THE PERVASIVE PATTERN OF METHANE POLLUTION



FROM MND OPERATIONS IN SOUTH MORAVIA

2026

CDE Center for Transport and Energy

CATF CLEAN AIR TASK FORCE

CONTENTS

Executive Summary	3
Organizations and Experts	4
Campaign Scope and Regulatory Context	5
Methodology and Limitation	6
Key Findings	8
MND Oil Production	9
Gas Storage CZ	13
Conclusions and Recommendations	15

Executive Summary

Clean Air Task Force (CATF) and Centrum pro dopravu a energetiku (CDE) surveyed 48 oil and gas sites operated by MND and Gas Storage CZ in South Moravia in September 2026. Using optical gas imaging (OGI), the team surveyed 48 sites and documented visible hydrocarbon plumes at 31 of them (with 44 individual emission sources). Nearly 60% were fugitive emissions and about 40% were intentional venting, principally from pressure-relief valves or hatches on storage tanks and stacks.

The situation observed at MND facilities was particularly egregious. Emissions were found at 24 of the 27 MND sites observed. This included very large and continuous releases from crude-oil storage and separation equipment, as well as widespread leaks from valves and other components. The scale, frequency and recurrence of these emissions provide little visible evidence that MND is implementing the European Methane Regulation's core requirements: preventing and minimising emissions, controlling venting, and implementing effective leak detection and repair (LDAR).

By contrast, emissions were detected at 7 of 21 Gas Storage CZ sites. Although the leaks documented there also require repair, the scale of the emissions was smaller, and no intentional releases of methane were observed, showing better performance comparatively, as well as preparedness to implement the EU Methane Regulation (EUMR).



MND crude oil storage, SNS Dambořice;
photo from normal camera and from infrared camera capturing emissions.

Organizations Experts

Clean Air Task Force (CATF)
is a global climate organization working to advance the full range of solutions needed for a healthy climate and a thriving planet. Founded in 1996, CATF conducts research and analysis to identify promising solutions, then works across governments, industry, and partners in more than 40 countries to deliver them at scale. It takes no funding from governments or the industries it works to influence, so its analysis and advocacy follows the facts. Over 30 years, its work has helped shape major climate and energy policy around the world. CATF is consistently recognized as one of the most effective climate organizations in the world by independent evaluators including Giving Green and Founders Pledge. Learn more at cleanairtaskforce.org.

Théophile Humann-Guilleminot (CATF)
is the Senior Manager, Emissions Monitoring and Fieldwork, on the Methane Pollution Prevention team. By leading campaigns and revealing the extent of methane pollution at oil and gas facilities, he supports civil society groups and environmental organisations' actions in reducing methane emissions in their countries.

The Centre for Transport and Energy (CDE)
is a non-governmental, non-profit organisation that has been providing expert perspectives on an energy transition that is considerate of both people and the climate for over twenty years. We advocate for ambitious and fair climate policy, monitor the use of public funds, and collaborate with public authorities, the business sector, and academia. We strive for a climate-neutral world.

Nika Murzynová (CDE)
specialises in issues related to reducing methane emissions in the energy sector, accelerating the phase-out of fossil gas, and decarbonisation of district heating. They have a background in applied physics and experience in research work at the European Parliament, focusing on energy and climate legislation

01
Campaign Scope and Regulatory Context

The survey covered 27 MND facilities (25 oil well pads and 2 central facilities) and 21 Gas Storage CZ (19 well pads and 2 central facilities) during the period September 14 - 18.

CDE and CATF also surveyed facilities in Czechia in 2021, 2024 and 2025. The sites covered in **this year's campaign** were chosen based on previous fieldwork experience in the area and to maintain data consistency across the two sectors and various sites connected to central locations. A number of sites were revisited because emissions had been documented there in previous years, providing continuity across fieldwork campaigns. Sites with particularly large or potentially hazardous emissions were also revisited on subsequent days during the 2026 campaign.

The European Methane Regulation (EUMR) applies to domestic coal, oil and fossil gas production and to fossil gas transmission, distribution and underground storage within the EU. It requires operators to quantify and report emissions, establish leak detection and repair (LDAR) programmes, inspect components at prescribed intervals and repair leaks above applicable thresholds. It also restricts venting and flaring, the intentional release and/or disposal of methane gas, and requires operators to prevent and minimise methane emissions.

