



Delivering Excellence Through
Innovation & Technology



SR9: Strengthening of air quality monitoring, modelling and plans under the Ambient Air Quality Directives

ENV.C.3/FRA/2017/0012

Leonor Tarrasón (NILU) on behalf of the project team

Nordic Reference Laboratory online, 16th December 2021

www.ricardo.com

- Information gathering centred around 15 core questions

AQ Monitoring

- Q2 - (general) air quality assessment regimes
- Q3 - (monitoring) micro- and macro-scale siting of sampling points
- Q4 - (monitoring) representativeness and continuity of monitoring
- Q5 - (monitoring) monitoring other air pollutants

AQ Modelling

- Q6 - (monitoring / modelling) air quality assessment methods
- Q7 - (modelling) enhanced role of air quality modelling
- Q8 - (modelling) improving quality of air quality modelling
- Q10 - (air quality modelling and plans) role of modelling to support air quality plans

AQ Plans

- Q9 - (air quality plans) elements of air quality plans
- Q11 - (air quality plans) air quality plan development process and engagement
- Q12 - (air quality plans) ex-ante impact, costs and effectiveness of air quality plans
- Q13 - (air quality plans) ex-post assessments of impacts and costs of air quality plans

General

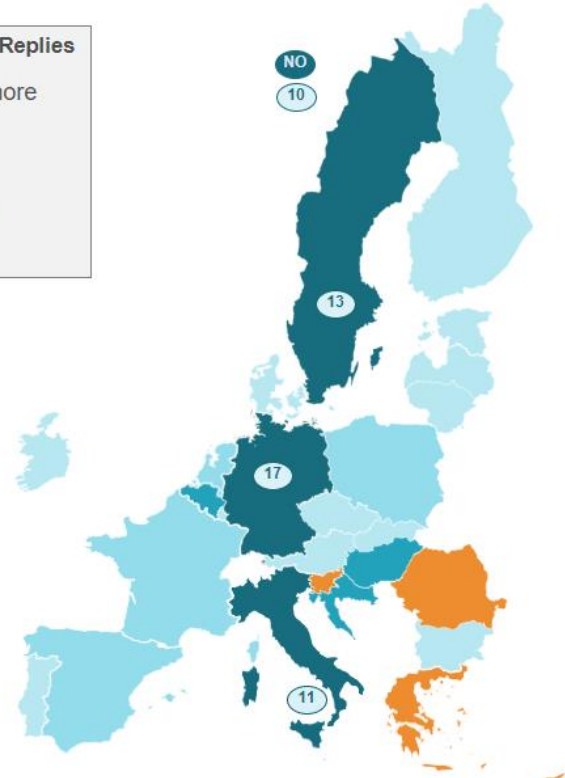
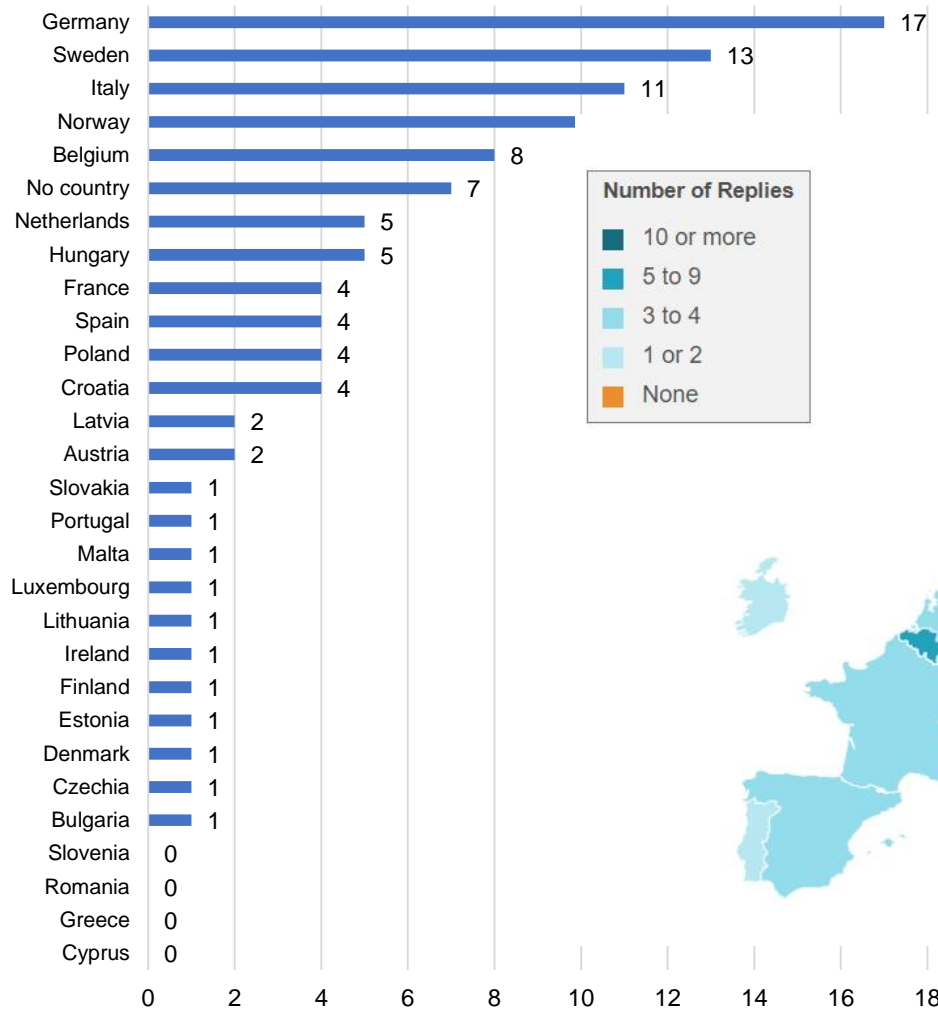
- Q1 - (general) administrative burden
- Q14 – (general) public access to air quality data
- Q15 – external sources contributing to the worsening of air quality

