"Capacity Building and Strengthening Institutional Arrangement"

Analysis and sampling of air and air pollution

Training of experts for the adoption and use of the new instruments and tools

Mr. Riccardo De Lauretis, Mr. Alfredo Leonardi

APAT

Agency for Environmental Protection and Technical Service

AIR POLLUTION AND ENVIRONMENTAL IMPACTS

New instruments and tools for air emission inventories

•IPCC GUIDELINES 2006: recently approved by IPCC plenary (April 2006); needs to be approved by UNFCCC

http://www.ipcc-wg2.org/index.html

•COPERT4 model: to estimate emissions from road transport at regional and national level. It include emission factor speed-dependant for different pollutants and for new technologies (EUROII, EUROIII and EUROIV) based on direct measurements

http://lat.eng.auth.gr/copert/copert4beta.htm

AIR POLLUTION AND ENVIRONMENTAL IMPACTS

MAIN APAT EXPERIENCES ON RISK ASSESSMENT

- EUROPEAN DIRECTIVE 96/82/EC ON MAJOR INDUSTRIAL HAZARDS
- AIRBORNE EFFECTS OF CERNOBYL NUCLEAR POWER STATION DISASTER ON ITALIAN TERRITORY
- REHABILITATION OF “CENGIO ACNA FACTORY” AND “PORTO MARGHERA” DISTRICTS (application of ROME software developed by APAT)
- AIR POLLUTION MODELLING: PM10 AT REGIONAL SCALE IN “PIANURA PADANA” (application of MINNI software developed by ENEA)

AIR POLLUTION AND ENVIRONMENTAL IMPACTS

ReasOnable Maximum Exposure - ROME 2.1

APAT software ROME ver.2.1 represents a decision support tool for the assessment and management of risks associated to contaminated sites

ROME ver.2.1 adopts a two-tiers (screening and site-specific) risk analysis derived by the ASTM Standards RBCA (Risk-Based Corrective Actions)

The tiers of analysis are:

Tier 1: Comparison with legal contaminant concentration limits of Decree n°471/99 and comparison with Risk-Based Screening Values

Tier 2: Site specific risk analysis and calculation of remediation objectives for contaminated soil and groundwater

AIR POLLUTION AND ENVIRONMENTAL IMPACTS

ReasOnable Maximum Exposure - ROME 2.1 (con't)

ROME ver.2.1 guides along the definition of the Conceptual Site Model and to the input of site-specific environmental and exposure parameters

ROME envisages human health exposure scenarios for two land uses of the site (residential/green areas and industrial/commercial) and the assessment of risks, produced by soil contamination, to surface water and groundwater receptors

It includes physical/chemical and toxicological databases for 118 substances and default values for exposure and environmental parameters. All parameters can be updated

AIR POLLUTION AND ENVIRONMENTAL IMPACTS

Register as ROME 2.1 user (con't)

Register is optional and has the purpose to allow APAT to inform users on software updates and news and to facilitate the assistance service

Download ROME 2.1 software (file zip 6129 Kb)

Download Rome Operating Manual 2.1 (file zip 1067 Kb)

