The Program Grows—Announcing Natural Gas STAR International!

Now in its 13th year, the Natural Gas STAR Program shows little sign of slowing. Natural Gas STAR Partner companies have realized more than 400 billion cubic feet (Bcf) in cumulative methane emission reductions. These results are being prompted by realized revenue generation as well as increased interest in the potential effects of methane on the environment. Accordingly, many partners are challenging themselves to identify and report additional methane savings by fully involving all aspects of their company operations worldwide.

Responding to this challenge and in support of partner needs, Natural Gas STAR is launching Natural Gas STAR International. Gas STAR International expands the scope of the Program internationally, allowing operators to realize Program benefits globally.

Natural Gas STAR International is part of the U.S. contribution to the Methane to Markets Partnership, an international initiative with 17 member countries that advances cost-effective, near-term methane recovery and use as a clean energy source. More information about the Methane to Markets Partnership is available online at methanetomarkets.org.

Why Join Natural Gas STAR International?

★ Gas STAR Partners have the opportunity to expand emission reduction activities and gain positive press about their global environmental efforts.

★ Join the international Program as a founding partner and attend the high profile launch ceremony on September 26, 2006, in Washington, D.C. Founding partner companies are invited to join the EPA Administrator [invited] for this momentous occasion.

Continued on page 7
Summary of Recent Methane to Markets Meeting In Mexico

For more information and to review the presentations, visit the Methane to Markets Web page at methanetomarkets.org.

**Oil and Natural Gas Subcommittee Meeting**

The semiannual Methane to Markets Oil and Natural Gas Subcommittee meeting was held in conjunction with the Technology Transfer Workshop in Villahermosa, Mexico. Each Partner country provided the subcommittee with its short, medium, and long term plans for activities related to the Methane to Markets Partnership. By sharing their plans, all Partner countries and Partner Network members are now able to leverage each member’s skills, resources, and technologies such that cost-effective emission reduction projects in the oil and gas sector can move forward more efficiently.

In addition, the subcommittee discussed the upcoming Partnership Expo in Beijing, China (Fall 2007). The primary outcome of the discussion was a consensus that it is vital for Methane to Markets to gain the participation and interest of the Chinese national oil and gas companies. As a result, subcommittee members will be working with the Chinese government to encourage involvement of the country’s oil and gas industry in the event.

**Upcoming Events**

The next Oil and Natural Gas Subcommittee Meeting will be held in Aberdeen, Scotland, in Spring 2007.
ConocoPhillips Alaska joined the Natural Gas STAR Program on May 23, 2006. The new partner is evaluating a number of methane emission reduction opportunities, including those at its liquefied natural gas (LNG) operations at the Kenai Liquefaction Plant. In addition to the Kenai plant, the company also operates the Greater Kuparuk Area, the Alpine oil fields, the North Cook Inlet platform, and the Beluga River Unit gas field, and has identified potential opportunities at many of these areas.

Producing LNG at Kenai

On June 8, 1969, Phillips Petroleum Company and Marathon Oil Company collaborated to produce the first and only LNG in Alaska. That fall, the first tanker loaded with LNG left the Kenai plant and, after a nine-day voyage, discharged its cargo in Yokohama, Japan, marking the first commercial LNG export from the Western hemisphere. Since 1969, ConocoPhillips Alaska, Inc. has operated the Kenai plant continuously, 24 hours a day. The facility is scheduled to continue service through at least 2009.

The Kenai LNG project originally stemmed from Marathon’s discovery of the Kenai gas field in 1959, and Phillips’ (and partner companies’) discovery of the North Cook Inlet gas field in 1962. At the same time, Tokyo Gas Company Ltd. and the Tokyo Electric Power Company Inc. recognized the value of LNG to help reduce Japan’s air pollution problems, diversify their fuel base, and provide much-needed energy (together, these utilities consume all of the LNG exported from Kenai). What followed was the largest joint project in both Phillips’ and Marathon’s history. The endeavor called for construction of a liquefaction plant, two LNG tankers, pipelines, and a receiving and regasification facility in Japan. The activities resulted in a comprehensive system that produced 68.3 trillion British Thermal Units (Btus) annually in the mid-1990s—enough energy to provide heat and power to the greater Tokyo region for 11 days.

Potential Methane Emission Reduction Opportunities in Alaska

- Reducing venting during planned facility shut downs.
- Installing automated monitoring of the flare pilot.
- Utilizing infrared optical imaging.
- Increasing vapor recovery.
- More extensive utilization of dry gas seals.

