

Implementing the EU Methane Regulation

Tasks and resources needed at the national level

- ▶ **Tasks of the Member States and their competent authorities**
- ▶ **Step-by-step analysis of implementation methods**
- ▶ **Needed resources, cost structures, potential synergies**

A decorative graphic on the left side of the page consists of several overlapping geometric shapes: a large light grey triangle pointing right, a smaller grey triangle pointing left, and a dark blue triangle pointing right, all partially overlapping each other.

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The responsibility for the contents lies solely with the authors.

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This paper’s original version from June 2024 was produced before the EU Methane Regulation was published in the Official Journal of the EU, based on its final text. We had assumed it would enter into force in July 2024, but it turns out it will enter into force on 4 August 2024. In this update, we have adapted all references to the date of entry into force and, consequently, to various deadlines for the implementation of individual provisions. We also corrected some typos.

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Abbreviations

AUCM	Abandoned underground coal mine
CA	Competent Authority / Authorities
CH ₄	Methane
CUCM	closed underground coal mine
EU-MER	EU Methane Emissions Regulation
IPAW	Inactive wells, temporarily plugged wells, permanently plugged and abandoned wells
LDAR	Leak Detection and Repair
MRV	Monitoring Reporting Verification (as prescribed by EU-MER)
MS	Member States
RM	Responsible Ministry / Ministries
RP	Responsible party
WP	Working Paper

Executive Summary

The recently adopted EU Methane Regulation (EU-MER) will be instrumental in reducing methane (CH₄) emissions from the energy sector both within and outside the EU. This will contribute substantially to climate mitigation and enhance our chances at achieving climate targets. It will also improve air quality, positively impacting human health and the environment. Additionally, some measures will reduce methane losses, consequently decreasing the EU's energy import needs and improving our energy security and geopolitical position.

The impact of the EU-MER will depend on the quality of its implementation. While the European Commission plays an important role that we describe in section 3.5, this series of papers focuses on implementation at the national level. The groundwork will be laid by the EU Member States (MS), as they establish their **competent authorities (CA)** and provide resources to them, as well as to the relevant units in the **responsible ministries (RM)**. **This paper describes their tasks in detail and analyses the resources they will need** to accomplish them. It aims to support public officers involved in the implementation and civil society organisations engaged in this process.

A main conclusion is that **time is of the essence**. By August 2025, the MS must establish rules on penalties, produce the inventories of closed and abandoned sites and identify the entities legally responsible for CH₄ mitigation measures at these sites. Already by February 2025, the RM must take decisions on the structures of the CA and provide them with the necessary resources and powers. Shortly afterwards, the CA must begin enforcing the EU-MER.

The RM and the CA should thoroughly plan the implementation of the EU-MER as early as possible. Early planning of, inter alia, the inspection routines, the mitigation actions for the old and abandoned sites, and levels of outsourcing in these tasks will not only improve the quality of implementation but also help the costs to be borne by public budgets. **A higher level of upfront investment by the RM and the CA will likely pay off in the long term.** Investing in the initial phase of EU-MER implementation is likely to help reduce the implementation costs in the medium and long term while increasing the climate mitigation impact. The most essential investment in the early phase will be in the training and staffing of the CA and the relevant unit(s) in the RM. Additionally, investment will be needed to procure the necessary equipment and services. This can be a substantial investment, but one that will likely pay off in the medium term as far as the quality and economic efficiency of implementation is concerned. The earlier the MS invest in the effective implementation of the EU-MER, the sooner these benefits will accrue.

Chapter 1 of this paper provides a concise overview of the key actions foreseen by the EU-MER and the actors involved, focusing on the tasks assigned to the RM and the CA, along with a brief discussion of their respective roles and functions.

Chapter 2 offers an overview of the types of resources needed by the RM and the CA to implement the EU-MER. The most essential resource is staff with industry knowledge, as well as technical, economic, legal and other skills. Another critical resource is specialised equipment, particularly if the CA intends to conduct inspections in-house rather than outsourcing them. The RM and the CA will need financial means to cover their costs.

Chapter 3 discusses key categories of EU-MER tasks at the national level and identifies the responsible entities for each. The RM is tasked with setting up inventories, developing mitigation plans and implementing mitigation measures for closed and abandoned sites. The

CA is responsible for conducting inspections at sites and companies subject to EU-MER obligations, analysing numerous reports and mitigation plans submitted by these companies, making decisions on these reports and plans, and enforcing sanctions against infringements of the EU-MER or, in some MS, initiating legal actions for enforcement.

For each of these activities, Chapter 3 provides a detailed description of the tasks assigned by the legal text of the EU-MER to the RM and the CA. Based on this, it offers a step-by-step analysis of how these tasks can be implemented, including timelines and an assessment of the required resources, as well as key factors influencing the costs. The chapter also explores cost structures, implementation management issues, and potential synergies that could arise from cooperation among multiple competent authorities within the MS and across borders.

About this Series of Papers

Methane (CH₄) is the second most important greenhouse gas (GHG), having caused around 30% of the global temperature increase since the Industrial Revolution. The energy sector is responsible for more than one third of the global anthropogenic CH₄ emissions, and it offers most of the short term CH₄ abatement potential.¹ In 2021, together with the USA, the EU announced the Global Methane Pledge, a commitment to reduce global CH₄ emissions by at least 30 percent from 2020 to 2030 signed by 155 countries.²

The EU Methane Regulation (EU-MER) has been adopted with the overwhelming support of 85% of the European Parliament and of all EU Member States except Hungary. It enters into force on 4 August 2024.³ If well implemented, it will be instrumental in significantly reducing the CH₄ emissions from the energy sector. Most of the CH₄ emissions associated with the energy consumed in the EU are generated in the producing countries from which the EU imports oil, gas, and coal. Therefore, the EU-MER provisions on imports are of critical importance. However, a thorough application of all EU-MER provisions at the domestic level is a necessary condition for the efficacy and acceptance of those related to imports.

The impact of the EU-MER will depend on the quality of its implementation. Even though EU regulations like the EU-MER are directly applicable in all EU Member States, its implementation requires extensive executive action as well as some regulatory provisions at the national level. This working paper is part of a series that aims to provide analysis, information, and practical support to help the Member States and encourage the newly established teams at the competent authorities (CA) to implement the EU-MER effectively, thoroughly, timely and efficiently.

There are two other working papers in this series:

- Implementing the EU Methane Regulation, Working paper N° 2. Governance at the national level: responsible ministries and competent authorities.⁴
- Implementing the EU Methane Regulation, Working paper N° 3. Penalties and selected legal issues.⁵

This series is intended to provide hands-on assistance to those involved in implementing the EU-MER at the national and at the EU level. Many of the issues we discuss are of relevance during the first 6 to 12 months after the EU-MER enters into force. To provide guidance from the very start of the EU-MER implementation, we worked on a legal text that was still in the approval process and we are releasing this series of papers just days after its formal adoption. Thus, some of the ideas contained herein could be developed further. We welcome any feedback that might help refine them.

¹ : IEA Global Methane Tracker 2024. <https://www.iea.org/reports/global-methane-tracker-2024/key-findings>

² See <https://www.globalmethanepledge.org/>

³ Regulation (EU) 2024/1787 of the European Parliament and of the European Council of 13 June 2024 on methane emissions in the energy sector and amending Regulation (EU) 2019/942. See: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32024R1787>

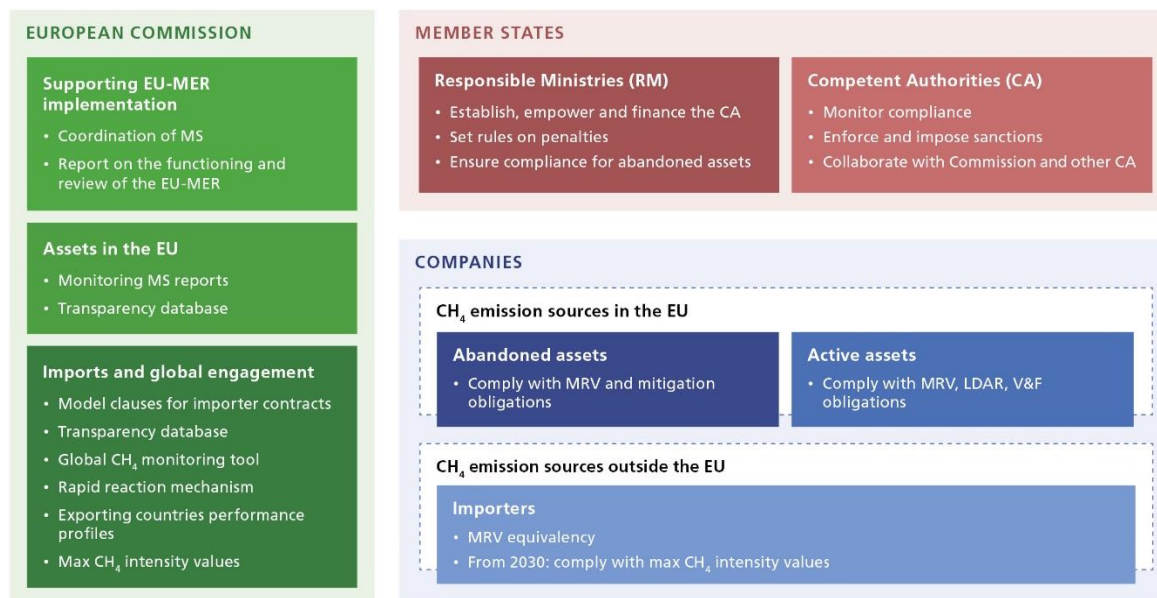
⁴ Piria Raffaele, Leon Martini: Implementing the EU Methane Regulation, Working paper N° 2. Governance at the national level: responsible ministries and competent authorities. Ecologic Institute, Berlin, 2024. Available at: <https://www.ecologic.eu/19719>

⁵ Piria Raffaele, Stephan Sina and Lina-Marie Dück: Implementing the EU Methane Regulation, Working paper N° 3. Penalties and selected legal issues. Ecologic Institute, Berlin, 2024. Available at: <https://www.ecologic.eu/node/19720>

1 Overview on tasks and roles

Figure 1 illustrates the **key actors for the EU-MER's implementation**. These are the responsible ministries and the competent authorities of the Member States, the companies subject to EU-MER obligations and the European Commission.⁶

Figure 1: EU-MER implementation: key actors and actions



EU-MER EU Methane Regulation MRV Monitoring, reporting and verification
LDAR Leak detection and repair V&F Venting and flaring

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This paper focuses exclusively on the implementation at the national level, particularly the tasks assigned to the Member States' responsible ministries (RM) and competent authorities (CA). These tasks are illustrated in Figure 1 above, elaborated further in Table 1 and describe in full detail in Chapter 3. Individual sections of Chapter 3 feature figures illustrating the timelines of specific tasks. The implementation at the national level will be influenced by the outcomes of the important tasks assigned by the EU-MER to the European Commission. Although discussing these tasks is beyond the scope of this paper, their timeline is provided in section 3.5.

Since the CA must be established and given powers and resources by the MS government, the latter carries the ultimate political and legal responsibility for potential failures of the CA to carry out their tasks, especially if the failure is a consequence of lack of resources and/or of empowerment.

In our Working Paper N° 2 on the EU-MER governance, we argue that the CA require a certain degree of autonomy from the ministries responsible for the operational tasks shown in Table 1.

⁶ For the sake of completeness, there are other EU-MER actors, which are not included in this list and in the figure because they play a minor role in implementation. Verifiers must verify some of the reports various entities must submit to the CA. The EU Member States' regulatory authorities in charge of the gas infrastructure must consider the costs of implementing the EU-MER carried by gas transmission and distribution operators when determining their regulated revenues. The EU Agency for the Cooperation of Energy Regulators (ACER) must define indicators and reference values concerning those costs.

