



**Integrating Tools for Air Pollution Assessment (ITAPA)
Project Planning Workshop Report**

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The RIVM (National Institute for Public Health and the Environment) from the Netherlands provided a video to explain how changes are made in AERIUS (<https://vimeo.com/416311414/834b12ea07>) and how AERIUS Calculator works in a UK context to support ITAPA (<https://vimeo.com/416365246/f7fca094e4>).

Many thanks also to the workshop attendees who provided their expertise and guidance. We look forward to working with everyone in future.

EQA:

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Summary

To support project planning for the Integrating Tools for Air Pollution Assessment (ITAPA) project, the Joint Nature Conservation Committee (JNCC) held a series of online workshops for external stakeholders. ITAPA aims to help develop a UK integrated tool for risk assessment and has been working with the Dutch Government to investigate how their software, AERIUS, might be helpful.

ITAPA began with user needs workshops that identified a key requirement for bringing together the data and tools used in risk assessment of air pollution effects on ecosystems. As caselaw develops, there is more scrutiny of decision-making and risk assessment in this area. When coupled with diverging responses to case law, an integrated approach becomes increasingly urgent to support sustainable development and streamline the decision-making process for planning permission. ITAPA undertook an options appraisal for this need for improved alignment, data access and an easy to use risk assessment tool or process. This led to support for an integrated tool and subject to funding, these next phases of ITAPA will focus on fulfilling this need.

In total there were over 135 attendees to the three workshop sessions. These included:

- an open session to introduce attendees to ITAPA, the rationale for the project and to explore current user needs;
- a technical session to discuss the dispersion model and data behind the Dutch AERIUS tool; and
- a policy session to discuss expectations for how the tool could be governed, used and help fulfil UK strategies for cleaner air, food and farming as well as nature and ecosystems.

The workshops helped to refine initial plans and the attendees were generally supportive of an integrated tool. Feedback specifically was used to:

- extend project timelines for engagement and software development;
- increase planning for expert advice and to develop actions in the first stages to engage experts;
- accommodate new data sources and modelling projects where possible; and
- update the initial criteria for selection of a dispersion model and its validation.

A virtual workshop was held due to Covid 19 lockdown restrictions. This format was successful and managed to reach a wider audience than might have been possible in face to face workshops. This required prepared materials and mechanisms to engage the audience.

The ITAPA project planning is the beginning of a much longer journey towards a tool to facilitate risk assessment of air pollution on habitats and the species that rely on them. By building on the Dutch AERIUS tool, ITAPA is a great opportunity for knowledge transfer, international cooperation and aiming to develop tools that cut red tape and make sustainable development easier to achieve. We are all looking forward to working with stakeholders to realise this. To learn more, contact ITAPA@jncc.gov.uk or visit <https://jncc.gov.uk/our-work/itapa/>.

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1 Introduction

This workshop report describes the project planning workshops held for the Integrating Tools for Air Pollution (ITAPA) project in three sessions between 12th and 13th May 2020. The workshops were held by the Joint Nature Conservation Committee (JNCC) with technical support from Wing on behalf of the Dutch National Institute for Public Health and the Environment (RIVM).

1.1 Workshop Aims

- Introduce external stakeholders to the ITAPA project.
- Provide opportunity to answer stakeholder questions and update user needs gathered during the 2018/19 phase of ITAPA described in the ITAPA User Needs Case Study (<https://jncc.gov.uk/news/user-stories-show-integrated-way-forward-for-air-pollution-assessment-tools/>).
- Gather information from stakeholders to inform a final draft project plan for ITAPA.
- Develop materials for further engagement as ITAPA progresses.
- Test options for stakeholder engagement whilst under UK lockdown and under virtual working arrangements.

1.2 Background

Air Pollution (particularly nitrogen deposition) is a major pressure to semi-natural habitats in the UK. There are implications for attainment of favourable conservation status as required by the Habitats Regulations and to favourable condition of Areas/Sites of Special Scientific Interest (A/SSSI) notified under the Wildlife and Countryside Act. More generally, air pollution must be addressed to achieve country-level biodiversity policy objectives.

Additionally, national reporting of UK air emissions and effects on ecosystems is required to meet national and international statutory obligations. For example, the UK has committed to reduce emissions to target levels for 2020 and 2030 under the National Emissions Ceilings Directive. All of these policy needs require data about emission sources or require risk assessment of air pollution effects on ecosystems.

