



Table of Sunset Dates/ Technologies and Practices by Industry Sector

Methane Emission Reduction Technologies & Practices— Production Sector

The list below describes a variety of methane emission reduction technologies that Natural Gas STAR partners in the production sector have implemented and reported to Natural Gas STAR. **Sunset dates (i.e., the length of time a technology or practice can continue to accrue emission reductions after implemented) are one year in duration unless otherwise noted in parentheses.** An asterisk (*) indicates that a technical document related to the technology or practice is available online at epa.gov/gasstar/tools/recommended.html.

Compressors/Engines

- Automate compressor systems operation to reduce venting
- Catalytic converter installation (10 years)
- Convert to low pressure compressor starters (10 years)
- Eliminate unnecessary equipment and/or systems*
- Increase compression capacity to reduce venting/flaring
- Install automated air/fuel ratio controls (10 years)*
- Install electric compressors (10 years)*
- Install electric motors (10 years)
- Install electric motor starters (10 years)*
- Install lean burn compressor (10 years)
- Lower compressor purge pressure for shutdown
- Perform gas recovery using slipstream (10 years)
- Redesign blowdown/alter ESD practices*
- Reduce emissions when taking compressors offline*
- Reduce gas venting with fewer compressor engine startups and improved engine ignition*
- Replace compressor cylinder unloaders (10 years)*
- Replace gas starters with air or nitrogen (10 years)*
- Turbine fuel use optimization

Dehydrators

- Convert pneumatics to mechanical controls (10 years)*
- Install condensers on glycol dehydrators (10 years)
- Install flash tank separators on glycol dehydrators (10 years)*
- Reduce glycol circulation rates in dehydrators*
- Replacing glycol dehydrators with desiccant dehydrators (10 years)*
- Reroute dehydrator/tank vents to flare or station suction (10 years)*
- Reroute glycol skimmer gas*
- Shutdown glycol dehydrator stripping gas in winter
- Use rich glycol in glycol pumps

Directed Inspection and Maintenance

- DI&M at compressor stations*
- DI&M: leak detection using IR camera/optical imaging*

- DI&M: leak detection using lower emission threshold
- DI&M: survey and repair leaks*

Pipelines

- Inject blowdown gas into low pressure mains or fuel gas system*
- Pipeline replacement and repair
- Use hot taps for in-service pipeline connections*
- Use pipeline pump-down techniques to lower gas line pressure before maintenance*

Pneumatics/Controls

- Capture/use gas released from gas-operated pneumatic pumps
- Convert gas pneumatic controls to instrument air (10 years)*
- Convert natural gas-driven chemical pumps (10 years)*
- Convert pneumatics to mechanical controls (10 years)*
- Identify and replace high-bleed pneumatic devices (7 years)*
- Install controllers on gas-assisted methanol pump (10 years)
- Install/convert gas powered separators to solar powered separators (10 years)
- Install no bleed controllers (10 years)
- Install non-venting dump controllers (10 years)
- Reduce gas pressure on pneumatic devices
- Reduce venting from unlit pilot: install electronic safety devices (10 years)*
- Replace bi-directional orifice meter with ultrasonic meters*
- Replace chemical pumps with electronic flow controllers (10 years)
- Use add-on controls to reduce emissions from pneumatics (10 years)

Tanks

- Change out vent pallet (10 years)
- Convert water tank blanket from natural gas to CO₂ (10 years)*
- Eliminate unnecessary equipment and/or systems*



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Tanks

- Install evacuators (10 years)
- Install flash gas compressors (10 years)
- Install hydrocarbon liquid stabilizer (10 years)
- Install pressurized storage of condensate (10 years)*
- Install vapor recovery units (VRUs) on storage tanks (10 years)*
- Install VRUs on pipeline liquid/condensate tanks (10 years)
- Recover gas during condensate loading*
- Reduce excess blanket gas blow-by to the atmosphere
- Replace leaking above-ground tanks (10 years)
- Route gas to compressor suction/blowcase vessel (10 years)
- Use protective tank coatings to reduce leaks (10 years)

Valves

- Heat tracing to prevent control valves from freezing open
- Install BASO® valves (10 years)*
- Install plugs on valves and open ended lines (10 years)
- Test and repair pressure safety valves*

Wells

- Artificial lift: gas lift (10 years)
- Artificial lift: install plunger lifts (10 years)*
- Artificial lift: install pumpjacks or rod pumps on gas wells (10 years)*
- Artificial lift: install smart lift automated systems on gas wells (10 years)*
- Artificial lift: install velocity tubing strings (10 years)*
- Artificial lift: pressure swabbing
- Artificial lift: use capillary strings (10 years)
- Artificial lift: use compression (10 years)
- Artificial lift: use pumping unit (10 years)
- Artificial lift: use to reduce blowdown in gas wells (10 years)*

