

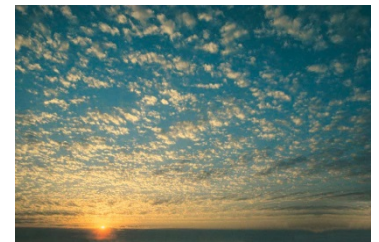
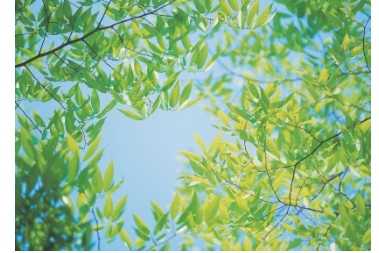
# International policy trends of Resource Efficiency/ Circular Economy with focus on policy development

With Japanese practice

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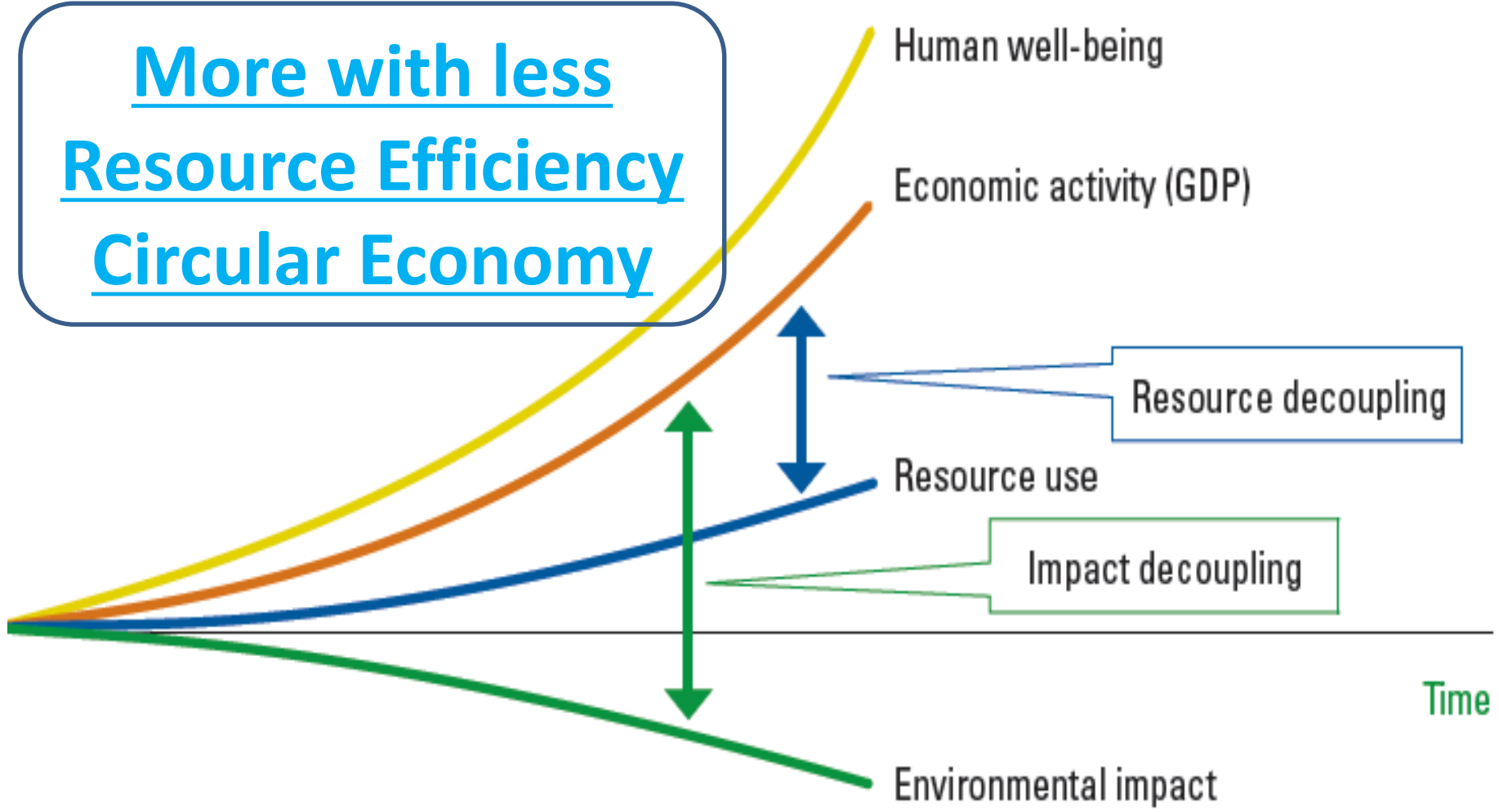


# Today's contents

- 1. International discussion on RE and CE**
- 2. EU CE policy**
- 3. National strategy on RE/CE**
- 4. Japanese practices on food waste recycle or food loss**