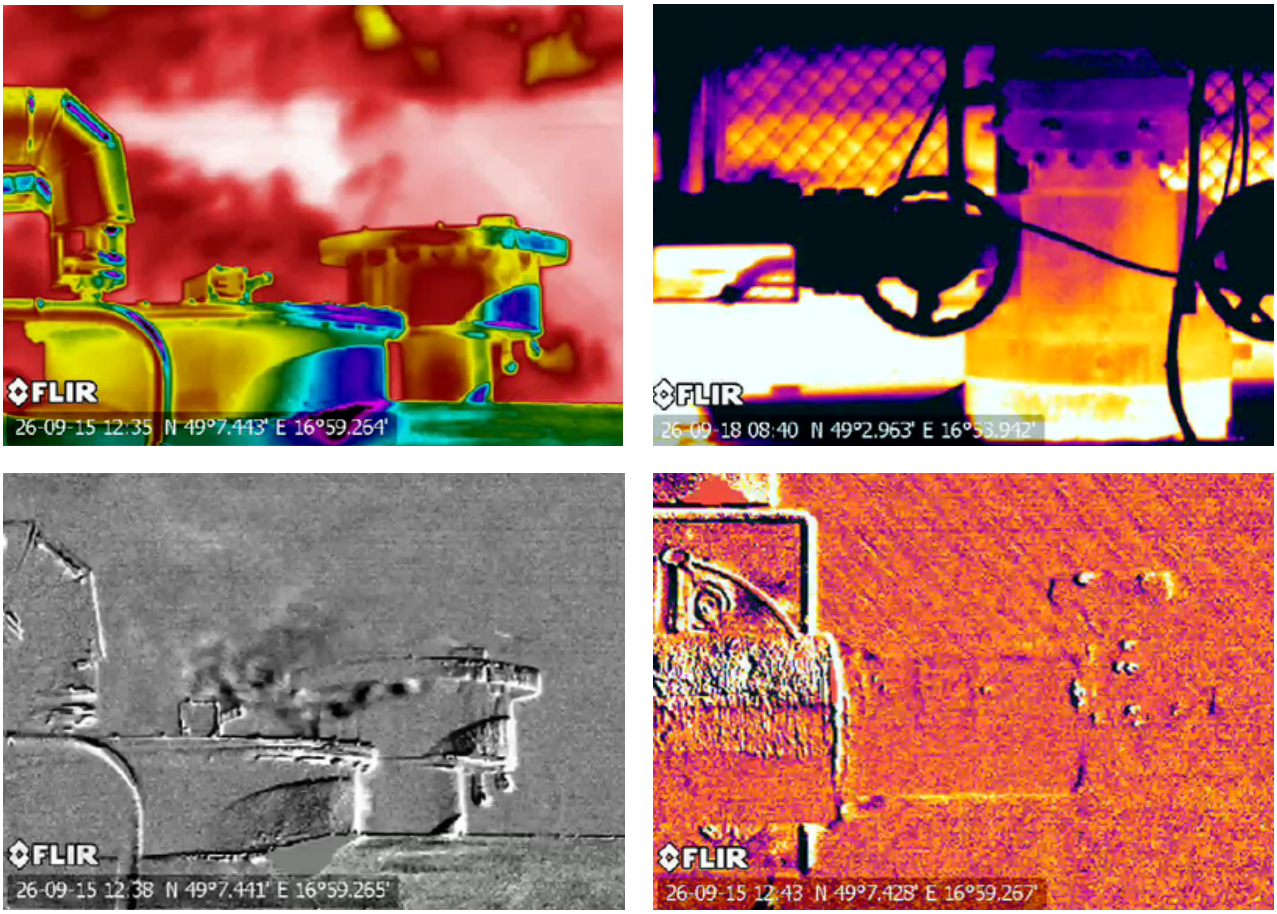
An overview of the **state of the implementation** of EUMR in Czechia has been carried out by CDE in partnership with Ecologic Institute in 2025. The analysis remains relevant today as it was at the time of publication, since the adoption of the crucial provisions into the Czech legislative system has stalled. Despite the delays in implementation at the national level, obligations set in the Regulation are in force, and compliance must be ensured.

02
Methodology and Limitation

The survey used a FLIR GF320 OGI camera with a 6° narrow-angle lens. OGI makes methane and certain other hydrocarbons visible when atmospheric and background conditions provide sufficient thermal contrast. The footage was recorded and assessed by Théophile Humann-Guilleminot, a certified Level 1 ITEMA OGI thermographer. Field notes and location data were recorded for the observations.