Table 1: Overview of EU-MER tasks assigned to the MS and to their CA

Tasks of the Member States	Tasks of the competent authorities
<p><u>Policy making:</u></p> <ul style="list-style-type: none"> ▪ Set up the CA and ensure that they have adequate powers and resources; ▪ Lay down the penalty regime and take all measures to enforce it; ▪ Ensure that certification, verification and qualification schemes are available; ▪ Report to and collaborate with EU Commission, publish specific information. <p><u>Operational:</u></p> <p>For inactive, closed, and abandoned oil and gas wells and coal mines, MS must:</p> <ul style="list-style-type: none"> ▪ Set up inventories; ▪ Identify solvent responsible parties, where possible; ▪ Develop mitigation plans and implement mitigation measures and report on them to the CA (or ensure that “responsible parties” do so). 	<ul style="list-style-type: none"> ▪ Plan and carry out routine and non-routine inspections; ▪ Analyse and evaluate incoming reports submitted by companies and entities subject to EU-MER obligations; ▪ Take decisions on a number of technical issues, including monitoring and reporting requirements, leak detection and repair programmes, venting and flaring reports, exemptions; ▪ Impose penalties to sanction non-compliant behaviour; ▪ Process and react to complaints ▪ Produce a series of reports and notifications to the EU Commission, publish specific information; ▪ Cooperate with the CA of other MS and with the EU Commission.

The CA are ultimately organs of their MS. However, the EU-MER clearly differentiates between tasks that the CA are responsible for and tasks that the MS, i.e., the government of that MS, are responsible for. Therefore, in this paper we use the term “**responsible ministry**” (**RM**) with reference to the entity in charge of (coordinating) the EU-MER implementation in one EU MS and be accountable vis-a-vis the Commission. In some EU MS, certain aspects of the EU-MER implementation might (partly) fall within the responsibility of other ministries than the RM. Moreover, in some EU Member States, the competence for a part of the actions required by the EU-MER lies at the regional level. If so, the RM will (also) have to coordinate with the responsible entities at the regional level.

As for the CA, in many MS there will likely be more than one. The EU-MER involves a range of different activities – including air pollution measurements, monitoring underground mine activities, monitoring oil and gas extraction, monitoring regulated gas infrastructure, checking monitoring import contracts – which are analogous to activities already carried out by various public agencies. In some EU countries, parts of these analogous activities are carried out by public agencies at the regional level. Therefore, it is likely that several or all MS will allocate the CA role to more than one existing agency, in some cases also involving those at regional level. In this paper, **the acronym CA generally stands for competent authorities in plural**. We discuss some pros and cons of a more or less centralised or fragmented allocation of the CA functions in our Working Paper N° 2.

2 Types of resources needed

This chapter discusses the type of resources needed for the RM and the CA to carry out the tasks outlined above.

Here, we consider two main types of resources essential to carrying out the core EU-MER tasks: skilled staff, equipment and the financial means necessary to procure staff, equipment as well as all other standard resources needed to carry out administrative activities.

To procure the specific equipment and the skilled personnel described in this chapter, the RM and the CA will need financial resources, which will be likewise needed to procure other generic resources, including IT hardware and software, premises, possibly drones, vehicles and other operational needs.

2.1 Skilled staff

To carry out their core tasks, the RM and the CA will need staff with specific technical skills and industry knowledge. Moreover, they will need staff with legal skills and, to a lesser degree, economic skills.

Both the CA and the MS may choose to outsource some activities related to the EU-MER implementation. However, even if they do so to the largest possible degree, they will still have to maintain a certain amount of own skilled workforce to control the work done by the external service providers. Thus, the degree of outsourcing is a management and governance issue, but does not impact the kind of skills needed by the CA.⁷

Industry knowledge: Implementing the EU-MER requires a certain degree of knowledge of the relevant industries: coal mining, oil and gas extraction, oil pipeline transport as well as gas transport, gas storage, gas distribution and LNG.

Industry knowledge will be necessary, among others, for the CA to evaluate the incoming reports produced by the companies and entities subject to EU-MER obligations, to carry out the inspections, to take decisions, e.g. on mitigation plans and on sanctioning breaches of the EU-MER, and to deal with some of the expectable complaints. A typical profile for this kind of work could be industrial engineers with significant experience in the relative sectors.

Depending on each MS's profile of domestic CH₄ emission sources, the focus of the required industry knowledge may lie on certain specific industries. In principle, all CA must be able to deal with importers' reports, regardless of where the imported fossil fuels physically enter the EU in the territory of the CA's Member State. The reason is that the importers' reports will be delivered to the CA of the country where the importers are established (Art 27).

Technical skills will be mainly needed with respect to the rapidly evolving technologies, methods and procedures to measure, quantify and mitigate CH₄ emissions from the energy sector.

The MS will need these skills to fulfil their obligations concerning emission reporting, mitigation plans and mitigation measures in abandoned fossil extraction assets.

⁷ In our Working Paper N°3 on selected legal issues, we discuss the extent to which the Competent Authorities may outsource inspection activities, with particular attention to the provisions of Article 6(2) and 6(7) of the EU-MER. In our Working Paper N°2, we discuss governance issues, among others related to outsourcing.

The CA will need these skills to analyse the plausibility, appropriateness and completeness of the incoming MRV reports and mitigation plans, to carry out inspections, to underpin some of the decisions they must make, and, lastly, to deal with complaints related to CH₄ measurement technologies, methods and procedures.

Essential skills that need to be mastered are:

- CH₄ measurement technologies and procedures.
- Methods to quantify CH₄ emissions, including statistical methods based on the analysis of measurements from a representative sample of emitting sources, in order to derive accurate emission factors.
- Interpreting data coming from different sources, including satellites and based on different types of observations, such as emission rates, pressure, CH₄ concentration on the atmosphere.
- Using drones, infrared gas imaging, and airplanes to support MRV, LDAR and/or inspection activities.
- Understanding of mitigation plans and measures for their implementation.

Legal skills will be required by the CA, as some of their activities and outputs could be prone to litigation. This can be expected especially for the CA's role of imposing penalties against breaches of the EU-MER. The effectiveness of penalties in terms of discouraging non-compliant behaviour is enhanced when the sanctioning authority proves to be able to impose penalties that withstand legal challenges. Thus, penalty decisions must be thoroughly prepared and defensible, and potential litigation must be dealt with professionally. Inspections might be prone to litigation, too. Legally sound inspection procedures will help to minimise the occurrence of litigation and favour a smooth and effective implementation.

To a lower extent than the technical and legal skills, **economic skills** will be necessary for some of the CA tasks that may require the application of the principle of proportionality with reference to economic factors. According to Art 33(1), for instance, the penalties to be imposed by the CA must⁸ be “*effective, proportionate and dissuasive*” and the fines must be set at a level that “*at least deprives those responsible of the economic benefits derived from the infringement in an effective way*” [Art 30 (2)]⁹. Although not explicitly mentioned in the relevant Art 18(9), the CA might¹⁰ also have to apply the principle of economic proportionality when requiring

⁸ For the sake of clarity, we use “must” instead of the original wording “shall” for all EU-MER provisions where “shall” actually means “must” and could therefore be translated in other EU languages with verbs that could be translated back into English as “must”, such as *devoir* in French, *müssen* in German and *dovere* in Italian. Usually, the official translations of “shall” in EU legal texts into these three languages completely renounces the use of a modal verb, for instance here: “*Les États membres déterminent le régime des sanctions (...)*” or “*Die Mitgliedstaaten erlassen Vorschriften über Sanktionen (...)*”. See: Felici, A. (2012). ‘Shall’ ambiguities in EU legislative texts. *Comparative Legilinguistics* 10 (January):51-66. <https://doi.org/10.14746/cl.2012.10.04> .

⁹ The proportionality mainly refers to the environmental damage and to the impact on human safety and health. We discuss this point in detail in our Working Paper N° 3 on the penalty regime.

¹⁰ Article 18 (9) requires that “*Member States or the party responsible (...) shall prepare a mitigation plan to remediate, reclaim and permanently plug inactive wells and temporarily plugged wells*”. Neither Article 18 nor Annex V prescribe a specific level of CH₄ emission reduction that must be achieved when “addressing” an inactive well. Assuming that the plugging of inactive oil and gas wells is characterized by a typical efficiency curve, reducing the last small shares of CH₄ emissions might have disproportionately high costs. The responsible party or the Member States responsible for the inactive oil and gas wells might thus refer to the principle of proportionality, if the CA requires to reduce the emissions to zero. Recital (10) EU-MER, with reference to the costs carried by regulated operators such as gas distribution network operators, affirms that compliance costs taken into account in tariff setting “*should not result in a disproportionate financial burden on end users and consumers*”.

amendments to mitigation plans presented by the responsible parties or, in their absence, by the MS themselves.

Furthermore, MS and CA will need staff with **other skills**, such as IT, logistics, management, administration, communication, etc., in order to carry out a number of ordinary activities related to the EU-MER implementation.

2.2 Specialised equipment

The CA will need specialised equipment to carry out routine and non-routine inspections. Each site must be routinely inspected at least every three years, and the first round of routine inspections must be concluded within 21 months of the EU-MER entering into force, i.e. by May 2026. Additional inspections can be triggered by various events. Depending on the number of sites to be inspected in each MS, the volume of the inspection work may prove to be substantial in some MS. More on this can be found in chapter **Error! Reference source not found.** below.

Moreover, the RM will need specialised equipment to fulfil their obligations concerning the inventories and the mitigation plans and measures for “*inactive wells, temporarily plugged wells, and permanently plugged and abandoned wells*” (IPAW), “*abandoned underground coal mines*” (AUCM) and “*closed underground coal mines*” (CUCM). More details on the requirements can be found below.

Both the CA and the MS may choose to carry out the measurements with equipment they own or lease, or to have the measurements done by external companies. Some aspects of these choices are discussed below in chapter 4.

The specific equipment needed includes:

- **CH₄ detection equipment**, such as flame ionisation detectors, infrared gas detectors, photoionisation detectors (...)
- **CH₄ measurement equipment**, including equipment capable of capturing emissions of individual sources, and equipment suited for the measurements of emissions from entire sites.
- **Mobile monitoring stations** including a combination of sensors, such as those mentioned above, mounted on vehicles or on mobile installations.
- **Drones and airplanes** able to carry detection and measurement equipment.
- **Add other categories** that may be relevant to mention here.

3 Implementing the EU-MER task by task: necessary steps and resources

This chapter consists of four subchapters discussing the following categories of EU-MER tasks:

- 1) Inventories, mitigation plans and mitigation in inactive, closed and abandoned oil, gas and coal extraction sites. This task is assigned to the responsible ministries (RM);
- 2) Inspections. This task is assigned to the competent authorities (CA);
- 3) Analyse incoming reports and take consequential decisions;
- 4) Other tasks assigned to the RM and to the CA.
- 5) A timeline of the tasks assigned to the European Commission

Each subchapter contains a first subsection detailing the tasks mentioned in the legal text based on a careful paraphrase of all relevant EU-MER provisions. The second subsection provides a step-by-step analysis of how the RM or the CA can implement each of the key tasks assigned to them by the EU-MER, including an analysis of the key parameters that determine the cost of carrying out the specific tasks, and the resourced needed. We skip this second subsection with reference to the other tasks (3.4.). The last subsections provide further considerations on the cost structures, implementation management and potential synergies that might emerge from the cooperation between several CA within and across the MS.

3.1 Inventories and mitigation in closed and abandoned assets

The EU-MER assigns responsibility to the MS for setting up inventories of “*inactive wells, temporarily plugged wells, permanently plugged and abandoned (oil and gas) wells*” (IPAW) and of closed and abandoned underground coal mines (CUCM and AUCM) located on the MS’ territory or under their jurisdiction. For all these sites, the EU-MER prescribes systematic CH₄ measurements, the development of mitigation plans, and the implementation of mitigation measures. In principle, the responsibility for all these actions lies with the entities owning the sites, which the EU-MER refers to as the **responsible parties (RP)**. However, where the MS cannot identify a solvent RP, the responsibility lies with the Member State.

This is the most substantial set of EU-MER tasks **directly under the responsibility of the responsible ministries (RM)**, i.e. without counting the tasks that the EU-MER assigns to the CA, which we discuss in the subsequent sections.

3.1.1 The tasks of the responsible ministries

The tasks relate to the inventories and those related to the mitigation plans and measures partially overlap. Therefore, we describe both of them in two parts of this section. In the following section (3.1.2), we analyse at once the steps necessary to implement these overlapping tasks.

3.1.1.1 Inventories

By August 2025, the RM must set up inventories, make them publicly available and keep them up to date afterwards. The rules that apply to the IPAW slightly differ from those that apply to the CUCM and AUCM.