# Decoupling well-being/economy from resource use

More with less  
Resource Efficiency  
Circular Economy



# New Global Norm

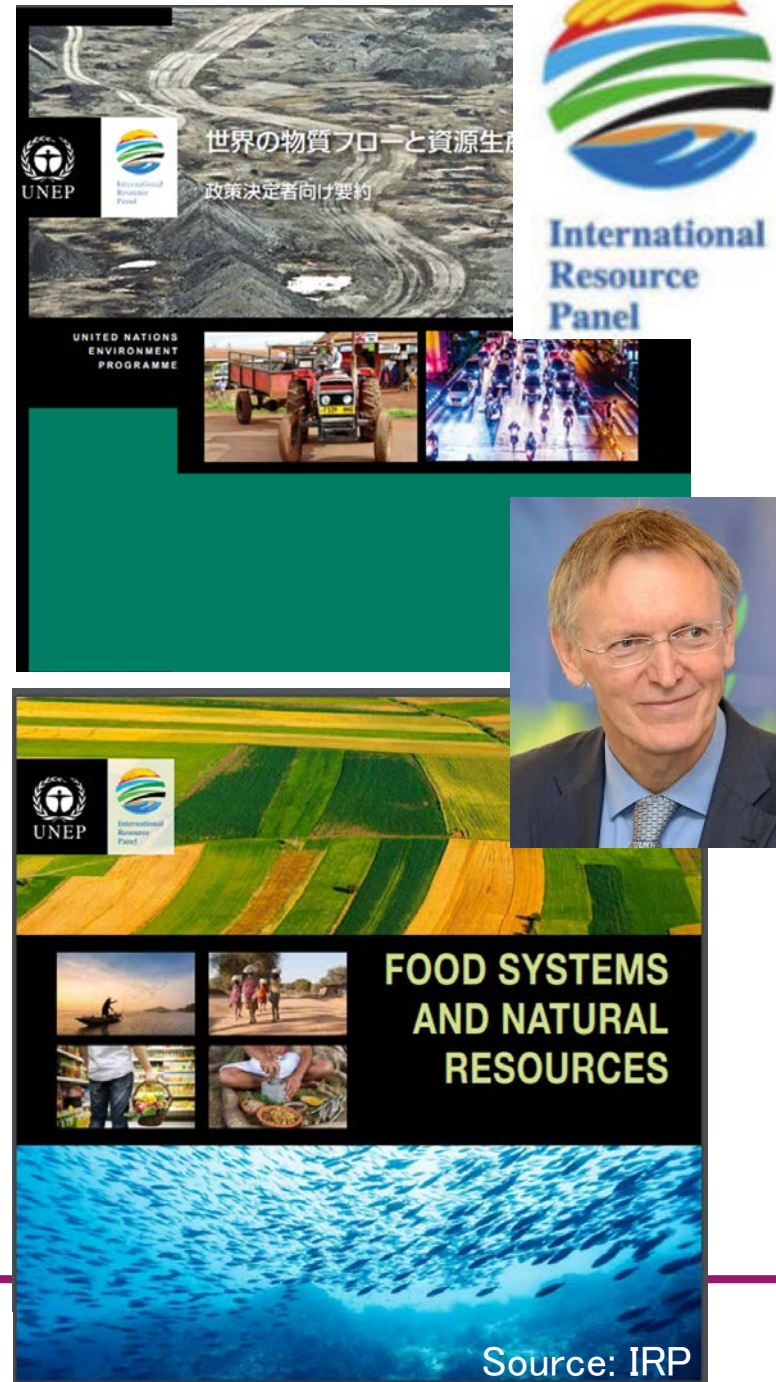
## G7 Alliance on Resource Efficiency

## G20 Resource Efficiency dialogue

Source: ministry of foreign affairs



Source:UN

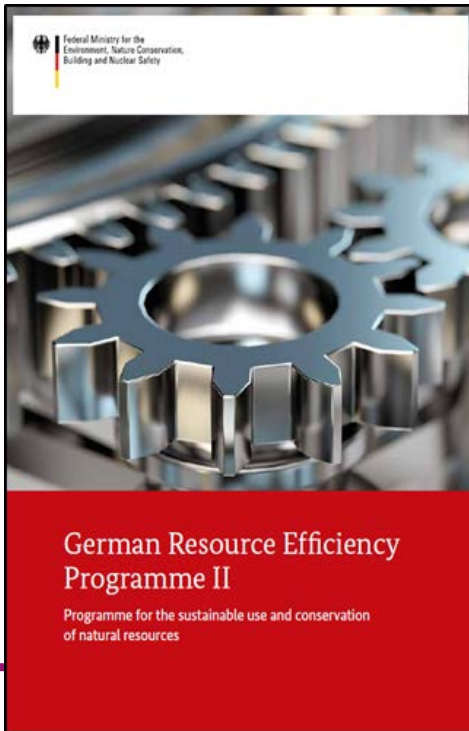
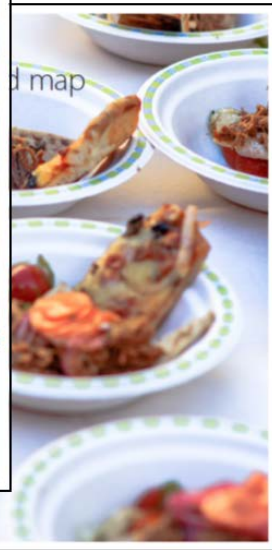


# National policy/strategy development

- |    |   |
|----|---|
| RE | <ul style="list-style-type: none"><li>• <b>EU:</b> Resource Efficient Europe(2011)</li><li>• <b>Austria:</b> The Resource Efficiency Action Plan(2012)</li><li>• <b>Germany:</b> The Resource Efficiency programme (ProgRess) (2012, 2016)</li><li>• <b>Finland:</b> National material efficiency programme – sustainable growth through material efficiency (2014)</li></ul>   |
| CE | <ul style="list-style-type: none"><li>• <b>JP :</b> Fundamental Plan for establishing a Sound Material-Cycle Society (2003,2008,2013,2018)</li><li>• <b>China:</b> Circular development leading plan (2016) / national circular economy promotion act (2008)</li><li>• <b>Sweden:</b> From waste management to resource efficiency Sweden's Waste Plan 2012–2017 (2012)</li><li>• <b>Netherlands:</b> Waste to Resource programme (2014) / A Circular Economy in the Netherlands by 2050 – Government-wide Program for a Circular Economy (2016)</li><li>• <b>EU: Closing the loop- An EU action plan for the Circular Economy (2015)</b></li><li>• <b>France:</b> Circular Economy (Energy Transition for Green Growth Act) (2015) Let's go into the loop : a roadmap for the 100% circular economy) (2018)</li><li>• <b>US:</b> Sustainable Material Management (2009, 2015)</li><li>• <b>Finland:</b> Leading the cycle -Finish road map to a circular economy 2016-2025 (2016)</li><li>• <b>Italy:</b> Towards a Circular Economy in Italy (2017)</li><li>• <b>UK:</b> Increasing resource efficiency and reducing pollution and waste (Green Future: Our 25 Year Plan to Improve the Environment) (2018) ⇒new strategy development</li><li>• Paris, London, Amsterdam, Rotterdam, Brussels</li></ul> |



**Leading the cycle**  
Finnish road map to a circular economy 2016–2025

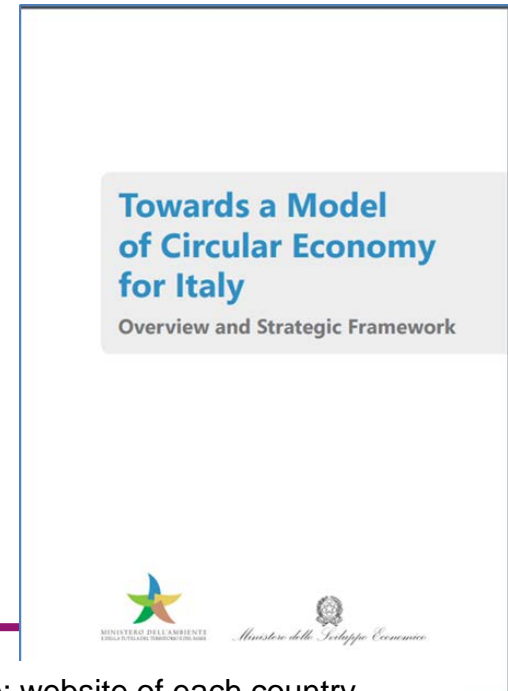


## German Resource Efficiency Programme II

Programme for the sustainable use and conservation of natural resources



## A Circular Economy in the Netherlands by 2050



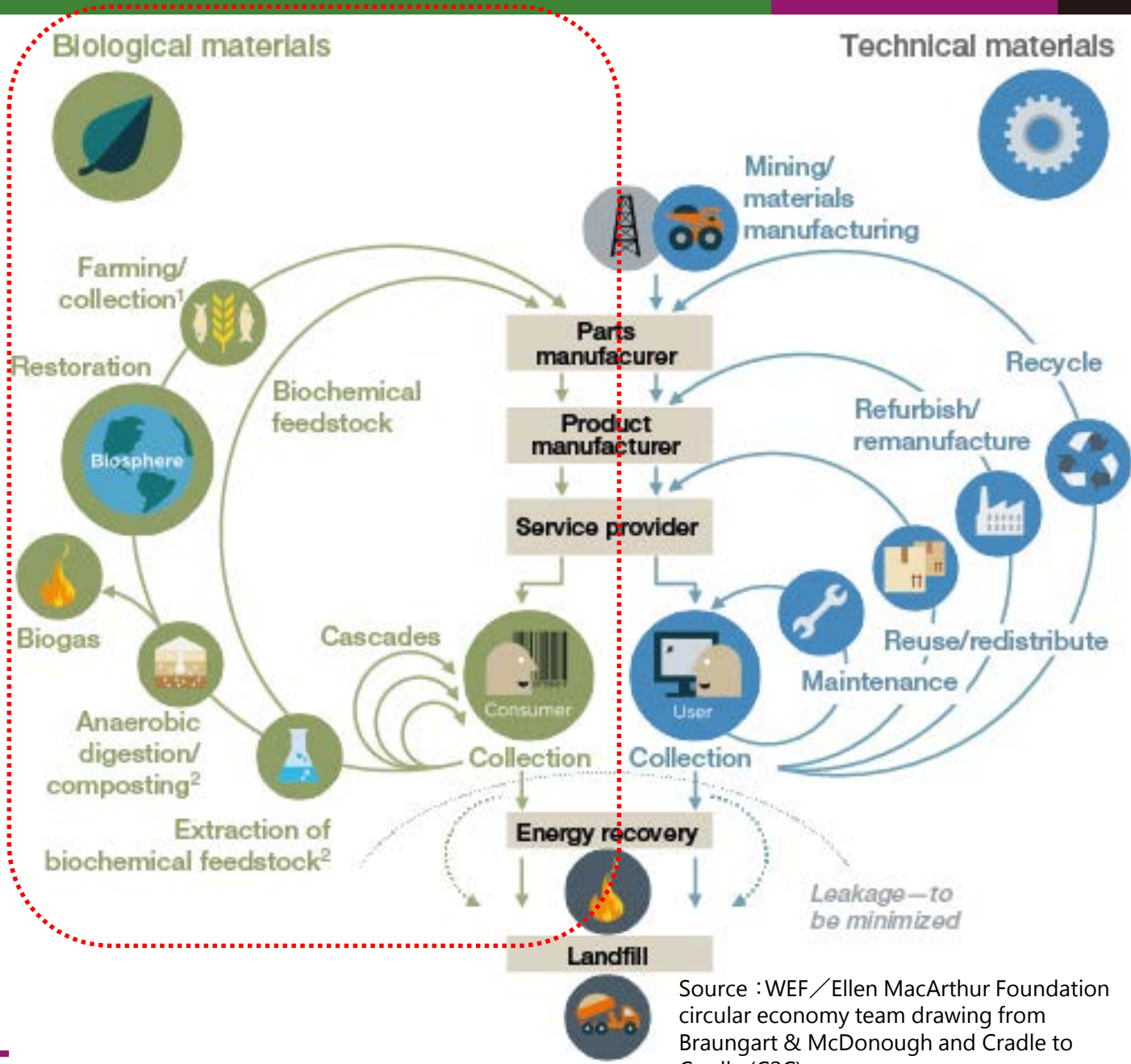
## Towards a Model of Circular Economy for Italy

