

# Solid waste management I

# Today's lecture

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- Magnitude and sources of solid wastes
- Classification of solid wastes
- Fate of solid wastes

# Solid waste

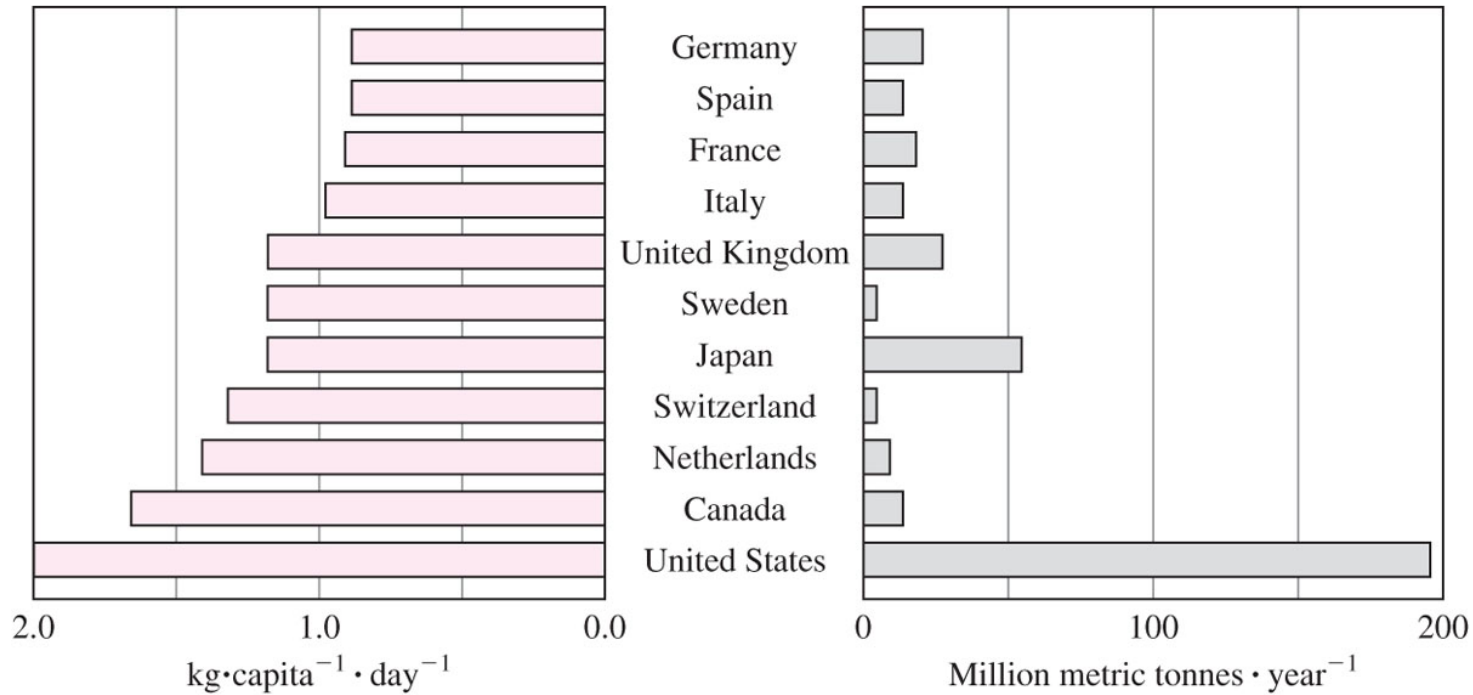
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- Things we throw away
- Called garbage, refuse, trash (쓰레기, 폐기물)



# Magnitude of the problem

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(2010)

Korea:  $0.95 \text{ kg}\cdot\text{capita}^{-1}\cdot\text{day}^{-1}$  (2012)

