

EPA Natural Gas STAR Program Accomplishments

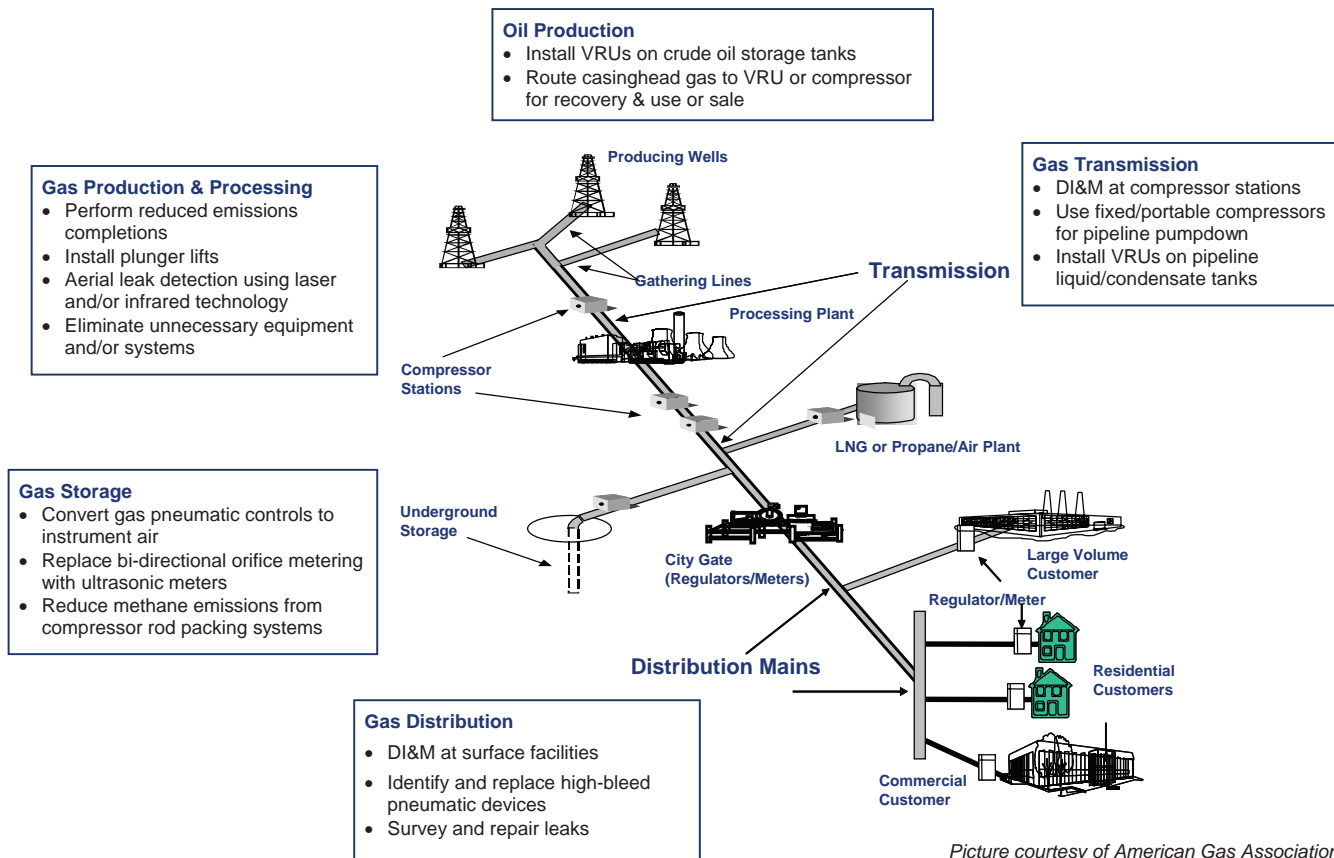
Introduction

Established in 1993, the Natural Gas STAR Program is a flexible, voluntary partnership that encourages oil and natural gas companies—both in the United States and internationally—to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce methane emissions. Given that methane is the primary component of natural gas and is a potent greenhouse gas—23 times more powerful than carbon dioxide (CO₂) in trapping heat in the atmosphere over a 100-year period—reducing methane emissions can result in environmental, economic, and operational benefits.

