



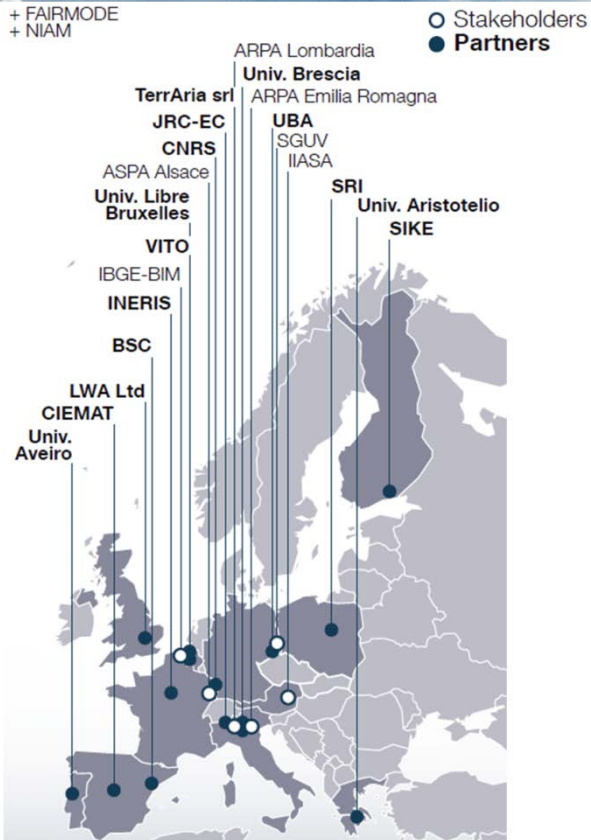
## Appraisal project

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

# Progress of the APPRAISAL project

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[www.appraisal-fp7.eu](http://www.appraisal-fp7.eu)





# APPRAISAL IN 3 STEPS

- 1. Analysis** Approaches currently used to design and assess regional/local air quality plans...strengths/weaknesses → DB
- 2. Design** Data, models, methodologies available to design Air Quality Plans...research needs to improve these approaches → IAM FRAMEWORK
- 3. Guidance** Integrate data, models, methodologies ? → GUIDANCE

**Communication to key stakeholders and to policy-makers**  
**Support the review of the EU Air Policy**



# Review/gaps in AQ/HIA approaches

WP LEADER: University of Aveiro

assessment capabilities

and modelling tools

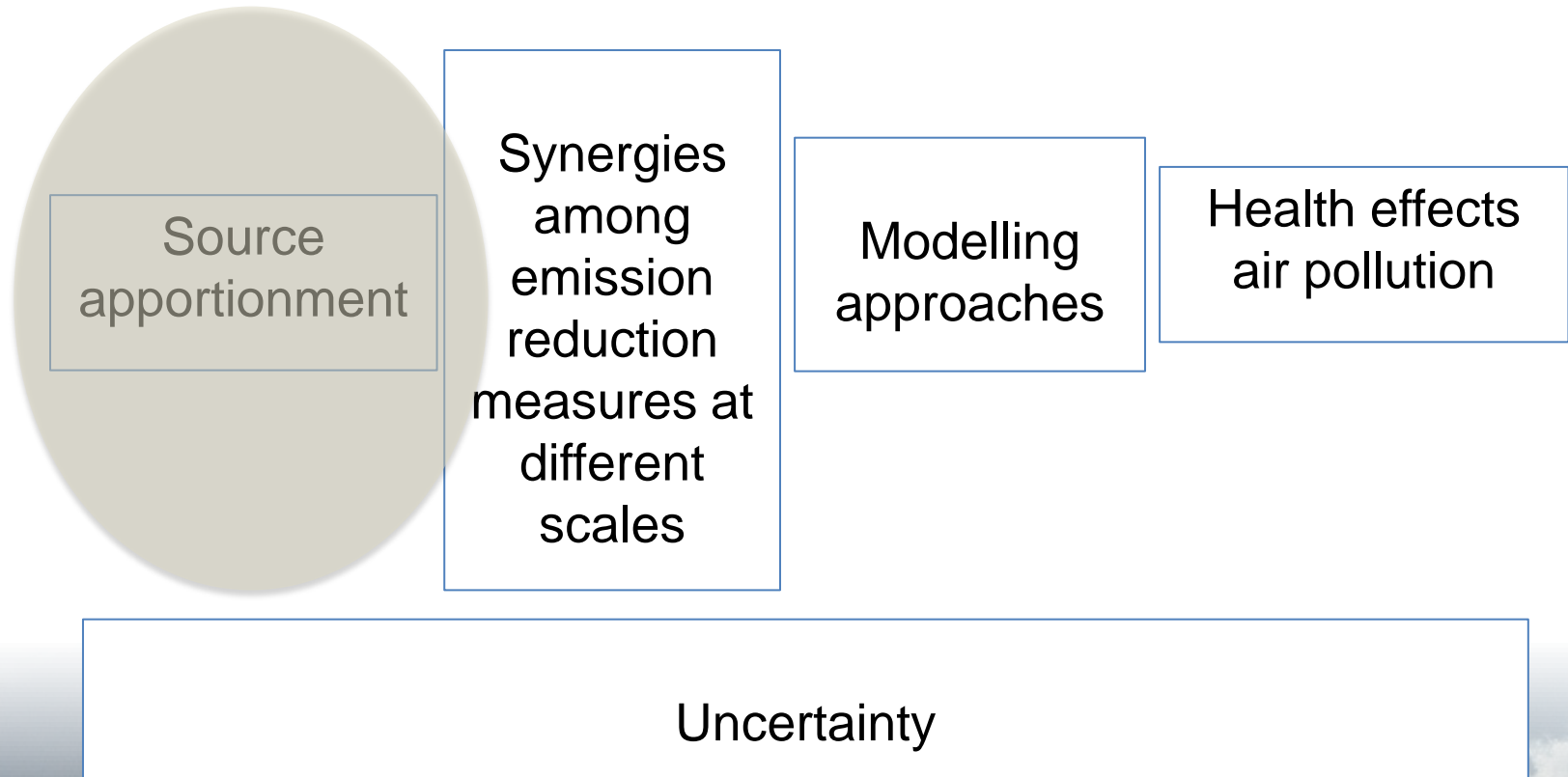
used in the EU Member States  
to evaluate the effects of local and  
regional air quality plans, through a DB

Analysis of the currently  
available assessment methods

Identification of **key areas**  
for improvements



## database (>50 quest.)





What was the purpose of the source apportionment study ?



