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LOGISTYKA ODZYSKU – OPAKOWANIA

Food waste reduction in Japan Misuzu Asari Kyoto University



ORGANIZATOR:



EKO CYKL ORGANIZACJA ODZYSKU OPAKOWAŃ S.A.

WSPÓŁORGANIZATOR:



M&M CONSULTING
DORADZTWO W ZAKRESIE OCHRONY ŚRODOWISKA

PATRONAT HONOROWY:



Marszałek
Województwa
Mazowieckiego



**DOLNY
ŚLĄSK**

PATRONAT HONOROWY MARSZAŁKA WOJEWÓDZTWA
DOLNOŚLĄSKIEGO CENZEGO PRZYBYLSKIEGO

PATRONI:



Today's contents

- Brief introduction about MSW management in Japan
- Food waste generation in Japan
- Food waste generation and reduction in Kyoto city

ORGANIZATOR:



WSPÓŁORGANIZATOR:



PATRONAT HONOROWY:



PATRONI:



Targets of my research



MSW / domestic waste



Food loss



Disaster waste



Hazardous waste, Hg, As, etc.

Waste Management and Public Cleansing Act

Each municipality has responsibility. Separation is decided by municipality

Waste

Municipal
Solid
waste

1kg/capita/day

Waste
(ごみ)

Domestic waste

Office waste

Sewage

Specially controlled MSW

Industrial
waste

10kg/capita/day

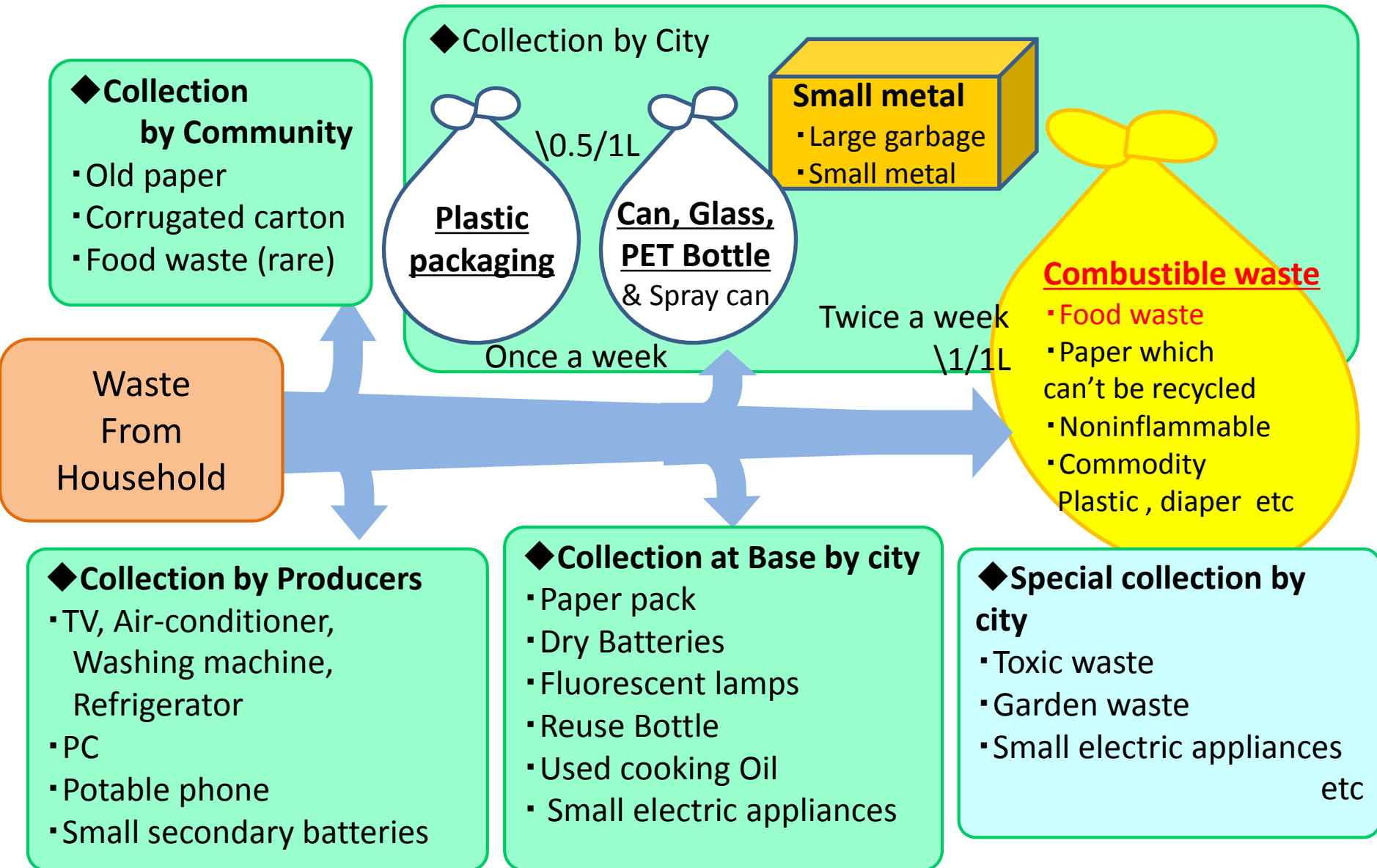
20 categories of
wastes defined by
the regulation

Including
plastics,
metals,
glasses,
etc.

Specially controlled
Industrial waste

Each generator has responsibility

Current flow of MSW in Kyoto city



Number of waste incineration plant in Japan

- MSW: approx. 1,100 plants (2,000 incinerators)
- Industrial waste: approx. 1,200 incinerators
- Sewage sludge incineration: 280 plants
- Cement plant: 51 plants

OECD2008

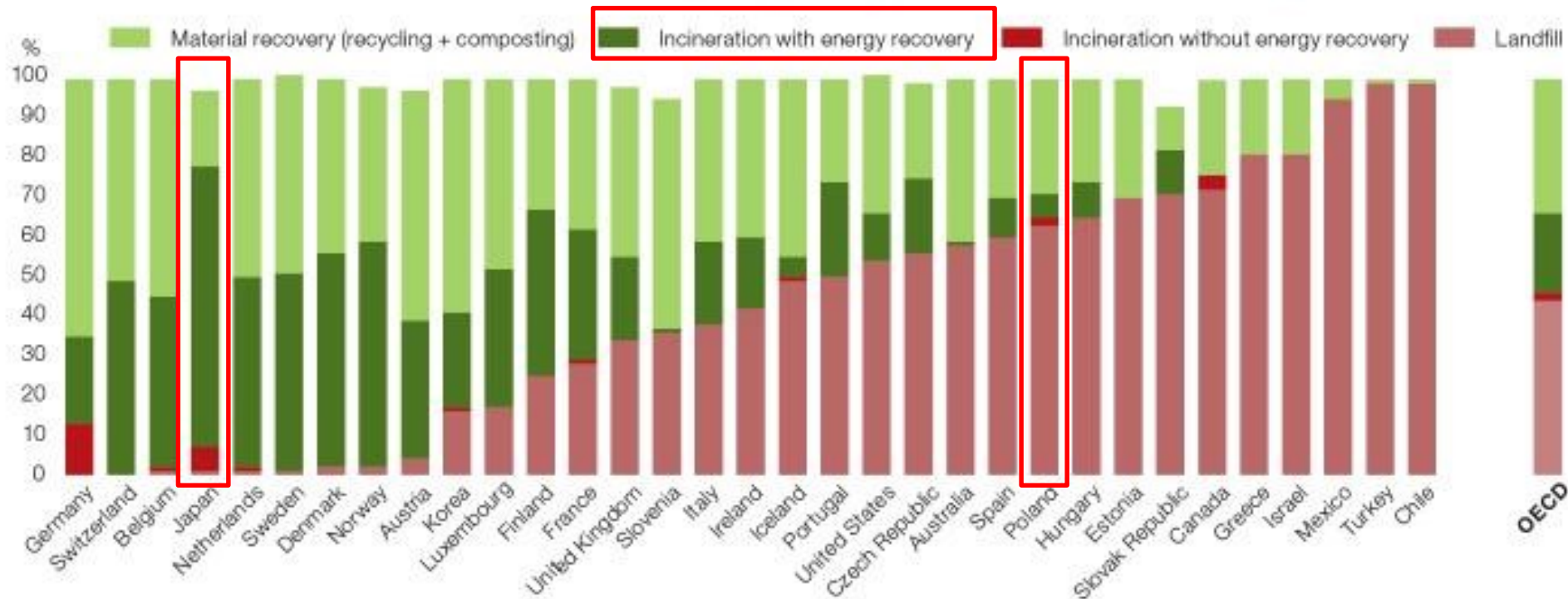
• USA	351
• France	188
• Germany	154
• Sweden	28
• UK	55

Temporary incineration plant was implemented at “Great East Japan earthquake” (2011-2014).



