

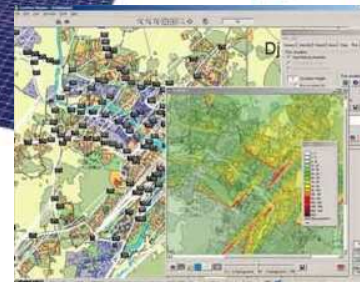
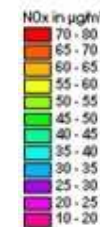
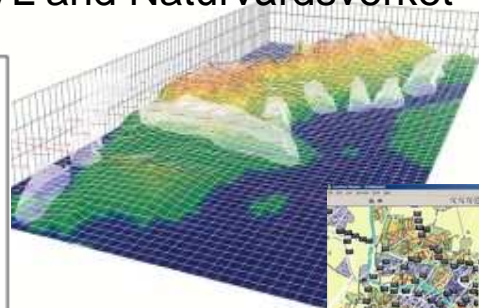
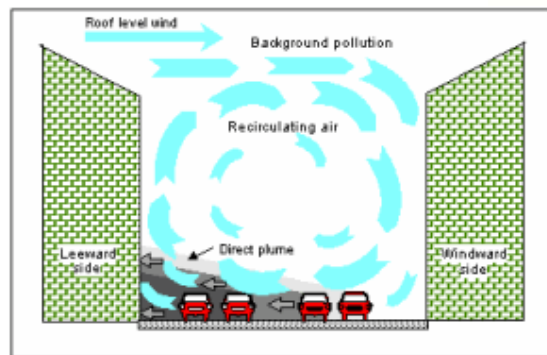
6th meeting Nordic National Reference Laboratories

FAIRMODE – Forum for Air Quality Modelling in Europe



What guidance can we support Swedish model users?

- **Use of models**
 - Understanding of model and results
 - Relevant model for area and situation
 - Indata
 - Knowledge and experience
- **Legislation**
- **Report results**
 - In cooperation with IVL and Naturvårdsverket



Main activities during 2013

- Guidance
- Course in Air Quality Modelling in November 2013
- Check list for calculations
- Excel tool for model validation
- Input for the revision of the “Air Quality Guide” by SEPA.
- FAIRMODE



What is FAIRMODE?

<http://fairmode.ew.eea.europa.eu/>

Forum for Air Quality Modelling in Europe

Aim

- Bringing together air quality modellers and users in order to promote and support the harmonised use of models by EU member countries.

Participants

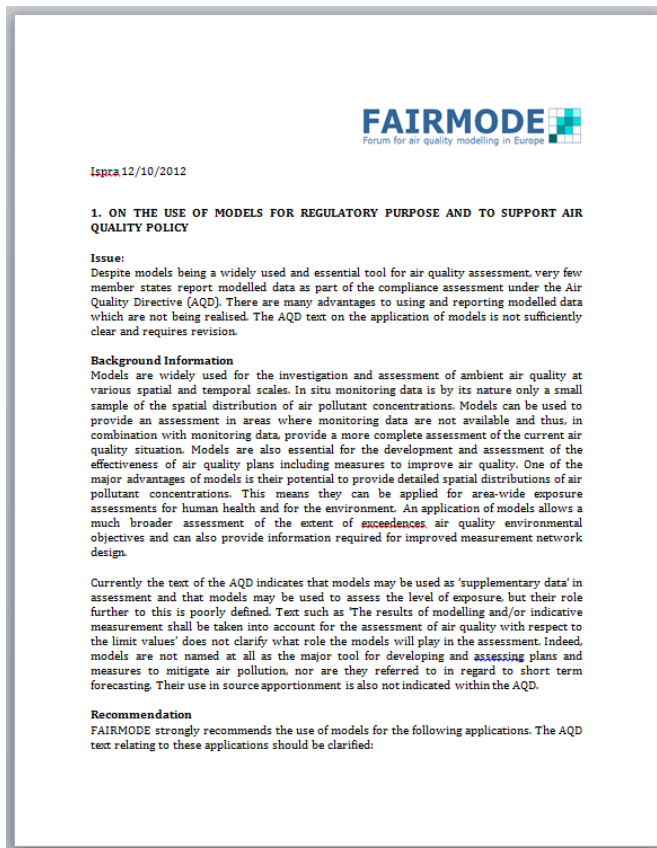
- Lead by JRC och EEA.
- About 50 participants from different states in EU.

How?

- Recommendations to the EU commission.
- Guidance documents.
- Tools for model validation.



