



Appraisal project

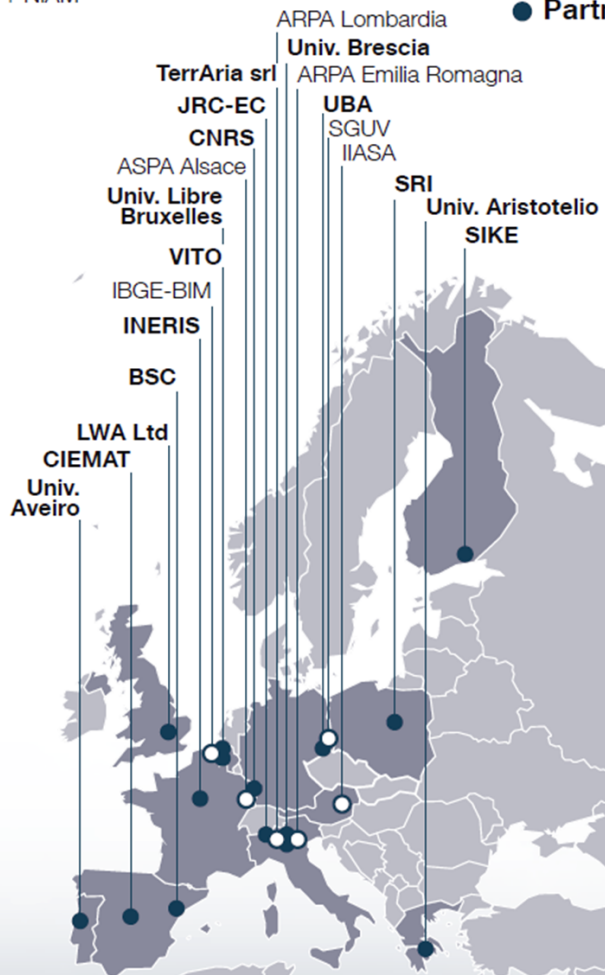
Air Pollution Policies
for Assessment
of Integrated Strategies
At regional and Local scales

www.appraisal-fp7.eu



+ FAIRMODE
+ NIAM

○ Stakeholders
● Partners

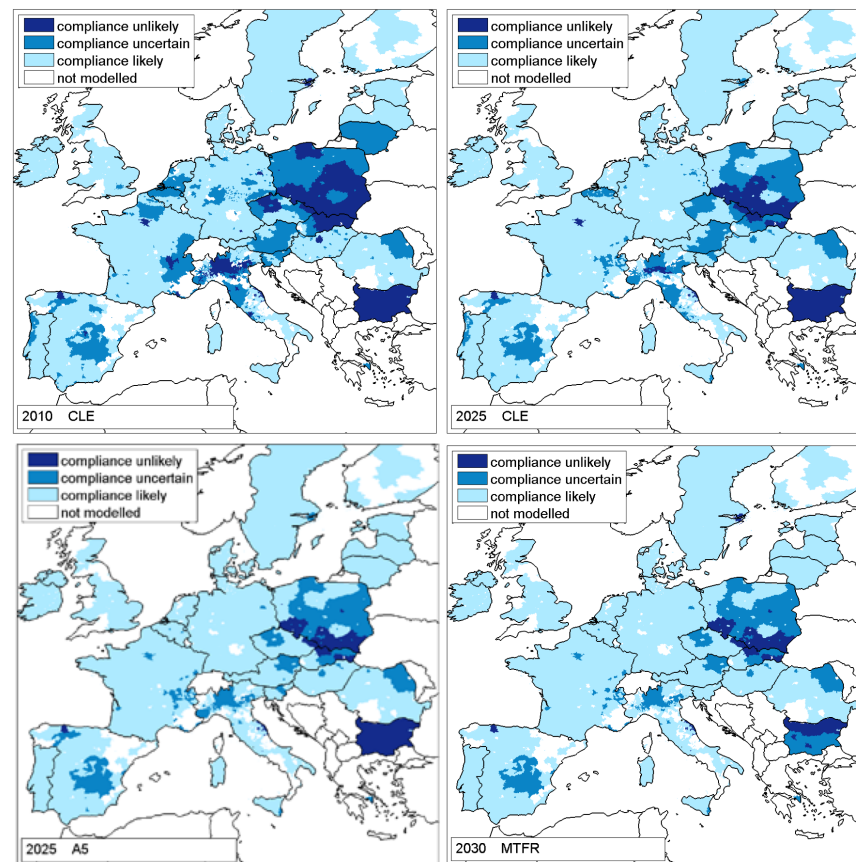
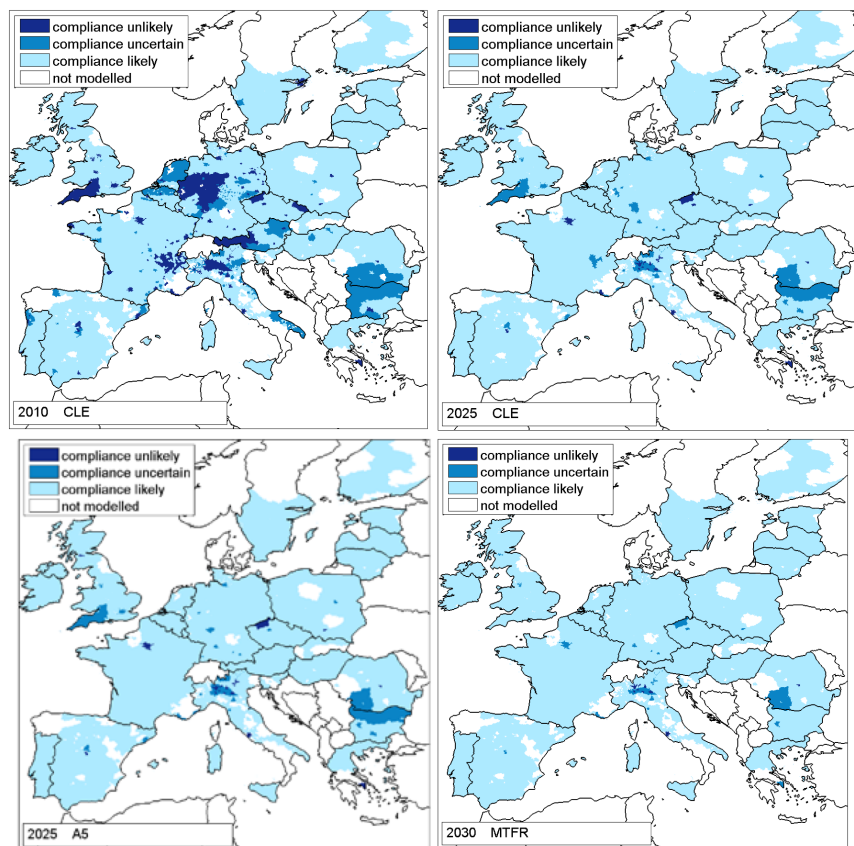


APPRAISAL project: Integrated assessment for regional and local air quality policies