# Sources of solid wastes

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Source	Typical facilities, activities, or locations
Residential	Homes
Commercial	Stores, restaurants, markets, office buildings, hotels, etc.
Institutional	Schools, hospitals, prisons, government buildings
Construction	New construction sites, road repair sites, demolition of buildings
Municipal services	Street cleaning, landscaping, parks and beaches, waste and wastewater treatment processes
Industrial	Construction, fabrication, manufacturing, refineries, chemical plants, power plants
Agricultural	Crop field, rice paddies, orchards, animal farms

# Classification of solid wastes

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- The regulation, classification, and management of solid wastes varies for different countries
- Classification by Korean government
  - By sources
    - Residential daily waste (가정생활계폐기물)
    - Industrial and commercial waste (사업장폐기물)
  - By hazard
    - Non-designated waste (일반폐기물)
    - Designated waste (지정폐기물)

# Classification of solid wastes

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- Classification by Korean government
  - By sources
    - Residential daily waste (가정생활계폐기물)
      - 1) Non-recyclables: the non-food waste we collect in plastic bags
      - 2) Recyclables: paper, metals, plastics, PET, glass, Styrofoam, clothes
      - 3) Food waste: collected in plastic bags
      - 4) Bulky waste: furniture, home electronics, etc. - collected separately

# Classification of solid wastes

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- Classification by Korean government
  - By sources
    - Industrial and commercial waste (사업장폐기물)
      - 1) Daily industrial and commercial waste (사업장생활계폐기물): everyday waste generated from offices, restaurants, etc. (waste characteristics are similar to the residential daily waste)
      - 2) Emission facility waste (사업장배출시설계폐기물): waste generated from designated emission facilities (specific waste characteristics depending on the facility)
      - 3) Construction waste (건설폐기물): construction or demolition of buildings, plants, roads, bridges, etc.

