



LCA e modelli di dispersione degli inquinanti: da ExternE allo sviluppo attuale

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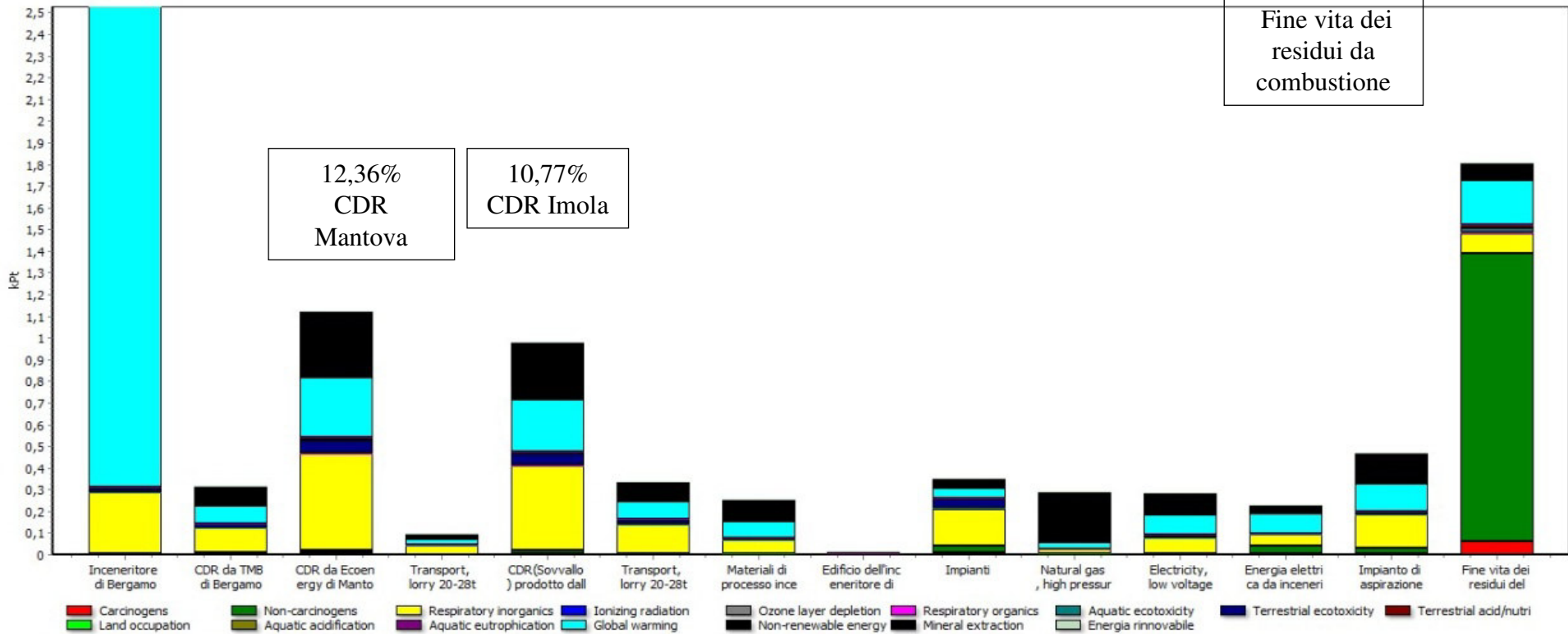




Scarpellini et al. (2014): Valutazione danno ambientale con IMPACT 2002



27,81%
TU di Bergamo



Analysing 59386 ton 'Inceneritore di Bergamo (senza i costi e i ricavi) (con macroprocessi)';
Method: IMPACT 2002+080513 senza costi V2.10 / IMPACT 2002+ / Single score



ExternE = “External Costs of Energy”



Ari Rabl, Ecole des Mines de Paris

funded by European Commission DG Research, since 1991

>200 scientists in all countries of EU

Series of projects, includ. ExternE Transport, ExternE-Pol, NEEDS (04-08), CASES (06-08) and related projects, e.g. ESPREME, ...

