



BRITISH
COLUMBIA

The Best Place on Earth

Ministry of
Environment



European Waste Hierarchy





EU Organic Waste Legislation

- **Waste Framework Directive (75/422/EEC):** *“To prevent and minimize waste and maximize the reuse, recycling, and use of environment friendly alternative materials...”*
- Directive (91/156/EEC), Directive (91/692/EEC) and Commission Decision 96/530/EC:
recycling of **organic substances** other than solvents through composting and other biological treatments.

- **Landfill Directive (99/31/EC):** targets to minimize landfilling of biodegradable municipal waste (expired in 2001). New targets are effective since 16 July 2004.
 - a) 75% reduction of the amount produced in 1995, by 2010
 - b) 50% by 2013
 - c) 35% by 2020



- The Landfill Directive includes recycling of **source segregated organic waste** by **aerobic** (composting) or **anaerobic** (digestion in biogas plants) treatments.



- **Animal Waste Directive (90/667/EEC)** replaced by **Animal By-Products Regulation No 1774/2002** on 1 July 2003.
 - a) collection,
 - b) treatment disposal
 - c) regulation for pre-treatment prior to landfilling (pathogenic by-product)
 - d) recycling as feed material
 - e) energy recovery



Directive 2008/.../EC (2 October 2008)

- **Article 11, Reuse and recycling:**
 - a) 50% by weight increase of reuse and recycling for household paper waste (by 2020)
 - b) 70% increase by weight of other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition (by 2020)



Directive 2008/.../EC (2 October 2008)

- **Article 22, Bio-waste:** Member states are required to take measures to encourage **separate collection** of bio-waste for composting or digestion with compliance with **high level of environmental safety** and utilization of the end-product.



Directive 2008/.../EC (2 October 2008)

Energy recovery

- **Article 23**, Mandates **permit** for waste treatment. Energy recovery (incineration) should occur with high level of energy efficiency.
 - a) Energy efficiency ≥ 0.6 installation in operation.
 - b) Energy efficiency ≥ 0.65 (permitted after 31 December 2008).



Efficiency

$$\text{Energy efficiency} = (E_p - (E_f + E_i)) / (0.97 * (E_w + E_f))$$

- E_p = annual energy produced as **heat** or **electricity** (GJ/year)
- E_f = annual energy input to the system from fuels contributing to the production of steam (GJ/year)
- E_w = means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year)
- E_i = annual energy imported excluding E_w and E_f (GJ/year)
- 0.97 is a factor accounting for energy losses due to bottom ash and radiation.