Recommendation to the EU commission



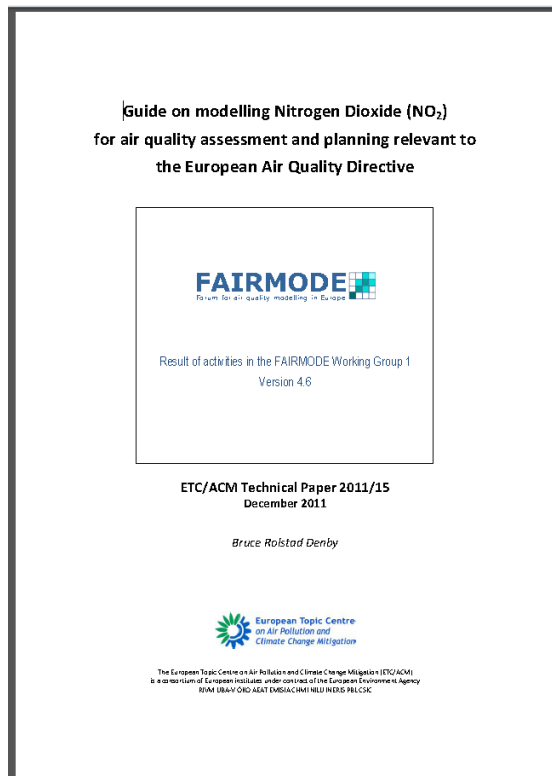
FAIRMODE strongly recommends use of models for the following applications:

- AQ levels, exceedances and exposure
- Forecasting and warnings
- Source allocation to establish the origin
- Plans and measures to control AQ exceedances
- Designing monitoring networks
- Determining the number of monitoring sites required

http://fairmode.ew.eea.europa.eu/guidance-use-models-wg1/directive-revision/fairmode-recomm_final.docx

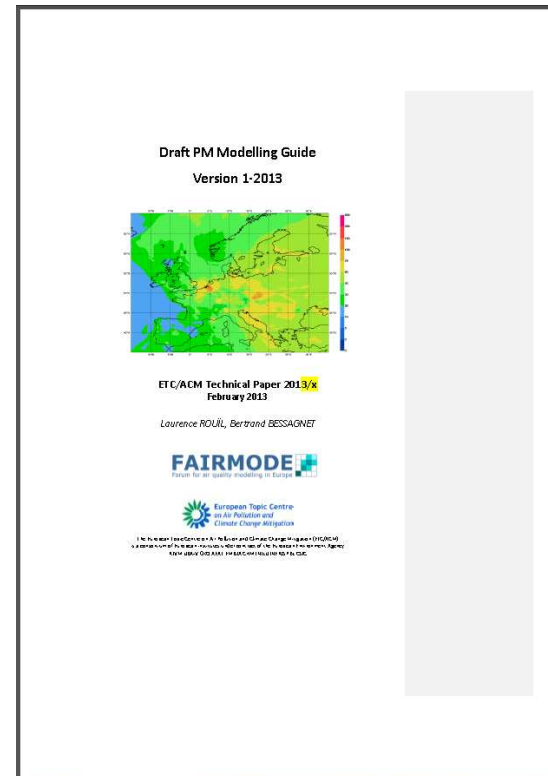
Guidance documents

Guide on modelling NO₂



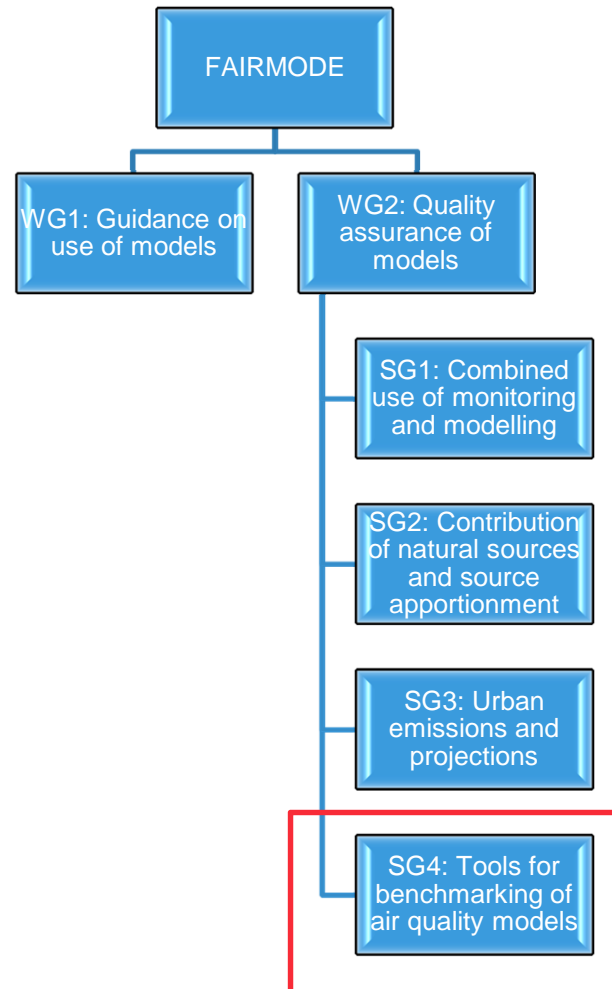
http://acm.eionet.europa.eu/reports/docs/ETCACM_TP_2011_15_FAIRMODE_guide_modelling_NO2.pdf

