LIFE09 ENV/IT/000092

Opera

Operational Procedure for Emission Reduction Assessment | **www.operatool.eu**

An integrated assessment methodology to plan local cost-effective air quality policies harmonized with national and European actions.

ARPA Emilia Romagna (I) · University of Brescia (I) · TerrAria s.r.l. (I) · CNRS (F) · University of Strasbourg (F)

In cooperation with: JRC EUROPEAN COMMISSION JRC (EC) · ASPA (F)

Outlook

Background

Objectives

Expected deriverables

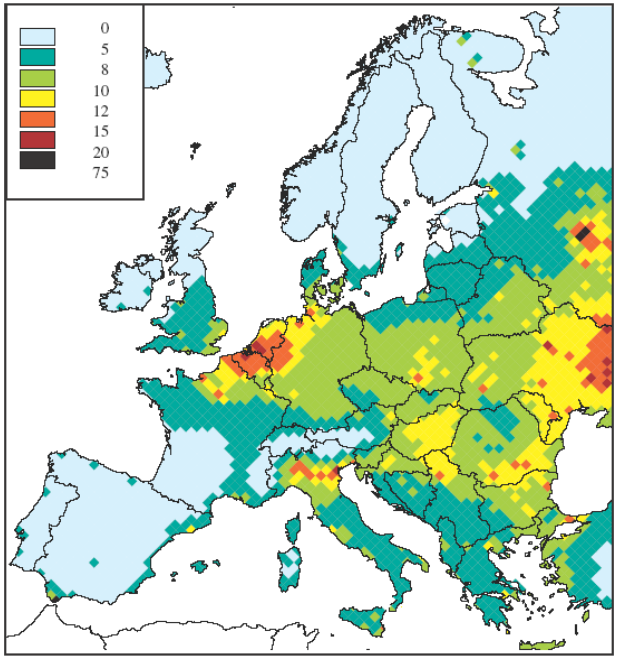
Actors

RIAT and RIAT+

Background

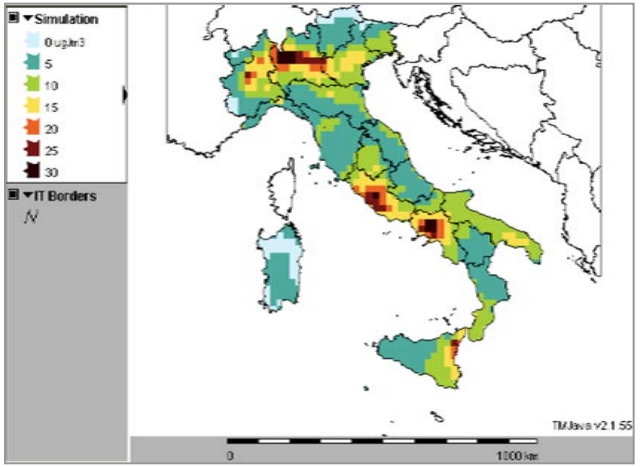
European scale

- Rains/Gains by IIASA



National scale

- Rains Italy by ENEA
- RAINS-Netherlands
- FRES-Finland
- UK-IAM



Objectives

- Set-up a methodology to assist local (sub-national) authorities in:
  - preparing, implementing and monitoring air quality plans to reduce population exposure to PM_{10}, NO_x and O_3 pollution and ecosystems exposure to NO_x and O_3.
  - integrating regional air quality plans with national and European plans
  - assessing the synergies between actions to reduce the burden of poor air quality and actions to limit climate change impacts
- Develop an integrated assessment tool (RIAT+) to support the proposed methodology
- Apply the tool on the Emilia-Romagna (Italy) and Alsace (France) regions
- Define guidelines for regional authorities to apply the methodology and tool
- Disseminate the guidelines and tool to local authorities, technical organizations and to the public at national and European levels

Expected results

- A methodology and tool (RIAT+) to support local authorities in designing and assessing efficient air quality plans.
- RIAT+ application to Emilia Romagna and Alsace and assessment of air quality plans in these two regions.
- A register including existing and new emission reduction measures (technical and non-technical) applied in the areas of the proposal. (Each action will be defined by its abatement efficiency and cost and will be linked to site specific implementation strategies).
- Guidelines for local administrations and environmental agencies (this is a national priority for Italy) to integrate local planning to national and European air quality policies.
- A full documentation, workshop and courses to support new users implementing the methodology to other European regions.

