



Natural Gas STAR Recommended Technologies and Practices— Production 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.

Production Accomplishments

Since 1990, production sector partners have achieved 684.7 billion cubic feet (Bcf) of methane emissions reductions, or 277 million tonnes of carbon dioxide equivalent.

The bar chart below shows the top seven technologies/practices with the largest emissions reductions reported by domestic production 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.

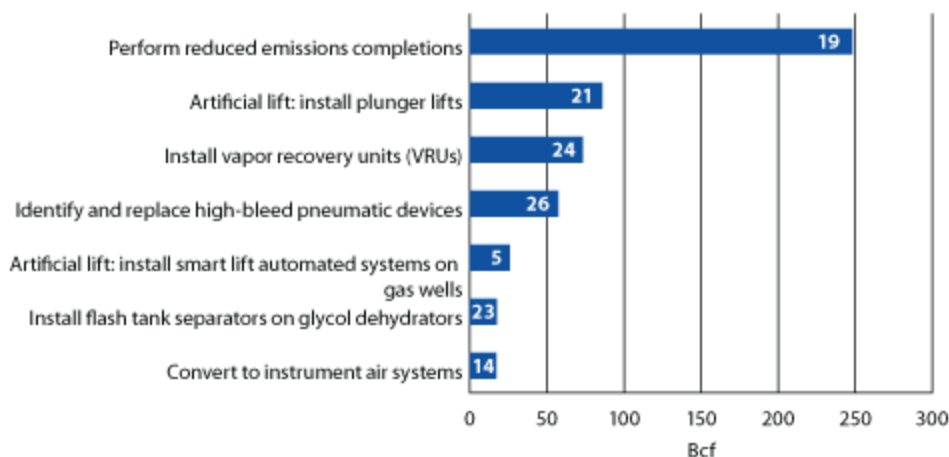
Already implementing these technologies and practices?

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 (Production Sector)*



*Note: The numbers noted on each bar indicate the number of production sector partners that have reported these activities since 1990.



[Technologies/Practices with the Largest Reported Methane Emissions Reductions \(Production Sector\)](#)

Perform Reduced Emissions Completions

A final step in developing gas wells before producing the natural gas to a sales line is to “clean-up” the well-bore and reservoir immediately surrounding the well. When wells are hydraulically fractured, part of this process involves producing the well to an open pit and venting or flaring the produced natural gas. Using a reduced emissions completion method reduces emissions and is a safer operating practice. **For more information, see “Green Completions”** at epa.gov/gasstar/documents/greencompletions.pdf.

Install Vapor Recovery Units (VRUs)

When crude oil is stored in tanks, light hydrocarbons, including methane, “flash out” and are typically vented to the atmosphere. Vapor recovery units installed on crude oil storage tanks capture nearly 95 percent of this methane and other light hydrocarbon vapors. **For more information, see “Installing Vapor Recovery Units on Crude Oil Storage Tanks”** at epa.gov/gasstar/documents/ll_final_vap.pdf.

Artificial Lift: Install Plunger Lifts

As gas wells mature, the accumulation of fluids can slow or even halt gas production. Traditional fluid removal operations can result in substantial methane emissions. Installing plunger lift systems is a cost-effective alternative to beam pumps and blowing down the well for removing fluids in mature wells and significantly reducing methane emissions. **For more information, see “Installing Plunger Lift Systems in Gas Wells”** at epa.gov/gasstar/documents/ll_plungerlift.pdf.

Identify and Replace High-Bleed Pneumatic Devices

Emissions from natural gas powered pneumatic control devices are one of the largest sources of methane emissions in the natural gas industry. Replacing high-bleed devices with low-bleed devices, retrofitting high-bleed devices, and improving maintenance practices are proven approaches to profitably reducing methane emissions. **For more information, see “Options for Reducing Methane Emissions from Pneumatic Devices in the Natural Gas Industry”** at epa.gov/gasstar/documents/ll_pneumatics.pdf.

Artificial Lift: Install Smart Lift Automated Systems on Gas Wells

Many partners use plunger lifts to remove fluids from mature wells. Some partners have optimized plunger lift and blowdown operations by installing “smart” automation systems that use remote telemetry units coupled with special software to improve well and venting performance. **For more information, see “Gas Well ‘Smart’ Automation System”** at epa.gov/gasstar/documents/smart_automation.pdf.

Convert to Instrument Air Systems

Pneumatic instrument systems powered by high-pressure natural gas are often used across the natural gas and petroleum industries for process control including pressure, temperature, liquid level, and flow rate regulation. The constant bleed of natural gas from these controllers is collectively one of the largest sources of methane emissions in the natural gas industry. Converting natural gas-powered pneumatic control systems to compressed instrument air systems can achieve significant cost savings and methane emission reductions. Instrument air systems substitute compressed air for the pressurized natural gas. **For more information, see “Convert Gas Pneumatic Controls to Instrument Air”** at epa.gov/gasstar/documents/ll_instrument_air.pdf.

Install Flash Tank Separators on Glycol Dehydrators

When using glycol dehydrators to remove water from natural gas, the dehydrator absorbent fluid also absorbs methane and other volatile compounds. These compounds are frequently vented to the atmosphere when the fluid is regenerated. Flash tank separators installed on dehydrators can capture approximately 90 percent of the entrained methane and a significant portion of other the compounds. **For more information, see “Optimize Glycol Circulation and Install Flash Tank Separators in Glycol Dehydrators”** at epa.gov/gasstar/documents/ll_flashtanks3.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.