Oil and Gas Systems

Methane emissions from oil and gas systems can be the result of normal operations, routine maintenance, and system disruptions. Reducing fugitive emissions can minimize product losses, enhance energy security, lower methane emissions, and increase revenues. In 2005, global methane emissions from oil and gas systems that could be utilized were estimated at nearly 1,170 $MMTCO_2E$.

The United States has collaborated with the Methane to Markets Partnership to encourage Partner Countries to implement proven, cost-effective technologies and practices that improve operational efficiency and reduce emissions. In this reporting year, the U.S. government has spent more than $2.3 million to support the deployment of these measures. Some of the U.S. government's notable 2008 accomplishments and ongoing activities are discussed below.

USAID and EPA Continue to Assist in PEMEX Efforts to Reduce Methane Emissions

USAID and EPA are continuing their support of several project activities with Mexico's state-owned oil company, Petróleos Mexicanos (PEMEX). The overall aim is to achieve significant cost-effective reductions in methane emissions at PEMEX and implement a sustainable GHG management program. The key benefits will include increased projects, improved energy efficiency, conservation of a valuable non-renewable resource, and reduced emissions. Ongoing activities focus on identifying and developing methane emission reduction projects and building organizational resources to sustain this work. To date, PEMEX has conducted campaigns at six facilities to quantify methane emissions, identify emissions reduction opportunities, and provide on-the-job training.

Through directed inspection, maintenance, and replacement of wet seals on compressors, PEMEX has reduced on-site emissions by approximately 30,000 metric tons of CO_2 equivalent ($MTCO_2E$). PEMEX has additional compressor seal replacement projects underway, which will reduce emissions by an additional 70,000 $MTCO_2E$. Projects that could yield additional reductions of approximately 400,000 $MTCO_2E$ in four other facilities have been identified.

EPA is helping PEMEX management establish internal leadership and organization to sustain further methane emissions reduction activities. As part of this effort, PEMEX is developing a comprehensive, corporate-wide emissions inventory. The inventory will serve as the basis for determining abatement potential. Specifically, in parallel, EPA has developed a marginal abatement cost (MAC) model tailored to the specific attributes of PEMEX. The MAC model is intended to provide information and guidance to PEMEX leadership as it advances its climate change strategy and sets methane emission reduction targets.

Work Continues on Reducing Emissions From Oil and Natural Gas Assets in India

In 2008, through Natural Gas STAR International, EPA continued its partnership with India's Oil and Natural Gas Company (ONGC) to work on reducing methane emissions. ONGC provided detailed operational data on seven of its sites, and EPA performed analysis to determine four priority sites. EPA analyzed and aggregated the emissions measurement results as well as the economic features for 12 methane recovery projects at these sites. If fully implemented, these projects could save approximately 154,000 $MTCO_2E$.

Methane to Markets–ONGC Collaboration Builds Capacity for Methane Reductions

The technical collaboration between EPA and the Oil and Natural Gas Corporation of India (ONGC), administered under the Methane to Markets Partnership, is building a strong base of knowledge and capacity within ONGC to cost-effectively reduce methane emissions now and into the future. Based on methane emissions identified and quantified during collaborative measurement studies in May 2008, and a resulting directive from the Board of Directors to actively implement mitigation projects, ONGC has reduced methane by approximately 115.47 thousand cubic feet, which is approximately 46,700 $MTCO_2E$. ONGC achieved these reductions through a variety of means, including repairing pipeline leaks, changing valves and replacing valve packings, replacing rod packing seals in reciprocating compressors, and at times simply tightening bolts. Thanks to these simple maintenance activities, ONGC is reaping the benefits of saving natural gas valued at $134,116 (at local natural gas values), increasing operational efficiency, and enhancing workplace safety by reducing fire hazard.

And this is just the start. ONGC has formed an internal measurement team and is currently procuring methane emission detection and measurement equipment in order to be able to replicate measurement studies in the future. EPA and ONGC have collaborated to train this team on the use of the measurement study equipment and conducted detailed technical studies to support implementation plans for more extensive capital investment projects to reduce methane emissions in the future. These plans—scheduled for completion in late 2010—include capturing low-pressure vented and flared gas at the Heera and Neelam Offshore Platforms in order to compress the gas for sale and internal use and capturing oil storage tank emissions from ONGC's Uran Plant near Mumbai.

Identifying Methane Emission Reduction Opportunities in Russia

Russia is a significant emitter of methane from oil and gas operations because of its large oil and gas operations. As Russian natural gas production continues to grow, identifying opportunities to reduce emissions is increasingly important. Several companies in Russia, including Gazprom, have begun to monitor or mitigate methane emissions from their systems. EPA and Battelle Memorial Institute, an international science and technology enterprise that explores emerging areas of science, have launched a project to work with Russia on methane mitigation in the Russian oil and gas sector. The project focuses on three main areas:

- Exchanging technical information on approaches to reducing methane emissions in the oil and gas sector.
- Developing a network of contacts in Russia to enhance awareness of methane identification and mitigation opportunities in the natural gas sector.
- Promoting technology transfer and investigating opportunities to develop methane mitigation projects in the Russian oil and natural gas sector.

In October 2008, Gazprom, VNIIGAZ (Gazprom's research institute) and EPA, with technical support from Battelle Memorial Institute, held a technology transfer workshop on methane mitigation in the natural gas and oil sectors in Moscow. The workshop focused on exchanging detailed technical information on proven, cost-effective technologies and practices to reduce methane emissions. Participants also visited a Russian compressor station to view several state-of-the-art technologies that detect and measure methane leaks.