- Total of 189 questions with some opening sub-questions
- Mostly multiple choice but many opportunities to provide qualitative feedback
- Took some considerable time to complete – our sincere thanks to anyone who spent the time to so diligently respond
- Was accessible from 1st February to 1st March 2021
- Invited individuals as well as requested dissemination to professional and technical groups:
 - Ambient Air Quality Expert Group
 - FAIRMODE
 - AQUILA
 - EUROCITIES
 - EIONET
 - CEN/TC 264/WG 44 on source apportionment
 - CEN/TC 264/WG 43 on Modelling Quality Objectives
 - Network co-ordinator of CLARS (Charging, Low Emission Zones, other Access Regulation Schemes)
 - ClairCity (Citizen-led air quality and carbon reduction in cities)
 - IPR -e reporting pilot community

Survey responses overview

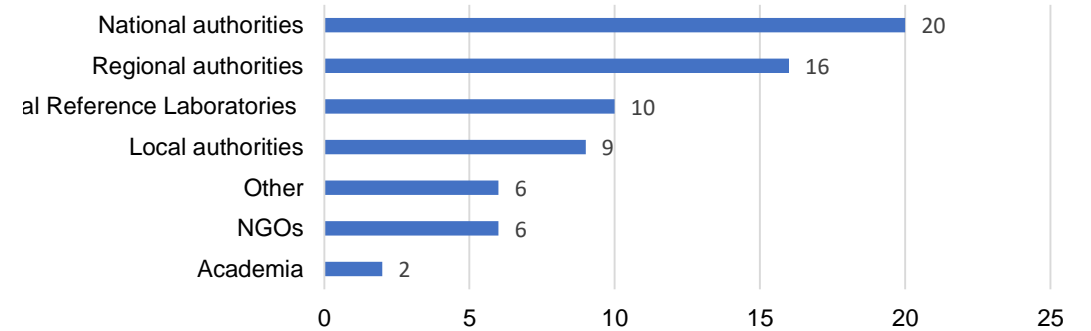
- Total of 107 responses, from 23 Member States (no responses from Slovenia, Romania, Greece and Cyprus)

