FIELD REPORT – Gasverdichterstation Holtum (Gasunie) monitoring report 2025

Clean Air Task Force – Théophile Humann-Guilleminot

August 2025

Executive summary

Clean Air Task Force (CATF) conducted an Optical Gas Imaging (OGI) inspection campaign at selected sites, including Gasverdichterstation Holtum in Holtum, Lower Saxony, Germany (operated by Gasunie). The objective of the fieldwork was to identify and visually document methane emissions from the compressor units and pipelines. CATF conducted on-site, fence-line, inspections using advanced optical gas imaging technology, gathering videos and images documentating any visible plumes.

CATF documented **five major methane releases** from blowdown at the main vent stack of the facility as well as routine venting from the same stack over multiple days. All the images were documented from the public road.

Timeline:

CATF conducted five visits of approximately one hour at the facility, over the course of a 48-hour period.

August 12th:

- 14:00 CET

August 13th:

- 8:00 CET
- 13:00 CET
- 16:00 CET

August 14th:

- 13:00 CET

- Localisation of the facility : Gasverdichterstation Holtum der Gasunie

Photographed August 12nd, 2025. Entrance sign of the gas compressor station of Holtum.

- Vent stack : 52°58'47.7"N 9°18'04.0"E

Photographed August 13th, 2025. Vent stack of the gas compressor station of Holtum.

2. Methodology

2.1 Equipment and Principles

The field campaign used a **FLIR GF320 Optical Gas Imaging (OGI) camera**, fitted with a **6° narrow-angle lens** to allow long-range, high-precision detection of methane emissions. The GF320 is equipped with a **cooled Indium Antimonide (InSb) detector**, operating in the **3.2–3.4 µm** band—ideal for detecting methane and other volatile organic compounds (VOCs).

Methane strongly absorbs in the mid-infrared range. By filtering the camera's spectral response to match this absorption window, methane plumes can be visualized as dynamic, semi-transparent clouds against thermally contrasting backgrounds.

The 6° lens increases optical magnification, enhancing resolution and plume visibility across large or complex installations such as piping networks, compressors, and pressure valves.

All inspections were conducted under ambient conditions during daylight hours. Operator ensured:

- Stable imaging geometry (when possible)
- Optimal background contrast (e.g., sky, vegetation)
- Minimal interference from wind and atmospheric instability

Limitations

- Reduced sensitivity under high wind or humidity
- Detection limited below ~1–5 g/h (depending on conditions)
- Background clutter and visual obstructions may obscure emissions

Key Advantages of OGI

- Remote methane detection
- Real-time visual documentation
- Rapid scanning of large sites
- Minimal operational disruption

2.2 Inspection Conditions

All inspections took place during daylight hours on **12 August-14 August 2025**, under optimal and suboptimal weather conditions (low humidity, uniform bluesky on August 13 and cloudy on August 12 & 14). Imaging protocols followed ISO best practices for fence-line, including:

- Optimal viewing geometry and background contrast
- Visual confirmation of emissions persistence and consistency
- Field annotations and GPS tagging of footage and recording of vantage point

Photographed August 14th, 2025. Suboptimal background with clouds. The positioning of the camera was decided to maximize the background contrast using the pocket of bluesky surrounded by clouds.

Photographed August 13th, 2025. Optimal background with uniform bluesky.

2.3 Confidence in methane detection and false positive mitigation

To ensure the reliability of visual detections and minimize the risk of false positives, several verification steps were implemented during the field campaign:

To confirm that the observed plumes were not artifacts caused by background motion or environmental interference, the apparent direction and dispersion of each emission were cross-checked against the prevailing wind direction. Valid plumes consistently moved downwind and were visually anchored to credible emission sources.

Baseline footage was recorded from unobstructed background areas (e.g., open sky, solid structures) to identify false visuals potentially caused by thermal shimmer, reflected sunlight, or atmospheric moisture. These control frames provided a visual benchmark, helping to distinguish true gas emissions from heat-related distortions or background clutter.

