Briefing Document: Use of Self-Monitoring and Reporting of Air Emissions on Compliance Assurance

1. Executive Summary

This IMPEL (European Union Network for the Implementation and Enforcement of Environmental Law) report, titled "Use Of Self-Monitoring and Reporting of Air Emissions on Compliance Assurance," aims to provide a support document for competent authorities on the effective use and reliability of duty-holder self-monitoring and reporting of air emissions. The project, a part of IMPEL's work under the European Commission's initiative on environmental compliance assurance, focuses on compliance assessment by designated competent authorities, drawing on baseline practices from various European countries. The report intends to strengthen legal provisions in EU and national legislation regarding self-monitoring, reporting, and compliance assessment, particularly concerning air emissions but also serving as input for other environmental media. The core objective is to optimize the informed use of self-monitoring data as a fundamental step in assuring environmental compliance, thereby decreasing inspection burdens, improving breach detection, and facilitating targeted enforcement actions.

2. Introduction to IMPEL

IMPEL is an international non-profit association of environmental authorities from EU Member States and other European countries. Established in 1992, its primary objective is to drive progress in the effective application of environmental legislation through awareness raising, capacity building, and the exchange of information and experiences on implementation, enforcement, and environmental inspections. The network's expertise allows it to address both technical and regulatory aspects of EU environmental law.

3. Main Themes and Key Ideas

The report revolves around several key themes and ideas concerning the role of self-monitoring and reporting in environmental compliance assurance, particularly for air emissions from industrial installations:

- **The Need for a Self-Monitoring and Reporting Scheme:** The report emphasizes that a structured and reliable "self-monitoring and reporting scheme" is not consistently defined in most EU legislation but is crucial for effective compliance assurance. It argues that timely and systematic assessment of self-monitoring data allows authorities to efficiently identify potential breaches and prioritize inspections,

contributing to a more proactive and less reactive approach to environmental protection. The report highlights that this scheme should be an autonomous step between permitting and inspection.

- "This project aims to produce a support document on the use of duty-holders self-monitoring and reporting of air emissions on compliance assurance focused on its reliability and use on compliance assessment by a designated competent authority..." (Page 3)
- "A credible self-monitoring scheme would decrease burdens of inspection, improve chances for a swift detection of breaches and thus help to limit environmental damages making authorities action more efficient." (Page 5)
- "Self-monitoring and reporting, and compliance assessment by public authorities - what we call in this IMPEL report a “self-monitoring and reporting scheme” - is not considered as a specific step in most EU legislation." (Page 9)
- "...assessing self-monitoring and its assessment as an autonomous step of compliance assurance monitoring, between permitting and inspection..." (Page 10)
- **Defining a Self-Monitoring and Reporting Scheme:** The report proposes a detailed definition of a self-monitoring and reporting scheme, encompassing three main components:
- **Self-monitoring:** Requirements for operators to systematically measure and/or collect samples or parameters, including in special cases indirect monitoring, using specified procedures and methods defined in their permit. The objective is to prove compliance with environmental laws, regulations, and permit conditions.
- **Self-reporting:** Requirements for operators to report self-monitoring results to a designated competent authority in a defined format, frequency, and mode, including a conclusive assessment of compliance and information on timely correction and prevention of non-conformities.
- **Assessment of self-monitoring and reporting:** The designated competent authority's timely and systematic analysis of submitted data, identification of non-conformities and legal infringements, and subsequent follow-up measures including prevention, correction, and sanction. This information must be communicated to permitters and inspectors and can lead to enforcement actions, permit revisions, or revocations.
- "In this IMPEL report, the main definitions are: Self-monitoring and reporting scheme: Self-monitoring and reporting as a responsibility from operators/duty-holders... and

assessment by a designated competent public authority, with clear and detailed dispositions specified in legislation, regulations and in more concrete and operational biding dispositions specified in the respective permit..." (Page 14)