total responses = 107

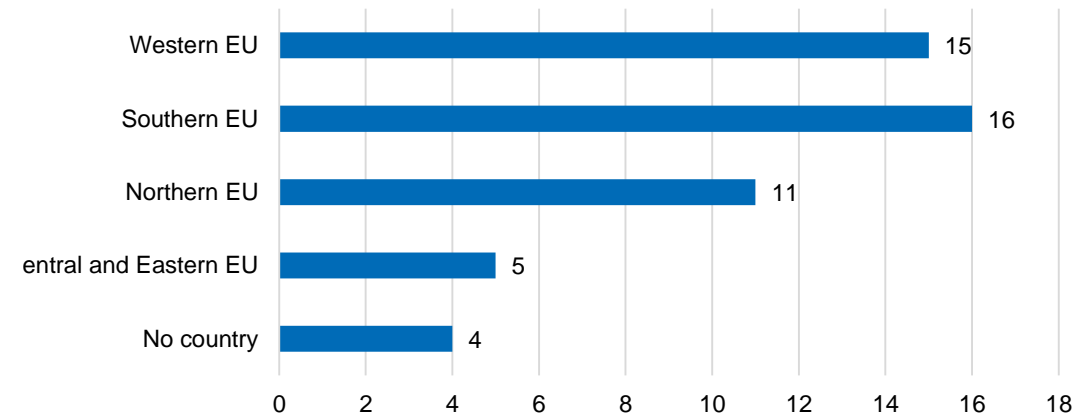


- Responses received from all types of stakeholders, majority of responses were from designated competent authorities at regional (24) and national (22) level

