Appraisal project

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

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APPRAISAL: IAM scheme and guidance

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DEIB – Politecnico di Milano

Brussels, APPRAISAL Final Conference, 11 May 2015

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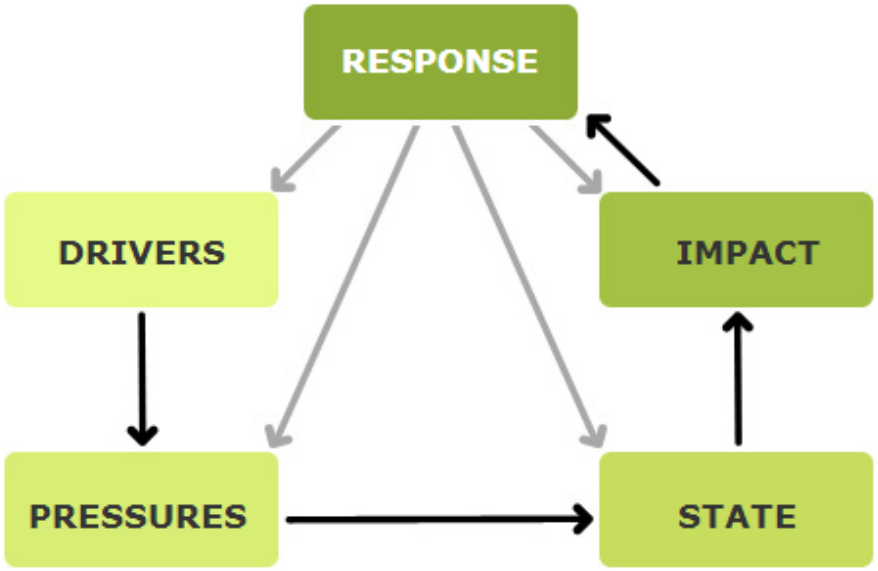
The DPSIR framework used by the EEA

Within the DPSIR framework used by the EEA, it is useful to focus on the links.

Release date 27/07/2007

Contributor Gabriel Agu

more information



DRIVERS
Population, economy, traffic, urbanization, climate,…

PRESSURES
Pollutant and precursors emissions

STATE
Air Quality

IMPACT
Human and ecosystem health, costs, effects on climate

RESPONSE
Decisions about pollution abatement, energy efficiency, land use,…

1 DPSIR blocks	2 LEVEL OF COMPLEXITY		
	Low	Medium	High
Activities that produce emissions (Drivers)	Top-down information in a limited number of sectors and at a coarse resolution. Detailed projections are not possible. Uncertainty is not considered	Combines top-down with bottom-up approach, preferably with local activity and emission factor information. Uncertainty is not considered	Bottom-up information at the highest possible resolution. The uncertainties for the emissions can be quantitatively calculated preferably using the Monte Carlo methods.
Emissions (Pressure)			
Air Quality (State)	Based on measurements combined with a source apportionment technique to li emissions to air quality indicators. Validation of the source apportionment model through model intercomparison is recommended.		
Health assessment (Impacts)	A simple description of exposure from measurements or AQ modelling simulations and a simple description of the spatial distribution and composition of the population.	A more detailed description of the air quality indicators distribution is combined with a simple population description.	Detailed temporal and spatial resolution for the air quality indicators distribution and population data, with the distinction of subgroups with different vulnerability.
	Different sources of uncertainty should be mentioned together with results		
Abatement measures (Responses)	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 single air quality m adapted to the studie spatial scale…