These observations are qualitative: they identify visible plumes but do not quantify emission rates. Descriptions such as "large" reflect the thermographer's experienced visual assessment rather than a measured flow rate.

A non-detection is not proof that a site was methane emission-free. Detectability varies with wind, humidity, distance, viewing angle, background contrast, operating conditions and obstructions. Inspections were conducted during daylight, primarily from publicly accessible land outside facility fence lines. CATF also uses a tripod to stabilise the camera and reduce vibrations and possible false positives.



Various OGI camera colour scales and modes: Rainbow High Contrast / Iron / Gray High Sensitivity / Iron High Sensitivity

What is Optical Gas Imaging and How Does it Work

Optical Gas Imaging (OGI) uses specialised infrared cameras to make invisible gas emissions visible. Infrared energy is part of the electromagnetic spectrum and behaves much like visible light. Our eyes don't see it, but instruments can - just as a car radio can detect signals we can't see. Each works with a different part of the spectrum.

All objects emit infrared radiation; warmer objects give off more of it. The thermal imaging camera FLIR GF320 detects temperature differences between objects or surfaces, and it has a special filter tuned to the 3.2-3.4 micrometre range. Methane and many other hydrocarbon gases absorb infrared energy in this range.

When a gas plume sits between the camera and a background (the sky, a pipe), it absorbs some of the infrared coming from that background. Where the plume is, the camera sees a slightly different amount of infrared than the surrounding area, and that difference shows up as a moving shape on the screen. To see a plume, a temperature difference of roughly 2°C between the gas and its background (e.g. the ground, sky or a wall) and plume movement caused by the wind are needed.
To help users see plumes clearly, the camera has several colour palettes, most commonly greyscale and ironscale, as well as a high sensitivity mode, which enhances plume detection.

Four conditions must be met for a successful detection:

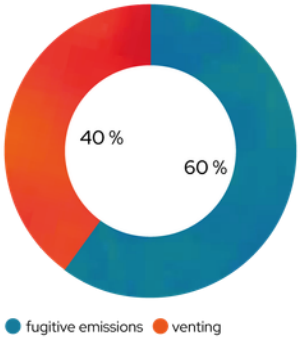
1. **A source of emission is present:** the camera is highly sensitive and, in ideal conditions, can detect small methane leaks at a short distance. However, not seeing a source doesn't mean none exists, as the other conditions also matter.
2. **The weather allows detection:** moisture in the air blocks infrared energy, so the camera cannot properly detect small sources when used in rainy, snowy or foggy conditions. If the wind is too strong, it can also lead to missed leaks (false negatives).
3. **A source is in line of sight:** detection can be limited by the presence of visual obstruction in front of a potential source, or if a hot object is behind the plume.
4. **The camera operator is qualified:** the results depend on adjusting focus, speed of survey, sensitivity modes and temperature ranges. That's why the CATF thermography team has trained through ITC and ITEMA and is certified in optical gas imaging.

To learn more about detection technologies, optical gas imaging and surveys: https://www.catf.us/resource/leak-detection-and-repair/

03
Key Findings

- 44 individual emission sources were documented across the campaign at 31 unique sites:
  - about 60% of documented sources were fugitive emissions
  - about 40% were venting
- Routine venting still occurs at MND facilities despite the entry into force of the restrictions on this practice in February 2026.
- Releases were concentrated at crude-oil storage and separation equipment, while leaks were observed from wellheads and gathering lines, mainly from gauges, valves, or bolted connections. Two were significant enough to be visible 15 meters away at the Hos-101 and Hos-102A wellpad in Dambořice. Three leaks were documented on a single well (ZD-65) in Mourinov.
- Continuous venting from the top of oil storage tanks at MND's SNS Dambořice site was confirmed by repeated visits during the campaign, confirming methane detection at this facility in 2021, 2024 and 2025.
- Based on past observations and campaigns, we can conclude that the problem with both intentional release of emissions and leaks across MND operations is widespread and systemic.
- At Gas Storage CZ sites, detected sources were mostly fugitive emissions, which can be prevented and repaired with a rigorous LDAR programme.
- No emissions were documented from the main stack at the active Tvrdonice underground gas storage facility during the survey. Stacks and vents are a recognised potential methane source at gas storage sites, typically from process vents. The EUMR introduced restrictions on routine venting and flaring, so this result is consistent with compliance at the time of the survey. As a single point-in-time survey, intermittent or non-routine venting could not be ruled out.

