CHALLENGE WHAT DESIGN CAN DO CUT THINKS CLIMATE CHANGE PERSPECTIVE TOKYO CITY

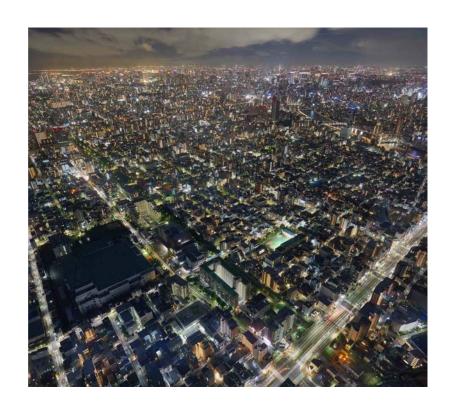


# CURRENT SITUATION MEGA-CITY, MEGA-CONSUMPTION

Tokyo is a global megacity with an area that covers some 2,194 km² and houses 14 million residents, making it the largest city in the world in terms of population. The central area of the 23 wards (districts) spreads over 627 km² and houses over 9 million residents, making it a highly dense area comparable to New York City and Paris.

The urban setting contributes to a high amount of consumption and waste. The 23 wards generate a total of around 3 million tonnes of municipal solid waste each year. This amounts to about 7.4 Tokyo Domes. About 70% of this waste comes from households, while the other 30% comes from shops/offices.

Each person in Tokyo generates close to 1 kg of waste everyday. The amount of municipal solid waste in Tokyo reached its peak in 1989 at 4.9 million tonnes and has decreased to around 3 million tonnes today thanks to rising awareness and government initiatives. However, much more can be done.



# **50 YEARS LEFT?**

Currently, Tokyo has only one operating landfill. The largest amount of what we dispose of at Central Breakwater Landfill is incineration residue, such as fly ash. And second to that is slag from municipal waste such as sewage sludge. Followed by non-combustibles such as metal and glass that cannot be burnt physically.

Furthermore, it has been said that this landfill will meet its capacity in around 50 years\* It is important to think about waste in its pre-waste state and head towards a circular economy.

\*The number of years we could use at New Sea Surface Disposal Site (Shinkaimen Landfill Site) located outside of Central Breakwater Landfills is variable. From 2007, the volume of landfill used annually has been radically reduced, thanks to thermal recycling (turning non-burnables into burnables), the spread of categorized recycling, and making molten slag from incinerator ash. Furthermore, the space has been expanded by digging deeper into the seabed within the landfill sites. As of 2018, it is considered that we can continue to use it for 'more than 50 years'.



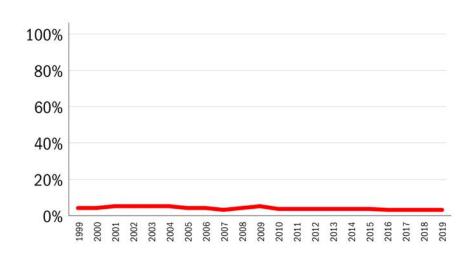
# CURRENT SITUATION IMPORTING FOOD WASTE

In Japan, it is custom to say "Itadakimasu" before eating and "Gochisosama" after eating to show your gratitude towards agricultural products and farmers. It has also historically been considered a courtesy and a virtue to finish every dish that is served at the table.

However, in reality, 1.3 billion tonnes of edible food is still wasted annually. In bustling Tokyo, industrial food waste from restaurants reaches up to 980 thousand tonnes annually, while households are responsible for 990 thousand tonnes.

Japan's food self-sufficiency rate is approx. 66%, but if you look at Tokyo, this number drops to only 3%. There is a contradiction baked into Tokyo's food system, where we import large amounts of food from outside the city, yet we throw them away without consuming them.

### **FOOD SELF-SUFFICIENCY RATE IN TOKYO**

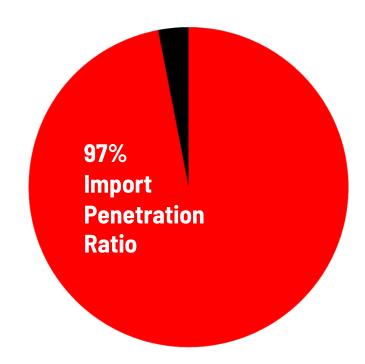


# CURRENT SITUATION MANY REASONS BEHIND TEXTILE WASTE

In Japan, 940 thousand tonnes of clothing is disposed of every year. However, it is difficult to get an accurate figure for Tokyo because textiles are often thrown away as burnable trash.