A chain of nested models adapted to the different scales…

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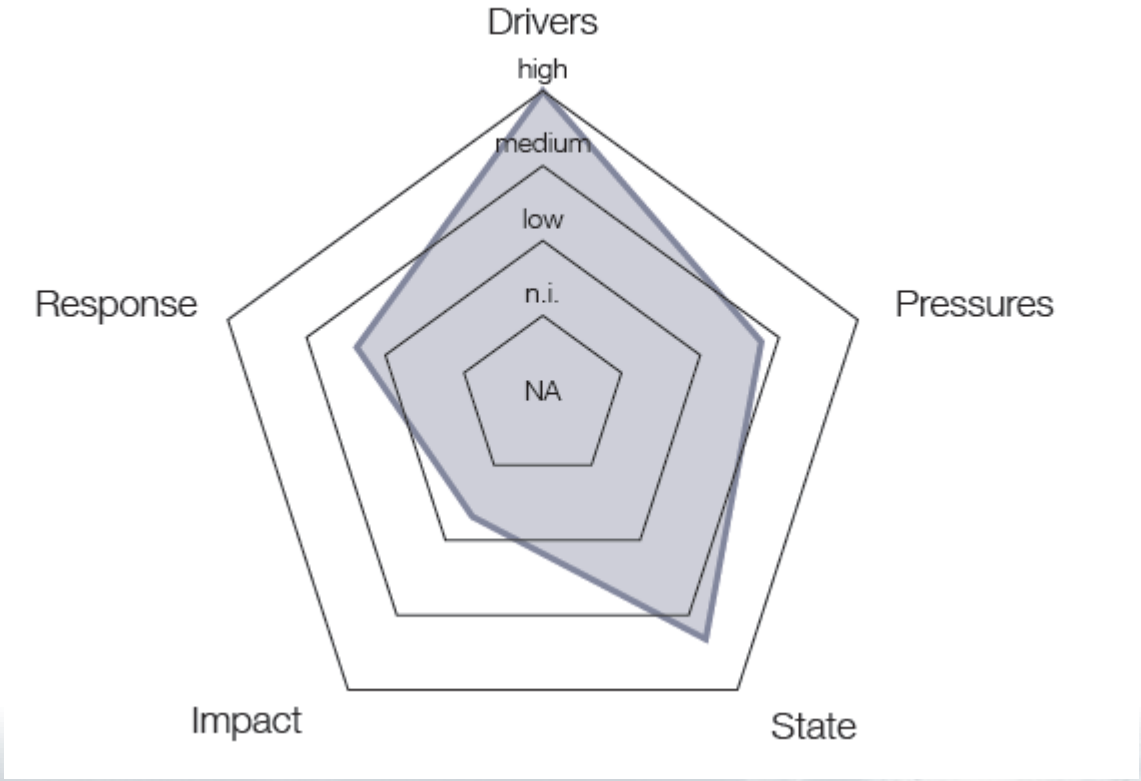
DB Plans/Projects taxonomy