The ITAPA project aims to develop an online tool to support UK risk assessment of air pollution effects on ecosystems, statutory reporting requirements and ideally, issuing of permissions for individual plans or projects (e.g. Environmental Permits, planning permission, etc.).

1.2.1 Why is an integrated tool important?

Current legislation and operating guidance for impact assessments associated with permitting or planning typically require the calculation of emissions; an estimate of resulting exposure of sensitive receptors (based on air pollution dispersion modelling or simpler screening tools) and assessment of “effects” - usually considered in terms of potential breaches of statutory standards or other environmental benchmarks (e.g. critical loads).

Such assessments now involve a complicated process drawing on many information sources (see figure 2 below) and existing tools. Tools and data sources in the UK have been developed to meet distinct purposes and currently sit under separate governance. This includes recognised screening tools such as Simple Calculator for Atmospheric Impact

Limits (SCAIL) and wider repositories such as UK-AIR and Air Pollution Information System (APIS).

Some tools and data are publicly available, and some require consultation with the conservation body or regulator which can take time to acquire. Others require investment in dispersion modelling, ecological survey and advice from an environmental consultant. Even with this extra investment, uncertainty on behalf of the decision-makers is leading to a delay for some new permissions.

A UK integrated tool addresses a number of risks not mitigated for by the current assessment approaches:

- A risk that the benefits of national and local measures are not registered. Consequently, impacts on sites may be over-estimated, or mitigation is unnecessarily implemented.
- A risk of limitation on growth objectives for agriculture and industry because of incomplete mechanisms for fulfilling conservation obligations.
- A high risk of legal challenge in casework and a perception of inconsistency.
- A risk of continuing damage to sensitive habitats and the plant species and wildlife that rely on them.

1.2.2 Where did ITAPA start?

The project was derived from collaboration with the Dutch Government and inspired by the Dutch Integrated Approach to Nitrogen (PAS) and its support tool, AERIUS (<https://www.aerius.nl/en/the-integrated-approach-to-nitrogen-and-aerius>). As part of the groundwork for the ITAPA project JNCC has worked in partnership with UK regulators and country nature conservation bodies (CNCBs). Before pursuing AERIUS for UK use, they:

- explored feasibility of implementing the AERIUS tool with UK data,
- identified user needs for UK risk assessment of air pollution effects on ecosystems (user stories¹),
- evaluated options for meeting those needs and
- developed a Business Case for the preferred option, an integrated tool for risk assessment.

1.2.3 Learning from the Dutch version of AERIUS

As with AERIUS, a UK integrated tool would record new emission source information, undertake dispersion modelling and incorporate this with monitoring and modelling data to provide information for risk assessment. The system could also support the issuing of permissions if a decision logic was able to be agreed.

¹ A user story is a tool used in Agile software development to capture a description of a software feature from an end-user perspective. The user story describes the type of user, what they want and why. A user story helps to create a simplified description of a requirement.

AERIUS is comprised of several related modules (http://www.aerius.nl/files/media/publicaties/documenten/aerius_roadmap_english_a4.pdf). Some modules may look familiar, such as AERIUS Calculator (like SCAIL but detailed modelling; Figure 1) and AERIUS Register (list of permissions/emission sources). Other modules like AERIUS Monitor provide opportunities for site managers and regulators to have a dashboard for specific designated sites or areas. AERIUS has also been subject to significant technical review for its dispersion model results, user interface and emission factors (<https://www.aerius.nl/en/reviews>).

The Netherlands have had good success with AERIUS and estimated a €25m saving in the first 18 months through time saved by local authorities and regulators. The Dutch Government is encouraging use of AERIUS by other countries with significant knowledge and technology transfer with a value of €8m for the software development itself. Despite legal challenge to the policy underlying the tool, specifically the concept of “room for development” that supports decision-making on air pollution in the Netherlands (The Dutch Nitrogen Judgment), the AERIUS tool itself was hailed as necessary and revolutionary.