The GF320's narrow-bandpass filter is optimized for detecting methane and other hydrocarbons in the 3.2–3.4 µm absorption range. While gases like carbon monoxide (CO) and carbon dioxide (CO_2) may absorb in adjacent spectral regions, they do not produce the

same visual signature or intensity in the filtered infrared spectrum. Confidence that the detected plumes were primarily methane was based on the following:

- Use of a methane-tuned spectral filter
- Emission sources located within known methane-handling infrastructure
- Consistency in plume behavior with established methane emission patterns

2.4 Surveyor

CATF's field surveyor was Théophile Humann-Guilleminot, certified level 1 ITEMA Optical Gas Imaging thermographer (obtained: May 2022). Humann-Guilleminot has completed more than 500 O&G site inspections across Europe and Australia and his thermography work has been used by public, private, and non-profit organizations.

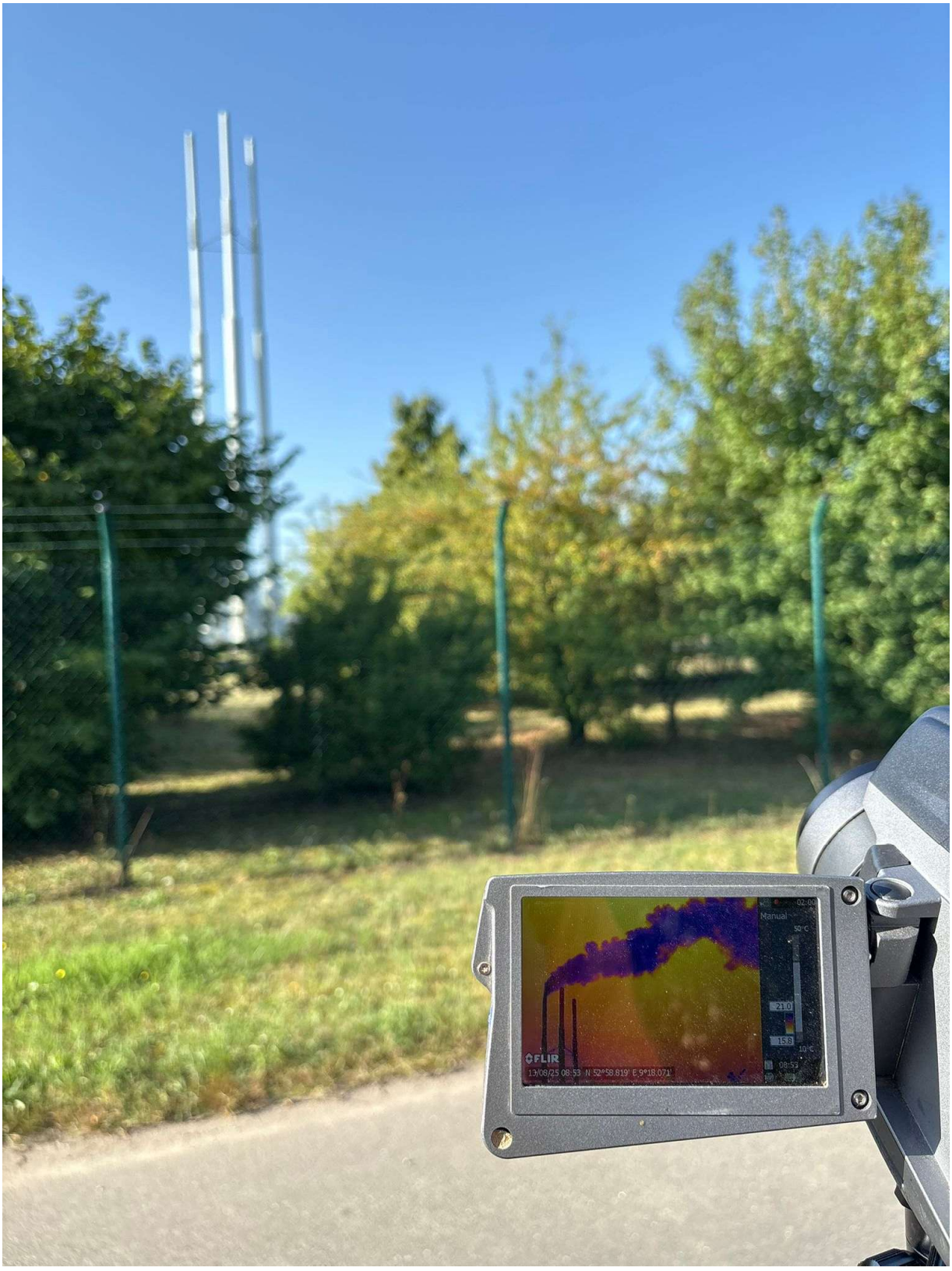
Logistical and documentation support was provided by CATF staff member .