Concerning the IPAW, the RM must take “*all reasonable efforts to locate and document*” all IPAW, “*based on a robust assessment taking into account the most up to date scientific findings*”

and best available techniques” [Art 18(1)]. The MS must report “*information on quantification of methane emissions and, where pressure monitoring equipment exists, information on pressure monitoring from all inactive wells, and temporarily plugged wells*” and submit them to their CA by May 2026, and by 31 May every year thereafter [Art 18(1)]. Moreover, the IPAW inventories must include a series of information, including the results of a quantification of CH₄ emissions to air and water, and may include a number of additional information [Annex V, Part 1(1)].

With respect to permanently plugged and abandoned wells (e.g. not including the inactive and temporarily plugged wells), the inventories must also include the last known measurements or quantification of CH₄ emissions to air and to water, if any such measurements exist, as well as documentation demonstrating that there are no CH₄ emissions from that well or well site [Annex V, Part 1(3)].

Member States with 40,000 or more recorded IPAW may adopt a plan for completing the inventory gradually, under a clearly defined set of deadlines until July 2030 [Art 18(3)].

The CUCM and AUCM inventories must list “*all closed underground coal mines and abandoned underground coal mines in their territory or under their jurisdiction where operations ceased after [70 years prior to the date of entry into force of this regulation]*” [Art 25(1)].

The CUCM and AUCM inventories must contain a series of information, including the results of source level direct CH₄ measurements taken in all shafts that were actively used while the mine was operational, as well as unused vent pipes, and unused gas drainage wells. These measurements must be performed according to specified principles, one of which is a CH₄ measurement accuracy of at least 0,5t per year [Annex VIII, Part 1].

3.1.1.2 Reporting, mitigation plans and mitigation measures

All inactive, closed and abandoned fossil energy extraction sites that must be inventoried as described in the previous section are also subject to monitoring, reporting and verification (MRV) as well as to mitigation obligations [Art 18(3), (4), (9) and (10)]. The related responsibility and tasks of the RM can be of two types:

- If the RM can identify responsible parties (RP) that “*have the adequate financial means to fulfil those obligations*” [Art 18(8)], the responsibility of the RM is limited to ensuring that the RP fulfil the obligations described in this section.
- If the RM cannot identify a RP¹¹, or where the latter has no adequate financial means, the MS itself, via its responsible ministry, is responsible to fulfil the following obligations [Art 18(5), 25(2), 25(4)].

Concerning the IPAW, Art 18(2) requires that the reports with a quantification of CH₄ emissions “*shall be submitted to the competent authorities by 21 months of the date of entry into force of this Regulation.*” Although this specific clause does not specify who the subject responsible for submitting those reports to the CA is, the context clarifies that the ultimate responsibility lies with the RM, either directly or by virtue of its duty to “*ensure that operators fulfil the obligations*” by the RP [Art 18(8)].

¹¹ By definition, “*‘abandoned coal mine’ means a coal mine where coal production has ceased but for which no operator, owner or licensee can be identified as being subject to the obligations under a valid permit, license or any other legal document conferring responsibility for the coal mine, or that has not been closed in a regulated manner*”; [Art 2(54)]. A “*‘closed coal mine’ means a coal mine where coal production has ceased (...) and for which an operator, owner or licensee has still a valid permit, license or other legal document conferring responsibility for the coal mine*” [Art 2(53)]. The definitions of “*inactive well*”, “*temporarily plugged well*” and “*permanently plugged and abandoned well*”, [Art 2(38-39-40)] – three separate concepts that in this paper are subsumed under the shortening IPAW – include both wells with and without a responsible party.

Furthermore, the RM are indirectly (via the RP) or directly responsible, among others, for taking “*all the necessary measures available to them for remediating, reclaiming and permanently plugging*” inactive wells where CH₄ emissions are detected, as long as this is “*technically feasible, and taking into account the environmental impacts of the necessary works in view of the associated reduction of the methane emissions*” [Art 18(6)].

Moreover, by August 2026, the MS or the RP must “*prepare a mitigation plan to remediate, reclaim and permanently plug inactive wells and temporarily plugged wells*” and implement it within 12 months of the reports mentioned above; in exceptional cases, within up to 36 months [Art 18(9)].

The mitigation plans must include “*the schedule of addressing each inactive well and temporarily plugged well, including the actions to be carried out*” as well as the “*projected end date of remediation, reclamation or plugging of inactive wells and temporarily plugged wells*” [Annex V, Part 2]. If the MS or the RP “*can demonstrate that the implementation of that mitigation plan is not possible within that deadline due to safety, administrative or technical considerations, they may delay*” until maximum three years from the submission of the first report [18(9)].

Thus, all reports should be submitted by the RP or by the RM to the CA by at latest May 2026. And the mitigation measures must be concluded by May 2029. If these deadlines are not kept, the MS risks to be subject to infringement procedures by the European Commission

Notably, these reports and mitigation plans must be reviewed by the CA and published within three months of submission. This is a strong argument as to why the CA should have a sufficient degree of autonomy from the responsible ministry, as we discuss in detail in our separate study on the governance of the EU-MER implementation.¹²

As for the AUCM and CUCM, the obligations include the measurement of CH₄ emissions on all elements which were found to emit > 0,5t CH₄/yr based on the inventory discussed above, with some exemptions [Art 25(2-4)]. By August 2026 and every year afterwards, the responsible ministries, or the mine operators, must submit to the CA reports containing estimated yearly source level CH₄ emissions data [Art 25(6)].

Moreover, the RM must develop and implement a mitigation plan to address CH₄ emissions from CUCM and AUCM. The mitigation plans must be submitted by the RM to the CA by February 2027 [Art 26(1)].

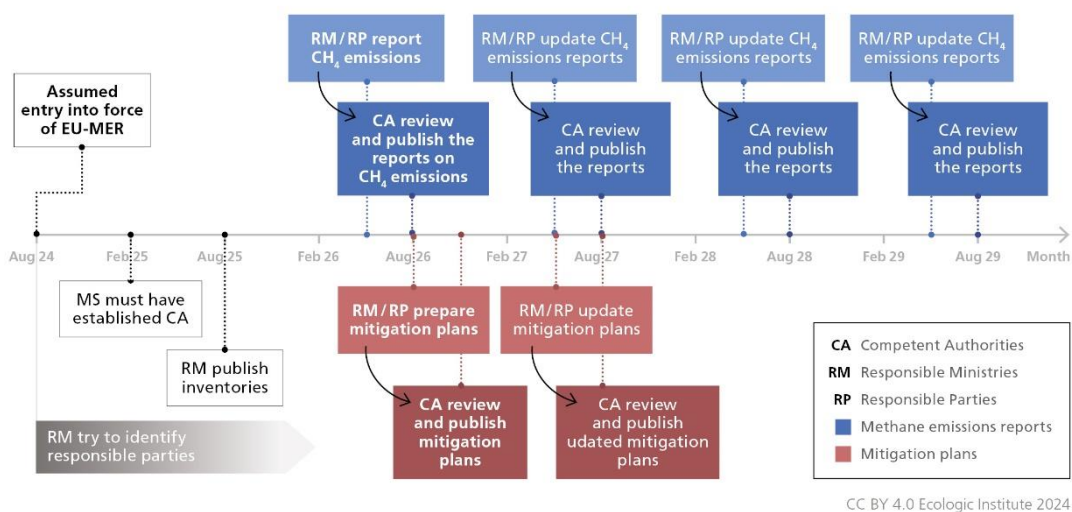
3.1.1.3 Timeline

Figure 2 illustrates the most important milestones related to the inventories, MRV requirements and mitigation plans and measures concerning inactive, closed and abandoned assets. More details can be found in the preceding text.

Most elements in this figure illustrate activities for which the EU-MER specifies a clear deadline. The only exception is the element at the bottom left, which mentions that the responsible ministries will attempt to identify responsible parties. In fact, this task is not explicitly required by the EU-MER, which merely stipulates that the liability for the costs of mitigation measures lies with the Member States if they cannot identify “responsible parties”, i.e., entities that carry this liability. In practice, it would be reasonable to conclude this search before the mitigation plans, due by August 2026, are prepared. Therefore, we advise concluding this search, at least in most cases, by the end of 2025.

¹² See Working Paper N° 2 on the governance of the competent authorities and responsible ministries.

Figure 2: Timeline: inventories and mitigation plans for closed and abandoned assets



The recurring series of reports to be submitted by the companies subject to EU-MER obligations, followed by reviews or evaluations conducted by the CA, are yearly cycles that extend beyond the timeframe shown in the chart. In other words, the red cycle continues into 2028 and beyond, and the blue cycle extends beyond 2029.

3.1.2 Implementation step by step, and resources needed

In this section, we provide a step-by-step outline of what it will take for the RM to comply with the obligations described above. In each step, we point to the kind of resources that will be needed and to the key parameters that need to be considered by the RM when quantifying the necessary resources. We also shortly consider the extent to which the respective work can be outsourced.

Setting up the inventories

In a first step, databases adequate to the EU-MER requirements must be set up. The responsible ministries should make sure that the databases do not only meet the inventory requirements, but also facilitate the implementation, monitoring and enforcement of the subsequent tasks related to the IPAW, CUCM and AUCM, i.e. the development of mitigation plans and the implementation of mitigation measures. Therefore, the databases should include all relevant parameters and enable the RM to effectively cope with both its potential roles, depending on whether a solvent RP can be identified or not.

In most EU countries, lists of relevant wells and mines are likely to be already available. However, in some EU countries this information is fragmented and the data from different sources might be stored in different formats. Therefore, some effort will be necessary to retrieve and harmonise the data from existing datasets.

In the next step, the RM will have to identify the wells and mines not listed in existing datasets.

The key parameters that will determine the costs for the RM will be:

- the number of sites not covered by existing datasets, heavily influenced by the intensity of past oil and gas extraction in the country (given the much larger number of oil and gas wells in comparison with coal mines);

- the average effort needed to identify individual missing wells and mines;
- the quality and completeness of (historical) records of company activities;
- the history of permitting procedures and authorities.

According to the EU-MER, CH₄ emission measurements will necessary be already in the phase of setting up the inventories. We cover those tasks in the section on MRV below.

Significant parts of the work to set up the inventories (creating the databases, research) could, in principle, be outsourced. A part will necessarily require in-house resources in the RM as well as in the public authorities that hold the existing lists of wells and mines.

The type of resources needed will mainly be staff with administrative and data handling skills, and IT equipment.

Determining who is responsible for the mitigation plans and measures

As described in great detail above, for all sites included in the inventories, the RM must determine who is responsible for measuring, quantifying and reporting emissions, for establishing mitigation plans and implementing the mitigation measures described above. To use economic terms, these new liabilities are being created by the EU-MER with the intention to reduce the massive external costs associated with methane emissions. Consequently, it is necessary to determine who carries these new liabilities. As described above, the liability falls back to the MS, represented by the RM, if it is not able to identify a RP with adequate financial means.

Depending on the legal and administrative context and on the history of coal mining and of oil and gas extraction, the process of searching for a RP may vary significantly across the MS. We can assume there being but little legal uncertainty about who owns the land. However, current land ownership does not necessarily coincide with the legal responsibility for the consequences of oil and gas extraction or coal mining activities that may have ended several decades ago. Land surface ownership may diverge from ownership of, or rights to exploit, underground resources. The legal persons originally responsible for the extraction activities may no longer exist.

Especially where the costs of the mitigation measures are substantial or where the identified RP did not expect such new liabilities to arise, the identified RP are likely to contemplate their legal options to avoid carrying them. One way for them to do so would be to contest that they can be declared liable. Another way would be claiming not to have adequate financial means. Settling the latter argument will involve an estimation of the costs of the mitigation measures required by the EU-MER, and a definition of the exact meaning of having the “*adequate financial means*” which may be prone to interpretation.

Ultimately, the RM will end up carrying all liabilities for which it is not able to identify an RP with adequate financial means. Should a RM be unable to identify the RP despite one actually existing, or should the RM accept an unwarranted declaration of the RP falsely claiming that it lacks financial means to comply with the EU-MER obligations, the result will be an undue transfer of costs from private law subjects to the state. While this would be an additional burden to the public budget, it would change nothing with regard to the mitigation obligations prescribed by the EU-MER. However, as long as it remains unclear who must carry the costs of the mitigation measures, they are likely to be delayed. Such a delay would imply an undue

continuation of excessive methane emissions and would subject the MS to the risk of infringement procedures by the European Commission and a loss of climate policy credibility.

