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| Waste Management | Annualized Technical Costs | Data Source |
| Collection | $86/ton of waste | World Bank (2012) provides costs for the collection and management of waste for countries of different income groups. For management without energy recovery, we use average costs across the lower-middle and upper- middle income tiers. The cost of recycling includes the cost of separation and materials recovery. The cost of processing and manufacturing are included in the value of recyclables (discussed in benefits) and is estimated from the EPA’s documentation of paper recycling costs (EPA, 2019).  We add a fixed cost for waste recovery as the costs provide in this literature are net of energy sales. |
| Management | $10/ton – open dumping  $57/ton – managed landfill  $61/ton – composting  $86/ton – anaerobic biogas  $72/ton – recycling  $70/ton – incineration |
| Energy Recovery | $70/ton – energy recovery from waste incineration, landfills, or biogas |
| Open Dumping | $10/ton of waste | World Bank (2012) |
| Landfilling, with Methane Capture, Flaring, and Energy Generation | $57/ton of waste  $205 per m3/hour of gas collection and flaringb  $[265, **430**, 890]/kwh for energy generation, valued in the energy sectorc | World Bank (2012)  World Bank (2016)  EPA (2019) |
| Composting | $61/ton of waste | World Bank (2012) |
| Anaerobic Biogas | $86/ton of wasted |  |
| Recycling | $72/tonof wastee | EPA (2019) The cost of recycling includes the cost of separation and materials recovery. The cost of processing and manufacturing are included in the value of recyclables (discussed in benefits). The separation and materials recovery costs are estimated from the EPA’s documentation of paper recycling costs (EPA, 2019). |
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SOURCE: World Bank (2012), What a Waste: A Global Review of Solid Waste Management;

World Bank (2016), Financing Landfill Gas Projects in Developing Countries; and EPA (2019)Global Non-CO2 Greenhouse Gas Emission Projections & Marginal Abatement Cost Analysis: Methodology Documentation, EPA-430-R-19-012, September.

NOTE: Where present, ranges represent [min, nominal, max] values found in the cited literature. In the case of costs derived from Annex E in World Bank (2012), the nominal values are the middle of the range of values provided for lower middle-income countries. Otherwise, nominal values reflect the median values found in the literature.

a

b The cost of energy captured and flared is calculated from the case study of Brazil’s Santa Rosa Landfill Flaring Project described in Table 12 of World Bank (2016) using the levelized cost of (C/L + O)/U, where C is the capital costs of the project (roughly, $16.6 million), O is the annual operational and maintenance cost (roughly $288,000), U is the capacity of the project in m3/hour (7,500), and L is the operational lifetime, assumed to be 15 years. Costs are adjusted from 2014 to 2019 dollars.

C Energy generation is an additional cost, that varies depending upon the technologies used. These costs ranges are based on Table 5-67 of EPA (2019) as (C/L + O) where C is the capital costs per kWh, O is the annual operational and maintenance cost per kWh, and L is the operational lifetime. Given the significant uncertainties and variation in cost per country and over time, we intentionally omit complicating factors such as discount rates and capital depreciation. Resulting costs are adjusted from 2010 to 2020 dollars. Nominal costs are the median cost of options.

de The levelized cost of anaerobic digestion is derived from the capital and annual O&M costs per ton noted in p. 5-217 of EPA (2019) and adjusted from 2008 to 2020 dollars.