Overview and Strategic Framework

# CE

“The value of products, materials and resources are maintained in the economy for as long as possible, and the waste generation is minimized.”

source: EC



# Closing the loop

## - An EU action plan for the Circular Economy

Eco design directive (EC → CEN, CENLEC(material efficiency))  
 Reparability • upgradability • durability • recyclability, spare-parts information

Plastic  
Food waste  
 Critical raw material  
 Construction and demolition  
Bio-based products

Extractive waste guidance  
 Best practice

EPR

Best Available Techniques reference

Guarantees  
 Planned obsolescence  
 Eco label  
 GPP

investment  
 In separation, collection, recycle but not in landfill and incineration

extraction

design

production

consumption

Waste management

### Monitoring framework

Self sufficiency of resources, GPP, waste generation, food waste  
 Recycling rate, recycled material contents, private investment, employment, value added, patent

**Industrial symbiosis by-product rule**

Reuse promotion

Secondary raw material market

quality standards for secondary raw materials;  
 End of waste; **organic and waste-based fertilisers**; water reuse; interface between chemicals, products and waste legislation

Revision of waste directives

R&D  
 Public investment

# EU Plastic strategy (2018, Jan.)

- A smart, innovative and sustainable plastics industry,
  - design and production fully respects the needs of reuse, repair, and recycling, brings growth and jobs to Europe and helps cut EU's greenhouse gas emissions and dependence on imported fossil fuels.
- By 2030, all plastics packaging placed on the EU market is either reusable or can be recycled in a cost-effective manner.
- By 2030, more than half of plastics waste generated in Europe is recycled.
- By 2030, sorting and recycling capacity has increased fourfold since 2015, leading to the creation of 200 000 new jobs
- use of recycled plastics in food-contact applications → safe use of recycled materials
- harmonised rules for defining and labelling compostable and biodegradable plastics.

## 【New rules for revised directives】

2018 May.22th  
Waste management  
and recycling: Council  
adopts new rules

- **New recycling targets (next slide)**
- **by 1 January 2025, separate collections of textiles and hazardous waste from households.**
- **by 31 December 2023, bio-waste is either collected separately or recycled at source (e. g. home composting).**
  - in addition to the separate collection which already exists for paper and cardboard, glass, metals and plastic.
- **The legislation contains a landfill reduction target (10%, 2035),**
- **minimum requirements for all extended producer responsibility schemes.**
  - Producers must take responsibility for the management of the waste stage of their products, and will be required to contribute financially.
- **Mandatory extended producer responsibility schemes for all packaging**
- **as of 2030, all waste suitable for recycling or other recovery, in particular in municipal waste, shall not be accepted in a landfill.**

# 【EU Recycle target in revised waste directives】

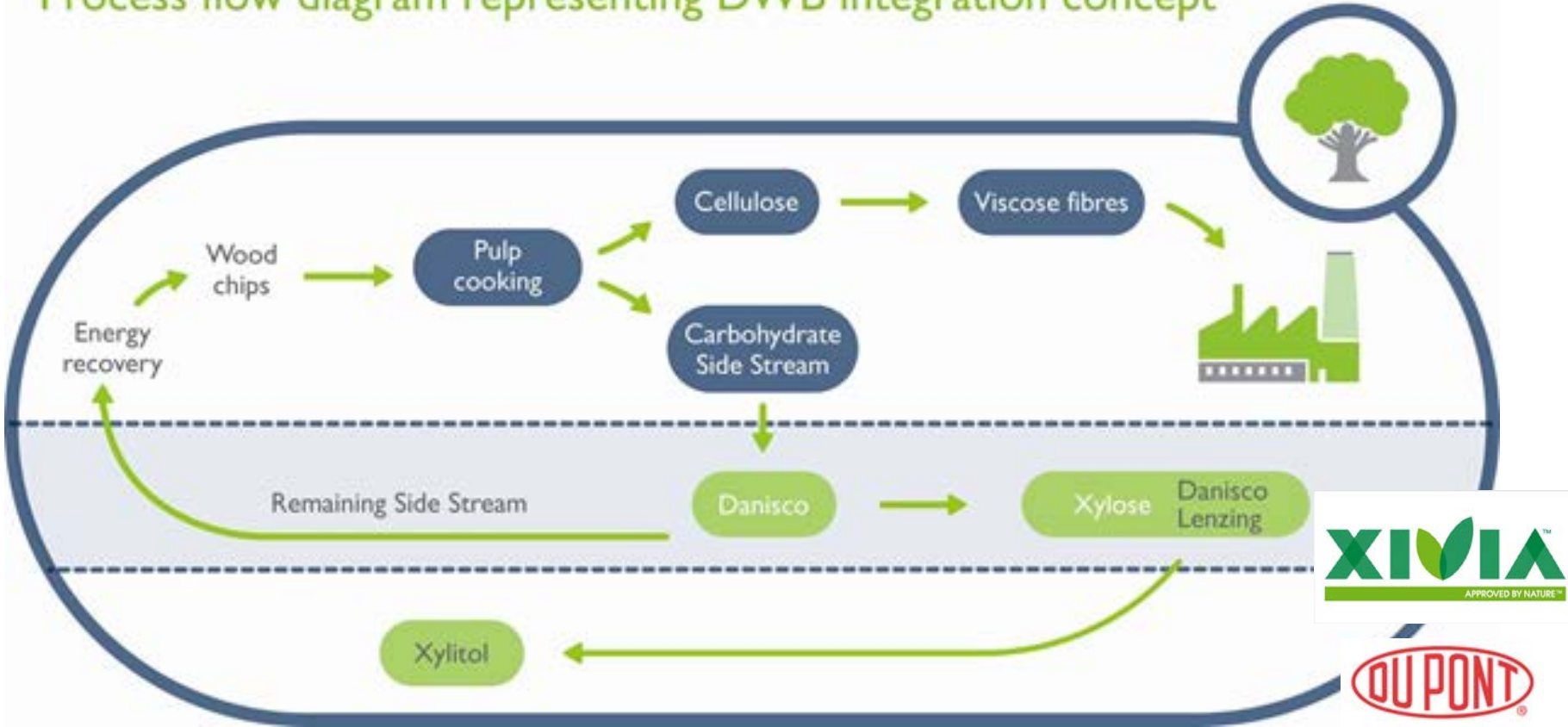
	2008.12	2025	2030	2035	Japan@2015(白書より引用)
Municipal Waste		55%	60%	65%	20.4%(一般廃棄物:総資源化/総排出) 参考:53%(産業廃棄物)@2014
<b>All packaging</b>	55-80%	65%	70%		8.5割 (再商品化/分別収集)
<b>Plastic</b>	22.5%	50%	55%		9割
<b>Wood</b>	15%	25%	30%		情報なし
<b>Ferrous metals</b>	50% (as metal)	70%	80%		8割
<b>Aluminium</b>		50%	60%		9割
<b>Glass</b>	60%	70%	75%		9割超
<b>Paper and cardboard</b>	60%	75%	85%		5-6割(紙)、8-9割(板紙)
Land fill				10%	10%(一般廃棄物:最終処分/総排出) 参考:3%(産業廃棄物)@2014

Recycled amount(amount which enters into reprocessing to product and material)

# Industrial symbiosis and Synergy with climate change

Du pont: using by-product from pulp paper industry for Xylitol production  
90% lower carbon footprint compared to Xylitol production made of corn in China

Process flow diagram representing DWB integration concept



source: The Chemical Industry Federation of Finland

# Japanese practices

## Food waste recycle and food loss

# Japan's Policy Framework for Sound Material Cycle Society

Basic Environment Law

Basic Environment Plan

## Basic Act on Establishing a Sound Material-Cycle Society

**Fundamental Plan for Establishing a Sound Material-Cycle Society**

Fully in effect **Jan. 2001**

**<Review every 5 years>**

Formulation of  
4<sup>th</sup> Plan  
underway  
Cabinet decision  
expected soon