- **Reliability of Self-Monitoring Data:** Ensuring the reliability and quality of self-monitoring data is a central concern. The report highlights the importance of accredited laboratories for periodic measurements and the need for verification of continuous monitoring systems by external accredited laboratories. It emphasizes the representativeness of sampling or in-situ measurements under various operating conditions. The report also discusses the use of quality management systems and periodic verification by accredited external laboratories as means to ensure reliability. Case studies from various countries illustrate different approaches to ensuring reliability, including the requirement for accredited laboratories, external checks by supervising authorities (witnessing sampling, contracting external measurements), and specific procedures for continuous emission monitoring systems (CEMS).
- "This project aims to produce a support document on the use of duty-holders self-monitoring and reporting of air emissions on compliance assurance focused on its reliability..." (Page 3)
- "Concerning reliability, it is key factor to ensure the representativeness of the samplings or measure in situ, considering operation performance conditions of the installation or activity during each sampling or measure, raw materials and fuels used, and abatement equipment." (Page 22)
- "The accreditation of the laboratories is usually a competence from a national body for accreditation, according to the norm EN ISO/IEC 17025:2017..." (Page 21)
- **Self-Monitoring and Reporting Plan:** A detailed self-monitoring and reporting plan should be integrated into each permit and be easily revisable. The plan should include identification of emission sources, an emission inventory, detailed information on sampling and measurement points, monitoring schedules, data collection and analysis procedures (including quality assurance and control), reference to accessing raw data, clearly defined limits and accepted uncertainty, reporting and recordkeeping procedures (including reporting exceedances), and provisions for continuous improvement. For CEMS, it should also cover monitoring equipment, data acquisition and management, and quality assurance protocols (like QAL1, QAL2, QAL3, AST).

- "The self-monitoring and reporting plan should be integrated in each permit and be easily revised and changed by the competent authority, whenever necessary." (Page 17)
- "The self-monitoring plan should contain at least the following detailed description of information/data..." (Page 17)
- **Compliance Assessment and Dealing with Non-Compliances:** The report details the process of assessing self-monitoring data for compliance. This involves a timely and systematic analysis of submitted reports by the designated competent authority, leading to the identification of non-conformities and legal infringements. Responses to non-compliance can range from permit revisions and recommendations for improvement to formal enforcement actions, sanctions, and even permit suspension or revocation. Criteria for determining the severity of non-compliance and factors that may influence the authority's response are discussed, including the duration, frequency, and magnitude of exceedances, the operator's competence and reliability, and the sensitivity of the receiving environment. The report highlights the importance of using self-monitoring data as evidence in administrative and legal proceedings.
- "A designated competent authority timely and systematic analysis and assessment of all self-monitoring and reporting submitted, with conclusion of non-conformities, reporting of the legal infringements, as well as any anomalies and follow-up measures, including prevention, correction and sanction, when applicable." (Page 15)
- "All legally required self-monitoring and reporting data should be brought by the authorities as evidence into court and when there are infringements should be used as a basis for non-compliance actions and prosecution against the facility and by imposing corrective actions..." (Page 39)
- **Data Management and IT Systems:** Effective data management is crucial for handling the volume of self-monitoring data. This involves the organization, transfer, storage, and processing of data to convert it into usable information for compliance assessment. The report suggests the use of IT automated systems with functionalities for automated analysis of non-conformities and timely alerts to authorities and operators. Examples of IT systems used in different countries are provided.
- "Data management involves the organisation of data reported by the operators and its conversion into information by authorities, for the purpose of compliance assessment." (Page 32)

- "Automatic analysis of compliance should be possible, with pre-loaded limits that submitted information would be compared against and (potential) infringements alarms sent to authorities and to operators." (Page 32)
- **Role of Accredited Laboratories:** Accredited laboratories play a vital role in ensuring the reliability of self-monitoring data, particularly for periodic measurements and the verification of continuous monitoring systems. Their accreditation according to standards like EN ISO/IEC 17025:2017 is considered essential. The report discusses their responsibility in ensuring the representativeness of sampling and the accuracy of analytical results.
- "In most countries periodic measurement of air emissions is subcontracted by the operator to an external accredited laboratory, a legal entity qualified on collecting samples/measurements from air emissions from stationary sources." (Page 21)
- "The accreditation of the laboratories is usually a competence from a national body for accreditation, according to the norm EN ISO/IEC 17025:2017..." (Page 21)
- **Uncertainty of Measurements:** The report addresses the importance of accounting for measurement uncertainty when assessing compliance with emission limit values (ELVs). This involves clearly defining how uncertainty is calculated and how it is considered in compliance assessments. Case studies show different approaches used in various countries.
- "Uncertainty of air emissions measurements. Methodology to assess compliance with limit values." (Page 8)
- "How compliance to ELV's is assessed considering the uncertainty of the measures." (Page 42 - Questionnaire topic)
- **Other Than Normal Operating Conditions (OTNOC):** The report touches upon the need to address emissions during OTNOC, such as start-up, shutdown, and malfunctions. It raises questions about whether operators develop OTNOC management plans, whether permits impose specific prescriptions for these conditions, and whether emissions during OTNOC periods are reported.
- "Other then Normal Operating conditions." (Page 43 - Questionnaire topic)