Monitoring questions; total responses = 69

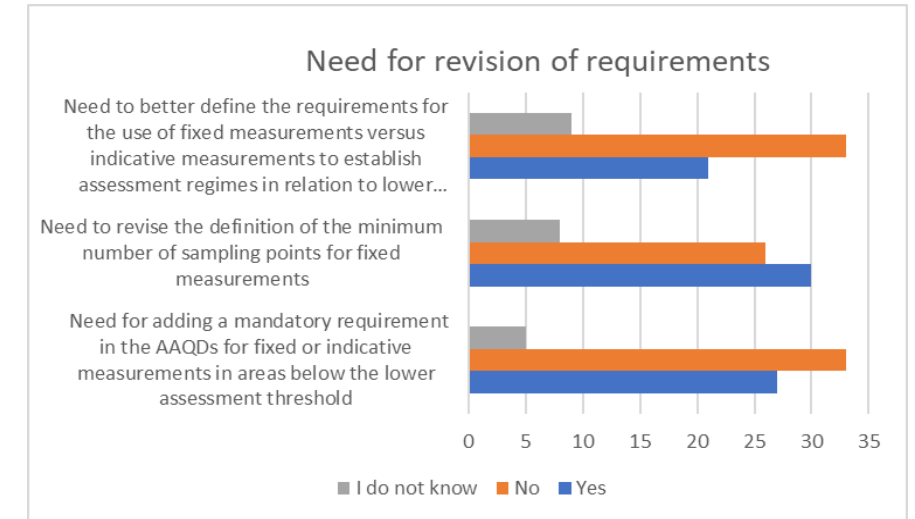


Monitoring questions; total responses = 69



AQ Monitoring

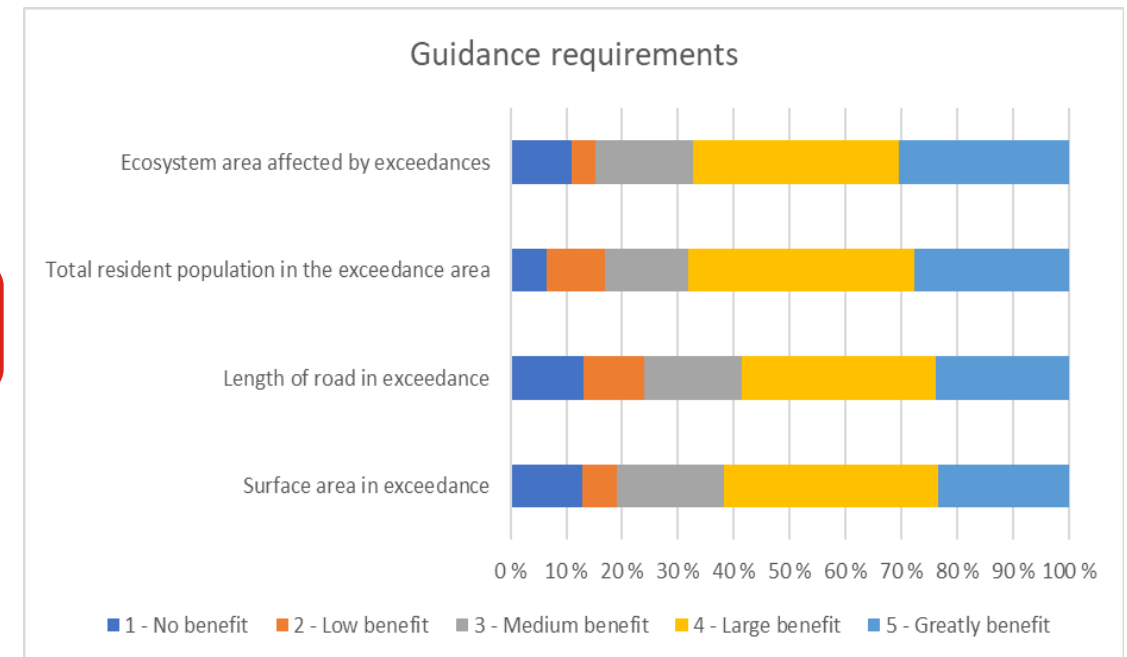
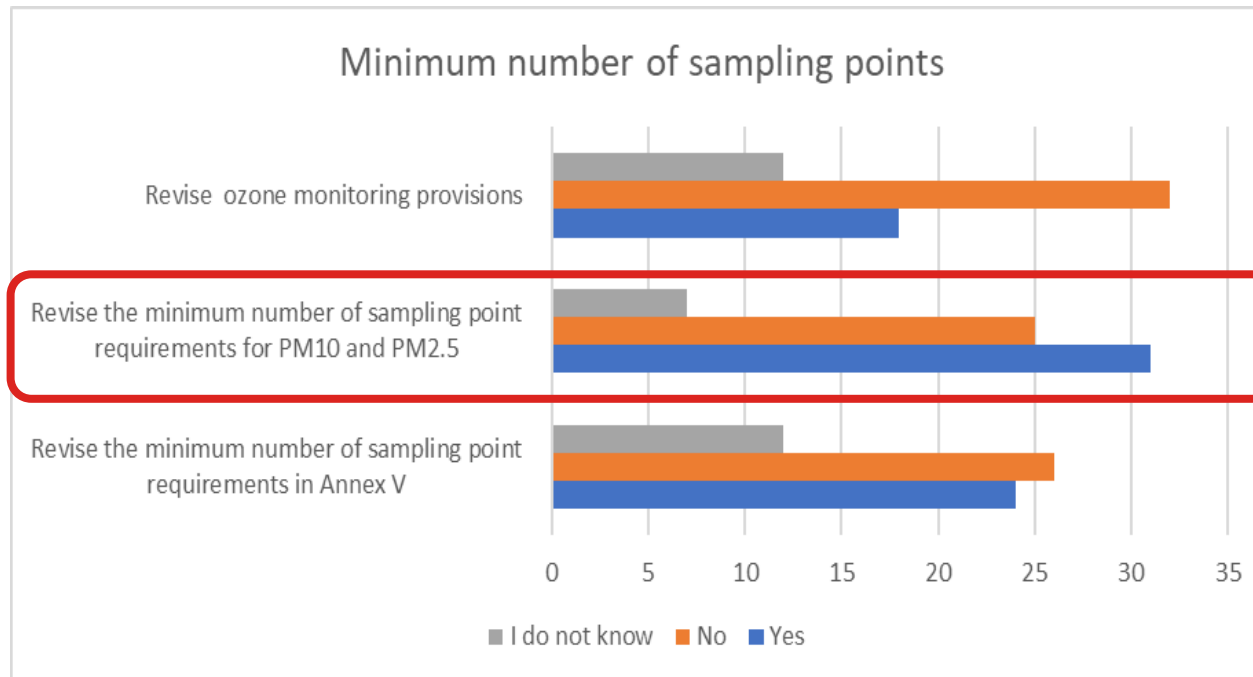
- Q2 - (general) air quality assessment regimes
- Q3 - (monitoring) micro- and macro-scale siting of sampling points
- Q4 - (monitoring) representativeness and continuity of monitoring
- Q5 - (monitoring) monitoring other air pollutants



- **Definition of air quality zones and agglomerations requires clarification**
 - with respect to how it relates to population exposure
 - cross cutting issue affecting monitoring, modelling and planning
- There is a need to **revise the minimum number of sampling points** – higher number
- There is a need to address the ambiguity regarding the use of **indicative measurements**.
- There is a need for better explanation for **the use of models** – allow for an enhanced use of models

