



European  
Commission

# Implications of the recommendations on the FAIRMODE organisation

FAIRMODE SG

February 2019



Joint Research Centre

the European Commission's  
in-house science service

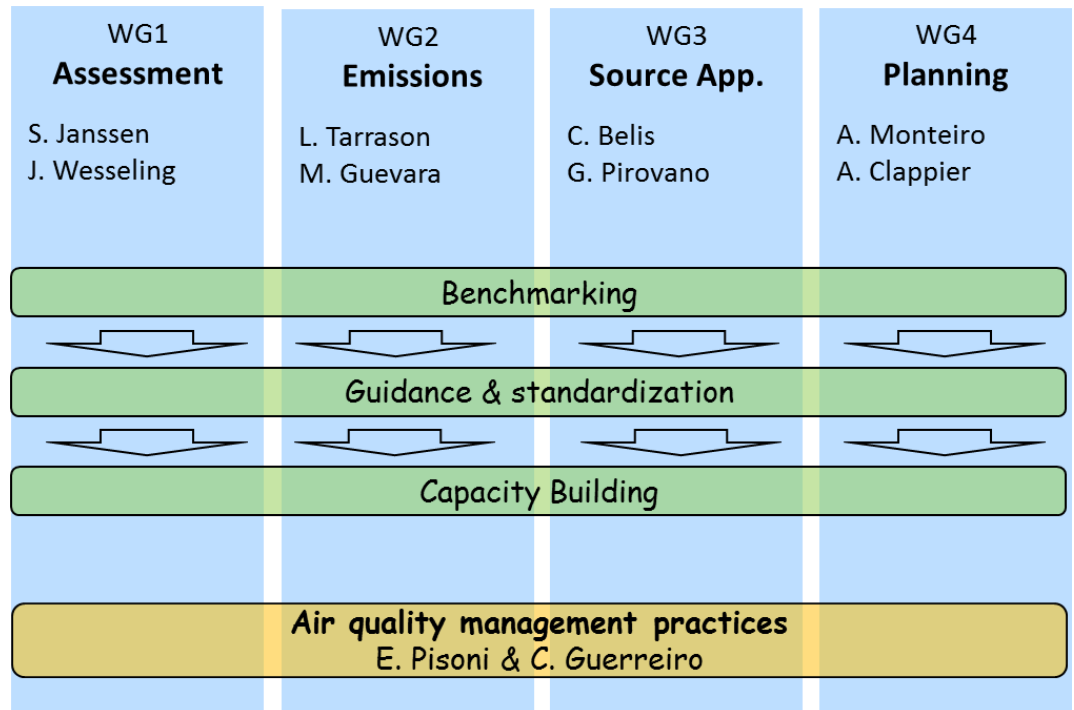
# Background



## The current FAIRMODE structure

- 4 pillar WGs
- A three-steps approach

avored WG-focused discussions around benchmarking.

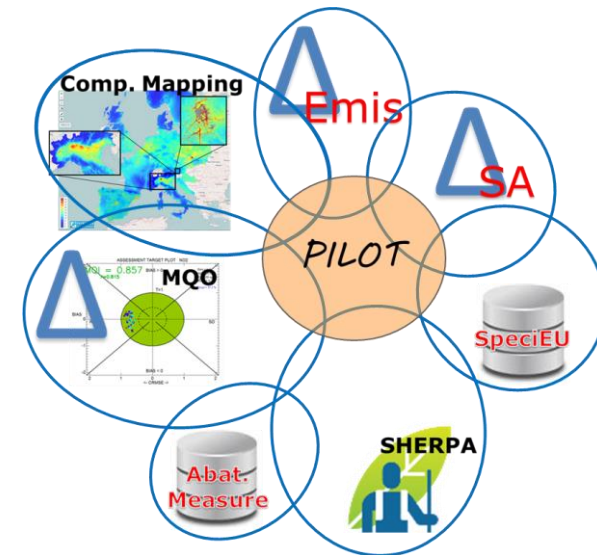
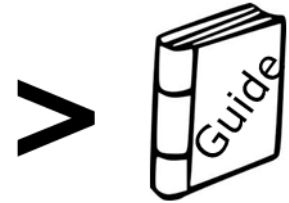


# Background



## Where are we now?

- Benchmarking → tools, datasets, inter-comp. Ex
- Many scientific publications and few technical guides
- Interactions with pilot cities raise practical questions on management practices
- In parallel, other relevant issues came on the table (exposure, sensors, CFD...)



