

LIMEX Pellet/Sheet

Innovative Sustainable Material Mainly Made from Limestone

Jan. 15th 2025

TBM Co., Ltd.

Global Business Development Team

TBM

Company Introduction

Company Name	TBM Co., Ltd.
Established	August 2011
Address	15F Toho Hibiya Building, 1-2-2, Yurakucho, Chiyoda-ku, Tokyo, JAPAN
CEO	Nobuyoshi Yamasaki
No. of employee	313 *as of December 2023
Capital	100 million yen *including capital reserve of 12,035,460,000 yen
Business	Develop ecological materials and promote material circulation.



Tohoku LIMEX Factory (Tagajo City, Miyagi Prefecture)



Yokosuka Circular Factory (Yokosuka City, Kanagawa Prefecture)



LIMEX

What is LIMEX ?

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

CaCO₃(Limestone) 50% ≤



&

Plastic Resin



LIMEX Pellet



LIMEX Sheet



Blown Film Molding

- Shopping Bag
- Waste Bag



Thermoforming

- Food Container
- Cup



Injection Molding

- Daily Goods
- Industrial Goods



Extrusion Molding

- Sheet
- Film



Blow Molding

- Bottle
- Tube



Spunbond

- Bag

Why Limestone?

Abundant natural resource worldwide



Reduce CO₂ emissions

Economical and stable price

Limestone

Environmental Impact of LIMEX

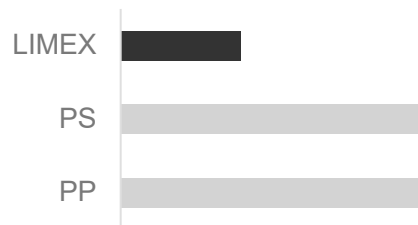


As alternative to plastic

Reduce oil consumption



Plastic consumption



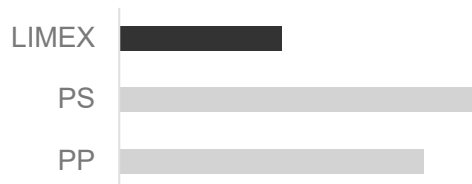
* Per kg (PS=100)

Reduce GHG emissions



GHG emissions*1

Raw material sourcing - incineration
(production of final product is excluded)



*Functional Unit/System Boundary
1 kg pellets
Evaluation of raw material procurement (including pelletizing), material transportation, product transportation, and disposal process
Assumed that disposal process is incineration as general waste
Product manufacturing is omitted since it depends on molding processes

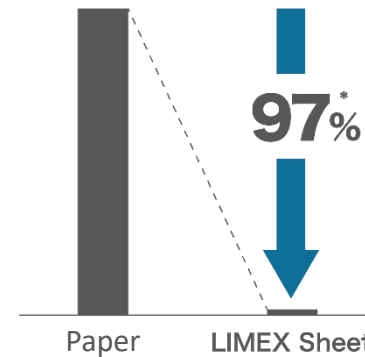


As alternative to paper

Reduce water consumption



Water consumption at manufacturing



Save Forest



Manufactured using 100% renewable energy



*1 Simplified LCA conducted by TBM Co., Ltd. (2020) | 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 *2 Water use divided by the production volume(weight) during the trial production period of 2022 at Tagajo Plant | Source: Japan Paper Association, "New Water Usage Intensity per 1 ton of Paper and Paperboard Please note that these are estimates for reference only and the values may change depending on the recipe, manufacturing conditions, and the data availability.

Introduction Cases

More than **10,000** companies and municipalities use various LIMEX materials and products.



Poster



Folder



Menu



POP



Waste Bag



Business Card



Guide Map



Backlight Film

Global Symbolic Cases of LIMEX

Recognized for its environmental benefits, LIMEX adopted by LVMH group's cosmetic brands and Big C, a supermarket run by a Thai conglomerate

