



RIVM response to the scientific audit report on the Centre for Environmental Quality (MIL)

RIVM

A. van Leeuwenhoeklaan 9
3721 MA Bilthoven
Postbus 1
3720 BA Bilthoven
www.rivm.nl/en

T 088 689 91 11

Appreciation

RIVM's staff and management would like to express their sincere gratitude to the audit committee for their work, recommendations and insights. We recognize that a strong scientific basis is necessary to fulfil our monitoring and advisory role for environmental policy. We agree that connections with national and international research institutions and universities are important for keeping knowledge and research methods up to date. The audit committee's insight, that a reputation of neutrality and authority is vital for MIL, and that greater transparency is not necessarily sufficient, will require further reflection.

In their final report of February, the audit committee stressed their great appreciation for the priority that MIL employees give to the quality of their work and for their dedication to delivering results on time. The committee was also positive about the modelling strategy that has been developed within MIL, the FAIRness of data and models, the application of modern data science, and all the work on uncertainty analysis that was done prior to the committee's visit to RIVM. Current work in the field of citizen science was also very much appreciated and should be expanded and incorporated in MIL's data strategy. The committee took note of the fact that stakeholders were - in general - positive about the work of MIL, including the fact that deadlines for products were respected and adhered to.

General response

RIVM has taken note of the committee's findings with great appreciation. The recommendations encourage further critical thinking about the role of MIL as a knowledge centre positioned between science and government policy. A number of these recommendations are in line with MIL's self-evaluation and initiatives that have since been taken. The committee's recommendations encourage further improvement of the scientific quality of MIL's work, strengthening the link with universities through part-time professorships and developing a research agenda together with partner knowledge institutions.

The challenge will be to acquire funding for further methodology development within our product-driven organisation. A solution is not self-evident, because the centre (unlike universities) does not have resources to do research that is not commissioned. Research grants account for only a few percent of MIL's total research capacity. The committee advises to decide, in consultation with clients, at which points output can be reduced in order to maintain or improve MIL's scientific quality, within the available project budgets.

The committee has raised some general concerns, including human resource management, such as the career perspectives for young people and the replacement of people that will retire. The committee also stressed the need for more publications in international scientific journals, the need for a research agenda, a data and a measurement strategy, and also stressed the need to strengthen cooperation with (inter)

national knowledge institutes. The committee recommends translating uncertainty analyses into clear advice on the application range of models and on the correct use of data. The committee recommends investigating how citizen science measurements can be included in data flows and reporting.

The audit committee further recommends dealing more consciously with RIVM's professional independence and keeping a greater distance from policy implementation, licensing and enforcement. In this context, the audit committee considers the use of AERIUS for licensing problematic from a scientific point of view. Too much involvement in policy implementation can damage the reputation of neutrality and authority. The committee advises avoiding one-sidedness in our communications and being more aware of the different interests at play. The involvement of policy scientists could be helpful for more neutral communication with the outside world.

Follow up actions

The audit committee's recommendations have been translated into 13 action points. Follow up, progress and completion of all action points will be monitored explicitly by the MIL management, amongst others, via the planning and control cycle of RIVM. RIVM will report to the Supervisory Committee on the progress of these action points in early 2025. [1] RIVM/MIL will involve stakeholders (including those interviewed for the audit) in developing the action points below.

A. Strategic choices regarding research and innovation

The centre has grown significantly in size in recent years. Nevertheless, workload has remained high, which means that methodology development and scientific publishing sometimes lags behind. The audit committee recommends proactively developing a research and innovation agenda and strengthening cooperation with universities and other research institutions. The audit committee also recommends making strategic choices in what MIL does and does not commit to, in order to create more room for maintaining and improving the quality of their work in general.

1. Key elements in MIL's work are and will continue to be measuring, modelling, analysing, signalling, reporting and policy advice. By developing a **long-term vision** and a **proactive research agenda**, MIL aims to strengthen its function of being a connection between science and policy. Any research and innovation efforts that is included in the various project assignments will be presented coherently in the research agenda. Further strategic research and proactive innovation suggestions will be included in the various department's research agenda and coordinated by MIL's management team. The central question remains, however, what knowledge is needed for the policy questions of the future? With their intended research agenda, MIL will give further direction to their research profile and project portfolio (while taking into account current long-term agreements with clients and the need to respond to unexpected events).
2. MIL's senior scientists will investigate how a broader, coherent, research agenda can be developed for specific environmental issues *in cooperation with other RIVM-centres and third parties*. These could profit from recent experiences with research programs, such as the National Nitrogen Knowledge Program, the National Rural Area Program and the Clean Air Agreement. For such environmental issues, **the current and desired network of knowledge institutions** will have to be determined. Within these networks joint research programs will have to be defined, including the steps that need to be taken to convince potential clients. [2]

3. In addition, international coordinators within MIL will map its **international knowledge network** and determine which points need to be strengthened, for example through the use of cooperation agreements.
4. In conjunction with the existing air quality and deposition modelling strategy, data-coordinators and managers of measurement networks of MIL will formulate a **data strategy** and **measurement strategy**. Decisions regarding how to include measurements by third parties (including citizen science measurements) in RIVM-modelling and reporting will need to be made as part of this process.
5. Developing this research agenda requires robust, **structural funding**. Investments in keeping the knowledge base and research methods up to date, as well as more collaboration with universities and research institutions may require adjustments to the rules currently being applied within MIL with regard to cost calculation and deliverables. In the coming months, liaisons-officers of MIL will investigate with their contact persons at ministries the possibility to allocate more resources within projects for methodology development and their support for funding of additional scientific research programs. [3]
6. In project plans, MIL will determine which **external reviewers** will be involved in the assessment of results/reports if relevant. [4] In its project proposals, MIL will claim that scientific articles and external presentations should be included as project deliverables, including the required budget.