Waste Management and  
Public Cleansing Act

Act on the Promotion of  
Effective Utilization of  
Resources

<Proper treatment of waste>

<Promotion of material recycling>

Regulations respond to characteristics of  
each article and material

Containers and  
Packaging  
Recycling Law

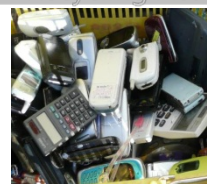
Home  
Appliance  
Recycling Law

**Food  
Recycling Law**

Construction  
Material  
Recycling Law

End-of-Life  
Vehicle  
Recycling Law

Small Electrical  
and Electronic  
Equipment  
Recycling Act



Act on Promoting Green Purchasing (2001)

# Circular Economy in Japan

## The 4th Fundamental Plan for Establishing a Sound Material Cycle Society (2018)

**Integrated measures toward a sustainable society**

Integrating environment, economy and society

**Technologies, Human Resources and Awareness Raising, and Information and Databases**

**Regional Revitalization**

**Regional Circular Decarbonized and Ecological Sphere**

**Resource Circulation throughout the entire Lifecycle**

**Appropriate Waste Management**

**Environment Restoration**

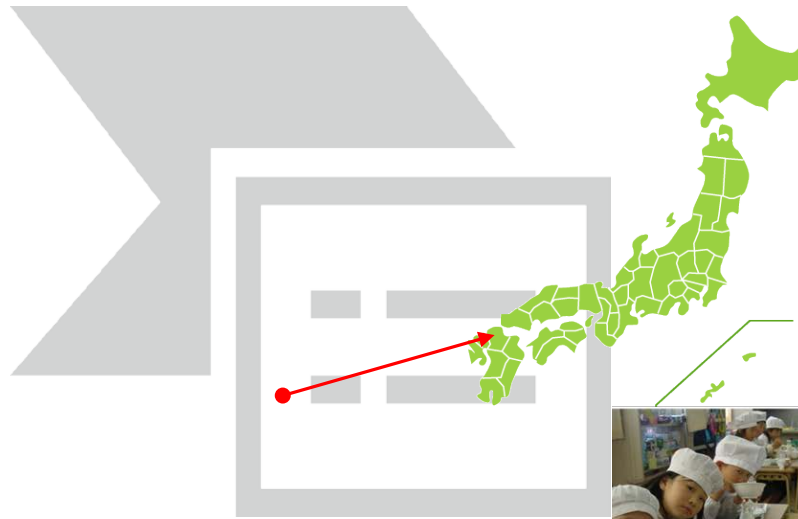
**Disaster Waste Treatment Systems**

**International Resource Circulation**

1. Plastic resource circulation strategy,
2. Biomass (food loss and waste),
3. Metal,
4. Construction (long life construction),
5. emerging topics (solar power generation, diaper)

# Local Government Practice: Ooki town

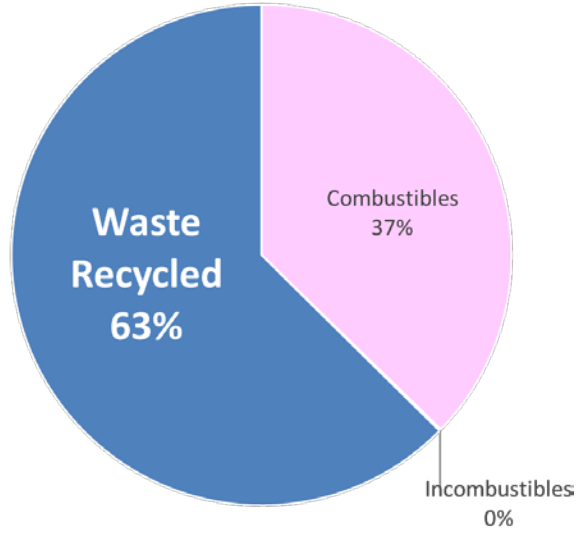
- Population: 14,300; Area:18.43km<sup>2</sup>
- **Action started in 2006**
- **Zero Waste Declaration in 2008**
- **28 segregation categories**
- Annual waste management cost **230 mil JPY(2005)→190 mil JPY(2016)**



**Kitchen Waste Separation**  
Separation of kitchen waste at home and at schools



**Human Waste and Septic Tank Sludge**



**Local Agricultural Product Supply**  
Supplying of agricultural products produced using bio-gas liquid and solid fertilizers to homes and schools



**Fermentation Recycling**  
Fermentation at biomass plant to recover bio-gas and organic liquid fertilizer

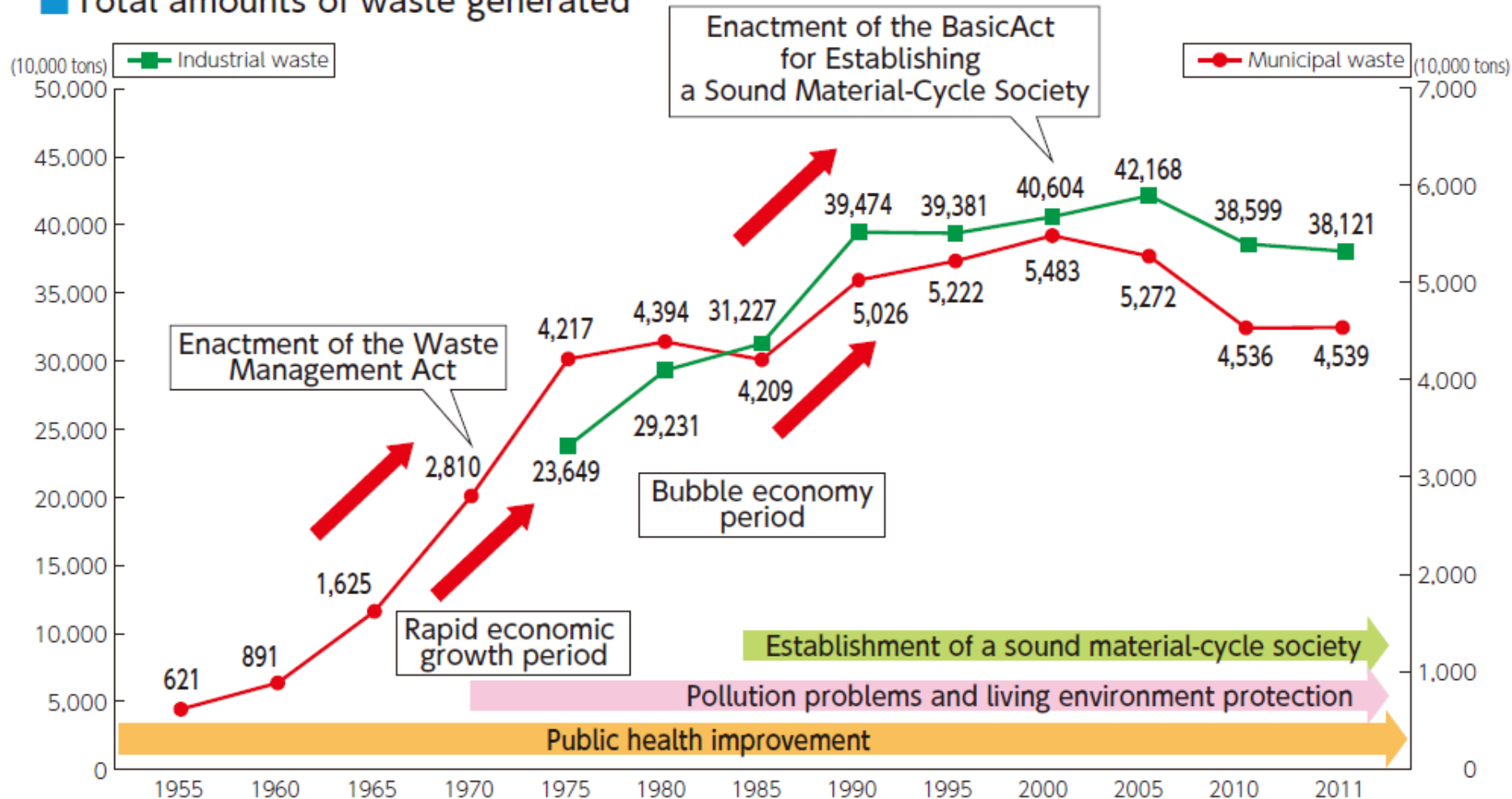
**Liquid Fertilizer Farm Usage**  
Bio-gas liquid fertilizer returned to farms as an organic fertilizer



Source: courtesy of Ooki-town(2017)

# Waste generation

■ Total amounts of waste generated




Source: Ministry of the Environment, Japan (MOEJ)

# Municipal Waste separation in household

English.....8~14

In the City of Yokohama, we collect garbage and things that can be recycled by separating them according to type.