**Based on the knowledge built (tools, datasets, publications...), FAIRMODE is now mature to address some of these issues and provide guidance and/or recommendations.**

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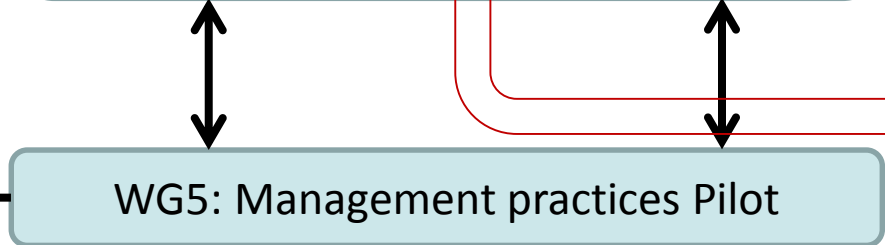
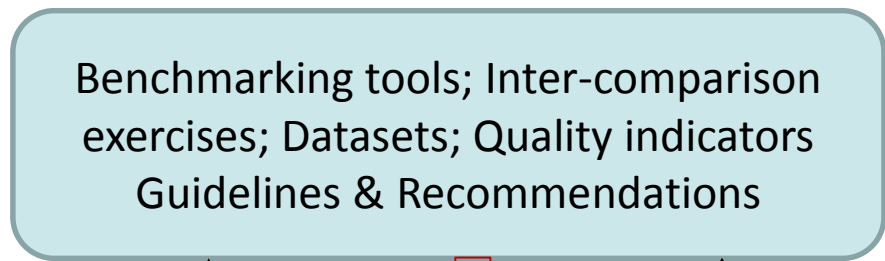
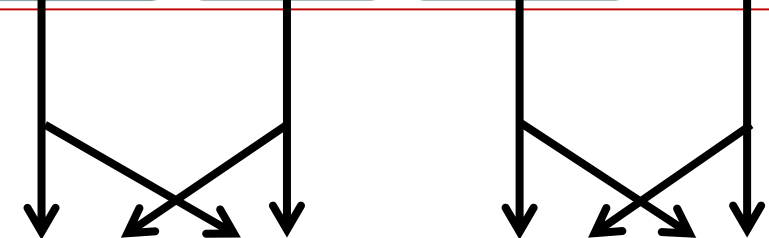
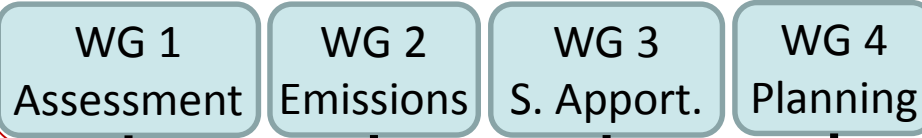
## BUT this is challenging

- ✓ Issues are many!
  - Priority order should be discussed and agreed
- ✓ Issues are cross-cutting (everybody is interested by everything!)
  - The current organization in parallel WG is not flexible enough