Major publications **1995, 1998, 2000, 2004**

www.externe.info

Methodology

- **Site specific Impact Pathway Analysis**
(for each pollutant: emission→dispersion→impact→cost)
- **LCA of fuel chain**



LCA ↔ Impact Pathway Analysis



Life cycle assessment:

first sum over
emissions
↓
 Σ

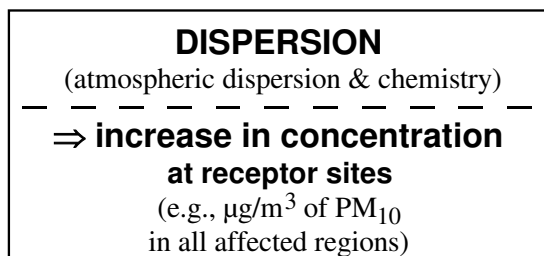
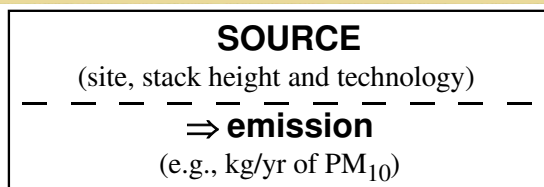
then
→ × multiplication by
"potential impact" indices

→ real impacts for each stage (site specific)
Goal : evaluate the entire matrix

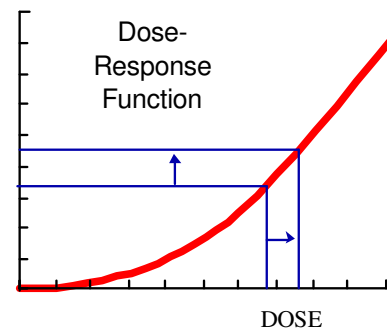
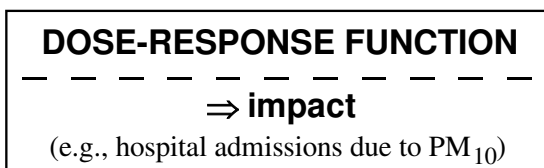
Steps of impact pathway analysis →		Emission	Dispersion	Exposure-response function	Economic valuation
Stage of fuel chain ↓	no impianti				
Fuel extraction					
Fuel transport					
Power plant					
Transmission of electricity					
Management of wastes					



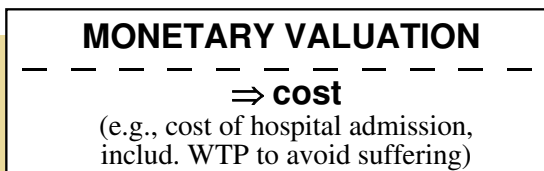
Impact Pathway Analysis



V.I.A.

