Non-CO$_2$ Greenhouse Gases: Methane

Source/Sectors: Natural Gas Systems (Field Production; Processing; Transmission)

Technology: Replace high-bleed pneumatic devices with compressed-air systems (A.1.2.1.5; A.1.2.3.3)

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).

Replacing of the high-bleed pneumatic devices (powered by natural gas) with compressed air systems will completely eliminate CH$_4$ emissions from these pneumatic devices in the natural gas production, processing, and distribution (USEPA, 2004; IEA, 2003). This is applicable at facilities with available electric power (Tingley & Fernandez, 2003). It should be noted that this option will incur some electricity-generation GHG emission.

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>Replace high-bleed pneumatic devices with compressed air systems$^1$</td>
<td>5</td>
<td>50</td>
<td>100</td>
<td>8</td>
<td>$6.82</td>
<td>$62.06</td>
<td>$8.21</td>
</tr>
</tbody>
</table>

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US$/MT$_{CO_2	ext{-eq}}$.

Industry Acceptance Level: Good

Limitations: Only applicable to high-bleed pneumatic devices.

Sources of Information:


