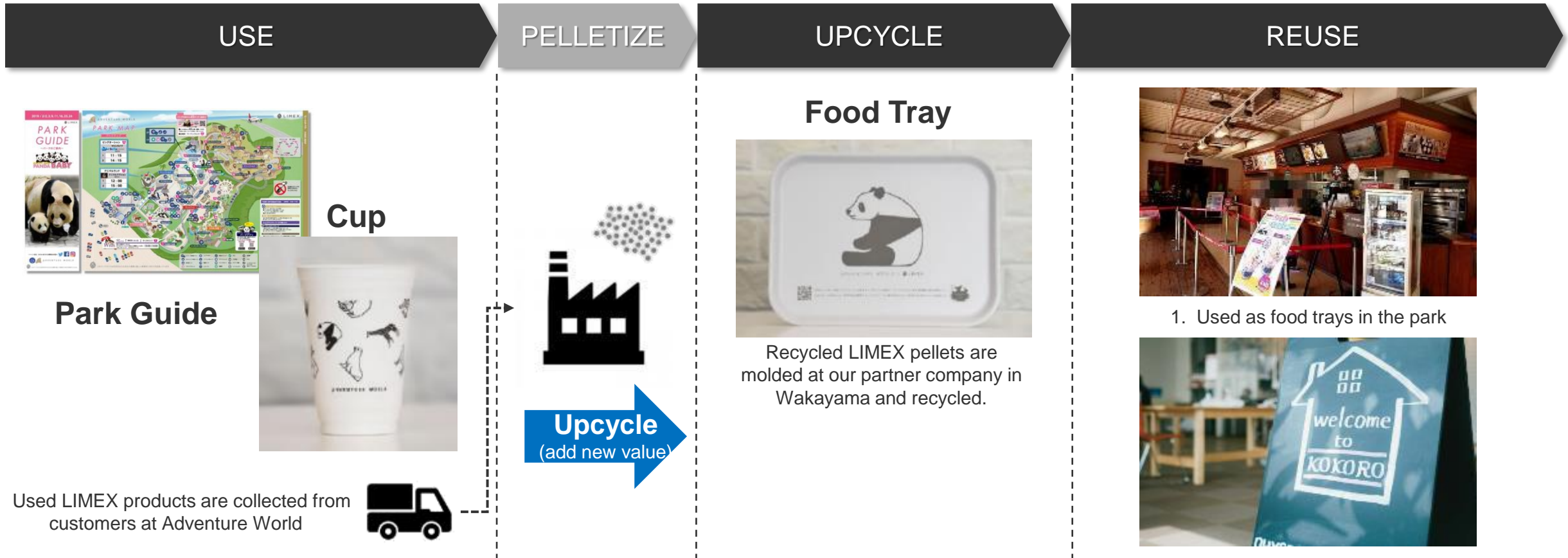
\* IBSA: International Blind Soccer Association