How to treat MSW (2013)

Municipal **waste** disposal and recovery: **recycling**, incineration, **landfilling**



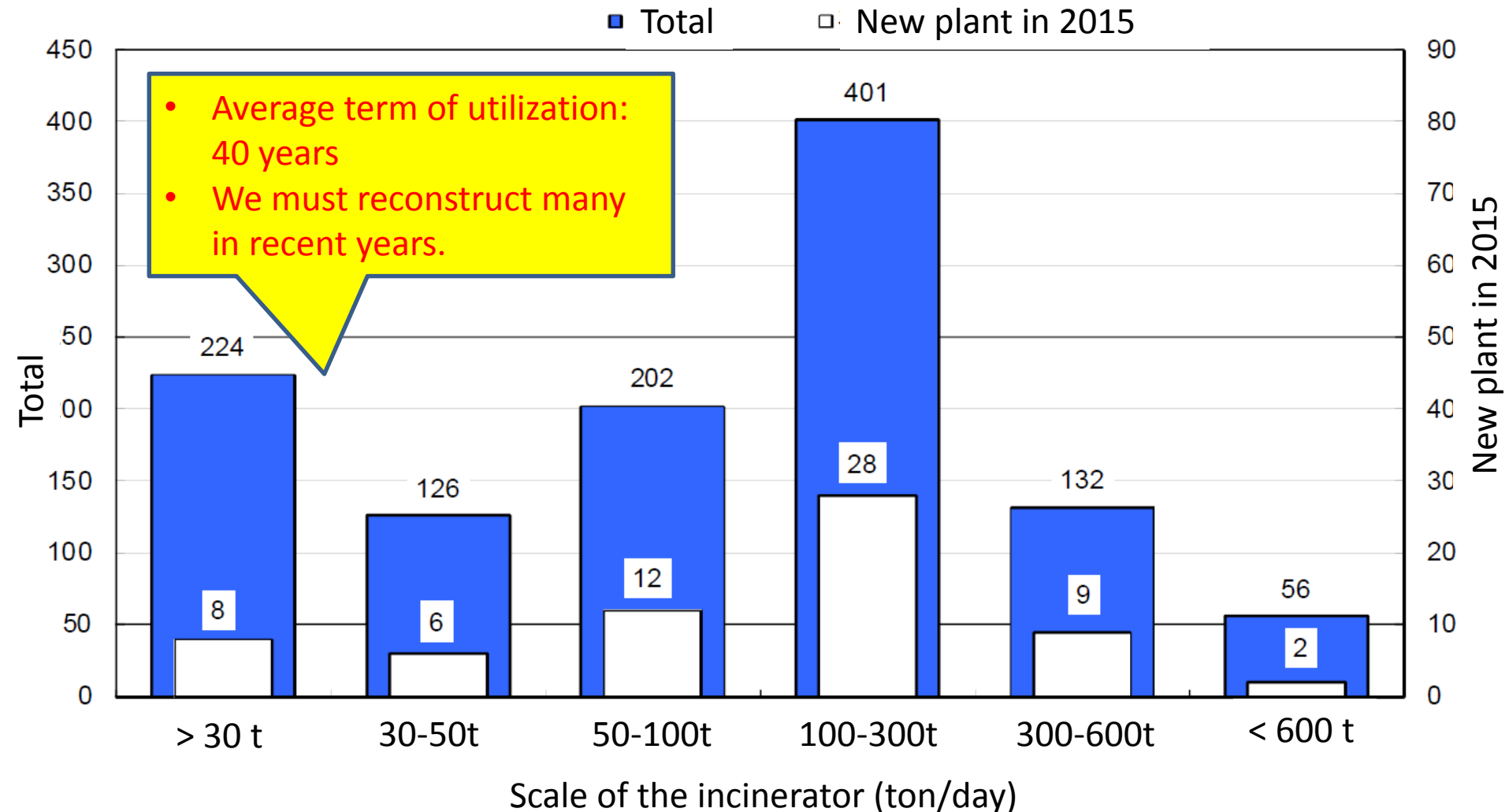
Municipal waste disposal and recovery shares, 2013 or latest year available.
Source: OECD Environment Statistics (database). Trash icon by Pezail Tapikin, The Noun Project.

Environment at a Glance 2015 <http://doi.org/8cd>

www.oecd.org/environment

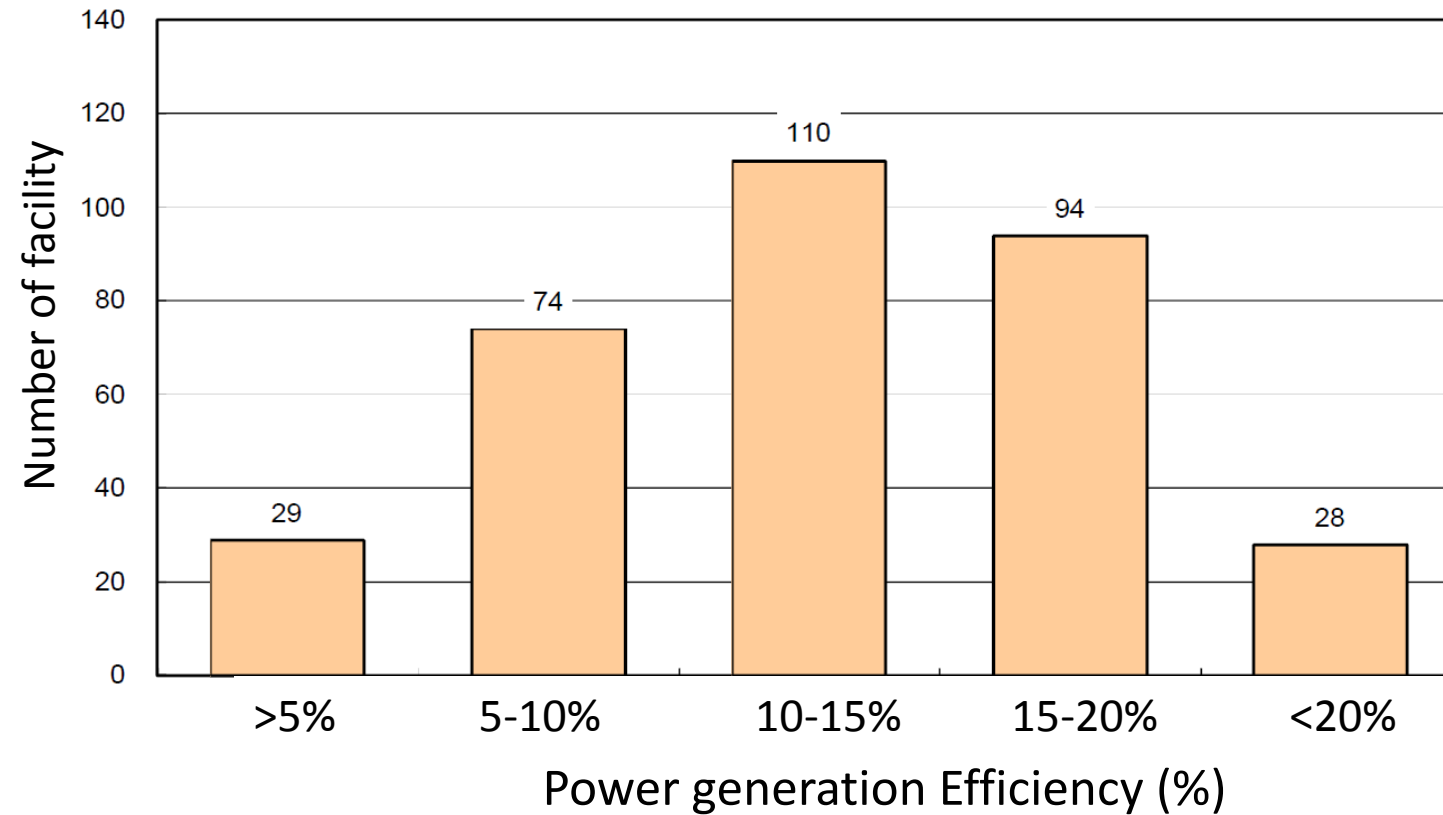
OECD (<http://www.oecd.org/env/environment-at-a-glance-19964064.htm>)