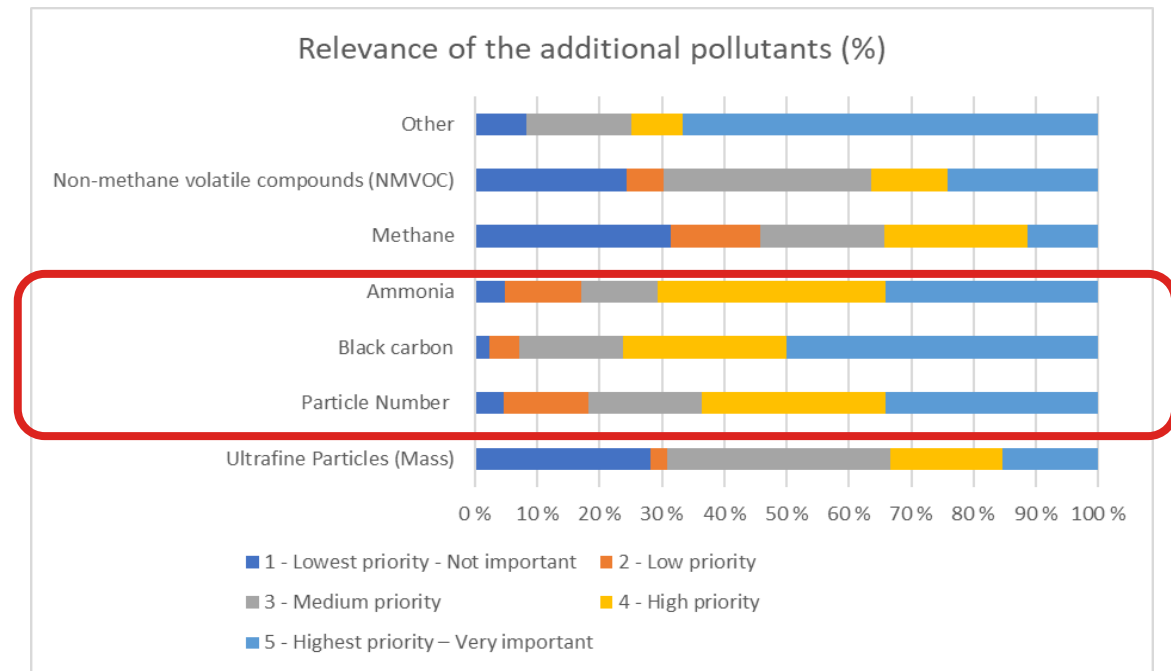
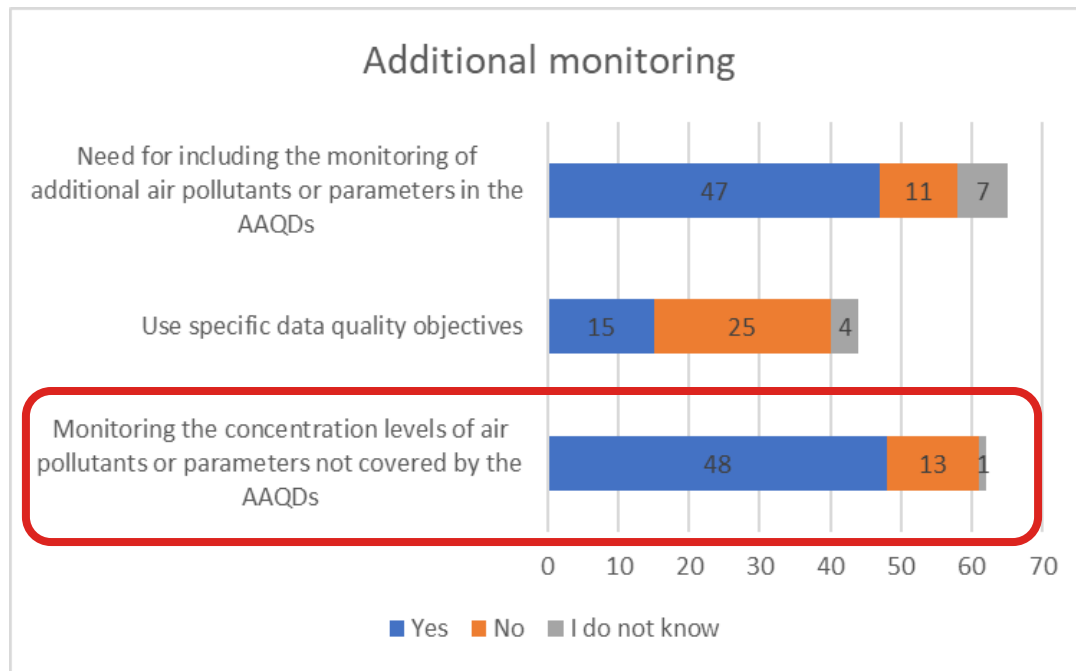
Representativeness and continuity of monitoring for exceedance and exposure calculations

- Methods to determine **representativeness** as expected – guidance under development in FAIRMODE
- Need for guidance for the calculation of exceedance and exposure indicators – CT8 in FAIRMODE
- Continuity of monitoring: recommended revision of the minimum PM₁₀ and PM_{2.5} number of sampling points and their proportional share – rather consider a separate minimum requirement for each – higher minimum for PM_{2.5}
- Monitoring design: Further need to link the minimum number of sampling points to representativeness and exposure considerations