# Current

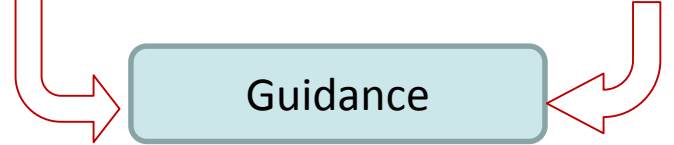
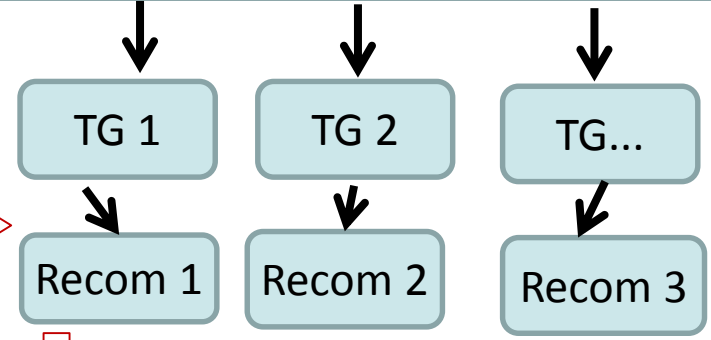
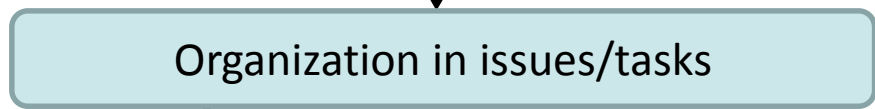
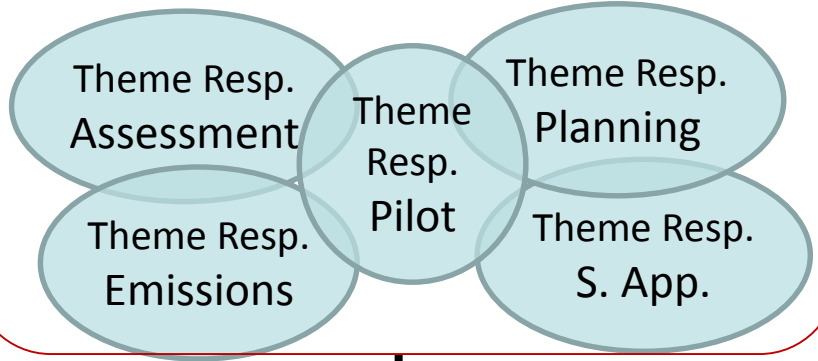


SG: WG chairs, JRC, DG ENV, EEA



# Future

SG: Th. Resp., JRC, DG ENV, EEA



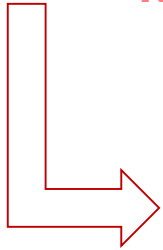
# Streamlining FAIRMODE activities



## Competence building

- Problem understanding
- Benchmarking

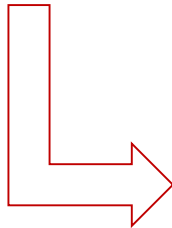
Requires support from MS and NCP



## Recommendations

Necessary actions

Requires support from MS and NCP



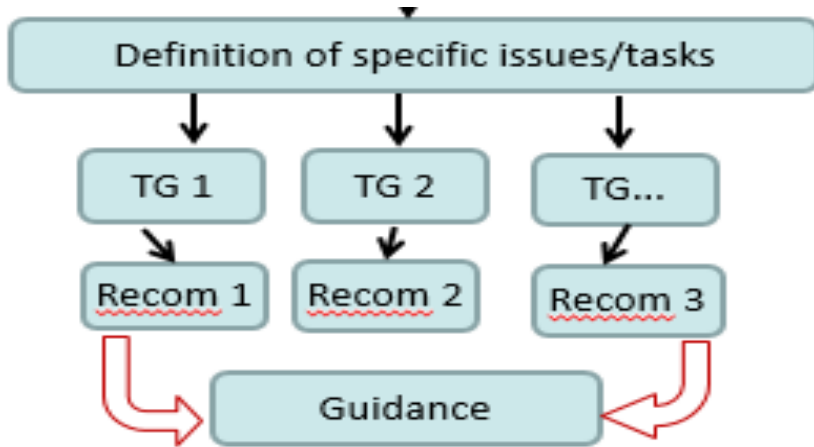
## Technical guides

Best practices

Requires additional means

# Streamlining FAIRMODE activities: Review

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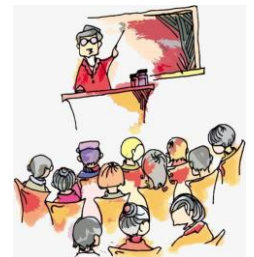


**Technical guide /  
recommendation**



**SG review**  
Approved at  
Tech meeting

**NCP review**  
Presented at  
Plenary meeting



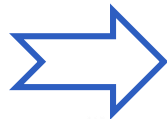
## Review process?

Similar to current recommendations

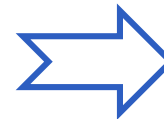
# Agreeing on priority questions (Plenary, right now!)



**Competence building**



**Recommendations**



**Technical guides**

Support from MS



- ❖ Hyper local scale
- ❖ NRT assessment with sensors
- ❖ Future projections
- ❖ Optimisation of monitoring network

- ❖ Urban emission
- ❖ Local management
- ❖ Overall model QA/QC



- ❖ Expos. & Exc Mod
- ❖ SA to AQ Manag.
- ❖ Forecasts QC?



Competence building



Recommendation



**Guidance**



## Technical guides on good practices

1. Exposure and exceedance indicators
2. Source Apportionment approaches to AQ management
3. Quality Control for AQ forecasts ?

# 1 - Exposure and exceedance indicators



**Purpose:** Support MS in the assessment and official reporting of population & exceedance indicators.

## **Means:**

- Review, comment (and test) the output of a recently launched DG ENV Service Contract
- Previous experience on Spatial Rep.

## **Scope:**

- What is a minimum **spatial resolution** for a correct modelling of population exposure? (is 1km sufficient?; what about canyons?)
- How to discriminate between **different pollutants**? Exposure for PM10, PM2.5, NO2? (what about O3?)
- Should we link this to the **health community**?
- How does this connect to **Spatial Representativeness**?
- What is a **fitness-for-purpose** criteria for exceedance modelling?

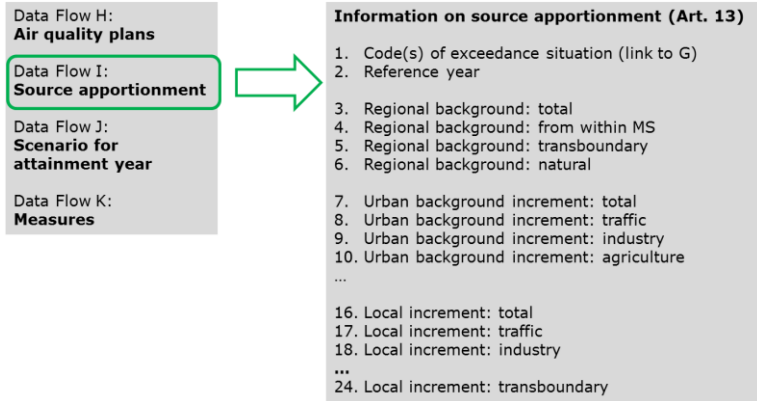
Reporting of an exceedance situation according to Impl. Decision 2011/850/EC

6. *Estimate of the surface area*
7. *Estimate of the length of road*
10. *Estimate of the total resident population*
11. *Estimate of the ecosystem/vegetation area*

# 2 - Src. Apport. approaches to AQ management



**Purpose:** Support MS in the production of source apportionment for different purposes (IPR scheme, background, natural..).



Competence building

Recommendation

Guidance

**Means:** Inter-comparison Ex., Guides on SA, specific datasets, ...

## Scope:

- What are the **different approaches** available (to be completed by a review of current local approaches)
- Which method for which **pollutant**?
- Which method for which **scale/sector**?
- Which method for which **purpose**?