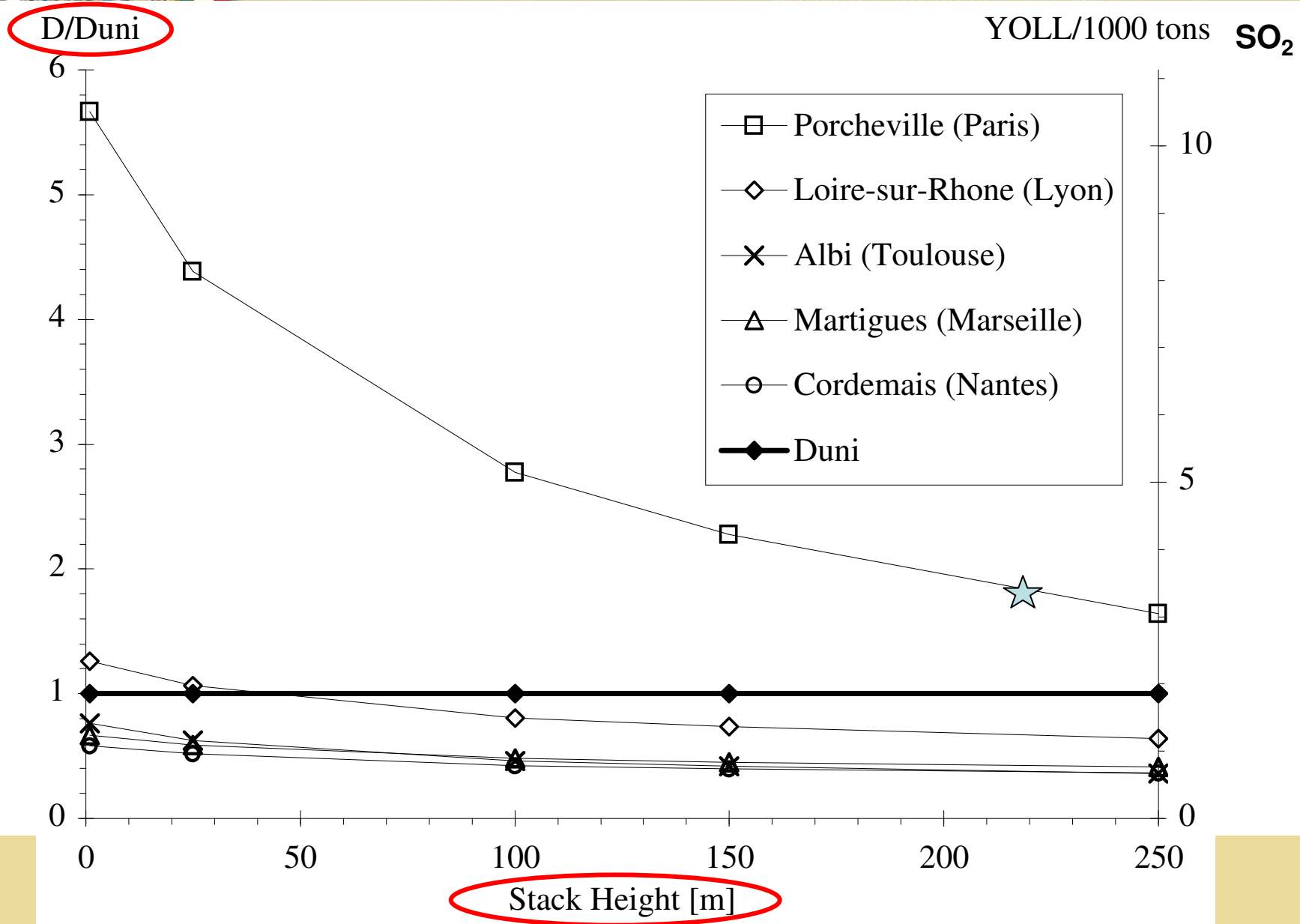


V.I.S.