Actors

- **Consortium**
  - ARPA-ER (IT): coordinator, ER system application
  - UNIBS, Università di Brescia (IT): integrated assessment
  - TerrAria srl (IT): software system implementation
  - CNRS (FR) and University of Strasbourg: Alsace system application
- **Stakeholders**
  - EC IES-JRC
  - Regione Emilia Romagna (IT)
  - ASPA (FR)

RIAT (2009-2010)

Regione Lombardia

RIAT

Regional Integrated Assessment Tool

A DSS for air quality planning developed by

DII, Università di Brescia (I) and TerrAria srl (I)

with consultancy of DEI - Politecnico di Milano (I) - and Les White Associates Ltd (EN)

RIAT+: the follow-up of RIAT

Methodology

System architecture

Source-receptor models

Output

Decision problem

$$\min_{\theta} J(\theta) = \min_{\theta} \left[AQI(\theta) \quad C(\theta) \right]$$

Internal Costs

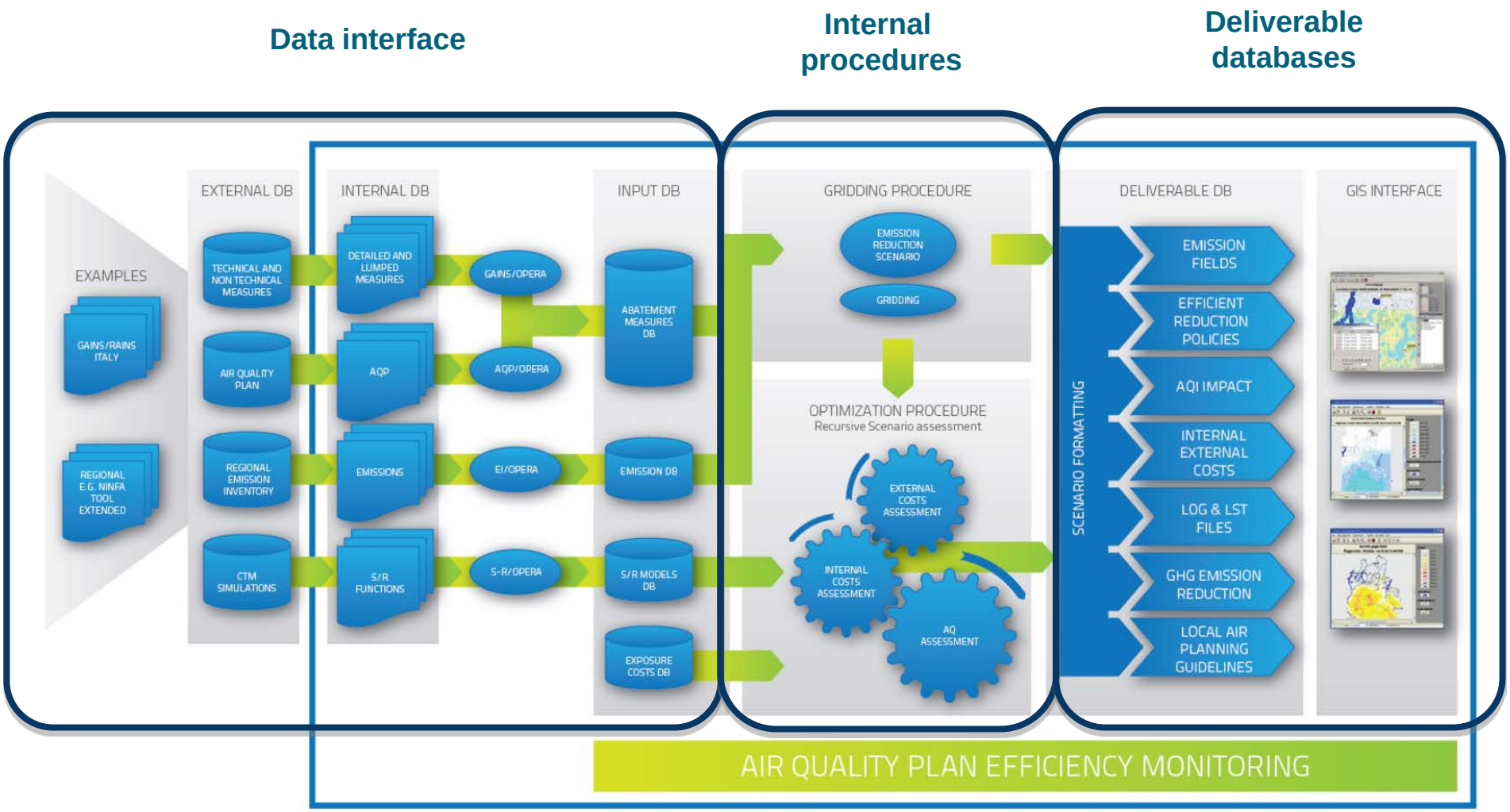
Air Quality Index: PM_{10}, $PM_{2.5}$, NO_2, Ozone

$$\theta \in \Theta$$

Set of feasible decisions

Set of decision variables (precursor emission reduction measures)