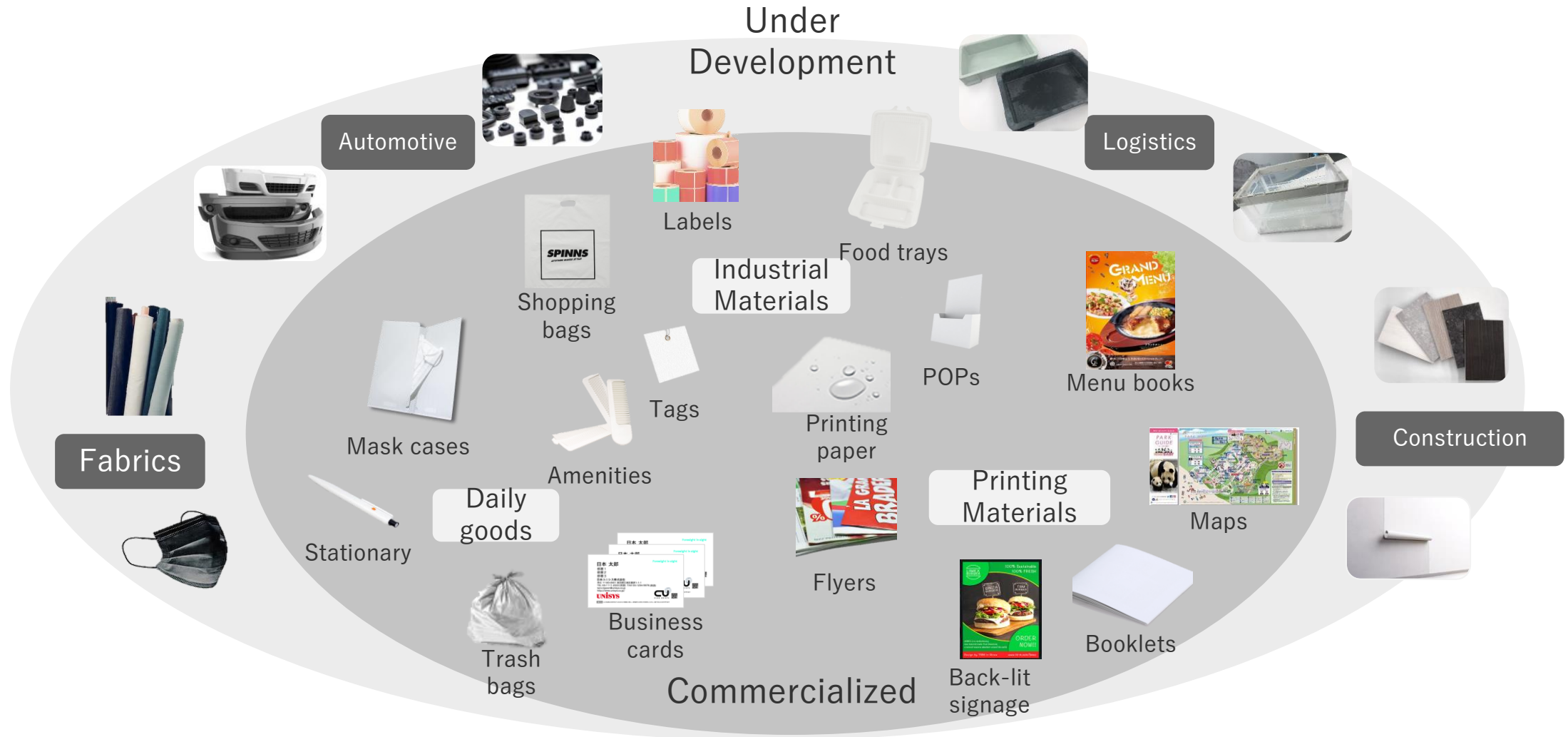
# Track records in Japan - Upcycle

Used LIMEX products (park guides and cups) were collected and recycled into trays for use in the park's bakery and employee cafeteria

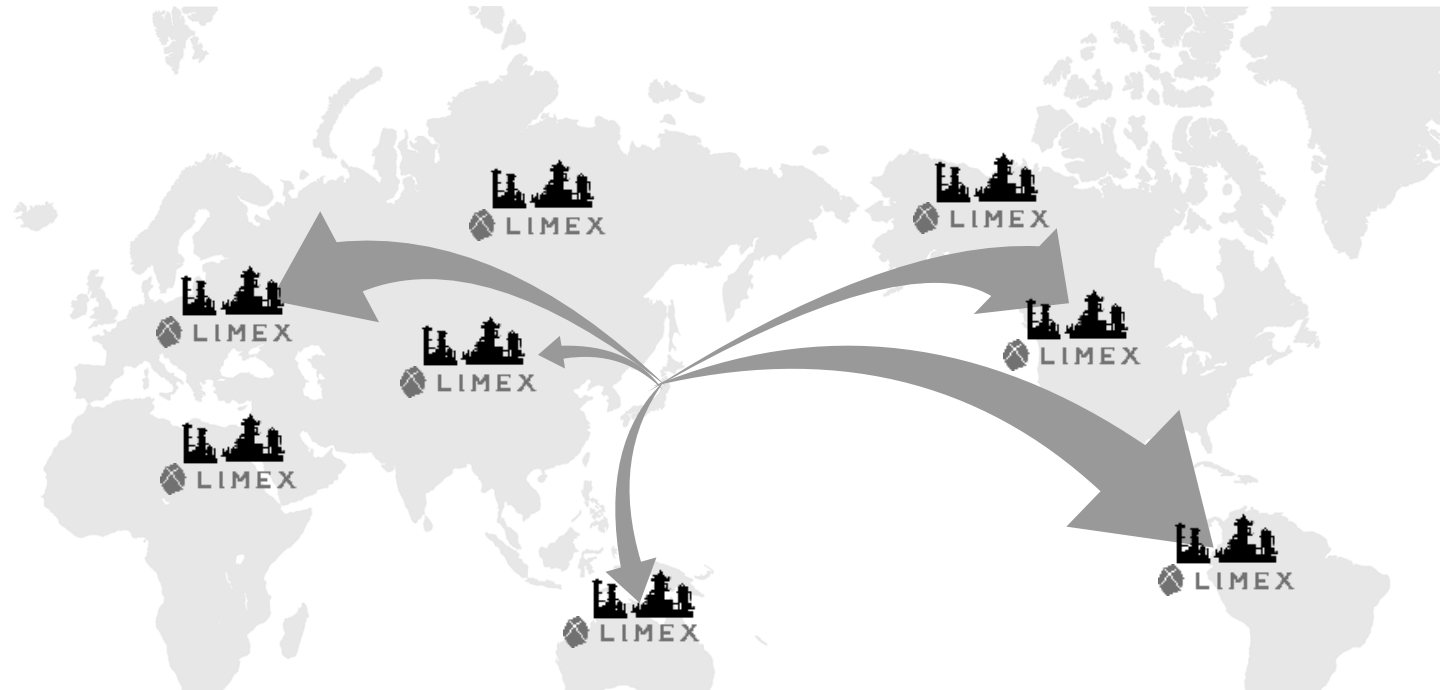
## Upcycle in Adventure World, a major zoo park in Japan