Links to FAIRMODE

M. Volta – University of Brescia (IT)

THE CHALLENGE



NO₂ compliance

PM₁₀ compliance



THE CONTEXT

DIRECTIVE 2008/50/EC

CHAPTER IV - Article 23

Where ... the levels of pollutants in ambient air exceed any limit value or target value ... **Member States** shall **ensure** that **air quality plans** are established ... in order **to achieve the related limit values** or target values

COMMISSION IMPLEMENTING DECISION 2011/850/EU

CHAPTER III - Article 13, article 14

In accordance with the procedure referred to in Article 5 of this Decision, **Member States** shall make available the **information** set out in **Parts H, I, J and K of Annex II** to this Decision on air quality plans as required by Article 23 of Directive 2008/50/EC



THE

(H) Information on air quality plans

DIRECTIVE 2008/50

(I) Information on source apportionment

CHAPTER IV - Article 17

(J) Information on the scenario for the attainment year

Where ... the levels
or target value ... **Me**
are established ... in
values

(K) Information on measures (type, time scale, affected
source sector, implementation costs, emission reduction,
expected impacts)

COMMISSION IMPLEMENTING DECISION 2011/850/EU

CHAPTER III - Article 11 Article 14

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in **Parts H, I, J and K of Annex II** to this Decision on air quality plans
as required by Article 23 of Directive 2008/50/EC



THE CONTEXT

DIRECTIVE 2008/50/EC

CHAPTER IV - Article 23

Where ... the level of ambient air exceed any limit value or target value, Member States shall ensure that **air quality plans** are established to ensure that **limit values** or target values are not exceeded.

Which methodologies, models, tools, databases?

COMMISSION DECISION 2011/850/EU

CHAPTER III - Article 5

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APPRAISAL

AQP database

1. **Analysis**

What approaches are currently used to design and assess regional/local air quality plans ? What are their strengths and weaknesses?



APPRAISAL

AQP database

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What approaches are currently used to design and assess regional/local air quality plans ? What are the weaknesses?

IAM framework:
DPSIR

2. Design

Which data, models, methodologies, tools to design Air Quality Plans? What are the future research needs to improve these approaches? (WP3)



APPRAISAL

AQP database

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AQP guidance and taxonomy

3. Guidance

How to integrate data, models, methodologies to define a plan?



APPRAISAL

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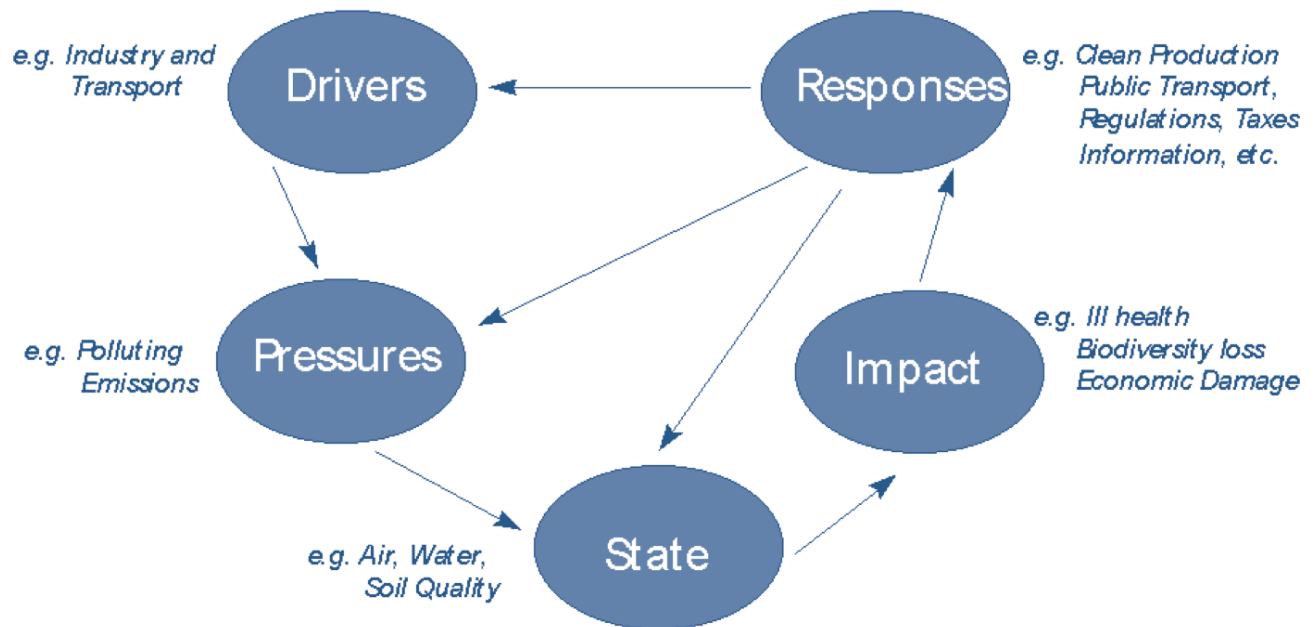
AQP guidance and taxonomy

3. Guidance

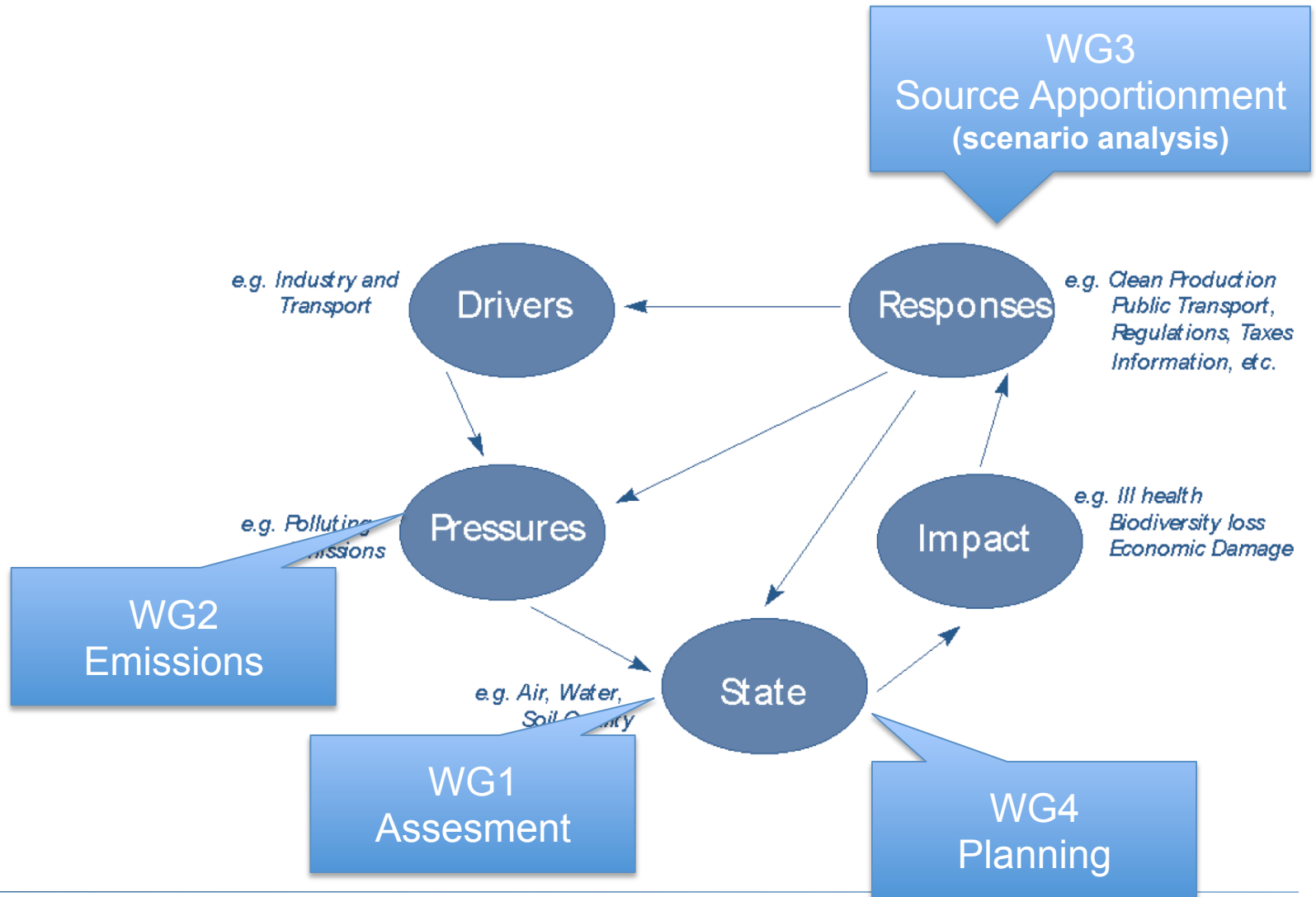
How to integrate data, models, methodologies to define a plan?

4. Support the review of the EU Air Policy

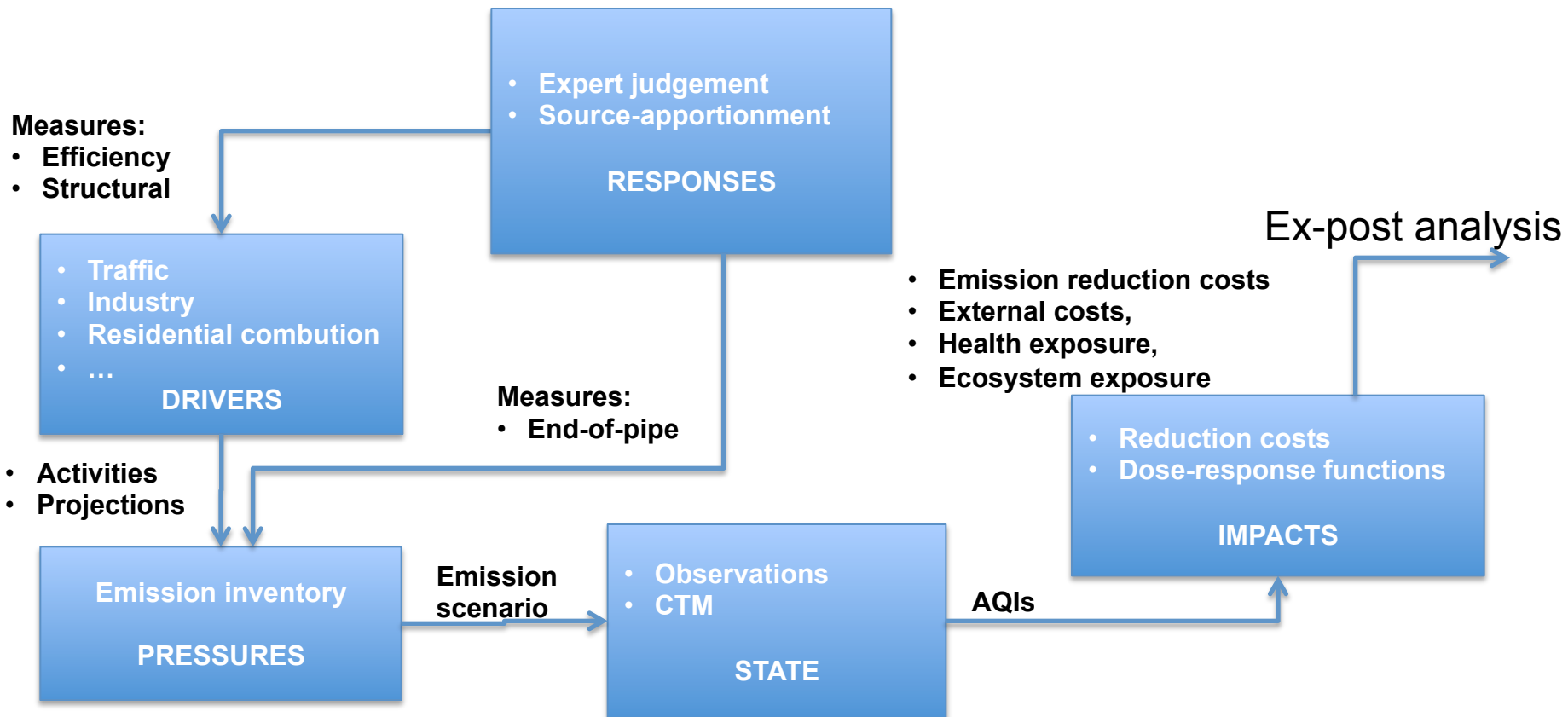
IAM system framework: DPSIR



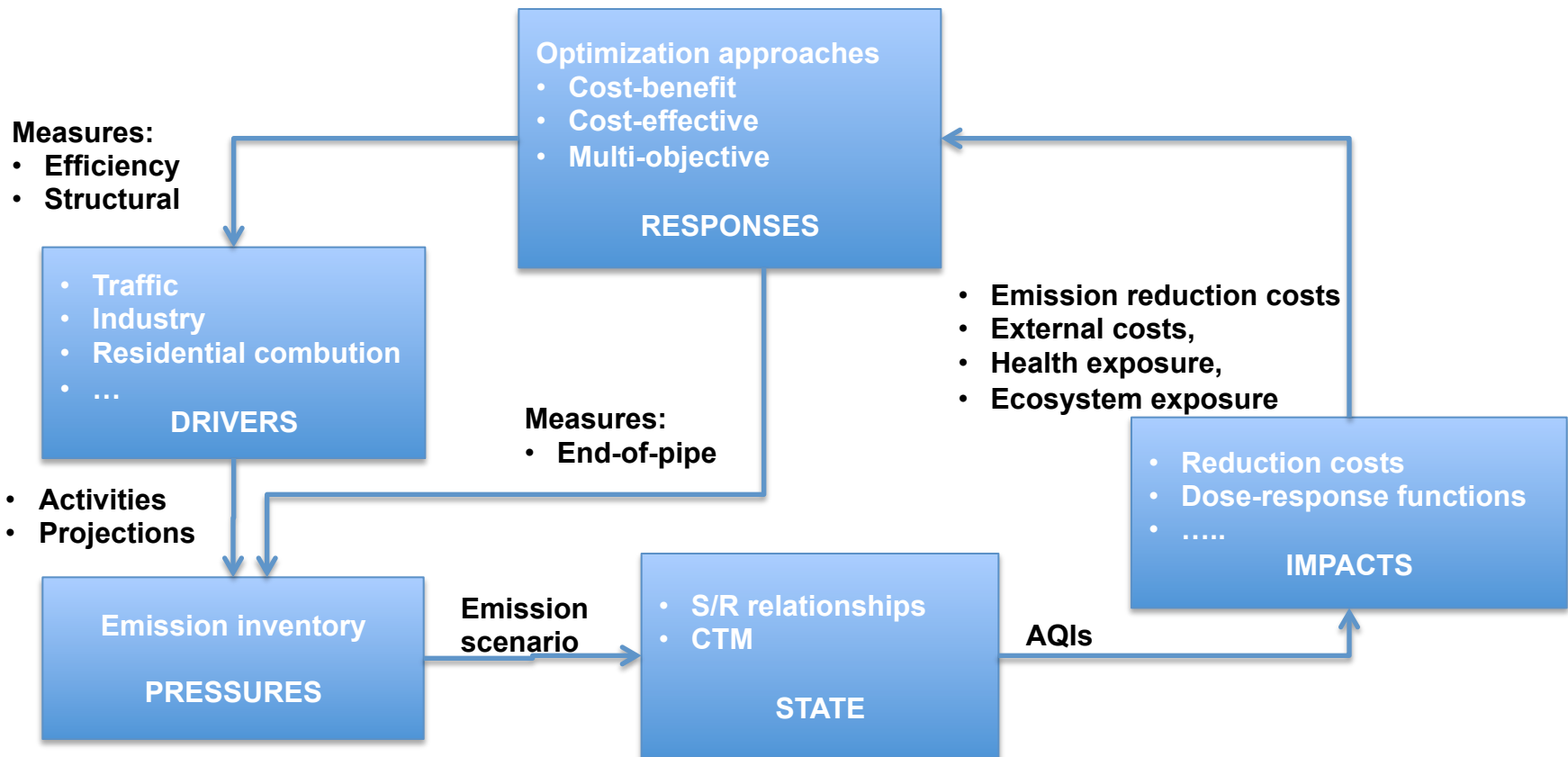
Links to FAIRMODE



1. IAM assesses proposed action impacts: scenario assessment



2. IAM identifies effective measures: optimization approaches



Approach 2: IAM identifies effective emission reduction measures

Multi-objective approach

$$\min_x J(x) = \min_x \left[AQI(x) \quad C(x) \right]$$

$$x \in X$$

Cost-effective approach

$$\min_x AQI(x)$$

$$C(x) \leq L$$

Control variables

- End-of-pipe measures
- Efficiency measures
- Structural measures

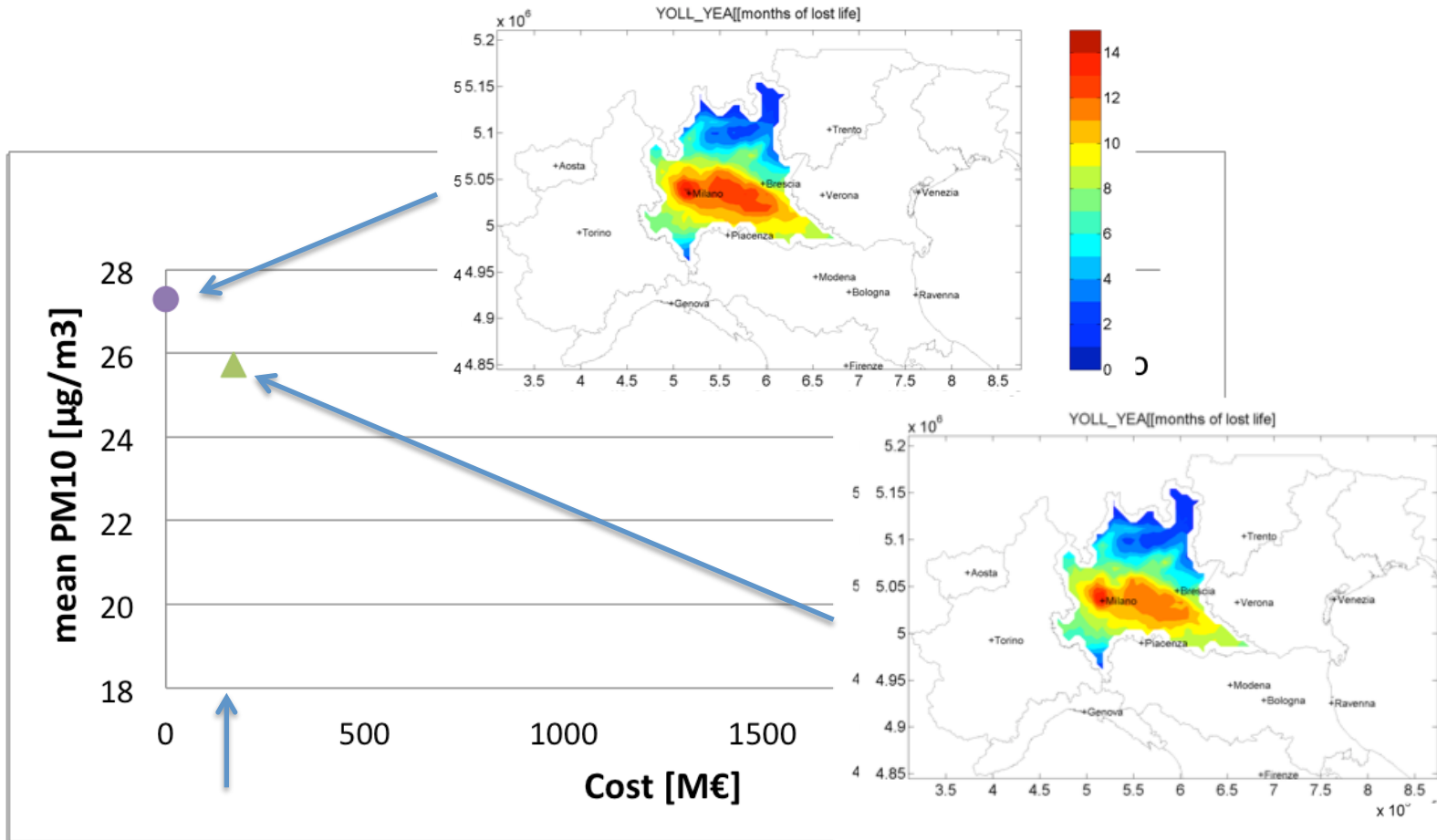
Traffic scenario analysis



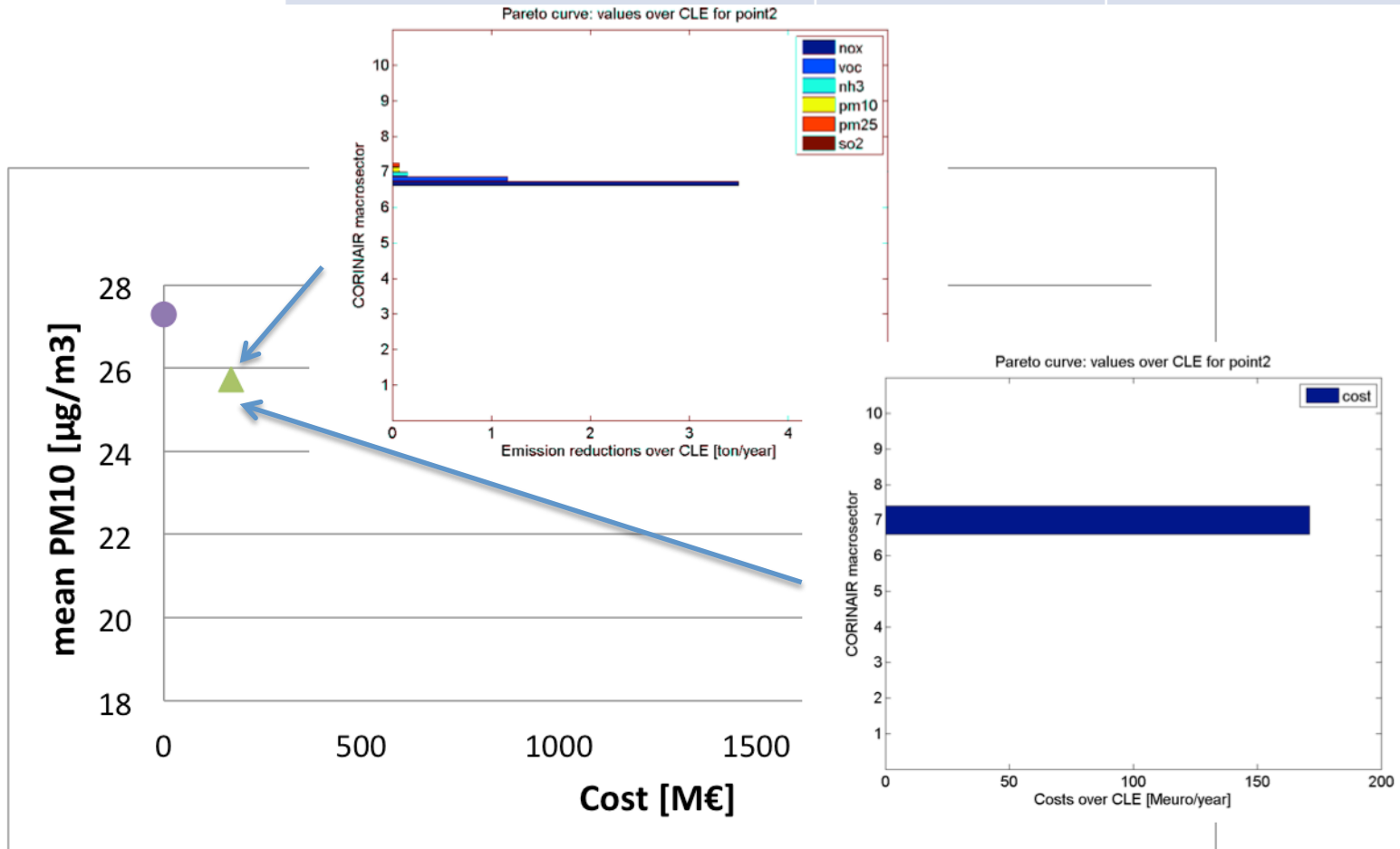
- Vehicle fleet: new EURO standard
- Efficiency Measures:
 - bus investment
 - bicycle path
 - lower speed on highway



Impacts	CLE	Traffic scenario
Emission reduction costs	0 €	171 M€
PM10 [$\mu\text{g}/\text{m}^3$]	27,3	- 6%
Health costs (PM10)		- 6%