3. Site Inspection Summary

Overview

The facility was active during the period of the fieldwork, at every time visited, including one of the two compressors.

Photographed August 12nd, 2025. Setup of the camera.


FLIR
13/08/25 08:53 N 52°58.819' E 9°18.071'
Manual
50 °C
21.0
15.8
10 °C
08:53

Photographed August 13th, 2025. Setup and captured emissions from controlled release from the main vent stack.

- **Vent stack**
    - **Vent stack :** 52°58'47.7"N 9°18'04.0"E
    - **Localisation of the ventage points of filming:**

- 52°58'49.3"N 9°18'03.5"E

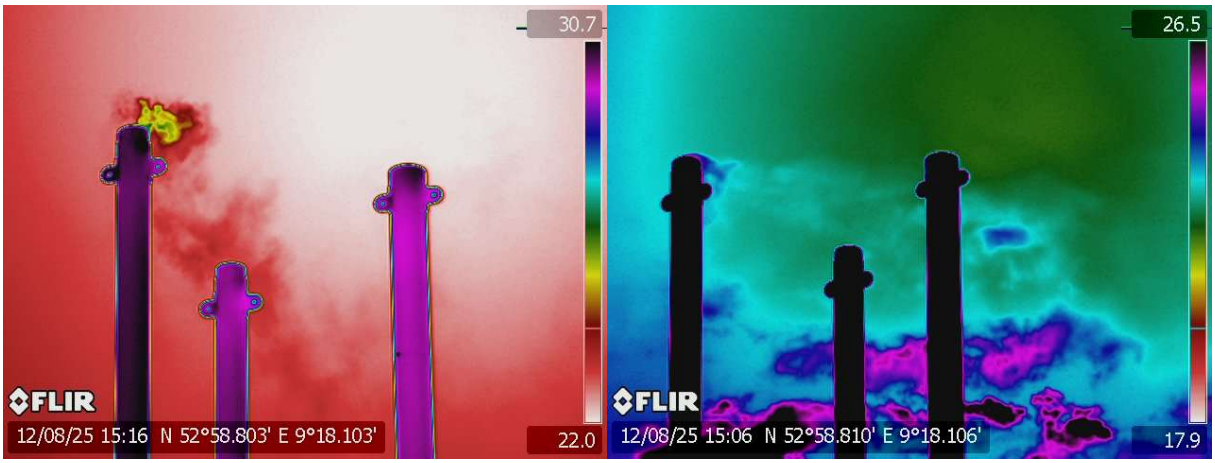
- 52°58'48.4"N 9°18'06.4"E

The distance of filming was 50-70 meters without accounting for the height of the vent stack.

Description of findings : Continuous and intermittent methane emissions from the central vent stack of the facility. The vent stack and plume were cold and emissions could be followed over a few hundred meters in the sky during controlled releases.

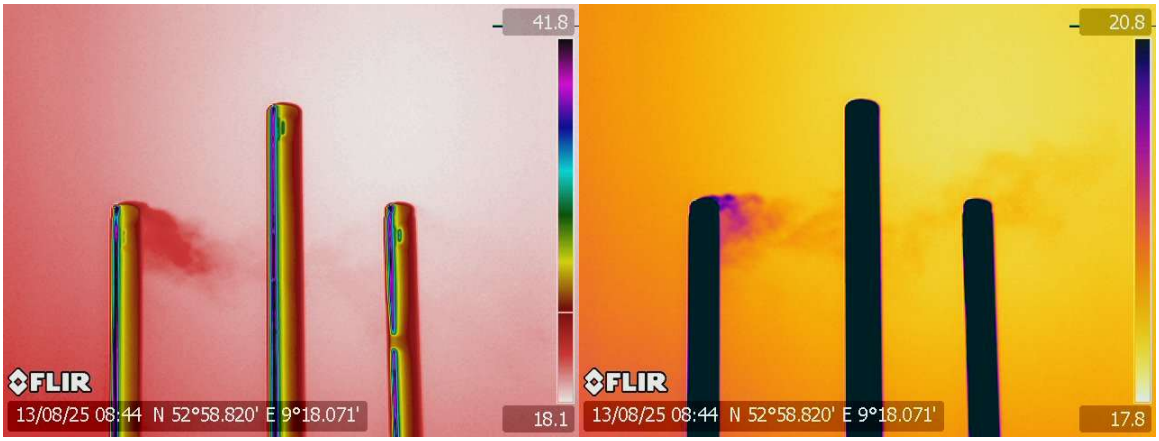
- **Visit 1 : August 12nd, 14:00**

Central vent stack (routine venting)