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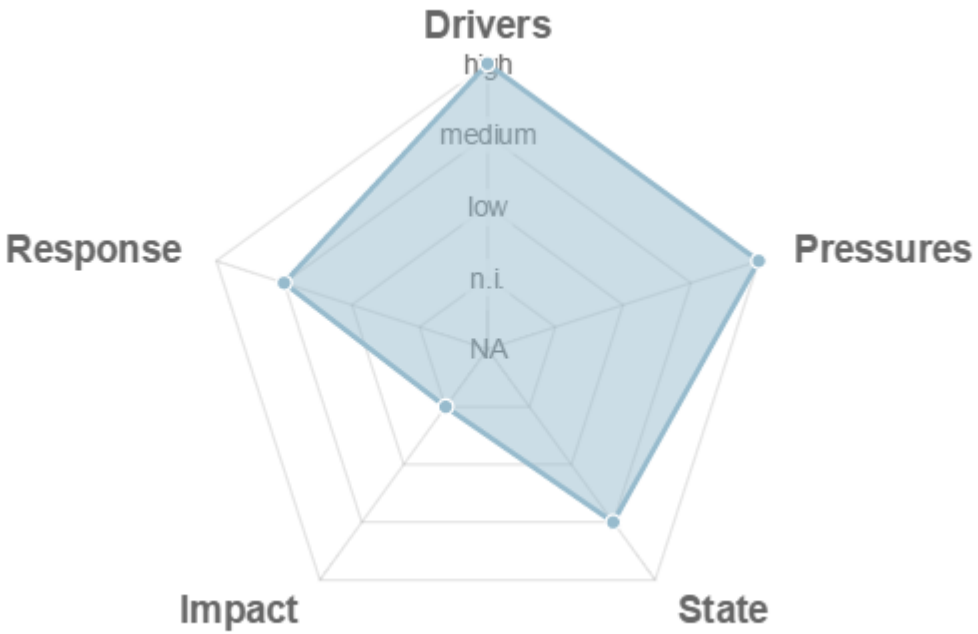