# Future Application Development



# Growth model of LIMEX



**Rapid global expansion with fables model,  
using existing plastic molding facilities**

- LIMEX pellet can be manufactured and molded using traditional plastic molding machinery (No need for special machinery)
- Therefore, there is no need to build a new factory, instead TBM can accelerate global expansion by utilizing existing plastic molding facilities worldwide through OEM and licensing

# World-class recognition



Registered in “STePP”  
the sustainable technology  
dissemination platform by UNIDO



Introduced at COP  
as a member of the Japanese  
government delegation



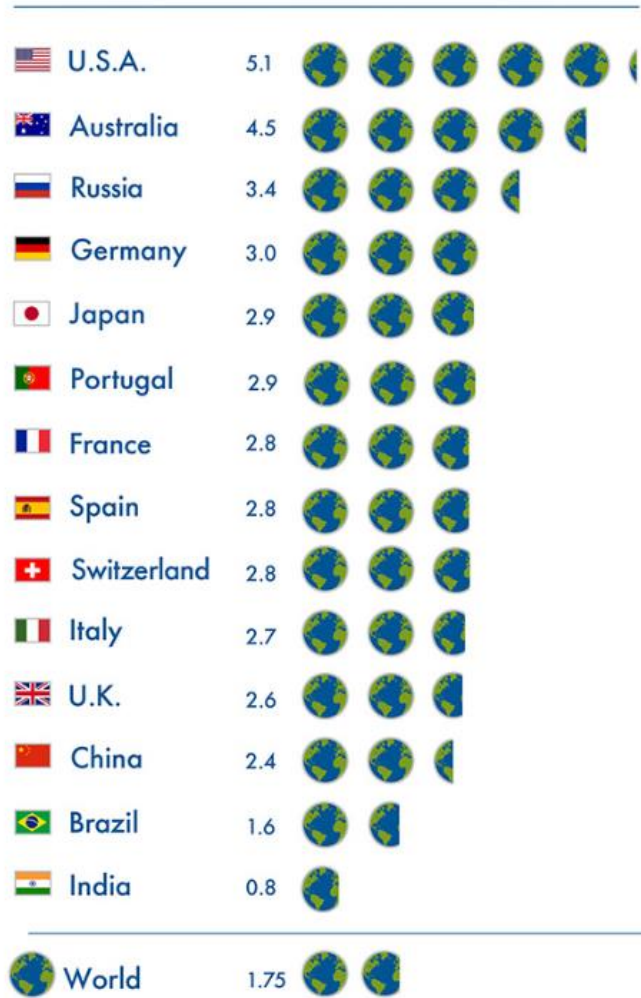
Participated at  
the G20 Innovation Exhibition



## Material Circulation

We are using too much resources of our planet.  
 We must save use of natural resources.

**How many Earths would we need**  
 if everyone lived like U.S.A. residents?



• **Resource reproduction**  
 • **CO<sub>2</sub> Absorption**  
**By the Earth**



• **Resource consumption**  
 • **CO<sub>2</sub> emission**  
**By human beings**