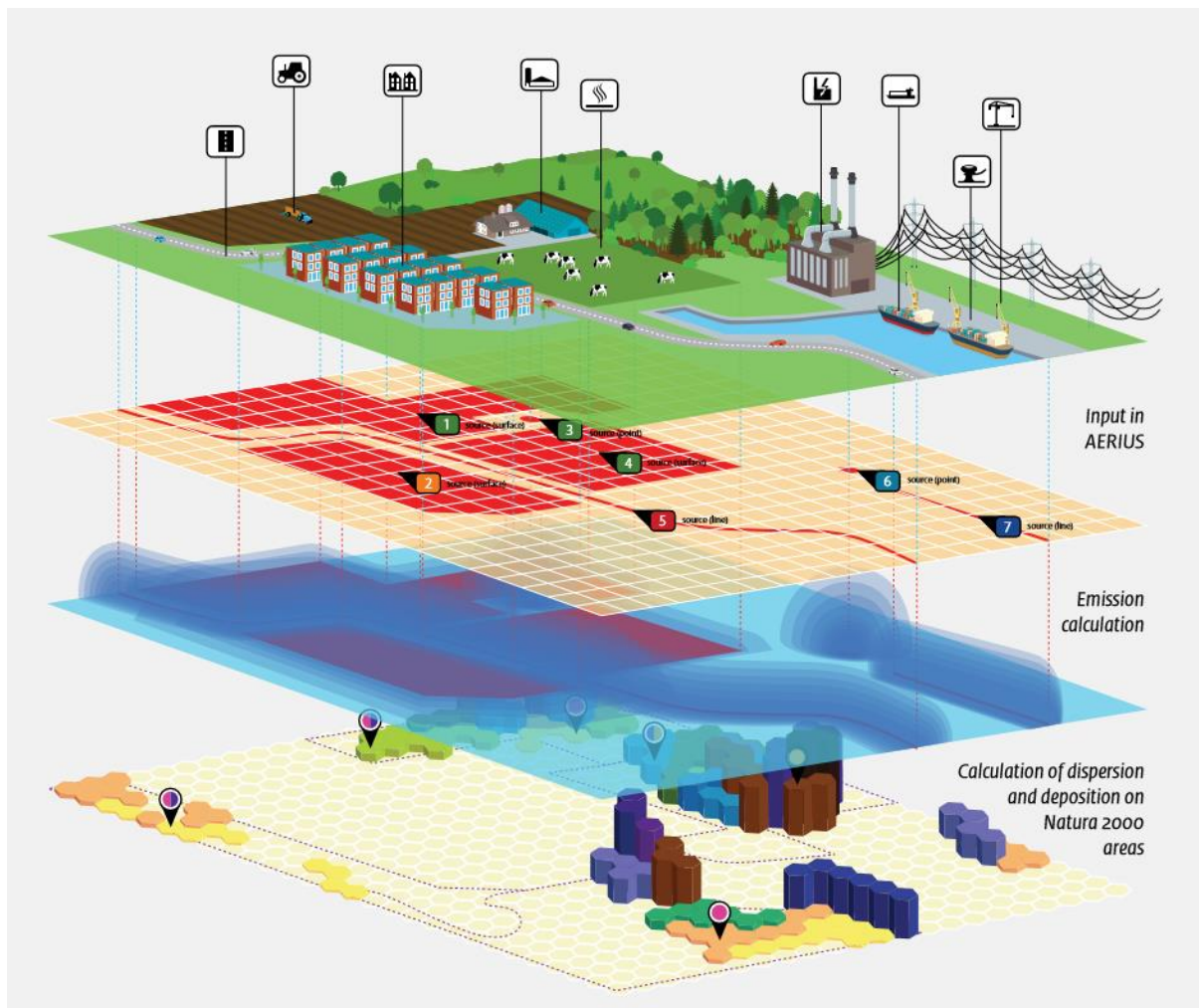


Figure 1: Schematic of AERIUS Calculator which combines emissions across sectors, performs dispersion modelling and calculates the concentration and deposition at ecosystems to support the Dutch Integrated Approach to Nitrogen (PAS). Figure reproduced with permission of Wing.

To support development of a UK integrated tool, the workshops reported here were tailored to work within the planned advisory and decision-making structure of the ITAPA project (Figure 2). An initial open invitation session provided a general update and ensured those

new to the ITAPA project were provided enough information to participate in targeted sessions if desired. Separate sessions were held for technical and policy stakeholders.