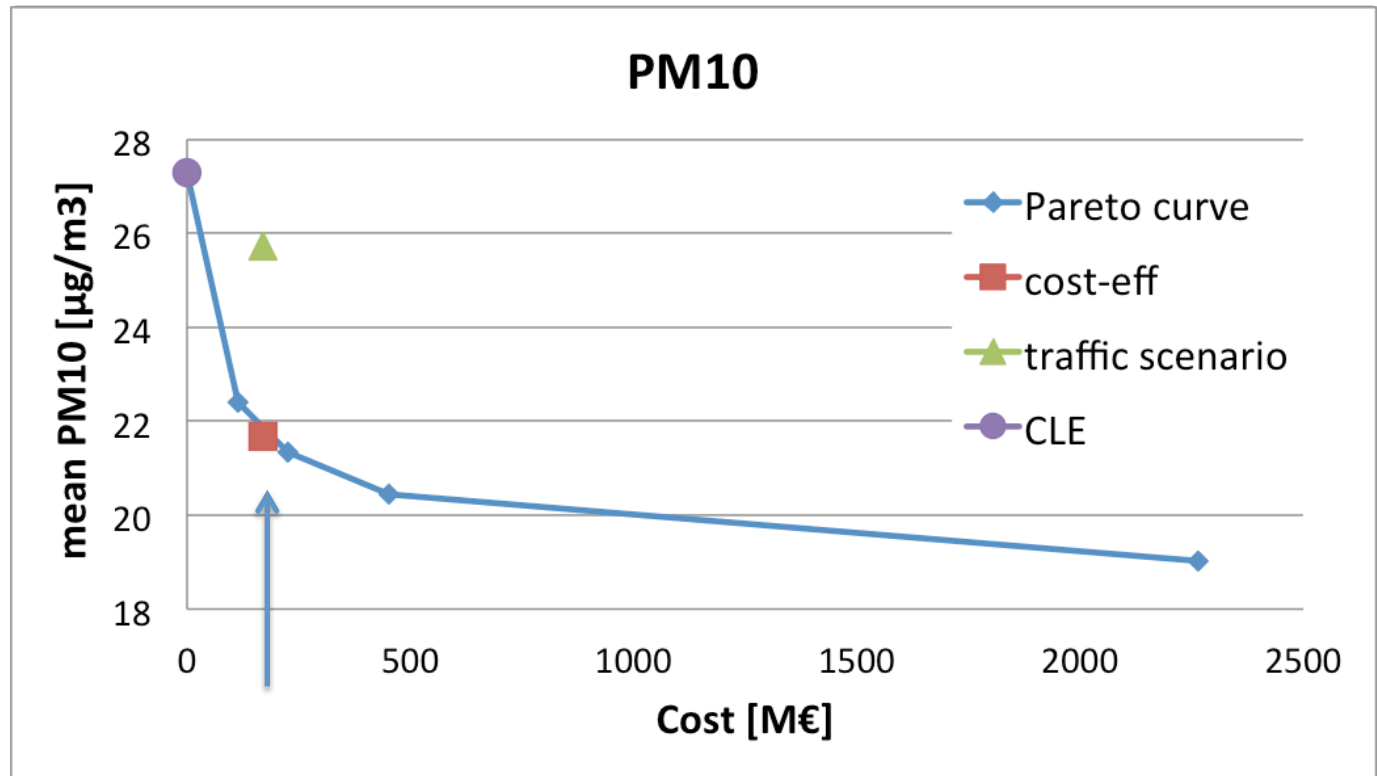


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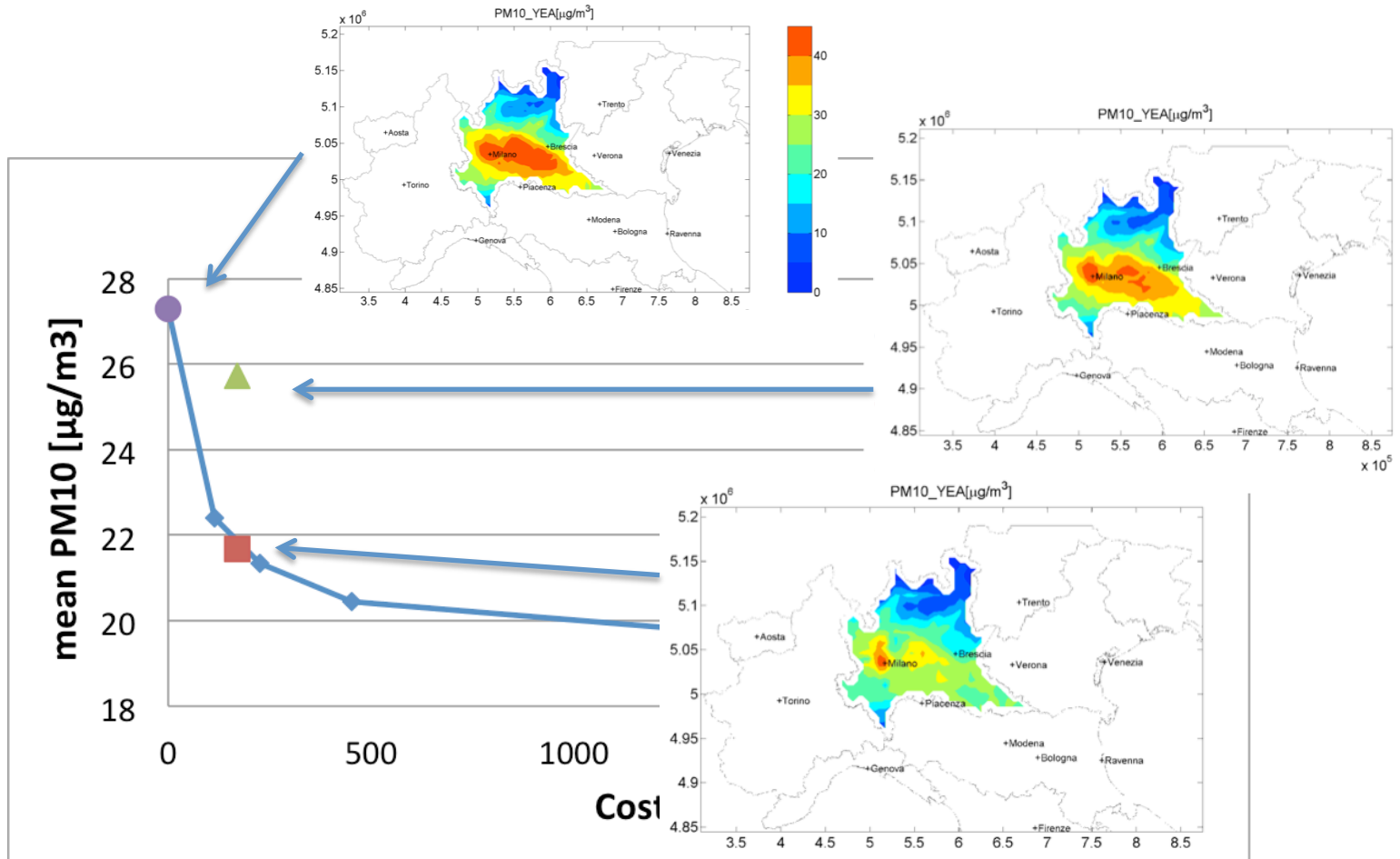
Multiobjective approach