This disposal is said to occur for a combination of reasons. Some of which are short cycles of consumption and production thanks to the rise of fast fashion, a reluctance to sell or resell at lower prices to maintain brand value.

In Japan, the import penetration ratio of clothing stands at 97%. About 60% of it is from China, while the rest comes from other Asian countries such as Vietnam and Indonesia.



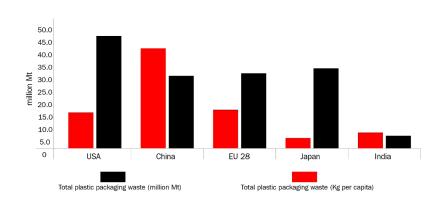
The import penetration ratio shows to what degree domestic demand is satisfied by imports. The domestic demand is calculated as GDP plus imports minus exports.

# THE SECOND LARGEST CONSUMER OF PLASTIC

Japan's domestic consumption of plastic products reaches up to 10.12 million tonnes per year. The amount of plastic packaging waste produced is second only to the United States, at a massive 35 kg per capita (2017). Until recently, most of this waste was exported to China for disposal. But since 2018, China and other Asian countries have begun to restrict imports, and waste plastic is now piling up at waste disposal plants all over Japan.

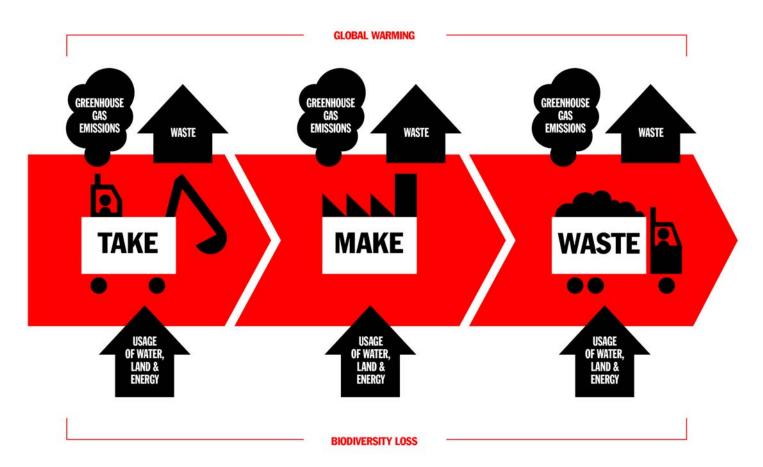
In recent years, the problem of microplastics flowing into Tokyo Bay has also emerged. There have been reports that microplastics have actually been detected in the bodies of fish swimming in Tokyo Bay. We are now faced with the difficult task of securing disposal sites while reducing consumption.

## PLASTIC PACKAGING WASTE GENERATION, 2014 (million Mt).



## THE CURRENT ECONOMIC 'TAKE-MAKE-WASTE' MODEL

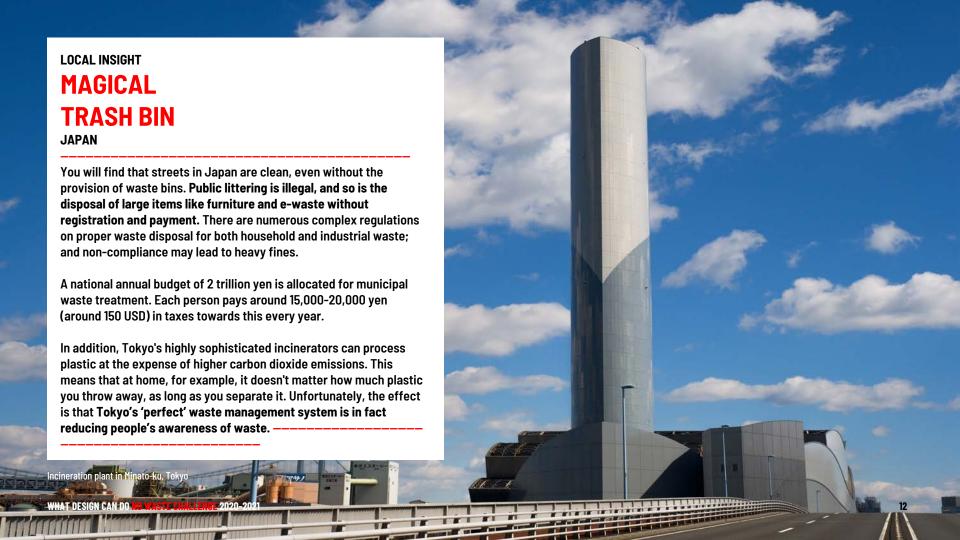
Global heating is caused by the collection of raw materials, the transformation of these materials into products that are used briefly and that are discarded as waste. It is important to realize that next to the production of waste and greenhouse gasses, each phase uses resources like water and energy as well as land that is no longer available for biodiversity and CO2 absorption.