Scale of MSW incinerator

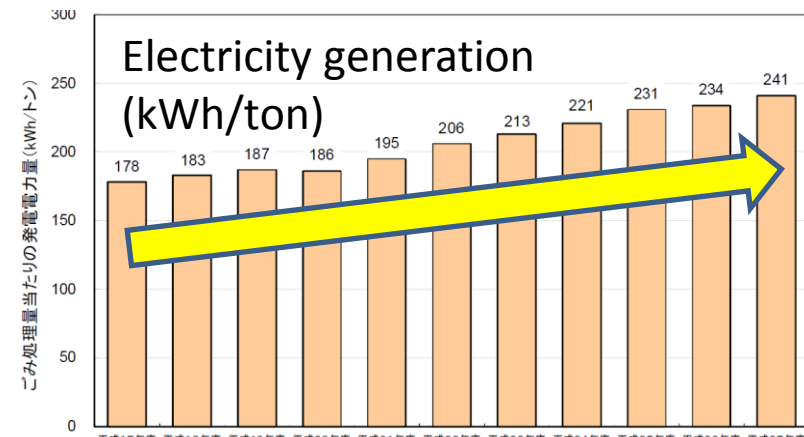


Source: Ministry of the Environment Japan

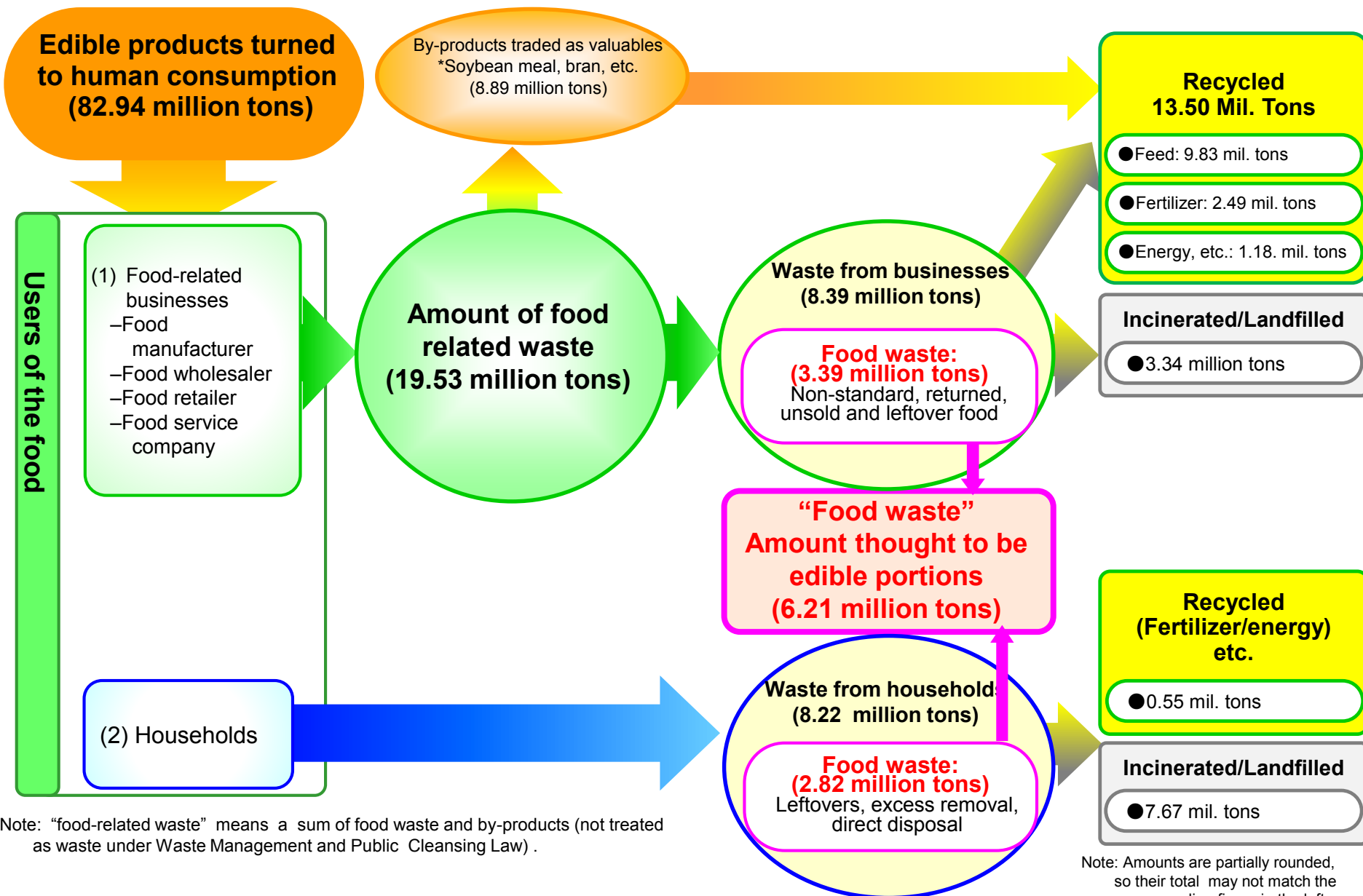
“Waste to Energy” at MSW incineration



- 30.5 % of MSW incineration has power generation system.
- Total electricity from MSW incineration: 8,175 GWh
- Average electricity generation per waste: 241 kWh/ton