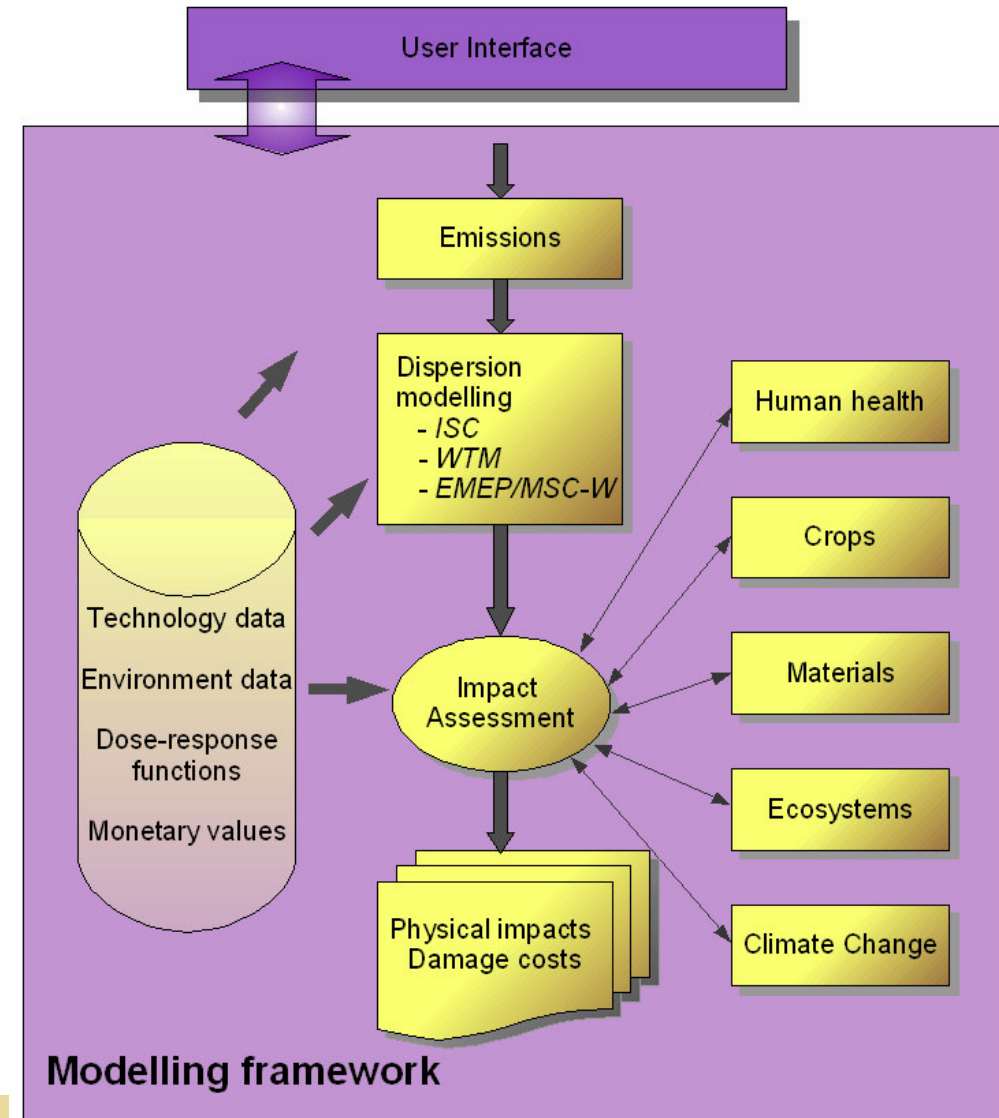
Effetto della locazione/dispersione: Confronto UWM ↔ modello dettagliato





