Introduction

This document presents general principles which apply to all Technical Guidance Documents (TGDs), unless stated otherwise in the TGDs. The TGDs are intended as living documents and will be updated as new data and technologies become available. If there are discrepancies or contradicting guidance between the TGDs and the General Principles TGD, Partners may select which guidance best applies to their situation.

The TGDs present guidance on quantification methodologies at level 3 and 4 for the main emission sources. These methodologies are intended to provide guidance. For the purposes of OGMP, companies can use the methodologies described in the guidance or select other quantification methodologies, both at level 3 and 4, provided that those other methodologies deliver similar or enhanced levels of data quality/certainty. Companies should, in such circumstances, be prepared to explain and justify any alternate approaches adopted and it is recommended that these, where related to material sources, are included in their annual OGMP report. Level 5 quantification is not covered by this TGD.

General principles

Scope boundaries

As part of OGMP, companies are expected to report methane emissions from all relevant methane emission sources. For instance, to meet the Gold Standard, companies would report all material sources at an asset at level 4, whether specifically covered by a TGD or not, while all other immaterial sources would need to be reported at level 3 (see below for further details on materiality).

The TGDs for the core sources are intended to facilitate reporting, given the varying nature of quantification techniques. Scope boundaries in each TGD are intended to outline where the sources fall within the reporting categories. However, if some individual emission sources could belong to several core sources (e.g. emissions from leaks due to corrosion could either be included in leaks or incidents depending on company practices or local regulation), corresponding to the list of TGDs, they should only be included within one of the core sources, with a bias towards the source most relevant to actual, final emissions. If it is required to select between a material and non-material core source, preference should be given to the material source. This should be mentioned in the annual report and attributed consistently throughout the company and over the years.

In addition, source specific TGDs have been prepared with a focus on the quantification of emissions from normally functioning equipment. While the approaches for quantification in the source specific TGDs may still be applied for determining emissions from malfunctions, malfunctioning equipment should be reported as incidents. For example, while fugitive leaks are malfunctions, they are typically small enough to go unnoticed until discovered during leak surveys. On the other hand, a blown flange gasket emitting a large enough volume of gas to set off facility LEL detectors and requiring immediate attention to stop would be considered a malfunction incident and reported under that emission source.

Methane emissions which are fully captured and reintegrated to the process need not be reported under the source specific TGD. Emissions which are fully sent to flare should be reported under *Gas flaring*.

De minimis[1] sources

De minimis (very minor) emission sources are out of scope of reporting. For example, emissions from incomplete combustion in domestic boilers in the facility's buildings are considered as de minimis sources.

Levels of reporting

As outlined by the framework[2], different levels of reporting can be used to quantify methane emissions.

Further details on the levels of reporting are presented in the OGMP 2.0 Framework or individual TGDs.

Materiality at asset level

In the annual report, report the vast majority of emissions at level 4 for any given asset.

In practice, this means:

- Prioritize more complete coverage of Level 4 measurements at assets that account for a larger share of operator-level emissions.
- For a given asset, rank all sources of emissions based on best available data (minimum L3)
- Perform L4 on sources that account for a minimum of 70% of the methane emissions from each asset with a justification as to why >90% is not reached.

The percentages described above are applied to a selected relevant year of reference[3] and this year of reference can be reassessed if there are significant changes in operations/methodology (e.g., 20% change of emissions within 3 years).

Materiality at portfolio level

As outlined by the framework[2], *Materiality in this context refers to the significance of emissions for assets in terms of total emissions.*

Assets within non-operated joint ventures where the company has a share in the joint venture of less than 5% equity are not considered material. For all operated assets and non-operated assets with higher equity than 5% the following applies.

At portfolio level: All material assets are ranked in terms of absolute emissions per asset. This step requires that emissions from operated assets are estimated at least at level 3. For non-operated assets, emissions should be estimated at the best available level (preferably level 3, but lower levels would also be acceptable). All assets that account for 95% of total emissions for a given operator are considered material. For purposes of this ranking, we consider total emissions from each asset without accounting for equity (as described in section 4.2.1, for reporting purposes only the equity share of emissions are attributed to a given operator). The subset of assets that account for less than 5% of emissions can be considered as immaterial because they have a significantly small contribution to total emissions from a given operator. Thus, emissions from this subset of assets are still reported but not required to get to level 4 and 5. Should assets outside of scope of reporting become in scope due to changes in the company portfolio over time, the company will have the

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[1] Example of *de minimis* from EU ETS for CO_2 to provide an idea of the scale emissions (cannot be directly applicable to methane emissions): where the source streams selected by the operator jointly corresponds to less than 1000 tonnes of fossil CO_2 per year or to less than 2%, up to a total maximum contribution of 20 000 tonnes of fossil CO_2 per year, whichever is the highest in terms of absolute value

[2] Adjusted, to reflect discussions on the OGMP TGDs, from Mineral Methane Initiative, *OGMP2.0 Framework,* November 2020

[3] Which reflects current operations and can be different from the baseline year, used to set targets

same pathway to gold standard with respect to those assets as a new company joining OGMP as described in section 4.2.2.

