Appraisal project

Air Pollution Policies
foR Assessment
of Integrated Strategies
At regional and Local scales

APPRAISAL
A review of current methodologies for air quality assessment and planning

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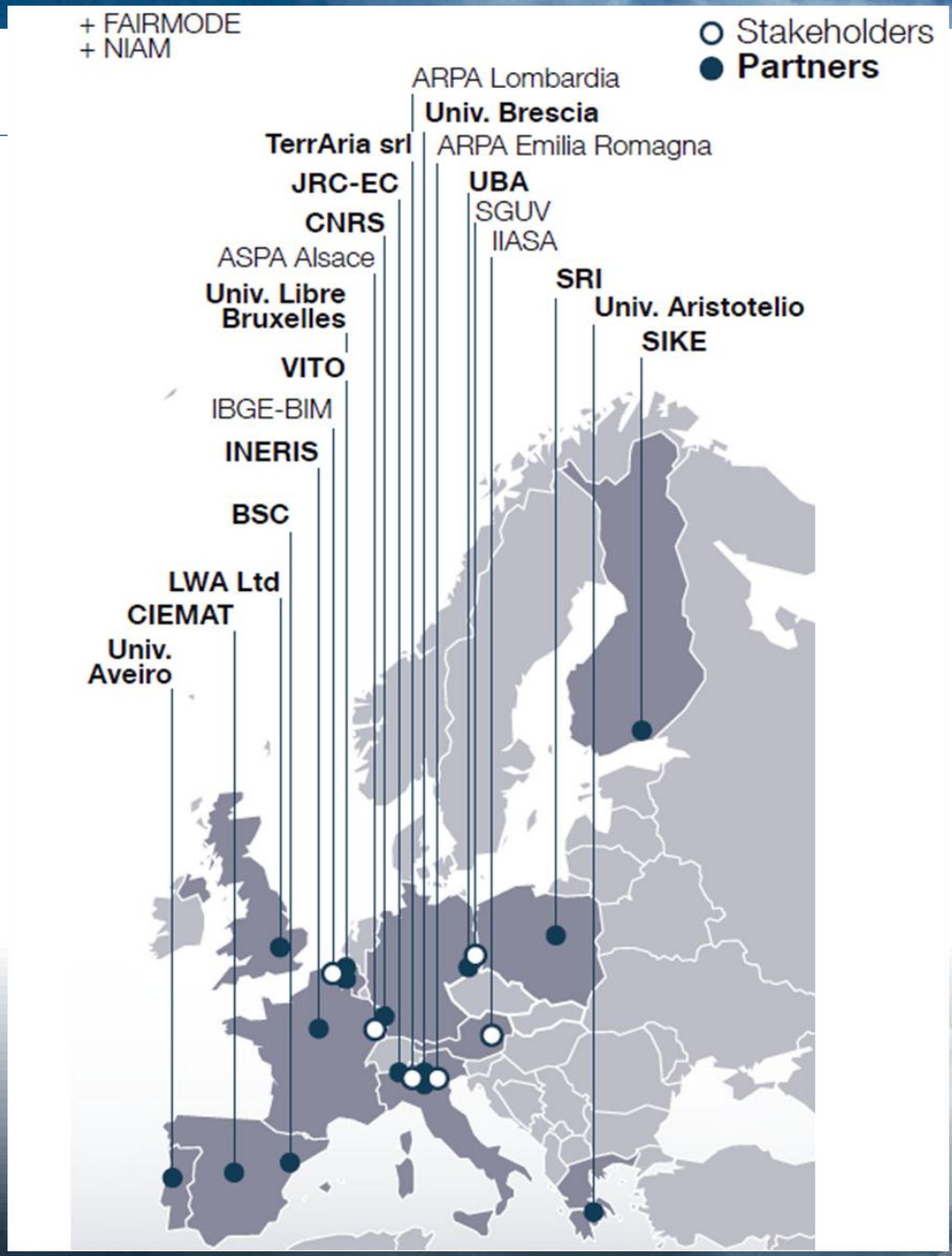
Partners & Stakeholders

15 partners from 11 MS



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What is APPRAISAL?

FP7 Coordination and support action

ENV.2012.6.5-4: Integrated assessment of air pollution supporting the revision of EU air quality legislation

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Member States have in the last decade developed and applied a wide range of different modeling methods to assess the effects of local and regional emission abatement policy options on air quality and human health.

What approaches are currently used to design and assess regional/local air quality plans ? What are their strengths and weaknesses?

Which data, models, methodologies to design Air Quality Plans?
What are the future research needs to improve these approaches?

How to integrate data, models, methodologies in a tool?
Two urban test cases (Brussels and Porto).