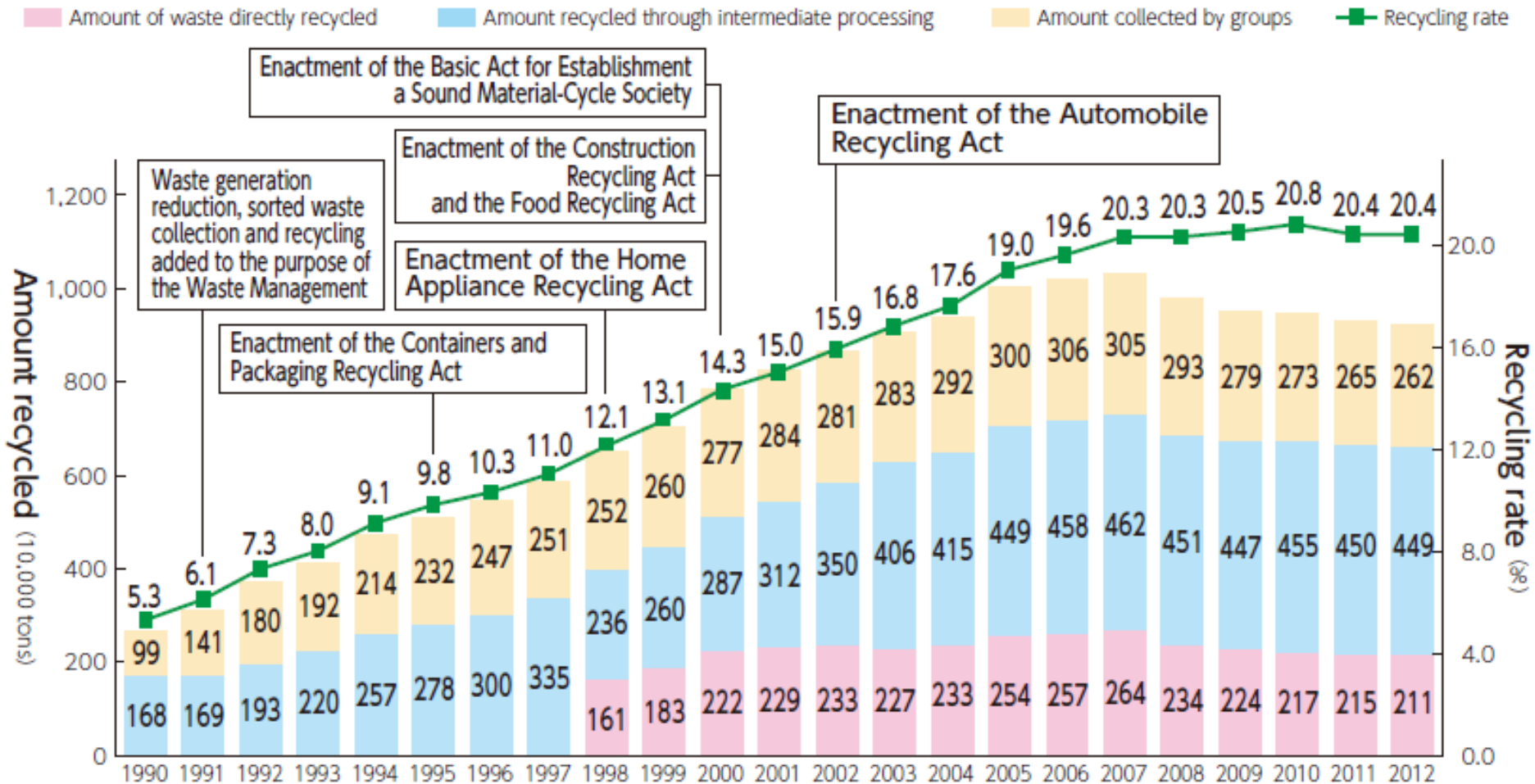
燃やすごみ <b>Burnable Garbage</b>		
乾電池 Dry-Cell Batteries	スプレー缶 Spray Cans	燃えないごみ Non-burnable Garbage
プラスチック製容器包装 <b>Plastic Containers and Packaging</b>		
缶・びん・ペットボトル Cans, Bottles, and PET Bottles	小さな金属類 Small Metal Items	
古紙(新聞、段ボール、雑誌、紙パック、その他の紙) <b>Paper</b> (Newspapers, Cardboard, Magazines, Milk Cartons, Other Paper)		
古布 Used Cloth	粗大ごみ Oversized Garbage	



Source: yokohama city

# Municipal waste recycling

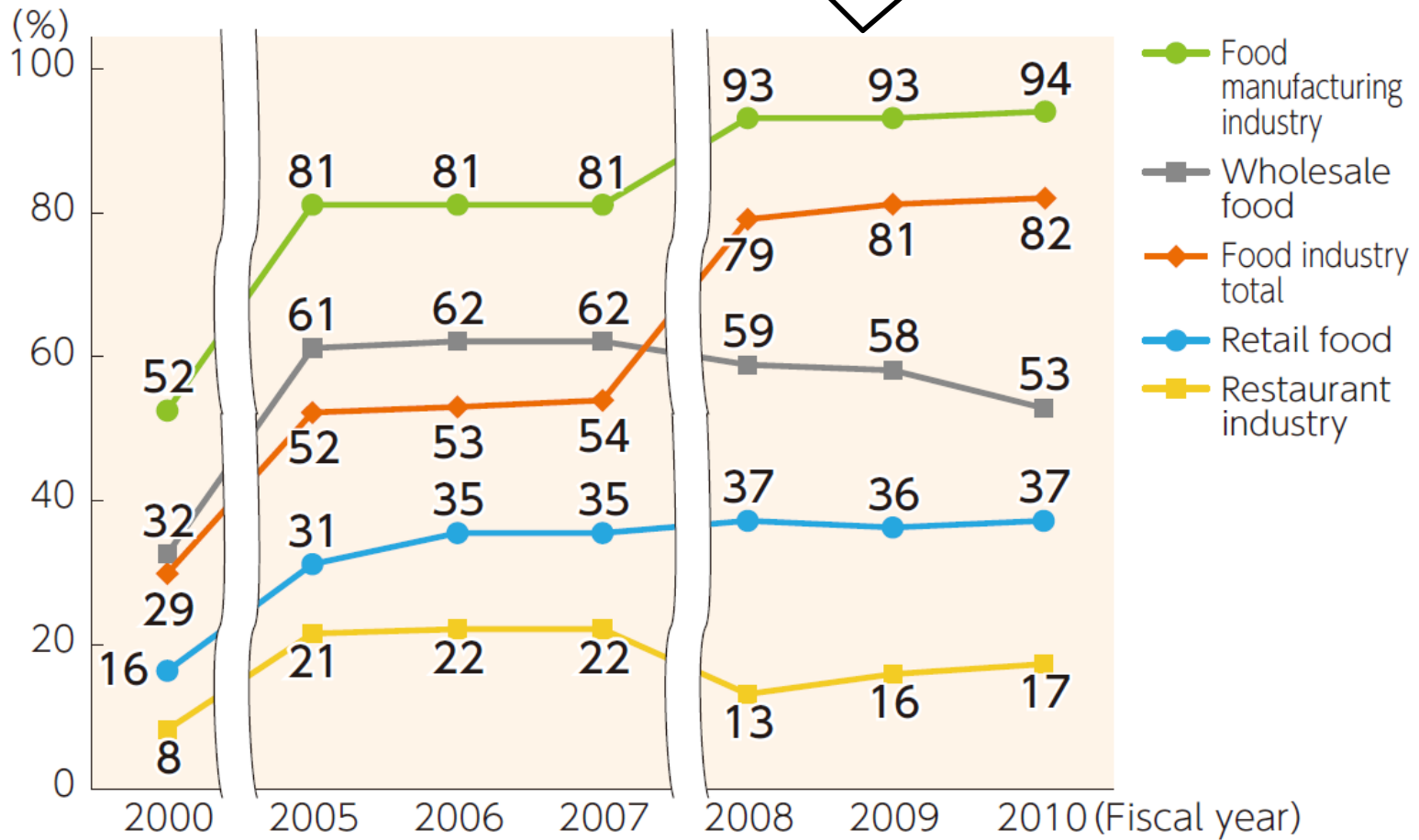
Recycled / generated



Source: Ministry of the Environment, Japan (MOEJ)