B. Strategic choices for human resource management

The long-term vision and research agenda will also be reflected in the strategic human resource planning of MIL and in department plans.

7. MIL's management will continue to work on further strengthening the connections with universities by increasing the number of **part-time appointments at universities** in line with the RIVM-wide professor/lecturer policy.
8. In the annual plans of departments planned **active international participation** in research networks and **publications in scientific journals** will be explicitly listed (see also point 6).
9. In addition to the professional development of existing employees, MIL's strategic personnel plan will also pay attention to the vulnerability in certain areas of expertise, the timely transfer of knowledge and contacts of employees who are retiring, and the **training and careers of new employees** as suggested by the audit committee.[5] In consultation with new employees, it will be determined where existing onboarding and training activities need improvement and how the innovative power of the skills that new employees bring can be used in the research agenda (e.g. skills in interdisciplinary and transdisciplinary research and in the use of artificial intelligence).

C. Neutrality and authority

The committee warns that our involvement in licensing and enforcement requires vigilance when it comes to maintaining our reputation for impartiality and authority. This will have to be addressed and taken to heart. MIL is also aware of the external criticism that employees receive for research results that are inconvenient to some stakeholders. It remains very important that employees feel safe to do their work. In some areas, such as that of the nitrogen issue, scientific knowledge and uncertainties have become part of a polarized social debate.

10. Management teams of MIL and other M&V centres will, in the coming months, make an inventory of its current responsibilities in supporting **licensing and enforcement** and assess whether it is desirable to phase out these tasks. In September 2023, RIVM already expressed its concerns about the role of AERIUS in licensing, that causes conflicts with its scientific role. RIVM requested the ministry to make another organisation responsible for the technical support of AERIUS. RIVM also advised improving the scientific substantiation of the cut off choices in AERIUS. Together with other M&V centres it will be investigated what existing practices are within M&V to combine independent scientific research with policy implementation, e.g. in cases with conflicting public stakes and large scientific uncertainties.
11. It is important to increase **awareness** among employees of the influence of existing interests in groups in society on the acceptance of our research results. Especially for cases where our findings are publicly contested and have become part of public debate, **strengthening RIVM's expertise in two-way communication** (listening and responding), while maintaining neutrality and scientific authority, is important. [6] Should we, for example, pay more attention in web messages and public summaries to uncertainties and the impact the information contained in these communications may have on the different interest groups? Experts with experience in science communication from MIL and other M&V centres will assess our current practice. Seeking external advice is being considered, as well as organising lunch lectures with external speakers and training courses for employees on dealing with disputed knowledge and conflicts of interest.
12. As part of MIL's data, measurement and model strategy, project leaders will ensure that the **statistical uncertainty** of model results and measurements is made explicit in MIL-products. E.g. by indicating the uncertainties in relation to the spatial resolution, or when calculating the influence of individual emission sources on local exposure. This effort can build on conclusions from recent projects, such as the assessment of Emission Inventory, and work for the National Knowledge Programme on Nitrogen, that started after in 2020 the Commission Hordijk raised doubts about the applicability of AERIUS for licensing. The users of MIL-data in other M&V centres will be consulted. If necessary, additional efforts will be deployed. MIL will use statistical indicators to promote the responsible use of models and data. Statistical uncertainties will be published in connection with the data and in reports and websites and can be used in discussions with clients, users and in public communications.
13. The audit committee points at the possible **legal liability** of RIVM for incorrect model applications. Advice will be sought on how to prevent RIVM from being held legally accountable for misuse by third parties of models and data outside their scope.

Notes

- [1] A large number of suggestions have been gathered from discussions within the MIL departments, which will be taken into account in the concrete elaboration of the action points.
- [2] Project leaders point at discouraging internal administrative obstacles they encounter when jointly submitting research proposals. Access to SPR resources also proved to be difficult.
- [3] Project leaders stress the need for a proactive support unit within RIVM to assist in submitting international project proposals, to lower the barriers for grant acquisition and to streamline procedures for subcontracts to universities and other external parties.

- [4] Involving external reviewers requires additional procedures for reimbursement and confidentiality.
- [5] Several new employees recognize the advice of the audit committee to paying more attention to the development of new employees. Some indicated that they felt lost in the beginning and missed a clear task or an easily approachable mentor. This may have been caused by the strong growth of the centre.
- [6] Several employees would like to be involved in this discussion, including those with a policy science background. One sees a tension between simple communication, as propagated currently by COM, didactic communication for stakeholders who want to have a deeper understanding and empathetic communication in the event of conflicts of interest.