First Objective

review

assessment capabilities and modelling tools used in the EU Member States to evaluate the effects of local and regional **air quality plans** regarding the **reduction of atmospheric pollutants and human health impacts**

Analysis of the limitations of the currently available assessment methods

Identification of key areas to be addressed by research and innovation

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How?

- synergies among national, regional and
approaches, including emission abate
- assessment capabilities to protect and efficiently reduce the impa on health (modelling approaches);
- source apportionment methodo
- essment approaches;
- uncertainty and robustness, including Quality Assurance / Quality Control (QA/Q

Topic 1

Topic 2

Topic 3

Topic 4

Topic 5

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How?

Database

- ***Stakeholders*** **(AQP), but also research activities (RP)**
- **63 contributions from 12 Member States**

Treatment and analysis of information

- Graphics automatically generated
- Bibliography review

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How?

database + our own review

Source apportionment

Synergies among emission reduction measures at different scales

Modelling approaches

Health effects air pollution

Uncertainty

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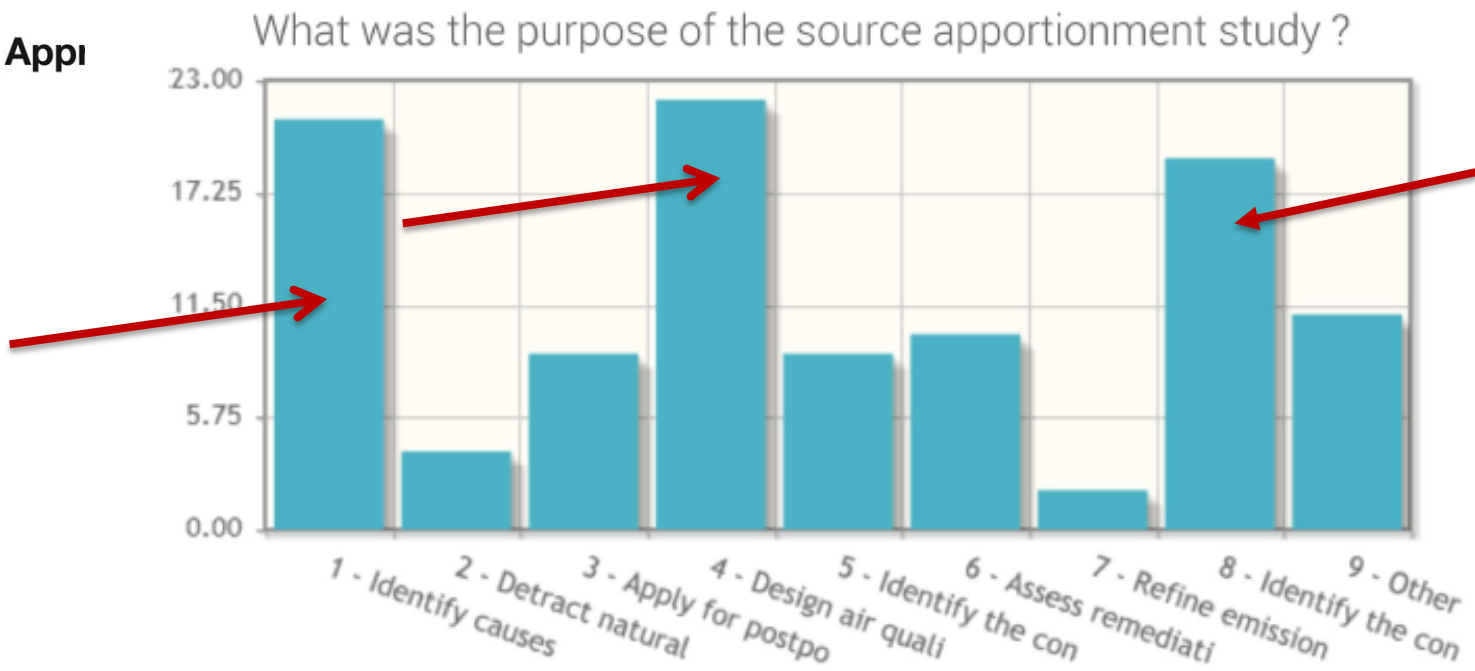
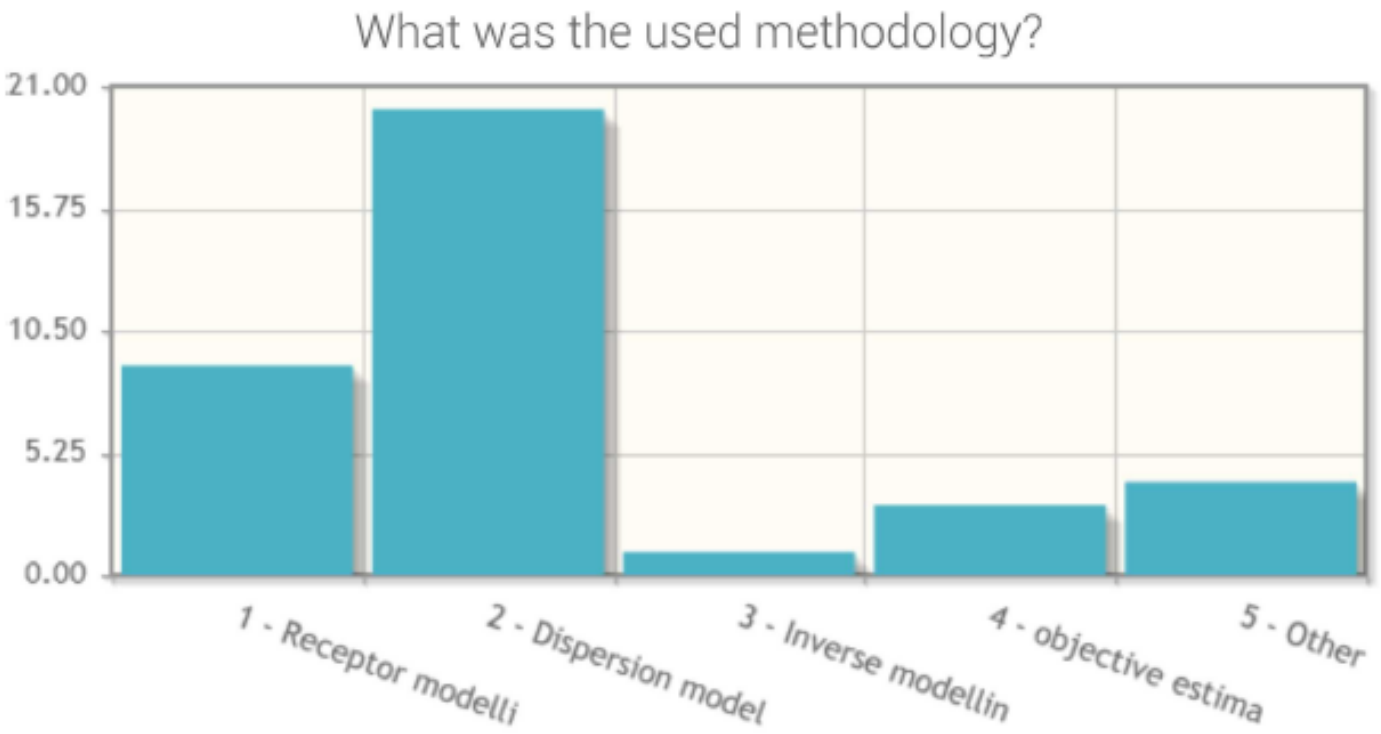