At the Kenai facility, raw gas is received as more than 99 percent pure methane and is processed to remove the remaining water, carbon dioxide, and other impurities. Next, the purified gas enters three chilling cycles, which use cooling agents, including propane, ethylene, and methane. Each cycle further reduces the temperature until the gas liquefies. Once cooled, the liquid is subjected to a reduced pressure, which produces LNG at approximately atmospheric pressure. The LNG is then transferred to three 225,000-barrel storage tanks, where a small amount boils off, or evaporates, cooling the tank and helping to keep the remaining LNG in its liquid state. ConocoPhillips Alaska maintains a system to capture the boiled-off gas and uses it as fuel for the plant’s refrigeration compressors.

Overall, the market for LNG is growing: according to the Department of Energy,
LNG now accounts for 6 percent of the world’s natural gas consumption (eia.doe.gov/oiaf/analysispaper/global/intrade.html). Since LNG occupies only a fraction (1/600) of the volume of natural gas, it is more economical to transport and can be stored in larger quantities. Thus, for companies with scarce land resources but extensive energy needs, LNG represents a valuable and necessary commodity. As the industry continues to expand, economic production practices and environmental controls will be all the more important. Therefore, ConocoPhillips Alaska has identified some areas in the production process where potential methane emissions can be reduced.

Improving Environmental Performance in LNG Operations

When the Kenai facility was constructed in 1969, it was considered to have state-of-the-art environmental controls. In recent years, awareness regarding the global warming potential of methane has increased. Through the Natural Gas STAR program scoping process, the Core Team realized it would be valuable knowledge sharing to use the facility to demonstrate future emission reduction opportunities for modern day installations. Toward this end, the company hosted a Technology Transfer workshop on May 25, 2006, with two goals in mind: showcasing potential methane emissions reductions opportunities at LNG facilities and increasing awareness of the Gas STAR Program throughout Alaska. During the workshop, the Kenai LNG facility served as a real-life demonstration location for infrared optical imaging. Although ConocoPhillips Alaska uses forward looking infrared radar (FLIR) mounted

Continued on page 6
EPA would like to welcome three new partners and three new endorsers to the Gas STAR Program.

**Partners**

**Targa Resources, Inc.**

Targa is an independent midstream company formed in 2003, to pursue gas gathering, processing, and pipeline asset acquisition opportunities. Targa recently purchased Gas STAR Partner, Dynegy Midstream Services, which includes natural gas gathering and processing, natural gas liquids (NGL) fractionation, terminalling, storage, transportation, distribution, and marketing assets. Since the acquisition, Targa now has operations in West Texas, North Texas, Southeast New Mexico, Southwest Louisiana, and on the Texas-Louisiana Gulf Coast. The company operates more than 9,500 miles of pipeline with more than 15 operating plants and various other facilities. For more information, please visit the company’s Web site at tar-garesources.com.

**CDX Gas**

CDX is an on-shore natural gas exploration and production company, focused primarily on unconventional resources, such as coal, shale and tight sands. CDX, formed in 1991, and its affiliated companies operate in numerous states, Alberta, Canada, and in several international countries. CDX and its affiliate companies employ approximately 450 people in offices throughout the United States and Canada. For further information on the company, please visit cdxgas.com.

**Southern Union Gas Company**

Southern Union Company is one of the nation’s leading diversified natural gas companies, focusing on the transportation, storage, gathering, processing, and distribution of natural gas. The company owns and operates the nation’s second largest natural gas pipeline system—more than 22,000 miles. Through Panhandle Energy, Southern Union’s interstate pipeline interests operate in the San Juan, Anadarko, and Permian Basins, the Rockies, the Gulf of Mexico, Mobile Bay, South Texas and the Panhandle regions of Texas and Oklahoma to major markets in the Southeast, West, Midwest and Great Lakes region. Through Southern Union Gas Services, the company is engaged in the gathering, transmission, treating, processing, and redelivery of natural gas and natural gas liquids in Texas and New Mexico. Through its local distribution companies, Missouri Gas Energy, PG Energy, and New England Gas Company, Southern Union also serves approximately 1 million natural gas end-user customers in Missouri, Pennsylvania, Rhode Island, and Massachusetts. For further information, visit www.sug.com.

