Non-CO₂ Greenhouse Gases: Methane

Source/Sectors: Natural Gas Systems (Field Production)

Technology: Installation of plunger-lift systems in gas wells (A.1.2.1.2)

Description of the Technology:
In the United States and worldwide, many efforts have been made to identify and implement mitigation options to reduce methane emissions from the natural gas sector (USEPA, 2003). For example, the Natural Gas STAR program is a voluntary partnership between US EPA and the oil and gas industry to identify and implement cost-effective technologies and measures to reduce methane emissions. The measures to reduce methane emissions from the natural gas systems can be grouped into the following mitigation strategies: prevention, recovery and re-injection, recovery and utilization, and recovery and incineration (Hendriks & de Jager, 2001).

Venting is one of the traditional remedial operations for well blockage due to fluid accumulation. A plunger lift uses the natural energy of the well itself to lift the fluids out of the well to prevent well blockage. It will help maintain the production level and reduce methane emissions resulted from venting (USEPA, 2004; IEA 2003).

Effectiveness: Good
Implementability: Good
Reliability: Good
Maturity: Good

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>Installation of plunger lift systems in gas wells¹</td>
<td>10</td>
<td>100</td>
<td>4</td>
<td>1</td>
<td>$3,986</td>
<td>$159.42</td>
<td>$8.21</td>
</tr>
</tbody>
</table>

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US$/MtCO₂-Eq.

Industry Acceptance Level: Good

Limitations: Capital and O&M costs are high.

Sources of Information:


