With the contribution of the LIFE Programme of the European Union
LIFE 15 IPE IT 013

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Monitoring the environmental effects of the air quality plans by special station and intensive observations

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Regione Emilia-Romagna
Regione del Veneto
Regione Lombardia
Regione Piemonte
Regione Autonoma Friuli Venezia Giulia
Provincia Autonoma di Trento
arpae agenzia prevenzione ambiente energia emilia-romagna
arpav Agenzia Regionale per la Prevenzione e Protezione Ambientale del Veneto
Arpa Piemonte Agenzia Regionale per la Protezione Ambientale
ARPA Lombardia Agenzia Regionale per la Protezione dell'Ambiente
ARPA Valle d'Aosta
ARPA FVG Agenzia Regionale per la Protezione dell'Ambiente del Friuli Venezia Giulia
ARSO Environment Slovenian Environment Agency
Comune di Bologna
Comune di Milano
Città di Torino
ERVET Emilia-Romagna Valorizzazione Economica Territorio
FLA Fondazione Lombardia per l'Ambiente

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Thematic Pillars

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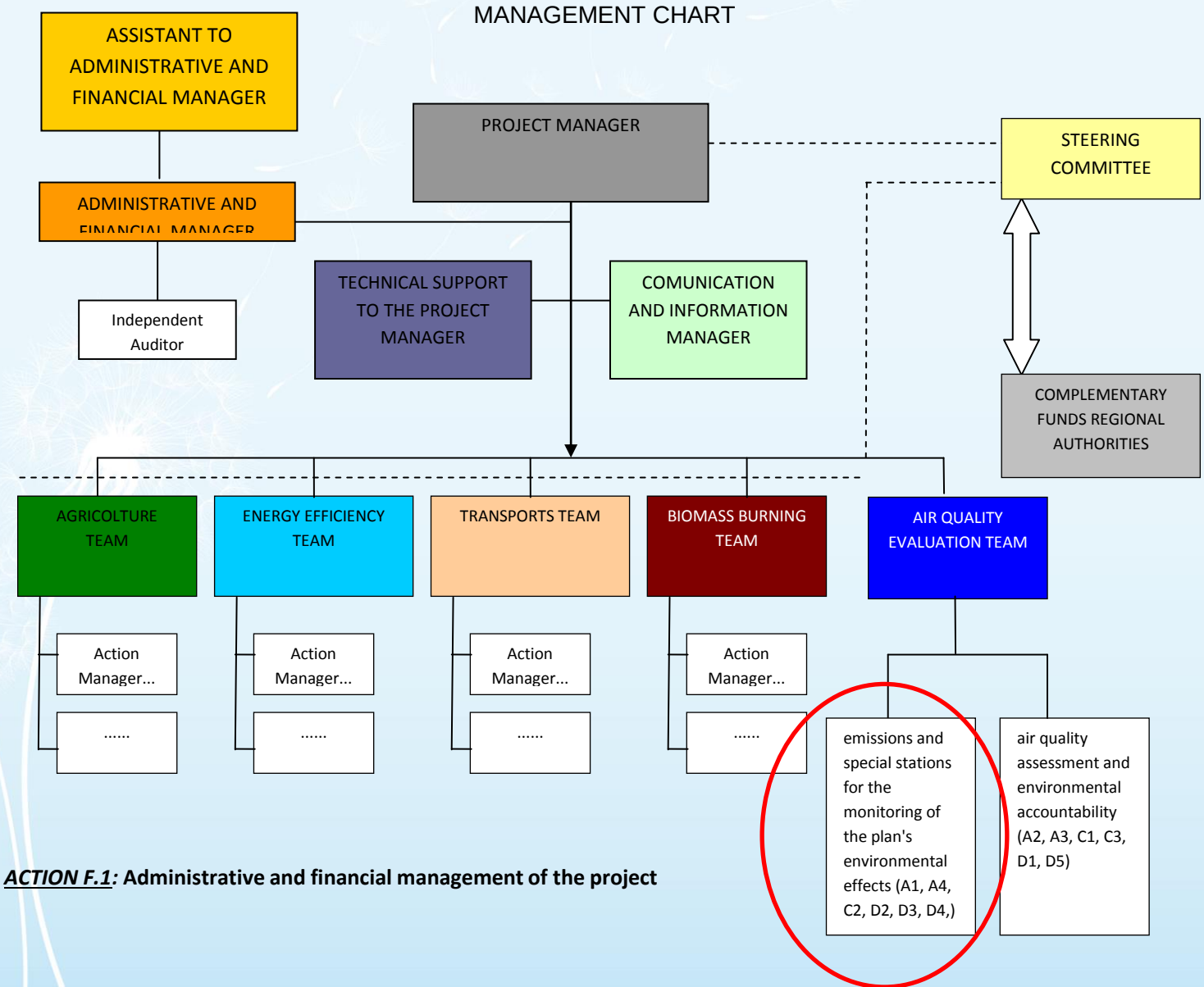

Adapted From: ***ACTION F.1:*** **Administrative and financial management of the project**

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The Actions by pillars

Emissions and special stations (ARPA Lombardy)

- A – Preparatory
  - **A1 Emissions data set**
  - **A4 Setting the measuring protocols for special stations**
- C - Concrete
  - **C2 Implementing the emission data warehouse**
- D - monitoring the impact of project actions
  - **D2 Periodic update of emission data**
  - **D3 Focus on wood consumption**
  - **D4 Focus on traffic flow**
  - **D6 Monitoring of the environmental effects of the plan by special stations**

- Air quality assessment and environmental accountability (Arpae)
- A – Preparatory
  - A2 the “actions and measures” data set and web based platform for collecting data
  - A3 preliminary assessment of the AQ plans impact on air quality
- C - Concrete
  - C1 Implementing the data sharing infrastructure
  - C1 Implementing the Air Quality models
  - C3 Implementing the Integrated Assessment model
- D - monitoring the impact of project actions
  - D1 Periodical collection of the application rate of measures already planned
  - D5 Regular assessment (monthly/yearly) of the air quality of the Po basin

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ACTION A4 Network of special stations for the monitoring of the Plan's environmental effects: definition of the network and of the protocols for measuring

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Coordinator: Arpa Lombardia
Area of implementation:
Emilia-Romagna, Piedmont, Lombardy, Veneto, Valle d'Aosta, Friuli Venezia Giulia and Slovenia
Participants:
Environmental Agencies of the regions involved

Deliverables:
- - 1 document defining the stations, the species and the frequency of measure and the protocols of the measures to be done continuously (30/09/2018);
- 1 document describing the standards for collecting and organizing the data by the existing special stations (30/09/2018);
- 1 document describing the experimental protocol for realizing possible intensive experimental campaigns during the Monitoring and evaluation of the AQ plan (30/09/2018).

Action:

Define the features of the network of special stations (location of the stations and pollutants to be measured) for the monitoring of the plan's environmental effects

measures; the criteria for organizing the data.

- Delivery of documents defining the stations, the species

The action will identify gap and common standards for collecting the samples; the protocols of measures; the criteria for organizing the data.

Timetable
The action will last from December 2016 to April 2018

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ACTION D6 Monitoring the environmental effects of pollutants reduction measures implemented by air quality improvement plans

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Coordinator: Arpa Lombardia

Area of implementation:
Emilia-Romagna, Piedmont, Lombardy, Veneto, Valle d'Aosta, Friuli Venezia Giulia and Slovenia

Participants:
Environmental Agencies of the regions involved

Deliverables:
DB of measurements, populated on a regular base after the first year (31/03/2019; 31/03/2020; 31/03/2021; 31/03/2022)
- 1 report about the source apportionment of PM (and of other pollutants when possible) (30/04/2021)
- 1 final report about the source

Action:

- Executions of routine sampling in the special stations network defined in action A.4.

source apportionment techniques to identified the evolution of the contributions of the different sources.

- It will be evaluated the possibility to conduct Specific intensive additional campaigns (to be evaluated in action A.4.)

action A.4.

will last from February 2017 and December 2018

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What to measure?

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Pollutants/species:

- Regulated & critical pollutants as PM10, PM2.5, NO2, O3
- Main Species: OC/EC/TOC (OptC), Ions, elements, (OptC)
- Tracers of specific sources
- In PM10 or PM2.5?

Some example:

- Traffic: OC/EC/Black Carbon, PM10/PM2.5, Cu, Zn, Si, Al, Ca, Ti (PAHs)
- Some industrial plants: Fe, Zn, Mn, other heavy metals, OC/EC
- Biomass burning: levoglucosan, OC/Black & Brown Carbon, K, Rb, (PAHs)
- Agriculture and farms: NH3
- Secondary pollution: [NH4]2SO4, NH4NO3

To discuss carefully with the partners:

Black Carbon / Brown Carbon

Number concentration of micro/nano particles – size distribution

Very Useful for high resolution information but… …their definitions, measurement methods and standards… …their sustainability after the end of the project…

consider them for intensive and temporary campaigns?

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Where to measure?

- Urban background stations
- Urban traffic stations?
- Rural background stations
- Rural remote stations?

The stations will be located in the territory of Lombardy, Emilia-Romagna, Piedmont, Veneto, Valle d'Aosta, Friuli Venezia Giulia and Slovenia regions.

It is possible to identify 4-5 stations where to measure with high frequency and other sites where to conduct temporary and/or intensive campaigns

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Why it is so important

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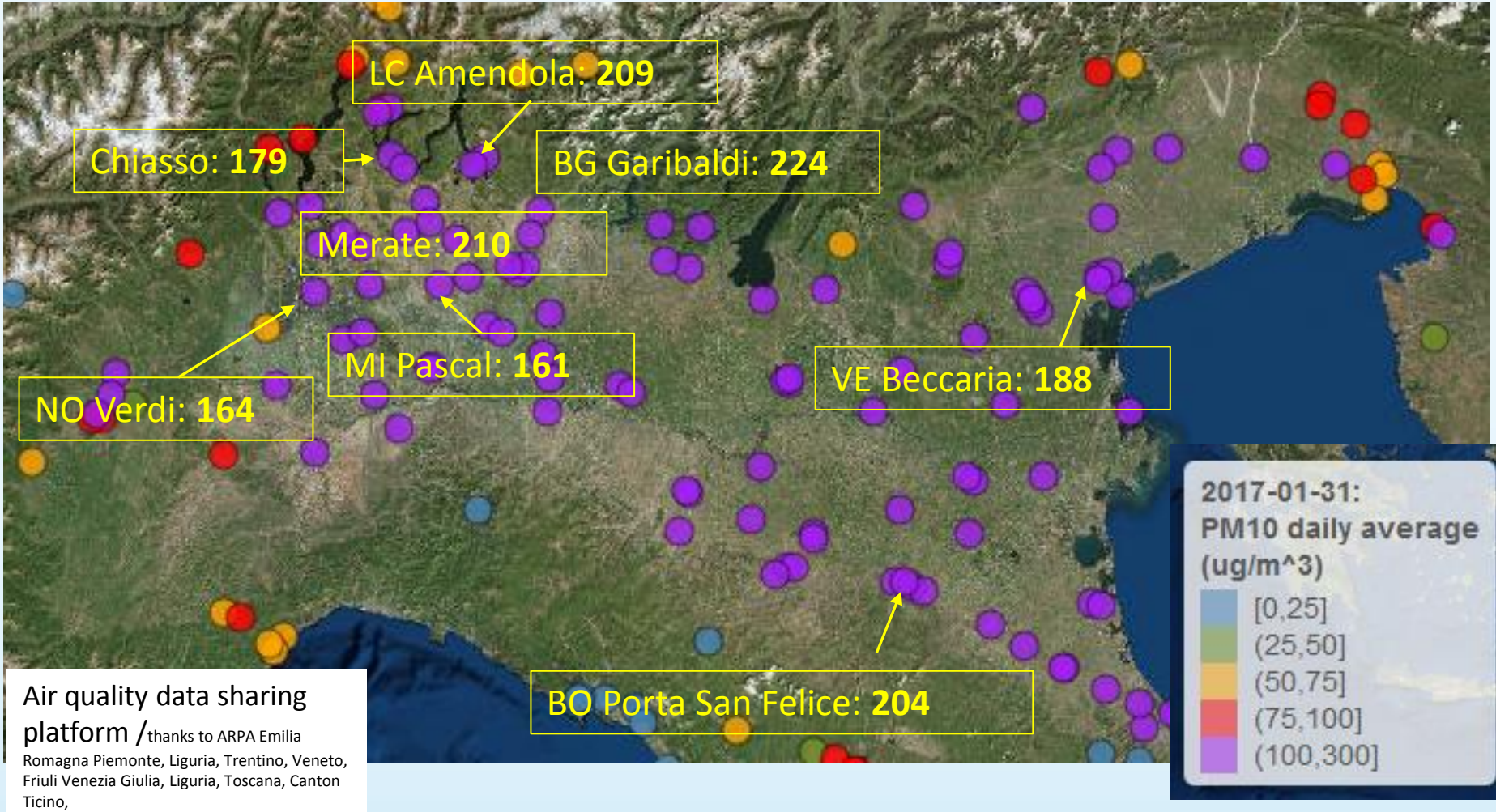

Air quality data sharing platform /thanks to ARPA Emilia Romagna Piemonte, Liguria, Trentino, Veneto, Friuli Venezia Giulia, Liguria, Toscana, Canton Ticino,

PM10 – Daily averages (µg/m3) 31 January 2017

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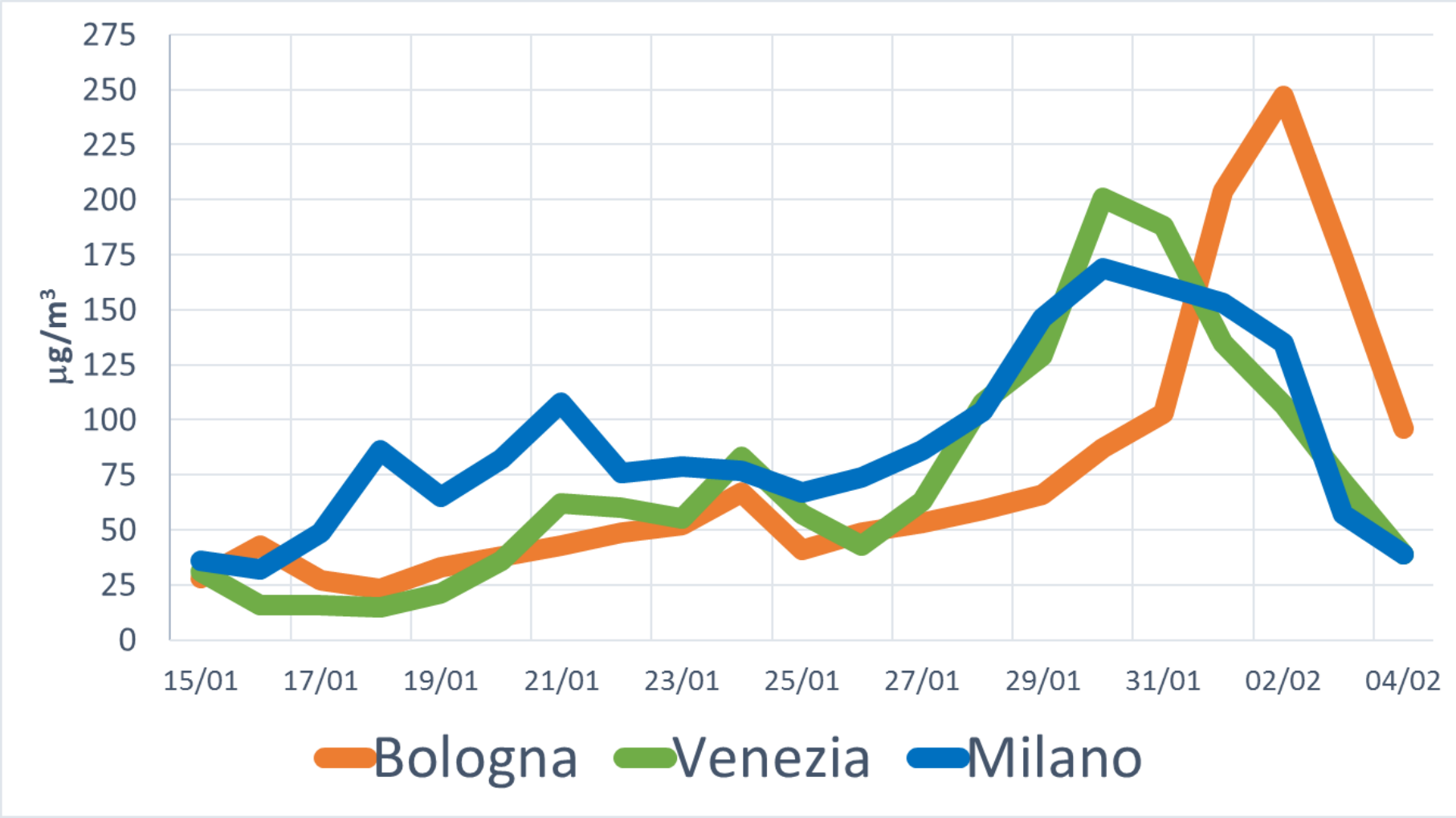

PM10 15.1.17 – 4.2.17
daily averages Milano, Bologna e Venezia

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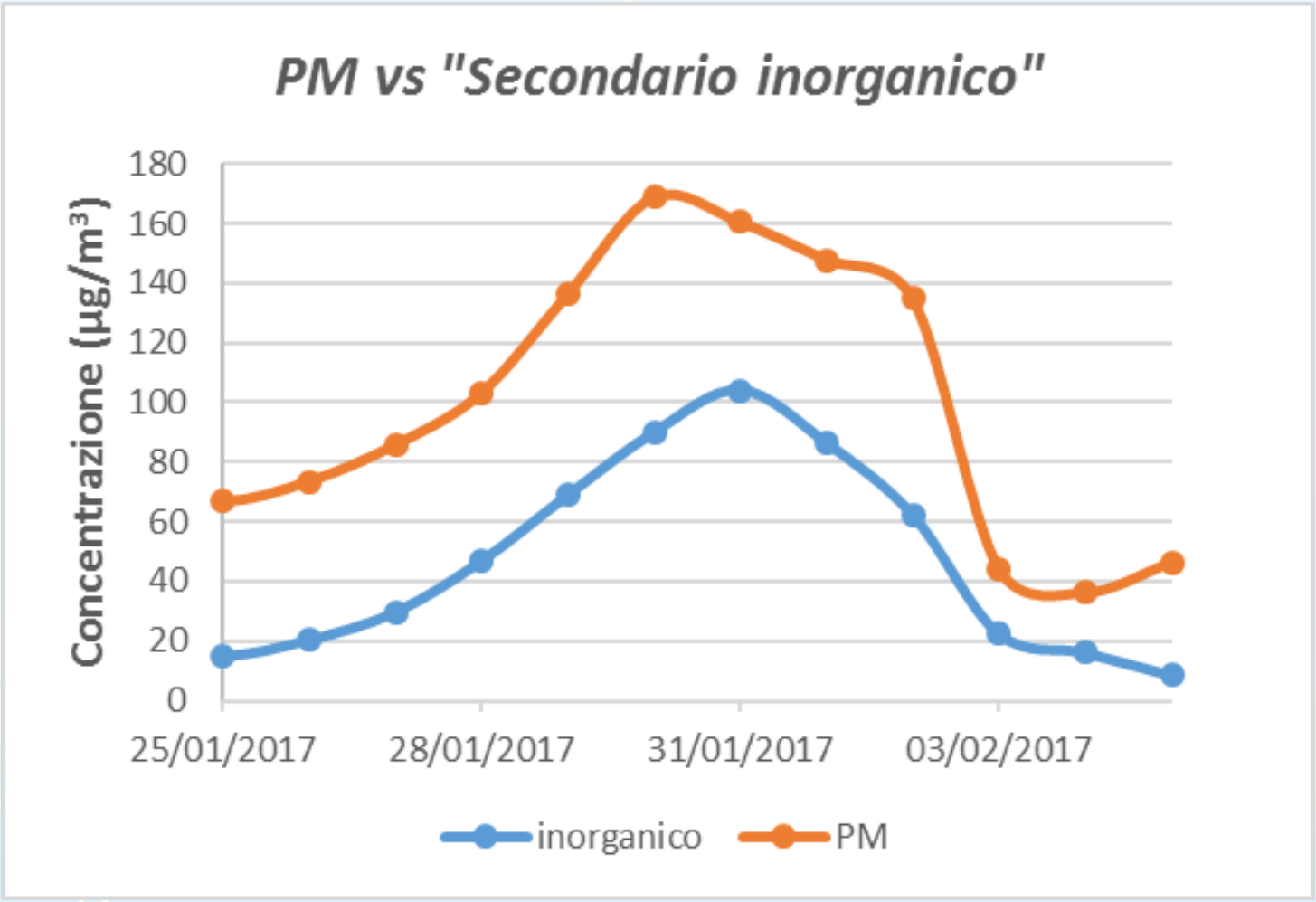

PM10 and secondary inorganic in Milano 25.1.17 – 3.2.17

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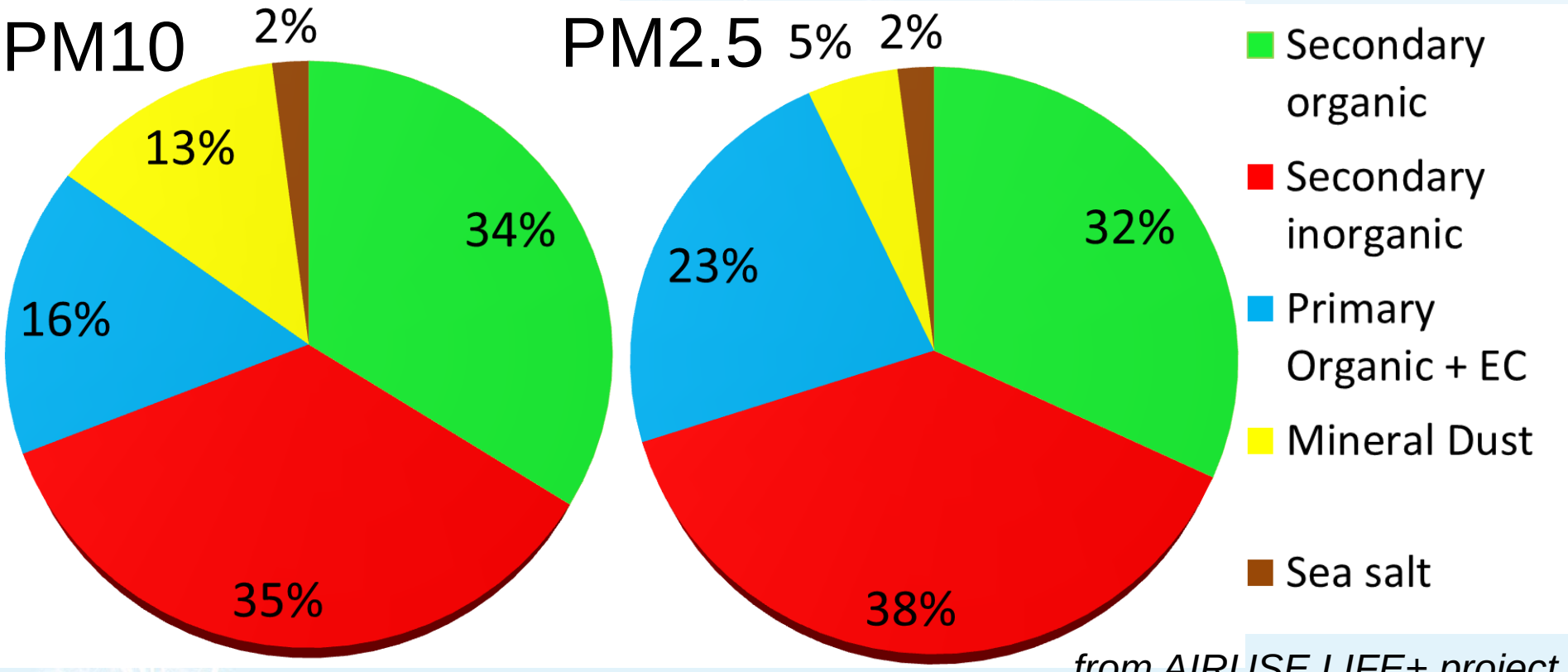

from AIRUSE LIFE+ project

Milan PM composition

Urban background station annual average

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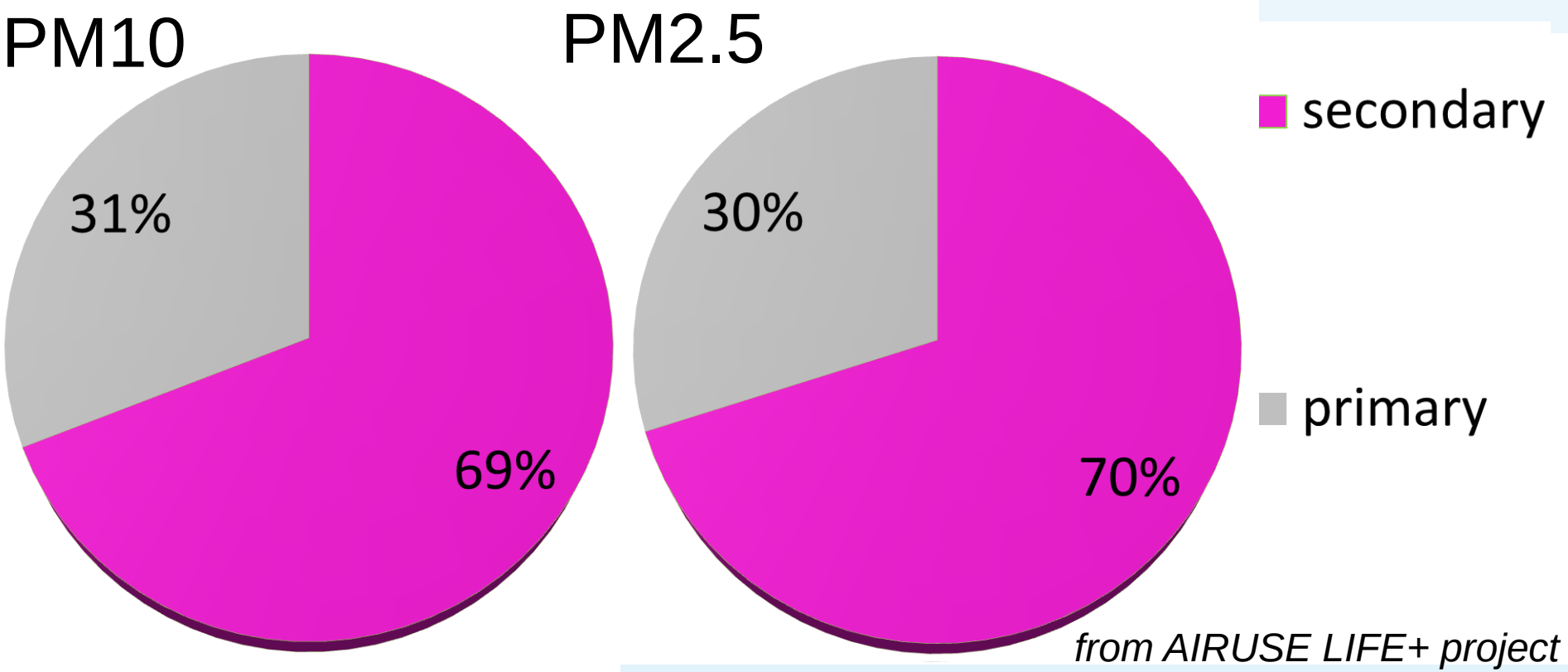
Why it is so important



from AIRUSE LIFE+ project

- The scale of secondary PM is the whole basin
- Local actions are not very effective for secondary PM
- It is necessary to limit precursors emissions, too
- Agriculture is the most important source of ammonia

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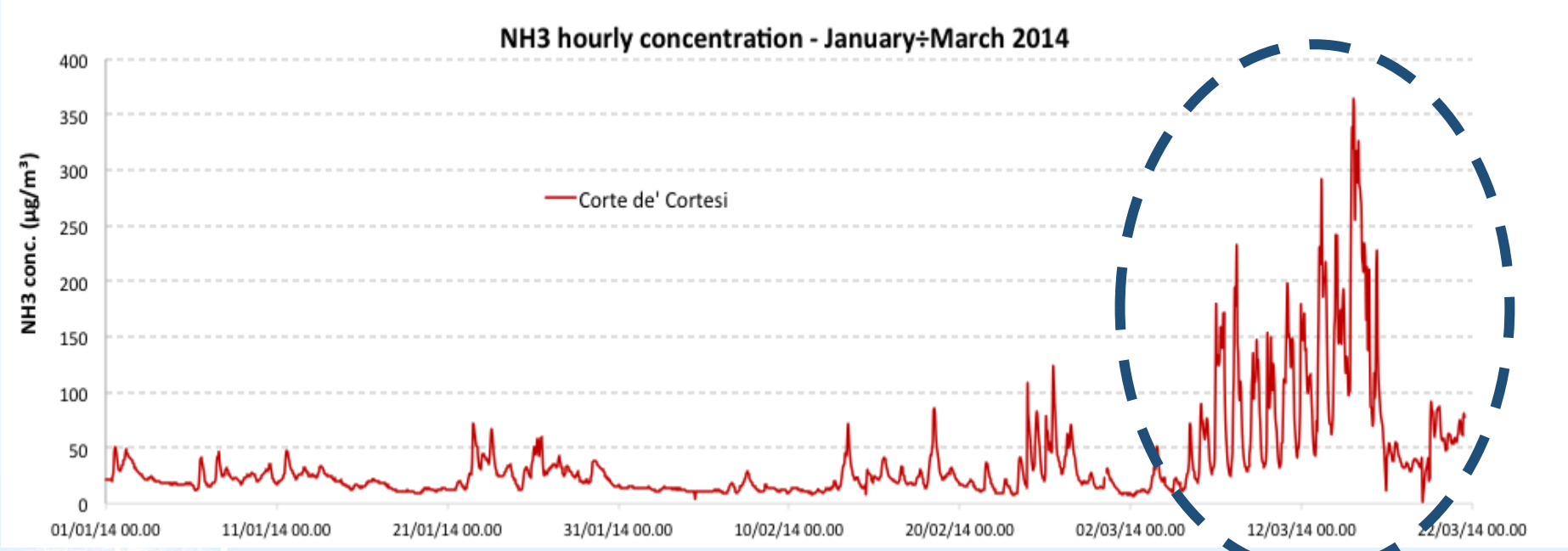
Measured NH_3: the Transport and Transformation – An application



Event connected with the start of spreading slurry on agricultural land

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Why it is so important

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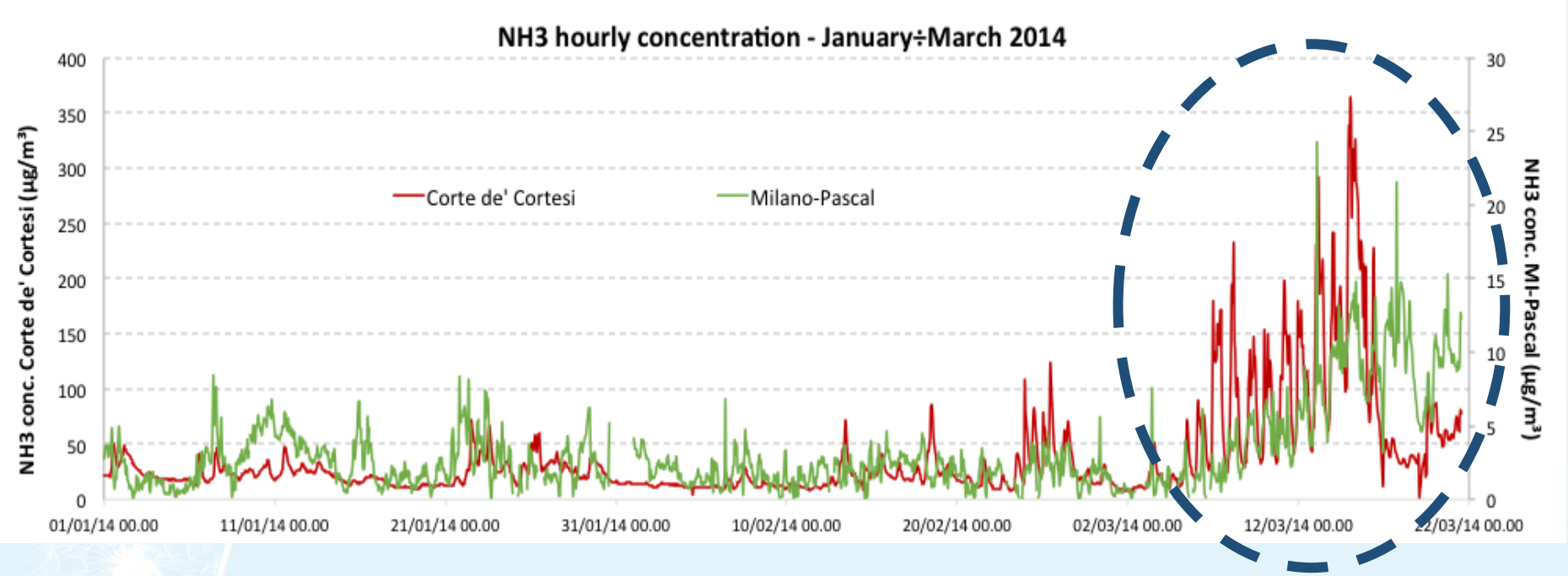
Measured NH_3: the Transport and Transformation – An application



Event connected with the start of spreading slurry on agricultural land

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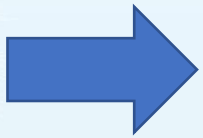
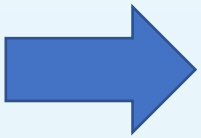
Action C.4

Promoting an ammonia low –emission application on fertilizers based on urea in agriculture

Influence on spatial distribution of ammonia concentration



Influence on inorganic secondary particulate matter formation



Action D.6

Lower concentration of Ammonium Nitrate

Lower concentration of PM2.5 (PM10)

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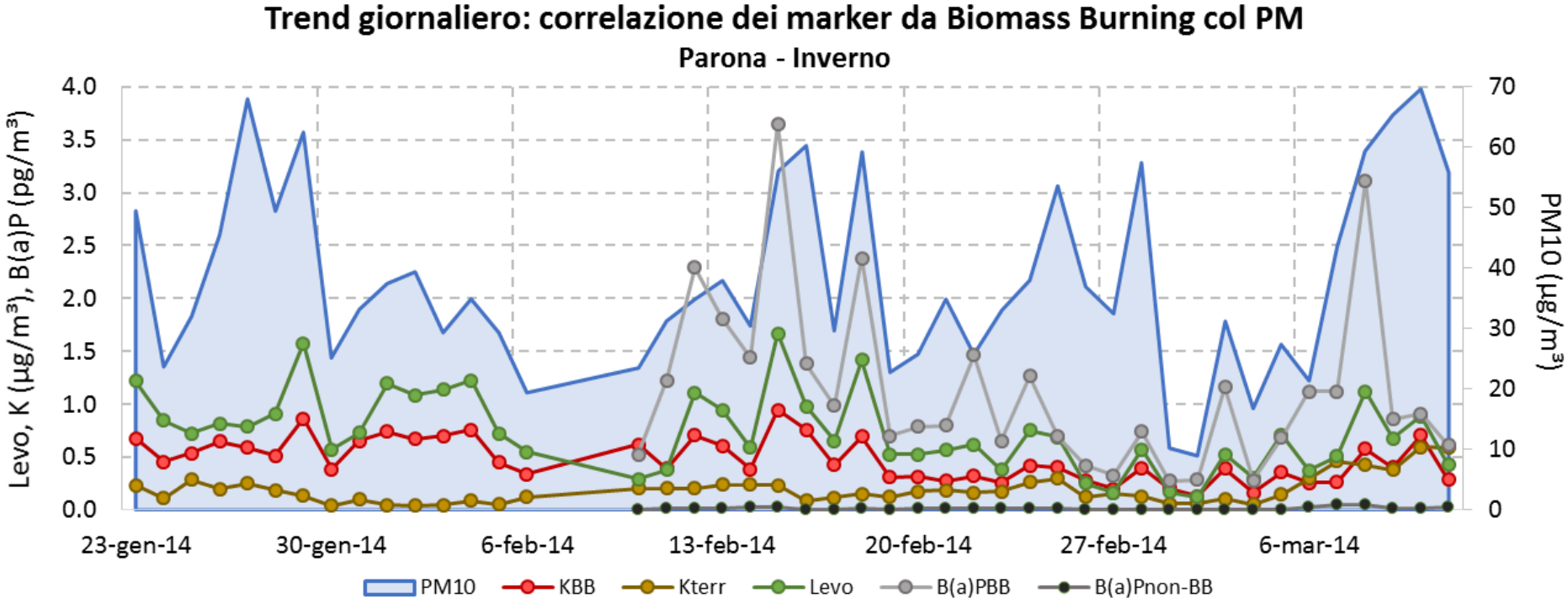
K, levoglucosan, PAH markers of biomass burning



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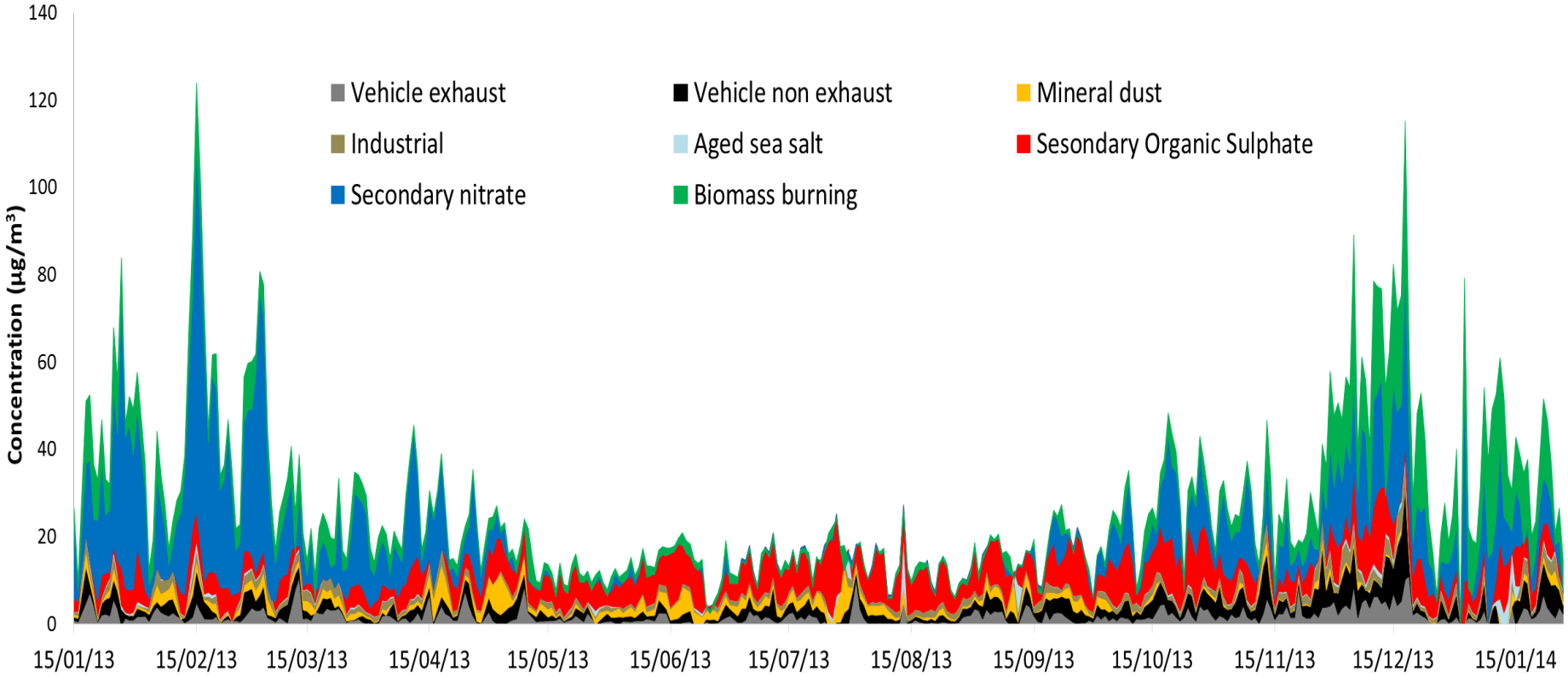
PM2.5 Milano Pascal