4. Key Facts and Findings

- IMPEL is a non-profit association of environmental authorities focused on implementing and enforcing environmental law in Europe.

- The report is a product of an IMPEL project linked to a European Commission initiative on environmental compliance assurance.
- The project surveyed experts from 12 countries (Croatia, Finland, Germany, Ireland, Italy, Lithuania, Portugal, Romania, Serbia, Slovakia, Slovenia, The Netherlands, and the United Kingdom (England)).
- The surveyed countries demonstrate varying practices regarding self-monitoring and reporting, highlighting the need for greater harmonization and clarity in EU and national legislation.
- In most surveyed countries, periodic air emission measurements are performed by external accredited laboratories contracted by the operator.
- Continuous emission measurement is commonly performed by the operator, with verification by external accredited laboratories.
- Accreditation of laboratories according to standards like EN ISO/IEC 17025:2017 is generally a requirement.
- Ensuring the representativeness of measurements, considering operating conditions, is crucial for data reliability.
- External checks by supervisory authorities, such as witnessing sampling, are practiced in some countries.
- The use of indirect monitoring methods (like PEMS or surrogate parameters) is often not allowed unless specifically permitted or for smaller plants.
- Several countries have IT systems for self-reporting and some offer automated analysis of non-conformities and alerts.
- The approach to assessing compliance considering measurement uncertainty varies among countries.
- Responses to non-compliance include formal notices, requests for clarification, administrative compulsion, requests for investigation, and the use of self-monitoring data as evidence for sanctions and permit actions.
- The concept and handling of "Other Than Normal Operating Conditions" related to self-monitoring and reporting appears to vary.

5. Conclusions and Recommendations

The report concludes that a well-defined and legally supported "self-monitoring and reporting scheme" is essential for effective environmental compliance assurance. Such a scheme, situated as an autonomous step between permitting and inspection, empowers authorities to utilize operator-generated data for timely identification of non-conformities and targeted enforcement actions.

The report implicitly recommends:

- **Strengthening Legal Frameworks:** EU and national legislation should provide clearer and more detailed dispositions explicitly recognizing and defining a self-monitoring and reporting scheme as a distinct component of compliance assurance.
- **Designating Competent Authorities:** Clear responsibilities should be assigned to designated competent authorities for the timely and systematic assessment of self-monitoring and reporting data.
- **Ensuring Data Reliability:** Implementing robust requirements for accredited laboratories, quality management systems, and external verification to ensure the accuracy, reliability, representativeness, and comparability of self-monitoring data.
- **Developing Comprehensive Self-Monitoring Plans:** Permits should include detailed and revisable self-monitoring and reporting plans outlining all necessary parameters, procedures, and reporting requirements.
- **Implementing Effective Data Management Systems:** Utilizing IT systems to facilitate efficient reporting, data analysis, and timely communication of potential non-compliances.
- **Consistent Compliance Assessment:** Establishing clear methodologies for assessing compliance, including how measurement uncertainty is considered.
- **Graduated Response to Non-Compliance:** Developing a system of graduated responses to non-compliance, ranging from corrective actions to formal sanctions and permit actions, based on the severity and circumstances of the infringement.
- **Addressing OTNOC:** Providing clear guidance and potentially permit conditions for monitoring and reporting emissions during Other Than Normal Operating Conditions.
- **Promoting Information Exchange:** Continued exchange of information and best practices among environmental authorities through networks like IMPEL to harmonize approaches and improve the effectiveness of self-monitoring and reporting schemes.

Overall, the report emphasizes that a credible self-monitoring and reporting scheme is a powerful tool for environmental protection, enabling authorities to be more proactive,

efficient, and effective in ensuring compliance with environmental legislation and preventing environmental damage.