- Install automated shut-in cycle units to reduce well venting (10 years)
- Install flash tank separator on water gathering system (10 years)
- Install pumps for separators (10 years)
- Install snubbing unit at wellhead
- Install soap launcher/soap unit (10 years)
- Lower heater-treater temperature
- Optimize gas well unloading times
- Perform reduced emissions completions for hydraulically fractured natural gas wells*
- Route casinghead gas to VRU or compressor (10 years)*
- Use foaming agents to reduce blowdown frequency*

Other

- Capture and use waste heat to reduce gas usage and emissions
- Convert natural gas-fired generator to solar power (10 years)
- Flare reduction program
- Improve system design/operation
- Install flares (10 years)*
- Install pilotless burner controls (10 years)
- Install purge reducer on flare (10 years)
- Nitrogen rejection unit optimization*
- Recover gas from separators
- Re-inject gas for enhanced oil recovery
- Re-inject gas into crude
- Replace aged heaters with new efficient gas fired heaters (10 years)



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Methane Emission Reduction Technologies & Practices— Gathering and Processing Sector

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Compressors/Engines

- Eliminate unnecessary equipment and/or systems*
- Install automated air/fuel ratio controls (10 years)*
- Install electric compressors (10 years)*
- Install electric motor starters (10 years)*
- Redesign blowdown/alter ESD practices*
- Reduce emissions when taking compressors offline*
- Replace compressor rod packing systems*
- Replace gas starters with air or nitrogen (10 years)*

Dehydrators

- Convert pneumatics to mechanical controls (10 years)*
- Install condensers on glycol dehydrators (10 years)
- Install flash tank separators on glycol dehydrators (10 years)*
- Reduce glycol circulation rates in dehydrators*
- Replace glycol dehydration units with methanol injection (10 years)*
- Reroute dehydrator/tank vents to flare or station suction (10 years)*
- Reroute glycol skimmer gas*

Directed Inspection and Maintenance

- DI&M: aerial leak detection using laser and/or infrared technology*
- DI&M at compressor stations*
- DI&M at gas plants and booster stations*
- DI&M: inspect/repair compressor station blowdown valves*
- DI&M: leak detection using IR camera/optical imaging*
- DI&M: leak detection using ultrasound*
- Improve measurement systems to track gas loss

Pipelines

- Pipeline replacement and repair
- Recover gas from pipeline pigging operations*
- Revise pigging schedule to reduce methane emissions
- Use composite wrap repair*
- Use hot taps for in-service pipeline connections*

- Use inert gases and pigs to perform pipeline purges*
- Use of improved protective coating at pipeline canal crossings (10 years)
- Use pipeline pump-down techniques to lower gas line pressure before maintenance*

Pneumatics/Controls

- Capture and use waste heat to reduce gas usage and emissions
- Convert gas pneumatic controls to instrument air systems (10 years)*
- Install back-up power at booster sites to prevent venting (10 years)
- Install no bleed controllers (10 years)
- Use add-on controls to reduce emissions from pneumatics (10 years)

Tanks

- Direct liquids at compressor suction to pipeline (10 years)
- Install hydrocarbon liquid stabilizer (10 years)
- Install pressurized storage of condensate (10 years)*
- Install vapor recovery units (VRUs) on storage tanks (10 years)*
- Install VRUs on pipeline liquid/condensate tanks (10 years)
- Reduce excess blanket gas blow-by to the atmosphere
- Reduce vapors vented out of drip tanks
- Route inlet flash vapors to station suction (10 years)

Valves

- Convert gas operated valves to hydraulic operation (10 years)
- Heat tracing to prevent control valves from freezing open
- Rupture pin shutoff device to reduce venting (10 years)
- Test and repair pressure safety valves*
- Test gate station pressure relief valves with nitrogen



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Other

- Convert natural gas-fired generator to solar power (10 years)
- Install flares (10 years)*
- Nitrogen rejection unit optimization*
- Process/re-route acid gas to reduce venting



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Methane Emission Reduction Technologies & Practices— Transmission Sector

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Compressors/Engines

- Automate compressor systems operation to reduce venting
- Eliminate unnecessary equipment and/or systems*
- Install automated air/fuel ratio controls (10 years)*
- Install electric compressors (10 years)*
- Install electric motors (10 years)
- Install electric motor starters (10 years)*
- Install lean burn compressor (10 years)
- Lower compressor purge pressure for shutdown
- Redesign blowdown/alter ESD practices*
- Reduce emissions when taking compressors offline*
- Reduce natural gas venting with fewer compressor engine startups and improved engine ignition*
- Replace compressor cylinder unloaders*
- Replace compressor rod packing systems*
- Replace gas starters with air or nitrogen (10 years)*
- Replace wet compressor seals with dry seals (10 years)*
- Use of turbines at compressor stations (20 years)