Monitoring other air pollutants or parameters

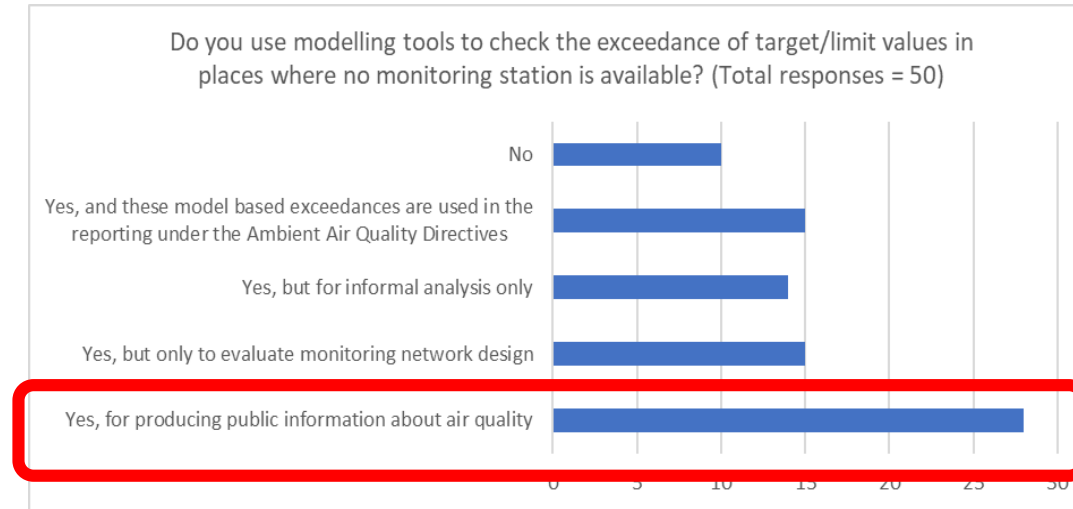
- There is significant additional monitoring in countries, although not all use harmonised DQO or CEN standards
- **Particle number, Black Carbon and Ammonia** are considered the additional pollutants with higher priority
- These are also the pollutants with considered higher maturity for harmonization



Air quality assessment methods and role of air quality modelling

AQ Modelling

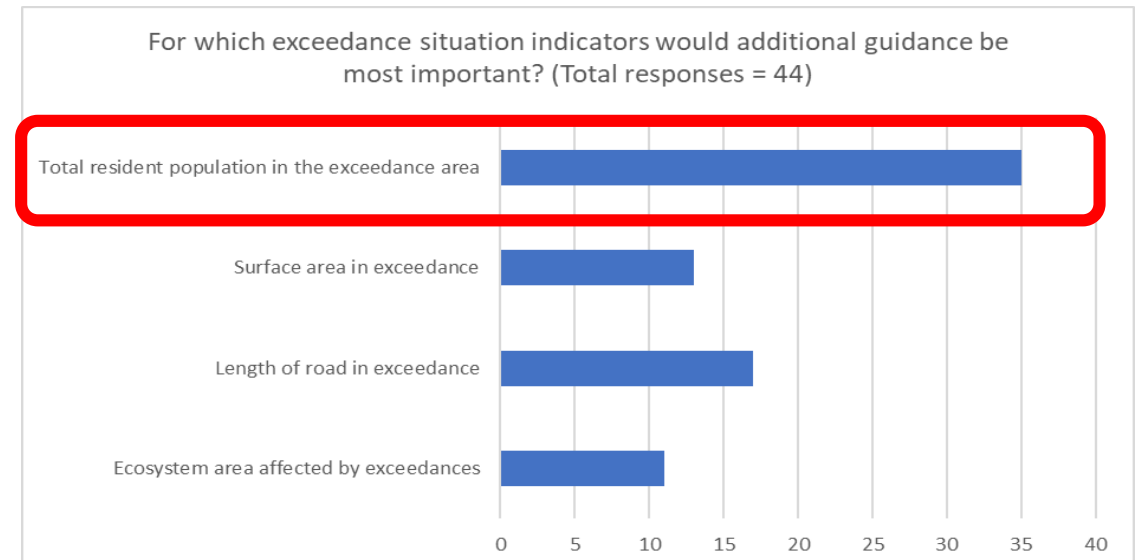
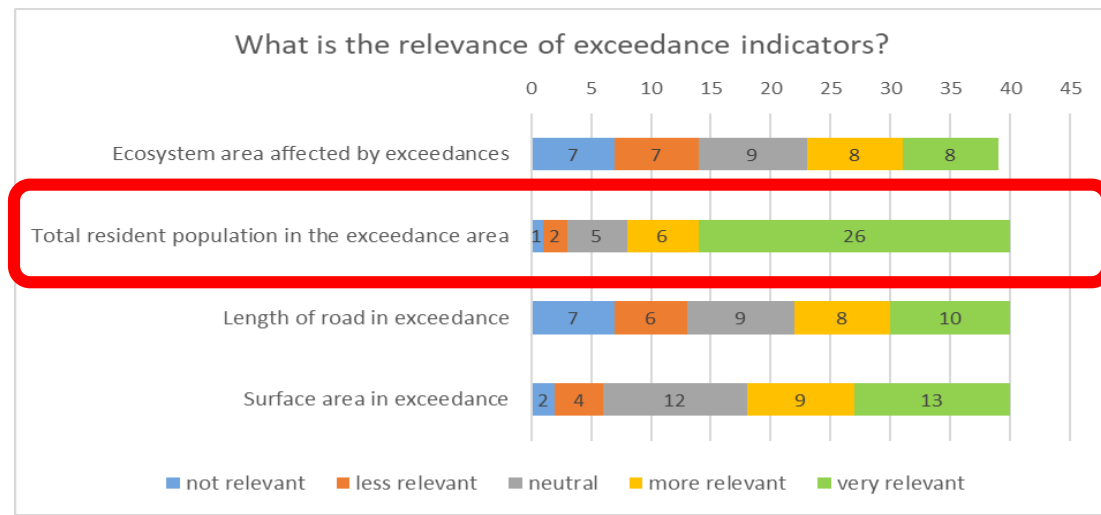
- Q6 - (monitoring / modelling) air quality assessment methods
- Q7 - (modelling) enhanced role of air quality modelling
- Q8 - (modelling) improving quality of air quality modelling
- Q10 - (air quality modelling and plans) role of modelling to support air quality plans



