**Non-CO₂ Greenhouse Gases:** Methane

**Source/Sectors:** Wastes/Landfills

**Technology:** Anaerobic digestion (A.5.1.3)

**Description of the Technology:**
Landfills are the largest anthropogenic source of methane emissions in the United States. Key reduction options for methane emissions from landfills are reduction of the amount of organics deposited into landfills, and energetic use or flaring of landfill gas (Lucas *et al.*, 2006).

Anaerobic digestion utilizes a reactor vessel to enhance natural decomposition under anaerobic environment. The temperature, moisture content, and pH are maintained close to their optimal values. The generated methane can be used to produce heat and/or electricity (USEPA, 2004). Anaerobic digestion (includes additional cost for waste separation) is similar to the above-mentioned option, anaerobic digestion, but this option includes the cost of source separation of waste prior to disposal in the anaerobic digestion system (IEA, 2003).

**Effectiveness:** Good

**Implementability:** Fair

**Reliability:** Good

**Maturity:** Fair

**Environmental Benefits:** It reduces methane emissions.

**Cost Effectiveness:**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Lifetime (yrs)</th>
<th>MP (%)</th>
<th>RE (%)</th>
<th>TA (%)</th>
<th>Capital cost</th>
<th>Annual cost</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaerobic digestion¹</td>
<td>15</td>
<td>-</td>
<td>95</td>
<td>100</td>
<td>$400.98</td>
<td>$67.61</td>
<td>$8.74</td>
</tr>
<tr>
<td>Anaerobic digestion (with additional cost for waste separation)¹</td>
<td>15</td>
<td>-</td>
<td>95</td>
<td>100</td>
<td>$484.91</td>
<td>$125.89</td>
<td>$5.25</td>
</tr>
</tbody>
</table>

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US$/MTCO₂-Eq.

¹: IEA (2003) & USEPA (2004);

**Industry Acceptance Level:** Low

**Limitations:** Capital and O&M costs are very high.

**Sources of Information:**