# GET INSPIRED BY JAPANESE HERITAGE



Utagawa Hiroshige, Fifty-three Stations on the Tokaido: Morning Scene at Nihonbashi Bridge, 1833-34

#### LOCAL INSIGHT

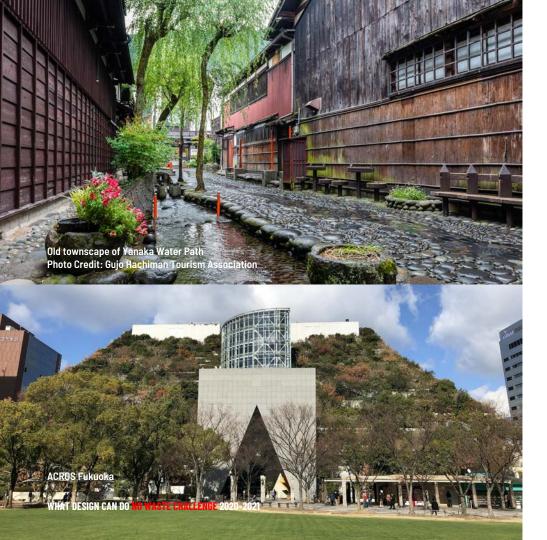
# TOKYO WAS ONCE A RESOURCEFUL SOCIETY

JAPAN

Japan's Edo period lasted from 1603-1868. The population of 30 million was said to be a resourceful community with the mindset of a circular society.

Back then, Japan had an active second-hand and recycling market and ecosystem. Material recycling, repair and reuse were widely practiced. This was made possible by a variety of occupations. For example, ash buyers collected ash from burned timber or waste to be used as fertilizers, fabric dyes, and for alcohol distillation.

Today, the second-hand market in Tokyo is mainly for materials like apparel, automobiles, and electronics. Are there ways for designers to activate new markets? How can designers normalize them and make them fun for consumers?



**LOCAL INSIGHT** 

### IN HARMONY WITH NATURE

**JAPAN** 

Japan is a mountainous island surrounded by seas, and has developed its own unique culture in harmony with nature.

In the riverside town of Gujo Hachiman in Gifu Prefecture, people have developed a lifestyle around the domestic use of spring and mountain water. From upstream to downstream, the same water is used over and over again but for different purposes, from drinking to washing clothes. As it goes downstream, the water is eventually used for farming, and completes a cycle by returning to the same waterways. This lifestyle in balance with nature makes the cityscape beautiful, and still fascinates people today.

In present day, there are some attempts made to create new harmonies with nature using our own hands. For example, ACROS Fukuoka utilizes the latest environmental technology to recreate as natural an ecosystem as possible. The architecture incorporates the flow of time with an eye for the natural features of the area, and a design that looks to the future while matching with today.

How can we stay in harmony with nature while utilizing our unique cultural values, within the constantly developing urban landscape of Tokyo?