For all these reasons, the RM should bring forward all activities outlined here as early and accurately as possible. Given the risk of legal disputes, it is advisable for the RM to make sure that their research for a RP is legally sound.

As a result, the RM will have two lists of inactive, closed and abandoned oil, gas and coal extraction sites: one list of sites for which they only have to ensure that the RP fulfil their obligations, and one list of sites for which the RM is directly responsible. It is clear that the resources required by the RM to fulfil the role of controller are far less than the resources needed to measure and quantify CH₄ emissions, develop reports and mitigation plans and implement mitigation measures, including the permanent plugging of the IPAW.

The key parameters that will determine the costs for the RM will be:

- the difficulty to find the relevant information;
- the number of the total cases and of the dubious cases;
- the frequency and complexity of legal disputes;
- the share and complexity of the sites for which solvent RP can (not) be identified.

The sooner the identification of the responsible party is completed, the sooner the MS can reliably determine the resources and budgets it needs to comply with the EU-MER.

The resources required for this effort include the time of specialised staff with legal and economic skills. This work could, to a certain extent, be outsourced. However, when considering potential outsourcing, due consideration should be given to the sensitive nature of these analyses due to their impact on public finances.

Emission monitoring, reporting and verification (sites for which the MS are responsible)

In this section, we consider all the CH₄ emission monitoring, reporting and verification (MRV) actions necessary to comply with all reporting obligations prescribed by Art 18 (concerning IPAW) and by Art 25 (concerning AUCM and CUCM), regardless of whether they apply in the initial phase when setting up the inventories, or afterwards as regular monitoring obligations.

The MRV effort of the Member States will mainly be a function of:

- the number and complexity of the sites the MS are responsible for. The “complexity”, in turn, will depend on several factors, such as:
 - the number of individual emission points;
 - their accessibility;
 - during the initial inventory phase, the previous availability of reliable emissions data.

- A secondary parameter is whether the MS intends to provide only the data that is mandatory under the EU-MER or also additional data that can be provided on a voluntary basis¹³.

The resources required for this effort include the time of specialised staff with technical skills, the equipment and other costs needed to gather and document the missing data. This work could be outsourced to a significant extent. In addition, MS must provide resources for the verification of their reports by accredited verifiers, before submitting them to their CA [Art 18 (7)].

Emission monitoring, reporting and verification (sites with a responsible party)

The RM must also plan some resources to monitor the implementation of the MRV measures by the RP. Given that the RP must submit verified reports, the specific RM' effort in this field (e.g. the effort per each site with a solvent RP) will be small, as it should be limited to the administrative supervision and an effective legal prosecution of non-compliant RP, if any.

This work requires the time of staff with administrative and legal skills. In our view, this work belongs to the functions that are at the core of the exercise of sovereign powers and can therefore hardly be outsourced, as they depend on the specific legal provisions of the individual MS (more on information on this in our Working Paper N° 3 on selected legal issues related to the implementation of the EU-MER).

Mitigation plans and measures

For several RM, developing the mitigation plans and implementing the mitigation measures in those inactive, closed and abandoned CH₄ emitting sites they are responsible for, will probably be (one of) the most expensive elements of the EU-MER implementation. According to a study that analysed 19,500 abandoned oil and gas wells in five heterogeneous US states, the median cost of plugging a well is circa 76,000 USD if the surface around the well is also remediated, or circa 20,000 USD if this is not done.¹⁴ While these figures are not necessarily transferable to European conditions, they do provide general orientation.

A description of the necessary steps would require a differentiation according to various criteria, including the types of sites and of the emission sources, the intensity of the emissions, specific geographical and geological conditions, and others. It is not possible to carry out this analysis within the scope of this paper.

The effort will depend on:

- the number and complexity of the sites the RM are responsible for;
- the type of mitigation measures adequate to those sites (e.g. permanently plugging abandoned oil wells, equipping coal mine shafts with methane capture equipment);
- the average costs of the mitigation measures;
- the availability of specialised staff or, alternatively, the cost of training staff to plan and carry out the mitigation measures.

¹³ Part 1 of Annex V distinguishes between information that “shall” (e.g. must, see above) and “may” be included in the inventories. Gathering and providing also the latter information can be helpful to identify and address harmful implications (e.g. air pollution seismic impacts) and to trigger learning effects that may help reducing the costs and increasing the effectiveness of mitigation measures.

¹⁴ Raimi et al.: Decommissioning Orphaned and Abandoned Oil and Gas Wells: New Estimates and Cost Drivers. Environ. Sci. Technol. 2021, 55, 15, 10224–10230. <https://doi.org/10.1021/acs.est.1c02234>

This work requires specialised staff with technical skills and knowledge of the relevant industries, the equipment and material, as well as a logistical and management effort to coordinate the activities. This work can be outsourced to a large extent.

The evaluation of the mitigation plans and of the reports on the mitigation measures are a responsibility of the CA, regardless of whether the reports come from the RP of, where solvent RP cannot be identified, from the RM. The evaluation task is discussed in one of the following chapters.

Table 2:
Summary: Inventories, MRV, mitigation plans and measures in closed and abandoned sites

Implementing steps	Key cost factors
Setting up the inventories	<ul style="list-style-type: none"> Effort needed to retrieve and harmonise data from existing datasets N° of sites not covered by existing datasets Average effort needed to identify individual missing wells and mines Quality and completeness of (historical) records of company activities History of permitting procedures and authorities
Determining who is liable	<ul style="list-style-type: none"> Difficulty of finding the information N° of total cases and of dubious cases Frequency and complexity of legal disputes Share and complexity of sites for which a (solvent) RP can (not) be identified
Monitoring, reporting and verification (MRV)	<ul style="list-style-type: none"> N° and complexity of the sites the RM is responsible for Their accessibility and complexity (N° of individual emission points etc.) N° of the RP the RM must ensure the compliance of, and complexity of their sites Scope of the information the RM intends to MRV (only the mandatory or also the voluntary information)
Mitigation plans and measures	<ul style="list-style-type: none"> N° and complexity of the sites the RM is responsible for Type and average cost of adequate mitigation measures

3.1.3 Cost structure, implementation management and potential synergies

Based on the step-by-step analysis above, the following should be considered by the responsible ministries and the competent authorities when quantifying the required efforts:

- Most of the parameters mentioned above point to a **share of variable cost**. In several EU MS, **the main determinants** of the efforts to be borne by the MS will probably be the number and complexity of the emitting sites for which they are responsible. Other important determinants for variable costs will be the type and costs of mitigation

measures, the number of dubious cases and the frequency of legal disputes concerning the attribution of the responsibility for abandoned sites to the MS or to a RP.

- Some of the parameters mentioned above point to **fixed, one-off cost elements**, including the effort needed to retrieve and harmonise data from existing datasets, to identify the wells and mines not covered by existing datasets, to identify the responsible parties. The smaller the number of sites a MS will be responsible for, the lower the proportion of variable costs and the higher the proportion of fixed costs.
- In several MS, significant time and efforts will be necessary to identify the number and complexity of sites for which the MS is responsible. Therefore, the **key determinant of the variable costs will often not be known at the time of entry into force of the EU-MER** and for a while afterwards. As a consequence, a reliable quantification of the resources needed to develop mitigation plans and measures will only be possible when the inventories are completed, including the first round of measurements and quantifications. The reliability of earlier estimations will depend on the availability of data to estimate the key determinants.
- Carrying out these tasks will mainly require **staff** with a mix of technical, economic, legal, data handling and administrative skills, as well as knowledge of the relevant industries. If the necessary personnel are not already available to the responsible ministries, they must consider the extent to which they wish to obtain them by hiring new employees and/or by training existing employees and/or by outsourcing parts of the task to external service providers. When considering these options, the RM should also take into account the other tasks for which it is responsible (see section 3.4 of this paper).
- Furthermore, technical **equipment** will be needed to carry out the CH₄ measurements, and various types of equipment and materials will be needed to implement the mitigation measures, such as the permanent plugging of abandoned oil and gas wells under the responsibility of the responsible ministries. The same type of equipment will be needed to carry out the inspections under the responsibility of the CA. Therefore, the responsible ministries and the CA should consider the opportunity to jointly purchase or lease (parts of) this equipment and/or to make a joint announcement of their intention to delegate (parts of) these activities to external entities. This decision should be made early enough to ensure that whoever is ultimately responsible for ensuring the availability of this equipment has the time to do so.
- There is potential for learning effects and there may be some limited potential for scale effects, when it comes to implementing a large number of similar mitigation measures. This could be the case for instance when permanently plugging inactive oil and gas wells.
- There is some potential for reducing implementation efforts by reaping synergies with other MS implementing the EU-MER. Synergies could be achieved by sharing best practices and potentially developing common IT tools for setting up inventories. Additionally, collaborating on the development and implementation of mitigation plans may also be beneficial.

3.2 Inspections

Besides the evaluation of reports and the decision-making functions discussed in the following chapter, the most substantial task of the competent authorities (CA) will be the inspections of the companies and entities subject to obligations under the EU-MER¹⁵.

3.2.1 The tasks of the competent authorities

The EU-MER mandates routine and non-routine inspections to verify and promote compliance. Routine inspections are only envisioned for the companies and entities operating relevant assets in the EU, but not for the importers, who are only subject to non-routine inspections [Art 6(1)].

The first routine inspections must be completed by May 2026. Afterwards, routine inspections must be carried out at least every 3 years. The programmes for routine inspections must be based on a risk assessment to be carried out by the CA, which should take into account “*the risks associated with each site, such as environmental risk, including the cumulative impact of all methane emissions as a pollutant, human safety and health risks, as well as any identified breaches of this Regulation*”. If a routine inspection reveals a serious breach of obligations, the next one must follow within 10 months [Art 6(3)].

According to Art 6(4), the CA must carry out non-routine inspections to:

- investigate substantiated complaints;
- ensure that the companies and entities subject to EU-MER obligations have implemented specific lead detection and repair (LDAR) and other mitigation measures;
- verify compliance by importers.

The non-routine inspection after a substantiated complaint is to be carried out as soon as possible and within a maximum period of 10 months following the reception of the complaint.

According to Art 6(2), the inspections must include the following elements, where they are relevant in the given case:

- site checks
- field audits examination of documentation and records that demonstrate compliance
- CH₄ emissions detection and concentration measurements
- any follow-up action to check and promote compliance of sites with the requirements of EU-MER.

The CA must prepare reports describing how the inspections have been carried out, their outcomes and providing recommendations for further action to the companies and entities subject to EU-MER obligations [Art 6(5)]. In case an inspection shows non-compliance, the CA can determine the time by which they must take action to comply [Art 6(6)].

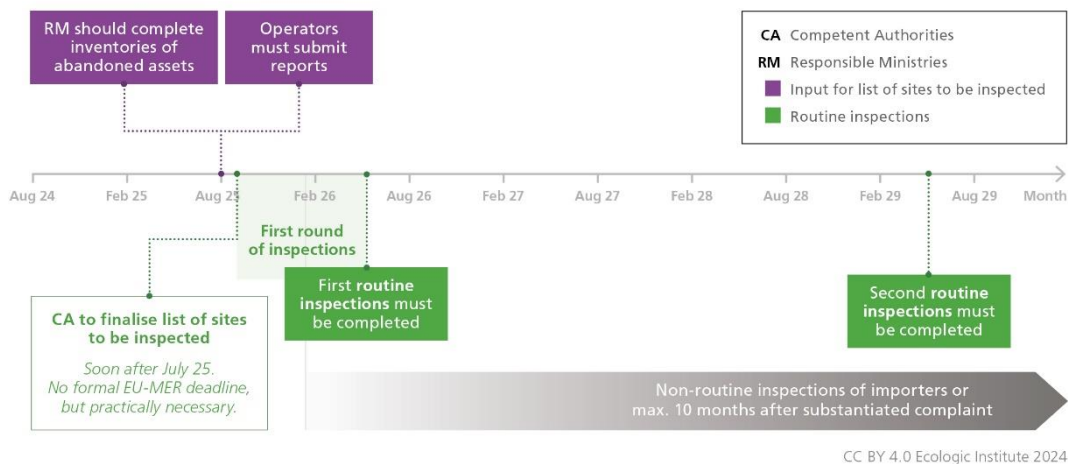
¹⁵ These companies and entities include four categories: ‘operator’, defined as “any natural or legal person who operates or controls an asset, or, where provided for under national law, to whom decisive economic power over the technical functioning of an asset has been delegated” [Art 2(3)]; ‘mine operator’ “means any natural or legal person who operates or controls a coal mine or, where provided for under national law, to whom decisive economic power over the technical functioning of a coal mine has been delegated” Art 2(12); ‘undertaking’ “means a natural or legal person who carries out at least one of the following activities: oil or fossil gas exploration and production, fossil gas gathering and processing, or gas transmission, distribution and underground storage, including with regard to LNG”; Art 2(13); and ‘importer’, which “means a natural or legal person who, in the course of a commercial activity, places crude oil, natural gas or coal originating from a third country on the Union market”.