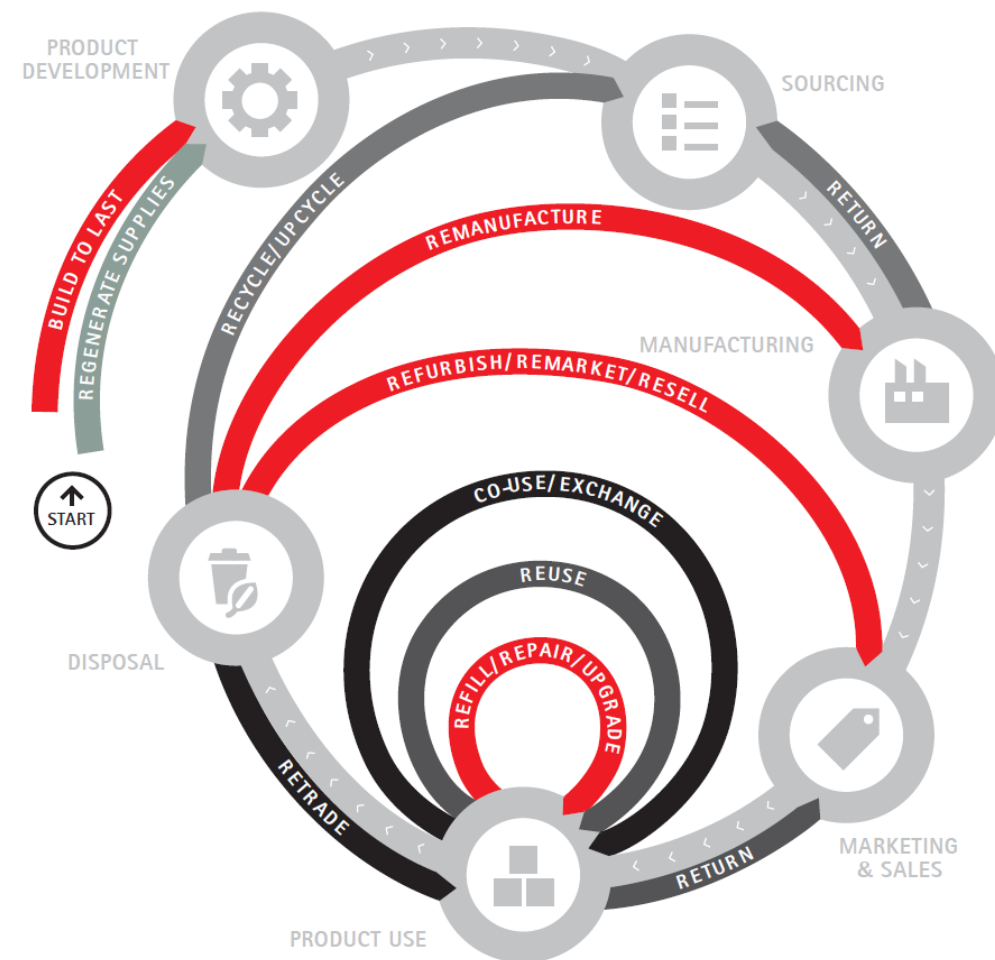
By circulating natural resources, the economic value of Circular Economy is expected to reach US\$ 4.5trillion by 2030.

# US\$ 4.5 trillion

If the mass production and mass consumption business model continues, the world will run short of natural resources by about 80 billion tons by 2030.

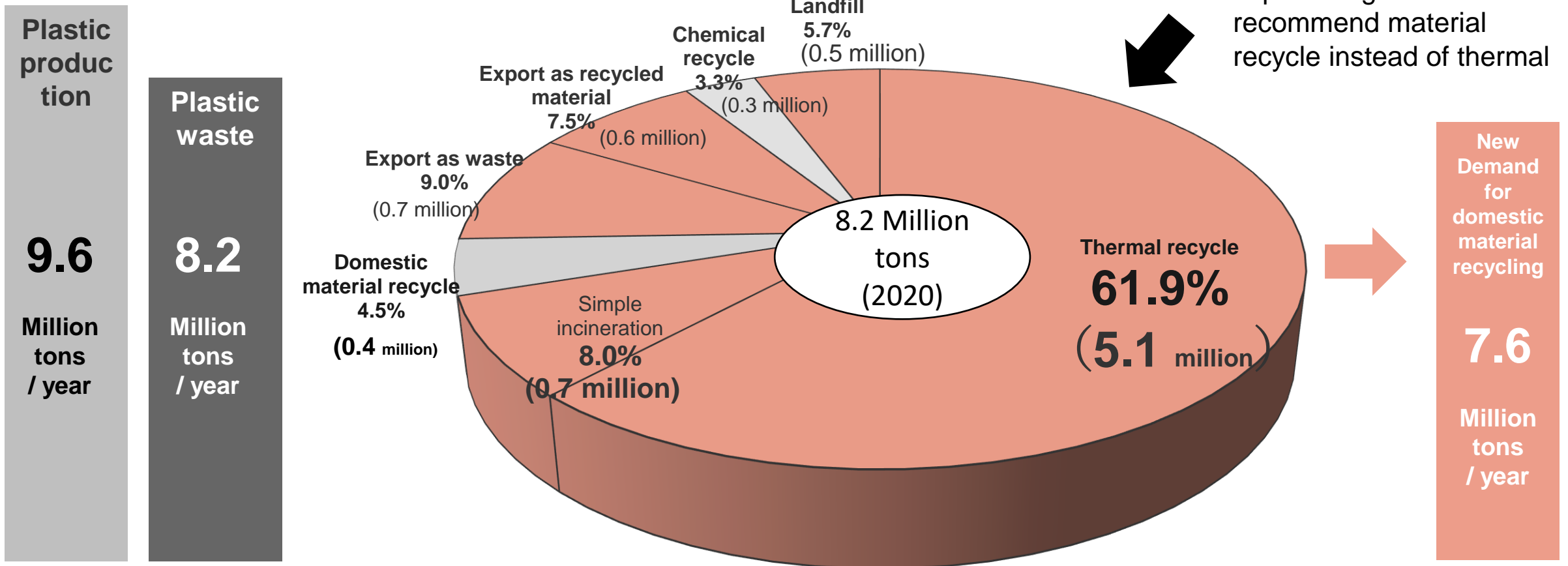
This supply-demand gap is equivalent to all the resources consumed in North America in 2014, and the economic loss is estimated to reach US\$ 4.5 trillion by 2030 and US\$ 25 trillion by 2050.