# 3 - Quality Control for AQ forecasts



Competence building



Recommendation



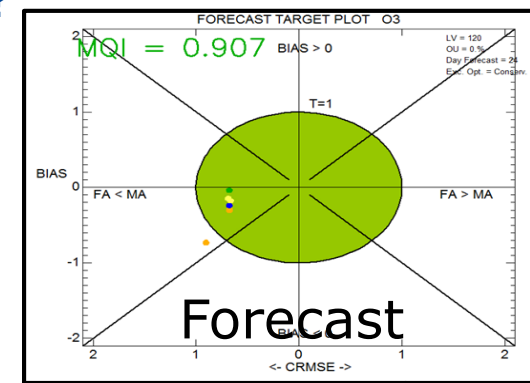
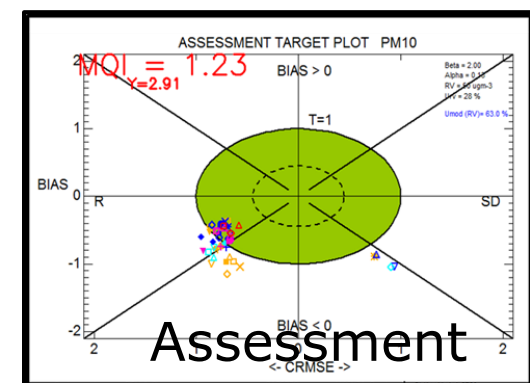
Guidance

**Purpose:** Support MS in assessing the quality of their forecasts to fulfil their obligations of informing the public and drafting short-term action plans.

**Means:** Existing technical documents, need for strengthen collaboration (QC) with CAMS (?)

**Scope:**

- Do we agree with currently proposed indicators?
- What is most important in the **QA/QC of forecast?**
  - Threshold exceedances
  - Do better than the persistence model
  - Overall model performance



## Recommendations

4. Compilation of urban emission inventories
5. Improvement of local and regional air quality management process
6. Overall modelling QA/QC scheme



# 4 - Compilation of urban emission inventory (connected to EEA/EMEP guidebook)

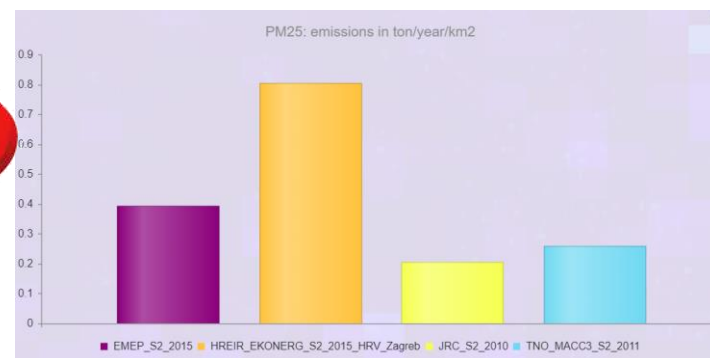
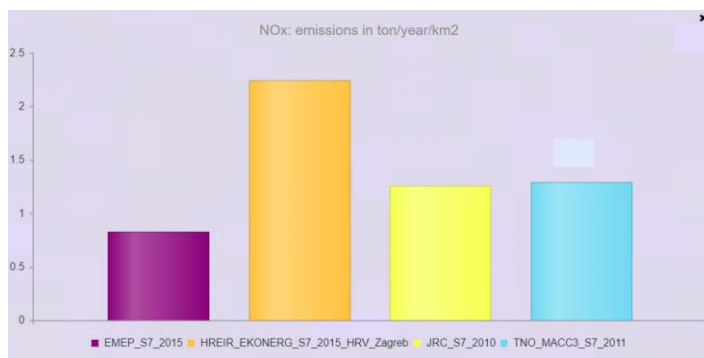
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Competence building