According to Art 6(2), the inspections can be undertaken “by or on behalf” of the CA. According to Art 6(7), to provide specialised expertise to support the CA when carrying out inspections, the MS “may enter into formal agreements with relevant institutions, bodies, agencies or services of the Union or with other Member States or other appropriate intergovernmental organisations or public bodies”, provided that their objectivity may not be compromised by a conflict of interest [Art 6(7)]. In our Working Paper N° 3 on legal issues related to the EU-MER, we discuss the extent to which the CA can outsource inspections tasks to private service providers considering the provisions of Art 6(2) and Art 6(7).

3.2.1.1 Timeline

Figure 2 illustrates the most important milestones related to the inventories, MRV requirements and mitigation plans and measures concerning inactive, closed and abandoned assets. More details can be found in the preceding text.

Figure 3: Timeline: inspections



3.2.2 Implementing steps and key parameters to quantify the resources needed

Establishing the list of sites and of importers to be inspected

In a first step, the CA will have to set up a comprehensive list of all sites and sources that will be subject to inspections. This list will consist of three elements:

- 1) The inventory of inactive, closed and abandoned fossil energy extraction discussed in the previous section.
- 2) All operated and non-operated (but not closed or abandoned) assets subject to EU-MER obligations, including oil and gas wells, coal mines, as well as gas storage facilities, gas transmission and distribution infrastructure, LNG terminals. If not already available, such lists should be included in the first reports due by the companies or entities subject to this obligation by August 2025 [Art 12(1), Art 20(6)].
- 3) The relevant importers. Notably, the EU-MER stipulates that the importers' reports are to be submitted to the CA of the MS in which the importers are legally established [Art 27(1)]. This implies that the importers' reports may be submitted to the CA of a different MS than the one where the pipelines or the ships carrying the imported fossil fuels enter the territory of the Union. It also implies that, in case the import contract is transferred from one legal entity to another one established in a

different MS, the CA responsible for the inspection will change. Therefore, unlike the case of the physical assets located in their country, the CA will have to regularly update the list of the relevant importers. To do so, the CA need to establish a procedure to ensure that all import flows are reported. This could be facilitated by regular exchange of data among the CA and the customs authorities of all MS. This could be one of the purposes of the collaboration among the Cas and with the Commission foreseen in Art 5(3) of the EU-MER.

The key parameters that will impact the effort to carry out these steps will be:

- the number of operated and non-operated assets mentioned in point 2;
- the number of importers that must submit reports;
- a secondary parameter is the effort to ensure that the CA is aware of all importers it needs to inspect.

This work will mainly require time of staff with administrative and data handling skills as well as knowledge of the relevant industries, possibly supported by staff with legal skills in case of litigations.

Depending on the legal conditions of the individual MS, the work described in point 2) could be outsourced to a certain extent, whereas the work described in point 3) is probably not suitable for outsourcing, as it affects commercially sensitive information and requires a direct collaboration between the CA and the customs authorities of other EU MS.¹⁶

Establishing programmes for routine inspections and planning non-routine inspections

To plan the scope and calendar of the routine inspections, the CA must take into account the EU-MER requirements concerning the frequency of the inspections as well as the outcomes of the risk assessment described above. The risk assessment exercise will require the CA to establish a methodology to weigh the risk criteria mentioned above and derive a prioritisation of the routine inspections of different assets. Moreover, the CA will have to consider logistic and other practical aspects, including the availability of in-house and external specialised staff and equipment. To be effective, the inspection programmes should maintain a degree of unpredictability from the point of view of the inspected companies and entities. To a certain extent, non-routine inspections can also be prepared for in advance, for instance when examining a complaint or taking into account the time limits set by the CA itself to implement LDAR measures.

In addition, the CA must draw up detailed protocols on the procedures for conducting individual inspections based on objective criteria in order to minimise the risk of jeopardising the integrity of the inspection process. The criteria might include the risk profiles of categories of sites and sources and of individual companies and entities, the consistency and plausibility of the latter's MRV reports, as well as elements of randomisation to reduce the predictability of the inspection process.

Planning the inspection process includes making decisions on the potential involvement of external service providers.

Inspections that may lead to tangible sanctions are prone to litigation concerning the scope, aspects of their implementation and outcomes. Therefore, all CA procedures should be legally sound, and the CA should be equipped to defend its actions and decisions.

¹⁶ See our separate paper on selected legal issues, which discusses the extent to which inspection activities can be outsourced.

The key parameters that will influence the planning effort will be:

- the number of sites in the specific MS;
- their variety (the CA of a MS with oil, wells, gas wells, coal mines, LNG terminals and several importers will face a higher planning effort than the CA of a MS that only needs to inspect gas pipelines and gas storage facilities);
- the number of CA involved in the inspection activities and therefore the transaction costs related to the coordination. Depending on the MS, there may be different thematic areas of competence (e.g. air quality measurements, underground coal mines) and different regional jurisdictions);

The planning effort will mainly require time of staff with technical, economic, data handling, administrative and legal skills, as well as knowledge of the relevant industries.

In our opinion, the planning activities cannot be outsourced, or only to a very limited extent, as they are at the core of state functions.

Carrying out the inspections

If the inspections are carried out by in-house personnel, the CA will have to manage the entire process, including the recruitment and training of the specialised staff, buying or leasing the necessary equipment, and managing the logistical aspects.

If parts of the inspection activities are outsourced, the CA will still have to take care of hiring and supervising the external inspectors, and to carry out its own core tasks, which may vary depending on the national legal context. We discuss the extent to which EU-MER inspection activities may be outsourced by the CA in our Working Paper N° 3. In general, we assume that the issuing of official inspection reports and of the administrative orders that result from them cannot be outsourced, as it is a core task of the CA.

In both cases, the key parameters that will impact the effort and the costs related to the inspection work will be:

- the number of sites to be inspected
- the average effort and cost of one inspection for each site profile
- the number of sites and of importers to be inspected
- the complexity of the importers' reports, which will depend on the complexity of their portfolios of suppliers
- Share of the inspection work that the CA will carry out with in-house resources and/or outsource to specialised service providers

Inspections carried out by in-house staff will require specialised staff with technical skills and knowledge of the relevant industries as well as the necessary equipment. Although to a lesser extent, this type of staff is also required in the event of outsourcing so that the CA can supervise the external inspectors. Moreover, in both cases, staff with legal and administrative skills will be required.

Table 3: Summary of inspections

Implementing step	Key parameters
Establishing the list of sites and of importers to be inspected	<p>N° of operated and non-operated assets to be inspected</p> <p>N° of importers that must submit reports</p> <p>Effort to ensure that the CA is aware of all importers</p>
Establishing programmes for routine inspections and planning non routine inspections	<p>N° of sites in the specifics MS</p> <p>Variety of the sites</p> <p>N° of the CA involved in the inspection process</p>
Carrying out the inspections	<p>N° of sites to be inspected</p> <p>Average effort and cost of one inspection for each site profile</p> <p>N° of sites and of importers to be inspected</p> <p>Complexity of the importers' reports, which will depend on the complexity of their portfolios of suppliers</p> <p>Share of the inspection work that the CA will carry out with in-house resources and/or outsource to specialised service providers</p>

3.2.3 Cost structure, implementation management and potential synergies

Based on the step-by-step analysis above, the following should be considered when quantifying the required efforts.

- The first two steps (list of sites and importers to be inspected, planning the inspection programme) are characterised by a high share of **fixed costs**: establishing the list will be largely a **one-off effort**; also, the first planning of the inspection programmes will be by far more complex than the planning of the subsequent inspection rounds. However, carrying out the inspections has a high share of **variable costs**, depending on the number and type of the necessary inspections. The **main determinants** of the size of both the fixed and of the variable costs will be the **number and types of the sites and companies to be inspected**.
- Therefore, the costs can only be **reliably estimated** once a sufficiently precise list of the sites and companies to be inspected is available.
- Significant parts of the work needed to carry out inspections can be outsourced, provided that the legislation of the MS allows to do so. However, even in case of maximum **outsourcing**, the CA will need specialised personnel to plan and supervise the inspections and to deal with potential litigations. If the inspections are carried out by in-house personnel, the CA will need to hire or retrain significantly more personnel with technical skills and to purchase or lease the necessary equipment. If the inspections are outsourced, a sufficient **budget** must be planned, which is likely to be substantial in MS with many sites to be inspected.

- Planning and carrying out inspections require types of skilled personnel and equipment similar to the tasks of the responsible ministries analysed in the previous section, concerning the inventories and MRV activities for IPAW, CUCM and AUCM. Therefore, as mentioned above, it could be useful for the competent authorities and the responsible ministries to consider the opportunity to jointly purchase or lease (parts of) this equipment and/or to make a joint announcement of their intention to delegate (parts of) these activities to external entities.
- Considering that the implementation of the EU-MER will greatly increase the number of CH₄ measurements carried out in Europe and probably globally, there is likely to be significant potential for learning effects, for example if measurement, quantification, and communication practices improve over time. When it comes to multiple-site monitoring, there could be a significant potential for scale effects, as airborne and mobile ground-based detection and quantification instruments could become cheaper, as they are more widely used. Where the number of inspections per year is very high, scale effects can also be achieved through effective logistics and planning, as well as high utilisation of specialised staff and equipment.
- Therefore, the implementation efforts can be reduced, and the implementation quality can be improved by reaping synergies with other MS implementing the EU-MER. In countries where the responsibility for inspections lies at the regional level (e.g., Germany's federal states), collaboration should also be sought between the regional CA. Synergies can be achieved by sharing best practices, developing common IT tools, and possibly also by pooling purchasing power for equipment.

3.3 Analyse incoming reports and take consequential decisions

In addition to the inspections discussed above, the most substantial task of the CA will be evaluating a large number of incoming reports and making various important governance and administrative decisions, including imposing requirements and sanctions on companies and entities that are found to be in breach of the EU-MER.

3.3.1 The tasks of the competent authorities

The CA will receive and must evaluate a large number of technical reports submitted by the operators of active assets subject to the EU-MER obligations, by the importers and by those who carry the liability for inactive closed and abandoned fossil fuel extraction sites (either the responsible parties, or the responsible ministries – see above). The reports to be evaluated by the CA include, among others:

- emissions monitoring reports;
- leak detection and repair reports;
- venting and flaring reports;
- reports on the mitigation plans;
- reports on the implemented mitigation measures;
- reports on imports.

A comprehensive list of the incoming reports that must be submitted to the CA and subsequently evaluated by them can be found in Annex 2 of this paper.