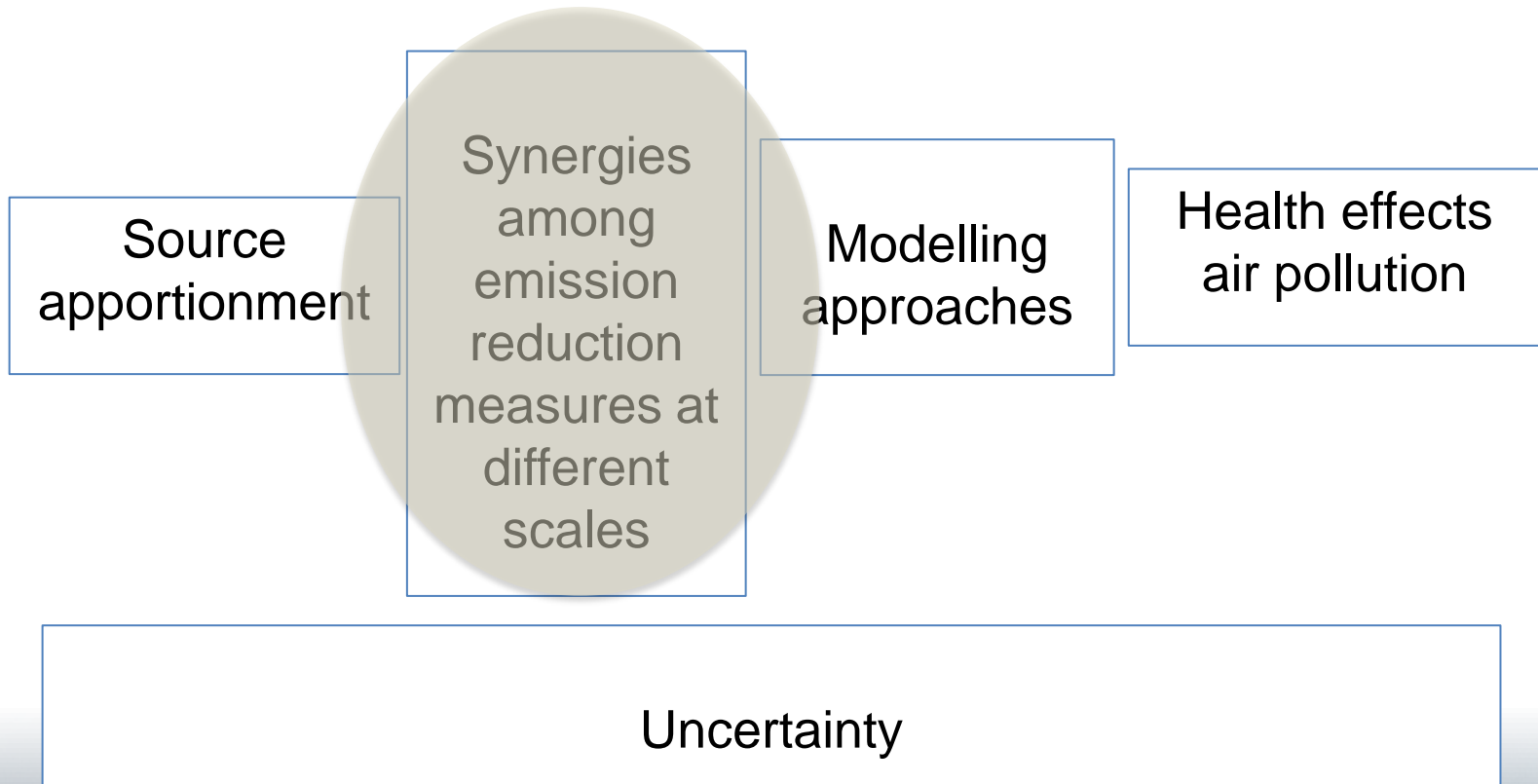
#### Legend

- 1 - Identify causes of exceedances
- 2 - Deduct 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 estimates

**Challenge: SA require time series of pollution measurements and chemical characterization**

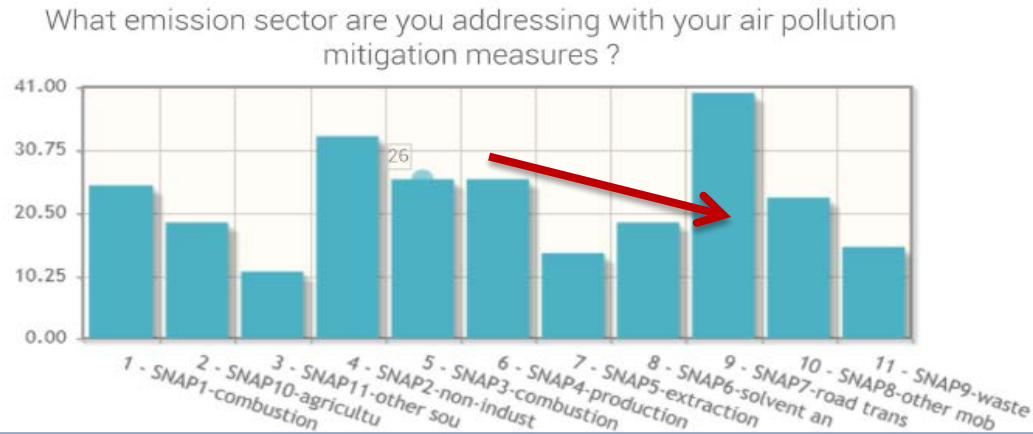
#### Info

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

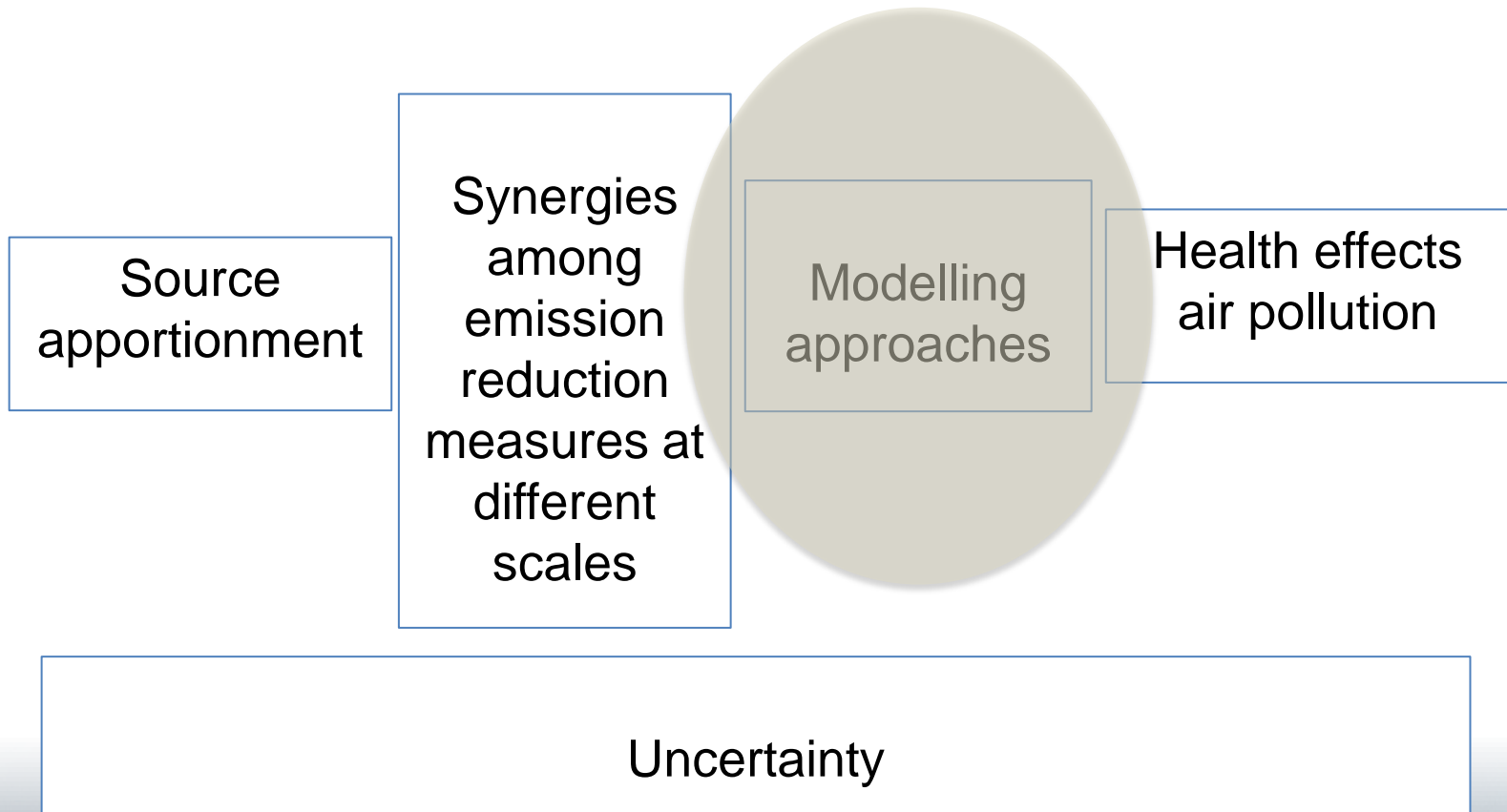




**Current practice: combined approach using both a bottom-up and a top-down methodology.**



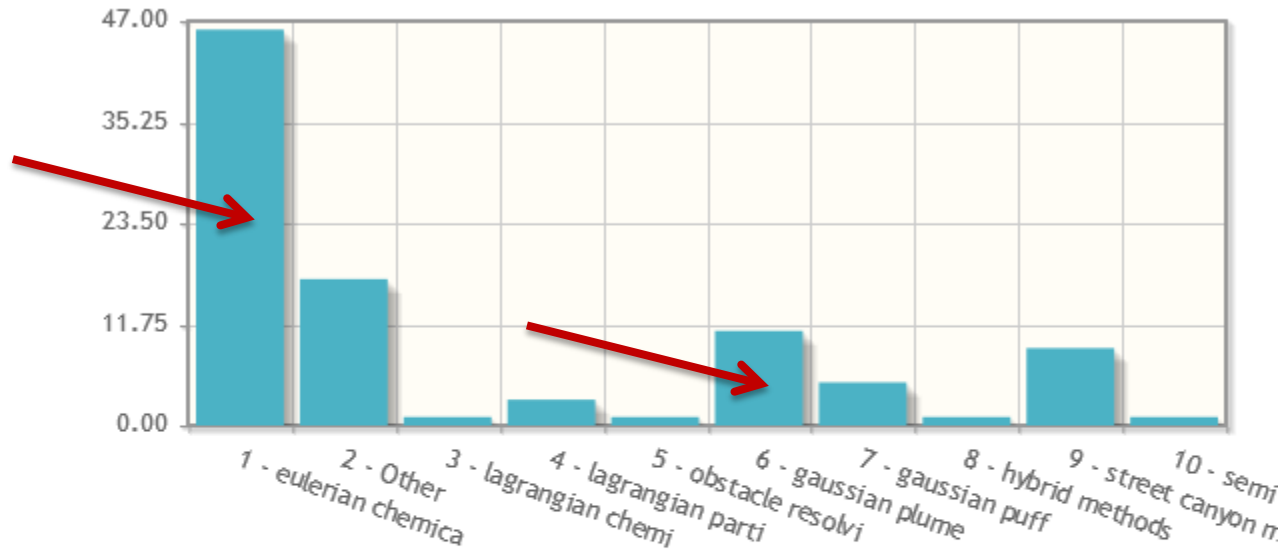
**Challenge: define the split between EU measures and regional/local ones**