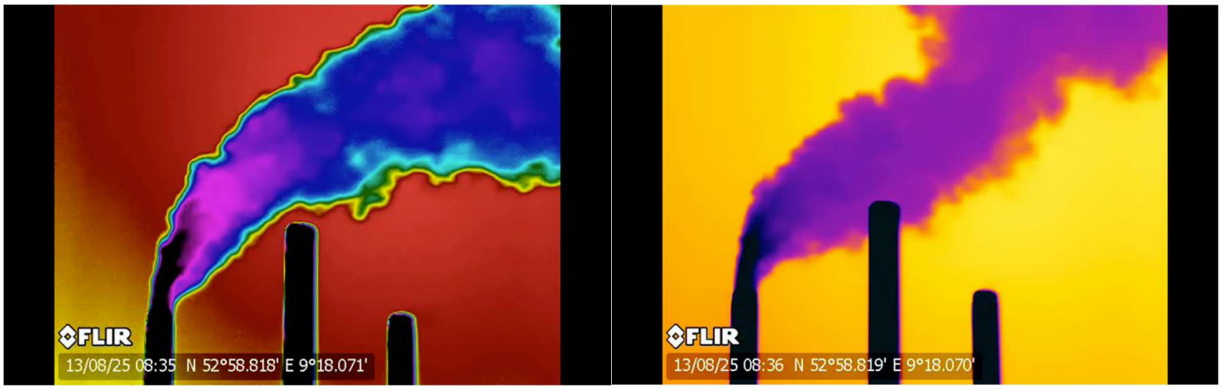


- **Visit 2 : August 13th, 8:00**

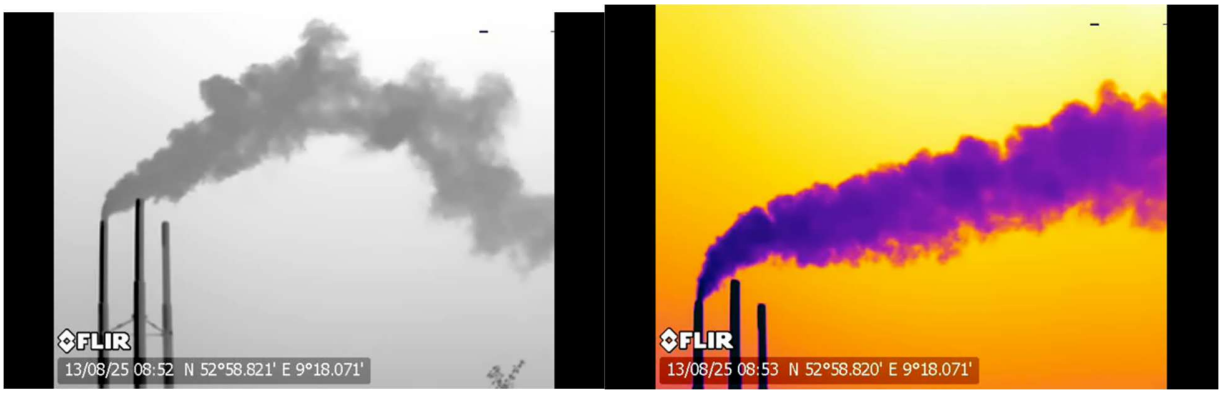
Central vent stack (routine venting)



Central vent stack (first controlled release – 8:35 – duration : 1min)