**LOCAL INSIGHT** 

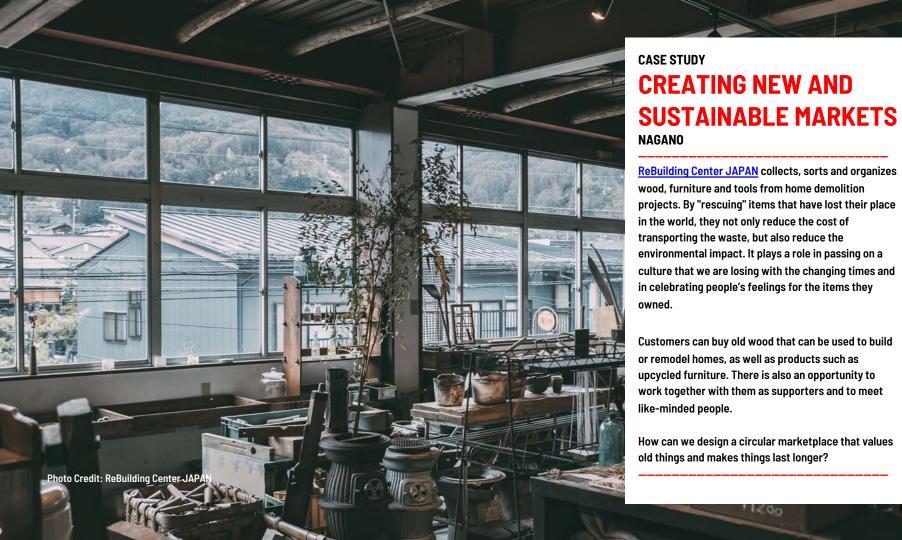
# MODULAR AND SUSTAINABLE AESTHETICS

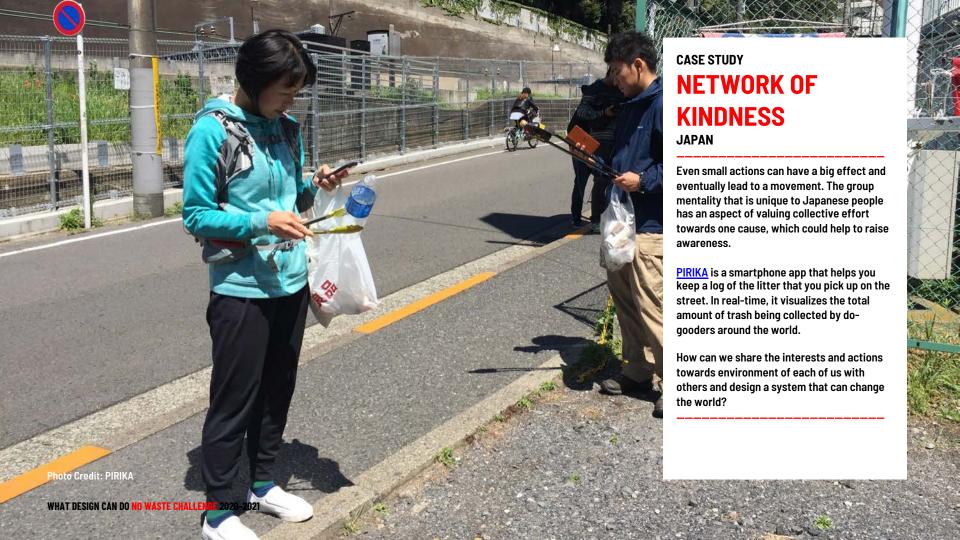
**JAPAN** 

Japanese architecture is closely related to its culture, and often fosters the Japanese sense of rationality and beauty. The spatial characteristics of the corresponding dimensions between pillars and *tatami* mats developed the concept of modules unique to Japan, which can still be found as an influence in current building systems.

Igusa, the material used for tatami, has a natural ability to regulate humidity, purify the air, and eliminate odors. And, if you take care of it, you can continue to use it for more than 20 years by turning it over when the front is worn out. The idea of sustainability as we know it today was also present in ancient Japanese practices.

How can the wisdom and spirit of the past inherited in Japanese culture be applied to life today?





# WHERE DESIGN CAN MAKE A DIFFERENCE IN TOKYO

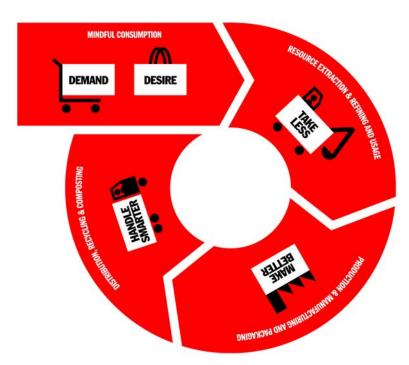
### TOWARDS A JUST AND CIRCULAR ECONOMY

To bend the line, we must focus on where it matters most.

We have to go beyond the current 'take-make-waste' system of the linear economy and aim for circular economies for all. We need to consume less, we must design out waste, and make products and materials that regenerate natural systems and that are kept in use. Sustainable living must become much more inclusive and diverse to be accessible to all.

Stabilising landfills (i.e. filtering out unsuitable waste and preventing the release of greenhouse gases) and recovering materials help, but they are not ideal long-term strategies. Reducing the waste that ends up in landfill should be the priority. Recycling and composting are more helpful but should still be limited, because they often destroy some value or lower the quality of resources. Re-using products and reducing waste should be prioritized when managing waste.