Recommendation

Guidance

**Purpose:** support MS and regional/local authorities in the compilation of urban? emission inventories.



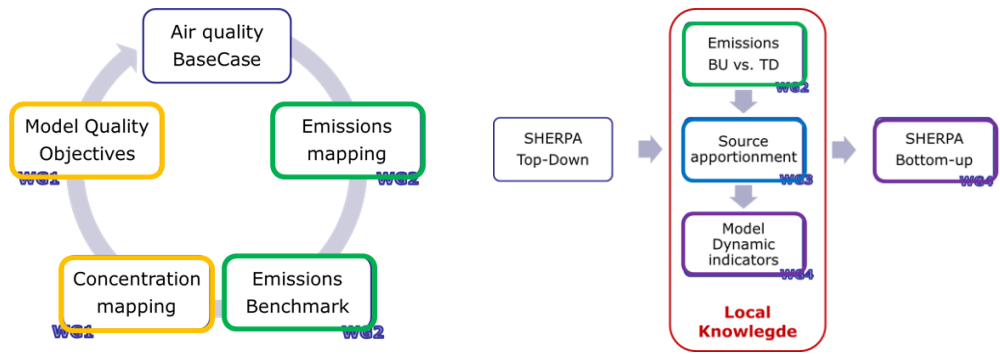
## **Scope:**

- Which **sector/pollutant**?
- What about **structural changes**
- Which **resolution**?
- Can we recommend anything on **governance** to make sure these best practices lead to permanent improvements and are not lost from one year to the other?

# 5 – Improvement of local and regional air quality management



**Purpose:** support local/regional authorities.



**Scope:**

- Suggest a **path to support AQ plans** (what is the first step: measurements, S. app., emissions, planning?)
- Which **pollutant/scale**?
- How to deal with **governance** issues?
- Distinguish between cities with **management practices** in place and those who do not have?
- Distinguish “management processes”, depending on **data availability** or on the geographical scale of the problem?

# 6 - Overall QA/QC scheme for air quality modelling (based on the Pilot?)



Competence building



**Recommendation**



Guidance

**Purpose:** Support the AQ modelling community

**Scope:**

- Which tests can we recommend to **ensure the quality** of model results
- What can we add to existing proposals (COST actions, German standards...)
- Can we use the FAIRMODE **benchmarking tools** (should we adapt them or develop others?)





**Competence building**

*Recommendation*

*Guidance*

## Competence building

7. Assessment of “hyper local scale” air pollution
8. Future projections
9. Near-real-time assessment modelling with sensors

# 7 - Assessment of “hyper local scale” air pollution



Competence building

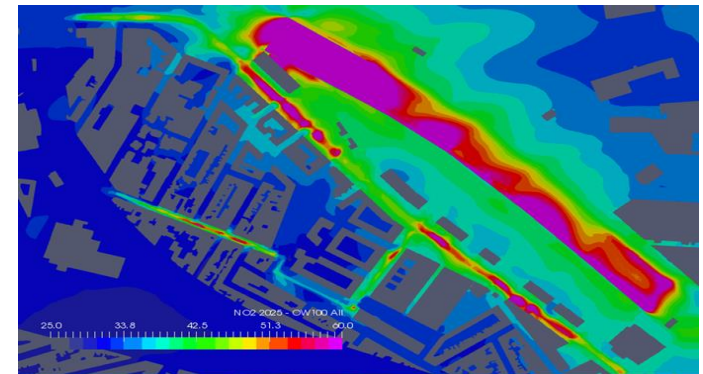


Recommendation



Guidance

**Purpose:** support local authorities in the assessment of air quality at the “very” local scale (in the context of the AQD) to support urban planning measures.



**Scope:**

- What tools are available: CFD, street box models, parametrized gaussian models,...?
- How to **couple** these local scale models to the regional background?
- How can we estimate **AQD indicators** like annual averages, percentiles from short term modelling?
- How can we assess the **quality** of these modelling applications? (can we use the MQO framework? What about limited number of observation?)