GRAF 01
Documented Emissions



GRAF 02
Emissions documented at MND sites



GRAF 03
Emissions documented at Gas Storage CZ sites



04
MND Oil Production: Egregious and Widespread Emissions

CATF documented emissions at 24 of the 27 MND sites surveyed: 22 of 25 well pads and both central facilities. The only three well pads where no emissions were detected were inactive and had no equipment beyond the wellhead. In practical terms, emissions were observed at every surveyed MND site with active or additional production equipment.

What was observed was not a collection of isolated defects, but instead a pervasive pattern of very large tank releases and equipment leaks across the surveyed oil operations. There was no sign on site that gas capture and utilisation equipment, such as piping systems to collect the gas and vapour recovery units, was present.

The emissions are therefore by design and fully unmitigated. Alongside methane, other hazardous and toxic air pollutants are released, including benzene, formaldehyde, and ethylbenzene. These air pollutants harm the health of workers and communities living near oil facilities.

Additionally, no evidence was present, such as tags attached to components characteristic of a survey and/or repair, indicating leak detection and repair surveys were being conducted following industry state-of-the-art practices.

MND has been made aware of the results of previous fieldwork campaigns conducted by CATF and CDE in 2024 and 2025. Despite last year's written assurance that they were preparing to implement the requirements of the EUMR, no improvements were observed during our 2026 campaign.

Continuous venting from tanks (case study)

TS Ždánice 57

On 15 September 2026, CATF and CDE documented large emissions from the vent of a crude-oil storage tank and from the vent stack of a production-water tank. Two distinct sources at one oil pad illustrate how associated hydrocarbons can be released from several pieces of storage equipment at the same facility.





Fig.1: Venting from production water tank – TS Zdanice 57
Video link



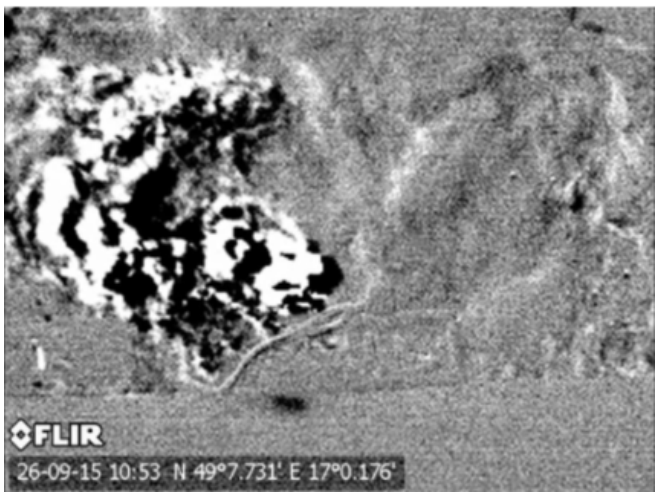


Fig.2: Venting from a pressure release valve on crude oil tank – TS Zdanice 57
Video link

ZD-148, ZD-149 and ZD-184

Later that day, CATF and CDE documented large, continuous venting from the pressure-relief valve on a crude-oil separator and storage tank at a nearby facility. The plume persisted during observation and originated from equipment designed to control tank pressure.



Fig.3: Venting from a pressure release valve on crude oil tank – ZD-148/149/184
Video link

Leaks from wellhead equipment

Hos-101 a Hos-102A

On 18 September 2026, CATF documented two large leaks from separate wellhead valves at an inactive wellpad. Although the well was inactive at the time of the survey, other equipment on the pad, including a dehydrator, was operating. The case shows that inactive production status does not necessarily mean that associated equipment is emission-free.



Fig.4: Leak from a valve on the wellhead – Hos-101/102A
Video link

Time series 2021-2026 venting from tanks (case study)

Counting the surveys conducted in 2021, 2024, and 2025 and the most recent campaign in 2026, CDE and CATF have monitored a total of 32 MND wellpads in South Monrovia. This accounts for a significant portion of the production sites owned by MND across the region. These observations underscore the significant methane emissions from MND wellpads.

SNS Dambořice

The MND gathering, processing, and storage facility of Dambořice has been surveyed by CATF and CDE during 4 separate fieldworks: in 2021, 2024, 2025, and 2026. A continuous, unmitigated stream of hydrocarbons was documented at each visit from the tank or set of tanks containing crude oil at the time.

