

Environmental Impacts and Costs of Solid Waste: A Comparison of Landfill and Incineration

Ari Rabi

The methodology for evaluating the impacts and damage costs (“external costs”) due to pollution from waste treatment is described and results are presented, based on the ExternE project series of the European Commission. The damage costs of landfill and incineration of municipal solid waste are compared, with due account for energy and materials recovery, as well as possible differences in transport distance. We have not been able to quantify the total damage costs of leachates because of the complexity of the environmental pathways and of the long time horizon of some persistent pollutants, but we consider an extreme scenario to show that they are not worth worrying about in the sense that reducing the pollutants in leachates beyond current regulations would bring negligible benefit compared to the abatement of other sources of the same pollutants. The damage costs due to the construction of the waste treatment facility are negligible. The damage costs of waste transport, illustrated with an arbitrary choice of 100 km roundtrip by a 16 tonne truck, is also negligible. The benefits of materials recovery make a small contribution to the total damage cost. The only significant contributions come from direct emissions (of the landfill or incinerator) and from avoided emissions due to energy recovery (from an incinerator). Damage costs for incineration range from about 4 to 21 €/t. waste, extremely dependent on the assumed scenario for energy recovery. For landfill the cost ranges from about 10 to 13 €/twaste; it is dominated by greenhouse gas emissions because only a fraction of the CH₄ can be captured (here assumed to be 70%). Amenity costs (odor, visual impact, noise) are highly site-specific and we only cite results from a literature survey which indicates that such costs could make a significant contribution, on the order of one € per tonne waste.