METHANE GUIDING PRINCIPLES

MGP Best practice guide on reducing methane emissions: Transmission, storage, LNG terminals and distribution. Case studies

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Best practice guide covering mid/downstream

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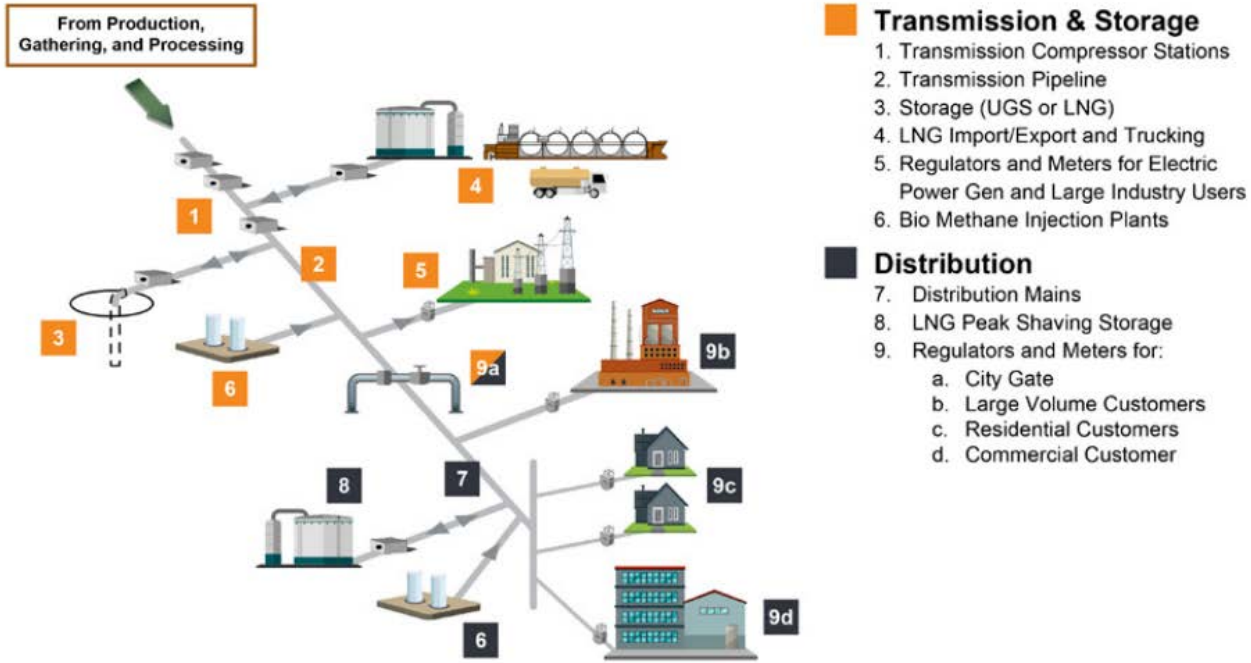

https://methaneguidingprinciples.org/wp-content/uploads/2020/09/Reducing-Methane-Emissions-transmission-storage-LNG-terminals-and-distribution-Guide.pdf