The application of materiality will be reviewed periodically, based on additional emission data that becomes available and any changes in assets.

Manufacturer estimates

Estimates provided by manufacturers are typically considered as level 3 quantification, unless otherwise specified in the TGD or determined through measurements of the specific equipment configuration and operating parameters or where the OGMP member company can justify similar operating conditions as those in which the tests were performed. In which case, it can be considered as level 4 quantification.

Units and conversion

The reporting units should be using the International System Units and only units of mass and volume of methane, avoiding reporting in energy units (e.g. MWh),thermal units (e.g. BTU) or CO_2 equivalent.

Emission factors can be converted to best fit the unit of the activity data, using standard unit conversion rates. In addition, if emission factors are given per volume of total gas, methane emissions should be adapted to reflect the methane content of the gas (or approximated from average facility methane content).

Alternative quantification methods

For level 3 quantification, where relevant, the TGDs present examples of emission factors, but other emission factors may be used, as long as they are source specific (and based on historic in-field measurements or similar (e.g. engineering calculations)). Accepted sources for emission factors include: published academic studies, industry compendiums, industry-wide or multi-company studies, recognized international standards, emission factors developed from procedures of certification bodies, and emission factors imposed by local regulations. OGMP member companies are encouraged to select emission factors which best represent their operational conditions. Whilst approval is not required for the use of alternate factors, it is recommended that, where used, they are fully documented.

Similarly, for large populations of like systems, industry emission factors based on in-field measurements for the purposes of regulatory reporting can be used as level 4, provided they can be justified as representative in the annual report (e.g. through measurements). These justifications are encouraged to consider if the emission factors are representative of the company's equipment make/model, activity/operating levels, maintenance practices, environmental conditions, or other relevant conditions to determining like systems, as well as the approach to define a representative sample in line with the definition provided by the OGMP framework, measurement method, and results validation.

The source specific TGDs can give examples of suitable quantification techniques, but alternative methods can be used, provided the alternative methods are broadly similar or enhanced in terms of their readiness, level of accuracy, and suitably evidenced in order to enable appropriate justification for their use (e.g. recognized international standards such as CEN or ISO standards, certification body procedures).

Where unspecified in the TGDs, accepted detection and quantification methods include methods prescribed by local regulation and methods recognized by international standards (CEN, ISO …) or certification bodies. OGMP members are encouraged to use detection and quantification technologies which are well suited to the source and operating conditions.

Alternative methods may also be considered to overcome unique implementation feasibility challenges, when typical quantification technologies cannot be reasonably deployed, for specific sources present at specific assets. It is recommended that alternative methods be documented and justified in the annual report.

In cases where the gas characteristics can be assumed to meet a regulated specification[4] (e.g. : underground gas storage, gas transmission, gas distribution, LNG terminals), methane content may be determined using average measured or measurement based estimated/calculated values (e.g. : average methane content in a grid based on gas quality measured at given network entry points).

In other cases, accepted equipment and techniques, as defined in this TGD, for determining methane content can be employed, where required. Following are typical equipment or methods to measure methane content, but the list is non-exhaustive:

- Sampling and lab analysis
- Portable gas chromatographer
- Draeger® tubes (provides information on ppm)
- Process engineering modelling/software

Measurement-based emission factors

Measurement-based emission factors can be developed as part of level 4 quantification for like systems. Some elements of like systems are presented for core sources in the corresponding TGDs. As a general rule, events or equipment with similar operational, environmental or design characteristics can be considered as like systems. Variations around some characteristics are acceptable, if it can be demonstrated that these do not significantly affect methane emissions.

Engineering calculations and process simulations

The source specific TGDs give examples of suitable detailed engineering calculations and process simulations, but alternative methods can be used for suitable sources, provided the alternative methods are broadly similar in terms of their level of accuracy or can provide improved accuracy, are adapted to operating conditions during the reporting period, and are suitably evidenced in order to enable appropriate justification for their use (e.g. recognized international standards such as CEN or ISO standards, certification body procedures). It is recommended that alternative methods be documented and justified in the annual report.

Conservative approach

When a range of values is available, companies may adopt a conservative assumption (with a bias towards higher emissions) when selecting the value used. It is recommended for the assumption to be documented and justified in the annual report.

Disclaimer on technologies

A key challenge toward meaningful emissions reporting is the development of technologies to reasonably provide a complete and accurate overview of the reporting unit's/facility's methane emissions, representative of the whole reporting period.

While this challenge will be short lived as technologies become proven, the wide use of emerging site-level or source-level methane sensing technologies to deliver desired Level 4 and 5 reporting in the initial few years may prove unviable or grossly infeasible broadly or for specific reporting units given potential challenges that may arise and cannot adequately be managed until more about the technologies is discovered (e.g.

[4] Within the EU, regulated specifications and quality standards may be applied

technology limitations, security challenges, regulatory hurdles, trade compliance issues, etc.), despite companies acting in good faith to identify and commercialize these technologies.