

## Written evidence from the National Physical Laboratory (NPL) (MET0039)

### **Context**

1. The National Physical Laboratory (NPL) is a public sector research establishment (PSRE) owned by the Department for Science, Innovation and Technology (DSIT). NPL is the UK's National Metrology Institute (NMI) and is responsible for developing and maintaining the UK's primary measurement standards, traceable back to the internationally agreed system of measurement units (the SI) that ensures the stability and comparability of measurement worldwide.
2. Addressing climate change requires ambitious international action. Confidence in emissions measurement and global greenhouse gas inventories will be vital to support evidence-based decision making. NPL plays a leading role in the development and verification of measurements of greenhouse gasses. Our research teams are working to understand and solve the measurement and monitoring challenges associated with mitigation of greenhouse gas emissions and any consequential environmental impacts such as pollution.

### **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. There are currently many methodologies and requirements for methane monitoring reporting which differ within and across sectors, nationally and internationally. To deliver accurate, robust, and importantly, comparable methane monitoring will require the development of a global framework to underpin the quality assurance and validation of methane measurement capabilities, and an independent quality assurance and certification scheme.
4. There are many different approaches employed for measuring, reporting and regulating methane emissions. Measurement approaches include methods for leak/source level detection and quantification, from individual emissions sources through to site and regional levels. There is, however, limited validation and standardisation of these methods. For example, within the oil and gas sector (which is the most advanced in reporting methane emissions) there are numerous different measurement frameworks.
5. For methane reporting, there are several voluntary schemes in place or under development, and a number of industry sectors and individual companies have made commitments to monitor and reduce emissions. These commitments generally include the need to monitor previously unreported emission sources such as diffuse sources, fugitive leaks, flares or

uncontrolled vents, arising from the entire value chains including process emissions, storage and transport activities. Such emissions are notoriously difficult to monitor and quantify. In addition, reported data are required for a range of different purposes such as annual mass emission reporting, source identification for leak identification and repair, and periodic validation of calculated emissions. This leads to different measurement challenges (scale, temporal variability and ranges of emission rate) and has resulted in a wide range of technologies being offered in the marketplace. Even in the case where a technology has become a *de-facto* industry standard, there are generally no commonly accepted performance standards.

6. There are also regulatory instruments such as emissions trading schemes and reporting requirements under the European Pollutant Release and Transfer Regulation (E-PRTR).<sup>1</sup> However, methane emissions from industrial processes are not currently routinely monitored and no standardised methods or performance requirements exist.
7. To address these issues, NPL is leading the standardisation of methane emission measurement methods at a national and international level, including work within the European Committee for Standardization (CEN) under Technical Committee TC264. NPL is delivering measurement and metrology programmes, some as part of the National Measurement System Programme, to support this work.
8. The UK has an ongoing inventory verification programme, funded by the Department for Energy Security and Net Zero, that provides independent measurement-based evaluation of the UK's reported annual emission inventory. This work places the UK at the cutting-edge of assessing the accuracy and robustness the emissions reported to the international community as an annex to the UK Government's National Inventory Report. It also provides the basis for significant future improvements, and NPL is taking forward a programme of work, funded through the UKRI's 'Building a Green Future' Programme, to develop the scope for these – the Greenhouse Gas Emission Measurement and Modelling Advancement (GEMMA) programme.<sup>2</sup>
9. GEMMA aims to enhance the spatial and temporal resolution of the reported emissions (including methane emissions) and provide source apportionment for methane emissions to track changes in emissions from different activity sectors and provide timely information on the progress of greenhouse gas (GHG) reduction actions. The GEMMA development programme includes investigation of new scientific measurement opportunities to contribute to improving the quality and geographical spread of observed methane

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<sup>1</sup> [https://environment.ec.europa.eu/topics/industrial-emissions-and-safety/european-pollutant-release-and-transfer-register-e-prtr\\_en](https://environment.ec.europa.eu/topics/industrial-emissions-and-safety/european-pollutant-release-and-transfer-register-e-prtr_en)

<sup>2</sup> <https://www.npl.co.uk/greenhouse-gas-emissions-measurement-modelling>

emissions including ground- and satellite-based remote sensing instruments.

10. NPL has also developed a successful model in assuring the quality in emissions data in the Environment Agency's (EA) Monitoring Certification Scheme (MCERTS).<sup>3</sup> This scheme consists of a number of performance standards and testing procedures addressing different regulatory monitoring requirements.
11. A new quality assurance scheme for methane emissions should be aligned with the approaches developed in MCERTS (and the EN 15267 standard) in conjunction with a large-scale testing and validation capability in the UK to assess measurement methods at different scales. Through this, a foundation for the framework to underpin the quality assurance and validation of methane measurement capabilities, and an independent quality assurance and certification scheme, could be established. This could then deliver accurate, robust, and importantly, comparable methane monitoring.

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<sup>3</sup> <https://www.npl.co.uk/products-services/environmental/mcerts-testing>