Based on the incoming reports mentioned above and other evidence as appropriate, the CA will need to make a number of decisions, some of which may have a significant impact on the respective subject. These decisions include, among others:

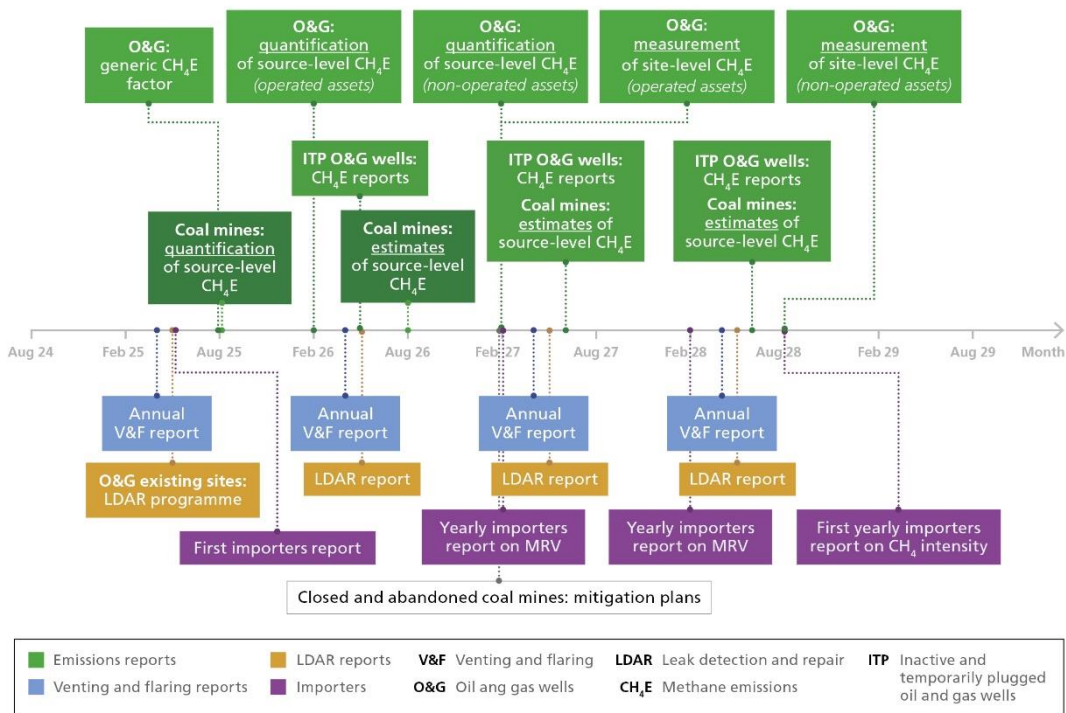
- (Dis)approving and requiring amendments to LDAR programmes and schedules
- Requiring modifications of the plans to comply with venting and flaring requirements
- Imposing remedial actions and/or penalties against non-compliant entities
- Exempting individual companies or entities from certain obligations, under precisely defined conditions

A comprehensive list of the incoming reports that must be submitted to the CA and then evaluated by them can be found in Annex 2 of this paper.

3.3.1.1 Timeline

The figure below only shows a selection of the numerous incoming reports that must be evaluated by the CA. It does not include several types of incoming reports that refer to irregular occurrences, such as reports on exceptional venting or flaring events or justifying exceptional delays of certain measures. In practice, the CA of middle and large countries are likely to be exposed to a continuous flow of incoming reports

Figure 4: Timeline: selected incoming reports that must be evaluated by the CA



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Like in Figure 2 above, the recurring series of reports to be submitted by the companies subject to EU-MER obligations, followed by reviews or evaluations conducted by the CA, are yearly cycles that extend beyond the timeframe shown in the chart.

3.3.2 Implementing steps and key parameters to quantify the resources needed

As a first step, the CA must create administrative structures to receive, store and subsequently evaluate the incoming technical reports.

Where an individual CA is responsible for a sufficiently large number and variety of sites, and as such receives a large number of incoming reports, it is likely to be beneficial to establish units with a degree of specialisation, for example on certain sectors (e.g. coal mines, oil and gas wells, gas infrastructure, importers) and/or on specific type of activities, reports and, subsequently, the corresponding decisions (e.g. CH₄ measurement technologies, LDAR, venting and flaring, plugging of oil and gas wells, other mitigation plans measures, importer contracts).

In some cases, the scope of competence of an individual CA may be too limited to reap the benefits of specialisation. This is likely to be the case in MS with a small number of relevant site as well as in those MS where the CA responsibilities are by law allocated to the regional/state level, such as in Germany. In such cases, the CA should consider pooling their resources with other CA from neighbouring regions/federal states or from other MS.

The outcomes of the evaluation of the incoming reports will directly flow into the manifold decisions to be made by the CA as outlined above. Some of these decisions (penalties, mandatory remedial actions) may entail significant costs to be borne by the operators, importers, responsible parties and, in certain cases, by the responsible ministry. Administrative decisions imposing significant costs are inherently prone to opposition and, in some cases, litigation. It will, therefore, be important for the CA to be able to prove the integrity, correctness and consistency of their evaluation processes, e.g. by using standardised evaluation criteria and procedures. Subsequent decisions, too, must be legally sound and capable of withstanding legal challenges.

The **key parameters that will influence the costs of evaluating the incoming reports** and taking the decisions based on them will be:

- the number, variety and complexity of the incoming reports, which is a consequence of the number of companies and entities subject to EU-MER obligations and of the variety and complexity of the sites and of the important contracts to be covered by a CA;
- the level of relevant expertise and structures already available within the CA;
- the efficiency of the internal evaluation and decision procedures of the CA;
- the quality of the reports submitted to the CA;
- the degree of compliance of the entities submitting the reports;
- the frequency, number and complexity of potential legal disputes.

This task will require a mix of staff with administrative, technical, economic and legal skills and with a significant degree of knowledge of the industries to be analysed, their technical characteristics, cost structures, potential mitigation measures.

We consider that there is little potential for outsourcing a significant share of these activities. As such, the handling, analysis and evaluation of the incoming reports concerning domestic assets might be outsourceable to a certain extent. However, the outcomes of the report evaluation are very closely linked to the subsequent decision-making process. The latter can

hardly be outsourced, since it is at the core of the state functions when implementing the EU-MER. When it comes to the import supply contracts that will be the object of the importers' reports, the EU-MER explicitly requires the CA to protect the commercial secrecy of the data obtained from the importers. This is an additional argument against outsourcing this task.

3.3.3 Cost structure, implementation management and potential synergies

Based on the step-by-step analysis above, the following should be considered when quantifying the required efforts:

- Some of the parameters above point to **fixed, one-off cost elements**, arising from the establishment of administrative structures and teams with the necessary technical, economic and legal skills. The extent of these costs may vary depending on the pre-existing structures of each MS.
- Most of the parameters mentioned above point to **variable costs**, which stem from the recurring task of analysing incoming reports, taking decisions, and defending them in court if necessary. Depending on the number of incoming reports as well as the propensity of the companies and entities subject to EU-MER obligations to contest subsequent decisions, the variable costs may differ significantly across Member States.
- Accurate estimation of **absolute costs** will be possible once the frequency and volume of incoming reports are known. MS should allocate resources for identifying the companies and entities subject to reporting obligation under their jurisdiction. Additionally, empirical data on the number of legal disputes, which will only become available over time, can be used to provide more accurate cost estimates.
- As the evaluation of incoming reports is a recurring and ongoing task, it is likely for **learning effects** to materialise over time, reducing the effort required for each evaluation and subsequently lowering variable costs.

3.4 Other tasks at the national level

In this paper, we aim to provide a complete description of all tasks that must be tackled by the RM and the CA in the EU MS when implementing the EU-MER. This section covers all tasks that have not already been mentioned above.

Some of the tasks described in this section are crucial for the success of the EU-MER, especially the RM's tasks of setting up the CA and of establishing the penalty regime. Some of them may involve a tangible effort. However, unlike the tasks described in the three previous sections, those listed here are not particularly specific. Rather, they involve ordinary policy making and administrative activities. Therefore, discussing their implementation step by step as we did in the previous sections would be of very limited added value. After the description of the tasks, we directly pass to some consideration concerning the costs and resources needed to carry them out.

3.4.1 Other tasks of the competent authorities

Dealing with Complaints

The CA must be capable of receiving written complaints filed by natural or legal persons on a possible breach of the requirements of the EU-MER [Art 7(1)]. Upon substantiated complaints, the CA must carry out non-routine inspections [Art 6(4)] (more on this in chapter 3.2 above).

“*Within a reasonable time but not later than 2 months*” after receiving the complaint, the CA must inform the complainants in case it decides not to pursue an investigation because the complaint does not provide sufficient evidence. The “reasonable time” wording suggests that substantiated complaints pointing to serious breaches should be processed more rapidly than within two months [Art 7(3)].¹⁷ The CA must keep the complainant informed of the steps taken and of appropriate alternative forms of redress, e.g., recourse to national courts [Art 7(4)].

The CA must publish indicative periods to take a decision on complaints [Art 7(5)].

Outgoing reports, notifications and publications to be produced by the CA

The EU-MER requires that the CA must publish a series of information and submit notifications and reports to the European Commission. The CA must make certain reports publicly available on a designated website [Art 5(4)]. Where information is kept confidential in accordance with Art 4 of Directive 2003/4/EC¹⁸, the CA shall indicate the type of information that has been withheld and the reason why [Art 5(4)].

A complete list of the outgoing reports, notifications and publications that must be produced by the CA can be found in Annex 3 of this paper.

Cooperation at the EU level and with other countries

The CA must establish a contact point that must support the networking activities with the CA of other MS organised by the European Commission [Art 4(2)]. The CA must cooperate with each other and with the European Commission and may cooperate with authorities of third countries [Art 5(3)]. Particularly with reference to penalties, the CA must “*cooperate closely to ensure that their powers are exercised, and that the administrative penalties and administrative measures they impose are designed and applied in an effective and consistent way across the Union*” [33(4)]. The European Commission may request information from The CA and the MS to support its obligation of monitoring, reviewing and reporting on the implementation of the EU-MER.

3.4.2 Other tasks of the Member States

Establishing and equipping the competent authorities

MS must designate one or more CA responsible for monitoring and enforcing the application of the EU-MER. MS must notify the Commission of the CA’s names and contact details by February 2025 and of any change thereafter [Art 4(1)].

MS must ensure that the CA have adequate powers and resources [Art 4(3)].

¹⁷ If the CA decides to pursue the investigation, this situation is regulated by Art 6(4), requiring that the CA must carry out a non-routine inspection upon substantiated complaint. “*Where complaints that are not sufficiently substantiated are repeatedly lodged and for that reason deemed abusive*”, the CA have no obligation to react [Art 7(3)].

¹⁸ Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information.

To provide specialised expertise to support the CA when carrying out their functions with reference to inspections, MS “*may enter into formal agreements with relevant institutions, bodies, agencies or services of the Union or with other Member States or other appropriate intergovernmental organisations or public bodies*”, provided that their objectivity may not be compromised by a conflict of interest [Art 6(7)].¹⁹

Laying down the rules on penalties

We discuss more in detail these issues input Working Paper N° 3 on penalties. Therefore, we only provide a short summary here.

Within an elaborate set of provisions established in Art 33 of the EU-MER, MS must lay down rules on penalties applicable to infringements of the EU-MER and must take all measures necessary to ensure that these rules are implemented [Art 33(1)]. Moreover, MS must ensure that the CA have the legal power to impose a series of specified administrative penalties and administrative measures relating to breaches of a (minimum) list of provisions of the EU-MER, “*provided that they (the penalties and measures) do not endanger the security of supply*”. Administrative measures other than penalties include for example the disgorgement of profit gained or the issuing of public warnings or notices [Art 33(2)]. Art 33(5) explicitly stipulates that a longer (minimum) list of particularly serious infringements must be subject to penalties, i.e. the reaction of the CA may not be limited to other administrative measures.

MS must notify the rules on penalties and any subsequent amendment to the European Commission [Art 30(2b)]. MS must publish information on the type and size of the penalties imposed under the EU-MER, on the infringements and on the companies and entities upon which penalties have been imposed [Art 33(8)].

Certification, accreditation and qualification

MS must “*ensure that certification, accreditation schemes or equivalent qualification schemes, including suitable training programmes, are available*” [Art 14(16)].

Operating underground coal mines: option to use incentive schemes

Within the Section II of the EU-MER, which is dedicated to the mitigation of CH₄ emissions from operating underground coal mines, Art 22 (1) forbids “*flaring with a destruction and removal efficiency by design level below 99 % and venting of methane from drainage systems*” from 1 January 2025, “*except in the case of an emergency or a malfunction, or where unavoidable and strictly necessary for maintenance*”. Moreover, with regard to CH₄ venting through ventilation shafts, Art 22(2) sets a maximum of, 5 and 3 tCH₄/kt of coal mined, from 2027 and 2031 onwards, respectively. These thresholds “*apply per year per mine and per operator, if one entity operates several coal mines. Measures taken in accordance with this paragraph shall not lead to the deterioration of the safety of workers.*”. These thresholds do not apply to coking coal mines, for which specific restrictions will be established in a delegated act to be adopted by the Commission within three years of the entry into force of the EU-MER.