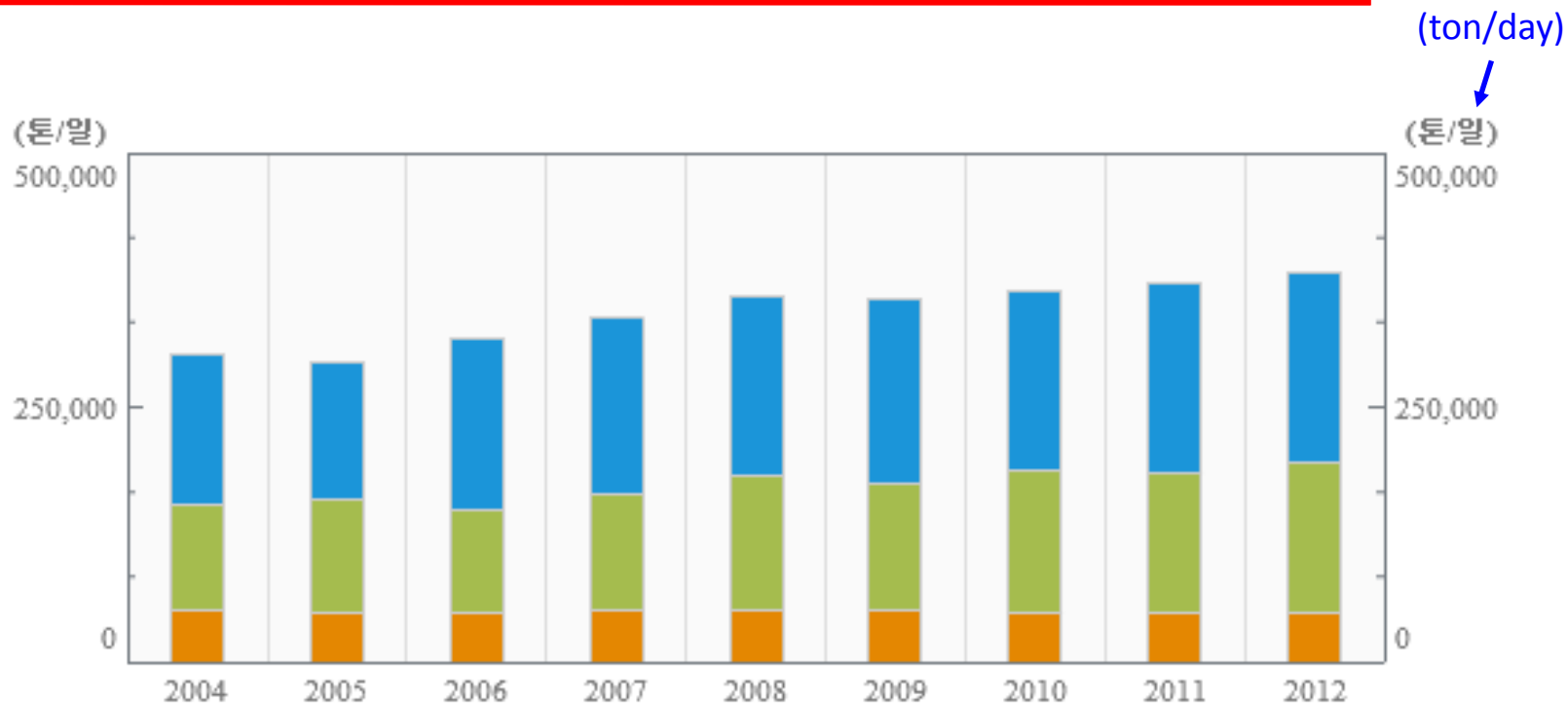


# Classification of solid wastes

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- Classification by Korean government
  - By hazard
    - Non-designated waste (일반폐기물)
    - Designated waste (지정폐기물): wastes generated from industrial and commercial facilities that are expected to have significant environmental impact
      - Waste acid, alkali, oil, organic solvent, polymer, asbestos, minerals, particulates, incineration residue, sludge, etc.
      - Medical waste

# Waste generation in Korea



■ 생활폐기물   
 ■ 사업장 일반폐기물   
 ■ 건설폐기물

Residential daily waste  
(가정생활계폐기물)

Industrial & commercial waste  
neither classified as designated  
waste nor construction waste