Global Cases



KENDO (LVMH Group)
Cosmetic Containers



Big C (Thai conglomerate BJC)
Baskets

From Japan to Overseas

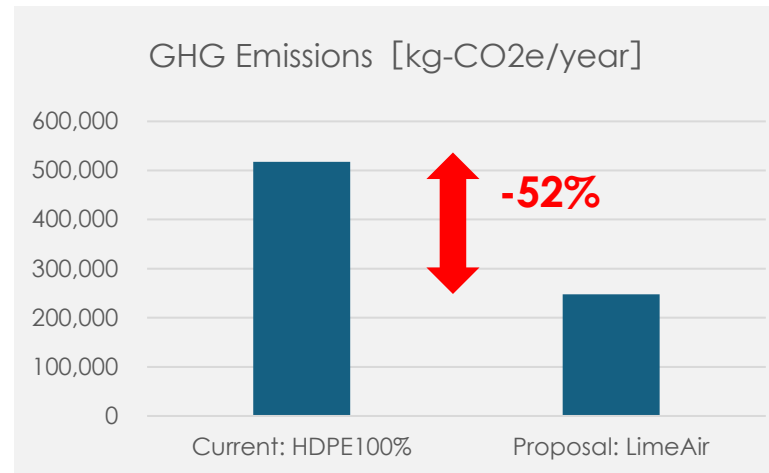
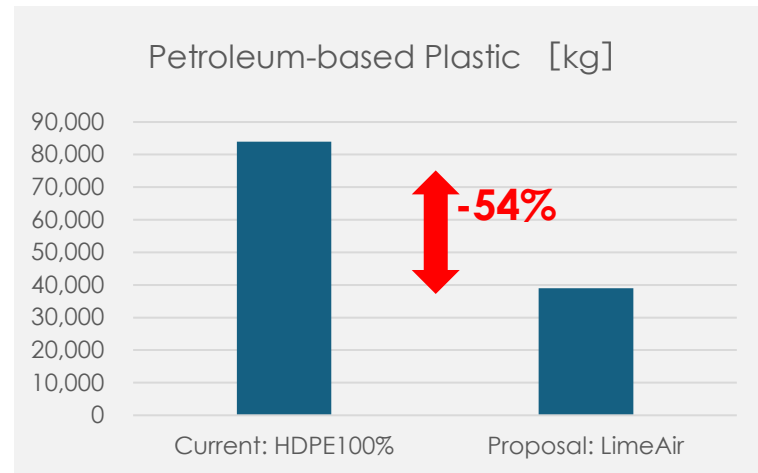


SEVENTEEN (K-POP Group)
Poster / Card

Case Study: Environmental Impact (Life Cycle Assessment)

TBM can calculate and provide **quantitative environmental benefits** using Life Cycle Assessment, which helps customers understand the exact environmental impact by introducing LIMEX.

No.	Item	Item	Thickness (mm)	Width (mm)	Gusset (mm)	Length (mm)	Annual quantity [pcs]	Petroleum-derived plastic[kg/month]		Greenhouse Gas Emissions[kg-CO ₂ e/月]	
								Unit	Net	Unit	Net
1	Current: HDPE100%	Shopping bag_Small	0.020	240	140	410		8,270	83,942	50,895	517,878
2		Shopping bag_Big	0.023	280	160	510		53,189		327,353	
3		Garbage bag_Small	0.030	457	203	910		1,773		10,914	
4		Garbage_bag_Big	0.050	762	355	1,117		20,710		128,716	
5	Proposal: LimeAir Bag	Shopping bag_Small	0.020	240	140	410		5,731	39,007	36,432	247,954
6		Shopping bag_Big	0.023	280	160	510		25,057		159,279	
7		Garbage bag_70L	0.020	800	-	900		1,091		6,937	
8		Garbage_bag_90L	0.030	900	-	1000		7,127		45,306	
Total								-44,935kg (-54%)	-269,924kg (-52%)		