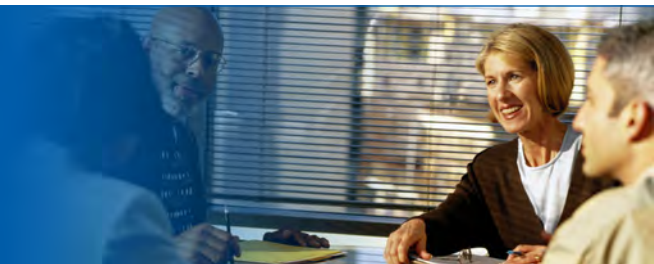


Natural Gas STAR partners have operations in all of the major industry sectors (production, gathering and processing, transmission, and distribution) that deliver natural gas to end users. Program partners represent 61 percent of the natural gas industry in the United States. Also, with the launch of Natural Gas STAR International in 2006, the Program expanded to include companies worldwide, significantly increasing opportunities to reduce methane emissions from oil and natural gas operations. Today, the Program has more than 130 partner companies—12 of which are international partners—and is endorsed by 20 major industry trade associations.

This document highlights the methane emissions reductions Natural Gas STAR partners have achieved to date under this important voluntary partnership program. It also highlights the variety of technologies and practices implemented by partners to reduce methane emissions. The following diagram shows some of the top methane emission reduction opportunities for each sector.



Picture courtesy of American Gas Association.



2009: Continuing Excellence

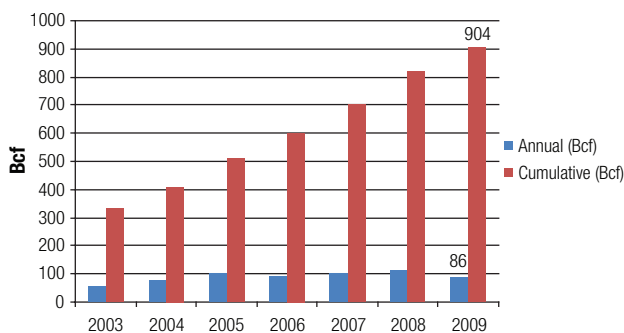
The Natural Gas STAR Program continues to achieve success through its partnerships with the oil and natural gas industry and trade associations representing the industry. Since 1993, the Program's domestic partners have eliminated more than 904 billion cubic feet (Bcf) of methane emissions through the implementation of approximately 150 cost-effective technologies and practices.

For calendar year 2009, nearly 85 percent of partners that were required to report submitted an annual report detailing their efforts to reduce methane emissions from their operations. Also for 2009, Natural Gas STAR partners reported domestic emissions reductions of 86 Bcf. These methane emissions reductions, voluntarily undertaken by Natural Gas STAR partner companies, have cross-cutting benefits on domestic energy supply, industrial efficiency, revenue generation, and greenhouse gas emissions reductions. In the 2009 reports, partners reported methane emission reductions resulting from the implementation of 82 technologies and practices, including one new activity.

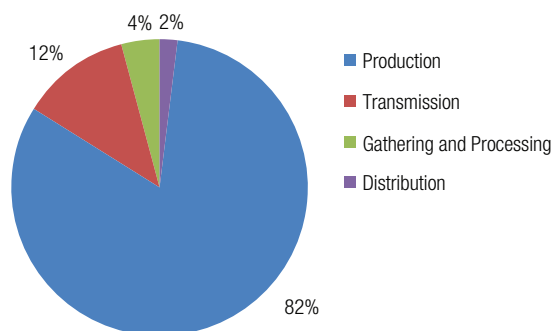
The reported 2009 voluntary domestic emissions reductions are equivalent to:

- The additional revenue of nearly \$344 million in natural gas sales (assumes an average natural gas price of \$4.00 per thousand cubic feet).
- The avoidance of 34.8 million tonnes CO₂ equivalent.
- The carbon sequestered annually by 7.4 million acres of pine or fir forests.

