PRESS KIT

Waste Valuation Method

The valuation of waste generated across the product value chains are based on five possible disposal methods: landfill; incineration; recycling, re-use and composting. Each disposal process has a different valuation method.

Landfill

Waste sent to landfill has three main external costs: greenhouse gas emissions (methane) from the decomposing waste; leachate emissions (liquid run-off that passes into the surrounding area); and disamenity effects of the site (noise, dust, litter, odour, the presence of vermin, visual intrusion and enhanced perceptions of risk).

Methane emissions were quantified based on the IPCC emission factors for waste, with national methane capture rates taken into account. The Social Cost of Carbon (described in the GHG Valuation Method) was then applied to each tonne of methane (measured in CO_2-equivalent). Since waste decomposition occurs over many years, future emissions were calculated using the US EPA's landfill life-cycle data tool and a discount rate of 3.4% (described in the GHG Valuation Method) was applied to the cost of future emissions associated with waste deposited in 2010.

Leachate costs are based on the cost of clean-up to remediate the affected area and depend heavily on the quality of the landfill site. High-quality, well-managed landfill sites will have negligible leachate costs. By contrast, basic landfill sites with no liner can have very high leachate costs. A leachate scale was developed based on best case and worst case scenarios. Leachate costs were

then derived based on the quality of waste management in each country (using the percentage of waste going to a formal disposal method as a proxy for waste management quality).

Disamenity effects are principally non-market effects and hedonic pricing methods are commonly used to infer the associated external costs. Average disamenity costs were derived and adjusted for different countries at purchasing power parity.

The weighted average value according to the locations across each product value chain is €66 per tonne of waste sent to landfill (ranging from €36 to €87 depending on location – as location influences the three factors described above).

Incineration

Waste incineration has two main types of external cost – emissions to air (GHGs, air pollutants, dioxins and heavy metals) and disamenity. An environmental 'benefit' can also be obtained through energy recovery (as this avoids the use of fossil fuel derived energy).

Quantities of emissions to air were estimated by assuming that emissions are equal to the incineration emission limit values of the study country or region (using average emissions limits for those where no data was available). GHG emissions were valued based on the Social Cost of Carbon. Valuation of air pollutants (sulphur dioxide, nitrogen oxide and particulates) follows the methodology described in the Air Pollution valuation note. The cost of dioxin and heavy metal emissions was derived from the 2009 EU study "Waste Management Externalities in EU25". Where energy recovery was present, conversion factors for energy recovery from waste and national grid electricity conversion factors were used to derive the GHG emissions avoided per tonne of waste incinerated. These 'benefits' of energy recovery were subtracted from the costs of incineration.

The weighted average value according to the locations across each product value chain is €51 per tonne of waste incinerated (ranging from €35 to €63 depending on location).

Recycling and Re-use

Using the cut-off-approach, only the impacts associated with transportation and waste sorting were included for recycling and re-use. The impacts relating to these processes are GHGs and air pollution GHG emissions were valued based on the Social Cost of Carbon. Valuation of air pollutants follows the methodology described in the Air Pollution valuation note.

The impacts associated with processing recycled material into a secondary raw material are considered in the "raw materials" phase of the next product life cycle and therefore excluded from disposal impacts.

For re-use, the ultimate disposal after the second life via landfill and incineration is also considered. These impacts are valued using the approach outlined in the relevant sections above.

Composting

For composting, the impacts associated with transportation, waste sorting and composting were included. The impacts relating to these processes are GHGs and air pollution. GHG emissions were valued based on the Social Cost of Carbon. Valuation of air pollutants follows the methodology described in the Air Pollution valuation note.