Calculation Assumptions

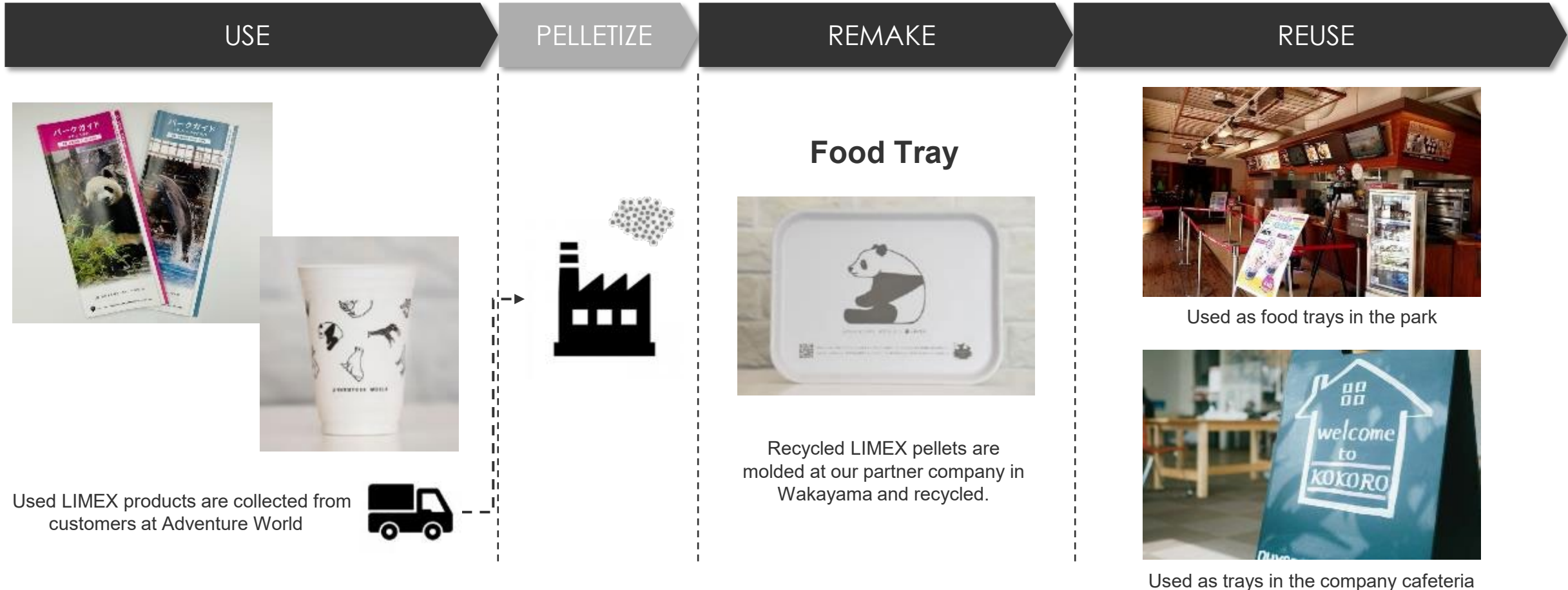
Calculation scope: From raw material procurement to incineration
 *Biomass-derived resin is assumed to be carbon neutral, CO₂ emitted from the material at the time of incineration is considered to be 0. The biomass content of each resin is not taken into account.

Remarks

- These values are for reference only. Please note that the values may vary depending on the formulation and manufacturing conditions of each product.
- The values are subject to change depending on the status of data acquisition, etc.
- Comparisons with other companies' products are not possible due to differences in LCA calculation methods and data collection methods.
- As stated in the Japan Chemical Industry Association document, differences of less than 10% are within the normal margin of error for LCA. - https://www.nikkakyo.org/sites/default/files/ICCA_LCA_Executive_Guid.pdf#page=10C
- Alculation method: Life cycle inventory
- Main inventory database: LCI database IDEA version 2.3 (2019/12/27) National Institute of Advanced Industrial Science and Technology (AIST) Safety Science Research Division IDEA Lab. Sustainable Management Promotion Organization (SuMPO)Impact
- Assessment method: Climate change IPCC 2013 GWP 100a

LIMEX Closed-loop recycling

Used LIMEX products (park guides and cups) were collected and recycled into the bakery and employee cafeteria trays.



USE

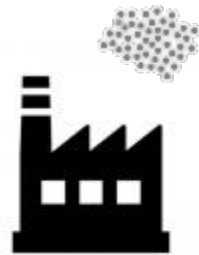
PELLETIZE

REMAKE

REUSE



Used LIMEX products are collected from customers at Adventure World



Food Tray



Recycled LIMEX pellets are molded at our partner company in Wakayama and recycled.



Used as food trays in the park



Used as trays in the company cafeteria

The Next-Generation LIMEX (CR LIMEX)

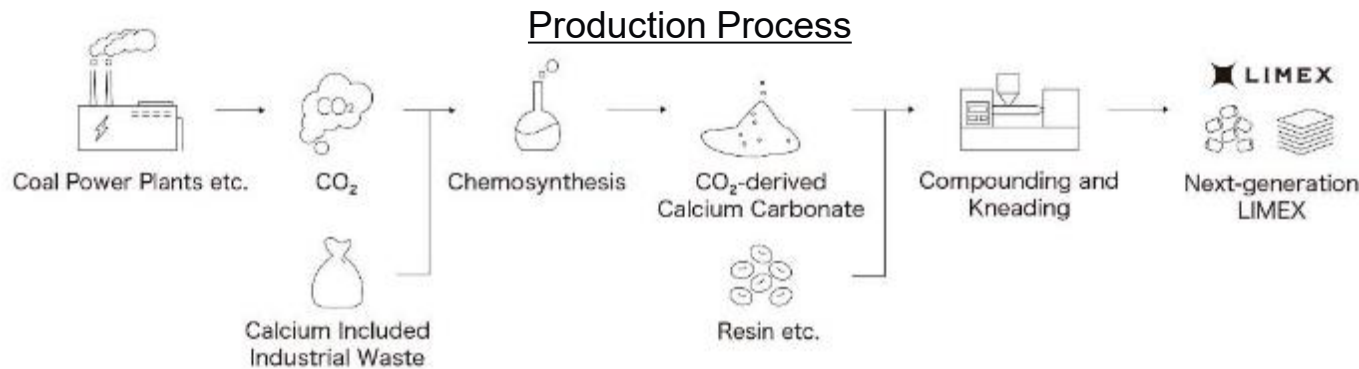


TBM succeeded to develop “Next-Generation LIMEX” using emission gas CO2 as raw material with **CCU** technology and presented at Davos.