For any problem with ROME 2.1, email to: rome@apat.it

http://www.apat.gov.it/site/en-GB/Download/Software_Rome_2.1/

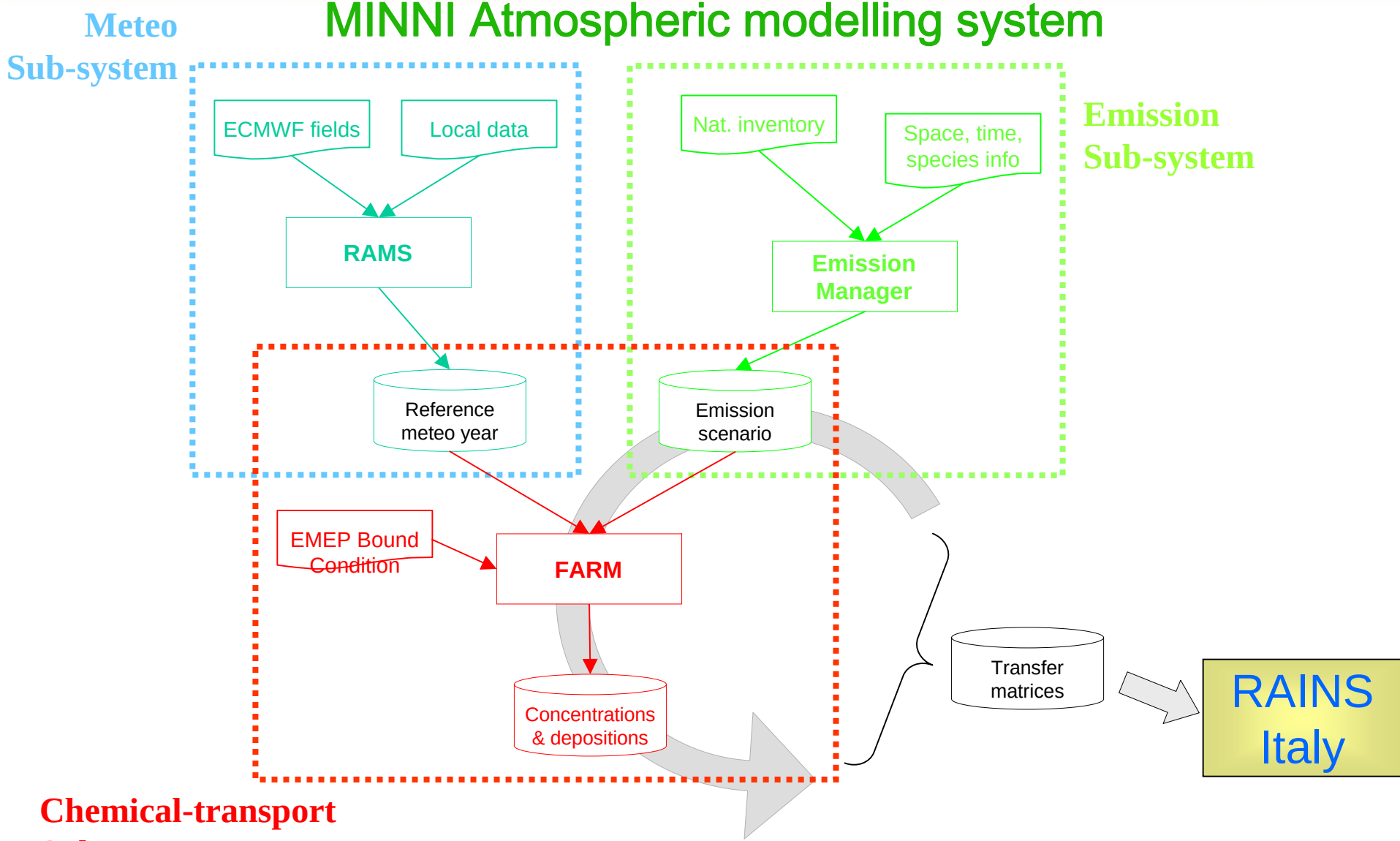
AIR POLLUTION AND ENVIRONMENTAL IMPACTS

MINNI – Atmospheric Integrated Assessment Model

- MINNI is the Italian acronym for Integrated National Model as supporting tool for the International Negotiation on atmospheric pollution
- Started in 2002 in the framework of an agreement beetween the Italian Ministry for the Environment and the Territory and ENEA, the Energy Environment and Technological Innovation Italian Agency.
- Tool under development jointly by ENEA, IIASA (International Research Institute) and ARIANET (private Italian consultant)
- Based on RAINS model developed by IIASA

