Written evidence from Flylogix Holding Ltd (MET0018)

Introduction

1. Flylogix is a UK-based SME which is pioneering new ways of using Unmanned Aerial Vehicles (UAVs) to measure methane emissions. By bringing together artificial intelligence, satellite communication and low-cost electronics we have developed a new generation of smaller, more efficient, unmanned fixed-wing drones, opening up the possibility of methane monitoring at low cost, with the least disruption and risk to people and the planet. Over the last five years, Flylogix has worked with nine major energy companies to measure methane emissions in the North Sea. To date, we have flown 50,000 km, unmanned, and recorded over 2.5 million methane concentration readings. Our technology allows safe and accurate measurement of emissions within 250 metres of an oil and gas facility. However, while COP28 gave significant attention to the importance of monitoring methane emissions and reignited focus on the problem, we are concerned that there is limited evidence that the fossil fuel industry in the UK is following through on the commitments made. Much of the momentum that was achieved during the COP28 meeting has been lost and there has been little action over the past year. Progress has stalled.

2. Our response focuses on the questions related to data, measurement and monitoring, and the fossil fuel sector. We would be happy to provide further details about any of the issues raised in this evidence if it would be useful for the committee.

Key messages

- Significant commitments were made at COP28 to reduce methane emissions in the fossil fuel sector, but there has been too little progress since to turn promise into action.
- Collecting accurate and repeatable data, on a regular and ongoing basis, is essential for meaningful monitoring and rapid response.
- Currently there is significant variability in the processing and analysis of data, and this uncertainty gives some fossil fuel companies an excuse for inaction. Independent validation, and an open framework with agreed standards, is essential to allow progress. We strongly support the Net Zero Technology Centre's initiative to develop an agreed framework for operators.
- A range of technologies, including satellite monitoring, fixed wing UAVs and quadcopters, offer benefits in different situations. There is not a one-size-fits-all-solution, and it is important to continue to support a diversity of approaches at the technologies mature.
- Fixed wing UAVs, such as operated by Flylogix, offer significant opportunities for regular monitoring of methane from offshore assets, but the benefits will only be realized if the aviation regulatory burden is

reduced and a more proportionate approach introduced for airspace approvals.

Data, measurement and monitoring

8) What is the status of methane accounting, monitoring and reporting in the UK at present and how does it compare internationally? Is UK accounting and reporting considered to be accurate and robust? What improvements, if any, are possible and what benefits would these deliver?

3. Until recently, UK reporting has been entirely based on the use of 'bottom-up' desk based estimates to calculate methane emissions from sources such as fugitives, combustion and flaring at asset-level. However, it is now possible to measure from the 'top down', to verify the estimates and allow a more precise picture of total emissions and sources. Real, accurate and repeatable data, collected on a regular and ongoing basis, is essential for meaningful monitoring and action.

4. Flylogix has worked with different methane sensor providers, including SeekOps and Aeris Technologies, which use gas sampling and miniaturised spectroscope analysis to monitor offshore methane emissions. However, this has highlighted that there is significant variability in the processing of measurements, leading to uncertainty about the analysis and interpretation. Independent validation, with standards made available through an open access framework, will be crucial to provide the certainty needed for robust reporting. As discussed below (Q.25), the current confusion about the stability of the asset level emission rate derived from the raw sensor data is exacerbating the lack of action from the fossil fuel industry. The variability mean that companies are currently reluctant to commit to regular monitoring and there is slower adoption of measurement than other regions such as onshore United States of America.

9) What progress is being made on methane monitoring and data collection in the UK using technologies such as satellite data and drones?

5. A number of different technologies are now available in the UK to enable methane monitoring and data collection. These include: satellite monitoring, the use of light aircraft, and unmanned aerial vehicles (UAVs) – both fixed wing drones, such as operated by Flylogix, and quadcopter/multi-rotor drones. These technologies have different advantages and disadvantages, as follows:

- ***Satellites:*** using sensors on satellites allows a global approach to monitoring. Satellite data are particularly useful for continuous tracking,

allowing monitoring over time and enabling a better understanding of seasonal changes. They work well over land, when there is no cloud cover. However, they are much less accurate over the sea because of reflections from the sea surface, which limits their ability to monitor offshore oil and gas facilities. Satellites can measure gross emissions and locate the source of new flares, but the lowest level of quantification is c.100 kg/h, which is much less granular than other technologies.[1]

- ***Piloted aircraft:*** while light aircraft and helicopters have been used in the past, they are expensive, involve more risk to people, and have 50x greater carbon dioxide emissions than using a UAV. They are also unable to safely fly as close to an asset as a UAV.