PMF5: daily averages

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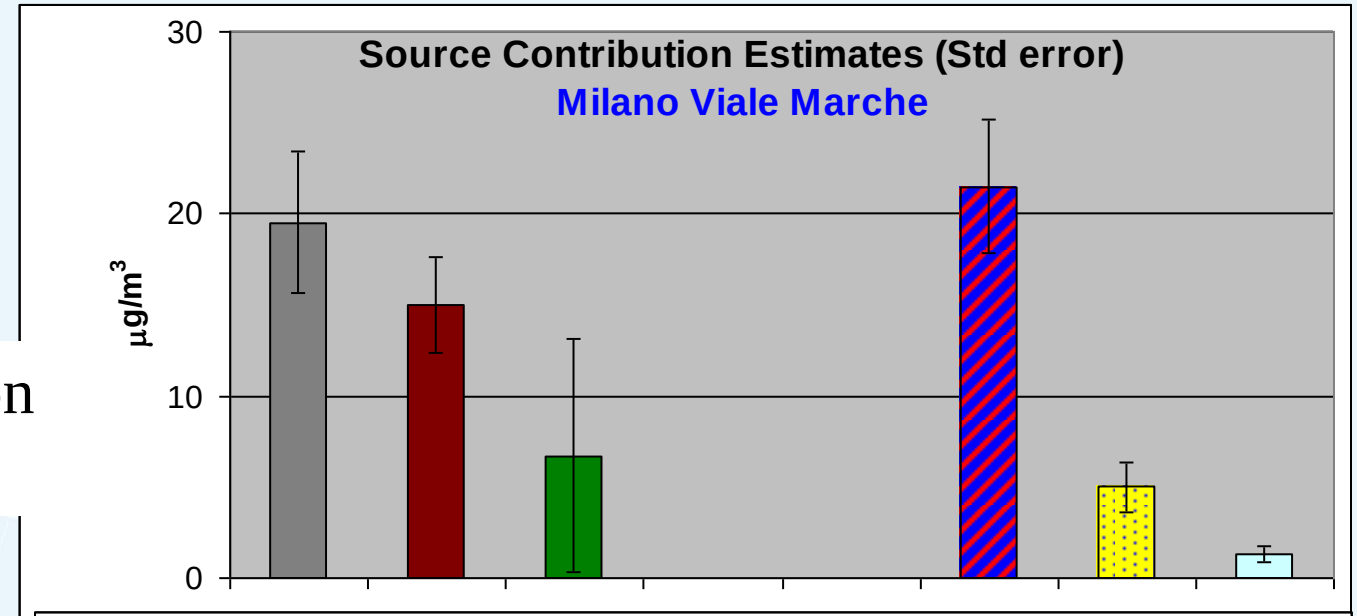
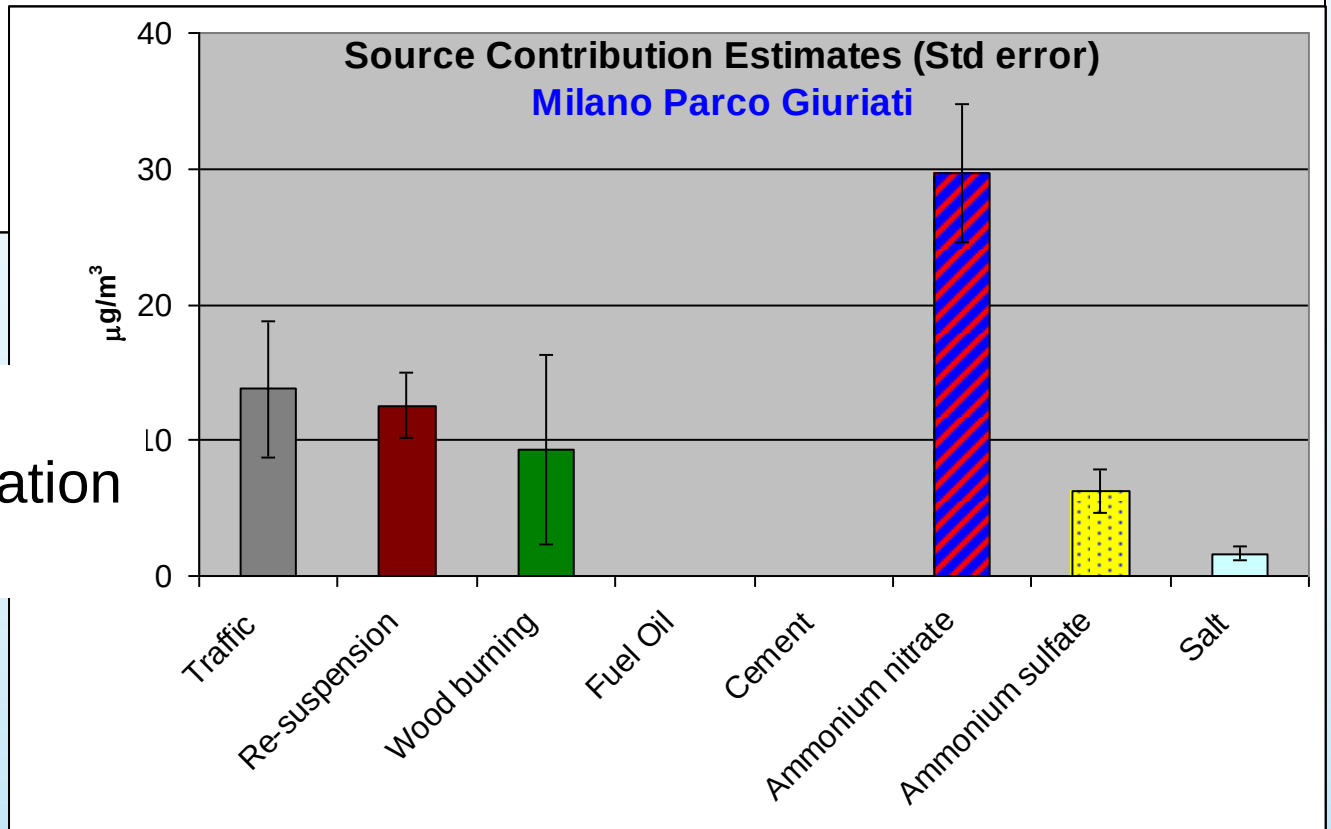
Milan, Traffic station
Annual average



Milan,
Urban Background station
average



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Thank you for your attention