- **Modelling expertise and capacity** within Member States has significantly improved and modelling is becoming a **more mature** method for air quality assessments
- To **strengthen the use of models** in air quality management practices, it would be beneficial if the **role of models could be better described in a revised AAQD and the related IPR documents**.
- **Model quality assurance remains** an important aspect, especially should models receive a more formal and legal character under a revised AAQD.
- **More guidance** is deemed necessary to extend the **Modelling Quality Objective (MQO)** to a full fitness-for-purpose evaluation framework.

Air quality assessment methods and role of air quality modelling

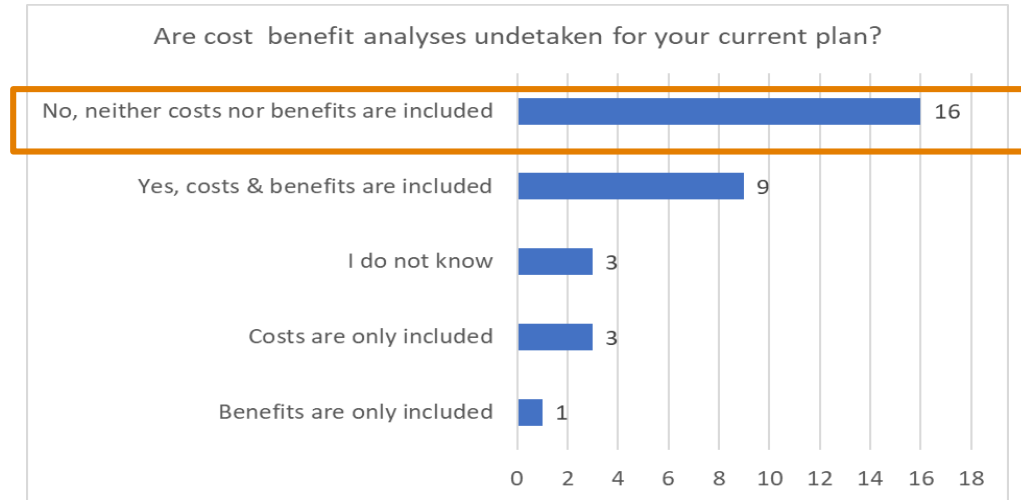
- **Modelling** and **passive samplers** followed by **expert judgement** are the most used complementary assessment methods
- **Satellite observations** and **low cost sensors** are not mature enough for direct application in the AAQD
 - Difficult to apply
 - Large uncertainties
- **Spatial resolution** of modelling results reported under the IPR ranges from local to regional scale but **Exceedance situation** estimation mainly relies on **high resolution** models
- High resolution models are used for **hot spot identification** but only a fraction (~40%) is used for official reporting
- **Population exposure** (or total population in the exceedance area) is identified as the most relevant indicator; **Road length** and **ecosystems** in exceedance are less relevant
- Most guidance is required for the estimation of population exposure