The European Methane Regulation (EUMR) entered into force in 2024, and yet, no change has been observed in the field that would suggest any steps towards the implementation of the provisions to reduce venting and flaring.

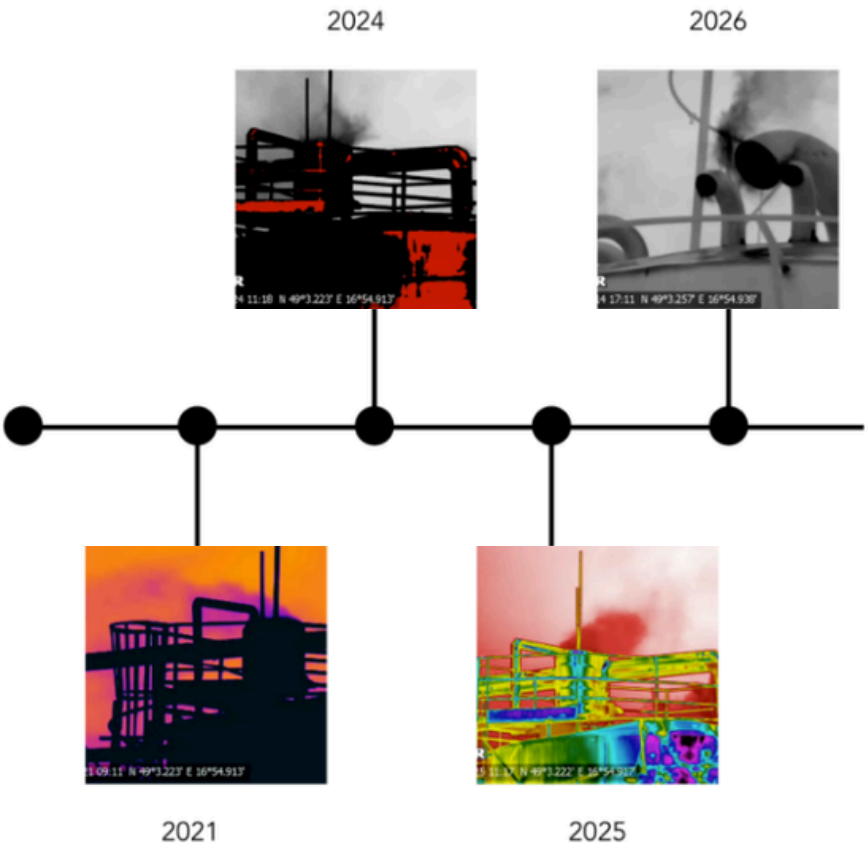


Fig.5: timeline of venting from oil storage tank – SNS Dambořice

05
Gas Storage CZ:
Fewer Sites with Detected Emissions; Repairable Leaks Remain

CDE and CATF visited the underground gas storage facility in Tvrdonice for the first time, and therefore no comparison in time can be drawn. Emissions were detected at 7 of 21 Gas Storage CZ sites: six well pads and one central facility. This was substantially lower than the share observed at MND sites.

Most documented sources were fugitive emissions rather than venting, and no emissions were observed from the main vent stack at Tvrdonice during the visit. Stacks and vents are a known potential source of methane at gas storage sites, most often through process venting.

The EUMR restricts routine venting and flaring, so the absence of emissions here is consistent with compliance at the time of the survey. However, because this was a single point-in-time survey, intermittent or non-routine venting cannot be ruled out.

In contrast, venting was present at other storage facilities operated by MGS (Uhrice) and SPP Storage (Dolni Bojanovice) during previous surveys in 2021, 2024, and 2025. The prohibition of routine venting and flaring entered into force in February 2026, requiring future surveys to assess the prevalence of routine venting at the various storage locations in Czechia.

Regarding fugitive sources, while fewer emissions were detected at Gas Storage CZ sites compared to MND sites, the team did not identify any direct evidence that LDAR surveys are being conducted at the Gas Storage CZ well sites (presence of tags characteristic of a survey or repair following industry state-of-the-art practices). Thus, we cannot draw final conclusions about the impact of EUMR requirements at these sites.

Z-70

On 14 September, CATF and CDE documented emissions from a poorly sealed connection valve on the wellhead. This is the type of source that routine LDAR and maintenance should identify and address.