**Endorsers**

**Air and Waste Management Association (A&WMA)**

A&WMA is a nonprofit, nonpartisan professional organization that enhances knowledge and expertise by providing a neutral forum for technology exchange, professional development, networking opportunities, public education, and outreach to more than 9,000 environmental professionals in 65 countries. A&WMA also promotes global environmental responsibility and increases the effectiveness of organizations to make critical decisions that benefit society. For more information, visit the association’s Web site at awma.org.

**The Independent Petroleum Association of America (IPAA)**

IPAA is a national trade association representing thousands of independent crude oil and natural gas explorers and producers in the United States. It also operates in close cooperation with more than 40 unaffiliated independent national, state, and regional associations, which together represent thousands of royalty owners and the companies that provide services and supplies to the domestic industry. For further information, visit the IPAA’s Web site at ipaa.org.

**Northeast Gas Association (NGA)**

NGA was formed in 2003 as a regional trade association that focuses on education and training, technology research and development, operations, planning, and increasing public awareness of natural gas in the Northeast U.S. The association represents natural gas transmission and distribution companies, liquefied natural gas importers, and associate member companies. These companies provide natural gas to 8.6 million customers in eight states (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont). For more information, visit the association’s Web site at northeastgas.org.
on airplanes to survey liquid transmission pipelines for spill detection purposes on the North Slope, the demonstration represented the first time this technology was used at the facility for methane detection. (See the Spring 2006 Partner Update for more information on this technology.)

Two methane emission reduction opportunities that have been identified and implemented at the LNG plant include reducing venting during planned facility shut downs, and installing automated monitoring of the flare pilot. One strategy for reducing venting during planned shut downs is utilizing gas generated from pipeline depressurization in the facility defrost process. This affords a process benefit and ultimately results in the gas being flared rather than vented. With regard to the flare pilot, it has been automated to ensure an alarm sounds when the flame is extinguished, which helps minimize the duration of venting from the flare tip. Prior to installing the alarm, venting would continue until operations personnel visually identified the problem.

Greenhouse gas and specific methane emission reduction opportunities for future installations might also focus on strategies such as turbine efficiency, vapor recovery, and more extensive utilization of dry gas seals.

**Incorporating Gas STAR Into Alaska Operations**

In mid-2005, ConocoPhillips Alaska assembled a core team of professionals consisting of subject matter experts from all business functions. The team’s goal was to evaluate the coupling of the Gas STAR Program with the company’s operational objectives, and determined that the Alaska operations as a whole were positioned to make a meaningful contribution to the program.

Leading up to this decision, team members from each discipline and operating asset carefully considered the list of production Best Management Practices (BMPs) and Partner Reported Opportunities (PROs) and conducted a three-part gap analysis. The intent was to determine which methane emission reduction practices (or equivalents) were already in place, identify best practices that ConocoPhillips Alaska could share with other partners, and identify areas for implementation of the BMPs and PROs. The findings of this evaluation were very useful and, not surprisingly, the company learned that many of the suggested practices were already in place. For instance, Alaska operations tend to be conducted within closed modules for weather protection, so safety concerns are a key driver in controlling fugitive losses. However, the team also identified opportunities that warrant further evaluation, such as voluntary tank vapor recovery, increased use of low emission flow backs, and use of low emission rod and pump packing. During the first year of Gas STAR participation, the core team will focus on a detailed economic and engineering evaluation of the potential opportunities and select specific opportunities to incorporate throughout the next several years.

Overall, the team realized that many of Gas STAR’s recommended opportunities offer win-win benefits, whether in terms of emission reductions, safety, product recovery, or eliminating nuisances (such as odors). ConocoPhillips Alaska is now looking to the future and planning to capitalize on these opportunities and expand its participation in the Program that is in-line with the company’s progressive approach to health, safety, and environmental performance.
An international discussion at a recent Methane to Markets event.

Although Methane to Markets has 17 Partner countries, all companies with oil and gas operations are welcome to join Gas STAR International—regardless of location. Discussions at previous Methane to Markets events have helped to shape the direction for Natural Gas STAR International. Different world regions have different market outlets and incentives for recovered methane and in some cases different methane sources to capture. Natural Gas STAR International aims to apply the successful U.S. concept of economical methane emission reduction to these differing market conditions.

In many instances, projects proven profitable by domestic Gas STAR partners are even more attractive to implement in other markets where demand might be higher and associated implementation or operating costs lower.