(Accenture)



In case of Japan, there is growing demand for material recycling, shifting from thermal recycling etc.

Plastic waste disposal in Japan\*



- Basel Treaty regulates the export of plastic waste
- Japanese government to recommend material recycle instead of thermal

\* Source: Plastic Waste Management Institute



# TBM is launching a LIMEX & plastic recycling plant in Yokosuka City, Japan, to meet the growing demand of recycling.

TBM launched a LIMEX & plastic recycling plant in Yokosuka City, Japan, to meet the growing demand of recycling.

## TBM's Yokosuka Recycling Plant



Annual processing capacity:  
approx. **40,000** tons

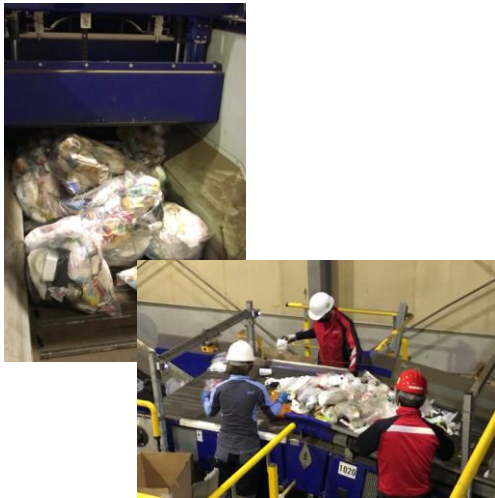
Production capacity:  
approx. **24,000** tons of recycled pellets  
(recycled LIMEX and recycled plastic branded as  
“CirculeX”, explained in next page)

1. The world's first plant to automatically sort and recycle LIMEX and plastic wastes
2. One of the largest plastic recycling plants in Japan
3. Advanced ability to recycle plastic waste discarded from offices and factories
4. Pioneering the recycling of household plastic



