OGMP Implementation Plan, TGD’s and the Uncertainty and Reconciliation Process.

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OGMP Requirements and Data Disclosure

**OGMP requirements**
- Define & disclose **2025 methane reduction target**
- Submit **implementation plan** on pathway to **Gold Standard**
- Report annually on methane emissions from **operated and non-operated assets**

**Publicly reported data**
- Declared methane **reduction targets** of companies
- Company total emissions (**aggregated** by core source and by level (1-5) & distinct operated and non-operated ventures) + **progress towards targets**
- Members have reasonable opportunity to review company fact sheet before publication.
- Confidential asset level data and/or country level emissions data will not be publicly disclosed.
2025 Company Target

• Companies can adopt different targets either absolute or intensity
• In case of variable gas production / conveyed volume intensity is an option, the denominator value is crucial.
• In case of absolute target the base year is important.

• UNEP recommends:
  • The adoption of an ambitious target that matches what the company is already doing and is aligned with publicly communicated targets
  • That the numerator is informed by measurements
Materiality Analysis

Recommended steps for the materiality analysis

- Using the OGMP 2.0 Materiality Analysis considering 90% of sources as material.
- The first step is to generate a complete L3 estimated inventory of the company assets and sources.
- Once estimated, the emissions starting from the bigger emitting sources were ranked and the 90% selected.
- Of the 90% selected, the sources were added by asset and the materiality list was as follows.

<table>
<thead>
<tr>
<th>Type of Asset</th>
<th>Name of the Asset</th>
<th>L3 Estimated Emission [kt CH₄]</th>
<th>Sub-Total [kt CH₄]</th>
<th>Percent Company Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNG Terminals (Regasification)</td>
<td>LNG Terminal 1</td>
<td>4.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LNG Terminal 2</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LNG Terminal 3</td>
<td>4.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission Networks</td>
<td>Trans. Netw. 1</td>
<td>4.1</td>
<td>7.9</td>
<td>25.5%</td>
</tr>
<tr>
<td></td>
<td>Trans. Netw. 2</td>
<td>3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trans. Netw. 3</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UGS</td>
<td>UGS &lt;Name&gt;</td>
<td>3.1</td>
<td>3.1</td>
<td>9.9%</td>
</tr>
<tr>
<td>Compressors</td>
<td>Compressor 1</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compressor 2</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compressor 3</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Commitment to reach L4/L5 reporting in 3 years for operated assets

The table shows that the company plans to achieve the GS, aiming to report all material emissions at level L4/L5 in year 3.

**Staged approach:** e.g. having assets reported at L4/5 prior to the deadline

**Explanation of staged approach:**
The company may add a note about the methodology used for the staged approach, (e.g.):
* Clustering of similar assets.
* Staged approach starting with assets with bigger complexity.
* Consider the ranked volume of gas produced/conveyed.

<table>
<thead>
<tr>
<th>Asset Name/Venture</th>
<th>Reporting Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Y0</td>
</tr>
<tr>
<td>LNG Terminals</td>
<td></td>
</tr>
<tr>
<td>LNG Terminal 1</td>
<td>L3</td>
</tr>
<tr>
<td>LNG Terminal 2</td>
<td>L3</td>
</tr>
<tr>
<td>LNG Terminal 3</td>
<td>L3</td>
</tr>
<tr>
<td>Transmission Networks</td>
<td></td>
</tr>
<tr>
<td>Transmission Network 1</td>
<td>L2</td>
</tr>
<tr>
<td>Transmission Network 2</td>
<td>L1</td>
</tr>
<tr>
<td>Transmission Network 3</td>
<td>L1</td>
</tr>
<tr>
<td>UGS</td>
<td></td>
</tr>
<tr>
<td>UGS 1</td>
<td>L3</td>
</tr>
<tr>
<td>Compressors</td>
<td></td>
</tr>
<tr>
<td>Compressor 1</td>
<td>L3</td>
</tr>
<tr>
<td>Compressor 2</td>
<td>L3</td>
</tr>
<tr>
<td>Compressor 3</td>
<td>L3</td>
</tr>
<tr>
<td>Venture / Asset Name</td>
<td>Operated / Not Operated</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>LNG Terminals</td>
<td>operated</td>
</tr>
<tr>
<td>Transmission Networks</td>
<td>operated</td>
</tr>
<tr>
<td>UGS</td>
<td>operated</td>
</tr>
<tr>
<td>Compressor</td>
<td>operated</td>
</tr>
</tbody>
</table>
Level 4/5 reconciliation considerations

• Companies are encouraged to share high-level considerations on how they plan to tackle reconciliation.
  
  o Thinking process regarding their sampling plan, justification for choosing a certain mix of methods, etc.