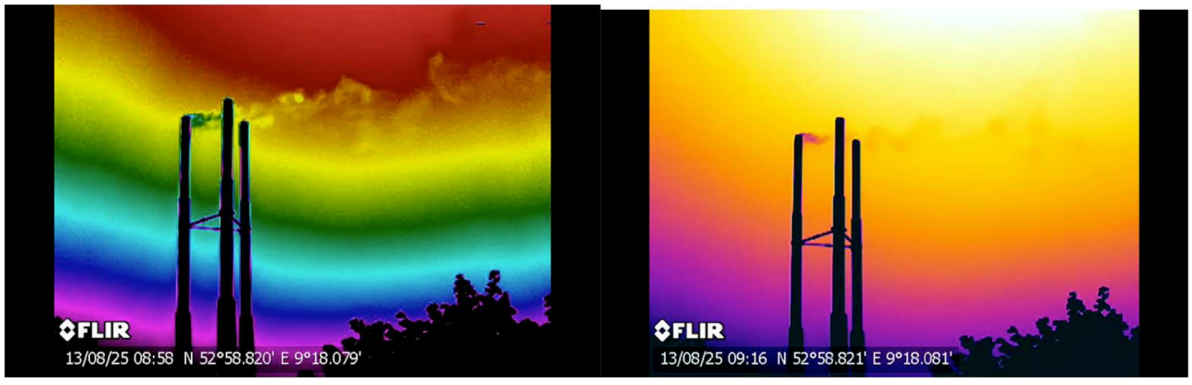
Central vent stack (second controlled release – 8:52 – duration : 1.5 mins)

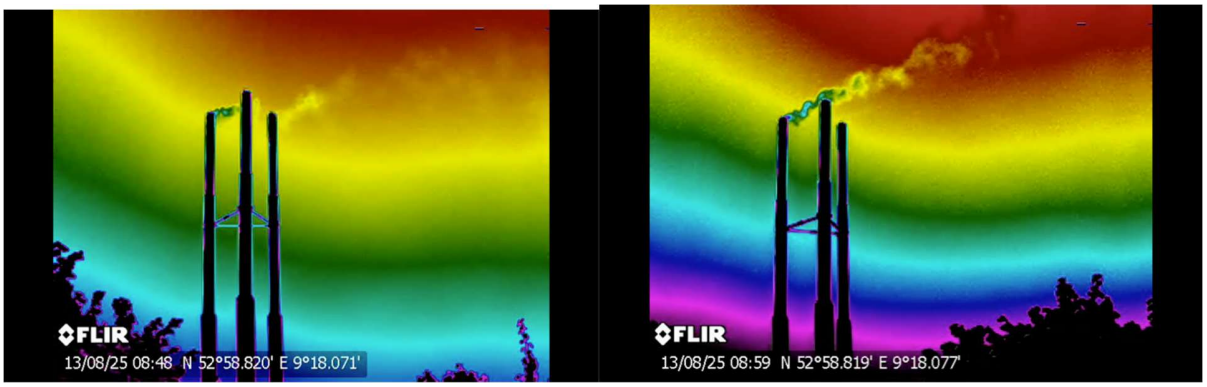


Central vent stack (third controlled release – 9:09 – duration : 1min)

Central vent stack (fourth controlled release – 9:24 – duration : 2min)