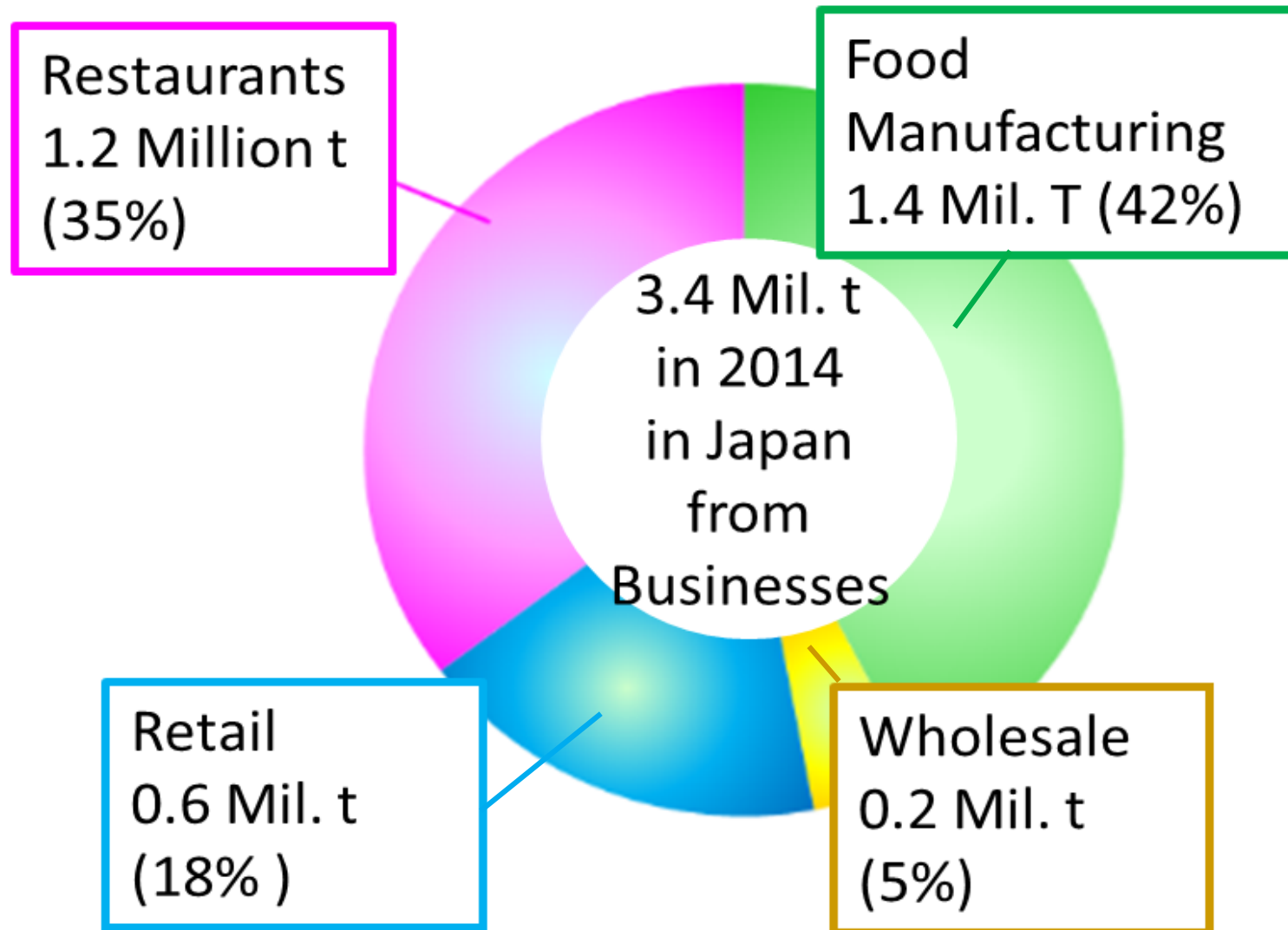
Food waste generation and recycling in Japan (FY 2014)



Note: “food-related waste” means a sum of food waste and by-products (not treated as waste under Waste Management and Public Cleansing Law).

Note: Amounts are partially rounded, so their total may not match the corresponding figure in the left column.

Food loss/ waste from Businesses in Japan



Overview of the Food Recycling Law

Key concepts of the Food Recycling Law

- Promoting an effective recycling of cyclical food resources generated from food-related businesses (to ingredients for fertilizers, feedings, etc.)
- Reducing generation of food waste, etc. from food-related businesses
(Prioritizing reduction of food waste generation) and volume reduction (dehydration, etc.)

Responsibilities for the Competent Ministers

(Minister of the Environment, Minister of Agriculture, Forestry and Fishery)

● Formulation of basic policy

- Numerical waste reduction and recycling targets for each food-related business
- Measures to promote recycling, etc.

● Development of criteria for food related businesses

- Criteria for reducing, recycling and thermal recovery, etc.

Guidance



Recommendations and orders
(in the case of insufficient actions)

Food related businesses

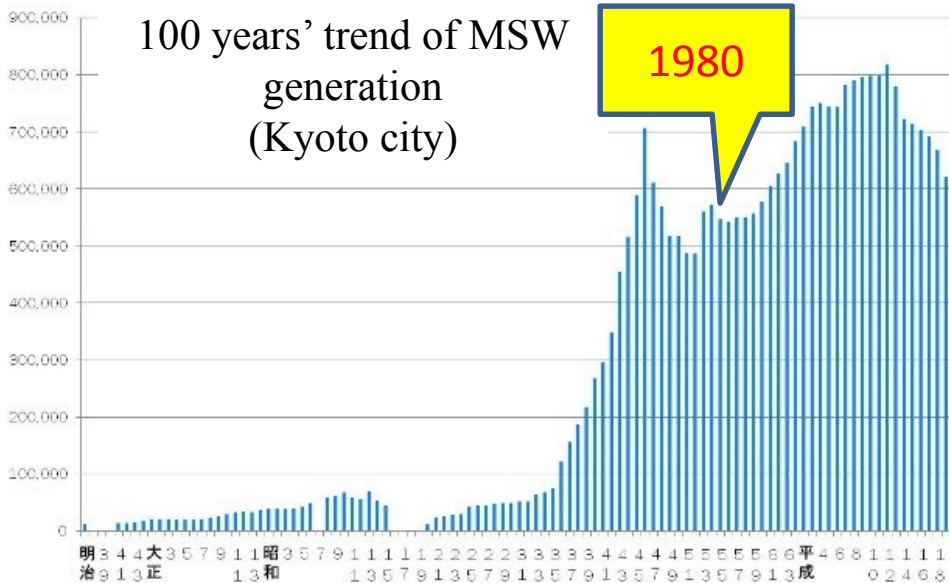
(Food manufacturers, wholesalers,
retailers, and food-service)
(approx. 190,000 business entities FY2012)

Food related businesses whose annual discharge exceeds 100 tons

Obligation of periodical report

(approx. 3,500 business entities, covering approx.
76% of total food waste generation)

MSW Compositional Analysis



Kyoto city and Kyoto University continue the survey since 1980.