Legend

- 1 - Identify causes of exceedances
- 2 - Detract natural sources or road salting and sanding from PM (Dir. 2008/50/EC art. 21)
- 3 - Apply for postponement of attainment (Dir. 2008/50/EC art. 22)
- 4 - Design air quality plans/ action plans (Dir. 2008/50/EC arts. 23 and 24)
- 5 - Identify the contribution from different geographic areas within a country
- 6 - Assess remediation measures effectiveness
- 7 - Refine emission inventories
- 8 - Identify the contribution from other countries (transboundary pollution - Dir. 2008/50/EC art. 25
- 9 - Other

Info

- Total answers at this question: 107
- Total number of questionnaires: 49



Legend

- 1 - Receptor modelling
- 2 - Dispersion modelling
- 3 - Inverse modelling
- 4 - objective estimation techniques (e.g. statistical models, spatial interpolation of measured data, statistical relationship between emission density/traffic data/meteorology fields and air pollution levels etc.)
- 5 - Other

Info

- Total answers at this question: 37
- Total number of questionnaires: 49

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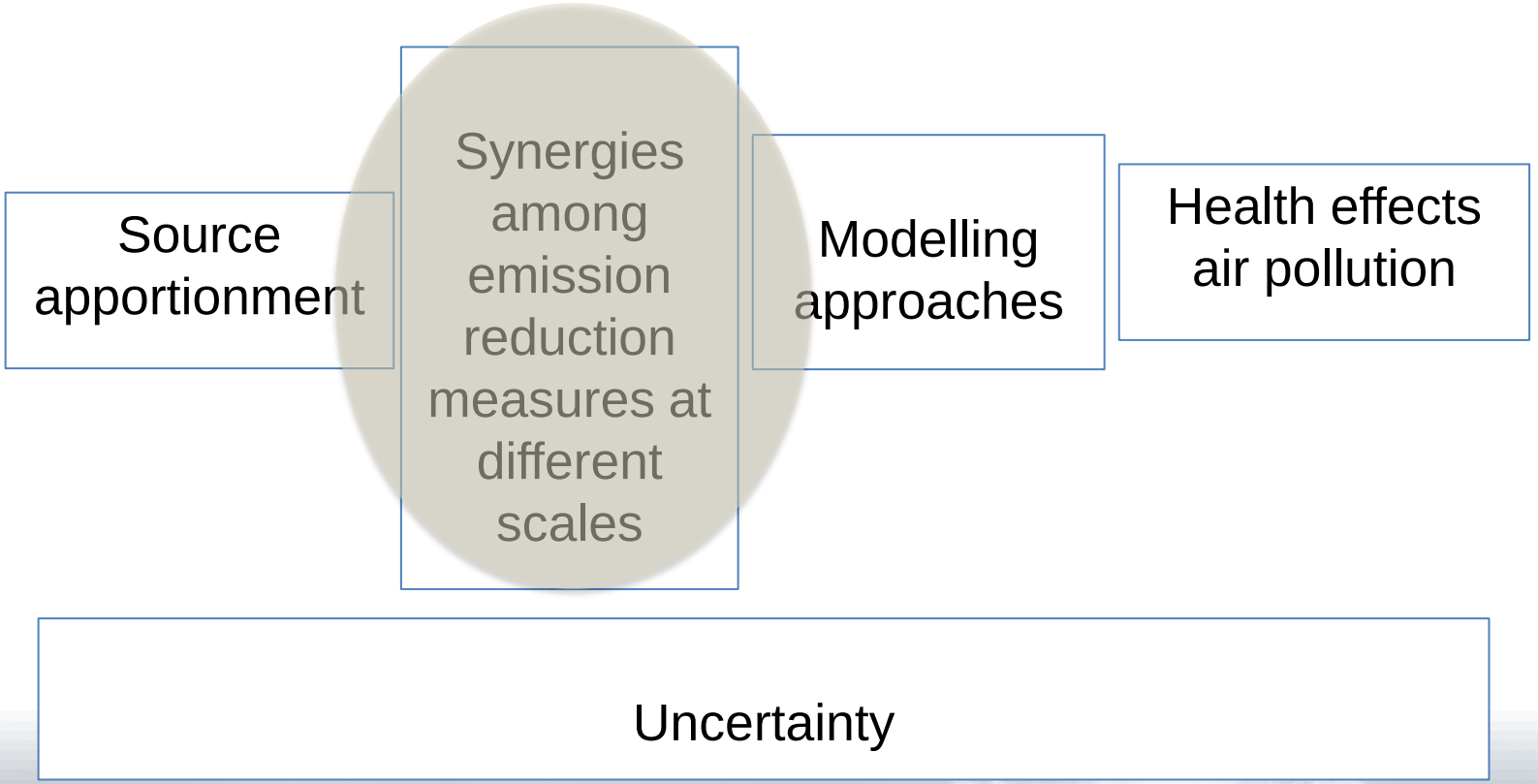
How?

database + our own review



Current practice: combined approach using both a bottom-up and a top-down methodology.

Urban, local and street level studies represent more th

Uncertainty

- anthropogenic stationary combustion installations (5% to 15%)
- mobile and small residential combustion sources
- biogenic and natural sources factor of 0.5 to 8)

The air quality
of potential pr
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+

251 answers

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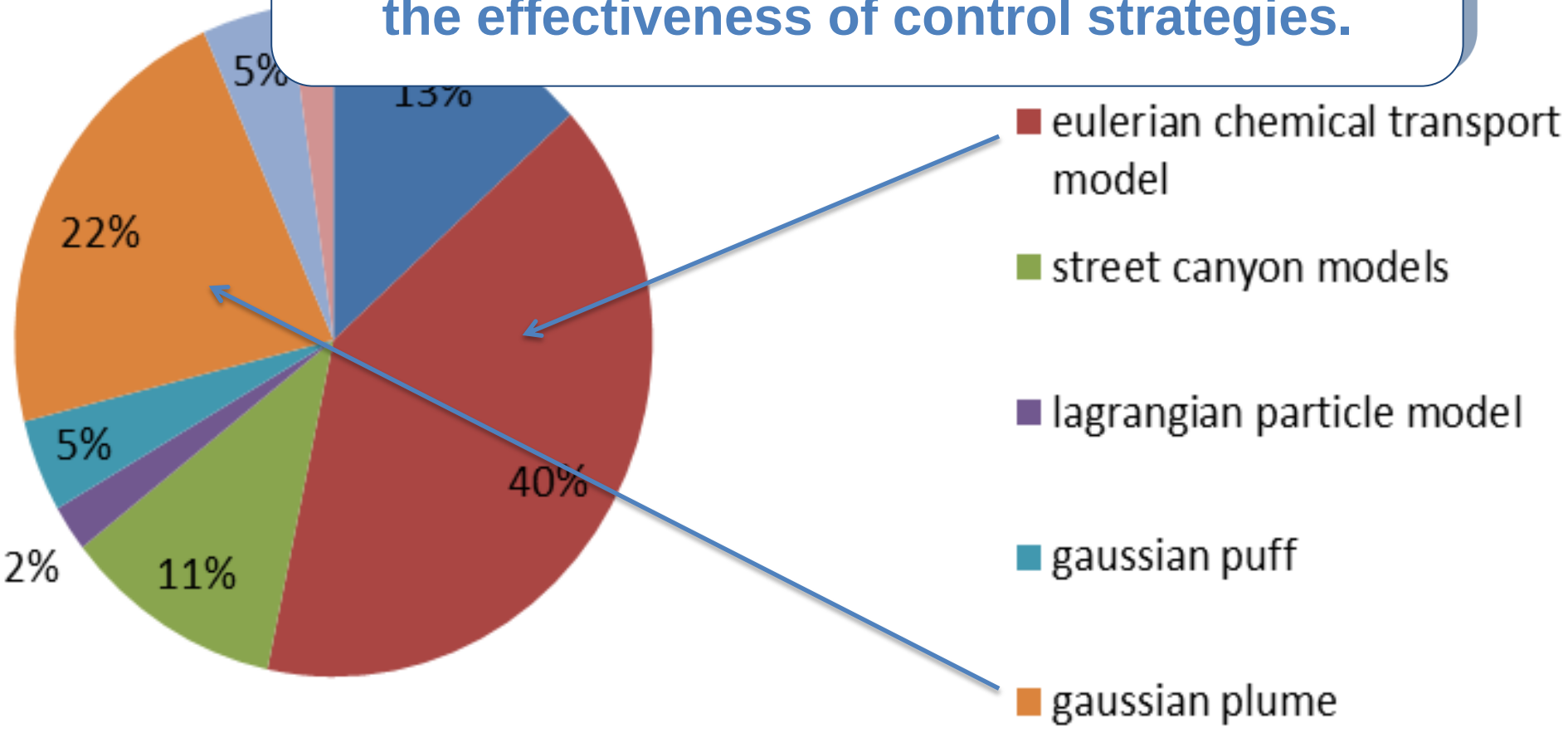
Air Quality modelling

AQP

Chemical transport (eulerian) and gaussian plume models