• The detailed approach will be included in the annual report
Commitment to work with non-operated ventures demonstrating reasonable endeavours to help them reach progressively L4/L5 reporting in 5 years

The table shows that the company plans to achieve the GS, aiming to report all material emissions at level L4/L5 in year 5.

<table>
<thead>
<tr>
<th>Implementation Plan to reach level 4/5 for non-operated assets</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Name/Venture</td>
<td>% Equity</td>
</tr>
<tr>
<td>Distribution Network</td>
<td></td>
</tr>
<tr>
<td>&lt;&lt;Asset Name 1&gt;&gt; NOp_DN</td>
<td>45%</td>
</tr>
<tr>
<td>&lt;&lt;Asset Name 2&gt;&gt; NOp_DN</td>
<td>35%</td>
</tr>
</tbody>
</table>

Credible and explicit path for non-operated assets

- The company is already engaged in discussions with their NOJV’s partners to explain the benefits of the OGMP 2.0 initiative.
- The company is organizing workshops with associated companies, where quantification methodologies at levels L3, L4 and L5 are explained.
- In the next few years, the company plans to help associates build their L4 inventories. To achieve this goal, the Company X will:
  
  * Prioritize super emitter leak management, true regular LDAR campaigns.
  * Develop of strategic investments on the most emissive Transmission networks.
  * Strive to repair leaks in a shorter time than that imposed by the Regulatory Entity.

- In the case of a LNG terminal co-owned with several partners, Company X is proposing their partners start with L4 measurements by latest 2024 and L5 for 2025. The company is encouraging their NOJV's partners to adopt the same methodology and technologies there are using into their own assets.
OGMP 2.0 Technical Guidance Documents

1. Technical Guidance Documents
   - TGDs provide guidance on how to meet OGMP 2.0 reporting requirements for most common material sources
   - Developed by TGD Task force, integrating inputs from all companies through the mirror groups
   - Approved by Steering Group by consensus after 2 week no-objection period
   - All TGDs were approved and are available on the OGMP 2.0 website: [https://www.ogmppartnership.com/templates-guidance](https://www.ogmppartnership.com/templates-guidance)

<table>
<thead>
<tr>
<th>Natural gas driven pneumatic controllers, pumps and measurement devices</th>
<th>Glycol dehydrators</th>
<th>Gas well hydraulic fracture completion venting/flaring</th>
<th>Incidents, emergency stops and malfunctions (under SG approval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fugitive component and equipment leaks</td>
<td>Un-stabilized liquid storage tanks</td>
<td>Flare efficiency</td>
<td>Level 1 and 2 reporting</td>
</tr>
<tr>
<td>Centrifugal compressor shaft seals (wet and dry seals)</td>
<td>Gas well liquids unloading</td>
<td>Incomplete combustion</td>
<td>Permeation</td>
</tr>
<tr>
<td>Reciprocating compressors</td>
<td>Oil well casinghead venting/flaring</td>
<td>Purging and venting, starts and stops and other process and maintenance vents (under SG approval)</td>
<td>General TGD</td>
</tr>
</tbody>
</table>
TGD example: Flare Efficiency

Approved by OGMP 2.0 Steering Group in June 2021

Structure:

- **Brief description of the source**
  - Types of flares (elevated & ground flares)
  - What typical flare system consists of & its role
  - Types of flaring (continuous, intermittent or released in a discrete batch)

- **Scope boundaries**
  - All sources of emissions related to incomplete combustion of waste gas as it is combusted in either a flare, enclosed flare or combustor should be reported under Flaring.