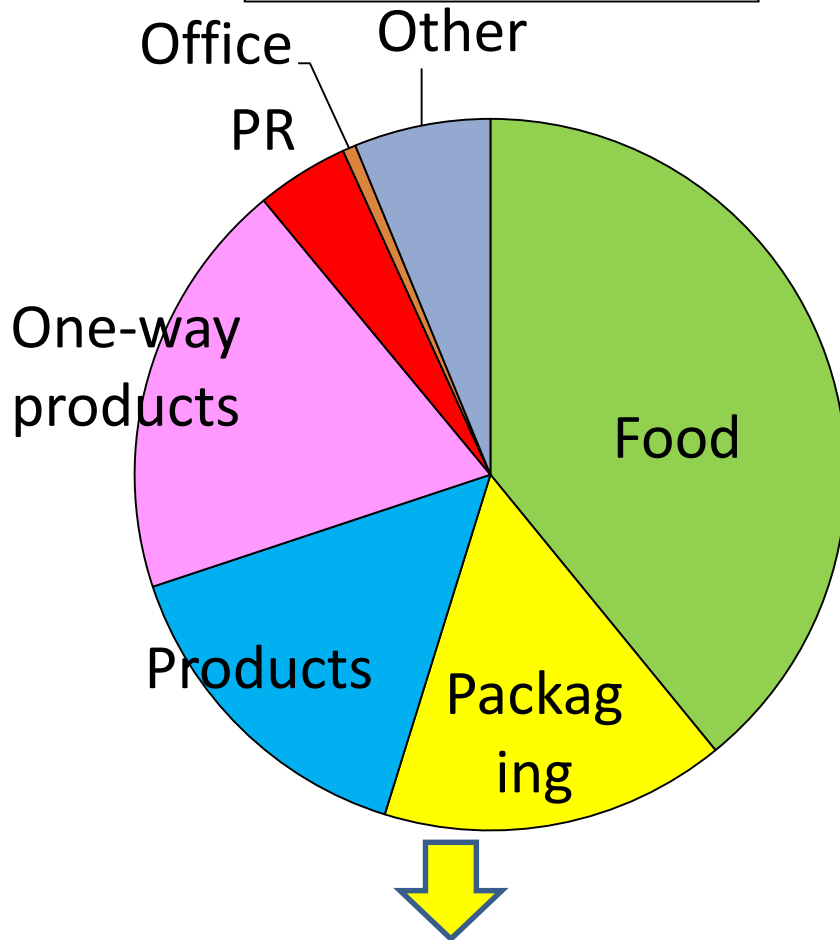


300 categories based on the product type and material



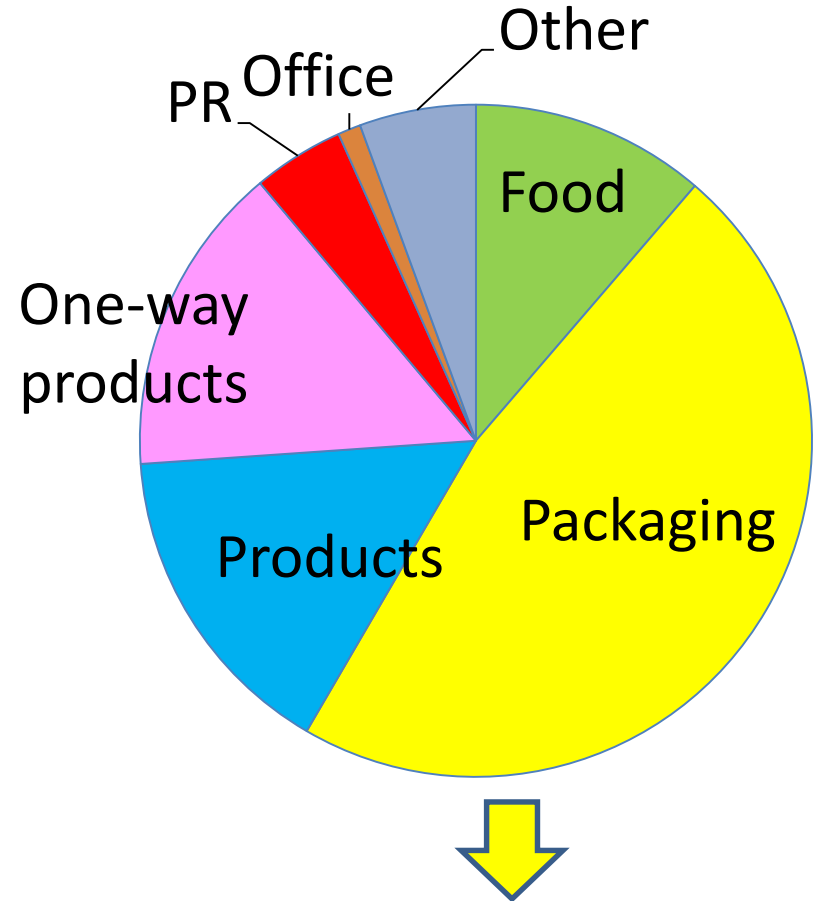
Composition of MSW in Kyoto

Wet-weight



- National level: Food recycling law, food loss reduction
- Kyoto city: 50% reduction of food loss

Volume



- National level: Packaging recycling law
- Kyoto city: reduction of plastic shopping bag

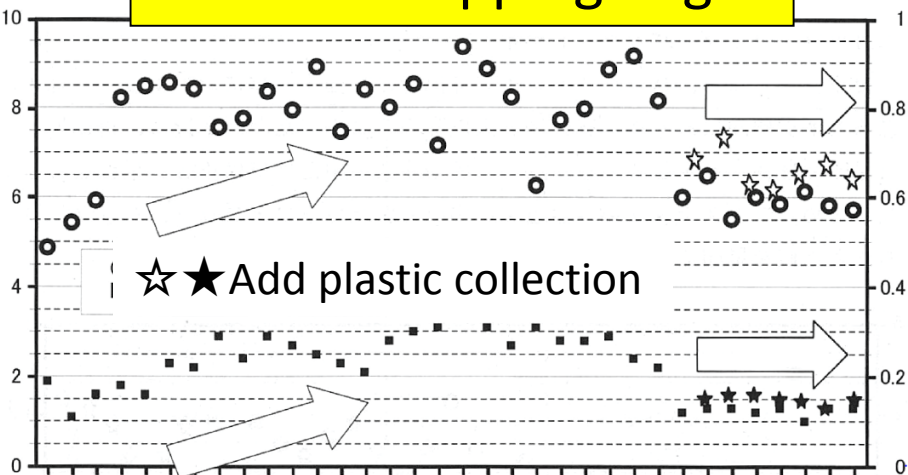
Diaper and...