are widely used for assessing the effectiveness of control strategies.



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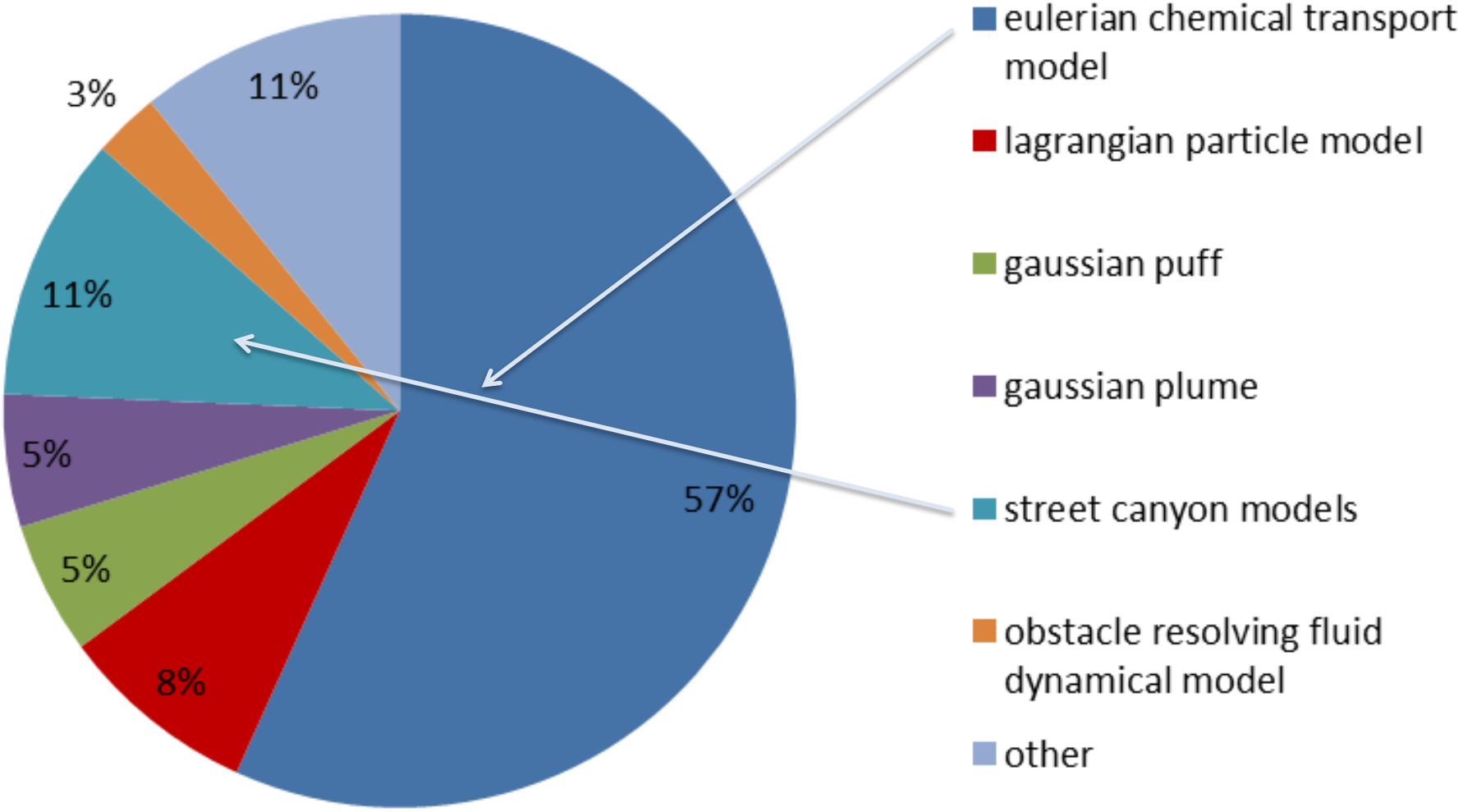
Air Quality modelling

RP



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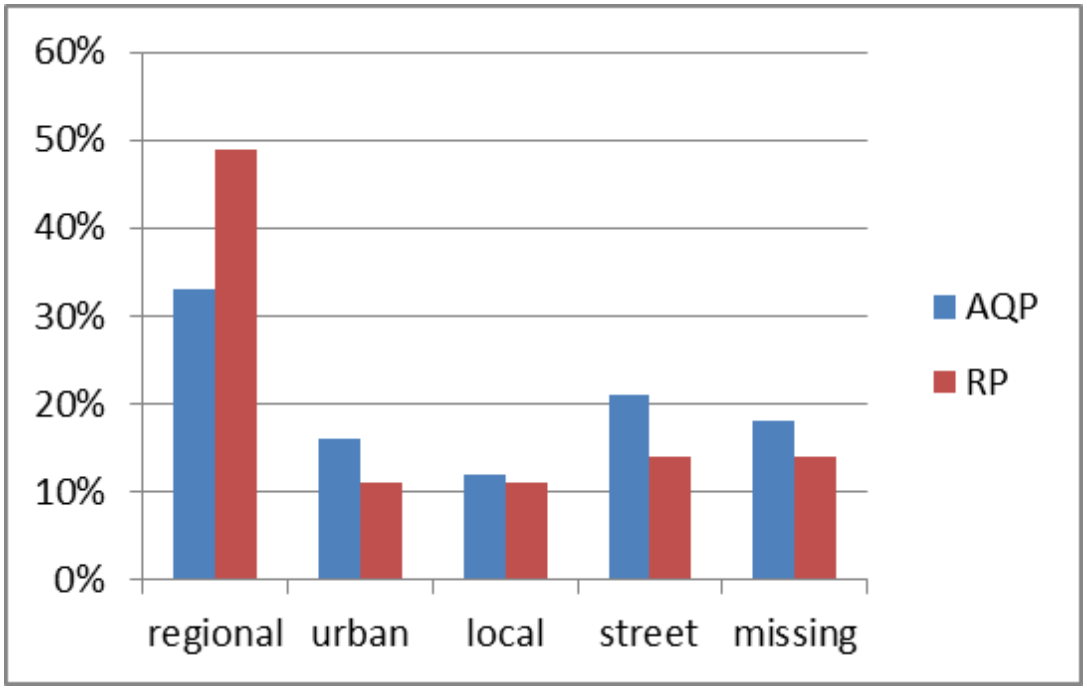
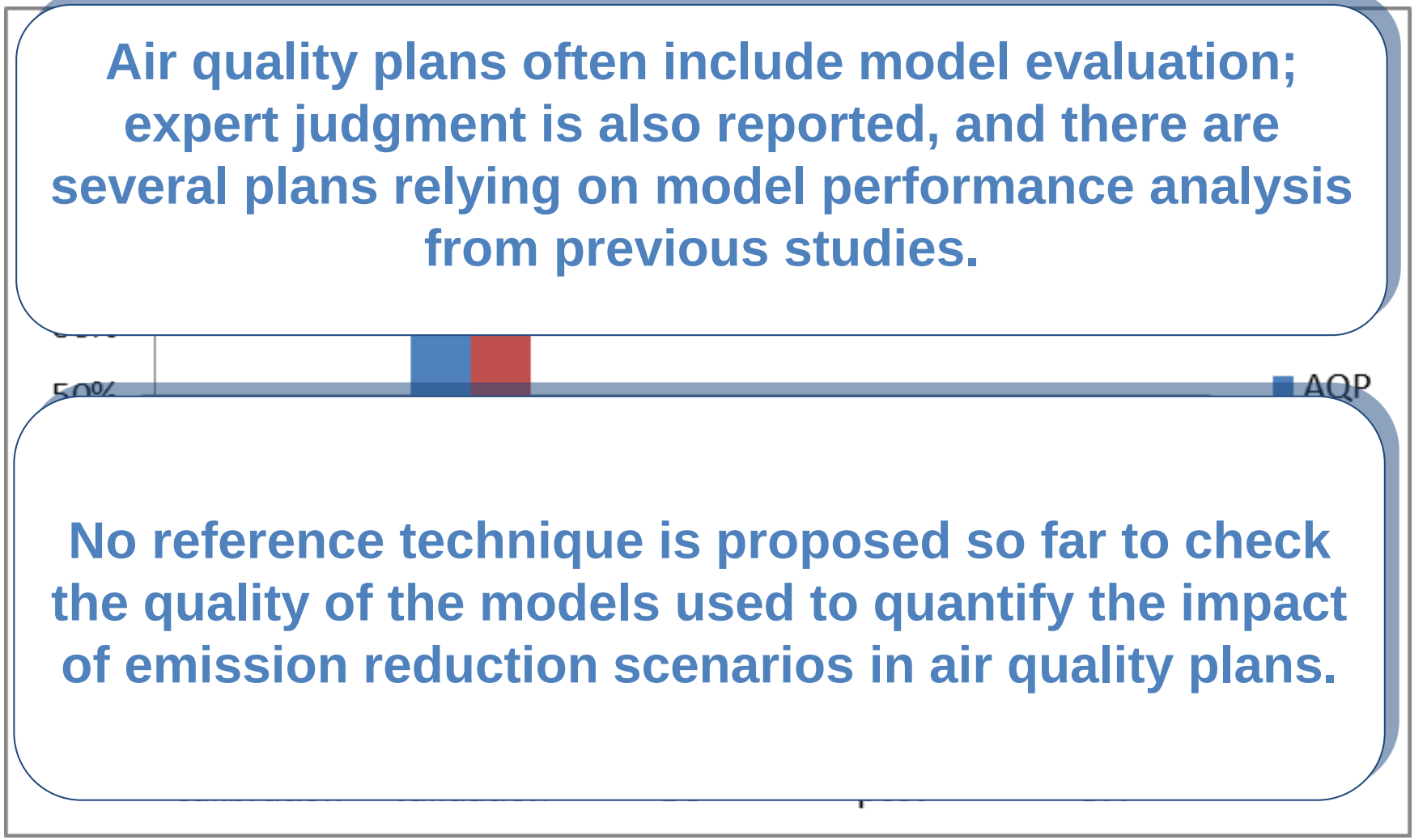
Air Quality modelling