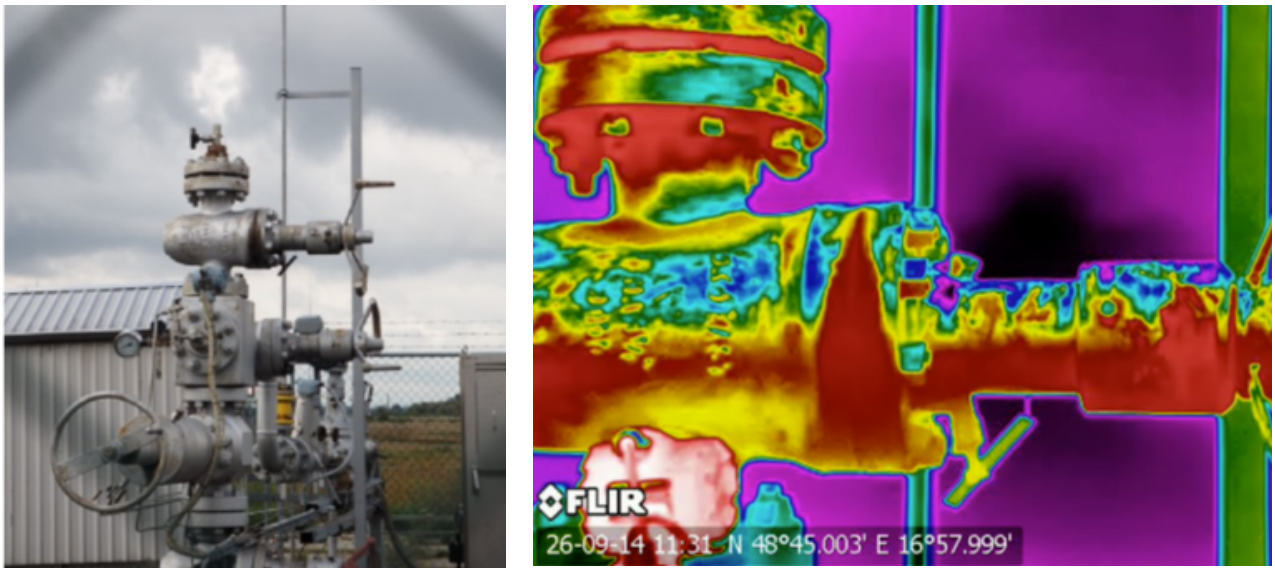


Fig.5: Leak from a valve on the wellhead – Z-70
Video link

06
Conclusions and Recommendations

The conditions documented at MND were egregious. Emissions were visible at almost every surveyed facility with active or additional production equipment, and some releases from crude-oil tanks and separators were very large and continuous. Such a widespread pattern, even after the European Methane Regulation had entered into force, demands urgent intervention by MND and rigorous enforcement by the Czech competent authorities.

Gas Storage CZ performed markedly better, but the wellhead leaks documented at Z-11, Z-70 and every other site still require prompt repair (see full field report here). There was no evidence on site that LDAR surveys and repairs were taking place at the wellpads visited.

OGI observations do not by themselves establish legal non-compliance, which must be determined by the competent authorities using operator records, measurements, and inspection reports. They do, however, provide compelling evidence of conditions that appear incompatible with the implementation of the Regulation's requirements to prevent and minimise emissions, restrict venting, detect leaks and ensure timely repairs.

Operators:
investigate every documented source, repair leaking components, verify repair effectiveness and review the design and operation of storage and separation systems that vent hydrocarbons.

MND:
immediately investigate and stop the documented releases; repair leaking valves and connectors; eliminate avoidable routine venting from crude-oil tanks and separators; and demonstrate, through records and verified follow-up surveys, that a comprehensive LDAR and preventative-maintenance programme is implemented across all facilities.

Gas Storage CZ:
repair the documented wellhead leaks and use the findings to test the effectiveness of existing LDAR procedures across comparable components.

Czech competent authorities:
conduct urgent inspections of the documented MND facilities; examine LDAR programmes, survey and repair records, emissions reports and the legal basis for observed venting; require corrective action; and use available enforcement powers where breaches are established.

Centre for Transport and Energy
and Clean Air Task Force,
November 2026

Authors:
Nika Murzynová, veronika.murzynova@cde-org.cz
Théophile Humann-Guilleminot, thumann@cleanairtaskforce.org
Julia Kislitsyna, jkislitsyna@cleanairtaskforce.org

Editor: Zuzana Gruberová
Graphic Design: Lucie Římáková