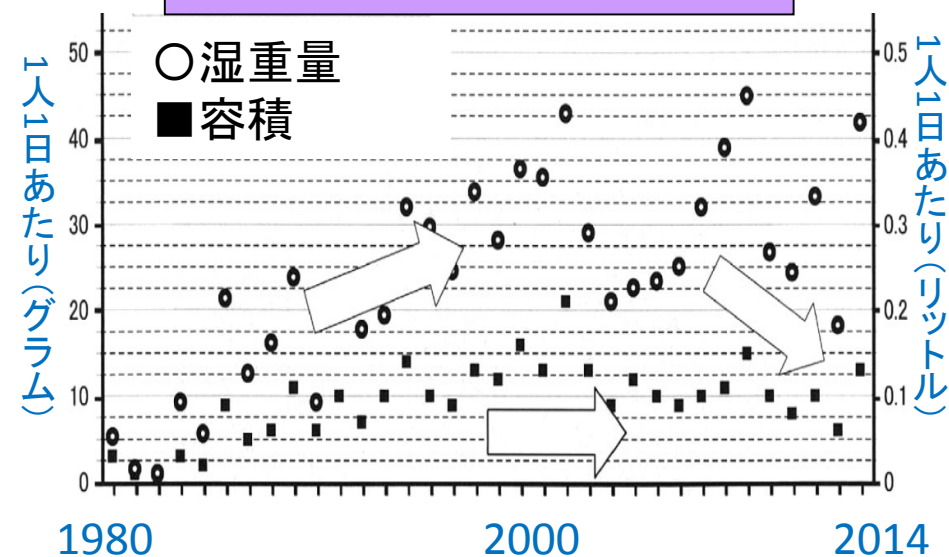
One-way products



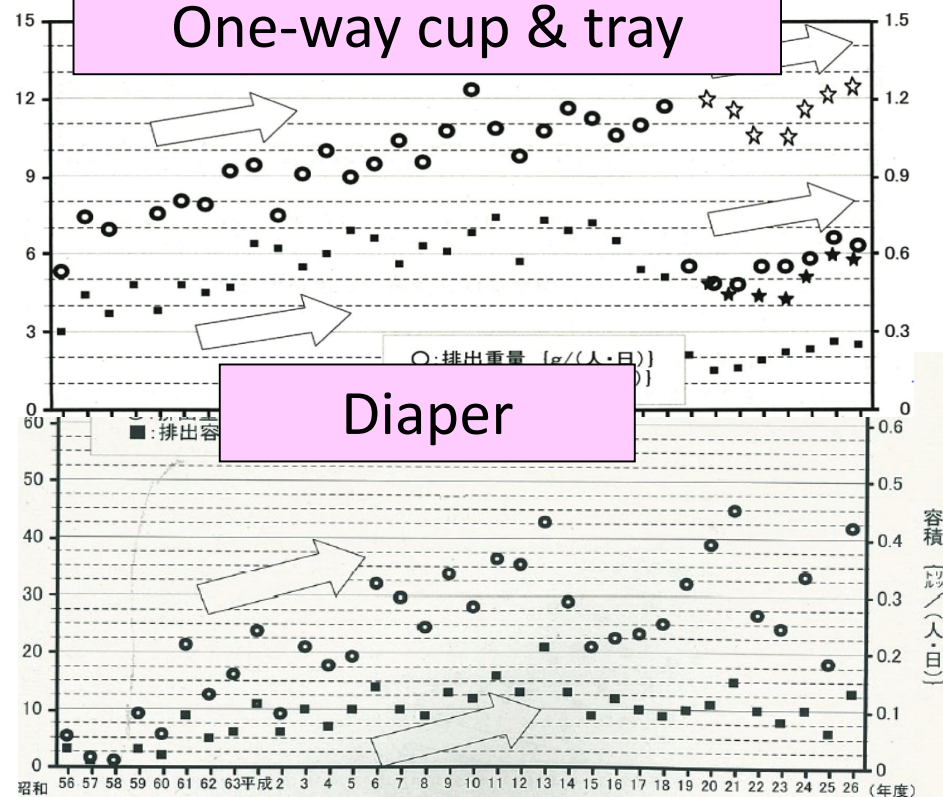
Plastic shopping bags



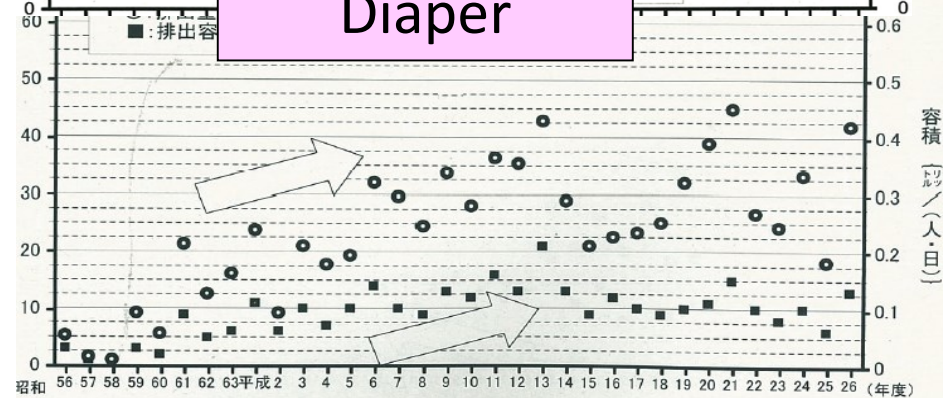
Untouched food



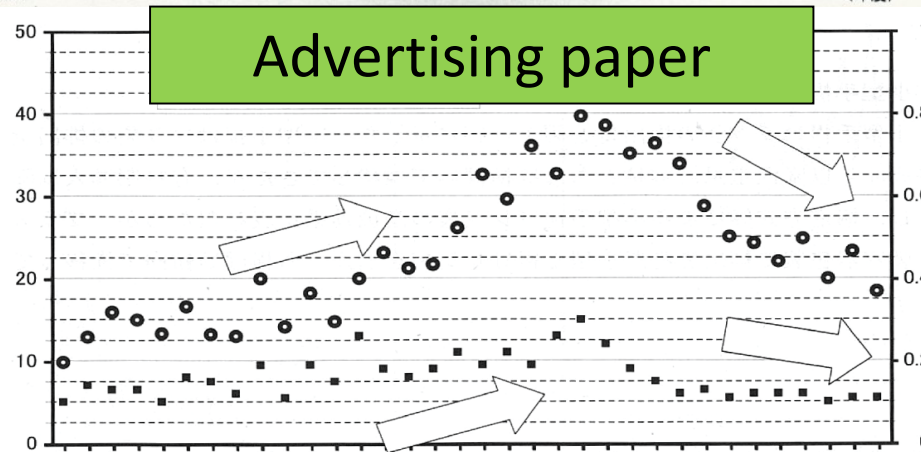
One-way cup & tray



Diaper



Advertising paper



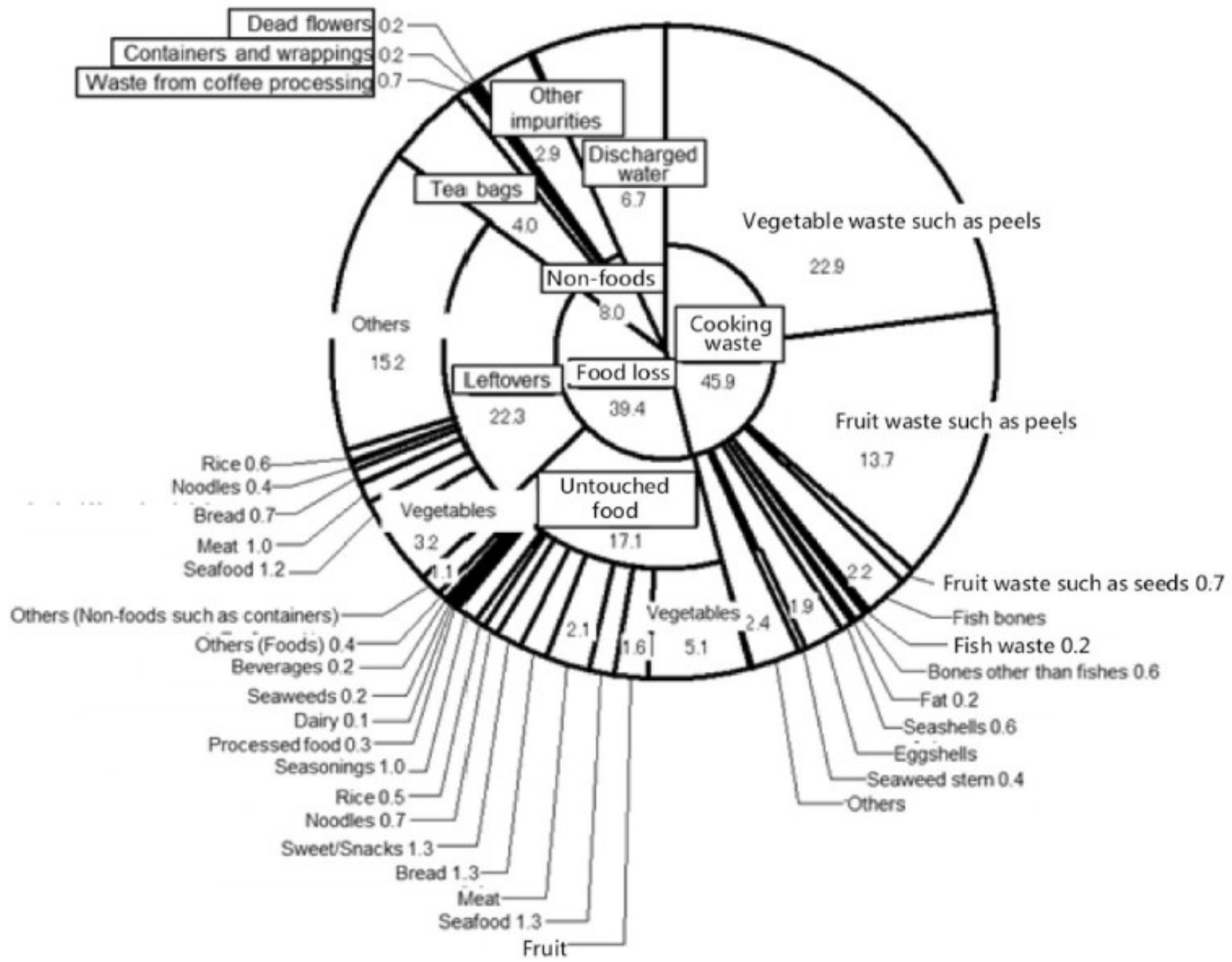
Food waste survey

Every 5 years, detailed survey on food waste is done.



Tetsuji Yamada, Misuzu Asari, Takahiro Miura, Tomoyuki Nijima, Junya Yano & Shin-ichi Sakai: Municipal solid waste composition and food loss reduction in Kyoto City, *Journal of Material Cycles and Waste Management*, 19(4), 1351-1360 (2017)

Detailed composition of food waste (2012)



Unused food accounts for about 10-30% of the entire waste and about 40-70% of uneaten food.