Scales of the modelling?



Air Quality modelling (use of monitored data)

Air quality plans often include model evaluation; expert judgment is also reported, and there are several plans relying on model performance analysis from previous studies.



No reference technique is proposed so far to check the quality of the models used to quantify the impact of emission reduction scenarios in air quality plans.

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How?

database + our own review

Source apportionment

Synergies among emission reduction measures at different scales

Modelling approaches

Health effects air pollution

Uncertainty

Health assessment approaches

… indicators to express the change in population health due to exposure to air pollution:

- premature mortality (most used)
- morbidity
- life-expectancy
- disability-adjusted life years (more recently).

Air Quality Plans

It is not a current practice to integrate health effects

→ PM10, PM2.5, NOx, O_3

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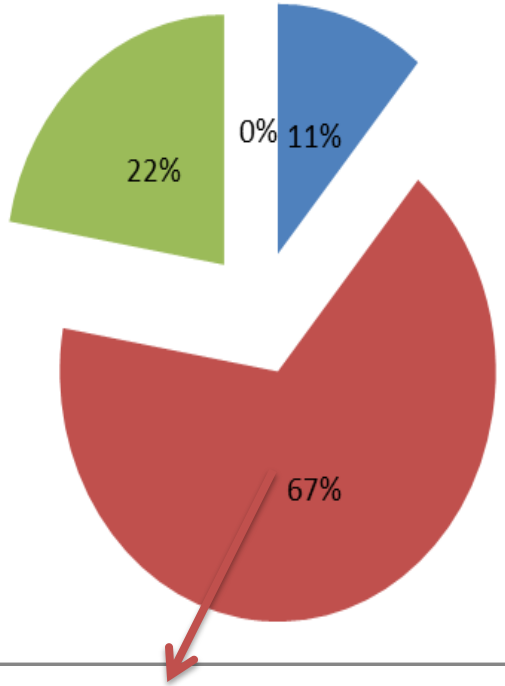
Health assessment approaches
exposure indicators based on...