Model classification

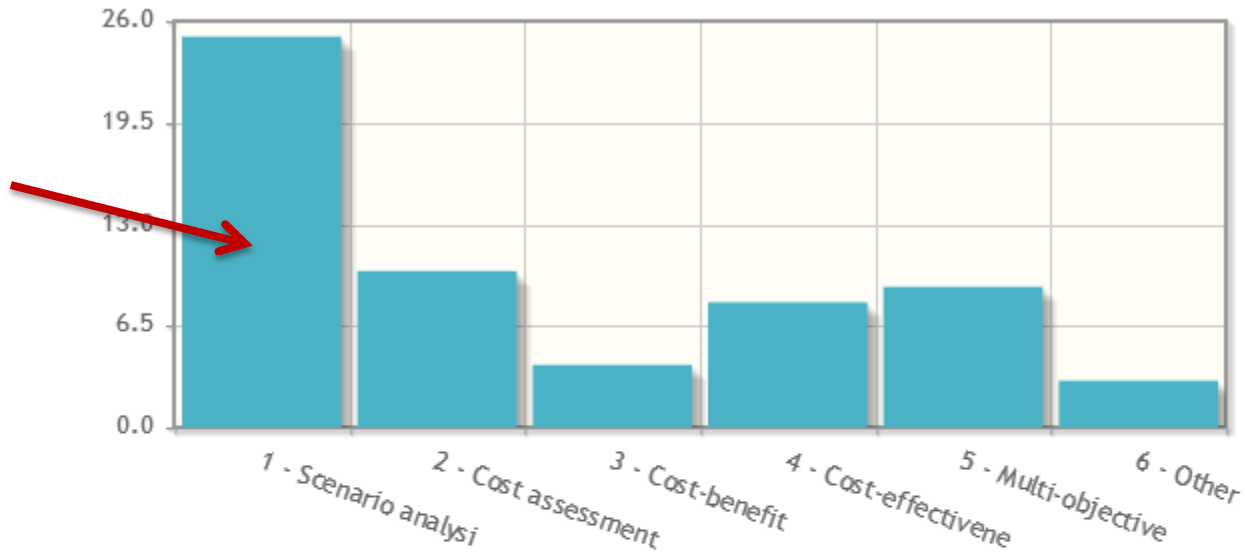


**Challenges: no reference technique exists to evaluate AQ models used for planning...also, in 40% of APPRAISAL reported studies, no measurement data were used (no validation)**