Air quality plans process and engagement

AQ Plans

- Q9 - (air quality plans) elements of air quality plans
- Q11 - (air quality plans) air quality plan development process and engagement
- Q12 - (air quality plans) ex-ante impact, costs and effectiveness of air quality plans
- Q13 - (air quality plans) ex-post assessments of impacts and costs of air quality plans

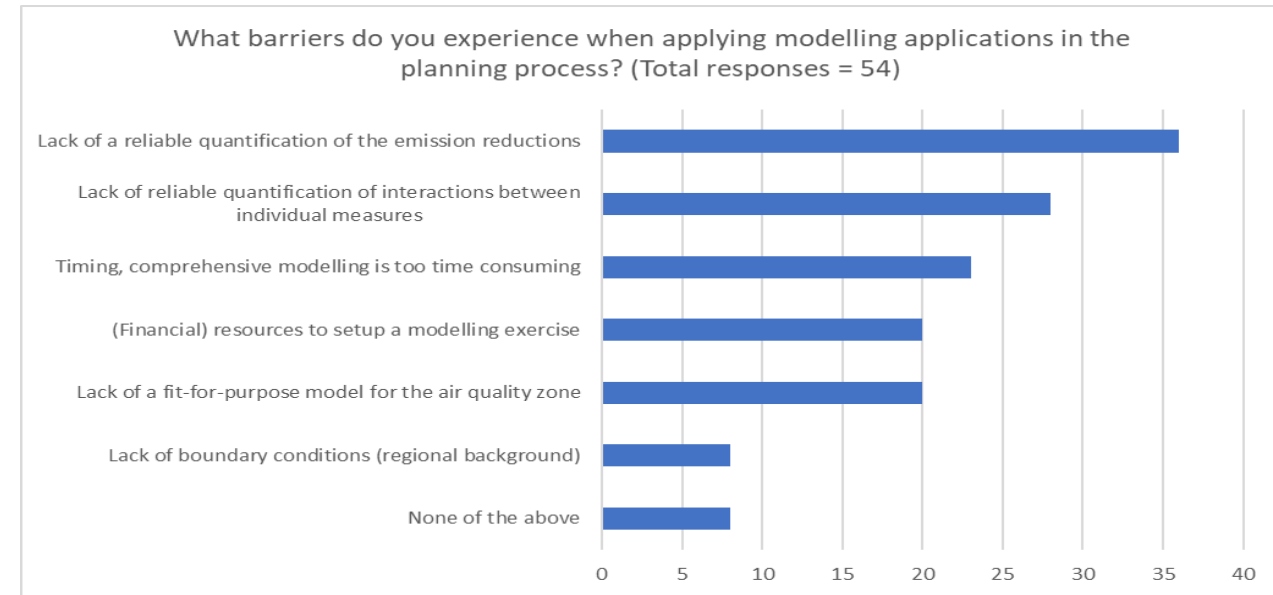


- Lack of clarity on the use of models to quantify the exceedance area, estimate source apportionment and estimate the impacts of measures considered in plans.
- Need for guidance on how to apply modelling systems in the various contexts: general mapping, hot spot detection or exceedance situation estimation, population exposure, evaluation of monitoring network design, source apportionment, assessment of long-range transport to support for air quality planning.
- Focus to given to those sources of emission contributing to high concentrations in the development of an air quality plan
- Need for further guidance on the evaluation of costs and benefits in air quality planning

Air quality plans process and engagement

AQ Plans

- Q9 - (air quality plans) elements of air quality plans
- Q11 - (air quality plans) air quality plan development process and engagement
- Q12 - (air quality plans) ex-ante impact, costs and effectiveness of air quality plans
- Q13 - (air quality plans) ex-post assessments of impacts and costs of air quality plans



- Most common barrier for air quality planning is availability of reliable emission scenarios
- Emission reduction data to support an air quality plan needs to be robust and better harmonised – further guidance on elaboration of emission scenarios needed
- Closer alignment with the National Emissions reduction Commitments Directive (NECD) necessary

Thank you for your attention