# Food recycling act

Prevention + recycle + recovery + reduction  
/ prevention + generation

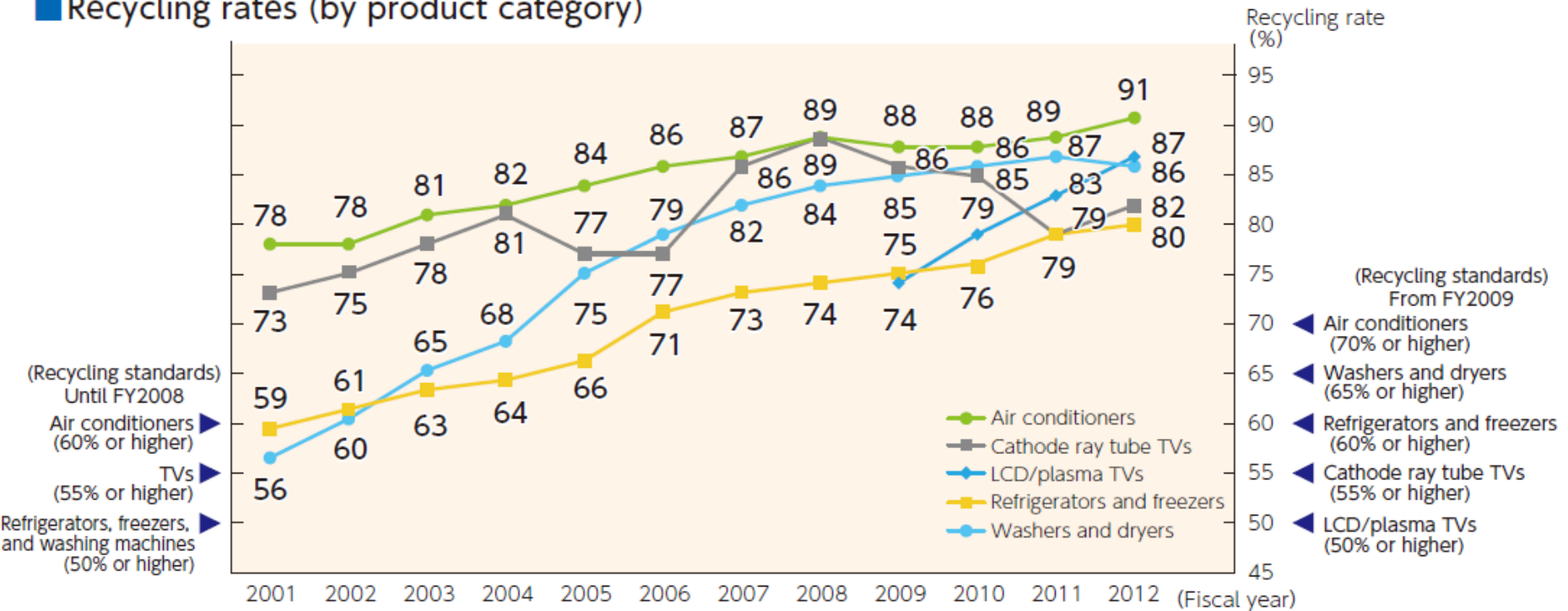


Source: Ministry of the Environment, Japan (MOEJ)

# Home appliances recycling act

Recycled / collected

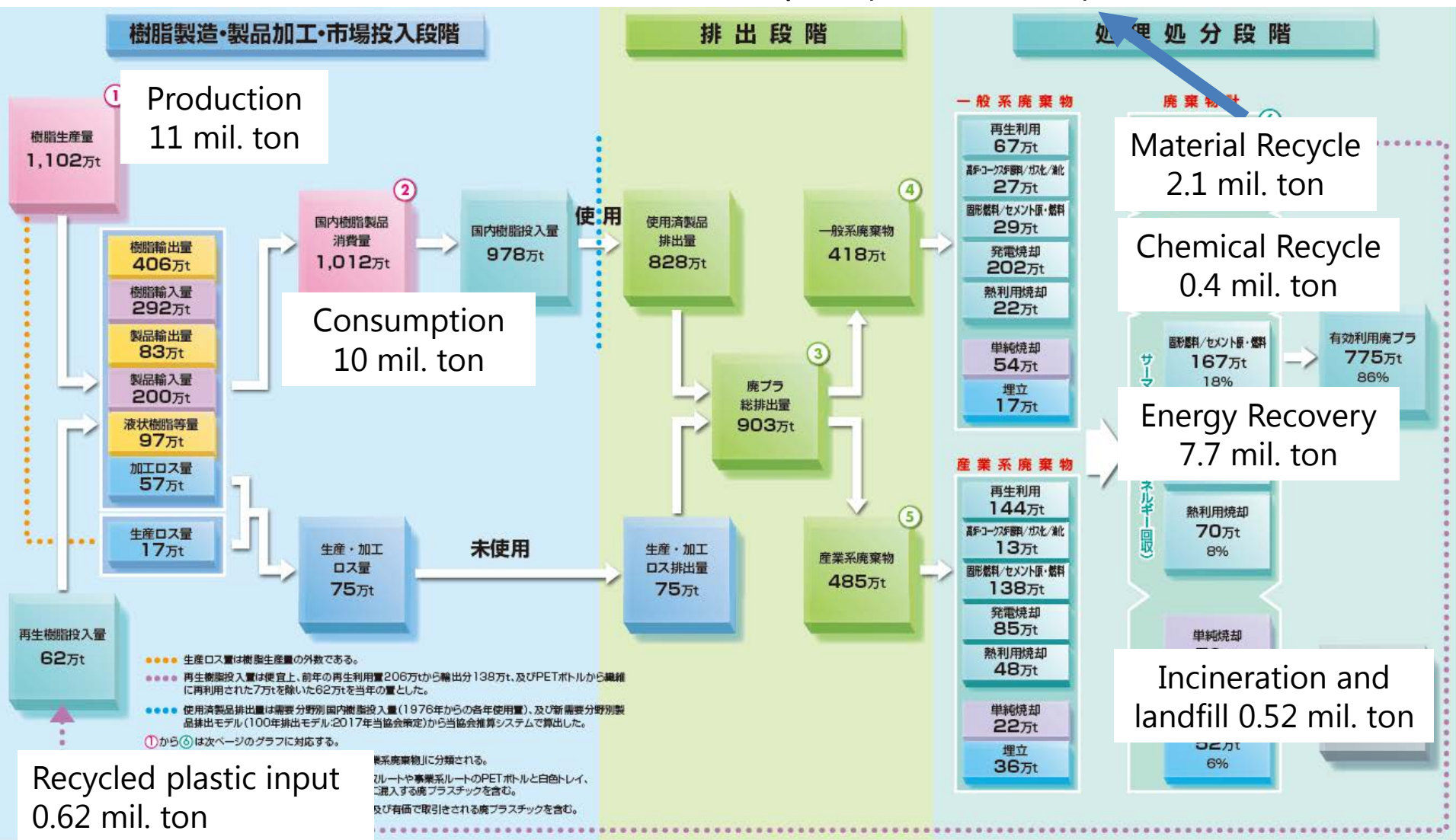
■ Recycling rates (by product category)



Source: Ministry of the Environment, Japan (MOEJ)

# Plastic flow in Japan

Export (1.5mil ton??): China→SE Asia→ ?



