Storengy France experiences as UGS operator within OGMP 2.0

MAY 2022
OUR PRESENCE IN France and OUR AMBITION

- Storengy France is focus on methane emissions monitoring and reduction since 2015
- Storengy France contributes to 0,1% of national methane emissions
- Methane emissions count about 50% of CO2eq direct emissions (Scope 1)
- Storengy joins OGMP 2.0 in September 2020 with a double objective:
  - Improve methane emissions monitoring/reporting ➔ L4 reporting on material sources by 2024 (2023 year reporting)
  - Reduce at least 25% of methane emissions by 2025

GOLD STANDARD

14 UNDERGROUND STORAGE SITES

10 GM3 IN CAPACITIES FOR GAS STORAGE

620 EMPLOYEES

1/4 OF FRENCH CONSUMPTION

* Implementation plan approved for data quality improvement
Design of a UGS site of Storengy France

Sources of methane emissions:
- Compressors
- Well heads...
- Gas treatment units
- Laboratoires
- Vents du to maintenance actions, works...
- Incidents
- Leaks
- Incomplete combustion

Injection withdrawal
Injection
Transport pipelines
Gas to/from Wells Manifold
Gas Compression
Gas metering
Wells
Sulphur removal unit
Water removal unit
OGMP 2.0 UGS reporting & Implementation Plan – an overall overview

1. **Compression activity methane emissions**, material source

   - From compressor seals
     - Technology suppliers and literature based EF - **Level 3 for all sites except for 2 sites that are reporting Level 4**
     - To reach **Level 4**, Storengy France is installing best solutions to ensure continuous monitoring.

   - From startup phase
     - Calculation based on the geometrical volume of the loop and the inlet pressure (aligned with international standards) - **Level 4**. Measurements under progress to validate procedure - **Level 3** reporting for 2022

2. **Depressurized shot-down**

   - Emissions calculated based on geometrical volume of the loop and the settled out pressure - **Level 4**

3. **Purging, Vents and incidents (compression, wells and gas treatment units)**

   - Engineer calculations using the volume section of the pipe/equipment and the pressure conditions - **Level 4**
OGMP 2.0 UGS reporting & Implementation Plan – an overall overview

3. **Methane Leaks (fugitive emissions), material source**
   - LDAR campaigns coupled with emissions quantification on all components of each UGS sites
   - IR camera (FLIR system) for detection coupled with FID analyzer for quantification according to EN 15 446
   - Quantification employing methodology recognized by international standards and certificated bodies - **Level 4**

   ➔ 2022 LDAR campaign compatible with regulation project with detection level at 500 ppm

   ➔ Experience (1st results):
     - Campaign duration x 3 (FID analyzer instead of IR camera for leak detection)
     - Supplementary emissions concerning 1% of total leaks

4. **Laboratory emissions, material source**
   - Methane emissions are currently quantified through direct measures via a flowmeter and/or engineering calculations can also be carried by taking into consideration the flowrate and the pressure on the fast loops of the sampling lines - **Level 4**

5. **Incomplete combustion, non-material source**
   - Generic EF for compressor turbines and engines - **Level 3** except for 1 site (material source) where specific direct measurement are performed regularly - **Level 4**
   - Generic EF for TEG regeneration flares - **Level 3**, EF from direct measurements for economizers - **level 4**.
Level 5 an important challenge on reconciliation source level and site level measurements

**Storengy France strongly committed in different initiative/studies:**

- Internally benchmark studies screening all available technologies in the market
- GERG project on Site level technologies experimentation in collaboration with a large group of gas operators actors
- Real UGS conditions drone campaign experimentation performed in mars 2022 at Saint-Illiers site in parallel of LDAR campaign (IR/FTIR analyzer and bagging for quantification at source level)
- Storengy France will keep active in this point in order to identify the best accurate solution for reach Level 5.
Main progress on OGMP 2.0 Reporting and Implementation Plan

• ~80% of material methane sources are reported in 2022 (reporting year 2021), according to TGDs specifications, at Level 4 (main progress)

• Storengy France is installing the best solutions to ensure continuous monitoring of methane emissions from compressor seals and reach level 4

• Incomplete combustion will normally remain a non-material source that reported mainly at level 3 (expect for some systems that are already reported Level 4)

• Storengy France will proceed efforts on Site Level technologies and reconciliation with Source Level measurements
Merci

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