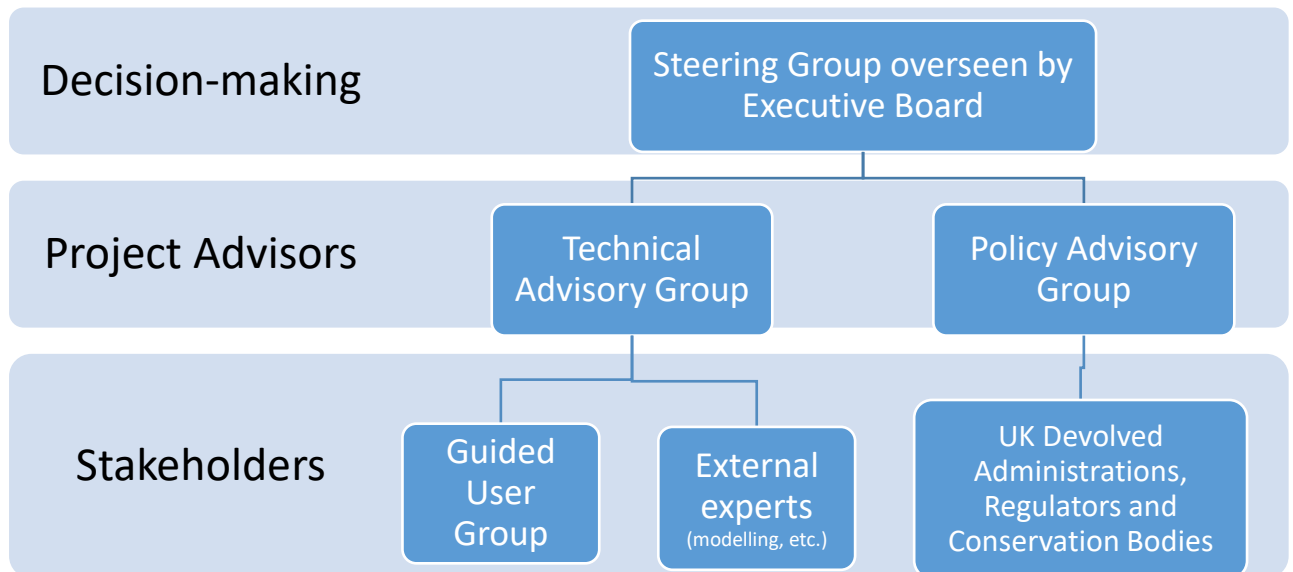


Figure 2: Proposed advisory and decision-making structure of the ITAPA project.

Each session began with an introductory presentation followed by question and answer sessions about things covered during the introduction. The second half of the session described planned project timelines and had an anonymous poll with questions tailored to the likely session audience. The National Institute for Public Health and the Environment from the Netherlands (RIVM, Rijksinstituut voor Volksgezondheid en Milieu) provided a video to explain how changes are made in AERIUS (<https://vimeo.com/416311414/834b12ea07>) and how AERIUS Calculator works in a UK context (<https://vimeo.com/416365246/f7fca094e4>).

2 Open Session

The Open session provided 70 attendees with an overview of the ITAPA Project and how the UK decided to pursue an integrated tool. During the session, attendees were given opportunity to ask questions about all aspects of the project and to provide information about plans or concerns as key stakeholders. The Open Session presentation slides are available in Appendix 1 through the JNCC Resource Hub (<https://hub.jncc.gov.uk/assets/f607af0e-0009-4470-92e8-e057e8a4a663>).

General conclusions from the Open Session feedback were that the ITAPA project is timely and welcome. Stakeholders thought significant further discussion was required on:

- how data could be inputted or extracted from the tool;
- resolution of the mapping capability and thus applicability for local risk assessment;
- selection of the dispersion model used in an integrated tool;
- validation of the integrated tool against current tools, and
- usability for applicants, particularly those running agricultural businesses.

An informal poll was taken during the meeting with five questions and varying answer formats:

- What is your role when dealing with air pollution on ecosystems? (Multiple Choice)
- A sliding scale for awareness of the AERIUS software (Low to High awareness).
- A ranking exercise for which areas of their work an integrated tool would assist with (Multiple Choice).
- A ranking exercise for which AERIUS products have importance for their work.
- Would you like to learn more? (Multiple Choice)

The following figures summarise the answers and insights from the polling element of the open session.

