Topic 8.3
Solid Domestic Waste

IB ESS 2020

Learning outcomes

Outline the characteristics of Solid Domestic Waste (SDW) or Municipal Solid Waste (MSW)

Describe differences between the linear and circular economy paradigms

Evaluate pollution management strategies for SDW

SDW or MSW is a growing problem

2006… about 2.9 billion urban residents, about 0.64 kg/capita/day (0.68 billion tonnes per year)

2018… about 4.2 billion urban residents, about 1.2 kg/capita/day (1.3 billion tonnes per year)

2025… estimated 5.5 billion urban residents, 2.2 billion tonnes per year

SDW a problem we can control and manage

Only about 5% of total human waste

Includes all trash/garbage/rubbish from **residential & urban** areas

E.g. Paper, Food, Glass, Dust, Metals, Plastics, Textiles, Paint, Batteries,...

USA : EU = 3.5 kg/capita/day : 1.4 kg/capita/day

Linear vs Circular Economy

Linear economy =
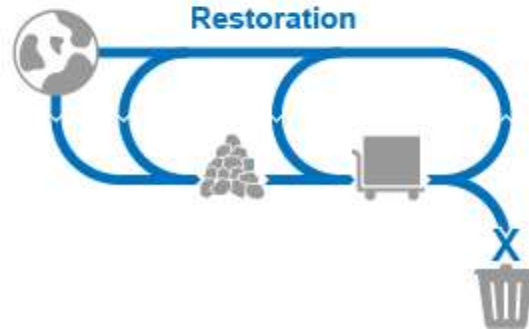
take, make, use, waste

Linear

Vs

Circular Economy
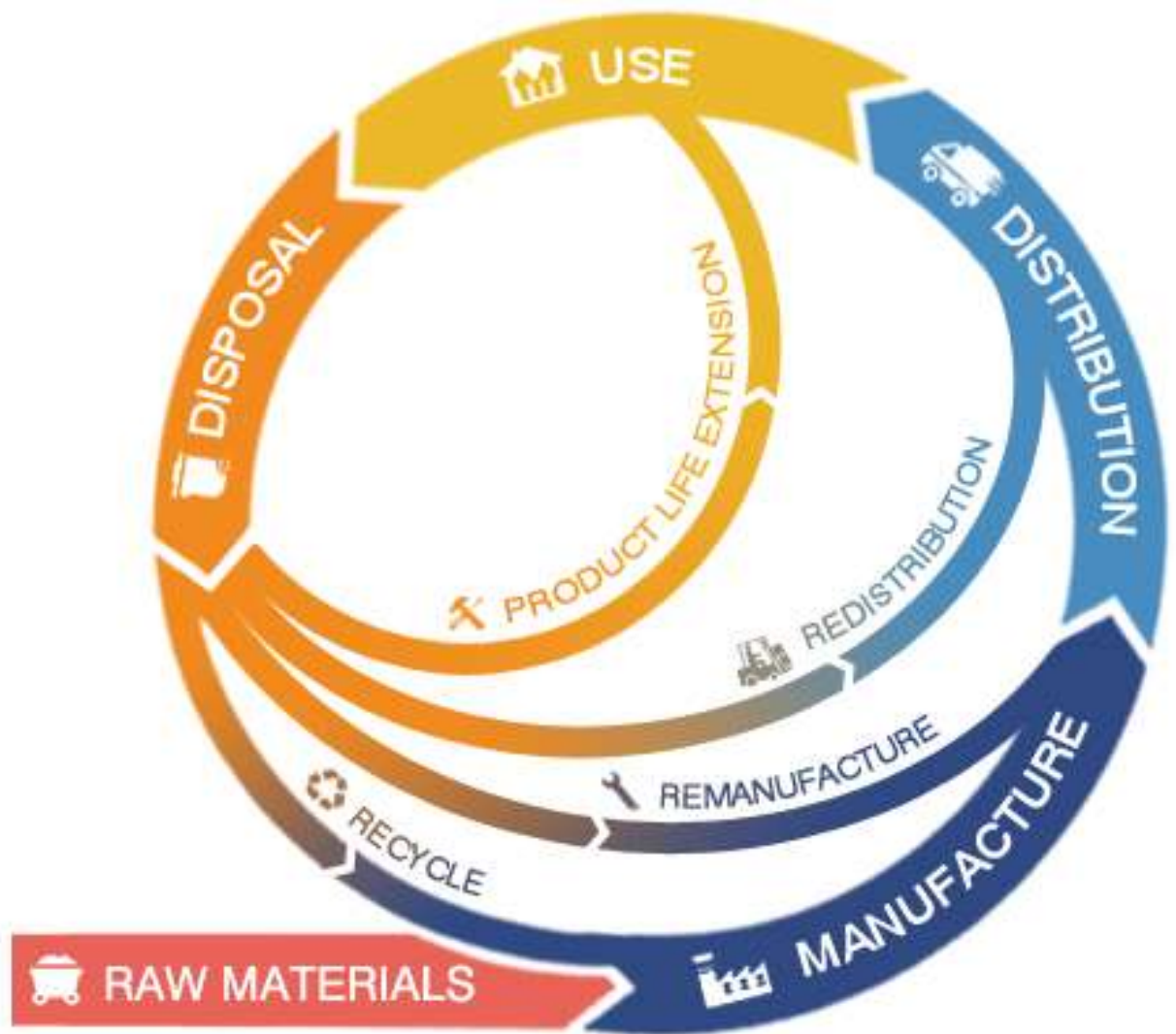
Circular Economy

- Reduce manufacture and (refuse) purchase
- Reuseable products
- Recycle pre- and-post consumer

Source:
https://connect.innovateuk.org/web/collaborations-circular-economy

Landfill and Incinerator Waste Disposal

Disposal Method	Landfill	Incinerator
	Photo Credit Discovery Education	Photo Credit Wikidot
Advantages ● Regulated, taxed ● Env. protection	Low waste-to-energy potential Reclaim old landfills for other uses	High waste-to-energy potential
Disadvantages ● Linear economy		Air pollution, including transborder

Composting

The process of decomposing non-pathogenic, household, organic materials anaerobically (without oxygen)

- **Small or commercial scale circular economy**
- **Produce methane gas which could be used as fuel for the generation of electricity**
- **Produce solids which are used as soil fertilizer**
- **The EPA estimates 28% of SDW is compostable.**
- **Reduces ecological footprint, benefits global biodiversity**

Investigating the relationship between human population growth and SDW

Independent Variable	Population growth rate	Annual percentage (%/yr)
Dependent	SDW generation rate	Tonnes per year (t/yr)
Controlled	Countries	All must be classified as MEDCs As much as possible countries should have similar characteristics e.g. region, climate, culture,...
Etc...		