CO2 gas emission from industries



Next-Generation LIMEX(made from CO2)



Supported by:





LIMEX

Collaboration Ideas



Retail Stores

Comprehensive Environmental Solutions by LIMEX



Non-woven Bag



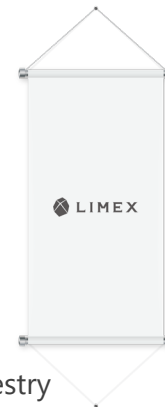
Shopping Bag



Garbage bag



POP



Tapestry



Poster



Toiletry & Daily Care

Comprehensive Environmental Solutions by LIMEX



Backlit Signage



POP



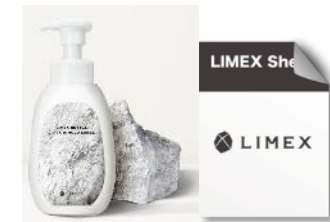
Flexible Packaging



Bottle



Flexible Package



In-mold Label/Adhesive Label



Food & Beverages

Comprehensive Environmental Solutions by LIMEX



Stand Up Pouch



Sachet



Bottle



In-mold Label/Adhesive Label



Garbage Bag

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

T B M

[Click here to contact us](#)

 search

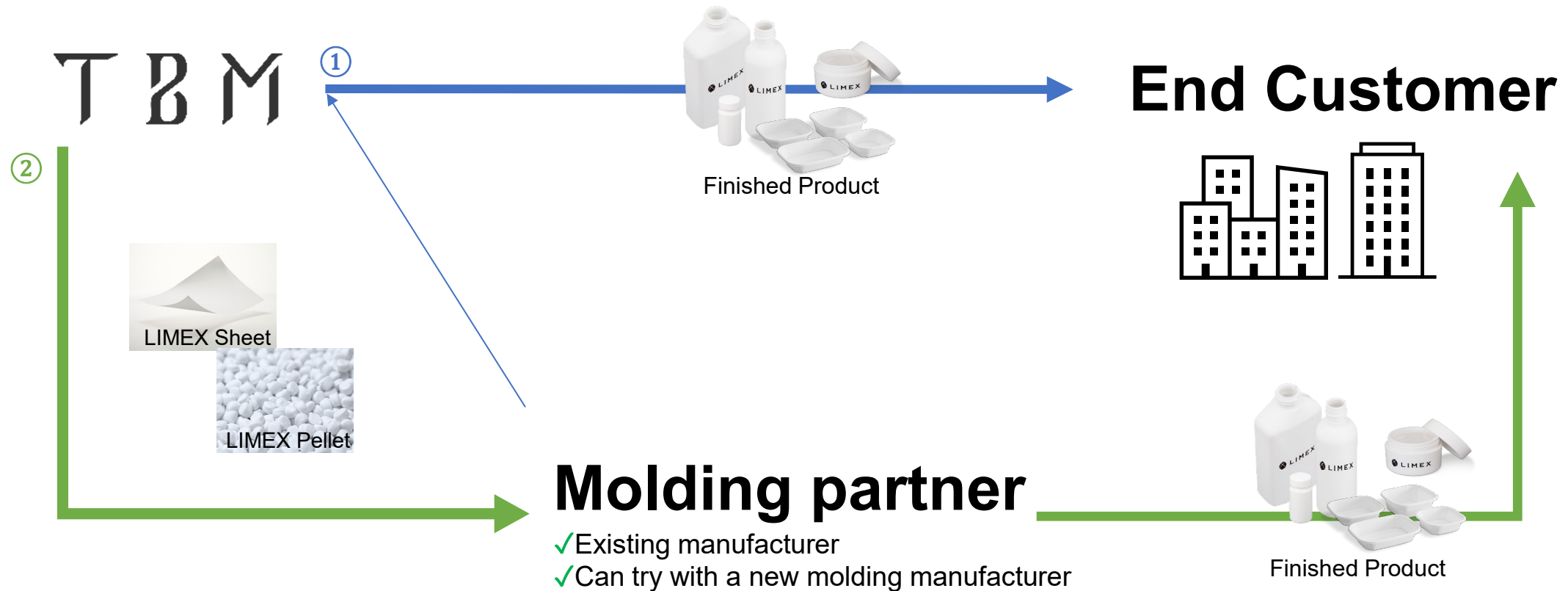
Appendix

Supply Chain Example

We have 2 options to provide LIMEX products to end customers depends on the customers preference.