# Major processes of Yokosuka Factory

Step 1  
Bag open/  
rough grinding



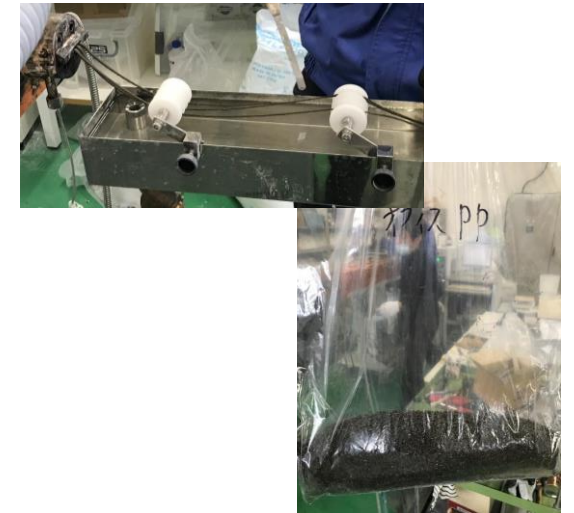
Step 2  
Automatic  
sorting



Step 3  
Pulverization  
and Washing

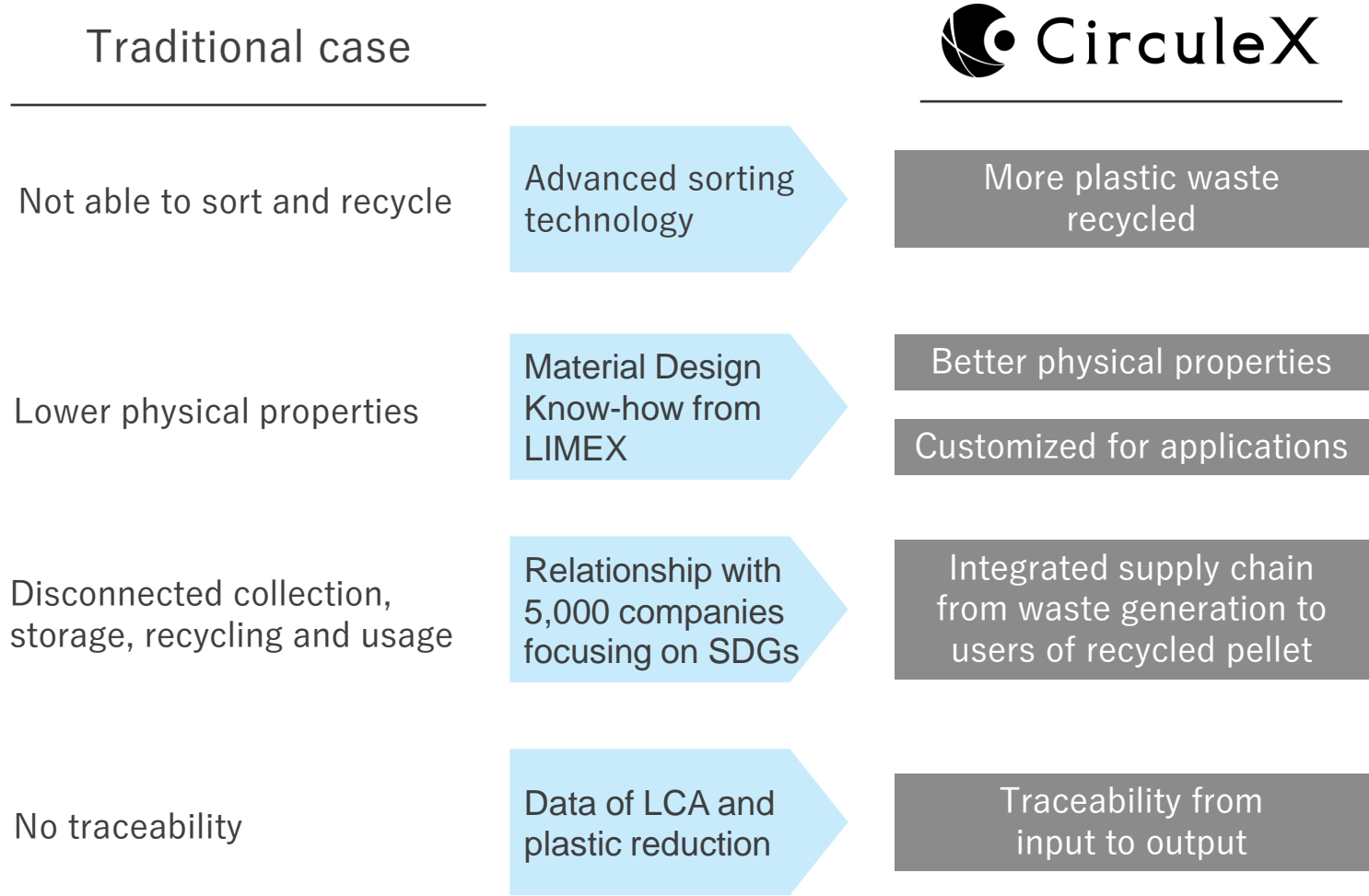


Step 4  
Re-pelletizing



Introduction movie of our Yokosuka recycling plant  
<https://www.youtube.com/watch?v=BfAN5aD17h4>

TBM launched CirculeX, a new and high added value material brand consist of over 50% of recycled material.



# CirculeX product track record in Japan: trash bag



- Consist of over 50% of recycled plastic from Thailand
- Sold at 13,897 Lawson shops, one of the major convenience store brand in Japan, from Mar. 29<sup>th</sup>, 2022
- Reduce the use of virgin plastics and GHG emissions compared with normal trash bags
- Secured tracability
- Certified by “Eco Mark”, a Japanese certification for eco-friendly products