- 10 - semi-empirical models



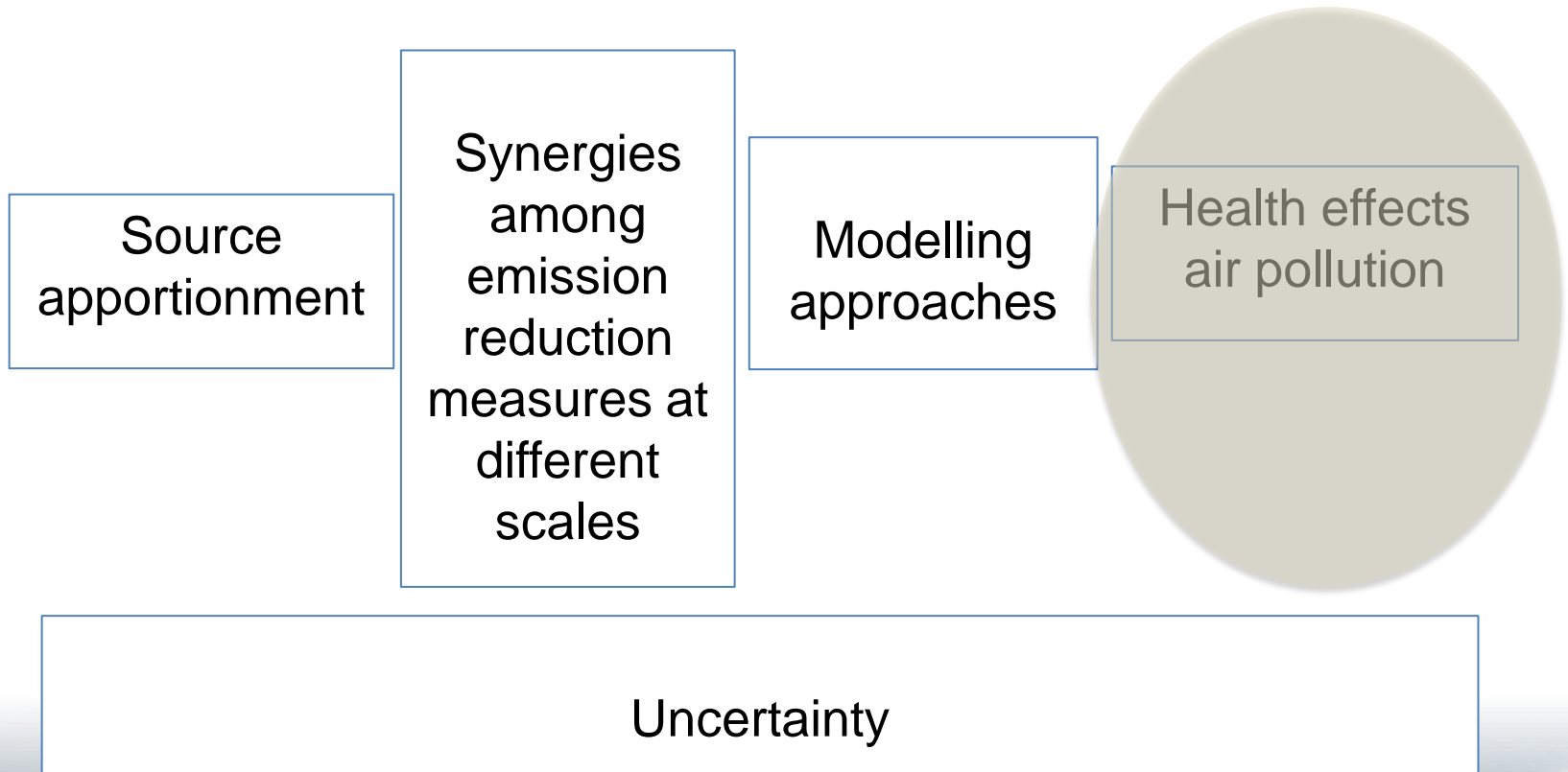
### IA methodology



#### Legend

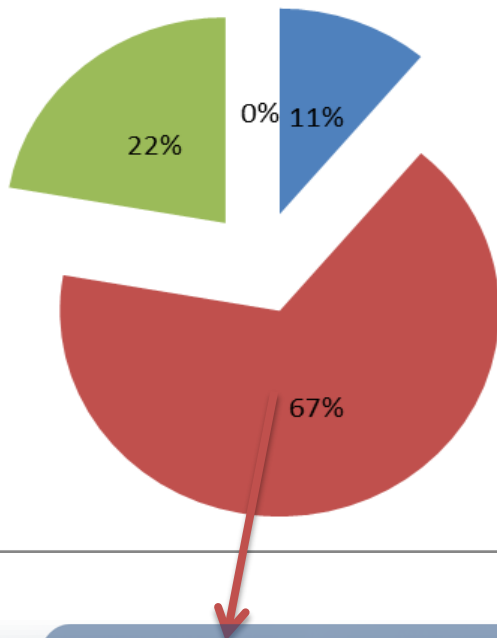
- 1 - Scenario analysis
- 2 - Cost assessment
- 3 - Cost-benefit
- 4 - Cost-effectiveness
- 5 - Multi-objective approach

**Challenge: mainly scenario analysis is used (usually, no optimization is performed)**



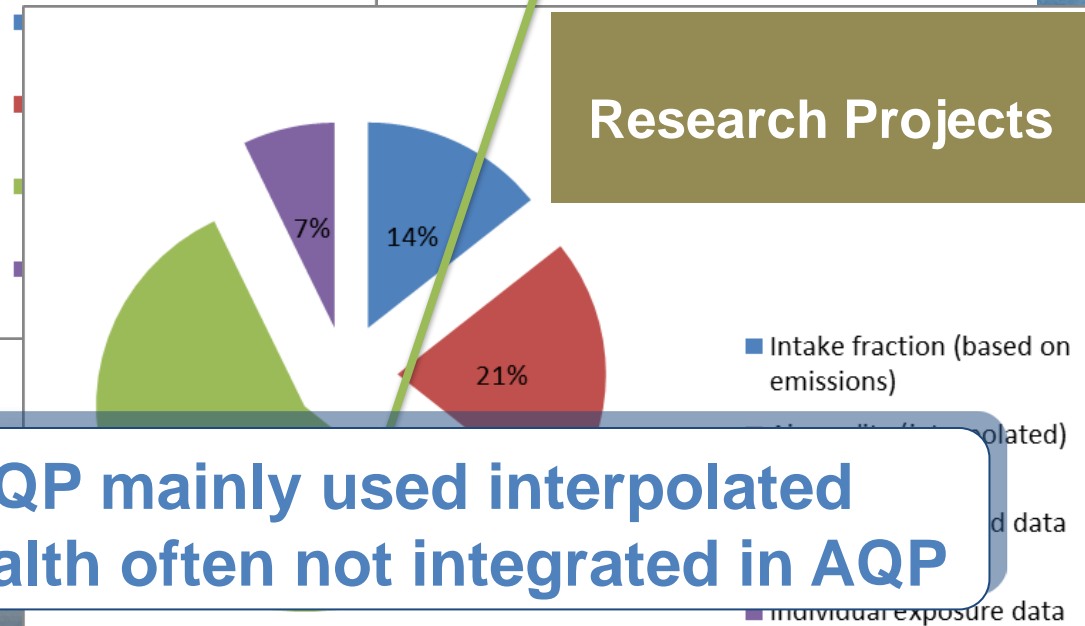
# Health assessment approaches exposure indicators based on...