Attendees at the Open Session had a broad range of backgrounds, as indicated by the Mentimeter Poll Results regarding their roles (Figure 3). The group of 59 responders (out of 70 total attendees) included advisers, decision-makers, conservation managers, researchers and modellers. Of note is that a significant number of stakeholders felt their work area was not represented by the available options; comments in the webinar software seemed to indicate consultants were a main feature of this group. Overall, responders were not highly familiar with the Dutch tool AERIUS, scoring 5.2 out of 10 where 10 was high awareness.

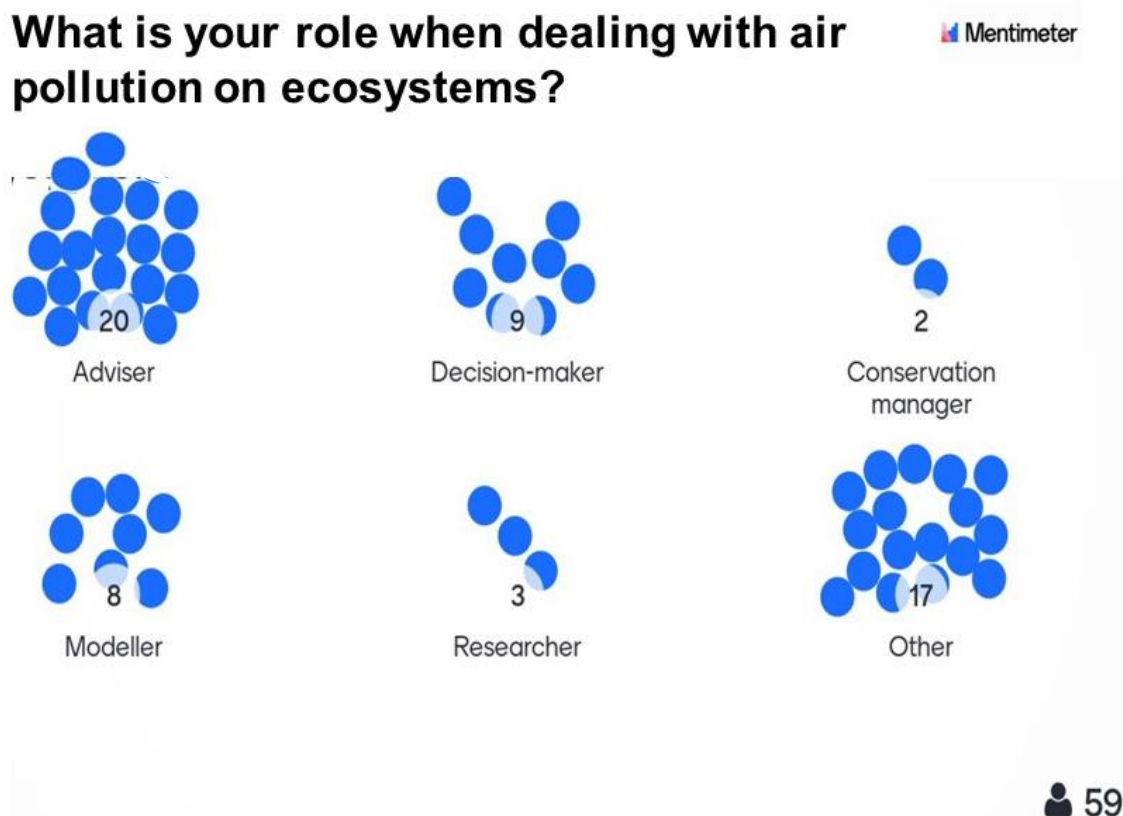


Figure 3: Anonymous Mentimeter poll results from 59 respondents about their role dealing with air pollution and ecosystems. The majority were advisers or in the "other" category. Decision makers and modellers each represented around 10-15% of the group. There were also researchers and conservation managers in attendance.

An integrated risk assessment tool has many potential benefits that were explained during the open session. Often these related to improving risk assessment of air pollution effects on ecosystems and how affects a decision about planning permission or permitting. There were also drivers for data improvement, alignment of approaches and changes in access to data. When given 100 ranking points, respondents considered improvements to decision-making and the assessment process to be the most likely area for enhancement through an integrated tool, at 30% and 32% respectively. Data access and data quality were also considered to gain from an integrated tool, but to a lesser degree at 20% and 17% average ranking. This is shown in Figure 4.

An integrated tool would improve....