Cost-effective approach



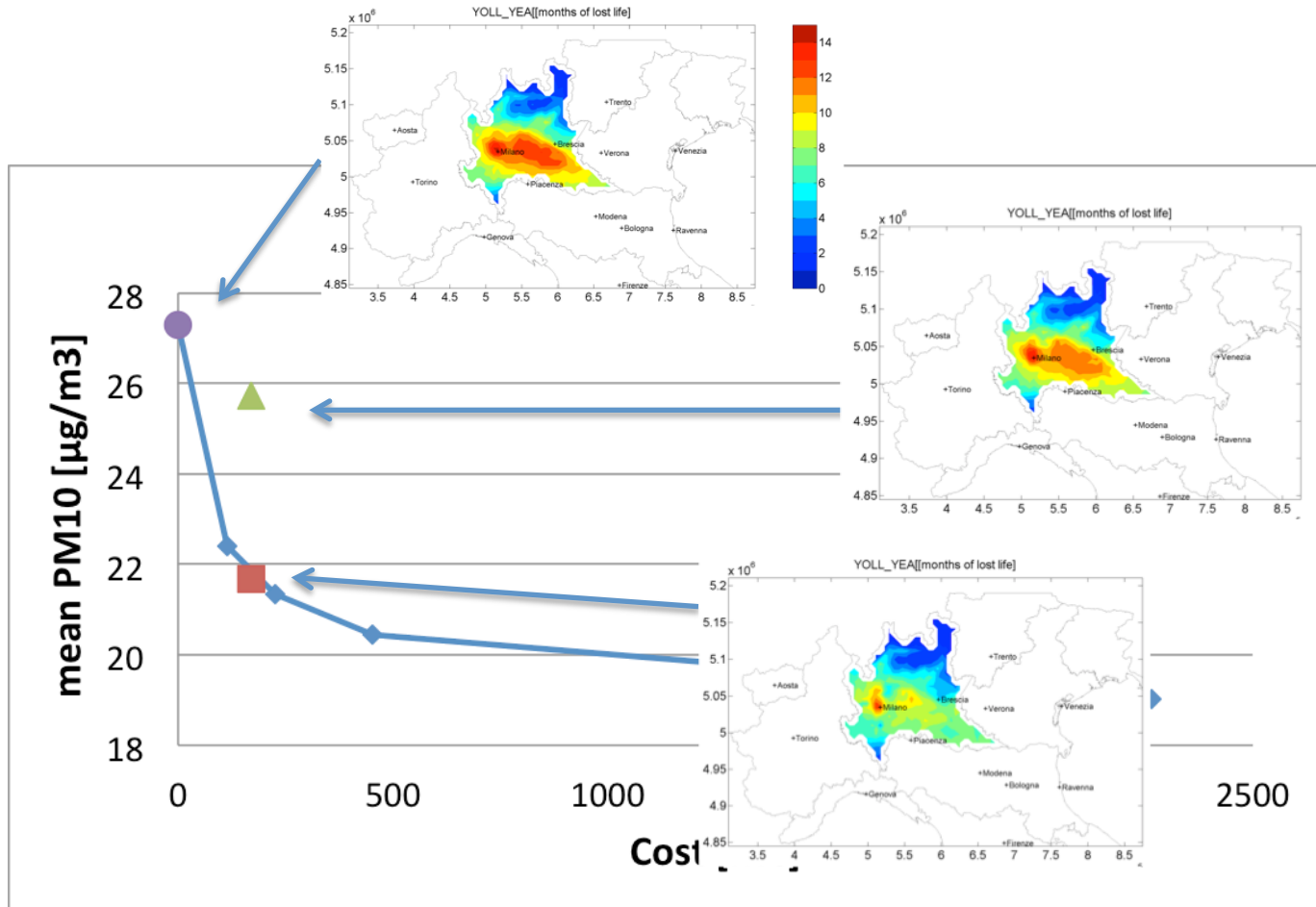


Impacts	CLE	Traffic scenario	Optimized scenario
Emission reduction costs	0 €	171 M€	171 M€
PM10 [$\mu\text{g}/\text{m}^3$]	27,3	- 6%	- 21%
Health costs (PM10)		- 6%	- 19%



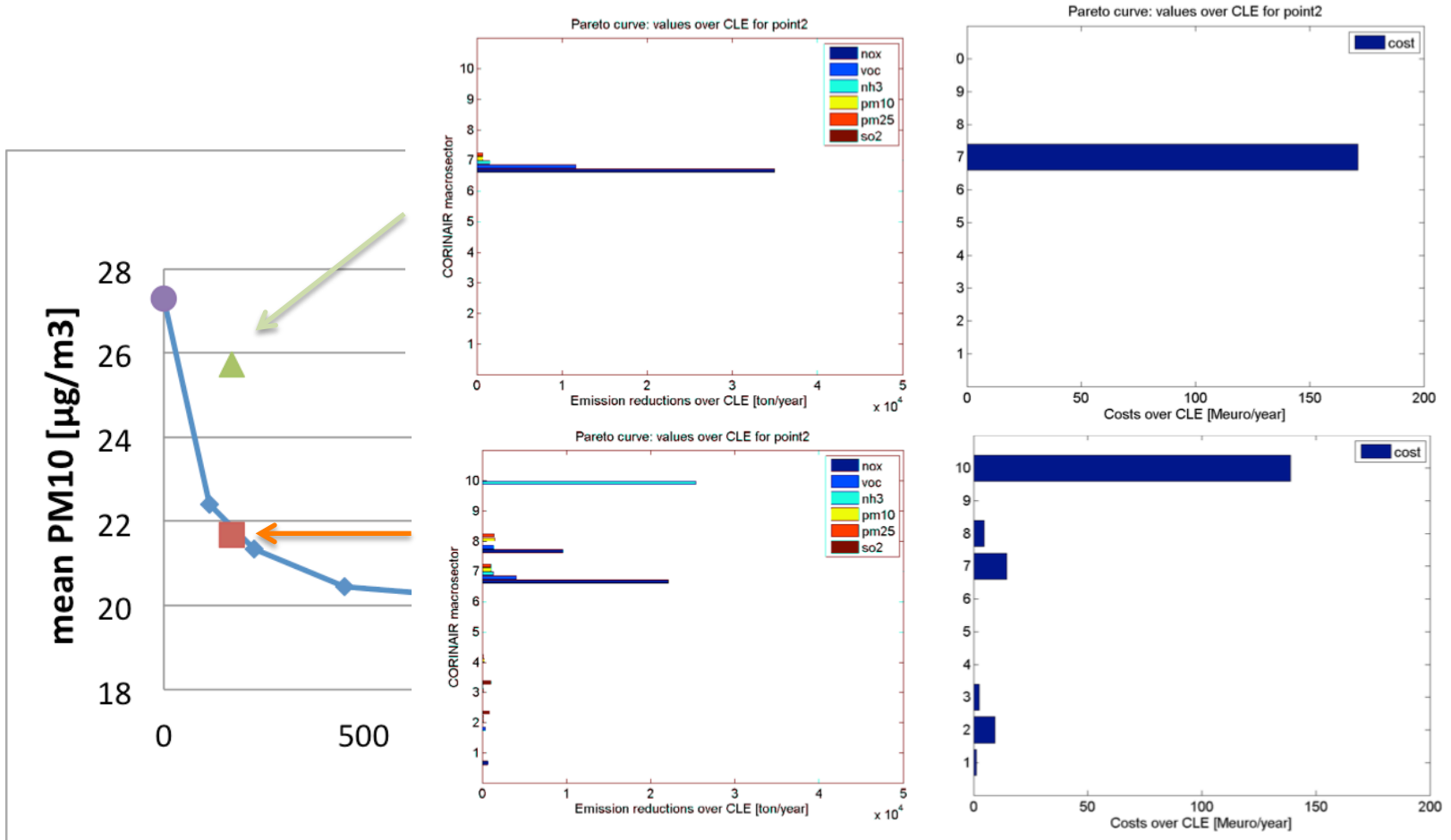


Impacts	CLE	Traffic scenario	Optimized scenario
Emission reduction costs	0 €	171 M€	171 M€
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Impacts

Emission reduction c

PM10 [$\mu\text{g}/\text{m}^3$]

Health costs (PM10)

Activity details

MS	Sector	Activity	Technology	LowHigh	Application rate (0→1)	CLE AR	OPT AR	POT AR
2	Residential-...	Fuelwood...	Biomass ...	1		15.0	74.7	100.0
2	Residential-...	Fuelwood...	Fireplace ...	1		7.0	75.0	100.0
2	Residential-...	Fuelwood...	Biomass ...	1		0.0	14.9	100.0
10	Fertilizer use ...	No fuel use	Urea sub...	1		0.0	100.0	100.0
10	Agriculture: LI...	Pigs - liqu...	Combinat...	1		0.0	57.0	100.0
2	Residential, ...	Medium d...	Thermost...	1		0.0	57.5	57.5
8	Other transp...	Medium d...	Stage 3A ...	1		13.0	31.0	100.0
10	Agriculture: LI...	Dairy cow...	Combinat...	1		0.0	13.8	100.0
7	Heavy duty ve...	Medium d...	EURO VI ...	1		55.8	67.0	100.0
10	Agriculture: LI...	Other pou...	Combinat...	1		32.0	57.0	100.0
10	Agriculture: LI...	Dairy cow...	Combinat...	1		0.0	28.2	100.0
7	Light duty vch...	Medium d...	EURO 6 o...	1		55.9	65.0	100.0