Dehydrators

- Convert pneumatics to mechanical controls (10 years)*
- Install condensers on glycol dehydrators (10 years)
- Install flash tank separators/controls on transmission sector glycol dehydrators (10 years)*
- Reduce glycol circulation rates in dehydrators*
- Replace glycol dehydrator with separator & in-line heaters (10 years)
- Reroute dehydrators/tank vents to flare or station suction (10 years)*
- Reroute glycol skimmer gas*

Directed Inspection and Maintenance

- DI&M: aerial leak detection using laser and/or infrared technology*
- DI&M at compressor stations*
- DI&M at remote sites*

- DI&M: inspect/repair compressor station blowdown valves*
- DI&M: leak detection using IR camera/optical imaging*
- DI&M: leak detection using ultrasound*
- DI&M: survey and repair leaks*

Pipelines

- Inspect/repair valves during pipeline replacement*
- Pipeline replacement and repair
- Recover gas from pipeline pigging operations*
- Reduce/downgrade system pressure
- Reduced emissions through third-party damage prevention
- Use composite wrap repair*
- Use hot taps for in-service pipeline connections*
- Use inert gas/pigs for pipeline purges*
- Use pipeline pump-down techniques to lower gas line pressure before maintenance *

Pneumatics/Controls

- Convert gas pneumatic controls to instrument air (10 years)*
- Convert natural gas-driven chemical pumps (10 years)*
- Install no bleed controllers (10 years)
- Identify and replace high-bleed pneumatic devices (7 years)*
- Reduce meter run blowdowns
- Replace bi-directional orifice meter with ultrasonic meters*
- Use add-on controls to reduce emissions from pneumatics (10 years)

Tanks

- Install flash gas compressors (10 years)
- Install vapor recovery units on pipeline liquid/condensate tanks (10 years)*



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Valves

- Close valves during repair to minimize blowdown*
- Design isolation valves to minimize gas blowdown volumes (10 years)*
- Move in fire gates at compressors (10 years)*
- Test and repair pressure safety valves*
- Use of YALE closures for ESD testing*

Wells

- Switch from underbalanced to overbalanced drilling in gas storage field

Other

- Convert natural gas-fired generator to solar power (10 years)
- Improve system design/operation
- Inject blowdown gas into low pressure mains or fuel gas system*
- Install flares (10 years)*
- Replace aged heaters with new efficient gas fired heaters (10 years)
- Require improvements in quality of gas received



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Methane Emission Reduction Technologies & Practices— Distribution Sector

The list below describes a variety of methane emission reduction technologies that Natural Gas STAR partners in the distribution sector have implemented and reported to Natural Gas STAR. **Sunset dates (i.e., the length of time a technology or practice can continue to accrue emission reductions after implemented) are one year in duration unless otherwise noted in parentheses.** An asterisk (*) indicates that a technical document related to the technology or practice is available online at epa.gov/gasstar/tools/recommended.html.

Compressors/Engines

- Eliminate unnecessary equipment and/or systems*
- Install electric motor starters (10 years)*
- Redesign blowdown/alter ESD practices*
- Reduce natural gas venting with fewer compressor engine startups and improved engine ignition*
- Replace compressor rod packing systems*

Dehydrators

- Reroute dehydrator/tank vents to flare or station suction (10 years)*

Directed Inspection and Maintenance

- DI&M at compressor stations (non-mainline transmission)*
- DI&M at gate stations and surface facilities*
- DI&M: increase frequency of leak surveys*
- DI&M: survey and repair leaks*
- Improve measurement systems to track gas loss

Pipelines

- Identify and rehabilitate leaky distribution pipes
- Insert gas main flexible liners (10 years)*
- Reduce/downgrade system pressure
- Reduced emissions through third-party damage prevention
- Use hot taps for in-service pipeline connections*
- Use no-blow insertion fittings
- Use pipeline pump-down techniques to lower gas line pressure before maintenance*

Pneumatics/Controls

- Convert gas pneumatic controls to instrument air (10 years)*
- Convert natural gas-driven chemical pumps (10 years)*
- Convert pneumatic devices to mechanical/electronic (10 years)*
- Identify and replace high-bleed pneumatic devices (7 years)*
- Use add-on controls to reduce emissions from pneumatics (10 years)

Valves

- Install excess flow valves (10 years)*
- Install overpressure protection system (10 years)
- Test and repair pressure safety valves*
- Test gate station pressure relief valves with nitrogen

Other

- Convert natural gas-fired generator to solar power (10 years)
- Improve system design/operation
- Inject blowdown gas into low pressure mains or fuel gas system*
- Install flares (10 years)*
- Re-inject CNG cylinder test gas
- Retighten LNG pump seals
- Use automated systems to reduce pressure