

# Methane Policy Recommendations for the EU

Leak Detection and Repair (LDAR)

The European Commission (EC) adopted on 14 of October of 2020 a Communication on an EU strategy to reduce methane emissions. That strategy includes the development of a policy proposal for legislative acts to further reduce methane emissions in the energy sector. These policy proposals will include delivery of a legislative proposal in 2021 on obligations to improve the leak detection and repair (LDAR) of leaks on all gas infrastructure, as well as any other infrastructure that produces, transports or uses gas, including as a feedstock [1] [2].

The Methane Guiding Principles initiative is promoting methods of reducing methane emissions from leaks in equipment as part of its Best Practices Toolkit [3]. Other initiatives with gas industry involvement, such as the Oil and Gas Methane Partnership (OGMP) [4], UNECE [5], GIE and MARCOGAZ [6] [7] and NOROG [8] have also published guidance documents addressing LDAR programs. LDAR programs are widely considered to be the main mitigation strategy for reducing leaks from the pressurized equipment used in the oil and gas sectors. This is also recognized in the EC “Best Available Techniques Guidance Document on upstream hydrocarbon exploration and production” [9].

This paper attempts to provide input to the EC’s considerations when developing legislative proposal on LDAR obligations in the EU energy sector. It starts with a description of terms and general remarks, then lists some available information on existing LDAR legislation, regulation or industry standards/best practices, and concludes with high level recommendations.

Companies in the oil and gas sector typically have LDAR programs in place and take leak detection and repair actions on a regular basis for safety reasons, but also as part of its methane emissions mitigation efforts. This includes the comprehensive scanning of individual equipment and components to locate leaks and repair them.

LDAR practices along the oil and gas value chains differ depending on the technical characteristics and specificities of the assets and equipment used. Such differences typically are based on assessments of the risks of equipment failures / leaks (Risk Based Inspections). Differences in LDAR practices do also exist depending on whether equipment is part of regulated versus non-regulated operations or depending on national requirements. Also technologies, instruments and methodologies are constantly evolving and improving [10] [11].

**It is therefore important not to impose blanket obligations and rules across the whole value chain but to allow for flexibility<sup>1</sup> for defining thresholds, instruments to be used for detection and measurement, frequencies (detection, repair), etc.**

## Description of terms

- **Leaks** are unintentional emissions from pressurised equipment used in the oil and gas industry. Leaks are usually caused by imperfections in, or ordinary, wear and tear of sealed joints, such as flange gaskets, screwed connections, valve-stem packing, or by poorly seated valves. Leaks can also come from the walls of pressurized equipment (e.g. vessel or pipeline), as a result of corrosion or damage.

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<sup>1</sup> There are already examples in other jurisdictions. For example Canada is implementing a pilot program (alt- FEMP) which allows operators to use temporarily an alternative technology in the LDAR campaigns. After this period both the company and Regulator will review and evaluate the results and the next steps. Also the EPA allows operators to use novel technologies (Alternative Means of Emission Limitation (AMEL)), as long as they demonstrate emission reduction equivalence. Companies need to apply individually for a permit.

- **LDAR programs** are used to identify and support the repair of equipment or infrastructure that can be a source of emissions due to leaks from pressurized equipment. It is often accomplished by a periodic inspection survey to identify leaks, followed by repair of any found leaks.

(Note - While LDAR in certain jurisdictions can have a specific regulatory definition, it is more generally used to describe the processes and systems by which leaking equipment is identified, prioritized and then repaired.)

- **Super emitters**<sup>2</sup> are a methane emission source that represent a disproportionate amount of the total methane emissions released from all sources.

## Some existing LDAR legislation, regulation or industry standards/best practices

The majority of the EU Member States have not set binding rules on LDAR programs specific to methane emissions (where this is the case, they are mainly applicable to distribution system operators mainly for safety reasons). However, regulation exists which points to industry standards in designing and operating pressurized equipment with the aim to minimize emissions and ensure safe operations. For example, in Germany the Energy Law (Art. 49) points to industry standards set by the German Association of Gas and Water Industry (DVGW) [12]. Also in Norway, the Norwegian Oil and Gas Association (Norog) has developed a document [13] that describes how Optical Gas Imaging surveys should be conducted and how the results of these should be used to inform the reporting process for small leakages (which is required by the Norwegian Environment Agency) as part of the annual reporting process for methane and NMVOCs. In addition, a series of methodologies, standards and voluntary frameworks is available, e.g. EPA Method 21, EN15446, MARCOGAZ methodology.