## Air Quality Plans

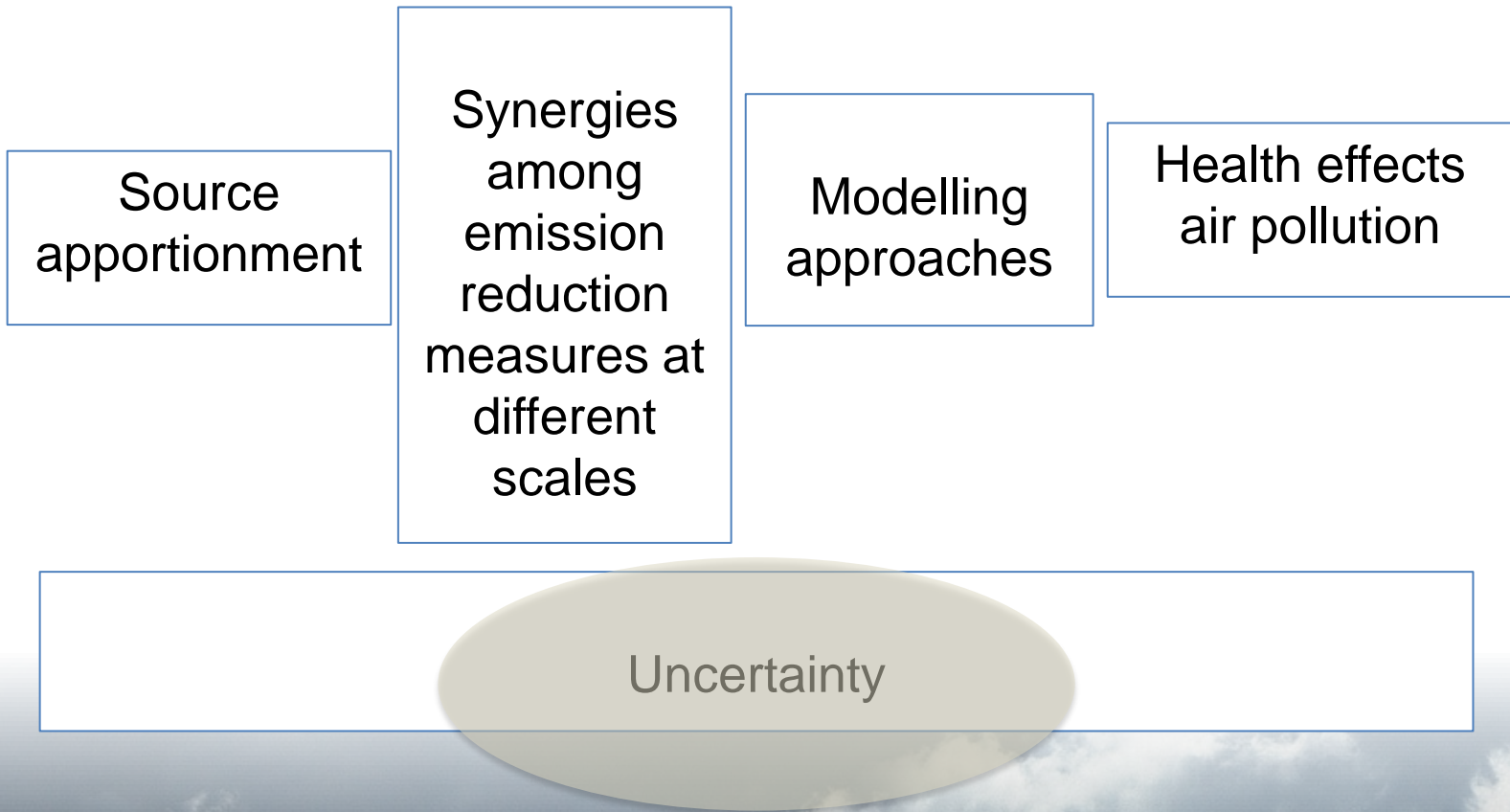


## Air quality modelling results

## Research Projects



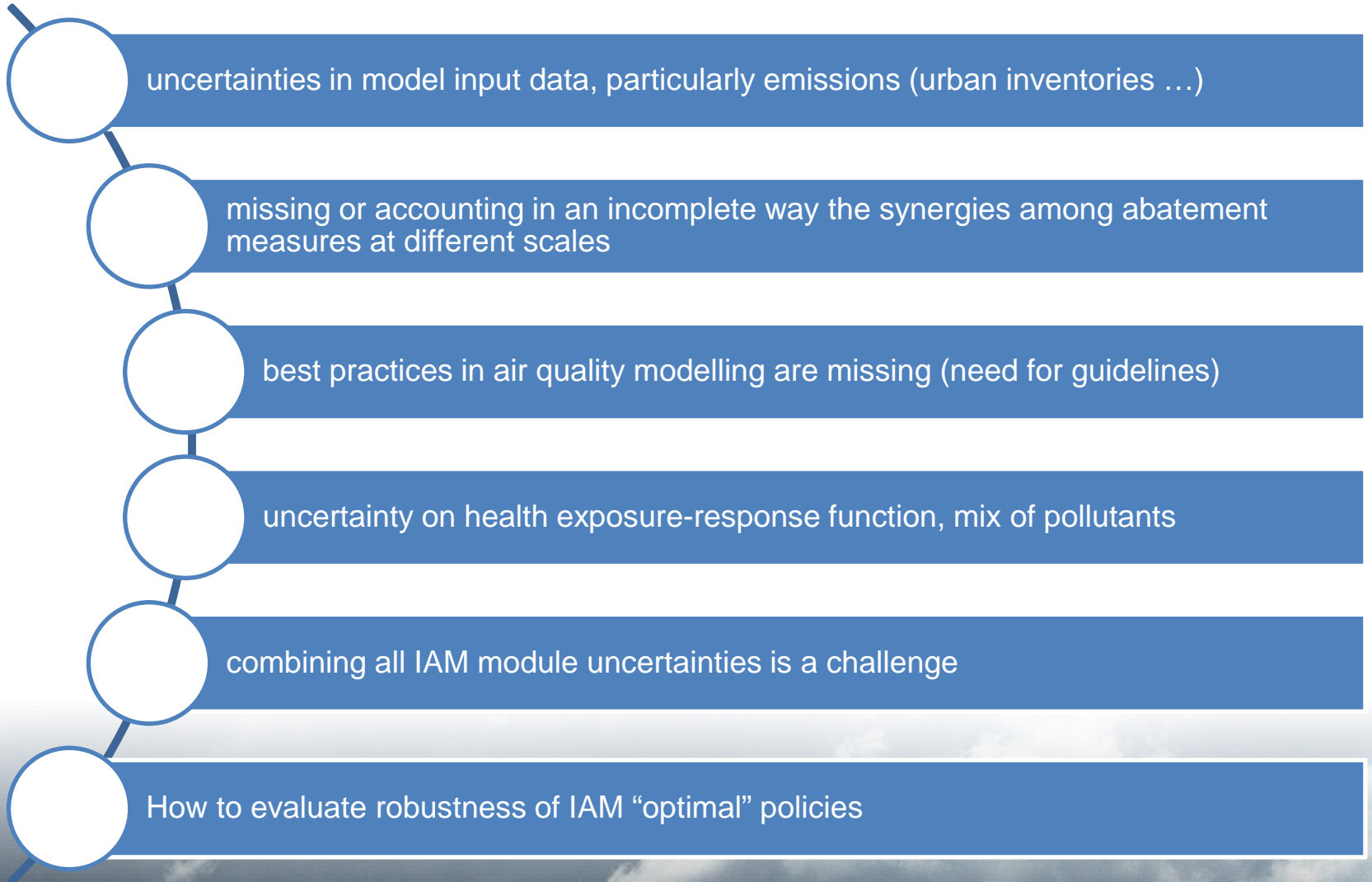
**Challenges: in AQP mainly used interpolated measured data...health often not integrated in AQP**





## Appraisal project

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# Design of a IAM framework, for regional/local scale

WP LEADER: University of Brescia

Using the DPSIR scheme to provide a framework for IAMs at regional/local scale

Structuring the DPSIR scheme for IAM

Classifying AQ plans through the DPSIR scheme (level of complexity for DPSIR implementation)

## DPSIR for AQ IAM



### **DRIVERS**

Changes in population, economy, traffic, urbanization, climate,...