PM modelling guide (draft)



http://fairmode.ew.eea.europa.eu/guidance-use-models-wg1/fairmode_pm_report_march_2013_for-commentspdf.pdf

FAIRMODE's workgroups and subgroups



Model quality objectives

- In the EU AQ Directive there are quality objectives for data and monitoring
- Furthermore, there are quality objectives for modelling

	NO2 SO2 CO	PM10 PM2.5 Pb	Benzene	As Cd Ni	B(a)P
Hourly average	50 %	-	.	-	-
Running 8h average	50 %	-	.	-	-
Daily average	50 %	Not yet defined	.	-	-
Yearly average	30 %	50 %	50 %	60 %	60 %

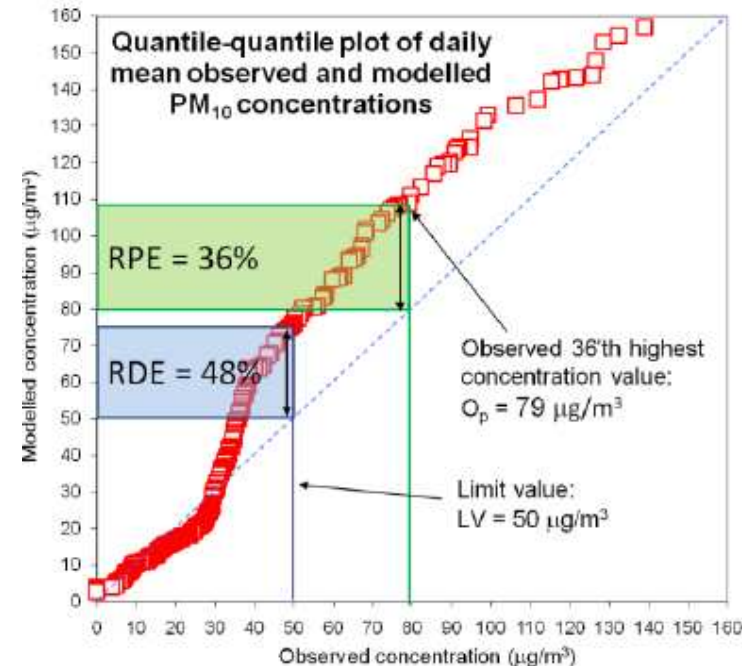
How can these uncertainties be interpreted?

How can the model quality objectives be interpreted?

Relative Directive Error (RDE) and Relative Percentile Error (RPE)