Mentimeter

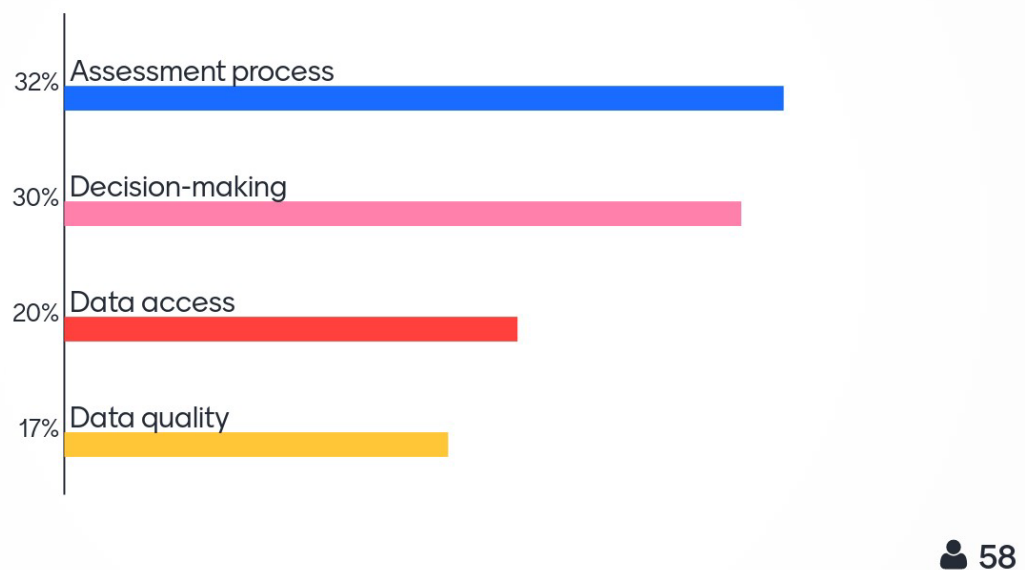


Figure 4: Anonymous Mentimeter results for a ranking poll where respondents split 100 points amongst choices for areas an integrated tool could improve. Assessment process and decision-making had the highest rank for improvement through an integrated tool at about 30% each. Data access and quality following closely behind at about 20% each.

There are a variety of AERIUS products available:

- **Calculator** – Dutch detailed modelling tool (eg advanced SCAIL/AST)
- **Register** - system to submit applications, issue and record permits
- **Monitor** - manages deposition/ reports trends, permit accounting and Dutch room for development
- **Scenario** - provides overview of deposition under different scenarios
- **Connect** – Chargeable service; network of people from government and industry
- **AERIUS Extra** - data management tool for large projects/business

Attendees were asked to rank the products in importance for their work assigning a portion of 100 points to each module. On average AERIUS calculator, the more complex version of tools that predict deposition at protected sites, was ranked highest with 31%. AERIUS Monitor, Register and Scenario received similar rankings at 21%, 19% and 19% respectively. AERIUS Connect, the module that assist with large scale data exchange

received 10% of the ranking points on average. When asked if they would like to learn more about ITAPA and the AERIUS tool, the majority of respondents (55 out of 59) said yes.

3 Technical Focus Session

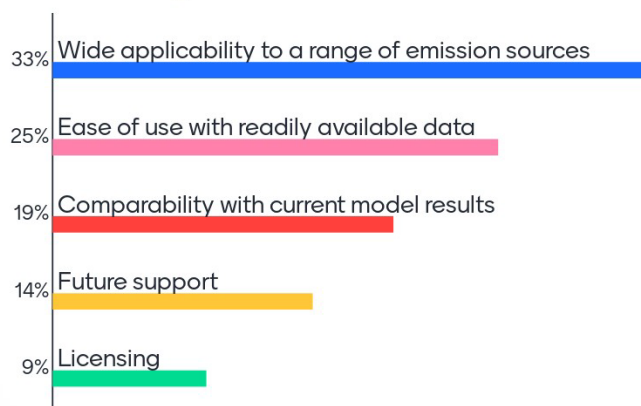
The Technical Focus Group comprised 31 attendees from a range of disciplines including those undertaking modelling for risk assessment, mapping, data management or software development within UK Government, regulators and CNCBs. This session was an opportunity for the Core Project Planning Team to gather technical views and for technical staff to ask questions. It was focussed to allow detailed questioning on the dispersion model, data quality, data handling and expected development of the integrated tool. Presentation materials used are available as Appendix 2 through the JNCC Resource Hub (<https://hub.jncc.gov.uk/assets/f607af0e-0009-4470-92e8-e057e8a4a663>). Attendees were a more focussed yet still varied group consisting of advisers (9), decision-makers (2), modellers (5) and consultants (9).

