Natural Gas STAR Recommended Technologies and Practices—Transmission Sector

Natural Gas STAR is a voluntary partnership program between the U.S. Environmental Protection Agency (EPA) and the oil and natural gas industry to cost-effectively reduce methane emissions from oil and natural gas operations both domestically and abroad. Partners implement a variety of voluntary cost-effective technologies and practices to reduce methane emissions each year. By reporting these activities in their Natural Gas STAR annual reports, partners share valuable technical information with EPA and other partners who may benefit from the voluntary implementation of similar technologies and practices.

Transmission Accomplishments

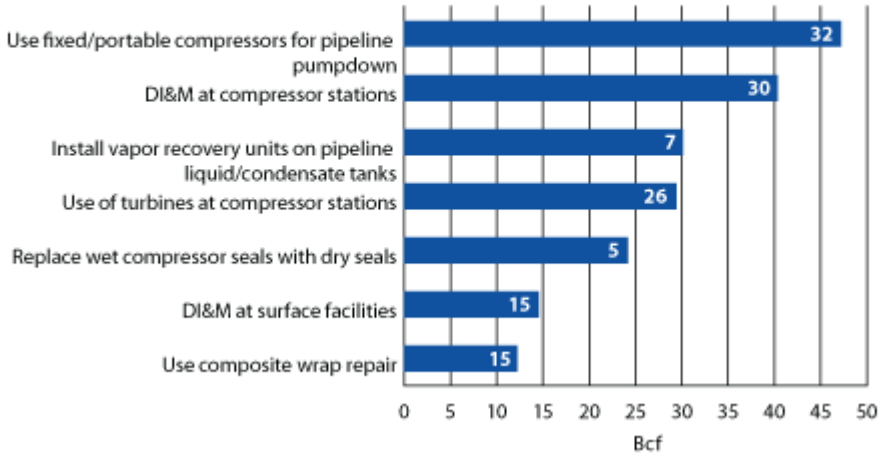
Since 1993, transmission sector partners have achieved 232.85 billion cubic feet (Bcf) of methane emissions reductions, or 94.2 million tonnes of carbon dioxide equivalent.

The bar chart below shows the top seven technologies/practices with the largest emissions reductions reported by domestic transmission sector partners since the beginning of the Natural Gas STAR Program. Natural Gas STAR encourages partners to consider additional ways to reduce gas losses, such as these technologies and practices, to ultimately save money and protect the environment.

Already implementing these technologies and practices?
Partners performing any of these activities are encouraged to tell EPA about it by including this information in their annual reports.

Interested in trying new technologies and practices?
Detailed descriptions of the technologies/practices presented in the bar chart below can be found on the following page, in addition to information about technical tools and resources available to partners.

Technologies/Practices with the Largest Reported Methane Emissions Reductions (Transmission Sector)*



*Note: The numbers noted on each bar indicate the number of transmission sector partners that have reported these activities since 1993.

Technologies/Practices with the Largest Reported Methane Emissions Reductions (Transmission Sector)

Directed Inspection and Maintenance (DI&M) at Compressor Stations

Transmission pipeline compressor stations are one of the largest sources of fugitive emissions from leaking compressors and other equipment components such as valves, flanges, connections, and open-ended lines. Implementing a directed inspection and maintenance (DI&M) program is a proven, cost-effective way to detect, measure, prioritize, and repair equipment leaks to reduce methane emissions. **For more information, see "Directed Inspection and Maintenance at Compressor Stations"** at epa.gov/gasstar/documents/ll_dimcompstat.pdf.

Use Fixed/Portable Compressors for Pipeline Pumpdown

Operators of transmission pipelines routinely reduce line pressure and vent gas from pipeline sections to the atmosphere to ensure safe working conditions during maintenance and repair. Using pipeline pumpdown techniques to lower gas line pressure with inline compressors either alone or in sequence with portable compressors is an effective way to reduce emissions and yield significant economic savings. **For more information, see "Using Pipeline Pump-down Techniques to Lower Gas Line Pressure Before Maintenance"** at epa.gov/gasstar/documents/ll_pipeline.pdf.

Install Vapor Recovery Units (VRUs) on Pipeline Liquid/Condensate Tanks

Transmission partners are finding increasing use for vapor recovery units (VRUs) in their operations by installing these units on tanks, vents, and other equipment in which natural gas vapors collect and are traditionally vented. Vapors captured by VRUs can be reinjected into pipelines for sale or onsite use. **For more information, see "Installing Vapor Recovery Units on Crude Oil Storage Tanks"** at epa.gov/gasstar/documents/ll_final_vap.pdf.

Use of Turbines at Compressor Stations

Many compressor stations use reciprocating engines to drive gas compressors that emit unburned methane in their exhaust. Using natural gas driven turbines in place of reciprocating engines reduces these methane emissions. **For more information, see "Recommended Technologies and Practices"** at epa.gov/gasstar/tools/recommended.html.

Replace Wet Compressor Seals with Dry Seals

Centrifugal compressors use high-pressure oil seals on the rotating shafts to prevent the high-pressure natural gas from escaping the compressor casing. Partners have found that replacing these "wet" (oil) seals with dry seals, which use high-pressure gas to seal the compressor, significantly reduces operating costs and methane emissions. **For more information, see "Replacing Wet Seals with Dry Seals in Centrifugal Compressors"** at epa.gov/gasstar/documents/ll_wetseals.pdf.

DI&M at Surface Facilities

Fugitive emissions from leaking meters and regulating equipment at gate stations and surface facilities are a significant source of methane emissions. Implementing a DI&M program is a proven, cost-effective way to detect, measure, prioritize, and repair equipment leaks to reduce methane emissions. **For more information, see "Directed Inspection and Maintenance at Gate Stations and Surface Facilities"** at epa.gov/gasstar/documents/ll_dimgatestat.pdf.

Use Composite Wrap Repair

Gas transmission pipelines often have non-leaking defects such as pits, dents, gouges, and external corrosion. Composite wrap repair reduces methane emissions and is a less expensive repair approach than traditional repair methods (such as pipeline replacement or installation of full encirclement steel split sleeves) because it eliminates the need to shutdown a pipeline and vent gas in order to repair the pipeline. **For more information, see "Composite Wrap for Non-Leaking Pipeline Defects"** at epa.gov/gasstar/documents/ll_compwrap.pdf.

Technical Tools and Resources

Technical Documents for Natural Gas STAR recommended technologies and practices can be found at epa.gov/gasstar/tools/recommended.html.

Service Provider Directory includes information on service and technology providers that can facilitate methane emission reduction activities. The directory can be found at epa.gov/gasstar/tools/service-provider-directory.html.

EPA Program Managers and STAR Service Representatives are available to assist in reviewing technologies and practices and for all other program-related questions at epa.gov/gasstar/partners/service-reps.html.

For more information on the Natural Gas STAR Program, visit epa.gov/gasstar.