Recycled plastic input 0.62 mil. ton

Source : Plastic Waste Management Institute

# Recent development for Addressing Plastic



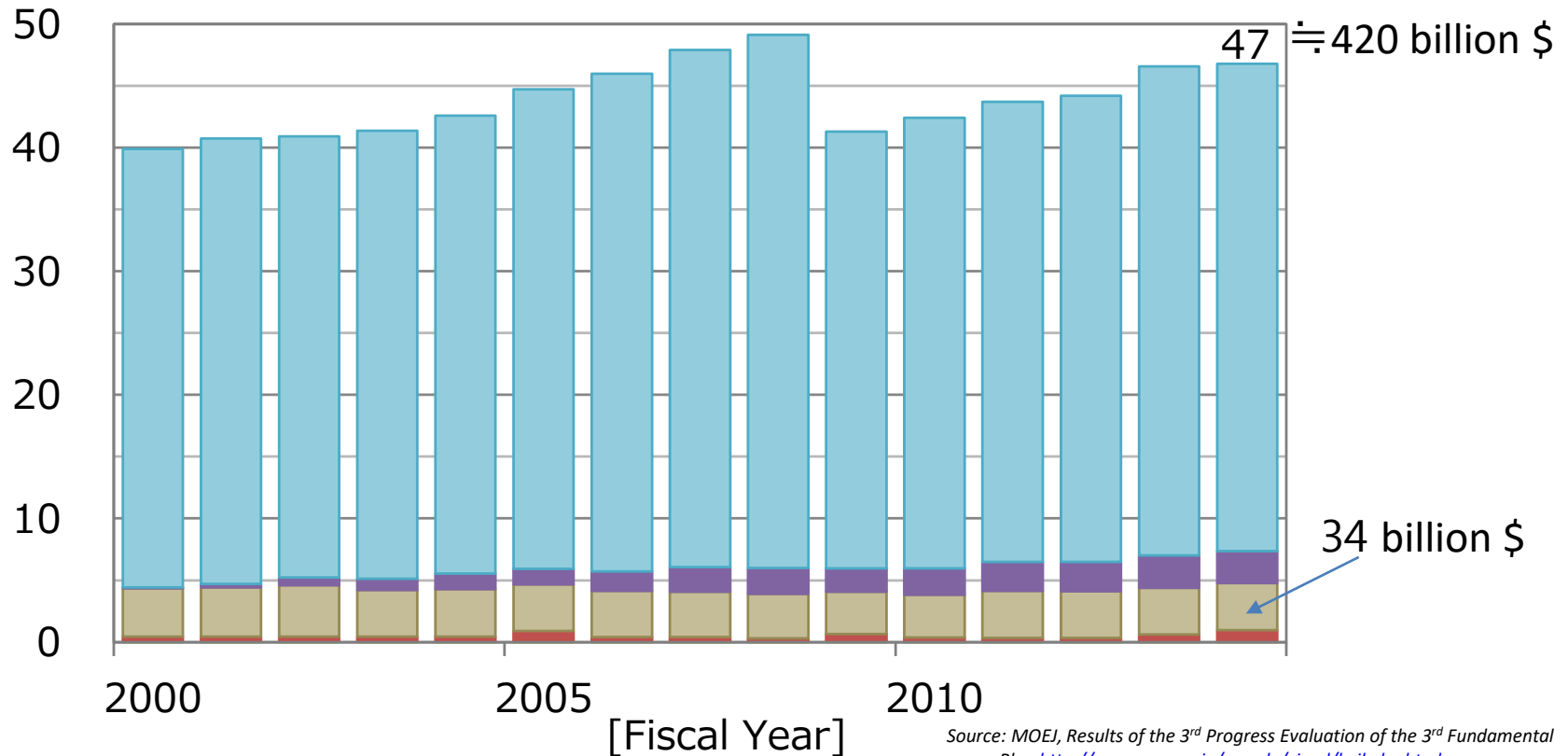
<http://plastics-smart.env.go.jp/>

- Plastic Resource Circulation Strategy
- Plastic smart
- Clean Ocean Material Alliance (METI)



# CE relevant Market in Japan

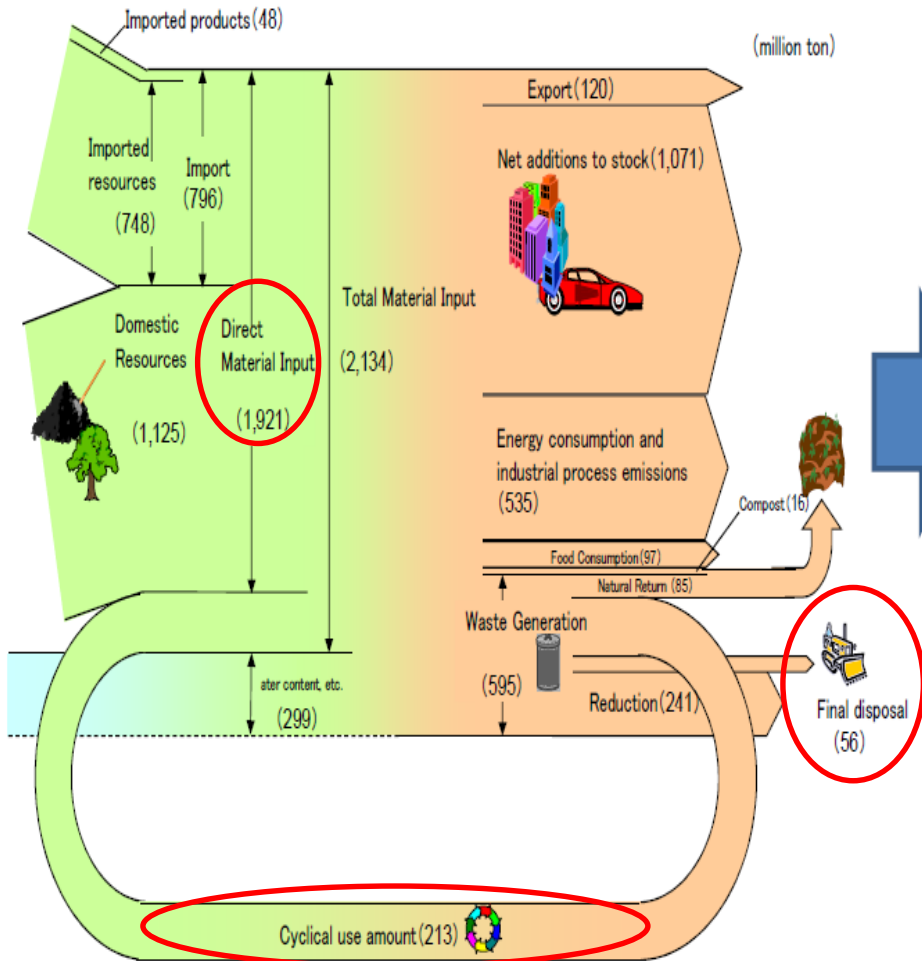
- Efficient use of resources and equipment
  - Longer lifespan (Housing)
  - Waste treatment and Recycling
  - Use of clean energy
  - Sustainable agriculture, forestry and fisheries
- [trillion JPY]



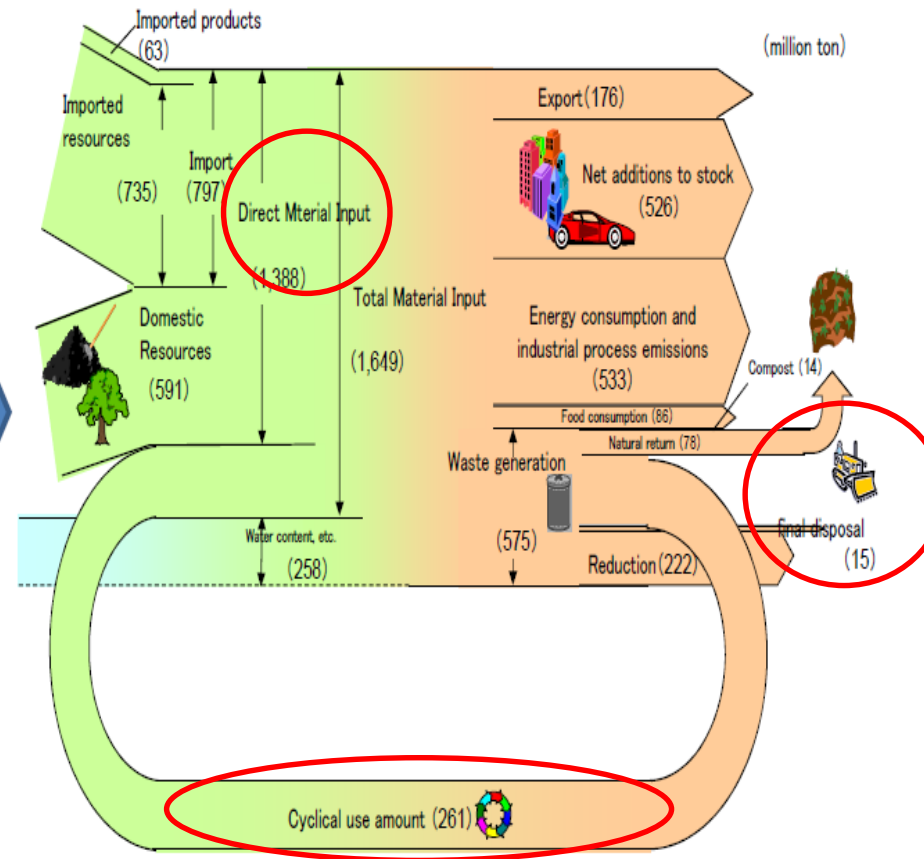
Source: MOEJ, Results of the 3<sup>rd</sup> Progress Evaluation of the 3<sup>rd</sup> Fundamental Plan <http://www.env.go.jp/ recycle/circul/keikaku.html>

