Waste Management and Recycling
Indicators of Japan and OECD

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Japan’s Environmental Statistics (1)

**Economy-wide MFA**
- Material Flow Indicators
  - Resource productivity, cyclical use rate, final disposal amount, TMR of metal resources

**Municipal solid waste (MSW)**
- Treatment flow of municipal solid waste (MSW)(national)
- Total generation of MSW
- MSW generation per capita
- Situation of MSW management in each prefecture
- Type, number and size of waste management facilities (incinerators and recycling facilities)
- Situation of establishment and capacity of waste management facilities in each prefecture
- Remaining capacity and year of final treatment sites of MSW.
- Situation of final treatment sites in each prefecture
- Change in operation cost of MSW management
Japan’s Environmental Statistics (2)
Industrial waste
- Flow of treatment of industrial waste (national)
- Total generation of industrial waste
- Generation of industrial waste in different industrial sectors
- Generation of different types of industrial wastes
- Change in amount of recycling, reduction, and final treatment of industrial wastes
- Number of different types of industrial waste management facilities. Treatment capacity, remaining capacity and remaining year of industrial waste management facilities
- Number and amount of illegal dumping cases
- Type of illegal dumpers

Japan’s Environmental Statistics (3)
Recyclables
- Ratio of packaging waste in household waste
- Production and shipment of packaging
- Recycling rate and collection rate of packaging
- Number of used home appliances accepted to designated collection point, number of recycled used home appliances, rate of recycling of home appliances, total weight of materials and components of different targeted used home appliances, amount of recovery and destruction of CFCs
- Amount of generation of different types of construction wastes, situation of recycling each different type
- Generation of food waste and situation of treatment
- Number of taking back of end of life vehicles
- Collection and recycling of small batteries and PCs
MFA Indicator under 2\textsuperscript{nd} Fundamental Plan

- Monitoring progress in policy implementation is essential.
- Japan introduced MFA-based indicators and policy targets for 2010 in 2003 to monitor the progress of 3R implementation at macro-level.
- Based on the progress, Japan revised its fundamental plan in 2008 and set new targets for 2015.

**“INPUT”: Resource Productivity**

GDP/natural resource input

- ¥420,000/t in 2015

**“CIRCULATION”: Cyclical Use Rate**

Cyclical use amount/cyclical use amount + natural resource input

- 14-15% in 2015

**“OUTPUT”: Final treatment of waste**

- 23 million t in 2015

Effort indicators under 2\textsuperscript{nd} Fundamental Plan of Sound Material Cycle Society

[Effort Indicators (target year: FY2015)]

1. Numerical targets
   1. Reduction of municipal solid waste
      - Total waste generation per capita/day
      - Household waste generation per capita/day
      - Waste generation from business sector
   2. Final disposal amount of industrial waste
      → Reduction by 60% comparing to FY2000 level (e.g. 47% reduction in 2005)
   3. Citizens' awareness of and behavior concerning 3Rs
      → Awareness: approx. 90%, Behavior: approx. 50%
   4. Promotion of recycling businesses
      → Market size will be doubled from FY2000 level (e.g. 1.3 times in 2005)

2. Other indicators monitoring a progress made by individual stakeholders
   1. Percentage of customers not taking plastic shopping bags,
   2. High-ranked municipalities in terms of 3R efforts, and other indicators
Indicators to evaluate the waste management performance

<table>
<thead>
<tr>
<th>Category</th>
<th>Objective to be measured</th>
<th>Indicator</th>
<th>Unit</th>
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<tbody>
<tr>
<td>Establishing recycling-based society</td>
<td>Waste generation</td>
<td><strong>Waste generation per person·day</strong></td>
<td>kg/person·day</td>
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<td></td>
<td>Recycling rate</td>
<td>Recycling rate from waste</td>
<td>% (ton/ton)</td>
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<td></td>
<td>Thermal recycle</td>
<td>Energy recovery from waste</td>
<td>MJ/ton</td>
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<td></td>
<td>Final Disposal</td>
<td><strong>Proportion of waste sent to landfill-site</strong></td>
<td>% (ton/ton)</td>
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<td>Prevention of global warming</td>
<td>GHGs emission</td>
<td>GHGs emission per a person a day associated with waste disposal</td>
<td>kg/person·day</td>
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<td>Public service</td>
<td>Residents’ satisfaction for waste treatment</td>
<td><strong>Degree of Satisfaction of residents</strong></td>
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<td>Annual waste treatment cost per a person</td>
<td>JPN yen/person·year</td>
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<td>Cost of recycling</td>
<td>JPN yen/ton</td>
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<td>Cost of thermal recycling</td>
<td>JPN yen/MJ</td>
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<td>Cost associated with waste reduction service</td>
<td>JPN yen/ton</td>
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<td>Economy</td>
<td>Cost-effectiveness</td>
<td><strong>Data collection/management</strong></td>
<td>Source: Maeda and Hayashi 2012</td>
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</tbody>
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**OECD Statistics**

- Material Use of different countries based on MFA (DEU, DMC, Physical Trade Balance, breakdown of material use, stock)
- Amount of waste generated by sector (different sector and urban waste) (no consecutive data)
- Amounts of waste generated by selected waste stream (no difference in industrial waste and urban waste, data on packaging)
- Generation of municipal waste (consecutive data), generation of household waste, municipal waste per capita, household waste per capita
- Composition of municipal waste (consecutive data)
- Situation of disposal of municipal waste (latest information)
- Production, movement (export and import) and disposal of hazardous waste
- Waste recycling rates (paper and cardboards)
- Waste recycling rate (glass)
- Waste treatment and disposal installations (number and capacity of controlled landfill, number and capacity and energy recovery of incinerators, number and capacity of treatment plants, number and capacity of permanent storage)
UN Stat

• Ratio of population with municipal solid waste management collection
• Collection amount of municipal solid waste
• Generation of hazardous wastes
• Generation of municipal wastes
• Generation of industrial wastes