# CirculeX product track record in Japan: Apparel package

@Mizuno, a major sports apparel brand



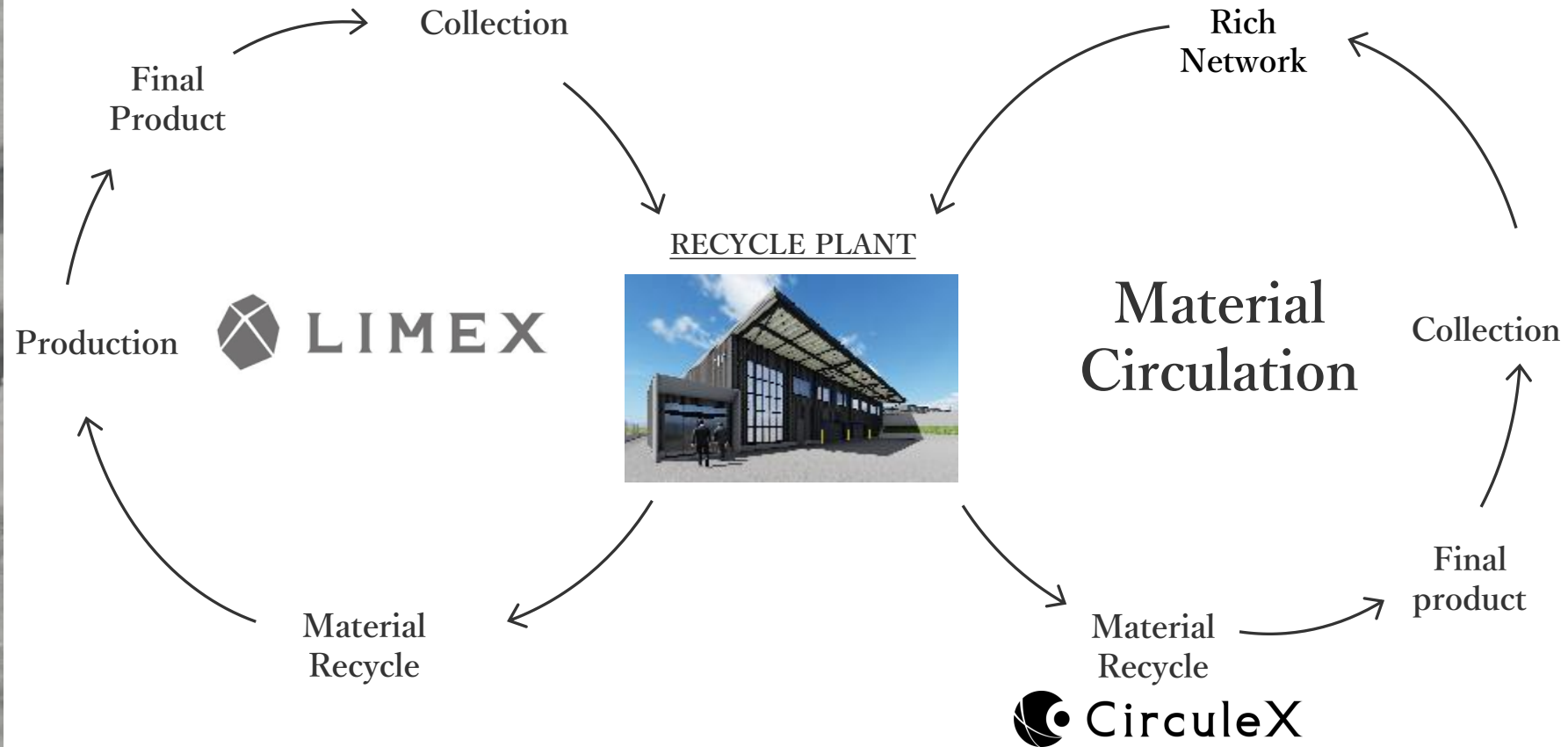
- Consist of 98% of recycled plastic (pet bottle caps and stretch films) from Japan
- Reduce greenhouse gas emissions by approx. **41%**
- Can be recycled repeatedly