When asked about which dispersion models they used, a limited number were listed. Twenty-two attendees described using ADMS, AERMOD, SCAIL (tool using AERMOD), RapidAIR and Ansys.

As the group were familiar with modelling and model validation, the opportunity was taken to ask specifically about model selection criteria in a UK integrated tool. Respondents were given 100 points to distribute amongst choices (Figure 5). In discussion, we also supplemented these choices by asking about any gaps in criteria. The group suggested that ensuring it was clear to anyone how the model works (eg transparency) be added to the criteria for evaluation.

What are the most important principles for selecting a model to use in an integrated tool?

Mentimeter



24

Figure 5: Anonymous Mentimeter average ranking for dispersion model selection criteria based on 100 total points per respondent. Applicability to a wide range of emission sources was considered of most importance (33%). Ease of use and comparability to current tools came in at 25% and 19% respectively. Cost and future support were ranked as lower in importance than these other criteria.

The technical group raised questions about open source software improvements and two-way exchange, data protection, spatial resolution of predicted deposition and the need for improvements in use of meteorological data and habitat maps. From a technical point of view, there were no significant limitations found for hosting an AERIUS-style integrated risk assessment tool within the UK. It is recognised that there will be a significant amount of technical discussion needed to implement an integrated tool and this has been incorporated into the project planning, consultation exercises and expert workshops.

4 Policy Focus Session

The policy session provided more information about the pressure from air pollution on ecosystems and the context in the UK for decision-making in this area. The session aimed to allow potential users and policymakers to ask questions and provide reflections to the project team. Presentation materials are available as Appendix 3 through the JNCC Resource Hub (<https://hub.jncc.gov.uk/assets/f607af0e-0009-4470-92e8-e057e8a4a663>).

As expected, air pollution cuts across a wide range of policy areas. Of the 35 attendees, 23 responded to the Mentimeter poll about the primary policy area they work in. The majority were in environmental policy (14), food and farming (3), air quality (3), science and evidence (2) or human health (1).

The policy group was concerned about the governance of an integrated UK tool, how changes would be decided on, costs of implementation and whether guidance would be provided. In addition, there were specific questions raised about assessing road traffic for Local Plans and large-scale strategic planning, as well as how alignment could be achieved between neighbouring authorities. Attendees queried whether there was experience of AERIUS implementation in other countries (eg Germany and Flanders) and whether an expansion of the tool to risk assessment of other parameters such as noise, dust and odour is possible. Specific answers to collated questions are available in Appendix 4 through the JNCC Resource Hub (<https://hub.jncc.gov.uk/assets/f607af0e-0009-4470-92e8-e057e8a4a663>) and the project team will ensure these questions are utilised in the user needs update and validation exercises.

When asked what cost the attendees would expect at point of use, there were a variety of answers. A significant majority expected the tool to be free or have minimal cost for applicants. This is similar to the Dutch AERIUS tool which is free for users.

Would you expect the tool to be?