Inbetween each controlled release, routine venting continued

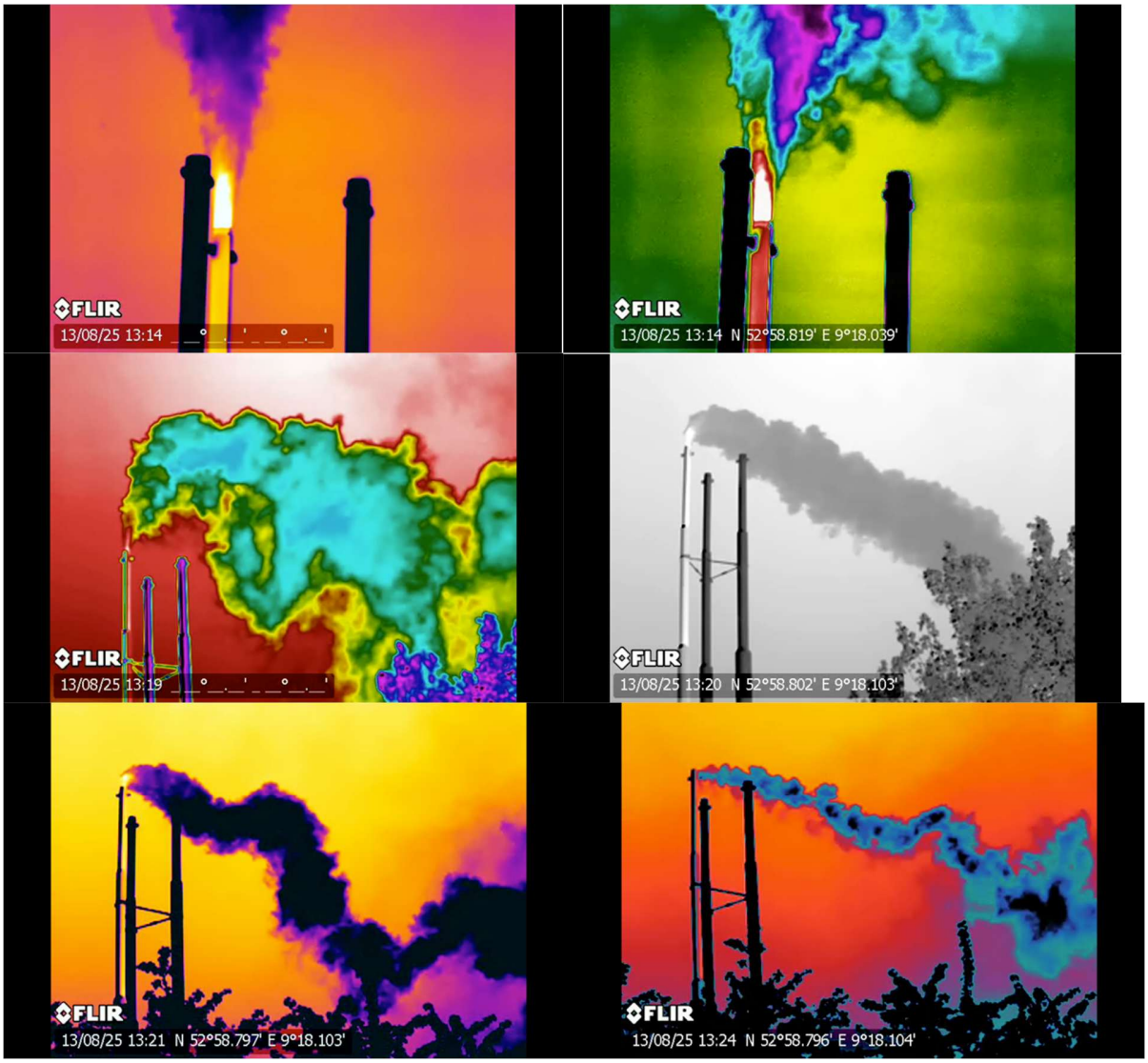




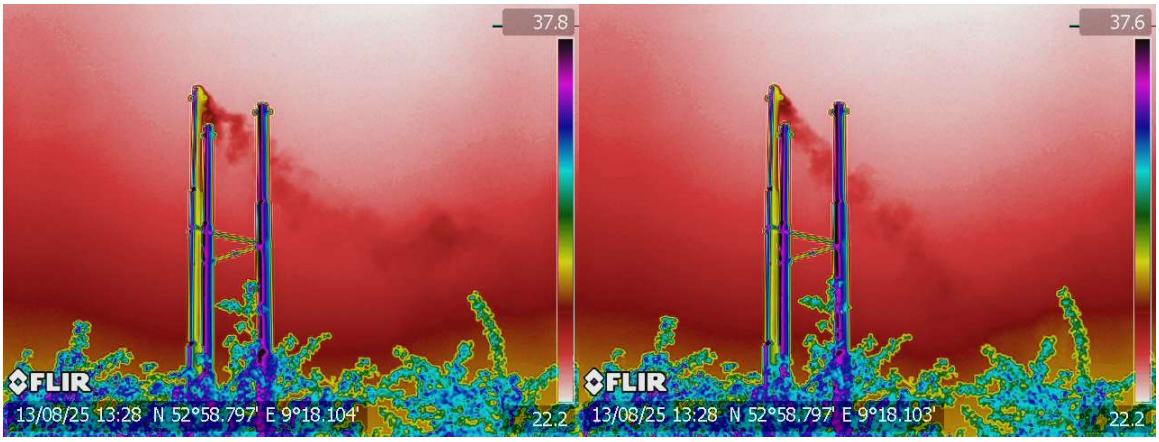
- **Visit 3 : August 13th, 13:00**

Central vent stack (blowdown – 13:09 – duration : 15mins)

The first minutes of the event were not recorded due to the OGI camera cooling down. The exact start time was recorded using the noise of the gas going through the vent stack (see below in additional notes).