**Groundwork for Gas STAR International**

Natural Gas STAR has been reaching out to stakeholders around the world for a number of years, beginning by sending representatives to the 2nd and 3rd International Methane Mitigation Conferences in Novosibirsk, Russia, and Beijing, China, to discuss cost-effective applications for saving methane. More recently, the Program has been inviting methane emission mitigation experts from outside the United States to speak at domestic Technology Transfer Workshops. The Program also translated the majority of Gas STAR technical documents into Spanish and Russian, which can be found online at epa.gov/gasstar. Natural Gas STAR has also been propagating the message that methane mitigation can be a profitable investment opportunity through workshops and meetings organized by the Methane to Markets Partnership.

**Current Activities for Gas STAR International**

As a result of these efforts, the Natural Gas STAR Program created a new Memorandum of Understanding allowing international operators to participate. This has established new ties with international stakeholders, and has prompted the Program to develop strategies for implementing projects outside the United States. Natural Gas STAR welcomes feedback from...
Employees of TransCanada work to update a natural gas line.

international operators and environmental personnel about the Gas STAR International reporting process, technology transfer, and other resources. Natural Gas STAR is reaching out to partner companies with operations outside the United States for partnership participation. Those partners’ current Implementation Managers are in a unique position to shape the future of Natural Gas STAR International by providing insight and suggestions based on their own companies’ international investments. Comments on structuring the international Program or requests for international partnership enrollment can be directed to the Gas STAR Program Managers.

**Outlook for Gas STAR International**

The Natural Gas STAR International Program commencement will officially take place on September 26, 2006, in Washington, D.C. A charter international partner signing ceremony in conjunction with an International Petroleum Industry Environmental Conservation Association (IPIECA)/Methane to Markets Technology Transfer Workshop will be held at the Key Bridge Marriott Hotel.

The international Program is one way in which many U.S. partners can maintain or increase their current level of methane emissions savings. Natural Gas STAR will begin accepting annual emissions reductions reports from international partners in 2007. Partners may report historical savings if desired. Additionally, Natural Gas STAR International will continue to support other Methane to Markets workshops in the future and focus on the core tasks of identifying and supporting specific methane emission reduction projects with measurable methane savings.

Please contact Gas STAR Program Managers, Carey Bylin or Roger Fernandez for more information on Natural Gas STAR International.
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For additional information on topics in this Update, please contact Roger Fernandez.

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**Calendar**

**13TH ANNUAL NATURAL GAS STAR IMPLEMENTATION WORKSHOP**

October 23-25, 2006  
InterContinental Houston  
Houston, Texas

This workshop will provide Gas STAR partners and other interested parties with an opportunity to obtain information about the most current and cost-effective methane emissions reduction technologies and practices and exchange ideas with more than 150 other Natural Gas STAR partners. This year’s meeting will focus on More Methane to Markets in an Era of High Gas Prices. Included will be concurrent sessions focusing on all areas of the natural gas industry: production, processing, transmission, and distribution.

Information and online registration information is available at [epa.gov/gasstar/workshops](http://epa.gov/gasstar/workshops).

**2006 TECHNOLOGY TRANSFER WORKSHOPS**

- **Producers Technology Transfer Workshop**  
  June 6, 2006  
Petroleum Club of Fort Worth  
Ft. Worth, Texas  

- **Producers Technology Transfer Workshop and Field Visit**  
  June 8-9, 2006  
Occidental Petroleum Corporation Offices  
Midland, Texas  

- **Processors Technology Transfer Workshop**  
  July 27, 2006  
Holiday Inn Express  
Hobbs, New Mexico  
Co-sponsored by EPA, Targa Resources, the Gas Processors Association, and New Mexico Oil and Gas Association.

**METHANE TO MARKETS WORKSHOPS**

- **Natural Gas as a Climate Change Solution: Breaking Down the Barriers to Methane’s Expanding Role**  
  September 26, 2006  
Key Bridge Marriott Hotel  
Washington, D.C.  
Co-sponsored by IDECA and Methane to Markets. Further information and registration will be available online at [methanetomarkets.org](http://methanetomarkets.org).

**MISCELLANEOUS EVENTS**

- **International Gas Union (IGU) World Gas Conference**  
  June 5-9, 2006  
Amsterdam, The Netherlands  
More information is available online at [wgc2006.nl](http://wgc2006.nl).