Art 22(4) stipulates that, without prejudice to the state aid provisions of the Treaty on the Functioning of the EU, MS “*may use a system of incentives to reduce methane emissions based on fees, charges or penalties as referred to in Article 33, in order to guarantee that operators of existing [underground] coal mines comply with the obligations*” of Art 22. The EU MER articles on CH₄ emissions from oil and gas wells and from abandoned and abandoned coal mines do not provide for the possibility of using incentives. This option is intended to support the

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operators of underground coal mines in their efforts to comply with Art 22. However, it does not mean that they would be exempt from penalties if they do not comply. On the contrary, infringements related to Art 22 are included in the list of particularly serious infringements which must be sanctioned with penalties and not only with administrative measures [Art 30(5)].

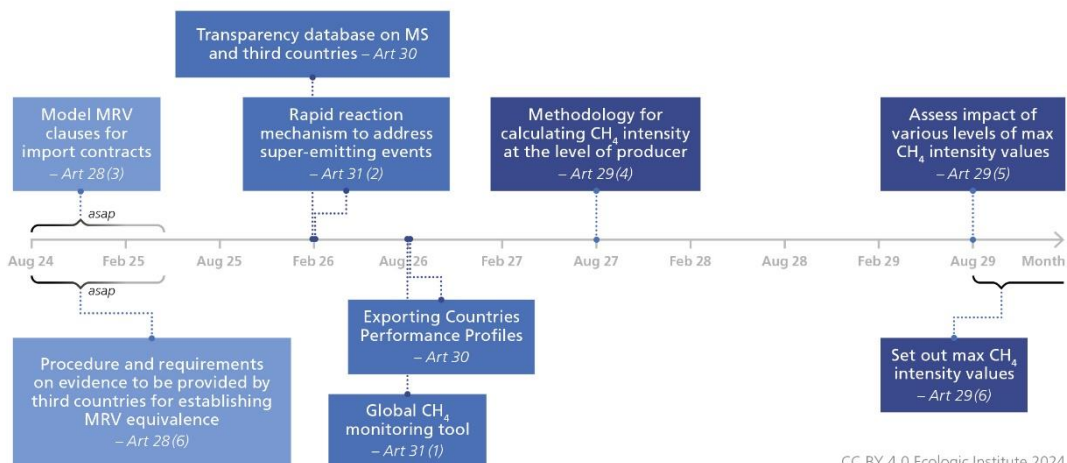
3.4.3 Considerations on costs and resources needed to carry out these tasks

- The CA's tasks that necessitate specifically skilled personnel and specialised equipment have been outlined in the previous chapters. The additional tasks addressed here call for generic administrative and communication skills. Nonetheless, it must be highlighted that the CA must also employ staff proficient in the requisite language, technical and communication skills to facilitate productive collaboration with the CA of other Member States and with the European Commission.
- The total budget required by each CA will exceed the sum of the budgets needed for the individual tasks listed in this document. Given the complexity of the EU-MER, significant coordination and management efforts will be necessary, including collaboration with other bodies. The more fragmented the responsibilities are within a MS, the greater the costs of coordination.
- On the other hand, consolidating the number of CA within a MS may necessitate the transfer of responsibilities from one public authority to another. This process entails transaction costs and potential retraining expenses, which are not incurred if the EU-MER activities are allocated among existing authorities. Further discussion on this and other governance issues is available in our Working Paper N° 2.
- From the point of view of the responsible ministries, their other tasks described in this section are ordinary policy-making activities. When taking decisions about the allocation of the responsibilities and tasks to various CA, the MS should consider the overall effectiveness, efficiency and cost of implementing the EU-MER. This involves considering some trade-offs and strategic choices, which we discuss in the next chapter.

3.5 Timeline of the tasks assigned to the European Commission

This paper focuses solely on the implementation of the EU-MER at the national level. Therefore, we do not discuss the tasks assigned by the EU-MER to the European Commission, which is responsible for producing a series of important legal acts and documents. Since these acts will impact implementation at the national level, we provide here a timeline showing by when the most important acts to be produced by the Commission are due or can be expected.

Figure 5: Timeline: selected acts to be produced by the European Commission



4 Conclusions

Drawing on the analysis above while simultaneously considering insights emerging from our research for the parallel Working Papers mentioned in the introduction, we provide some conclusions based thereon. In the following and last chapter, we formulate recommendations for NGOs that intend to engage for a strong EU-MER implementation.

4.1 Time is of the essence: For a thorough, timely planning of the EU-MER implementation at the national level

The EU-MER has been finally adopted in May 2024 and enters into force on 4 August 2024. However, the Member States (MS) governments agreed on the final text in December 2023, and most of its contents were clear before then. Nonetheless, a small series of talks with relevant experts and public officers seems to suggest that, at the time of writing these lines (May 2024), some MS are not yet ready to deciding on the most basic aspects of the EU-MER implementation – namely which units in which ministry will be responsible, nor which agencies will take on the role of competent authorities (CA) for which tasks.

Formally, no objections can be raised: The MS do not have to communicate the name of their CA to the Commission until 4 February 2025. However, in view of the substantial preparatory work necessary to properly carry out all tasks and comply with the EU-MER deadlines, it is highly advisable that the MS do not wait until the latest possible deadline.

Time is of the essence. All sites must be inspected by 4 May 2026. Especially in MS with a large number and variety of sites to be inspected, this will be difficult to achieve unless the CA conclude the planning of their inspection programmes in early 2025 and start executing them before the summer of 2025. This presumes that the concrete planning starts well before the end of 2024, which is unlikely to happen if the CA is only designated at the very last moment in February 2025.

In addition to establishing the division of work, the necessary resources must be planned and made available. The responsible ministries (RM) should work to produce a first estimation of the staff, equipment and financial resources needed to implement the EU-MER in their country as soon as possible. Chapter 3 of this paper provides some help by identifying a series of relevant parameters. A more precise estimation will be possible once the inventories have been completed and all other essential cost determinants quantified. Therefore, to allow adequate planning, it is advisable to finalise the inventories as soon as possible.

According to Art 4(3) of the EU-MER, the Member States must ensure that the CA have adequate powers and resources. Therefore, the RM must not only retrain and/or hire the staff and procure the equipment they will need to carry out their own tasks (see chapter 3.1 and 3.4.2). The RM must also ensure that each designated CA has the resources it needs to carry out its EU-MER tasks (see chapters 3.2, 3.3, and 3.4.1). This budgeting exercise should be advanced in 2024 based on a rough estimation of the costs, to make sure that the CA can start being operative by the beginning of 2025 at latest.

In sum: All these arguments point to the fact that the responsible ministries should thoroughly plan the implementation of the EU-MER as early as possible. An early planning can also contribute to reducing the costs of implementation, as argued in the following section.

4.2 Keeping implementation costs at bay without diminishing its quality

As they approved the EU-MER, the governments of the EU-MS took on a series of new tasks and liabilities with the goal of achieving a rapid reduction of methane emissions from the energy sector. All EU-MER provisions are directly applicable in the MS and must be implemented.

Keeping the implementation costs for public bodies at bay will be beneficial as it will leave more resources for other state tasks and will strengthen the legitimacy of climate policy measures. However, it is important to avoid the cost minimisation strategies jeopardising the quality of the implementation.

The analysis above shows that a substantial share of the costs associated with implementing the EU-MER consists of variable costs that largely depend on factors which are out of the RM's and CA's control. Notable examples are the number and complexity of the sites to be inspected by the CA, the number of inactive, closed and abandoned sites, and the complexity and cost of the associated mitigation measures for which the RM must be directly liable (as opposed to the larger number they could be liable for, as discussed below).

However, some of the determinants of the variable costs to be borne by the RM and by the CA can be influenced by them. We identify three particularly relevant areas.

To a certain extent, the RM may be able to reduce the number of inactive, closed and abandoned sites (oil and gas wells, coal mines) for which they will be liable in terms of the mitigation plans and measures mandated by the EU-MER. In a first step, the RM must try to identify responsible parties (RP), e.g. private law entities that should carry the liability instead of the RM (see chapter 3.1). In some cases, the search for an RP might be a complex issue. How effectively the RM identifies the RP might have a significant impact on the costs that the Member State has to bear for the implementation of the EU-MER. The more sites that cannot be identified, the higher the costs for the Member State.

In a second step, some of the identified RP might claim not to have adequate financial means (see chapter 3.1). In this case, the liability would be carried by the RM, which would thus need to verify this statement and, in case of doubt, might opt to challenge it. A thorough review of such statements can prevent the state from bearing costs that should actually be borne by private law entities. However, if the dispute is likely to be protracted, the RM should nevertheless develop the mitigation plans and implement the mitigation measures, while reserving the right to pass on the costs to the RP, if its claim is found to be unfounded. Postponing the mitigation plans and measures would unnecessarily prolong the duration of the relative methane emissions and could lead to an infringement procedure.

Moreover, the RM can explore ways to reduce the specific costs of the mitigation plans and measures they are liable for with regard to the inactive, closed and abandoned sites discussed in the previous point. There may be different, more or less costly ways to achieve the same level of emission mitigation at a specific site. Moreover, there may be a learning potential that could reduce the unit costs, e.g., of plugging inactive and abandoned oil and gas wells. This potential may be considerable, considering the very high number of inactive or abandoned oil and gas wells that will be inventoried²⁰. Particularly in regions with a lot of oil and gas wells to be plugged, it may also be possible to achieve economies of scale by procuring the well

²⁰ Art 18(1) allows a relaxed deadline to conclude the inventories for MS that have more than 40.000 inactive wells, temporarily plugged wells, and permanently plugged and abandoned wells. We assume that this figure has been proposed by one MS that is convinced to be above it. Therefore, the total number across the EU is likely to be six-digit.

plugging service under a single contract and at a lower unit cost than would be possible under multiple contracts.

Similarly, the CA may be able to reduce the specific costs of carrying out inspections. First, early and smart planning can enable more efficient choices. A smart inspection programme can take into account (among others) cost factors, for instance when determining the order in which the sites are to be inspected, thereby using staff most efficiently and reducing travel costs. An early planning of the routine inspections will be helpful regardless of whether the CA intend to carry out the inspections with in-house staff or to outsource (parts of) the inspection work. In case of outsourcing, one can assume that the earlier the tenders for assigning the inspection work are published, the more time the service providers will have to carry out the required number of inspections, the smoother the work can be planned, thus avoiding unnecessary and costly peaks. Similar arguments are valid in case the CA implements the inspection with in-house staff: early planning will help to better and more efficiently manage the processes of hiring and/or re-training existing staff to carry out methane inspections and of purchasing or leasing the necessary equipment.

4.3 The value of early and substantial upfront investments for an ambitious EU-MER implementation

In times of tight public budgets, a higher level of upfront investment by the RM and the CA during the initial phase of the EU-MER implementation is likely to help reducing the implementation costs in the medium and long term, while increasing the climate mitigation impact.

The most essential investment in the early phase will be in the training and staffing of the competent authority as well as the relevant unit(s) in the RM. This can be a substantial investment, but one that is likely to pay off in the medium term when it comes to implementation quality and efficiency. If the CA tasks are allocated to several agencies, the RM must take into account additional resources for an effective coordination. Moreover, the time for retraining and acquiring new specific skills must be considered – the earlier MS start the process, the better.

In addition to the investment in human resources, the initial investment will also consist in generic equipment (IT, offices, vehicles) as well as in specific equipment for inspections or CH₄ measurements, unless the MS and CA outsource these completely to private service providers. Procuring specialised equipment requires sufficient expertise, which is why the specialised staff must be prioritised. In addition, the communication infrastructure and databases must be established, which will involve substantial upfront investments.