RIAT+ system architecture



Databases

- Emissions:
  - Emission factors
  - Activity rates
- Abatement measures:
  - Abatement efficiency
  - Application rate
  - Costs
- Emission-AQI relationship:
  - Deterministic model simulations

AQI identification

- AQI-emission simulation model:
  - Deterministic model >> too high computational costs
- Model reduction: surface response
  - ANNs identified processing CTM model simulations

Source-receptor models: ANN

- Input data: precursor emissions
- Target data: AQI

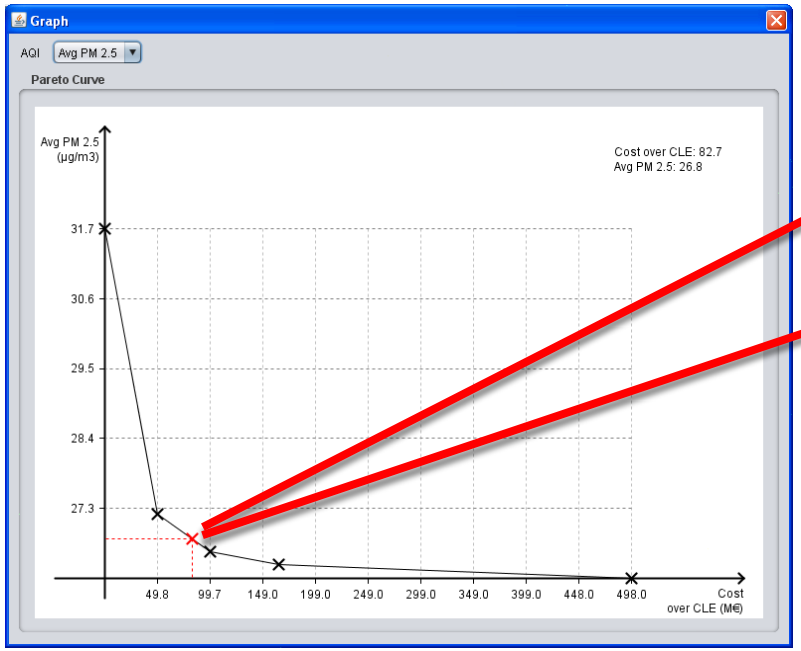
ANNs inputs:
quadrant precursor emissions

ANNs output:
AQI

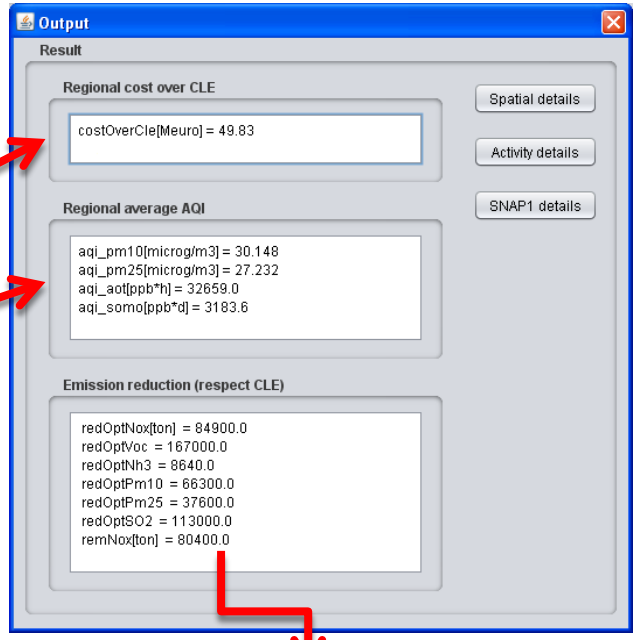
- Identification pattern: CTM simulations