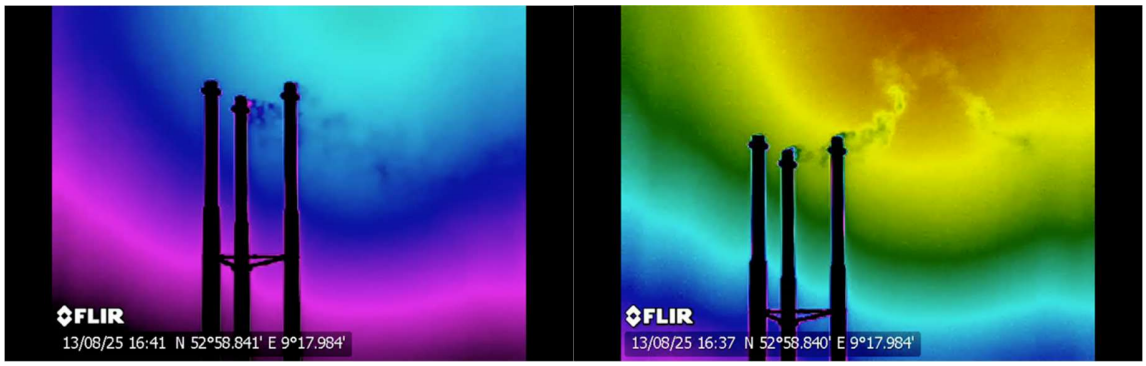


Central vent stack (routine venting)



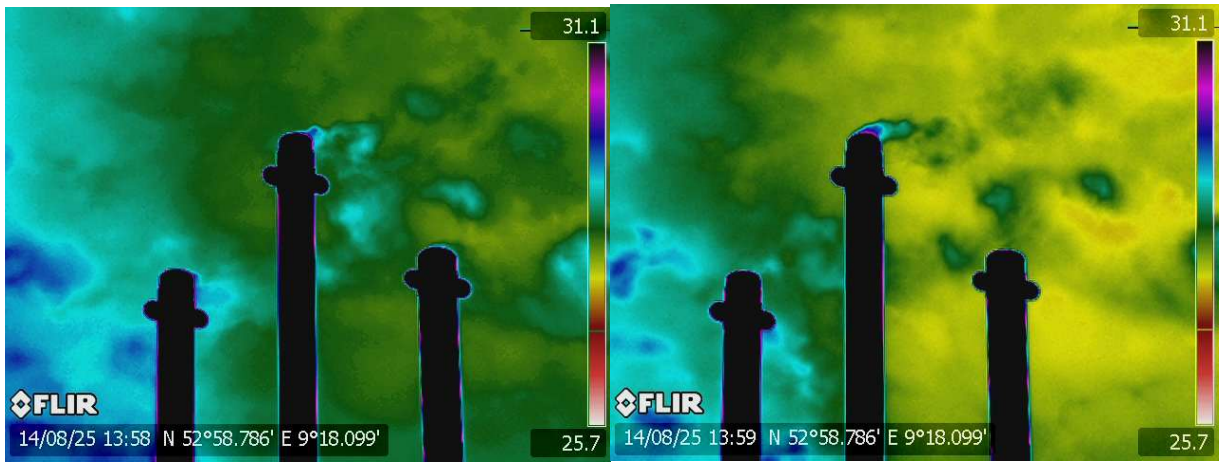
- **Visit 4 : August 13th, 16:00**

Central vent stack (routine venting)



- **Visit 5 : August 14th, 13:00**

Central vent stack (routine venting)



4. Additional Notes

The temperature ranges displayed on the still images give an indication that the gas vented from the stacks is at near ambient temperature and no heat/combustion is visible on the footage. During the blowdown on August 13th at 1pm, the gas is hot at the exit point (tip of the vent stack) due to the very high pressure and flow. The temperature of the gas becomes ambient a few meters away from the tip.

During the controlled releases (venting), the characteristic sound of gas going through the block valve could be heard. The exact start and finish times confirmed the sound attribution to the gas going through the vent stack.

Recording of the sound can be found in the folder additional content.

The compressor station was situated in a location with little access to network that can explain the camera's loss of GPS coordinates in some parts of the recorded footage.

In addition, CATF documented additional venting from the active compressor unit at the facility. The emissions were consistent with venting by design compressors.

- Location: 52°58'43.7"N 9°18'01.1"E

Attachments:

- Infrared footage
    - Vent stack
    - Additional vent emitting
- Still Frames (JPEG)
- Digital pictures (phone and digital camera)
    - Equipment surveyed (vent stack)
    - Others

Prepared by:
Théophile Humann-Guilleminot
Clean Air Task Force
thumann@cleanairtaskforce.org