Construction waste

# Fate of residential daily wastes (Korea)

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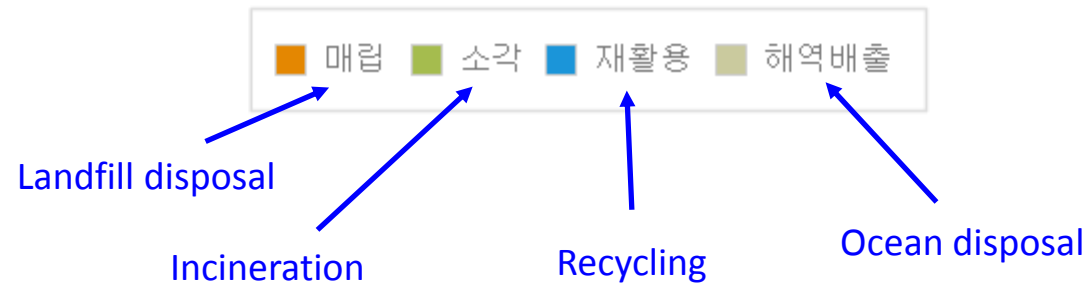
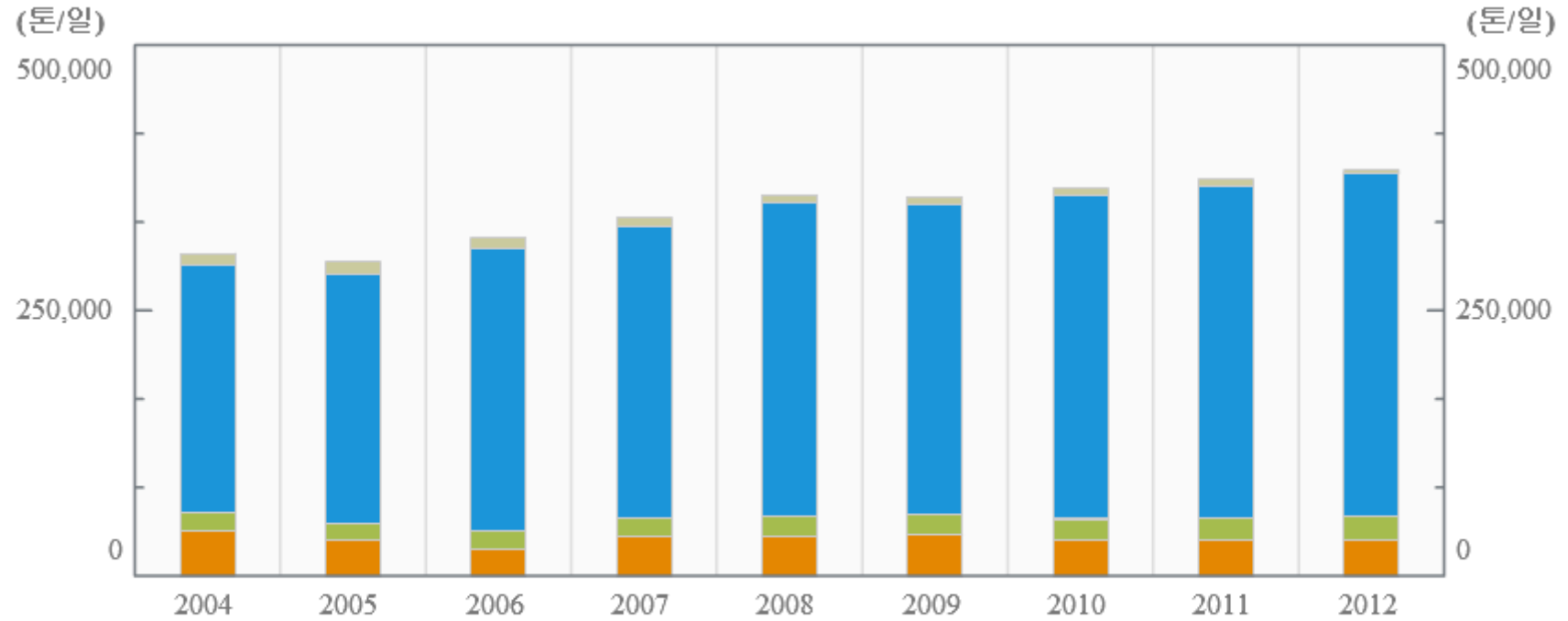
- Non-recyclables: collected by trucks → mostly landfilled or incinerated
- Recyclables: collected by trucks → recycling center for further classification → industrial consumers
- Food waste: collected by trucks → food waste resource center (generate resources such as animal feed, compost, or fuel) → the resources are sent to consumers, and the final wastes are landfilled or incinerated