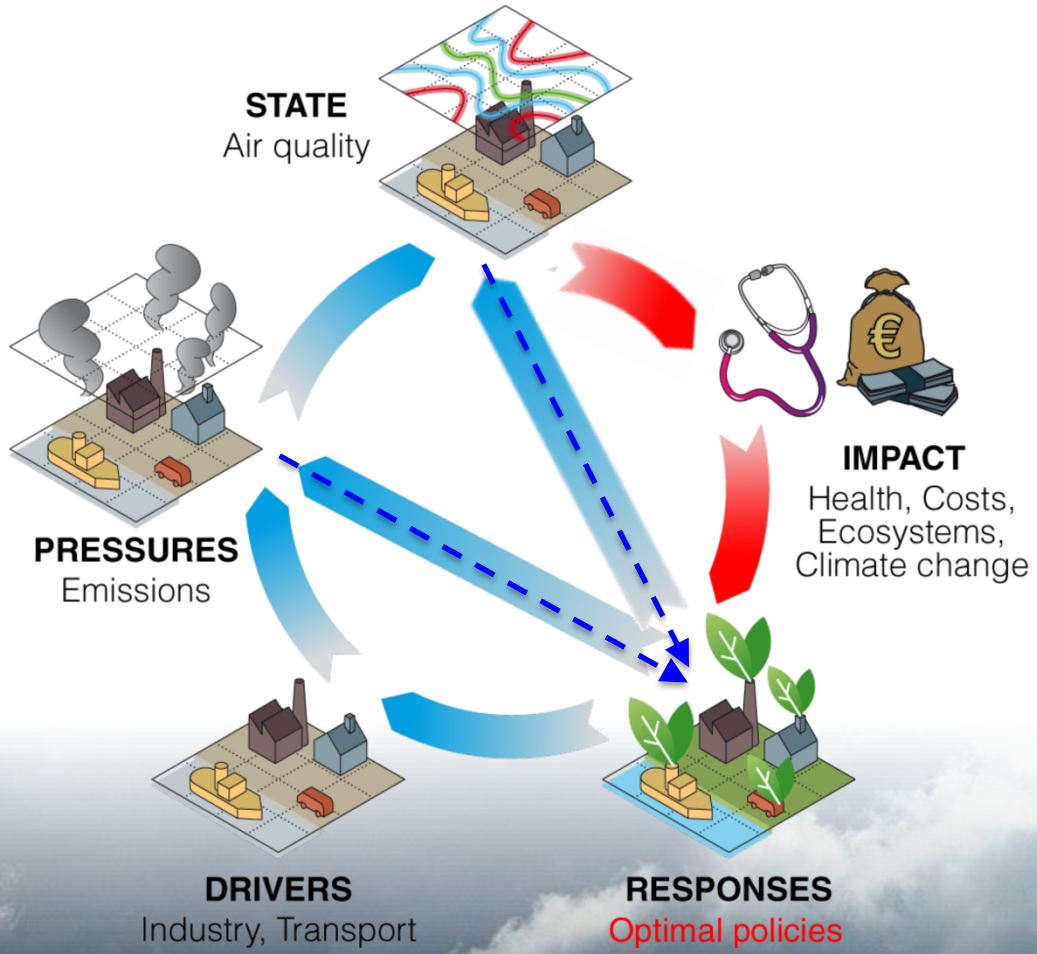
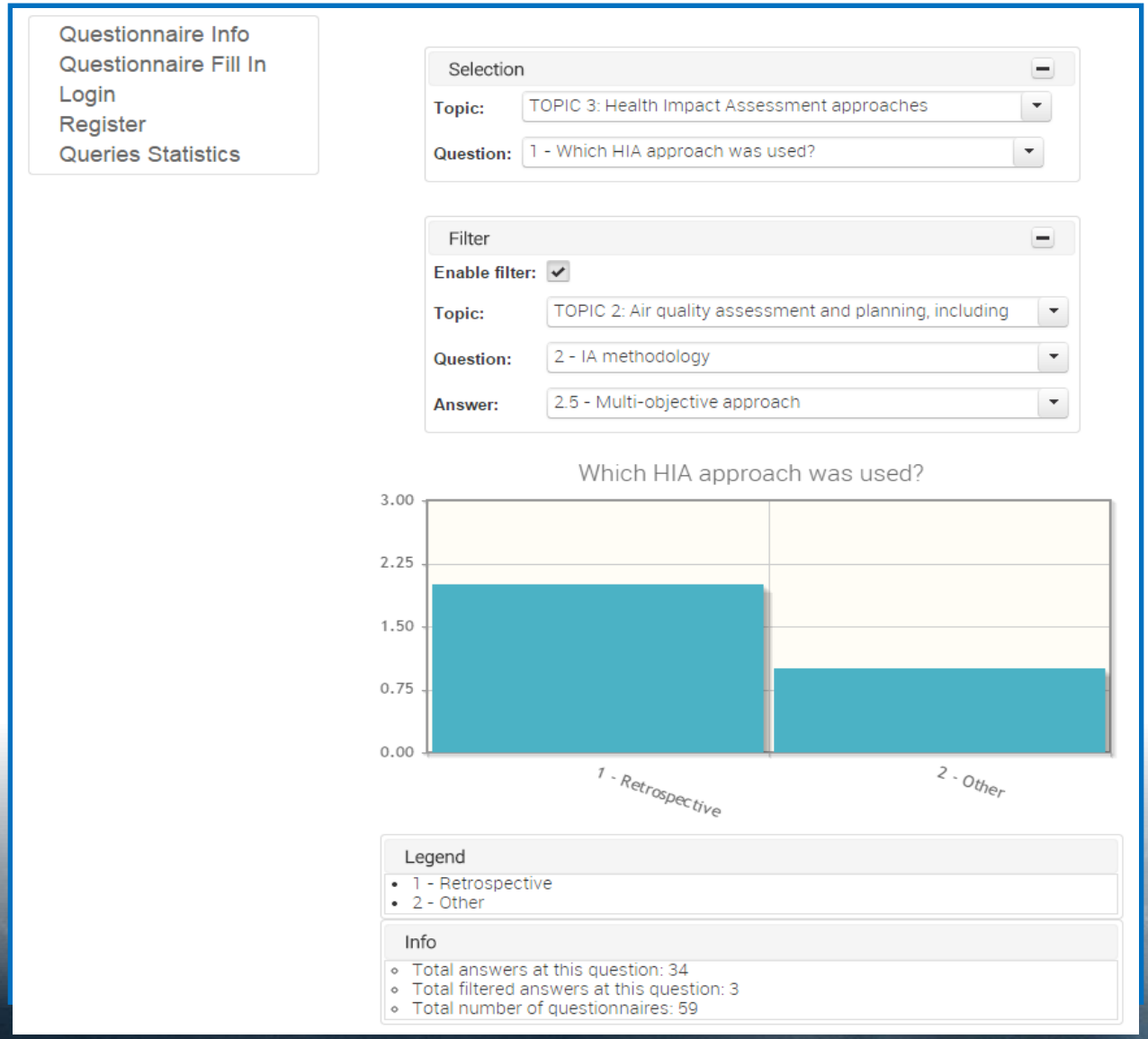
Plans taxonomy (actual plan in Germany)