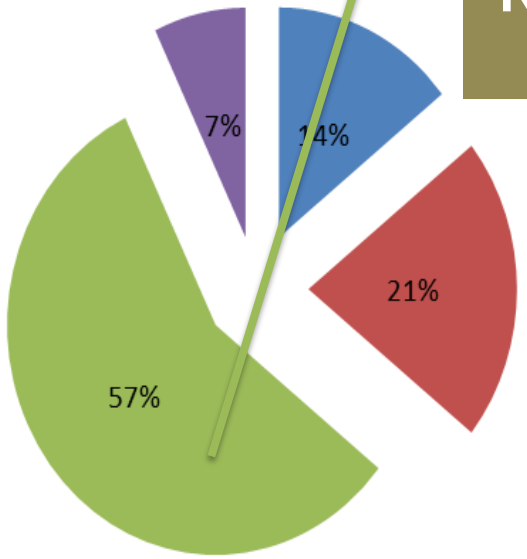
Air Quality Plans



Interpolated measured data

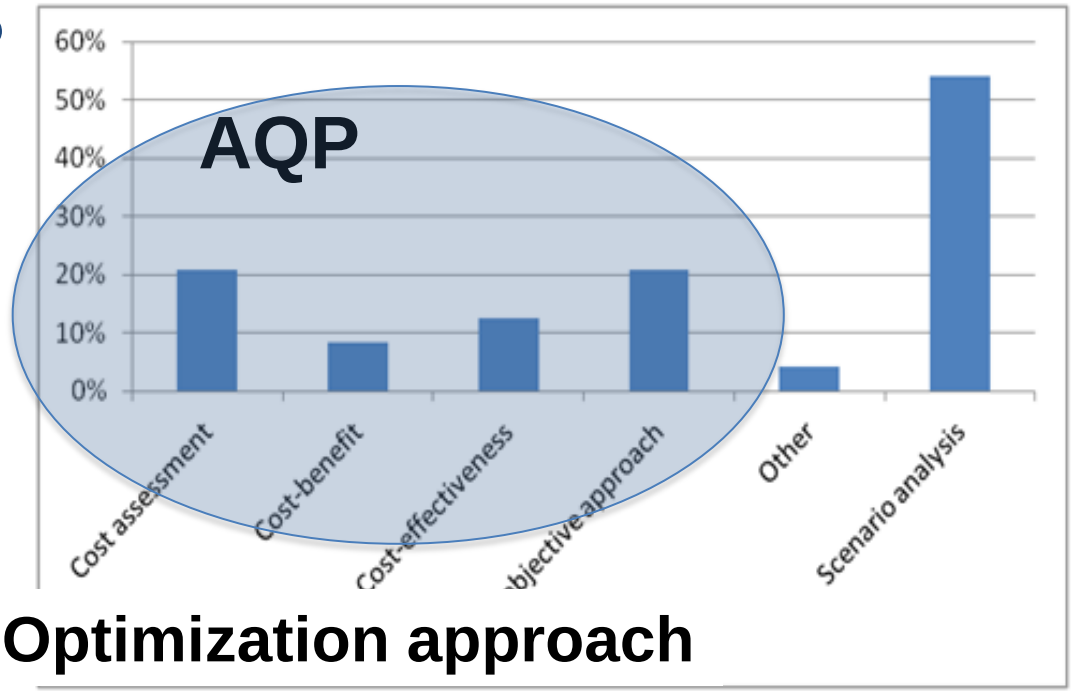
Air quality modelling results

Research Projects



16 answers

IA methodologies?



Optimization approach

Notwithstanding some already developed and applied local/urban scale integrated assessment optimization approaches (e.g RIAT+, LEAQ, UKIAM), the current practice within air quality plans developed by member states is mainly based on simpler approaches such as scenario analysis.

- reduce uncertainties in model input data, particularly emissions (urban inventories and new technologies)
- missing or accounting in an incomplete way the synergies among abatement measures at different scales
- best practices in air quality modelling (e.g. higher resolution, longer periods, peer-reviewed)
- SA receptor models require measurements time series and chemical characterization
- uncertainty on health exposure-response function, mix of pollutants

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Final comments

There is a link between the APPRAISAL project (particularly its review and database) and FAIRMODE activities and working groups.

Both aim to provide insights to the modelling community regarding the Air Quality Directive implementation.

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On line data base

Plase, participate filling in!!!

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Final/updated document at the end of APPRAISAL (june 2015)

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Thank you!!!