# Fate of industrial & commercial wastes (Korea)

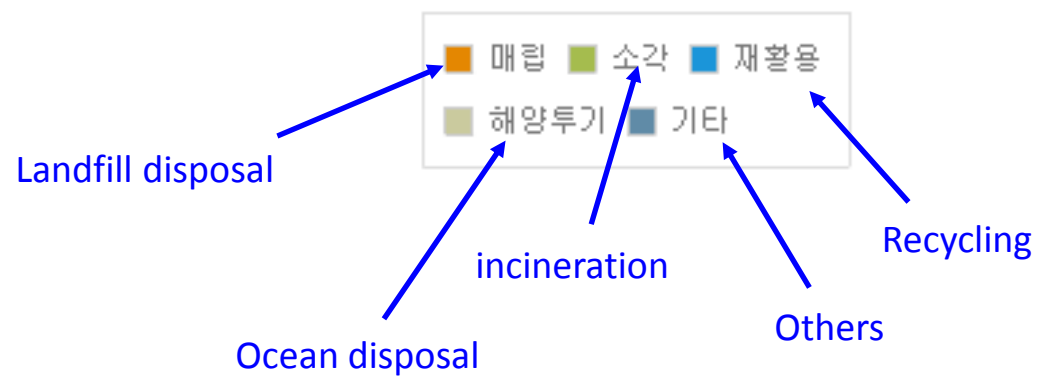
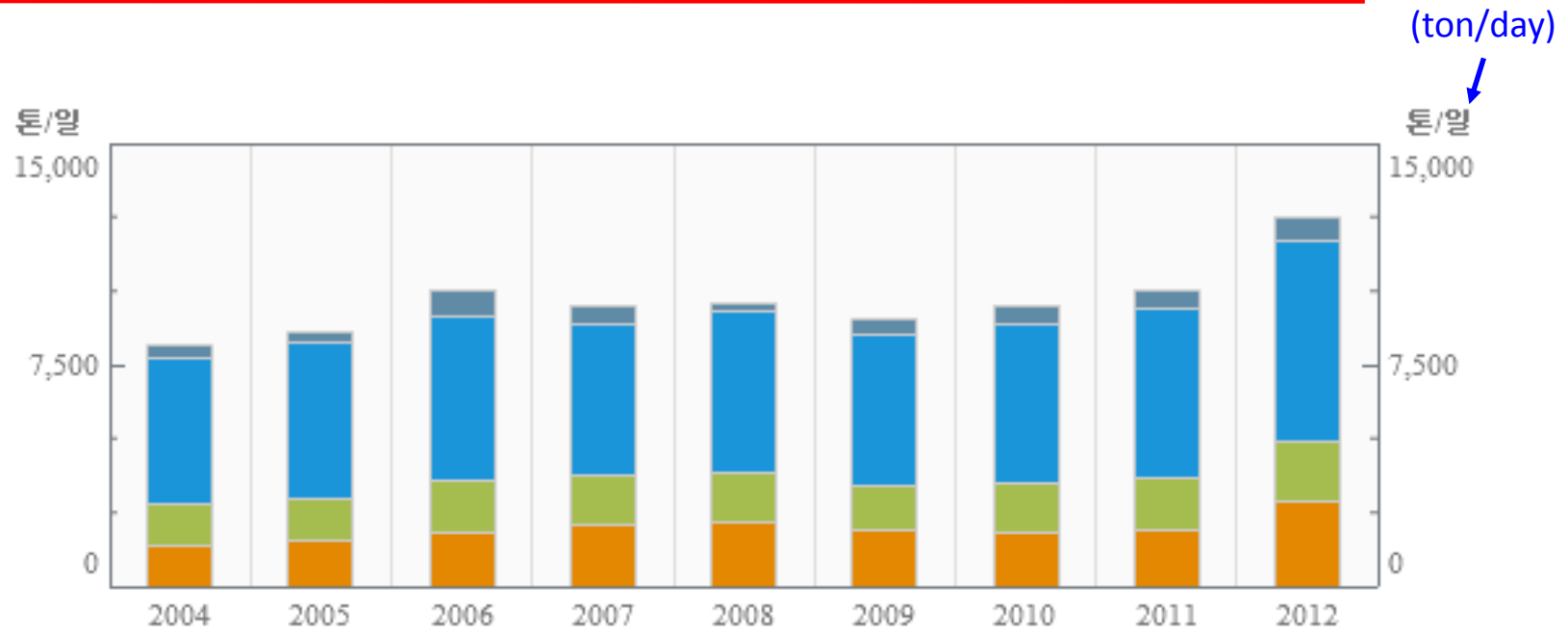
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- Daily industrial and commercial waste (사업장생활계폐기물): combined with daily residential waste
- Other industrial and commercial waste
  - Non-designated waste (일반폐기물): mostly recycled (ex: construction waste – recycled as construction materials)
  - Designated waste (지정폐기물): treated by specific procedures, recycled, incinerated or disposed in secure landfills (지정폐기물 매립지)

# Statistics – fate of non-designated wastes in Korea



# Statistics – fate of designated wastes in Korea



# Reading assignment

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Textbook Ch. 13 p. 654-661