Domestic Natural Gas STAR Methane Emissions Reductions as of 2009



2009 Methane Emissions Reductions by Sector (86 Bcf)



Technology Transfer Activities

Natural Gas STAR methane emission reduction technologies and practices have become widely implemented by partners as a result of technology transfer and sharing partner experiences across the industry. This is achieved through Natural Gas STAR's comprehensive suite of technical documents, technology articles in the *Partner Update*, and partner sponsored Technology Transfer Workshops as well as the Annual Implementation Workshop.

In 2010, Natural Gas STAR held two domestic production sector Technology Transfer Workshops in Vernal, Utah, and Farmington, New Mexico. EPA also held international Technology Transfer Workshops in Turkmenistan and through its affiliate voluntary Program, the Methane to Markets Partnership in New Delhi, India.

Co-sponsored by industry partners, endorsers and/or other relevant organizations, these workshops provide an opportunity for participants to engage in a peer-based exchange of technical and economic information related to cost-effective methane emission reduction technologies and practices and other best practices. More information on these technology transfer workshops can be found on the Natural Gas STAR website at epa.gov/gasstar/workshops/index.html.





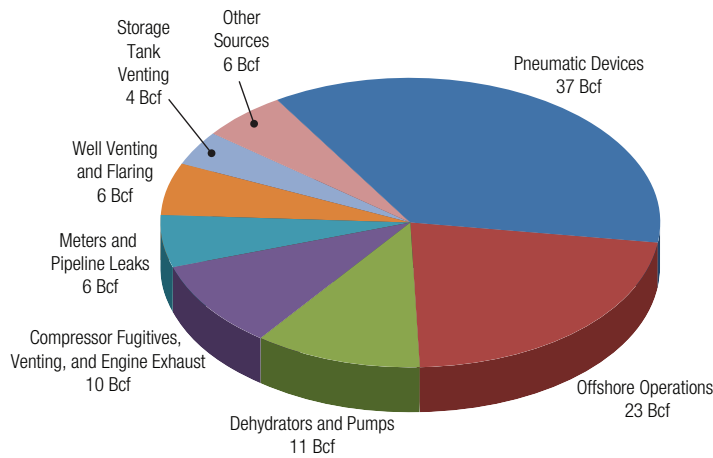
Domestic Emissions Reductions by Sector

The following section illustrates the major sources of methane emissions from each industry sector and the technologies and practices implemented by partners to reduce methane emissions. The information showing the breakdown of emissions sources was taken from the EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008, dated April 2010, and the information showing Natural Gas STAR partner activities was taken from partner reports and Natural Gas STAR historical data.

Production Sector Accomplishments

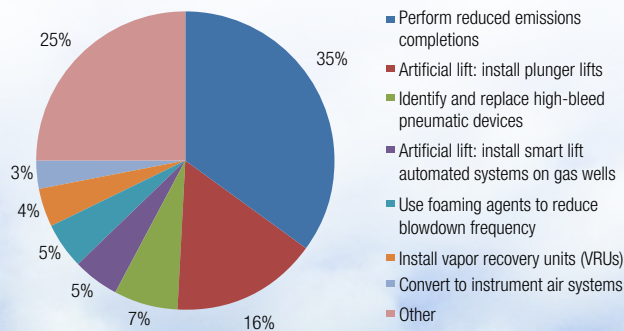
2008 Production Sector Methane Emissions (103 Bcf)

EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2008, April 2010. Available on the web at: epa.gov/climatechange/emissions/usinventoryreport.html.

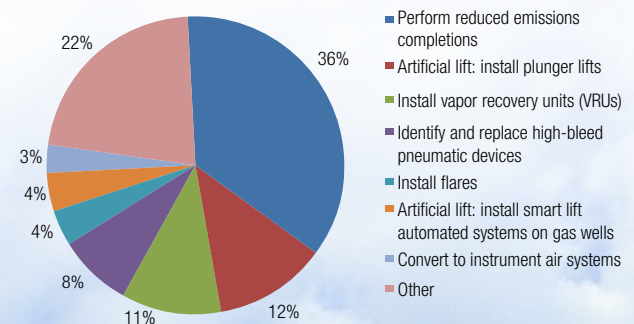


Production partners reported 70 Bcf of methane emissions reductions in 2009—and a total of 608.6 Bcf since 1990. The technologies and practices employed by production sector partners include:

Top Technologies in 2009
Total Sector Reductions in 2009 = 70 Bcf



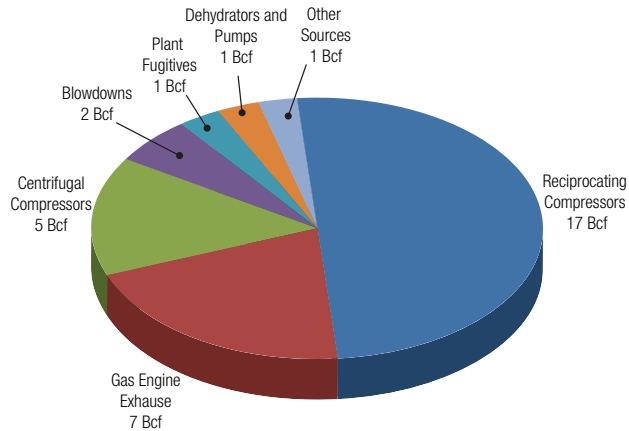
Top Technologies Since 1990
Cumulative Sector Reductions = 608.6 Bcf





Gathering and Processing Sector Accomplishments

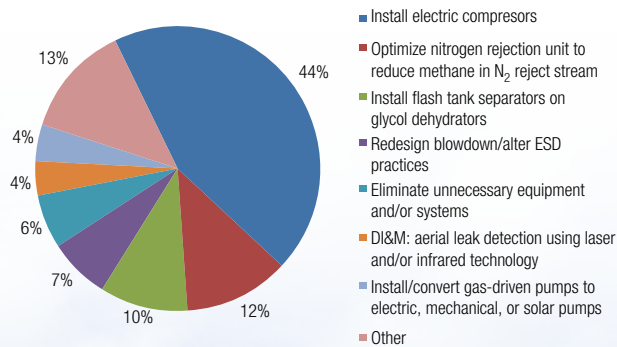
2008 Gathering and Processing Sector Methane Emissions (34 Bcf)



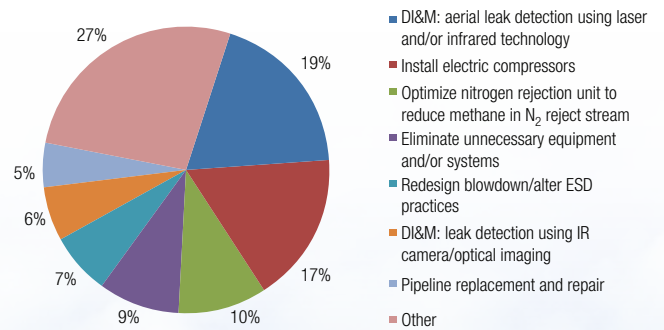
EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2008, April 2010. Available on the web at: epa.gov/climatechange/emissions/usinventoryreport.html.

Gathering and processing partners reported 3.7 Bcf of methane emissions reductions in 2009—and a total of 46.5 Bcf since 1990. The technologies and practices employed by gathering and processing sector partners include:

Top Technologies in 2009
Total Sector Reductions in 2009 = 3.7 Bcf



Top Technologies Since 1990
Cumulative Sector Reductions = 46.5 Bcf

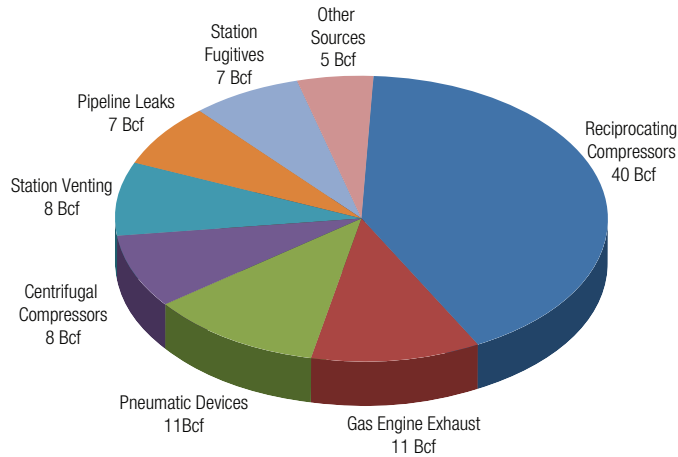




Transmission Sector Accomplishments

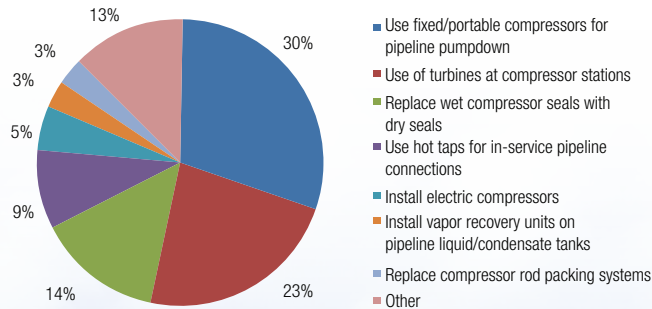
2008 Transmission Sector Methane Emissions (97 Bcf)

EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2008, April 2010. Available on the web at: epa.gov/climatechange/emissions/usinventoryreport.html.

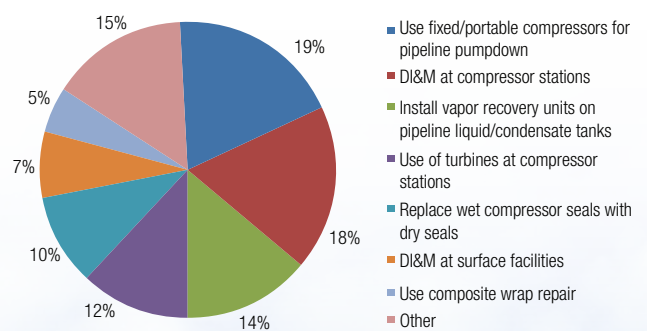


Transmission partners reported 10.7 Bcf of methane emissions reductions in 2009—and a total of 219.3 Bcf since 1993. The technologies and practices employed by transmission sector partners include:

Top Technologies in 2009
Total Sector Reductions in 2009 = 10.7 Bcf



Top Technologies Since 1993
Cumulative Sector Reductions = 219.3 Bcf

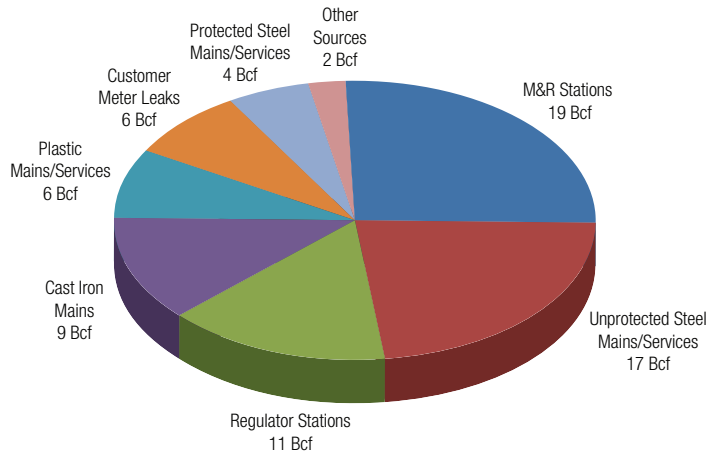




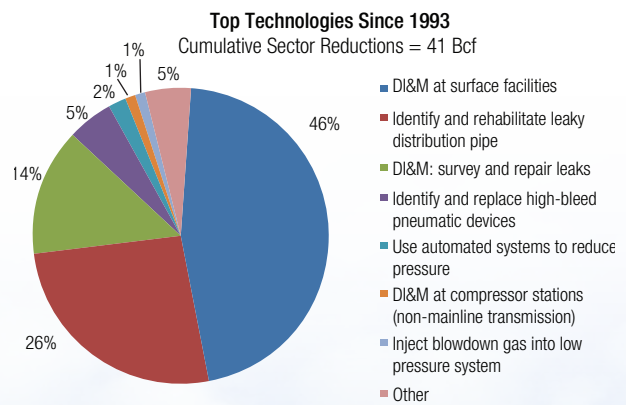
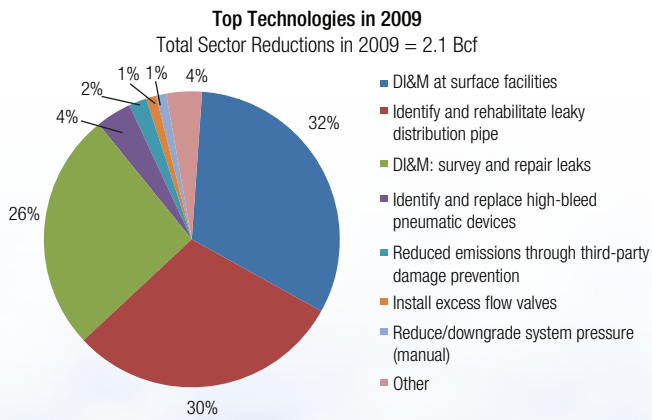
Distribution Sector Accomplishments

2008 Distribution Sector Methane Emissions (74 Bcf)

EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2008, April 2010. Available on the web at: epa.gov/climatechange/emissions/usinventoryreport.html.



Distribution partners reported 2.1 Bcf of methane emissions reductions in 2009—and a total of 41 Bcf since 1993. The technologies and practices employed by distribution sector partners include:





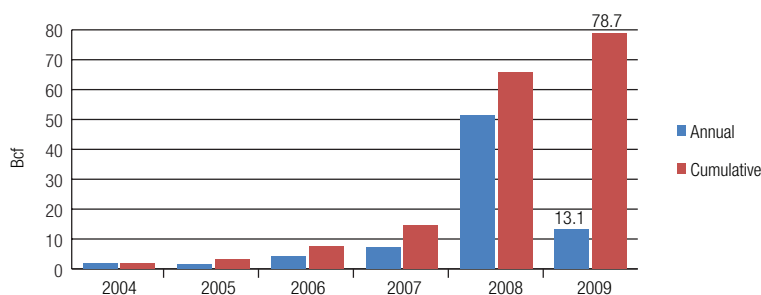
Natural Gas STAR International

In addition to the successes reported under the domestic Program, international progress is also being made in reducing methane emissions through Natural Gas STAR International. The Natural Gas STAR International Program requirements mirror that of the domestic Natural Gas STAR Program, and membership is open to all oil and natural gas companies worldwide. In 2009, four partners joined the Natural Gas STAR International Program. Existing partners reported 13.1 Bcf in methane emissions reductions for a total of 78.7 Bcf since inception of the Natural Gas STAR International Program. Partners reported methane emission reduction activities in Argentina, Brazil, Canada, Equatorial Guinea, India, and Nigeria. In the 2009 annual reports, international partners reported methane emissions reductions resulting from the implementation of 27 technologies and practices, including one new activity.

The reported 2009 voluntary international methane emissions reductions are equivalent to:

- The additional revenue of more than \$52 million in natural gas sales (assumes an average natural gas price of \$4.00 per thousand cubic feet).
- The avoidance of 5.3 million tons CO₂ equivalent.
- The carbon sequestered annually by 1.1 million acres of pine or fir forests.

Natural Gas STAR International Methane Emissions Reductions as of 2009



New Tools and Resources

New format for the Partner Update (epa.gov/gasstar/newsroom/index.html)

The *Partner Update* has a new format. It still has the same level of technical and programmatic detail as the previous format but now has a newer look and better reader navigation.

New PROs reported by partners

Partners continued to report new PROs in their 2009 annual reports. One such PRO—Slipstream Vent Capture System—was highlighted at a recent Methane to Markets Technology Transfer Workshop. (www.methanetomarkets.org/documents/events_oilgas_20090914_slobodnik.pdf)

In the coming year, the Program will be updating select PRO Fact Sheets and Lessons Learned Studies.