# 8 – Future projections



*Competence building*



*Recommendation*



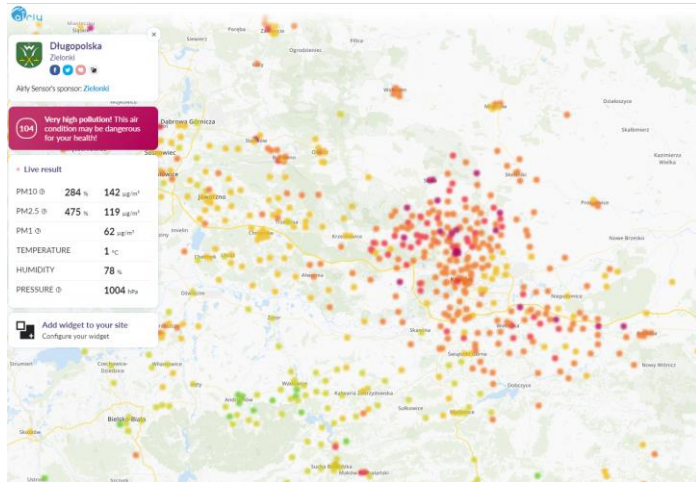
*Guidance*

**Purpose:** support to MS

**Scope:**

- How can we estimate **future exceedances** (e.g. 2030)?
- How can we best deal with **meteorological** variability? Is meteorology from one year sufficient (e.g. use meteo 2012 for 2025, 2030...).
- How can we link AQ model projections to recent **observations** if the model results are under/over estimated in the base year?
- Uncertainty and **a-posteriori verification** of AQ plans
- Which approach to recommend to move from national **NECD** to local/regional emission reduction targets
- NEC requirements and compliance to AQD

# 9 – Near-real-time assessment modelling with sensors



Competence building



Recommendation



Guidance

**Purpose:** support local authorities and MS in the integration of sensor data in the modelling applications

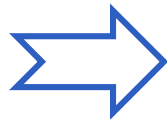
## **Scope:**

- How can sensors be used to **improve model applications** (via e.g. data fusion)?
- How can a model be used to **benchmark sensor network** output & quality?
- Does this work in **near-real-time** applications?

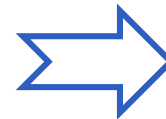
# Agreeing on priority questions (Plenary, right now!)



## Competence building



## Recommendations



## Technical guides

Support from MS



- ❖ Hyper local scale (10/3)
- ❖ NRT assessment with sensors (6/0)
- ❖ *Optimisation and representativeness of monitoring network (10/0)*
- ❖ *Effectiveness of measures (20/0)*

- ❖ Urban emission (10/0)
- ❖ Local management (10)
- ❖ Overall model QA/QC (10/0)
- ❖ *Needs for air quality plans, future projections (20/0)*



- ❖ Expos. & Exc Mod (25/0)
- ❖ SA to AQ Manag.(15)
- ❖ Forecasts QC? (10)

# Annexes

# Tallinn topics



	<b>Topic</b>	<b>WG</b>	<b>hours</b>
1	MQO & Guidance & e-reporting (WG1)	1	1.5
2	Pilot Assessment (WG1)	1	2.0
3	CFD (WG1)	1	1.0
4	Forecast (WG1)	1	2.0
5	Pilot Emissions follow-up (WG2)	2	1.5
6	Guidance receptor models (WG3)	3	1.5
7	Guidance source-oriented models (WG3)	3	2.0
8	Spatial and local scale models for SA (WG3)	3	1.0
9	Long term air quality strategies (WG4)	4	1.0
10	Design of an inter-comparison exercise (WG2-WG3-WG4)	234	1.0
11	SA and SRR (All)	1234	1.5
12	Increased QA/QC	1234	1.0
13	SHERPA	4	1.5
14	CEN WG44 follow-up on validation of Source oriented models (WG3)	3	2.0
15	Recommendations	1234	4.5
16	Benchmarking/Guidance priorities	2	1.5
17	Benchmarking/Guidance "new sectors"	2	1.5