STATE
Air quality
IMPACT
Health, Costs,
Ecosystems,
Climate change
PRESSURES
Emissions
DRIVERS
Industry, Transport
RESPONSES
Optimal policies


Questionnaire Info
Questionnaire Fill In
Login
Register
Queries Statistics
Selection
Topic: TOPIC 3: Health Impact Assessment approaches
Question: 1 - Which HIA approach was used?
Filter
Enable filter:
Topic: TOPIC 2: Air quality assessment and planning, including
Question: 2 - IA methodology
Answer: 2.5 - Multi-objective approach
Which HIA approach was used?
3.00
2.25
1.50
0.75
0.00
1 - Retrospective
2 - Other
Legend
1 - Retrospective
2 - Other
Info
Total answers at this question: 34
Total filtered answers at this question: 3
Total number of questionnaires: 59

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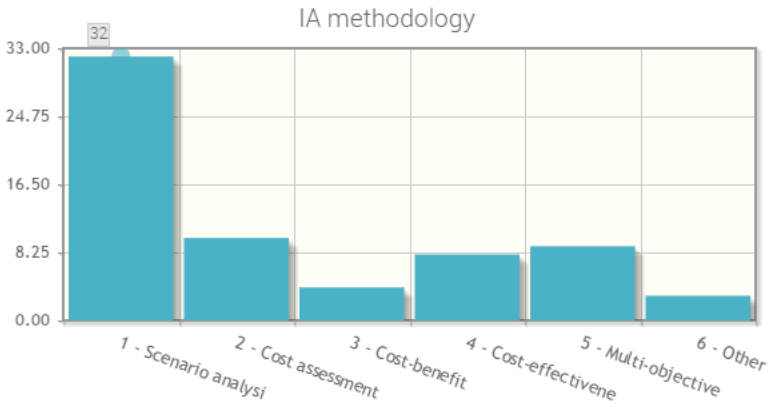
- Questionnaire Info
- Questionnaire Fill In
- Login
- Register
- Queries Statistics

Selection

Topic: TOPIC 2: Air quality assessment and planning, including

Question: 2 - IA methodology

Filter



Legend

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

Info

- Total answers at this question: 66
- Total number of questionnaires: 59

Guidance on IAM

- Presents a comprehensive set of topics that should be addressed to develop an IAM study, together with the main approaches that can be used.
- The emphasis is mainly on the overall picture and the links between DPSIR building blocks.
- It does not represent detailed technical instructions on how to set up an IAM and even less the user's manual of a specific tool.

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Guidance on IAM/2

STATE: Pollution concentrations

- How to **determine the concentrations** for describing the state?
- How to choose an AQ **model** for determining the state?
- How can **Source-Receptor** models be used?
- How to use **observational data with model** results?
- What would be an appropriate **period**?
- How to

  - ***Operational model evaluation*** *involves comparison of model results with routine monitored data …*
  - ***Diagnostic model evaluation*** *is a process-oriented analysis to determine whether the individual physical and chemical processes are correctly represented …*
  - ***Dynamic model evaluation*** *is the analysis of model responses to changes in model input data…*
  - ***Probabilistic model evaluation*** *is performed on the basis of methods such as model inter-comparison and ensemble modelling, and attempts to capture statistical properties,…*

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Guidance on IAM/3
IMPACTS: Health

- Why do we consider **health impact** in an IAM?
- What levels of **complexity** can be achieved in health impact assessment?
- Is there a preferred **indicator** to be used to quantify health impact?
- Are ther
  health e
- What ar
- What ar
- What **u**
  health i

- *Indicators often used are number of **premature deaths, YOLLs, DALYs**, number of hospital visits and life expectancy changes.*
- *Cost-benefit studies prefer to list all **mortality and morbidity outcomes** to compare all health benefits with the costs of mitigation actions.*
- *Recent studies suggest a large range of outcomes other than cardio-respiratory diseases, among those, effects on **reproduction, birth weight and duration of gestation**.*

Guidance on IAM/4

- Each DPSIR block must be represented by one or more **indicators** to guarantee the possibility of comparisons.
- To effectively support decisions, indicators have to express the potential impact of policy (in)action. Different indicators have **different strengths** in supporting policies.
- The indicator **choice** thus depends on the available data and on the policy question itself.

$\Rightarrow$ A certain level of subjective judgement is unavoidable

Guidance on IAM/5

- There is no way to validate future scenarios for drivers nor pollution models in situations quite different from current ones.
- Uncertainty is thus inherently large ("*deep uncertainty*").
- Technology often enters the picture with an unpredicted speed (e.g. LED lights).

⇒ The time span over which an air quality plan may remain valid is rapidly reducing

⇒ We need to move to a **new evolving approach** which closely follow socio-economic dynamics

Two test cases

Bruxelles city

Porto region