Sufficiently early investments in staff, equipment, and infrastructure can support an effective implementation of the EU-MER. Moreover, due to the resulting better planning and implementation, early investments may also pay off in the long term by leading to a more efficient implementation. This is because a well-planned implementation can, among other aspects:

- reduce the risk that of the state carrying liabilities that should actually be carried by private law entities;
- improve the efficiency of inspections;
- avoid bottlenecks, allow a higher utilisation of specialised equipment
- reduce legal costs linked to litigations;
- help to avoid infringement procedures;

- help to avoid reputational damage, which would be associated with a poor implementation of the EU-MER;
- explore the possibility of obtaining support from the Recovery and Resilience Facility, or other EU funding opportunities.²¹

All in all, the groundwork the MS lay with the establishment and resourcing of the CA and of the relevant units in the RM will be an important determinant for the success of the EU-MER's implementation, which will be instrumental to reducing methane emissions from the energy sector occurring within and outside the EU. This will bring high benefits in terms of climate mitigation, thus enhancing our chances at achieving our climate targets. It will also increase air quality. These benefits have a positive impact on human health and safety. Some of the measures lead to a reduction of methane losses, thereby reducing the EU's energy import needs and therefore improving our energy security and geopolitical position. The sooner MS invest in the effective implementation of the EU-MER, the sooner these benefits will accrue.

²¹ For some Member States, it might still be possible to get support from the Recovery and Resilience Facility (RRF) to help funding investments (e.g. in equipment or training) to implement the EU-MER. According to the original plan, the RRF can finance Member States' reforms and investments through to the end of December 2026. Using RRF funds for the EU-MER implementation is just a hypothesis that we cannot verify within the scope of this paper.

Annexes

Annex 1: List of the incoming reports to be analysed and evaluated by the CA

This list contains all types of reports that must be submitted by the companies and entities subject to EU-MER obligations to the CA. The list is sorted according to the contents of the reports, rather than in the order in which they appear in the EU-MER text.

Emissions monitoring reports to be submitted to the CA

- Monitoring report with generic emission factors to be submitted by the operators of the oil and gas sectors assets within 12 months of the entry into force of the EU-MER [Art 12(1)].
- Monitoring reports with the results of the measurement of the volume of methane releases per ventilation shaft and with yearly source-level emissions and to be submitted by coal mine operators within 12 months of the entry into force of the EU-MER [Art 20(1), Art 20(6)].
- Monitoring report with a quantification of source-level emissions to be submitted by the operators of the oil and gas sectors for their operated/non-operated assets respectively within 18/30 months of the entry into force of the EU-MER [Art 12(2)].
- Monitoring report with a quantification of source-level and measurement of site-level emissions to be submitted by the operators of the oil and gas sectors for their operated/non-operated assets respectively within 30/48 months of the entry into force of the EU-MER [Art 12(2)].
- Reports quantifying the emissions and information on pressure monitoring from all inactive & temporarily plugged oil and gas wells, to be submitted by the operators within 21 months of the entry into force of the EU-MER and yearly by 31 May thereafter. In MS with more than 40,000 IPAW, a relaxed schedule applies [Art 18(3)].
- Information on the standards, including international standards, or methodologies used for measurements and quantifications to be submitted by operators from the oil and gas sectors [Art 12(5)] and by coal mine operators [Art 20(4)] or the Member States, where the latter bear the responsibility for e.g. abandoned underground coal mines [Art 25(2)].
- Notifications on discrepancies to be submitted by the operators of the oil and gas sectors without delay after detection of a discrepancy between a quantification and a measurement [Art 12(6)].
- The results of the reconciliation process to be submitted by the operators of the oil and gas sectors that have the duty to carry out the reconciliation process as soon as possible after the detection of a discrepancy [Art 12(6)].
- Reports about hydrogeological conditions and the absence of material CH₄ emission to be submitted by those responsible for closed or abandoned coal mines (RP or RM) [Art 25(4)].

- Reports containing estimates of yearly source-level CH₄ emissions data to be submitted by those responsible for closed or abandoned coal mines (RP or RM) within 24 months of the entry into force of the EU-MER and by 31 May every year thereafter [Art 25(6)].

LDAR to be submitted to the CA

- Leak detection and repair (LDAR) programmes to be submitted by oil & gas sectors operators within 9 months of the entry into force of the EU-MER for existing sites, and within 6 months of the date of start of operations for new sites. These reports must include sufficient information on the standards or methodologies used [Art 14(1)].
- Evidence justifying decision to delay repair to be submitted by the operators without any delay [Art 14(10)].
- Repair and monitoring schedules and reports summarising the results of all surveys to be submitted by the operators yearly [Art 14].

Venting and flaring reports to be submitted to the CA

- The demonstration of the necessity to opt for flaring instead of either re-injection, on-site utilisation, storage for later use or dispatch of the methane to a market, to be submitted by the oil & gas sectors operators who opt to do so [Art 15(4)]
- Detailed implementation schedules with evidence of conditions justifying the exceptional delay of the actions concerning venting and flaring required by Article 15, to be submitted by the oil & gas sectors operators [Art 15(8)].
- Notification of venting and flaring events to be submitted by the operators without delay after the event and at the latest within 48 hours of the start of the event [Art 16(1)].
- Annual reports of all venting & flaring events, to be submitted by the oil and gas sector operators [Art 16(2)].
- Demonstration of the necessity to – in exceptional cases – opt for venting instead of flaring, to be submitted by the drainage station operators as soon as possible and at the latest within 48 hours of the operator becoming aware of the event, applicable from 1 January 2025 onwards [Art 22(1)].
- Notification of all venting events and of all flaring events with a destruction and removal design efficiency below 99%, to be submitted by the drainage station operators [Art 23(1)]

Reports to CAs on mitigation plans

- Mitigation plans for emissions from closed and abandoned underground coal mines, to be submitted by the operators or by the Member States within 30 months of the entry into force of the EU-MER [Art 26(1)].

Reports to CAs on imports

- Information set out in Annex VIII to be submitted by importers within 9 months of the entry into force of the EU-MER or, alternatively, a justification why this information has not been provided [Art 27(1)].
- Report and demonstration that import supply contracts concluded or renewed after the entry into force of EU-MER for the supply of crude oil natural gas or coal produced outside the EU do cover solely crude oil natural gas or coal with monitoring, reporting

and verification (MRV-equivalence). To be submitted by importers from 1 January 2027 onwards [Art 28(1)].

- Information showing the results of the importers' reasonable efforts to require MRV-equivalence for the supplies covered by contracts concluded before the entry into force of the EU including a justification in case the fail to achieve MRV-equivalence. To be submitted by importers as of 1 January 2027 [Art 28(2)].
- Report from producers and importers with supply contracts concluded or renewed after the entry into force of the EU-MER about the CH₄ intensity associated to the production of oil, gas and coal placed on the Union market. To be submitted by producers and importers by 4 years after the entry into force of the EU-MER and every year thereafter [Art 29(1)].
- Reports from producers and importers with supply contracts concluded or renewed before the entry into force of the EU-MER about their reasonable efforts to get the data needed to report the CH₄ intensity associated to the production of oil, gas and coal placed on the Union market and the results of such efforts [Art 29(1)].

Annex 2: List of the decisions to be taken by the CA

Besides some decisions already mentioned above, e.g. in the chapters on inspections and on dealing with complaints, the EU-MER assigns to the CA the task to take a number of governance and administrative decisions, including imposing requirements and sanctions on operators who are found to be in breach of the EU-MER.

We list here these decisions according to their subject.

Decisions concerning monitoring and reporting

- In case of notifications on statistically significant discrepancies between the source-level quantification and the site-level measurement of methane emissions by the companies and entities subject to EU-MER obligations, or where the CA receives from them information on a reconciliation process concerning such discrepancies, the CA may request additional information or additional actions [Art 12(6)].
- The CA may exempt CUCM and AUCM operators from their monitoring duty where mines have been fully flooded for at least 10 years [Art 25(4)].

Decisions concerning LDAR

- The CA may require from the operators to amend their LDAR programme according to the requirements of the EU-MER [Art 14(1)].
- On request of the operators, CA must (dis)approve, and thus may prohibit alternative LDAR survey frequencies for components where no leaks were identified [Art 14(5)].
- The CA may require the operators to amend their repair and monitoring schedule in three specified cases [Art 14(9), Art 14(10), Art 14 (14)].
- The CA must (dis)approve, and thus may prohibit the possible decision of an operator decision to delay the repair of any leak [14(10)].
- The CA may recommend that surveys of the relevant components take place more frequently, if a higher risk to safety or a higher risk of methane losses is identified [14(12)].

- The CA may require the operators to amend their annual LDAR report summarising the results of all surveys completed during the previous year [Art 14(14)].

Decisions concerning venting and flaring

- The CA may require modifications of the implementation schedule for requirements concerning venting and flaring [Art 15(8)].
- The CA must (dis)approve, and thus may prohibit the usage of remote or automated monitoring systems as alternative to regular inspections concerning venting and flaring [Art 17(3)].

Decisions concerning sanctions and remedial actions

- If an inspection according to Art 6 identifies a serious breach of any requirements of the EU-MER, the CA must either issue to the inspected company or entity notice of remedial actions (with clear deadlines for those actions) or instruct them to submit a set of remedial actions to address the breaches identified within one month from the conclusion of the inspection. In case of the latter, the CA must (dis)approve such set of remedial actions [Art 6(2)].
- The CA must impose penalties at least in the case of (list of 15 types of infringements), based on a list of obligatory indicative criteria for imposition of penalties according to [Art 33(3)], [Art 33(5)].
- If the legal system of a MS does not provide for administrative fines, the CA shall initiate a fining procedure [Art 33(3)].

Sector specific decisions

Offshore oil and gas / IPAW

- The CA may exempt from the obligations under Art 14 offshore oil and gas components located in their territory at a water depth greater than 700 meters, if robust evidence can be provided that the impact on the climate of potential emissions from those components is highly likely to be negligible [Art 14(17)].
- The CA may exempt offshore oil & gas wells in depth greater than 200 metres, under different conditions for different depths [Art 18(11) and 18(12)].
- If the CA has evidence that an offshore inactive well or an IPAW emit longer than foreseen by Art 18(3), it must determine the application of certain obligations originally set out for temporarily plugged wells [Art 18(5)].
- The CA may ask the MS or RP to amend the mitigation plan concerning IPAW [Art 18(9)].


Abandoned underground coal mines (AUCM)

- The CA must receive and, arguably²², (dis)approve the plans of measures to avoid methane emissions submitted by entities applying for a permit for an alternative use of abandoned underground coal mines [Art 26(3)].

²² Art 26(3) EU-MER only states that the applicants “shall provide a detailed plan” showing that it will comply with the monitoring, reporting and mitigation obligations established by the EU.MER. The text does not specify the role of the CA. We assume that the permitting authority will require the CA’s approval of this plan.

Annex 3: List of the outgoing reports, notifications, and publications to be produced by the CA

- Following each inspection, CA must prepare a report. Thereby, it may issue one report covering multiple inspections of components, assets or sites of the same operator or mine operator, provided such inspections are done in the same inspection period [Art 6(5)].
- Within two months after a carried-out inspection the CA must also publish the related report in accordance with Directive 2003/4/EC, which means that where relevant, the CA must indicate that information has been withheld according to Article 4 of the 2003/4/EC and explain why [Art 6(5) and Art 5(4)].
- The inspection related report must be notified to the concerned company or entity and, where relevant, also to a complainant [Art 6(5)].
- After a (substantiated) complaint, the CA shall keep the complainant informed of steps taken and inform them of appropriate alternative forms of redress such as the recourse to national courts [Art 7(4)].
- The CA must publish indicative periods to take a decision on complaints [Art 7(5)].
- The CA must publish all reports set out in Art 12 concerning the methane emission measurements and quantification within no longer than 3 months of their submission by the companies and entities subject to EU-MER obligations [Art 12(8) and Art 5(4)].
- The CA must notify the EU Commission of derogations granted with regard to LDAR survey frequency [Art 14(5)].
- The CA must review and publish the IPAW reports and mitigation plans within 3 months of submission by operators or completion by MS [Art 18(10)].
- The CA must publish reports set out in Art 20 concerning the MRV duties related to operating coal mines within 3 months of submission by operators [Art 20(7) and Art 5(4)].
- CA must annually publish and notify the EU of any received information about venting/flaring events [Art 23(2) and Art 5(4)].
- CA must publish the report accompanying an exemption request from the RP for CUCM and AUCM [Art 25(4)].
- In general, CA must make reports concerning monitoring of CUCM & AUCM available to the public and the European Commission within 3 months from submission by operators [Art 25(8)].



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