Time trend of untouched food

1983年

1989年

2005年



昭和58年
(1983)

平成元年
(1989)

平成17年
(2005)

昭和61年
(1986)

平成3年
(1991)

平成18年
(2006)



1986年

1991年

2006年



2012年12月21日 約50世帯より(NHKさきどり取材協力)



ムダなく
便利

Food loss
= 11 Trillion
yen



Production of
agriculture and
fisheries
= 10 Trillion yen



Current situation of Food



Note: The author estimates that about 7 million tons of uneaten food is generated annually.



Best Before date is the birthday Food waste

作者註：台所ごみの中には期限切れの食料品が沢山見られます

Before

Within a week

A month

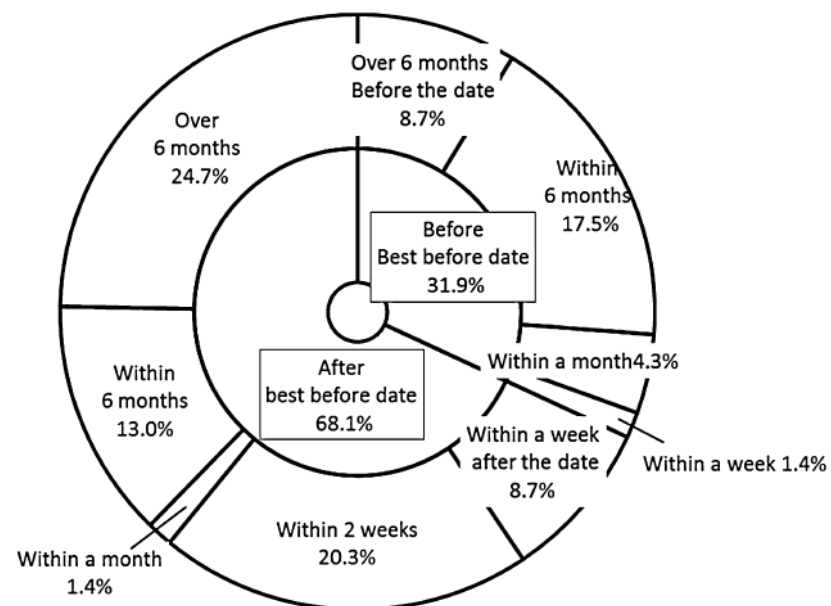
A year

2-6 years

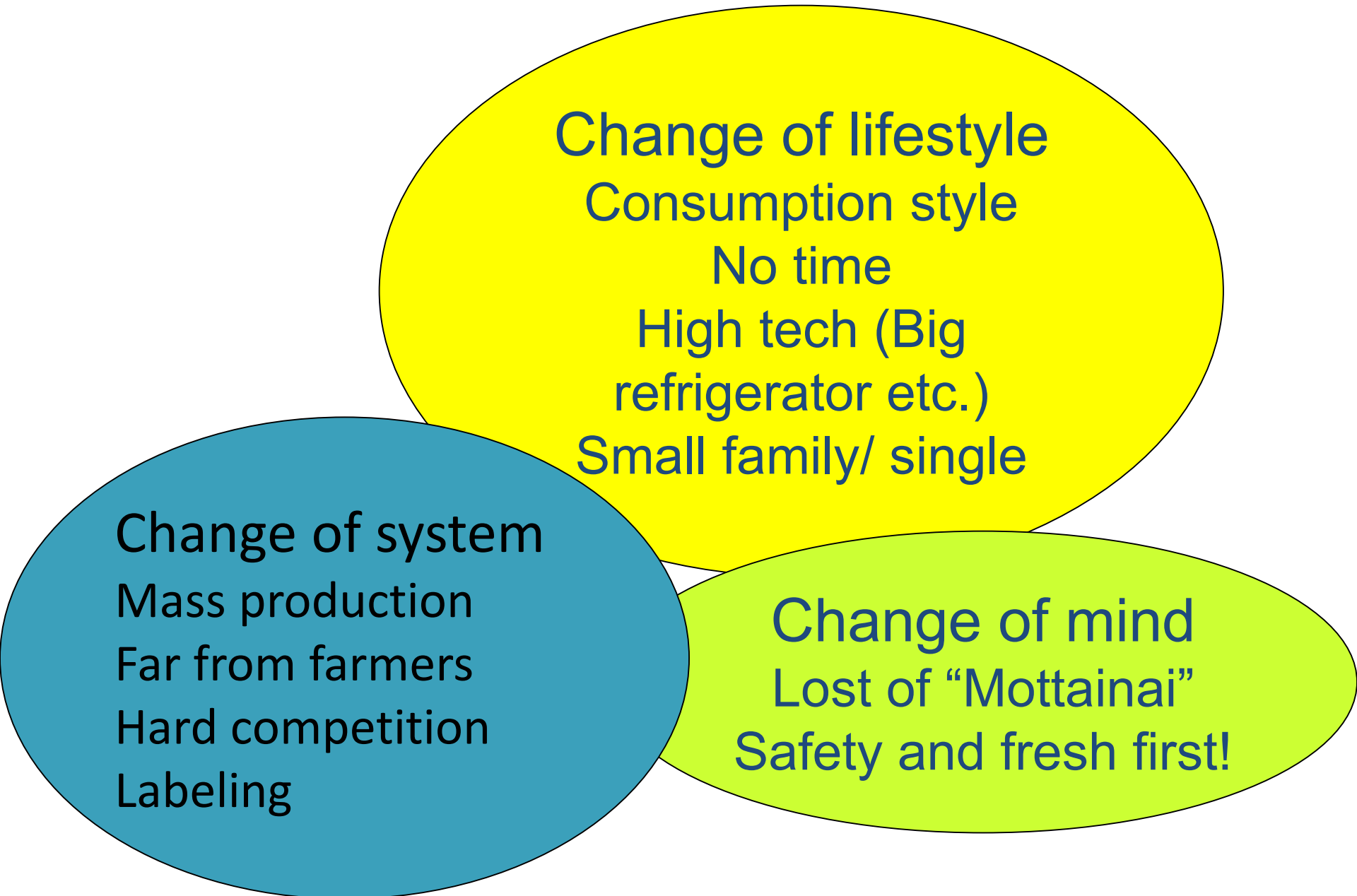


Expiration date: 14th Oct
MSW collection: 9th Oct

Sale



The background of such loss



My list for food waste reduction

◆ Individual (home and shopping)

◎ Management of food

- ☐ Reduce the food stock
- ☐ Frequent check for refrigerator and freezer
- ☐ Not rely on best before date
- ☐ Buy less food with good quality

◎ Shopping

- ☐ Don't go shopping with hunger
- ☐ List up food you need before shopping
- ☐ Be careful about packed sale
- ☐ Buy earlier "best before date" products

◎ Change our mind

- ☐ Don't stock so much because supermarkets are like our refrigerator
- ☐ "Sold out" shop is a good shop. Don't angry if there is nothing.

◎ Utilization of existing food

- ☐ Sharing with someone

◎ Others

- ☐ Use many small dishes/plates
- ☐ Especially, don't loss meat
- ☐ Food drive

◆ Restaurant and social activities

◎ Restaurant

- ☐ Ask small sized dishes
- ☐ Request the doggy bags
- ☐ 30・10 Campaign (no food loss at the party)

◎ Others

- ☐ Understanding of "best before date" and "expiration date"
- ☐ Food bank

Mottainai (what a waste!) and *Shimatsu no kokoro* (thrift)

- Japan annually generates 6.21 million tons of Food Loss (fiscal 2014)
- Food Loss in Kyoto City is estimated 65,000 tons (fiscal 2015)

This represents about twice the amount of global food aid, which is 3.2 million tons.



Mottainai!

Don't you agree?