# CirculeX product track record in Japan: Sustainumbrella

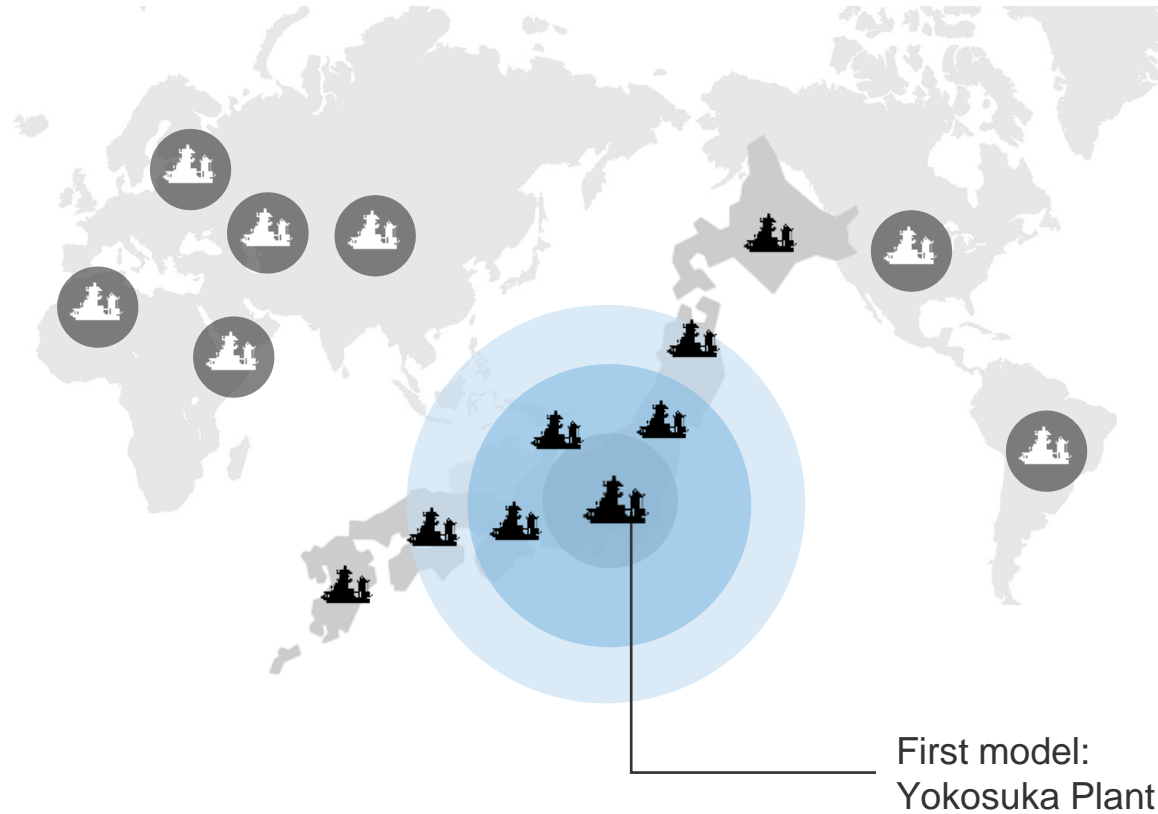


- Normal umbrellas are difficult to recycle as they are made from metal and plastic that cannot be disassembled. As a result, about 60 million umbrellas are landfilled in Japan annually.
- To reduce the disposal of single used umbrellas, Ca Et La, PALTAC and TBM together co-developed “Sustainumbrella”.
- The film and handle of the “Sustainumbrella” are made of CirculeX. The other parts are made of plastic, and no metal is used.
- The “Sustainumbrella” is durable and safe, and therefore can be used for long. Not using metals, it will not get rusted.
- “Sustainumbrella” will be sold at convenience stores, supermarkets and drugstores across Japan from April, 2022

# Material & Circular: TBM will develop the circulation model of **T B M** ecological materials using abundant limestone and plastic waste.



Starting from Yokosuka, TBM plans to expand the model to 10 domestic plants and global market.





Ref.) Most of the marine plastic waste is coming from South East Asia, where recycling infrastructure is not sufficient.

Marine Plastic Waste ranking\*1 [2010]

Ranking	Country	Marine plastic waste (tons)
1位	China	3,530,000
2位	Indonesia	1,290,000
3位	Philippines	750,000
4位	Vietnam	730,000
5位	Sri Lanka	640,000
6位	Thailand	410,000
7位	Egypt	390,000
8位	Malaysia	370,000
9位	Nigeria	340,000
10位	Bangladesh	310,000
	・	
	・	
20位	USA	110,000
	・	
	・	
	・	
30位	Japan	60,000

Recycle rate of solid waste\*2

Indonesia	7.0%	Iceland	55.8%
Sri Lanka	13.0%	Germany	47.8%
Malaysia	17.5%	Slovenia	46.4%
Vietnam	23.0%	Ireland	33.0%
Thailand	19.0%	Sweden	32.4%
Philippines	28.0%	Switzerland	32.0%

TBM will expand the Yokosuka model to the Asian countries to develop circular economy and reduce marine plastic waste.

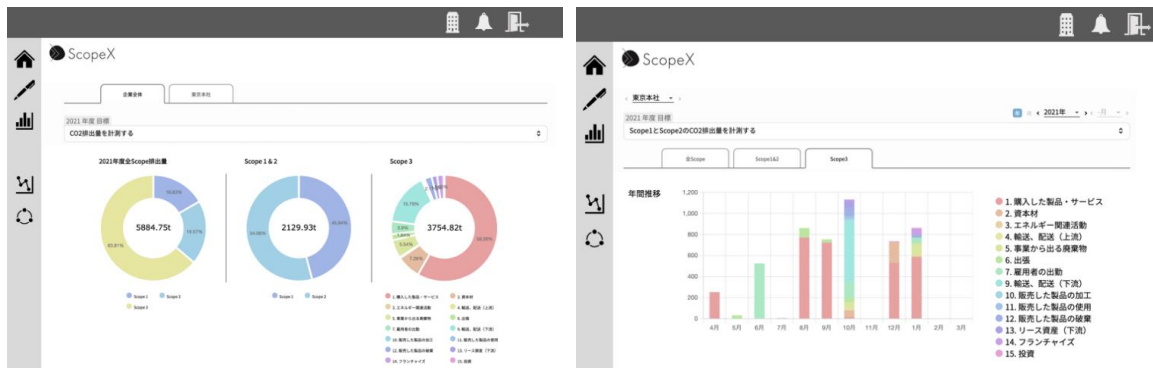
\*1 "Plastic waste inputs from land into the ocean" (2015.Feb. Science), "Reference material to plastic situation in domestic and overseas", The Japanese Ministry of Environment, 2020

\*2 "What a Waste 2.0 A Global Snapshot of Solid Waste Management to 2050", World Bank, 2018 (the data year varies by countries)

# TBM's cloud based GHG emission visualization service “ScopeX”



1. A dashboard that reports the comprehensive GHG emission situation, by facility and by scope 1, 2 and 3
2. Intuitive user interface / design that enables easy input and operation for non-experts
3. Recommendation of GHG emission reduction methods  
e.g. matching with solution provider, recommendation of better logistics and new materials



## Ambitious mid-term goal “TBM Pledge 2030”



### Go Carbon Negative by 2030

We aim for more greenhouse gas emissions reduction than the amount we emit throughout our value chain.



### Go Circular

We aim to circulate 1 million tons of LIMEX and plastic in 50 countries.

T B M