In the case of North America, the US [14] [15] Mexico [16] and Canada [17] have already adopted policies and regulatory frameworks addressing methane emissions in order to meet their targets to reduce methane emissions from the oil and gas sectors [18]. Although these jurisdictions cover LDAR programs, they have different requirements for different types of assets.

The recent regulatory roadmap and toolkit of the IEA [19] indicates that LDAR policies may address:

- **the classification of the types of equipment**
- **frequency of inspections / surveys depending on the type of facility**
- **the type or method of inspections and inspection equipment to be used**
- **the leak threshold that triggers repair requirements**
- **the length of time allowed to conduct the repairs**

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<sup>2</sup> Note - The term 'super-emitter' can refer to malfunctioning equipment, particularly in unmanned installations where such equipment has the potential to exist for long periods of time. The determination of a super-emitter is best associated with emissions data from a given source and should not be viewed as an attribute of an entire site. Care should be taken when utilizing methodologies for identifying super-emitters to differentiate between episodic events (e.g. gas actuation events), erroneous measurements and/or malfunctioning equipment. The term 'fat-tail' is often used to describe the statistical anomalously high values from a small number of sources seen from representation of the data—a probability distribution that is highly skewed relative to a well-behaved distribution such as the normal or an exponential distribution. Having super-emitters at a few sites could skew significantly the distribution of emissions from a sample of sites.

- **guidelines for personnel training requirements**
- **repair directives (e.g. time to address sources of emissions)**
- **requirements on reporting and LDAR protocols**
- **possible exceptions**

## Recommendations to the EC on LDAR obligations in the EU

EU proposals for legislation addressing LDAR on all gas infrastructure, as well as any other infrastructure that produces, transports or uses natural gas, including as a feedstock should address the following elements:

- Precise definitions of relevant terms in the context of LDAR programs which cover equipment along the complete oil and gas value chains, and an accurate inventory of equipment and components.
- High level details on the stages of LDAR programs.
- Flexibility and recognition that one type of solution does not fit all the assets, operations and equipment along the value chains, so different requirements for different types of assets/equipment should be allowed.
- Detecting emissions from the value chain necessitates the use of multiple technology platforms. While each individual technology has advantages and disadvantages, a mix of technologies achieves an optimal outcome.
- Flexibility and recognition that technologies and methodologies are constantly improving, and any legislation should allow for the adoption of future technologies and methodologies for LDAR.
- Technical recommendations, threshold that triggers repair requirements taking into account economic feasibility and environmental impact, LDAR protocols, guidelines for the type of equipment/component that must be surveyed, the length of time allowed to conduct the repairs, traceable calibration certification for LDAR equipment, personnel training requirements, and reporting and repair procedures should be available to ensure that the industry has a set up robust LDAR programs.
- In particular, flexibility in setting up LDAR programs will be accompanied by demonstration that LDAR programs are indeed effective in reducing emissions. This requires guidelines for quantifying emissions over time including representative measurements.
- In the case of regulated operators, costs associated to LDAR should be recognized by National Regulatory Authorities and their recovery should be allowed.
- LDAR results and information on the associated methodology should be recorded and be used for the reporting of methane emissions.

## ANNEX I - REFERENCES

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## ANNEX II – EU STRATEGY TO REDUCE METHANE EMISSIONS

In addition, the Commission calls on companies in the oil, gas and coal sectors to **set up more robust leak detection and repair (LDAR) programmes** to prepare for upcoming proposals for legislation that would make such programmes mandatory (more details in the next section).

[...]

In addition, such legislation should include an obligation **to improve leak detection and repair (LDAR)** of leaks on all fossil gas infrastructure, as well as any other infrastructure that produces, transports or uses fossil gas, including as a feedstock. In an effort to tackle emissions from venting and flaring, LDAR obligations will address flaring efficiency as a priority. Furthermore, the Commission will examine options as regards possible methane emission reduction targets or standards or other incentives on fossil energy consumed and imported in the EU.

**Upstream** gas companies **have a certain but limited financial incentive to implement LDAR programmes**, as they can sell the gas that they prevent from leaking. **Transmission, storage, and distribution** systems operators (including many **LNG terminals**) are **regulated businesses** and do not own the gas. For this reason, **the Commission will promote the recognition** by National Regulatory Authorities (NRAs) of LDAR and methane reduction **investments as allowed costs for regulated entities** in transmission, storage and distribution, including through possible guidance to regulators.

[...]

The Commission will deliver **legislative proposals in 2021** on:

- Obligation to improve leak detection and repair (LDAR) of leaks on all fossil gas infrastructure, as well as any other infrastructure that produces, transports or uses fossil gas, including as a feedstock.

## Companies supporting the recommendations