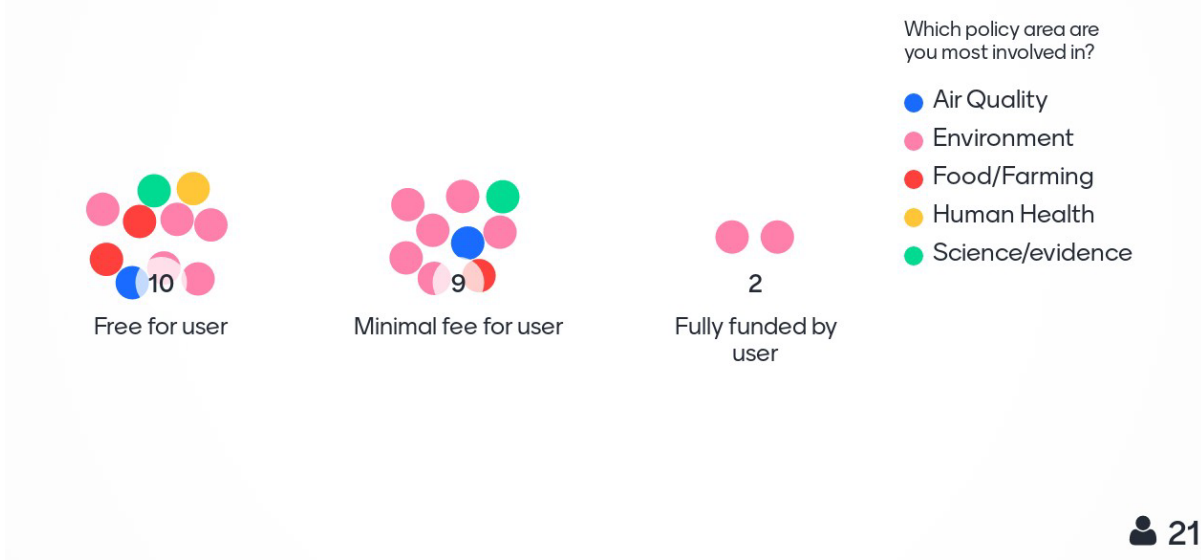


Figure 6: Results from the anonymous Mentimeter poll. The majority of policy session attendees expect an integrated tool to be free for end users (10) or have a minimal fee (9).

5 Workshop conclusion and next steps

The three workshop sessions covered a broad range of topics and stakeholders. Workshop aims were met and attendees were engaged, providing generally positive feedback. Appendix 4 through the JNCC Resource Hub (<https://hub.jncc.gov.uk/assets/f607af0e-0009-4470-92e8-e057e8a4a663>) provides a collated version of simplified questions and answers from all three stakeholder workshop sessions. Whilst new ideas for case studies were provided through the detailed questions and situations explored in the workshop, there were no major changes required to the project scope or timing.

Attendees thought that the project timelines were ambitious but also recognised that the UK would be building on significant investment made by the Dutch Government in the initial AERIUS tool. This led to a review of the detailed project plan and consideration for increasing timelines of some project aspects. As a result timelines were extended for both the consultation and development aspects of the project plan.

There is significant drive to implement an integrated tool but an equal level of concern that the tool is fit for purpose and supported into perpetuity. Substantial validation will be required for any UK implementation of AERIUS. As suggested, the transparency or openness about how the model works was added to the validation principles.

5.1 Virtual working and stakeholder engagement

Broad reaching projects such as ITAPA require a significant amount of stakeholder engagement. The ITAPA Project Planning workshops provided a test bed for use of virtual workshops and an indication of likely success in future project phases. Controls on movement and face to face meeting such as seen during the Covid-19 pandemic did not impede progress for this element of the project.

In order to sustain audience engagement, a range of tools were used including substantial question and answer sessions, close monitoring of chat, non-verbal tools such as videos and

interactive elements such as polls. These were important to maintain engagement and refocus the group after general question sessions.

There were some issues with stakeholder access to meeting technology, particularly from other Government departments and this needs to be tested ahead of future meetings. Overall the virtual workshop was successful. Running this format does require investment in prepared materials and extra resourcing on the day to provide backup for technological issues (e.g. dropping internet connection or failed microphone/speaker). ITAPA stakeholder engagement should confidently continue even under the current lockdown and social distancing requirements. For some aspects, the virtual workshop meant a broader range of stakeholders were able to participate alongside the geographically dispersed expert contributors.

5.2 Next steps

The workshop outcomes will be shared with participants and used to produce a detailed project plan along with materials available for use. These materials include 2 videos explaining how AERIUS Calculator works and the decision-making process, presentation slides and a Question and Answer database for future use in ITAPA.

Based on workshop findings and input, the ITAPA project planning team (JNCC, NIEA and Wing) will develop a detailed project plan. The workshops also form the basis for future engagement and expert advice as ITAPA and the thinking behind the project develop. Additionally, the materials and conclusions will be used on the JNCC website air pollution pages. Appendices are available as separate documents on the JNCC Resource Hub link to the workshop report (<https://hub.jncc.gov.uk/assets/f607af0e-0009-4470-92e8-e057e8a4a663>).

- Appendix 1: Open Session Presentation
- Appendix 2: Technical Session Presentation
- Appendix 3: Policy Session Presentation
- Appendix 4: Collated Questions and Answers

Many thanks again to the workshop attendees for their insights and for sharing their expertise.