國立臺北大學自然資源與環境管理研究所
111 學年度第一學期『環境工程科學概論』

課程講義(13)：廢棄物處理與資源回收
Solid Waste Treatment and Resource Recycling

- INTRODUCTION
  - □ Solid Waste (Refuse), Garbage (Food Waste), Rubbish, Discard => MSW
  - □ 一般廢棄物、事業廢棄物（一般事業廢棄物、有害事業廢棄物）
  - □ Waste-to-Energy Combustion/Incineration and Landfills =>灰渣：底渣＋飛灰
  - □ Treatment of Garbage: Composting, Anaerobic Digestion, Soil Conditioner, etc.
  - □ Recycling Schemes: 3Rs, 4Rs, 5Rs, 6Rs (Reduce, Reuse, Recycling, Recovery, R??)
    「資源循環零廢棄」6R：減量（Reduction）、再使用（Reuse）、物料回收（Recycling）、能源回收（Energy Recovery）、新生土地（Land Reclamation）及改變設計（Redesign）
    ⇒ Sustainable Materials Management, Sound Material-Cycle Society
  - □ 環境部資源循環署

- TREATMENT OF SOLID WASTE
  - □ Collection, Treatment, Disposal, Recycling, and Energy Recovery
  - □ Open Dump, Sanitary Landfill; Incinerators; Recycling and Recovery
  - □ Solid Waste Treatment and Disposal Facility
    ⇒ Externality: NIMBY (Not In My Back Yard)－嫌惡設施 => Positive Externality
  - □ Source Reduction（源頭減量）=> Waste Minimization; Cleaner Production
  - □ Collection and Transfer Operation =>「四合一」回收系統、垃圾費隨袋徵收

- SUSTAINABLE PRODUCTION AND CONSUMPTION
  - □ Sustainable Production: Waste Minimization, Eco-Design, Cleaner Production
  - □ Eco-Labelling
    ⇒ISO 14024 &14021 (ISO/TC 207/SC3)
    ⇒Environmentally friendly products labelling network | Global Ecolabelling Network
  - □ Life Cycle Assessment
    ⇒ISO 14040 &14044 (ISO/TC 207/SC5)
    ⇒LCA Cases: Diapers and Hot-Drink Cups
  - □ Circular Economy => the "Butterfly Diagram"
    ⇒Technological Cycle; Biological Cycle
    ⇒Cradle to Grave => Cradle to Cradle => Cradle to Cradle Certification
    ⇒Sustainability => Circularity + NZE (Agenda 2050?)

- HOMEWORK ASSIGNMENT #8（2022/12/20 Due）：
  請詳讀 Masters and Ela (2008) §9.6 Lifecycle Assessment: An Example LCA -- Polystyrene Cups (p.616)，以整理（1）該範例比較之產品；（2）比較之基礎（功能單位）；（3）考量的環境議題（投入與產出），最後請你評述那項熱飲容器「比較環保」？