- ***UAV - Flylogix fixed wing drone:*** The Flylogix UAV allows very accurate measurement at an asset level. To date, they have been used offshore, where satellites are less sensitive, and where it has the benefit of removing the cost, risk and disruption of needing to mobilise personnel. Departing from onshore, the Flylogix UAV can get very close to an asset in the North Sea, operating within 250m and flying in 10 metre increments in a cylinder around the outside of a facility, which allows very precise measurements. Accuracy is high: methane concentration is measured to <1% accuracy with a ~10 ppb real time detection limit, and we estimate the lowest level of quantification is c.2.5 kg/h. The low carbon footprint and cost-effectiveness of the approach means it would be possible to do regular monitoring of all assets in the North Sea on an ongoing basis. However, the biggest barrier to this is the aviation regulatory burden and time taken to get approvals for unmanned flights because it is a new technology.

- **UAV - Quadcopter / multi-rotor drone**: Quadcopters are valuable for detecting individual leaks close to a source, and can be used to locate and isolate leaks at a single asset. They carry the same sensors as a Flylogix UAV and so have similar levels of accuracy and sensitivity. However, needing to have an operator on board a facility to undertake the measurements can cause disruption, and leads to an increased cost and risk to safety.

6. As this shows, there is not yet a one-size-fits-all solution. While the technologies continue to mature, it is important to develop, support and use a diversity of approaches rather than restricting options by settling on one approach at this stage.

7. While a fixed wing UAV, such as that operated by Flylogix, which operates 'beyond visual line of sight' (BVLOS), undoubtedly offers opportunities for regular monitoring of methane from offshore assets, the benefits will only be realized if the regulatory burden is reduced. At the moment, to make a measurement flight, it is necessary to submit lengthy applications to the Civil Aviation Authority (CAA) for a 'Temporary Danger Area' (TDA)

[1] https://www.iea.org/reports/global-methane-tracker-2024/progress-on-data-and-lingering-uncertainties

approval. The application process is inflexible and disproportionate, and it is time-consuming to repeatedly seek permission for a finite time period. Each application currently takes a minimum of seven months and only allows three months operation – despite the fact that these are repeat approvals for an unmanned fixed wing drone that has been operating for six years and has not so far had any unsafe incidents. The bureaucratic hurdles are significantly restricting the adoption of this new technology. We are continuing to work with NATS to help develop a more enduring solution – the Transponder Mandatory Zone – but the CAA lack the resource and a clear mandate from DfT to enable them to progress critical work that is in the national interest at the speed needed.

Fossil fuels

25) Are there further methane reductions that could be made in the UK fossil fuels sector (e.g., oil, gas or other fossil fuels), or at a faster pace?

8. Over the past five years, Flylogix has had contracts with nine energy companies, including bp, Shell, TotalEnergies and Harbour Energy, Repsol and Neptune. However, these have not translated from a research testing regime into business-as-usual. There has been more enthusiasm to monitor the cleaner, newer assets, which are generally the ones with lower emissions, but there is not yet a sustainable approach to ongoing measurements across all North Sea assets. Crucially, progress appears to have stalled as a result of the uncertainty over the validation of processing measurements (described above in Q.8).

9. The Oil & Gas Methane Partnership 2.0 (OGMP 2.0) is the flagship oil and gas reporting and mitigation programme of the United Nations Environment Programme (UNEP). However, OGMP does not specify how companies should undertake the measurements, or set a clear framework of standards for reporting. Some companies appear to be using the confusion over the most appropriate approach as an excuse for inaction.

10. Operators need a single framework, which provides guidance about the best approach to use in different situations, and provides validation of the standards used for processing, analysis and interpretation of the sensor data.

11. The Net Zero Technology Centre (NZTC) in Aberdeen has been leading work to assess the different methodologies. Flylogix worked with NZTC to deliver the first industry test programme on this approach including a controlled emission releases (onshore) to validate sensor performance and empirically assess measurement uncertainties. Working with NZTC provided an important 'safe playground' to explore the technology options, and collaborate with different companies. But more needs to be done. NZTC has proposed a real-world offshore trial to explore all the

methods, assessing both different technologies and different sensors, in order to develop a single framework for operators. This would help to optimize the flight pattern and recommended stand-off distance for taking measurements, given the variability of wind speed and turbulence at each asset. We strongly support this approach, and would urge that it should be fully funded as an urgent priority. A standardised, open framework, should help provide the clarity and certainty needed to allow fossil fuel companies to commit to ongoing monitoring at a faster pace.

12. It is likely that a framework would make recommendations about the most suitable approach to be used for different types of monitoring. For example, satellite data to continuously monitor base-line emissions; fixed-wing UAVs to take regular, repeated measurements with high accuracy over multiple assets; and quadcopters used when high emissions are found, to identify and isolate leaks at an individual asset. Moving towards sustainable, cost-effective regular monitoring through an agreed framework of this nature would allow the UK to understand methane emissions across its fossil fuel sector, and rapidly take action to reduce significant leakages and reduce emissions.