# Material Flow in Japan

FY 2000



FY 2014



Source: Ministry of the Environment, Japan (MOEJ)

# Recycling Loop System in food recycling law

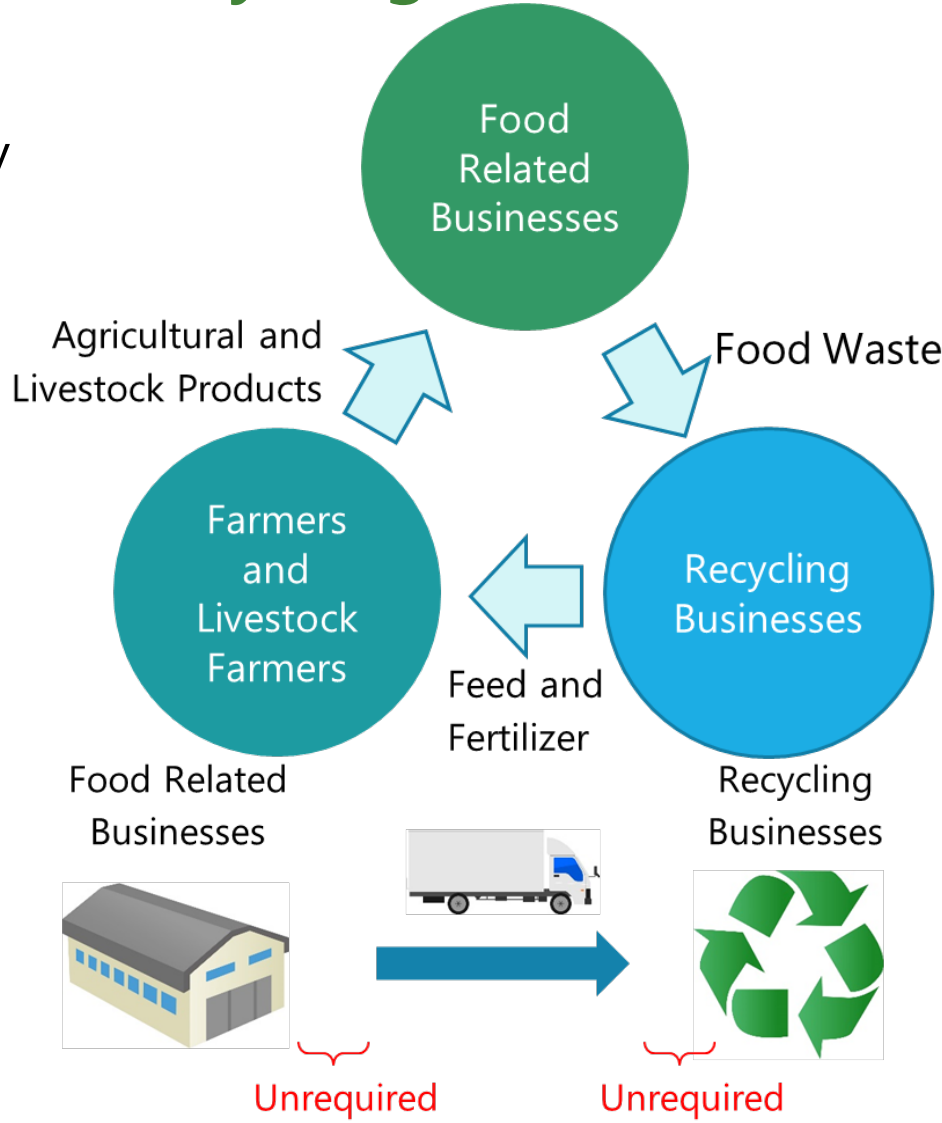
## ■ Recycling Loop System

Recycling projects can be approved by the national government when

- food waste is planned to be collected, transported and recycled in an appropriate manner, and
- agricultural products raised using feeds or fertilizers made from food waste are certainly consumed.

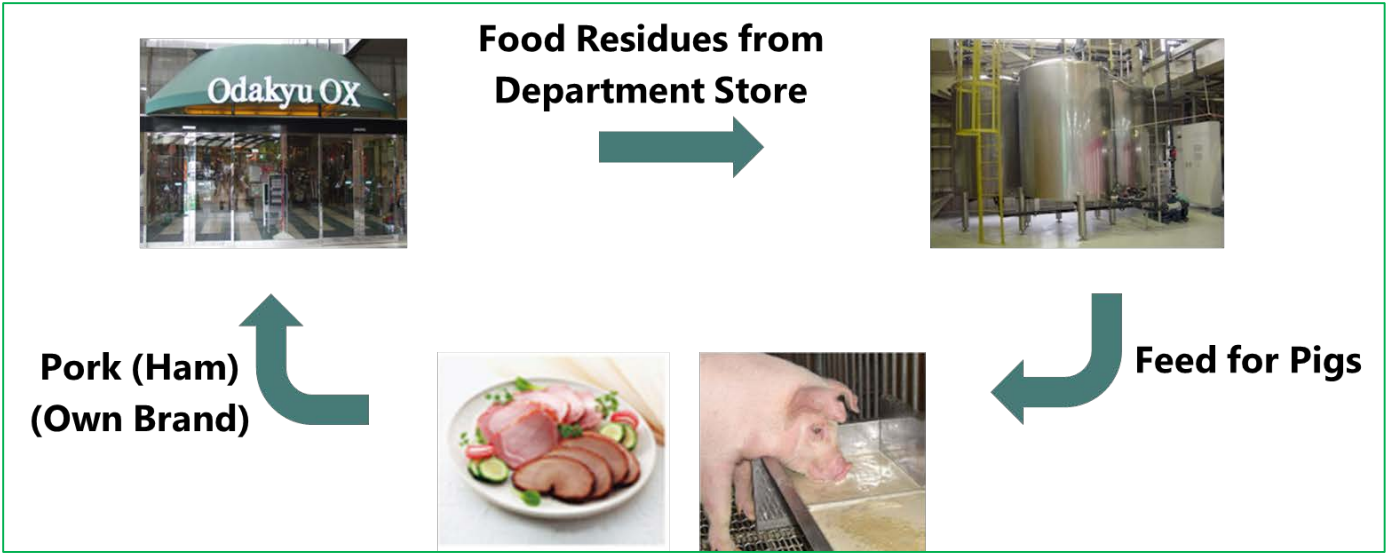
As of April 2019, 53 loops had been approved.

## ■ Exemption from required permission of waste collector in approved project



# Recycling Loop System in food recycling law

- **Example – feed for pigs**



- **Example – fertilizer use**



# Food loss: Cross-ministerial collaboration, Awareness and PPP

## Cross-ministerial liaison meeting on Food Loss

- Established in 2012
- Promoting collaboration of relevant ministry on Food Loss
- Director level
  
- 4 Ministries and 1 Agency
  - Education, Culture, Sports, Science and Technology
  - Agriculture, Forestry and Fisheries
  - Economy, Trade and industry
  - the Environment
  - Consumer Affairs Agency

## Awareness campaign

### NO-FOODLOSS PROJECT



- Logo (name: loss-non)
- Food bank support
- No left-over in restaurant

### Public-Private discussion on manufactured food business custom

- Reconsideration of limitation of delivery date of long-life food
- Best before  
(year, month, day → year, month)

# Business examples

## TOYOTA

- Global 100 dismantlers project
- Car to Car Recycle Initiative (usage of recycled resource in bumpers etc..)
- ECO Designs for recycling

## Kewpie Corporation

Extending best before date by improved packaging and manufacturing process (oxygen removal)

## DAIKIN

Building Air Conditioner, CO2 and Resource reduction through maintenance / parts exchange  
15% up energy efficiency 67% resource reduction compared to renewal

## Mercari

Mobile application for online flea market  
35 million DL in Japan  
Over 90 mil \$ transaction / month

## Richo

- Remanufactured office printer/copy machine

## SONY

- Innovation for high quality recycled plastic
- Target: 10% reduction of primary plastic in a product by 2020 compared to 2013

**Thank you !!!!**

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