Optimized measures

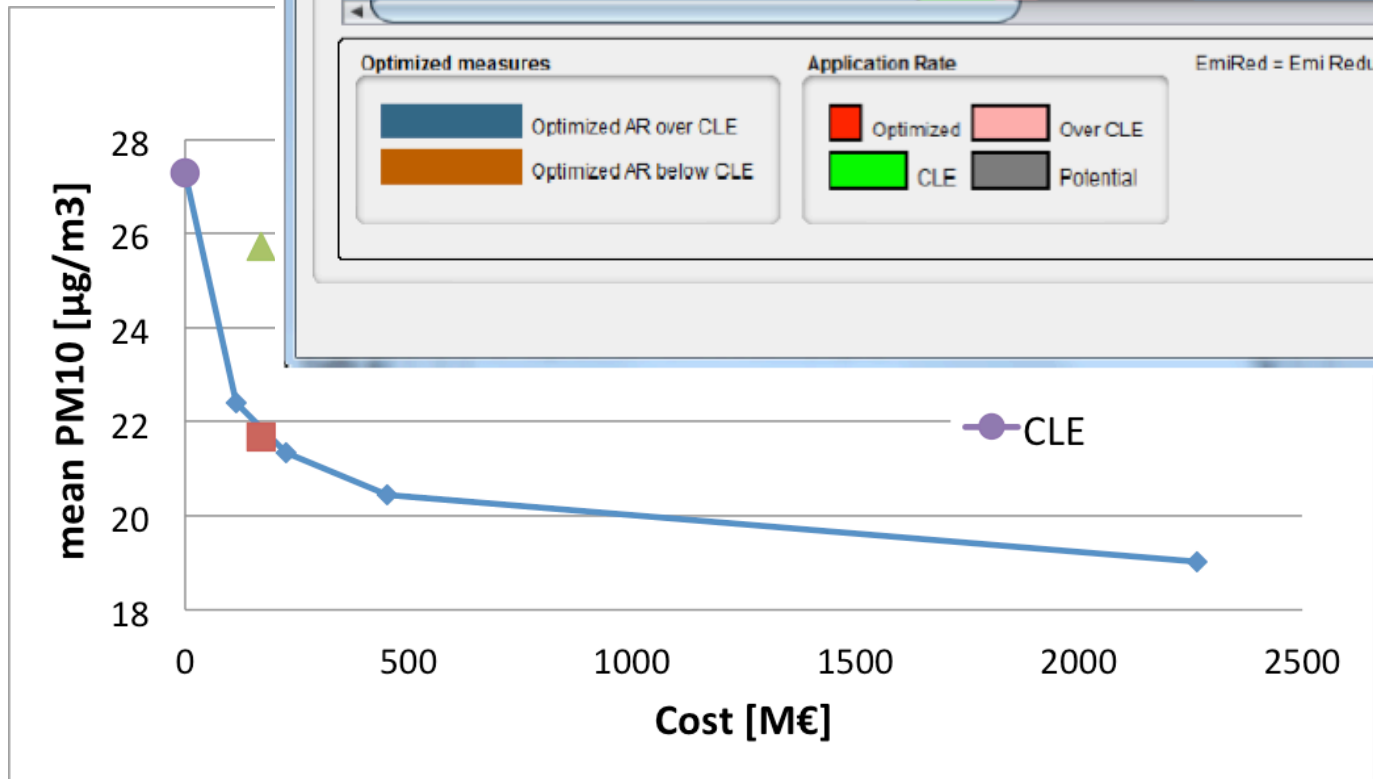
- Optimized AR over CLE
- Optimized AR below CLE

Application Rate

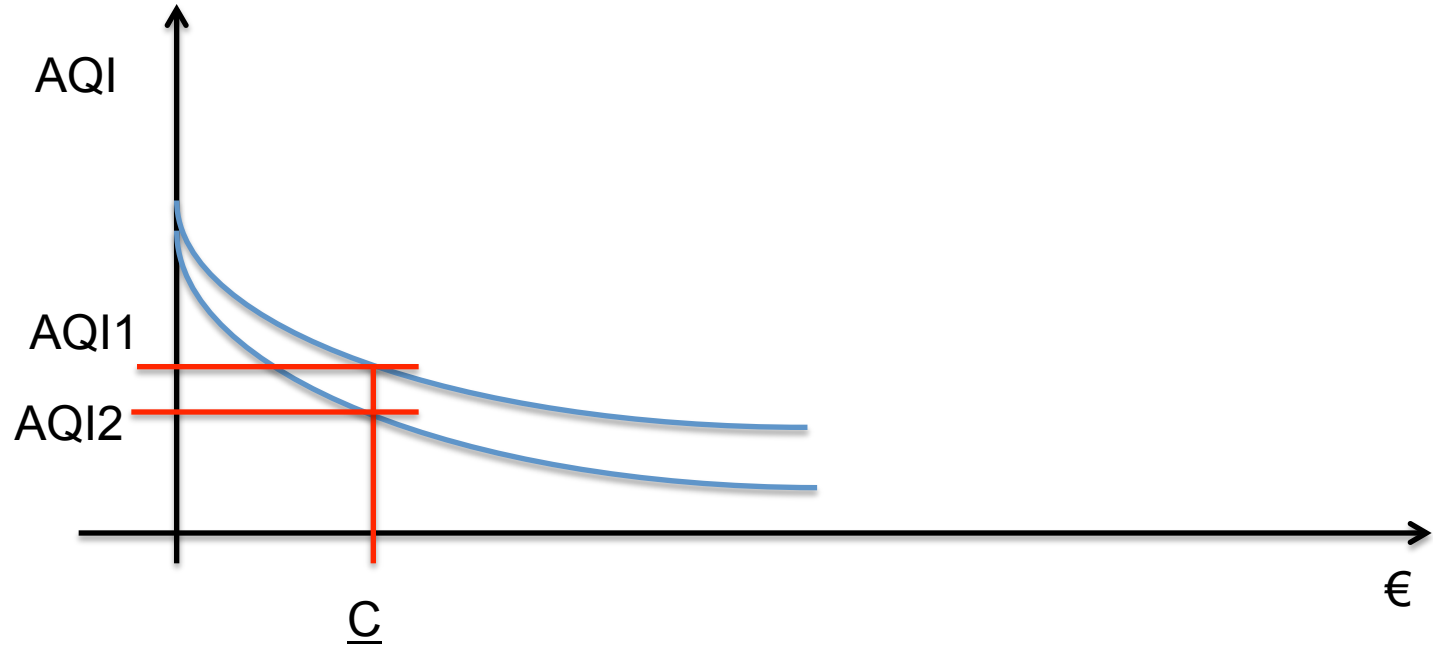
- Optimized
- Over CLE
- CLE
- Potential

EmiRed = Emi Reduced (respect CLE)

Export Excel



Policy uncertainty assessment



FAIRMODE

- **DPSIR block uncertainty**
- **System uncertainty**



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APPRAISAL **final conference**

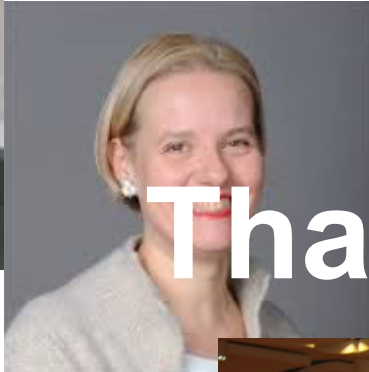
CoR, Brussels (Be)

May 11th 2015

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Links to FAIRMODE



Thank you!