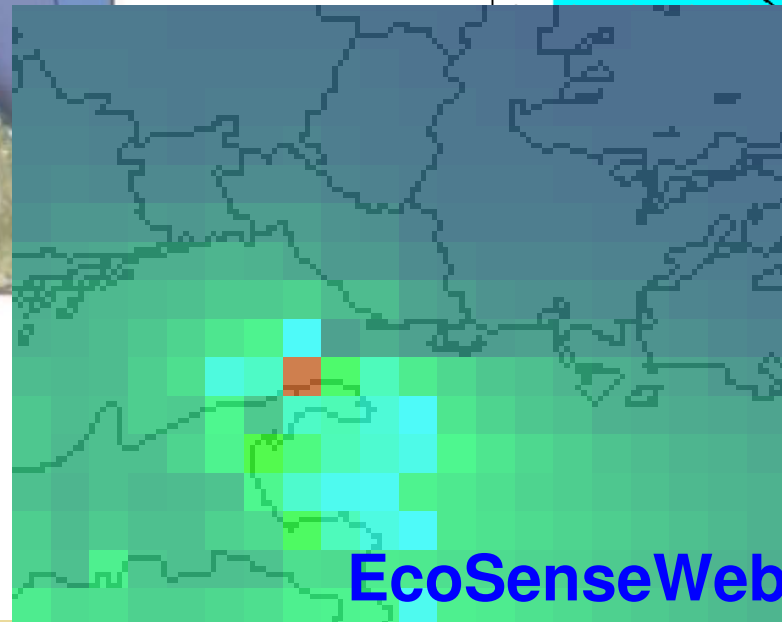
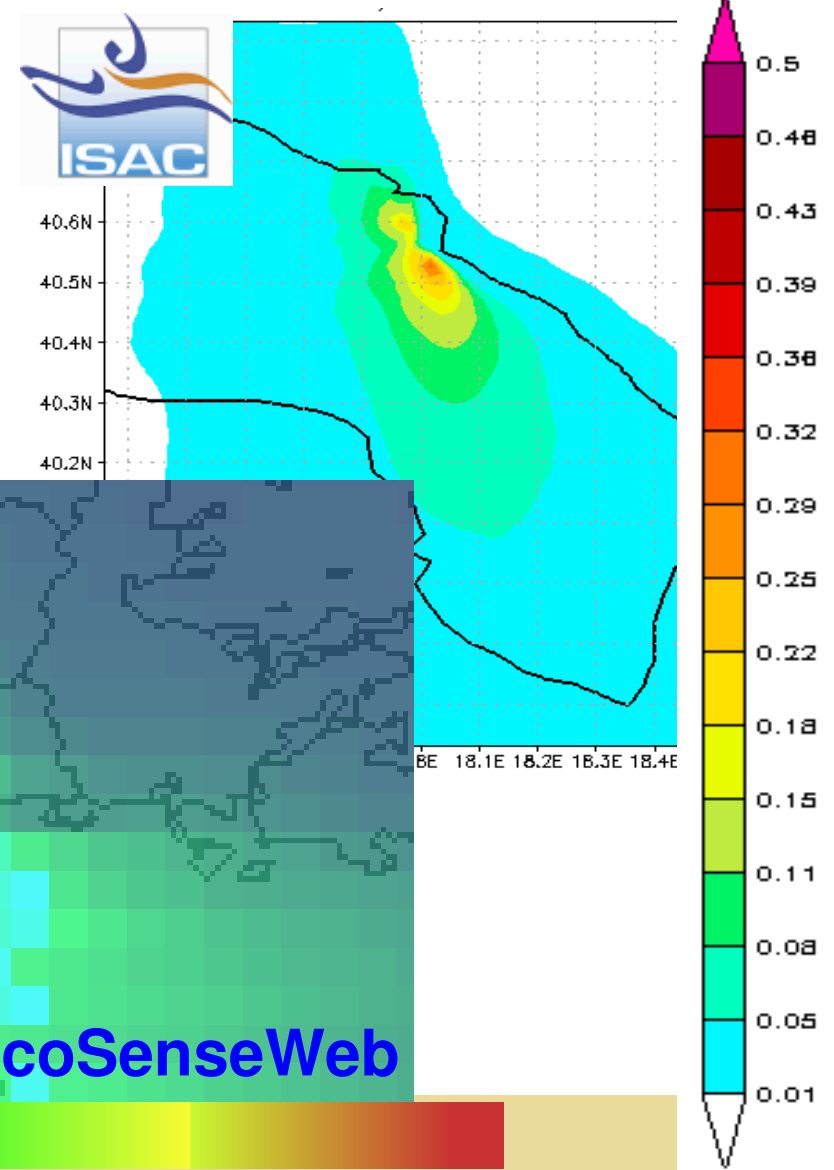
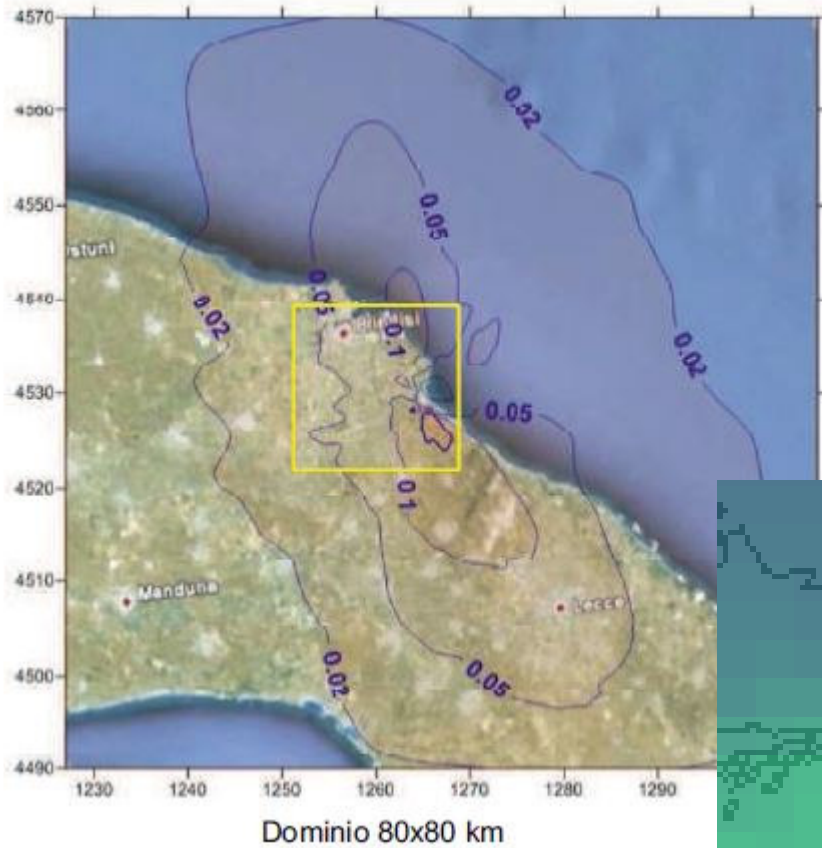
Universität Stuttgart
Institut für Energiewirtschaft und
Rationelle Energieanwendung **IER**