Best practices for reducing methane emissions

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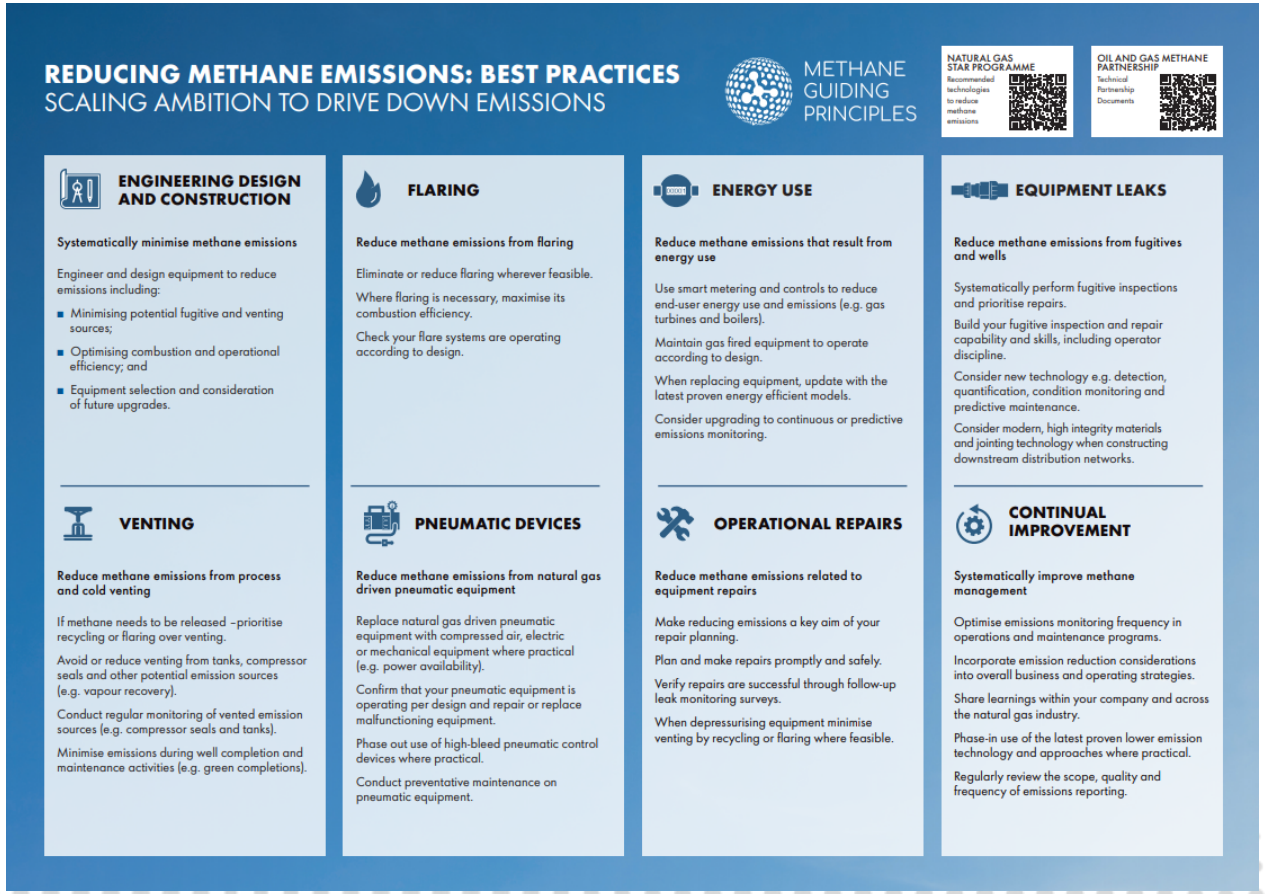
Checklist

Reducing methane emissions:

Transmission, storage, LNG terminals and distribution

- Prevent emissions whenever possible
- Reduce emissions that cannot be prevented
- Identify and repair equipment that is not working properly
- Track emissions and mitigation activities



REDUCING METHANE EMISSIONS: BEST PRACTICES
SCALING AMBITION TO DRIVE DOWN EMISSIONS

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NATURAL GAS STAR PROGRAMME
Recommended technologies to reduce methane emissions

OIL AND GAS METHANE PARTNERSHIP
Technical Partnership Documents

ENGINEERING DESIGN AND CONSTRUCTION

Systematically minimise methane emissions

Engineer and design equipment to reduce emissions including:

- Minimising potential fugitive and venting sources;
- Optimising combustion and operational efficiency; and
- Equipment selection and consideration of future upgrades.

FLARING

Reduce methane emissions from flaring

Eliminate or reduce flaring wherever feasible.

Where flaring is necessary, maximise its combustion efficiency.

Check your flare systems are operating according to design.