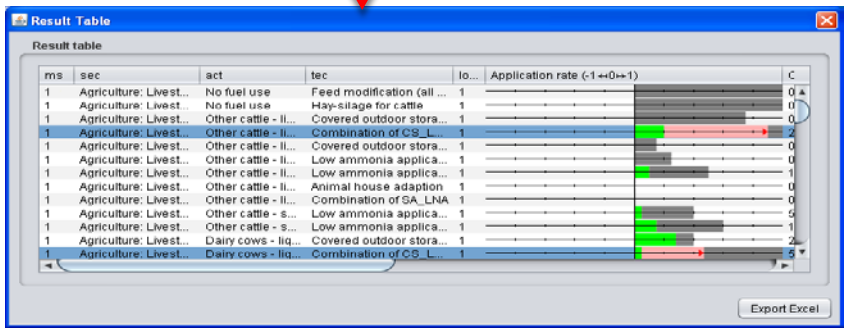
RIAT output

Pareto Boundary



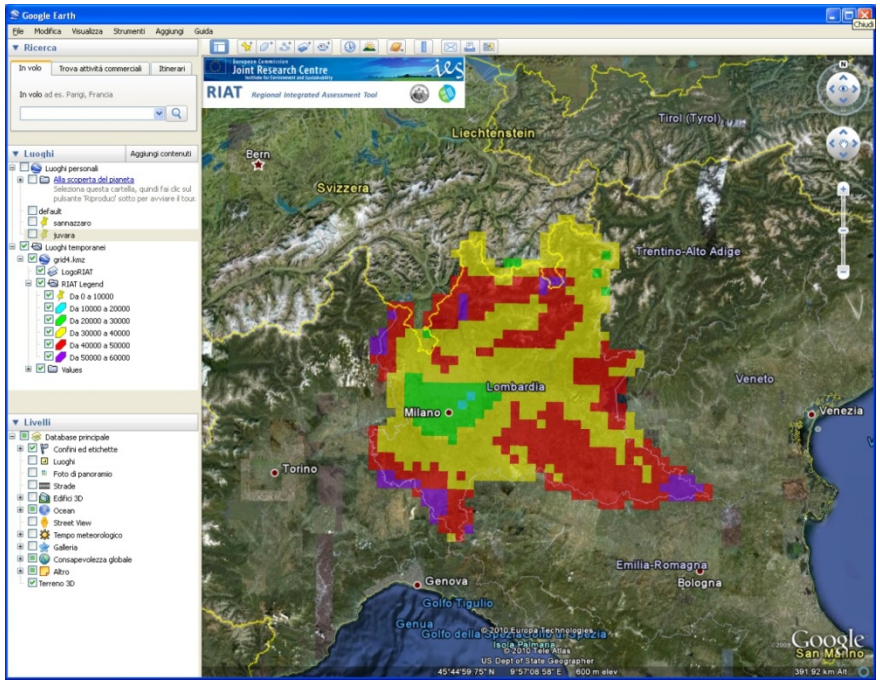
Effective policy



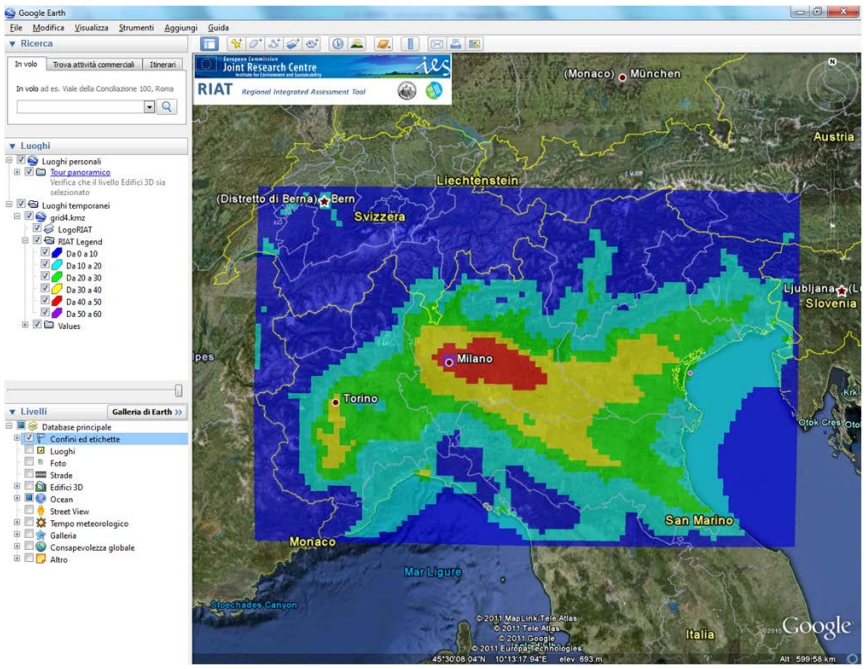


RIAT output

Emission maps



AQI maps



Test cases

- Emilia-Romagna and Alsace application
- Standard DSS for sub-national air quality planning in EU
- Guideline
- Technical and non-technical measure databases
- CO2 budget for effective policies

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