Monthly Methane Mondays: Industry views on the EC proposal for a regulation on methane emissions reduction in the energy sector. TAP case

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TAP in a nutshell

Diversity and security of energy supply for Europe

- TAP is the European leg of the Southern Gas Corridor, a value chain that improves the security and diversity of energy supply, by connecting European markets to new sources of natural gas in the Caspian Sea.
- 10 bcm/a initially available from Shah Deniz II corresponds to the amount of energy necessary to supply 7 million households in Southeastern and Western Europe.
- 878 km pipeline (550 Km in Greece, 215 Km in Albania, 105 Km offshore, 8 Km Italy), 2 compressor stations and 1 pipeline receiving terminal.
TAP in a nutshell

- TAP started operation in Dec 2020 being 2021 its first operating year. BAT installed

- Since the beginning TAP has implemented voluntary mechanisms in identification and quantification GHG emissions including Methane emissions

- Definition “Energy Transition Strategy” and “Carbon Management Plan” with emission reduction targets

- OGMP 2.0 (2022 level 2-3, 2023 level 3-4, 2024 level 4 and 2025 Level 4-5)
TAP GHG emissions analysis 2022

- Direct emissions (Scope 1) represent 98.3% of total emissions

- Indirect emissions related to electricity consumption (Scope 2) represent 1.7% of total emissions

- 94.6% of the TAP GHG emissions corresponds to CO2 emissions, generated mainly during the combustion of natural gas and diesel in stationary sources (emergency systems (power generation and firefighting equipment, gas turbines, gas generator and boilers).

- CH4 emissions, represent 5.4% of the footprint, are mainly due to emissions from natural gas vents and fugitive emissions.

- The emissions generated by the compression station and PRT account for more than 99% of the total footprint emissions, mainly due to self-consumption of natural gas in turbo-compressors.

- Emissions from transmission networks represent 1.2% of total emissions.

- Emissions from the vehicle fleet represent 0.03% of total emissions.

- Emissions from the electricity of TAP offices represent 0.10% of total emissions.
- 90.3% of emissions are generated by self-consumption of natural gas in **turbo-compressors** located in the compression stations.
- Emissions from **boilers and gas generators** represent 2.52% of total emissions.
- Methane **vented** in normal operations, maintenance, special operations and emergency operations represent 3.6% of total emissions.
- **Fugitive emissions** (methane) identified during Leak Detection And Repair (LDAR) campaign are currently responsible for 1.8% of GHG emissions.
- The **rest** of the emission sources (**Energy production, firefighting system, vehicle fleet and electricity consumption**) represent 0.12% of total emissions.
LDAR campaign

✓ A fugitive emissions detection and quantification campaign (HYBRID LDAR measurement campaign) was carried out in a series of facilities selected by TAP located in Greece, Albania and Italy in Sept-Oct 2021.

✓ The scope of this campaign was the identification and quantification of fugitive emissions at selected TAP facilities. For this purpose, all structures and components susceptible to fugitive emissions were reviewed. This review consisted of a hybrid fugitive emissions detection sampling (HYBRID LDAR), through initial identification by a FLIR GFx-320 infrared camera and subsequent concentration measurement with a SENSIT HXG-3P quantification equipment.

Methodology: Method EPA 21 and EN 15446:2008

The components to be sampled were those prone to fugitive emissions (leaks):

- **Valves (V):** In valve housings consisting of multiple parts, it was measured at all points where it could leak. When valves are installed with flanges, these are generally considered as separate components rather than part of the valve and will be included in another category of leakage points to be cited below (Other: where flanges are included).

- **Connectors (C):** This category includes all types of threaded joints, fittings, threaded plugs, etc.

- **Other (O):** Flange, blind flange, etc.

- **PSV'S or Safety Valves (PSV):** In most of these mechanisms it is difficult to sample at the seat seal. They usually leak through the body flange, cap and, if applicable, tube (atmospheric outlet).

- **Open End (OE):** Vents, Exhaust, Flowmeter condenser purges, etc.
LDAR campaign

Once the leak was identified and quantified, it was labelled.

As for the labels, 3 colours are used according to the concentration detected:

- **Green**: For points whose concentration is higher than 500 ppm (leakage threshold) and does not exceed 10,000 ppm.

- **Yellow**: For points whose concentration is between 10,000 and 50,000 ppm.

- **Red**: For those points exceeding 50,000 ppm (clamp value).

In parallel, each and every one of the detected leaks were recorded in a **Field Sheet** for subsequent computer processing and to obtain the methane emission rate (TonCH4/year).

**Block Valves**

An extrapolation has been done per country (GR and AL) considering worst case scenario from the highest value obtained.
LDAR campaign. Main conclusions

✓ **Zoning**: The zones with the highest number of points with detected leaks correspond to turbocompressor.

✓ **Priority**: of the total fugitive emissions initially identified in the campaign after the parallel repair, 114 were considered high priority (red label), 30 medium priority (yellow label), 46 low priority (green label).

✓ **Component**: the component with the highest number of emission points and the highest emissions was the Open End (OE), (aprox. 60% of the emission rate).

✓ Only 5 flanges have presented fugitive emissions out of the total number of flanges verified

✓ An action Plan is ongoing to mitigate the leaks identified

**2022: Target testing and Emissions reductions opportunities**

- Target testing
- List of measures for each source of emission and Methane Emissions Reduction Plan
- Setting of emissions reduction targets
- Yearly calculation methane emission footprint using OGMP 2.0 reporting questionnaire and guidelines

**2023: Methane emissions monitoring programme (3 countries)**

- LDAR campaign to ensure that targets identified are being met, according to measures implemented in the methane reduction plan
- Yearly calculation methane emission footprint using OGMP 2.0 reporting questionnaire and guidelines.
Thank you!

Thanks to non-invasive technologies, TAP preserved a small holm oak wood in Italy, located along the pipeline route. We also planted 117 new trees, enhancing this precious ecosystem. The shape resembles a green heart - perfectly capturing the bond established with the local territory.