ENERGY USE

Reduce methane emissions that result from energy use

Use smart metering and controls to reduce end-user energy use and emissions (e.g. gas turbines and boilers).

Maintain gas fired equipment to operate according to design.

When replacing equipment, update with the latest proven energy efficient models.

Consider upgrading to continuous or predictive emissions monitoring.

EQUIPMENT LEAKS

Reduce methane emissions from fugitives and wells

Systematically perform fugitive inspections and prioritise repairs.

Build your fugitive inspection and repair capability and skills, including operator discipline.

Consider new technology e.g. detection, quantification, condition monitoring and predictive maintenance.

Consider modern, high integrity materials and jointing technology when constructing downstream distribution networks.

VENTING

Reduce methane emissions from process and cold venting

If methane needs to be released –prioritise recycling or flaring over venting.

Avoid or reduce venting from tanks, compressor seals and other potential emission sources (e.g. vapour recovery).

Conduct regular monitoring of vented emission sources (e.g. compressor seals and tanks).

Minimise emissions during well completion and maintenance activities (e.g. green completions).

PNEUMATIC DEVICES

Reduce methane emissions from natural gas driven pneumatic equipment

Replace natural gas driven pneumatic equipment with compressed air, electric or mechanical equipment where practical (e.g. power availability).

Confirm that your pneumatic equipment is operating per design and repair or replace malfunctioning equipment.

Phase out use of high-bleed pneumatic control devices where practical.

Conduct preventative maintenance on pneumatic equipment.

OPERATIONAL REPAIRS

Reduce methane emissions related to equipment repairs

Make reducing emissions a key aim of your repair planning.

Plan and make repairs promptly and safely.

Verify repairs are successful through follow-up leak monitoring surveys.

When depressurising equipment minimise venting by recycling or flaring where feasible.

CONTINUAL IMPROVEMENT

Systematically improve methane management

Optimise emissions monitoring frequency in operations and maintenance programs.

Incorporate emission reduction considerations into overall business and operating strategies.

Share learnings within your company and across the natural gas industry.

Phase-in use of the latest proven lower emission technology and approaches where practical.

Regularly review the scope, quality and frequency of emissions reporting.

Mitigation measures

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Source of methane emission	Segment and facility	Emitting equipment or emission event	Mitigation measure	Relevant MGP guide and Case study
Venting	Distribution	Third-party damage and resulting gas release	Programs and policies to avoid third-party damage, installing excess flow valves in service lines	Case Study 9 Case Study 10
Fugitive emissions and venting (storage well operations)	Storage (underground storage)	Well heads and downhole well components	Monitor the integrity of the well Leak detection and repair (LDAR) programs and directed inspection and maintenance (DI&M) programs	MGP Leaks Guide and Operational Repairs Guide Case study 5
Venting and flaring	LNG regasification terminals	Boil-off gas (BOG)	Boil-off gas recovery (for example, install high-pressure BOG compressors to inject non-recoverable boil-off gas into the gas network)	See European Standard[5] EN 1473. MGP Engineering Design and Construction Guide

Case studies with features unique to this sector

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Case study	Description
Case study 1:	Pumping down pipelines with portable compressors before maintenance (transmission)
Case study 2:	Recovering blowdown gas at compressor stations using permanent compressors (transmission and storage)
Case study 3:	Flaring instead of venting for maintenance (transmission)
Case study 4:	Hot tapping for pipeline connections (transmission)
Case study 5:	Monitoring underground storage facilities (underground storage)
Case study 6:	Minimizing emissions from dehydrators by using vapor compression and low-temperature separation to remove water (underground storage)
Case study 7:	Minimizing emissions through the design of LNG terminals and LNG truck-loading systems (LNG terminals)
Case study 8:	Commissioning with vacuum pumps (distribution)
Case study 9:	Avoiding emissions caused by third-party damage (distribution)
Case study 10:	Installing excess-flow valves in service lines (distribution)

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Thank you!