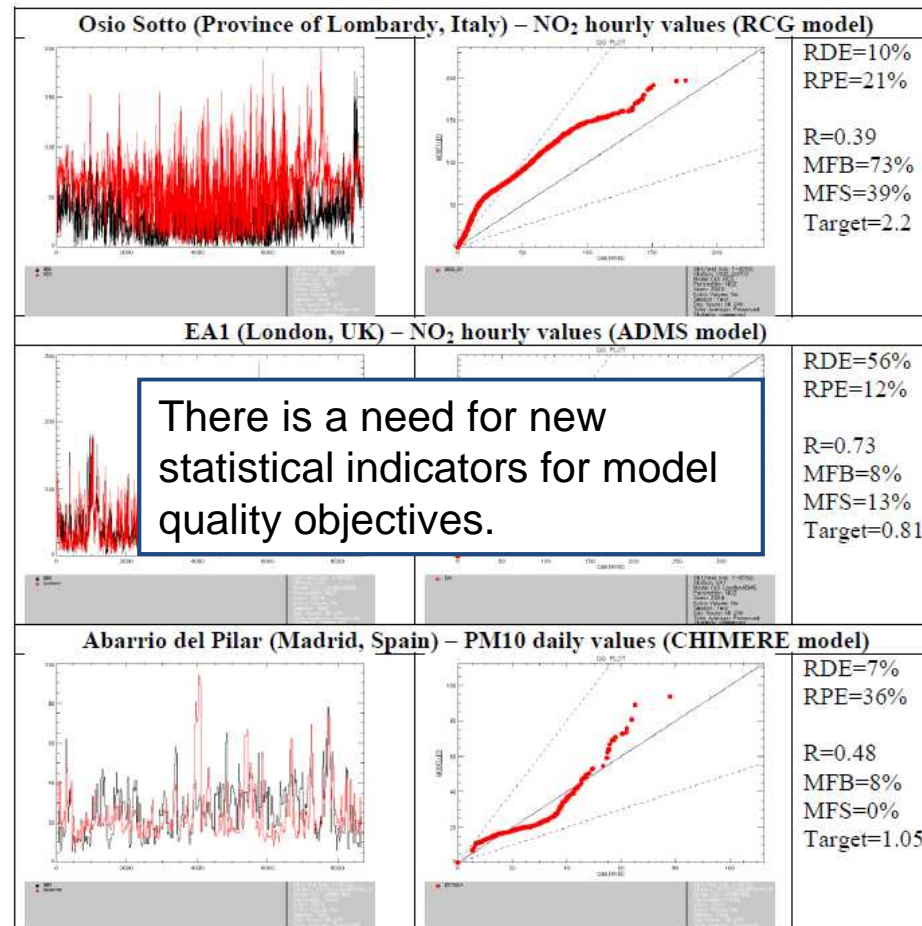
- FAIRMODE has suggested two statistical indicators for calculation of the model quality objectives; RDE and RPE.

$$RDE = \frac{|O_{LV} - M_{LV}|}{LV} \quad RPE = \frac{|O_p - M_p|}{O_p}$$



But they have some disadvantage...

Relative Directive Error (RDE) and Relative Percentile Error (RPE)



Proposal of new interpretation of model quality objectives

Target

$$RMSE/2U$$

Ideal value: Target = 0

Quality objective: Target \leq 1

Target plot

Target > 1.0

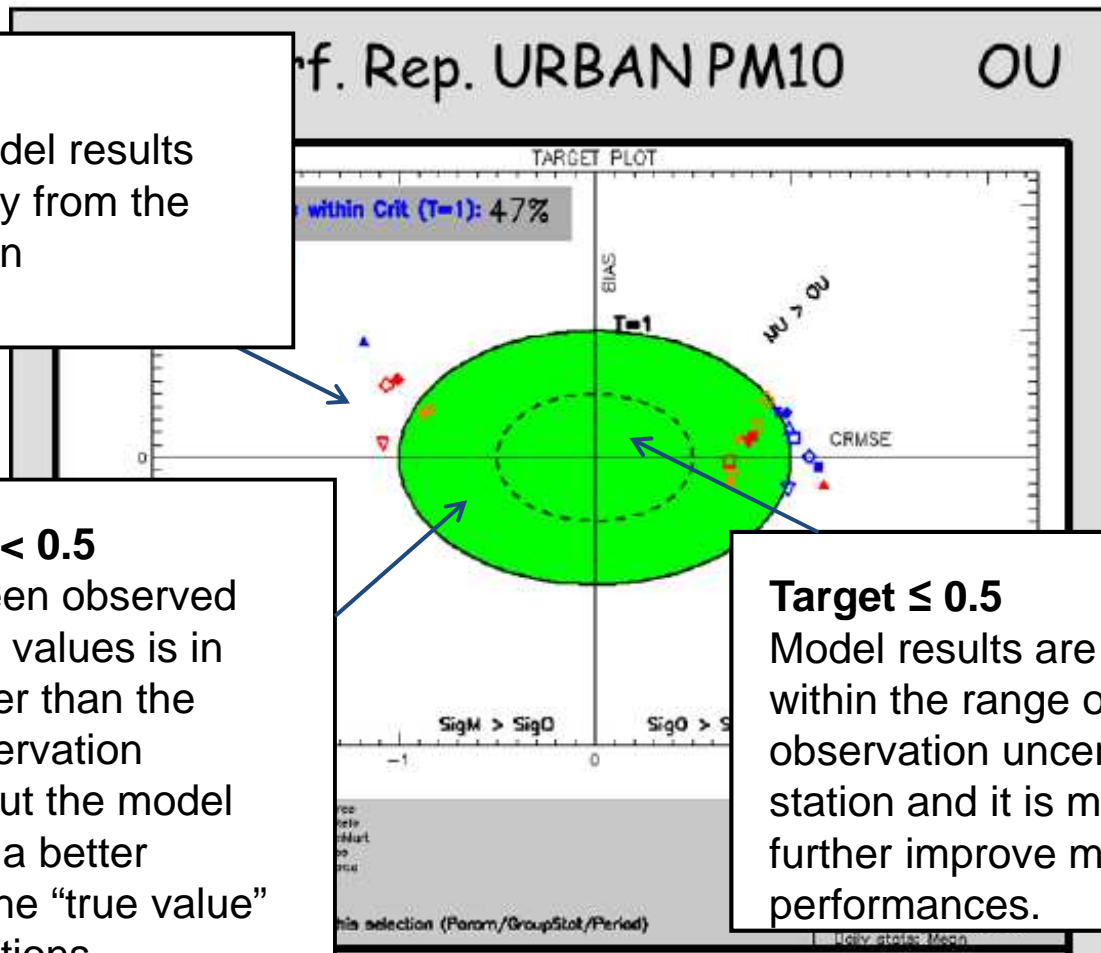
In this case model results are further away from the “true value” than observations.