http://www.iiasa.ac.at/web-apps/tap/RainsWeb/

MINNI Atmospheric modelling system



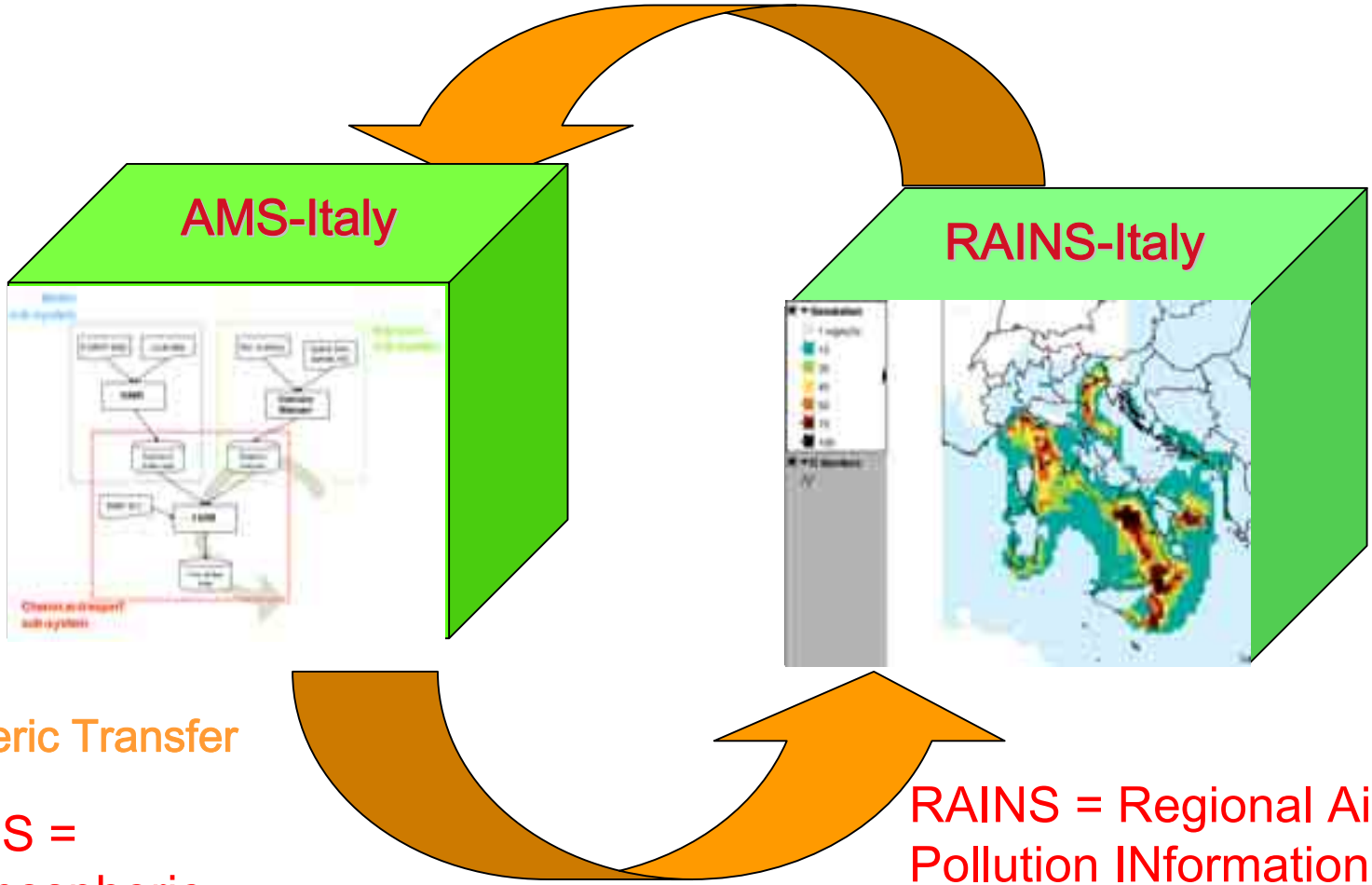
AIR POLLUTION AND ENVIRONMENTAL IMPACTS

The MINNI Project

The results from the atmospheric simulation system are the input for RAINS-Italy, a national-scale version of the RAINS Integrated Assesment model (IIASA, 2004), including:

- Italian-specific energy, costs and effects data, that are applied to evaluate the abatement strategies and their relative costs
- Matrices of source-receptor relationships for the Italian regions are calculated, allowing to detail the overall national abatement targets to the single Regions

The MINNI project



Atmospheric Transfer matrices

AMS = Atmospheric Modelling System

RAINS = Regional Air Pollution INformation and Simulation

RAINS-Italy characteristics:

✓Area Sources: 20 administrative regions, 4 metropolitan areas (Milan, Turin, Rome and Naples), 1 national sea traffic

✓Point sources: 14 Large Combustion Plants (refineries and power plants)

✓ ATM from AMS with 20x20 km^2 spatial resolution

RAINS-Italy output (for each area and point sources):

✓Emission scenarios: SO_2, NO_x, VOCs, NH_3, PM and O_3

✓ Deposition/concentration maps for acidification, eutrophication, PM and O_3

✓ National and regional abatement cost curves

✓ PM and O_3 health impacts

AIR POLLUTION AND ENVIRONMENTAL IMPACTS

Conclusions

- MINNI is expected to be an important tool to support the Italian policy makers in the field of air pollution management, both in the international negotiations on transboundary air pollution and in the regional breakdown of national abatement targets;
- MINNI provides a powerful tool for estimation and comparison of the effect-based impact of the local environmental policies, allowing also cost evaluation and their optimized allocation.