EcoSenseWeb V1.3
User's Manual &
"Description of Updated and
Extended Draft Tools
for the Detailed Site-dependent
Assessment of
External Costs".
10.01.2008





Brindisi: CTE a carbone 2640 MW_e contributo PM₁₀ primario $\mu\text{g}/\text{m}^3$



0

0.03



contributo PM_{10} secondario $\mu g/m^3$



SO_2, NH_3, NO_x, O_3 (gas) $\Rightarrow PM_{10}$ secondario
da gas a particelle, dopo ore o giorni

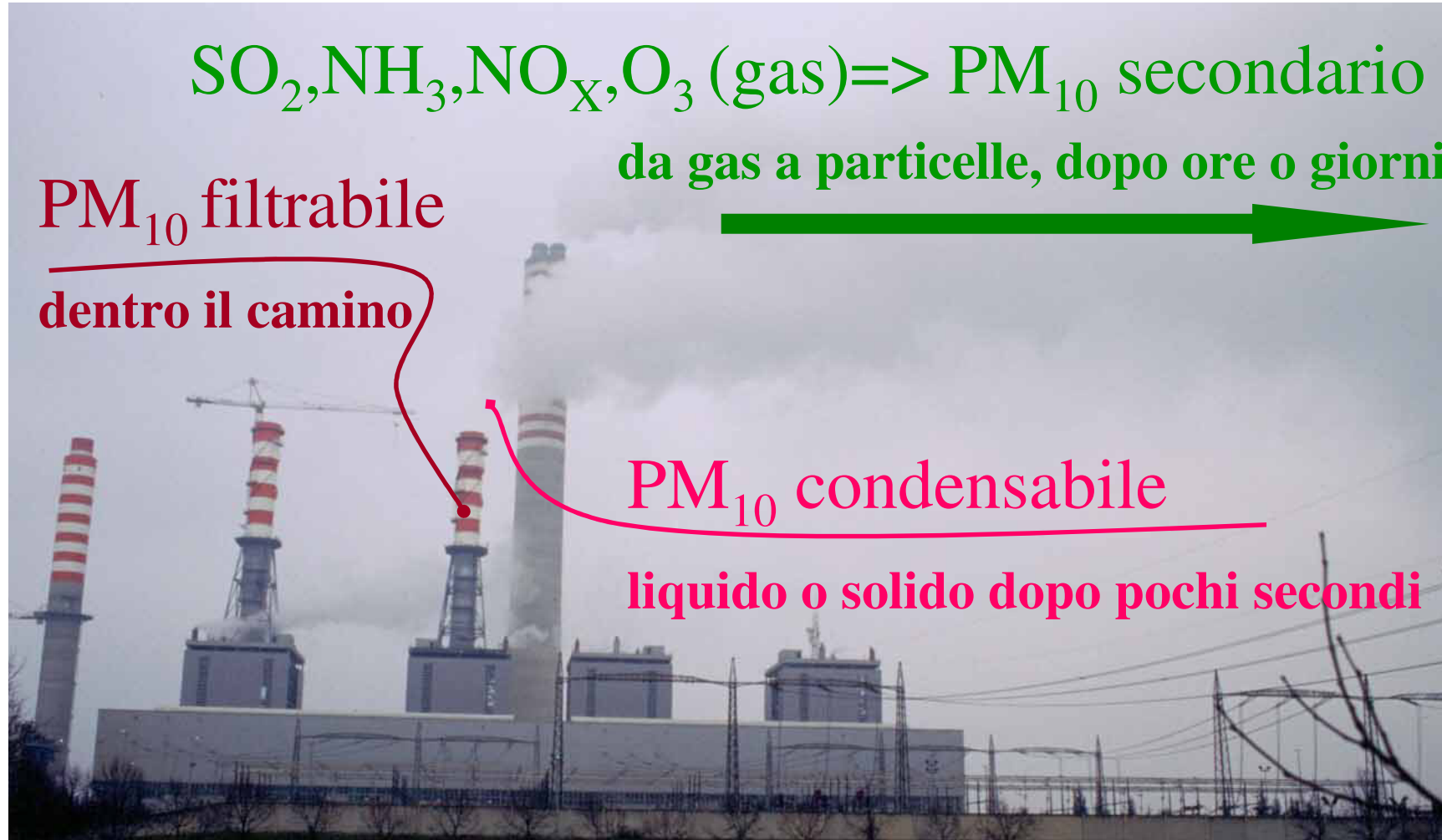


PM_{10} filtrabile

dentro il camino

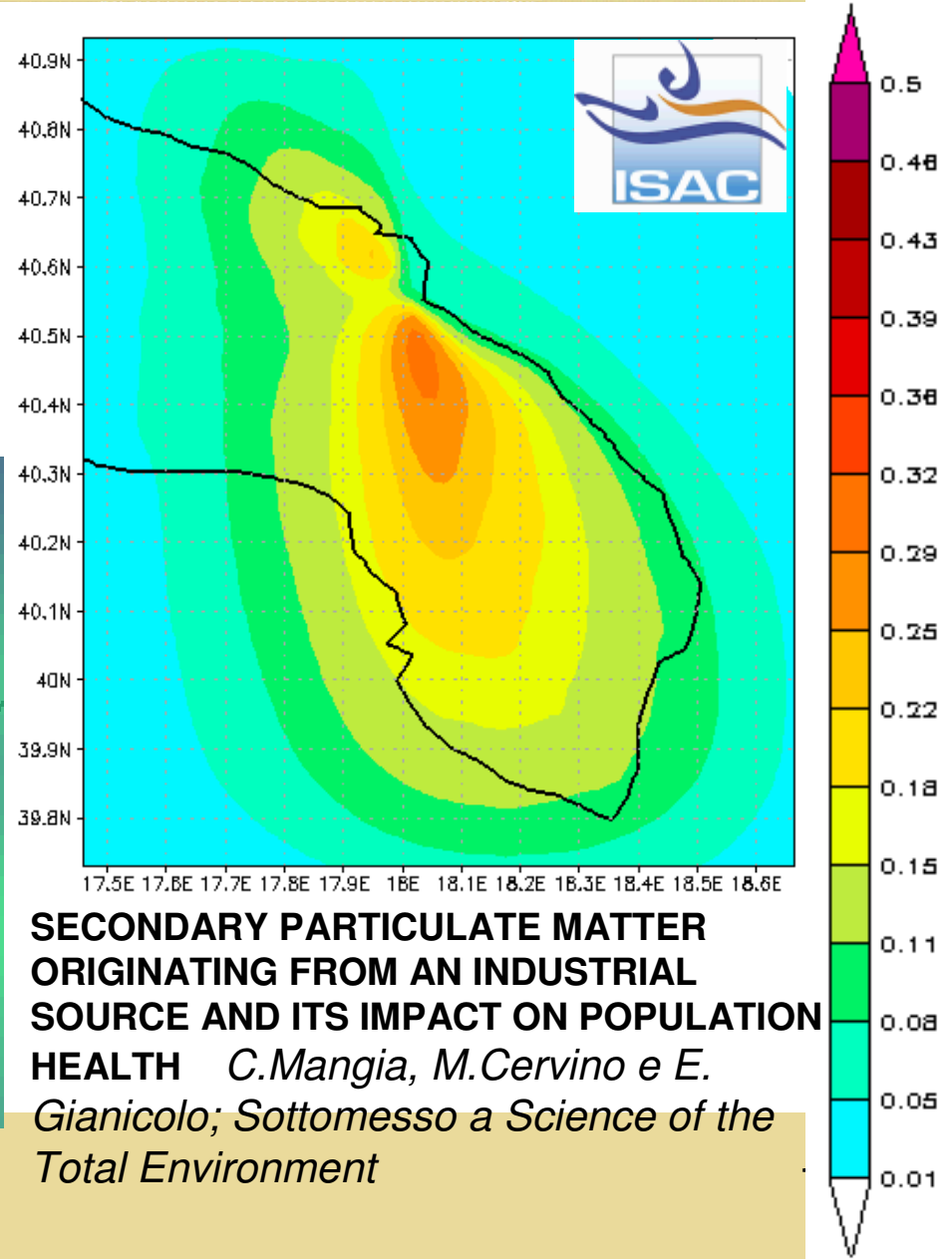
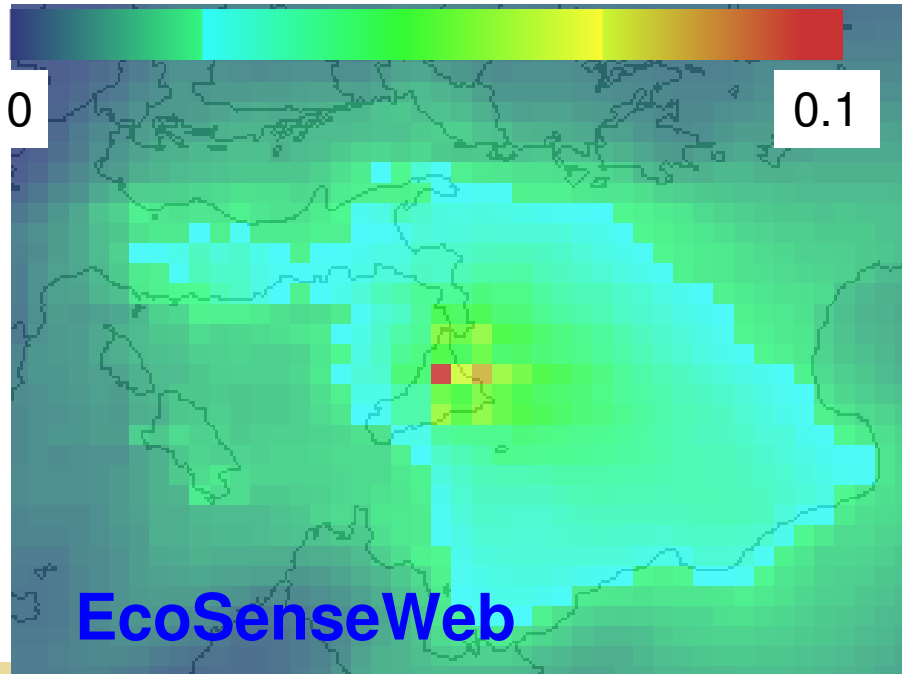
PM_{10} condensabile

liquido o solido dopo pochi secondi





Brindisi: CTE a carbone 2640 MW_e contributo PM₁₀ **secondario** μg/m³



**SECONDARY PARTICULATE MATTER
ORIGINATING FROM AN INDUSTRIAL
SOURCE AND ITS IMPACT ON POPULATION
HEALTH** *C.Mangia, M.Cervino e E.
Gianicolo; Sottomesso a Science of the
Total Environment*



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L'integrazione di modelli **EVOLUTI** di diffusione in atmosfera
[acqua / suolo / cibo / ...] **AMBISCE** a rispondere alle domande:

CHI, COSA, DOVE e QUANDO viene impattato dai processi di un
LCA a scale e risoluzioni spaziali e temporali più accurate di quelle
dei modelli a "COMPARTO UNIFORME"

..... Ci sarebbe ancora molta ricerca da fare.

Grazie per l'attenzione