### **PRESSURES**

Pollutant and precursors emissions (point, linear, areal sources)



### **STATE**

Air Quality (concentration, peaks, integral → indicator(s))



### **IMPACT**

Human and ecosystem health, implementation and external costs, effects on climate → indicator(s)



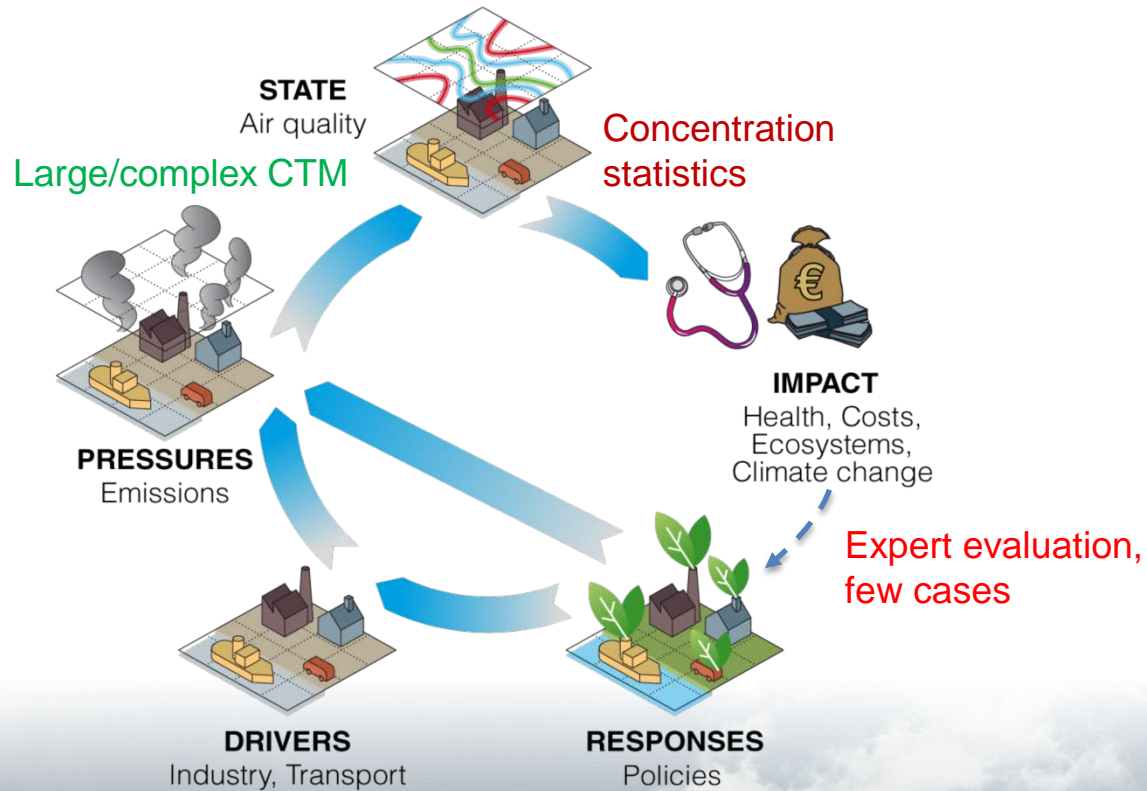
### **RESPONSE**

Decisions about pollution abatement, energy efficiency, land use,...