① Our molding partner produces the finished product, and TBM sells the finished product to the end customer

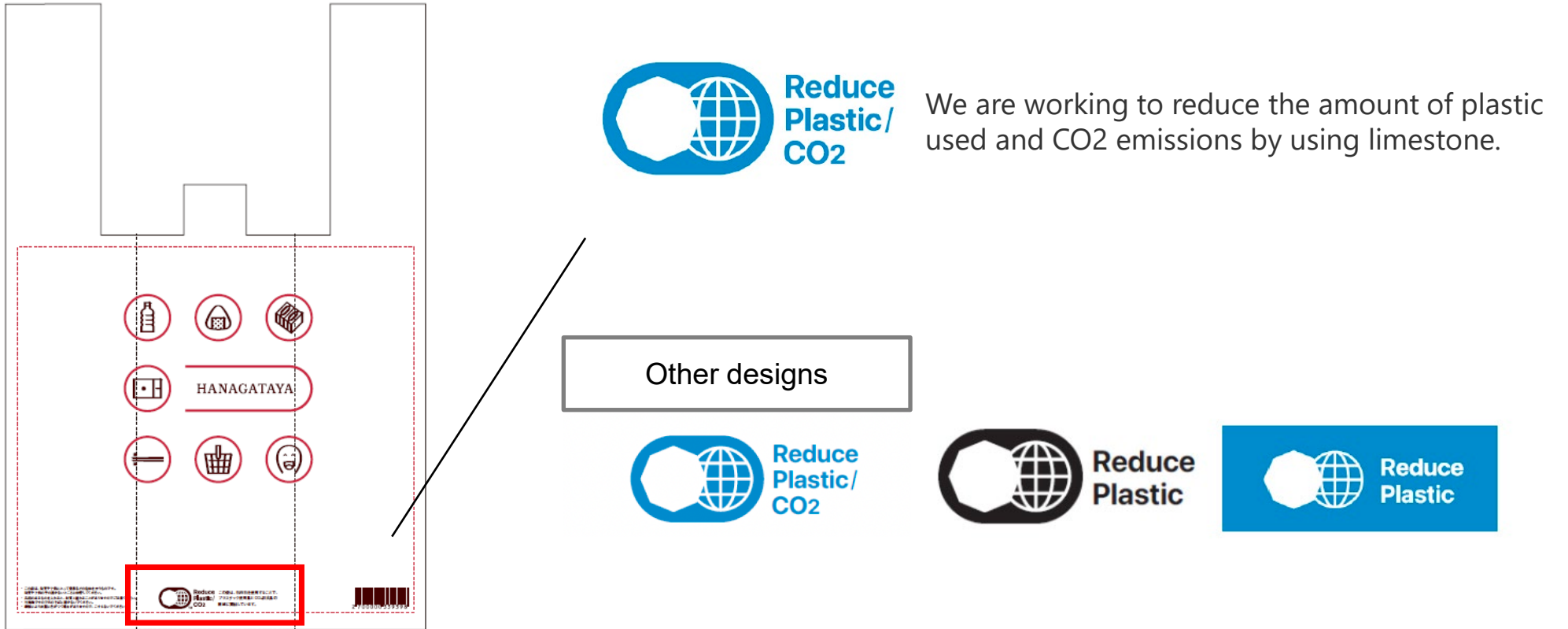
② TBM sells LIMEX pellet/sheet to the molding partner and they sell the finished product to the end customer



Label for promotion

The "Reduce Plastic/CO2" label is available to promote your environmental initiatives.

It is also possible to print the label on the outer bag/case instead of the product itself.





LIMEX

Beauty & Cosmetics

Comprehensive Environmental Solutions by LIMEX



Backlit Signage



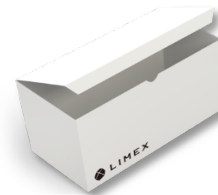
Cosmetic package



POP



Bottle



Flat pack



Blister Package



In-mold Label
Adhesive Label



Restaurants

Comprehensive Environmental Solutions by LIMEX



Non-woven Bag



Shopping Bag



Garbage bag



POP



Tapestry



Poster