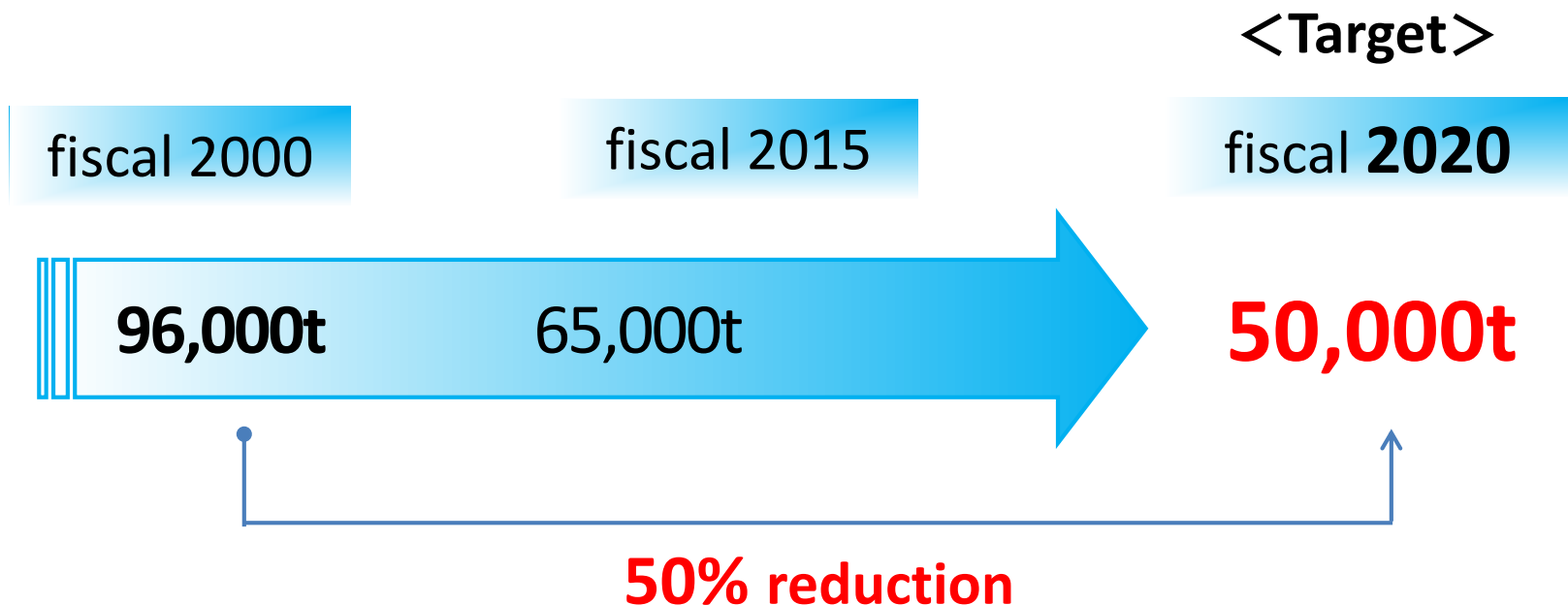
Japanese people have long cherished the idea that Buddhahood could be found even in inanimate things like grass, trees and soil. Similar anthropomorphizing of nature and its blessings is evidenced by the tendency seen in the custom, which is common in Kyoto, of affixing the honorific prefix “o” and honorific “san” to objects such as vegetables, statues and natural features, as in *oimo-san* (yams or potatoes), *ojizo-san* (Buddhist statue), and *oyama* (mountain or hill).

The phrase *itadakimasu* (the Japanese equivalent of saying grace before eating) expresses appreciation for the lives one consumes to stay alive.

Maintaining **appreciativeness** and **thrift**

Amount of Food Loss and the Quantitative Target

- The estimated amount of **Food Loss** (untouched food & leftovers) by Kyoto city's survey is **96,000t** at its peak amount in fiscal 2000.
- **Kyoto is the first city in Japan to set the Quantitative Target** for reducing Food Loss to **50,000t** (**half of its peak amount**) by fiscal 2020.



Toward 50% Reduction of Food Loss - 3-KIRI Movement

3-KIRI Movement

for Reduction of Food Waste since fiscal 2012

Tsukai-KIRI [Using up]

Don't buy too much foodstuffs.

Use up what you bought.

Tabe-KIRI [Eating up]

Mottainai! **Eat up**. No leftovers.

Mizu-KIRI [Draining]

Drain food waste before its disposal.

Toward 50% Reduction of Food Loss - Recognition System

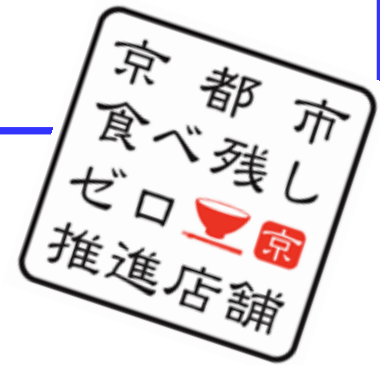
“Non-Leftovers Promotion Premises” Recognition System

since fiscal 2013

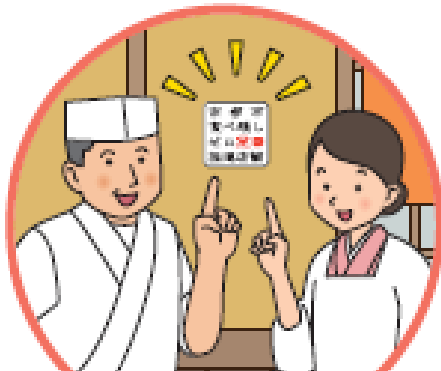
Restaurants and hotels have been recognized as “**Non-Leftovers Promotion Premises**”, based on their good practices of 3-KIRI Movement.

518 Premises as of May 2017

Certified restaurants & hotels are required to implement 3 following efforts.



Certification
Sticker



Display Stickers
issued by Kyoto City
inside the premises.



Promote their
efforts to reduce
food waste etc.



Try to reduce
garbage

Toward 50% Reduction of Food Loss - Do 30-10 Campaign etc.

No Leftovers! “Do 30-10 at the parties” Campaign

- ① Don't order too much not to waste food.
- ② Enjoy the meal for **30 minutes after** a toast without leaving your seat.
- ③ Come back to your seat at least **10 minutes before** the party is over and enjoy your meal again.
- ④ Take the leftovers home, if possible



2Rs Action Guide for Reducing Waste “Shimatsu-no-Kokoro” Manual



Party



Life



Travel

Concrete action to reduce waste is written.

Spring

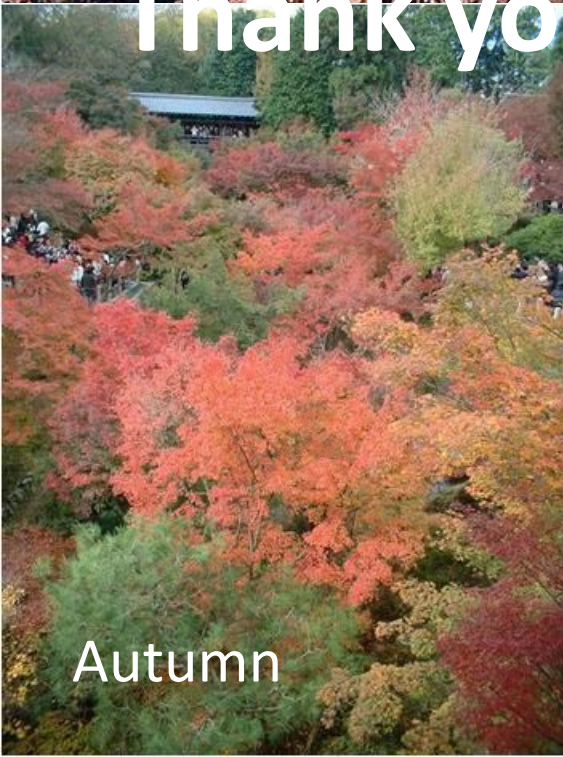


Summer



Thank you for your kind attention!

Autumn



Winter