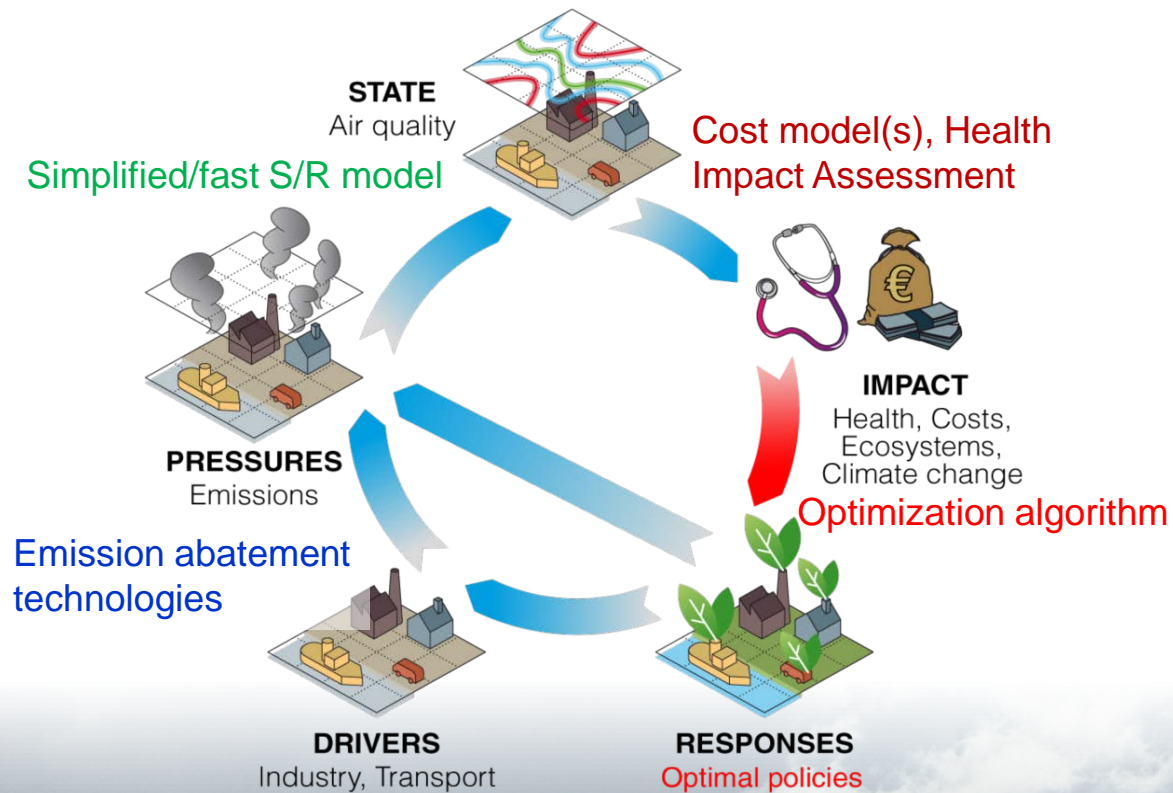




# TIER 1: scenario analysis



# TIER 2: optimization approach





# Level of complexity of IAM blocks

**Each block can be considered with different levels of detail**

**Example for PRESSURES (from EMEP/EEA air pollutant emission inventory guidebook 2013 )**

**This concept is then extended to all the DPSIR blocks (see next slide)**

**LEVEL 1** : Emissions are estimated for **rough sectors on a coarse grid**, using per default the top-down methodology.

**LEVEL 2** : A combination of **bottom-up and top-down methodology** is ...

**LEVEL 3**: Emissions are calculated with the **finest space and time resolution available** (bottom-up) ...



DPSIR blocks	Levels of complexity		
	Low	Medium	High
<b>Activities and Emissions (Drivers and Pressure)</b>	Top-down information in a limited number of sectors and at a coarse resolution, uncertainty not considered	Combines top-down with bottom-up, uncertainty not considered	Bottom-up information at the highest possible resolution, uncertainties quantitatively calculated
<b>Air Quality (State)</b>	Measurements combined with SA techniques, to link emissions to air quality indicators.	A single air quality model adapted to the studied spatial scale. Validation with observations required	A chain of nested models adapted to the different scales. Validation with observations required
<b>Health assessment (Impacts)</b>	A simple description of exposure from measurements or models, and a simple description of population	A more detailed description of the air quality indicators distribution combined with a simple population description	Detailed temporal and spatial resolution for the air quality indicators distribution and detailed population data
	Different sources of uncertainty should be mentioned together with results		
<b>Abatement measures (Responses)</b>	A selection approach based on expert elicitation is used	Expert based selection is complemented with source apportionment	The selection of measures is based on an optimisation procedure
	Uncertainty can be tackled by focusing on no-regret measures		



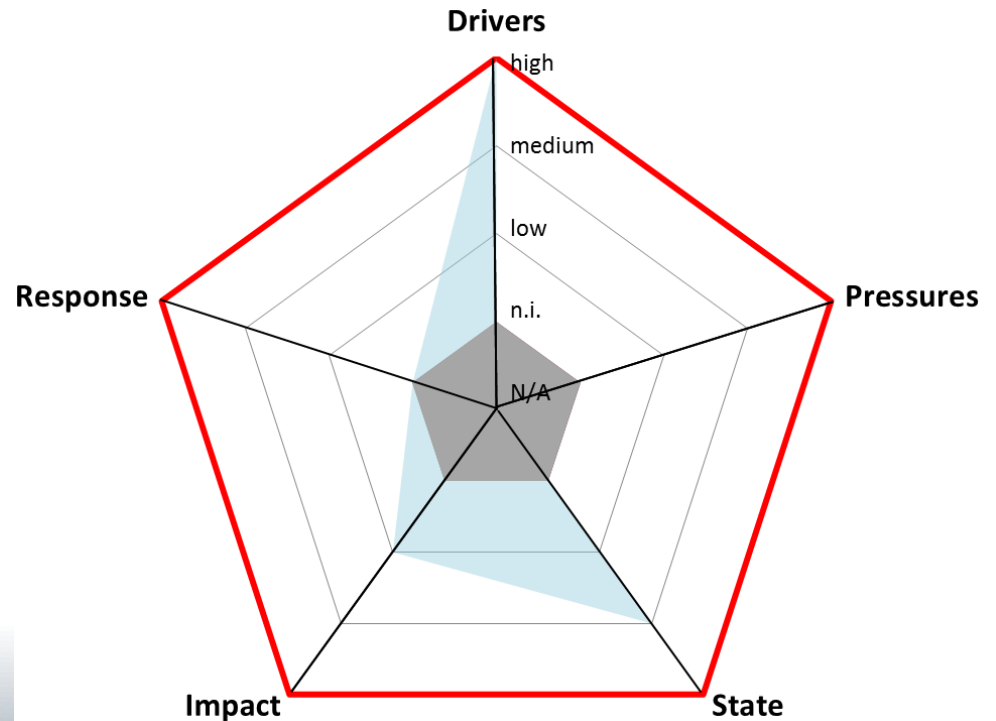
# A classification proposal

Certainly a simplification, but...

we can classify all the plans and studies in the DB according to the (perceived) level of detail used to study each block.

A radar graph may help understanding how deeply the plan/study considers each block.

*NOTE THAT: more detail does not necessarily mean “better” results.*





## Conclusions

At this stage first results on:

1. Review of existing AQ and RP
2. Design of IAM framework

Now working to update/finalize 1. and 2., and to prepare:

3. Guidance on IAM
4. IAM application to Porto and Brussels

Join APPRAISAL as stakeholder

Fill in the questionnaire, at:

<http://servizi.appraisal-fp7.eu/appraisal/>