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

Source: UNEP-IRP 2011
New Global Norm

G7 Alliance on Resource Efficiency
G20 Resource Efficiency dialogue

Source: ministry of foreign affairs
| RE | EU: Resource Efficient Europe (2011)  
|    | Finland: National material efficiency programme – sustainable growth through material efficiency (2014) |
|    | EU: Closing the loop- An EU action plan for the Circular Economy (2015)  
|    | Finland: Leading the cycle -Finish road map to a circular economy 2016-2025 (2016)  
|    | Italy: Towards a Circular Economy in Italy (2017)  
|    | UK: Increasing resource efficiency and reducing pollution and waste (Green Future: Our 25 Year Plan to Improve the Environment) (2018) ⇒ new strategy development |

Source: EEA,各国各機関HPなど
“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

Source: WEF/ Ellen MacArthur Foundation circular economy team drawing from Braungart & McDonough and Cradle to Cradle (C2C)
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

**Extractive waste guidance**
Best practice

**EPR**

**Best Available Techniques reference**

**Guarantees**
Planned obsolescence
Eco label
GPP

**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

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

**Waste management**

**Revision of waste directives**

**R&D**
Public investment

**Plastic**
Food waste
Critical raw material
Construction and demolition

**Bio-based products**
investment
In separation, collection, recycle but not in landfill and incineration

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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

- 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.

Source: European council
### EU Recycle target in revised waste directives

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

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

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*<br>  Fully in effect Jan. 2001<br>  <Review every 5 years>

- Waste Management and Public Cleansing Act<br>  <Proper treatment of waste>

- Act on the Promotion of Effective Utilization of Resources<br>  <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

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Act on Promoting Green Purchasing (2001)

Eco-Town Program (1997-2007): Development of 3R-related industrial infrastructures
Circular Economy in Japan

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


Source: Ministry of the Environment, Japan (MOEJ)
Local Government Practice: Ooki town

- Population: 14,300; Area: 18.43 km²
- Action started in 2006
- Zero Waste Declaration in 2008
- 28 segregation categories

Source: courtesy of Ooki-town (2017)

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

- 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

- Human Waste and Septic Tank Sludge

Waste Recycled 63%

- Combustibles 37%
- Incombustibles 0%
Waste generation

Total amounts of waste generated

- Industrial waste
- Municipal waste

Enactment of the Basic Act for Establishing a Sound Material-Cycle Society

Enactment of the Waste Management Act

Rapid economic growth period

Bubble economy period

Establishment of a sound material-cycle society

Pollution problems and living environment protection

Public health improvement

Source: Ministry of the Environment, Japan (MOEJ)

www.iges.or.jp

Institute for Global Environmental Strategies
Municipal Waste separation in household

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

**Burnable Garbage**
- Dry-Cell Batteries
- Spray Cans
- Non-burnable Garbage

**Plastic Containers and Packaging**
- Cans, Bottles, and PET Bottles
- Small Metal Items

**Paper** (Newspapers, Cardboard, Magazines, Milk Cartons, Other Paper)

**Used Cloth**

**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)
Recycling rates (by product category)

Source: Ministry of the Environment, Japan (MOEJ)
Plastic flow in Japan

**Production**
- 11 mil. ton

**Consumption**
- 10 mil. ton

**Recycled plastic input**
- 0.62 mil. ton

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

- Material Recycle 2.1 mil. ton
- Chemical Recycle 0.4 mil. ton
- Energy Recovery 7.7 mil. ton
- Incineration and landfill 0.52 mil. ton

Source: Plastic Waste Management Institute

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Recent development for Addressing Plastic

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

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

Best practices by private sector by KEIDANREN (Japan Business Federation)
CE relevant Market in Japan

Source: MOEJ, Results of the 3rd Progress Evaluation of the 3rd Fundamental Plan  
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**

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[Diagram of recycling loop system]

Food Related Businesses

Agricultural and Livestock Products

Food Waste

Farmers and Livestock Farmers

Feed and Fertilizer

Recycling Businesses

Recycling Businesses

Unrequired
Recycling Loop System in food recycling law

- Example – feed for pigs
  - Odakyu OX
  - Food Residues from Department Store
  - Pork (Ham) (Own Brand)
  - Feed for Pigs

- Example – fertilizer use
  - Food Residues from Supermarket
  - Vegetables
  - Fertilizer
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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