1.0 ≤ Target < 0.5

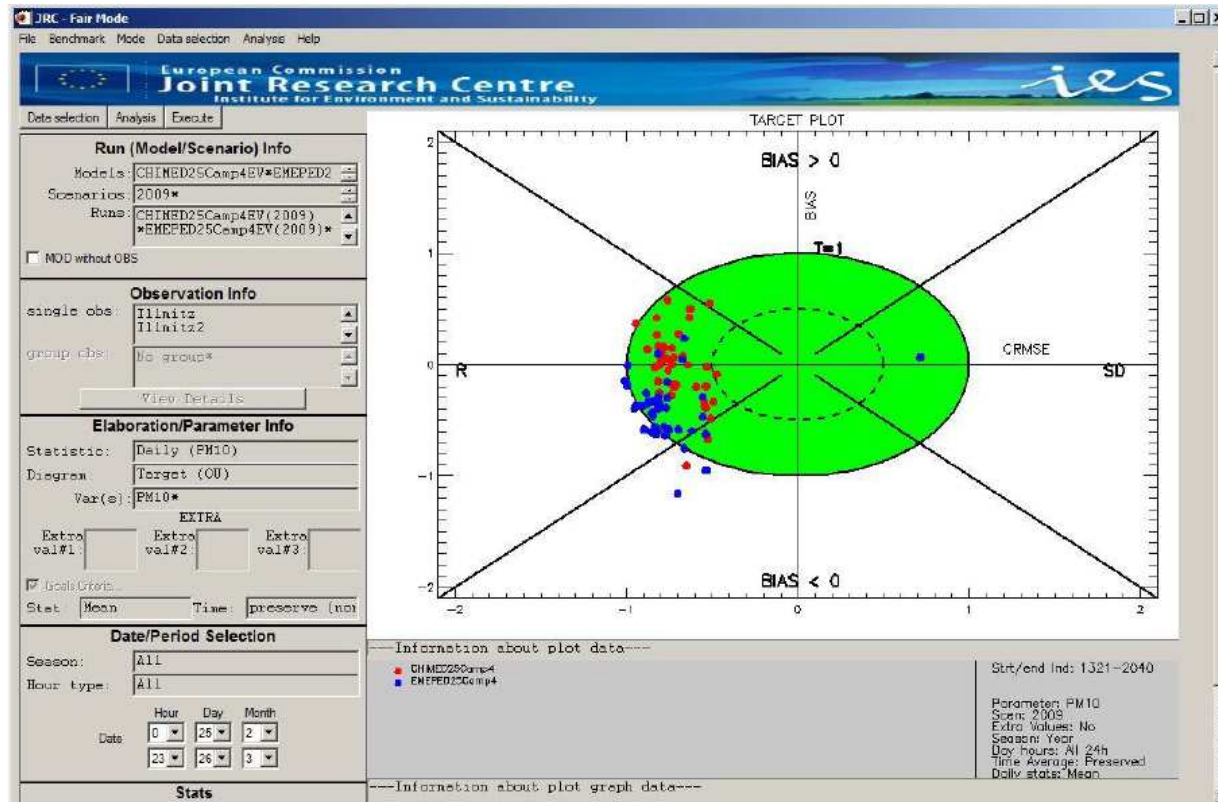
RMSE between observed and modeled values is in average larger than the range of observation uncertainty but the model might still be a better predictor of the “true value” than observations.

Target ≤ 0.5

Model results are in average within the range of the observation uncertainty for that station and it is meaningless to further improve model performances.



Delta tool – tool for AQ models benchmarking



<http://aqm.jrc.ec.europa.eu/DELTA/index.htm>

Thank you for your attention!

Questions?

Comments?