While eliminating and preventing the creation of waste is the ideal, we do not want to be rigid idealists. While we focus on **rethinking and redesigning** the entire system over the long term, we can also make an immediate impact by reducing waste and reusing stuff. Of course, better recycling and composting methods will still be needed.



#### THE CIRCULAR ECONOMY SYSTEM

A circular economy is restorative and regenerative by design. It prevents waste by reusing raw materials in closed circles. In this model, new raw materials are only used if they can be obtained sustainably without harming the planet.

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#### **TAKE LESS**

### **OPPORTUNITIES FOR DESIGN**



Convenience, perfection, standardization, and high sanitary standards are current consumption and production priorities that result in extensive packaging. How can we create new incentives for consumers and producers to use less packaging materials?

Japan ranks 2nd globally for the volume of single-use plastic waste per person. How can we boost the demand for plastic-free products?

How can we use natural resources that are available in Japan more wisely and consume mindfully? We have highlighted some key opportunities, but there are plenty more! Refer to the global brief for further inspiration.

Tokyo is known to have many single households and a declining sense of community. How can we design and promote ways of sharing that are convenient and attractive to single households?

# MAKE BETTER OPPORTUNITIES FOR DESIGN



Furoshiki, the traditional wrapping cloth that is used to wrap clothing, goods, and gifts is a widely used, multi-purpose item. How can we design products that are similarly multi-functional, reusable and aesthetically pleasing?

In Japan, there are traditional crafts that inherit both functionality and beauty, which are made out of local, natural resources. Each item is made by artisans' hands with sophisticated skills.

How can we rethink traditional crafts and develop them to create additional value?

Japan has a strong tradition of creative design. How can we make products that can be dissected into modules or smaller units that can be repaired or replaced?

How can we make products and materials that are kept in use or regenerate natural systems? Would it be possible to find a hint for new design from the variety of characteristics found in Japanese traditional culture? We have highlighted some key opportunities, but there are plenty more! Refer to the global brief for further inspiration.

WHAT DESIGN CAN DO NO WASTE CHALLENGE 2020-2021

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#### **WASTE NOTHING**

### **OPPORTUNITIES FOR DESIGN**



Single-use packaging and products flow quickly and efficiently to waste facilities in Tokyo. How can we create opportunities for items to be redirected and used as a valuable resource before they are considered waste?

In Tokyo, we have food banks, but it is not well recognized or used.

How can we better utilize this resource in order to reduce food loss?

How can we dispose of goods more responsibly and treat waste as a resource? We have highlighted some key opportunities, but there are plenty more! Refer to the global brief for further inspiration.

Today, second-hand markets
exist in Tokyo for materials like
apparel, automobiles, and
electronics. How can we activate
second-hand markets for more
kinds of products and materials,
like plastic and building
materials?

## **REFERENCES/LEARN MORE**

### SOURCES AND FURTHER RESEARCH

#### To learn more, here are the main sources used for creating this briefing.

#### **History and Cultural Context**

- Everyday Things in Premodern Japan, Susan B. Hanley,1999 (English only)
- Waste; Consuming Postwar Japan, Eiko Siniawer, 2018 (English only)
- <u>Consuming Life in Post-Bubble Japan, Katarzyna J. Cwiertka & Ewa Machotka,</u>
   2018 (English only)

#### **Data on Current Waste Problem:**

- hazard and catastrophes
   Short Documentary: Trashopolis: Tokyo, 2018 (English)
   https://www.youtube.com/watch?v=po49Zsqct\_c
- Ministry of Environment, "Solid Waste Management and Recycling Technology of Japan": https://www.env.go.jp/en/recycle/smcs/attach/swmrt.pdf (English)

- Clean Authority Tokyo, Waste Disposal of Tokyo 23 cities https://www.union.tokyo23-seisou.lq.jp.e.de.hp.transer.com/
- Resource Recycling Promotion Center: <a href="http://www.cjc.or.jp/">http://www.cjc.or.jp/</a>
  (Japanese only)

## Government Policies on Sustainability (Climate Change and Waste Problem)

- Tokyo Metropolitan Government, "Creating a Sustainable City: Tokyo's Environmental Policy", 2019
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- Tokyo Metropolitan Government, Bureau of Environment, "Sustainable
  Design Tokyo",
   https://www.kankyo.metro.tokyo.lg.jp/basic/plan/resource/waste\_trea
  tment.html (Japanese only)

#### What Design Can Do Tokyo

Related documents in Japanese can also be found at What Design Can Do Tokyo website.