- **Level 3 & 4 Quantification Methodologies**

- **Example Models**
Flare Efficiency TGD – Level 3 Quantification Methodologies

The following quantification methodologies are considered as providing Level 3 estimates:

- **Gas flow**
  - Directly measured
  - Mass balance

- **Gas composition**
  - Directly measured
  - Mass balance
  - Process simulation
  - Regulated specification

- **Destruction efficiency**
  - Assume 98%

• **Accepted QMs/those prescribed by local regulation** are considered as providing L3 estimated if they consider all 3 parameters.
Flare Efficiency TGD – Level 4 Quantification Methodologies

The following quantification methodologies are considered as providing Level 4 estimates:

- **Gas flow**
  - Continuous direct measurement
  - Mass balance
  - Process simulation

- **Gas composition**
  - Continuous direct measurement
  - Sample measurement

- **Destruction efficiency**
  - Measurement-based or determined via Representative Sampling
    - Engineering calculations
    - Models

- **Uncertainty guidance** provides guidances on how to develop a statistically representative sample.

- **Importance of operators’ judgment for both L3/L4**: practitioners should use methodologies that best represent conditions & practices of their facilities & adjust estimation methods given potential differences in their systems.
Developing L4 and L5 Inventories

Level 3
- All possible sources across assets
- Generic emission factors

Level 4
- Guided by materiality assessment @ L3
- All possible sources across assets
- Company specific methodologies

Level 5
- Relies on L4 source level inventory as starting point
- Perform site-level measurements and estimate uncertainty
- Best estimates and associated uncertainty for each asset after measurement and reconciliation

Company specific methods:
- Source level direct measurement;
- Company/asset specific measurement based emission factors/methods;
- Engineering calcs (as appropriate);
- Or any combination
Level 5 Reporting Process

Reconciliation is
- An iterative process of investigation
- Should not be thought of as a one-off comparison of two independent values.

The process, like the knowledge, will evolve over years – the focus is on making credible progress year over year.
Level 5 Reporting – An Illustration

Level 4 – Source level necessary for mitigation

Total = x

Site level measurement

Total = y+/-z

Investigate sources of discrepancy

Revise source level inventory to reflect learning

Level 5 Total
**Illustrative Approach of Sampling Strategy**

**Starting Point** - Depends on the materiality of the asset, availability of L4 details, etc…

No single sampling strategy can be identified - operators should use judgement to ensure representative sampling and provide justification of the approach.

<table>
<thead>
<tr>
<th>Site</th>
<th>Simple*</th>
<th>Complex*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small population (&lt;10)</td>
<td>10-20%</td>
<td>&gt;20%</td>
</tr>
<tr>
<td>Medium population (10-100)</td>
<td>10-15%</td>
<td>&gt;15%</td>
</tr>
<tr>
<td>Large population (&gt;100)</td>
<td>5-10%</td>
<td>&gt;10%</td>
</tr>
<tr>
<td>Mega population (&gt;1000)</td>
<td>&lt;5%</td>
<td>&gt;5%</td>
</tr>
</tbody>
</table>

Increasing sampling

<table>
<thead>
<tr>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site = Sum of source level (level 4)</td>
</tr>
<tr>
<td>Site level measurements</td>
</tr>
<tr>
<td>Reconciliation: Understand this discrepancy to improve the final answer</td>
</tr>
</tbody>
</table>

**Notes**

- Low contribution to materiality of emissions
- High contribution to materiality of emissions

*Complexity in terms of emissions distribution or site/infrastructure typology

Selection of sampling size should consider technical, time, and resource constraints.

Decrease the green area over time!
Uncertainty & Reconciliation

- Reconciliation should be carried out between emissions data which have been determined on the same basis.
  - Unique facilities or small number of facilities basis - Sampling strategy to ensure that the sum of source-level emissions is corroborated by site-level measurements at one or more points in time.
  - A population of sites basis - Sufficient site-level measurements to be representative over time. Monte Carlo analysis (or other appropriate statistical methods) can be used.
- Reconciliation requires an estimate of uncertainty for both L4 estimates and site level measurements.
- Ideally, L5 reported emissions would be derived where there is reasonable agreement between uncertainties of the two. Otherwise endeavor to understand the source of disagreement and incorporate any adjustment (increase or decrease as appropriate) to the asset level (L5) reported value.
- Operators should apply judgement and focus on reducing uncertainty where it matters most.
Thank you

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