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CHALLANGES FOR PM AND BaP IN PO VALLEY, WITH PARTICULAR REFERENCE TO THE CONTRIBUTION OF BIOMASS BURNING

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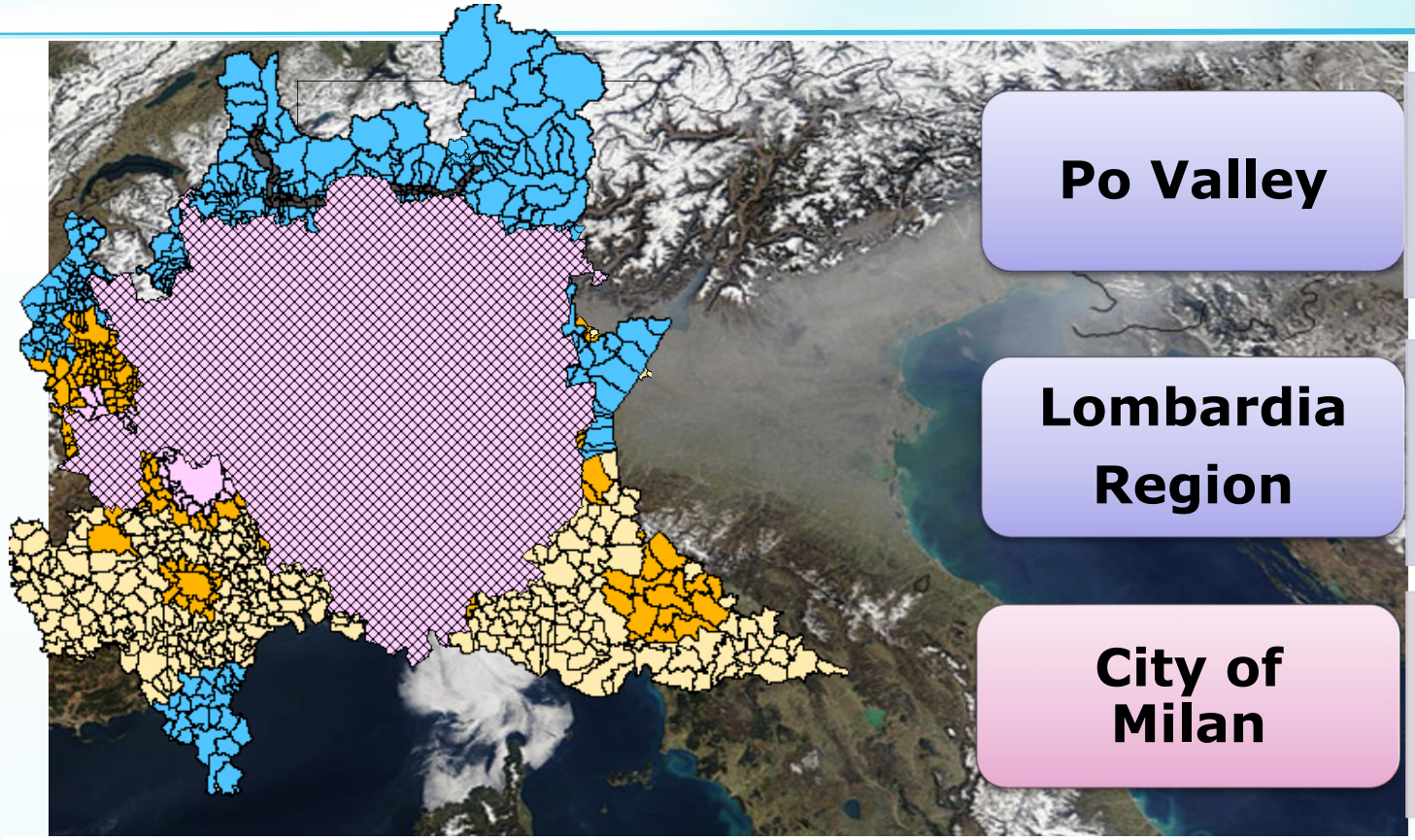
MILANO, LOMBARDIA AND PO VALLEY: WHERE AND HOW MANY



Po Valley

- **Inhabitants: 24 milion**
- **Population density: 264 inab/km2**

Lombardia Region

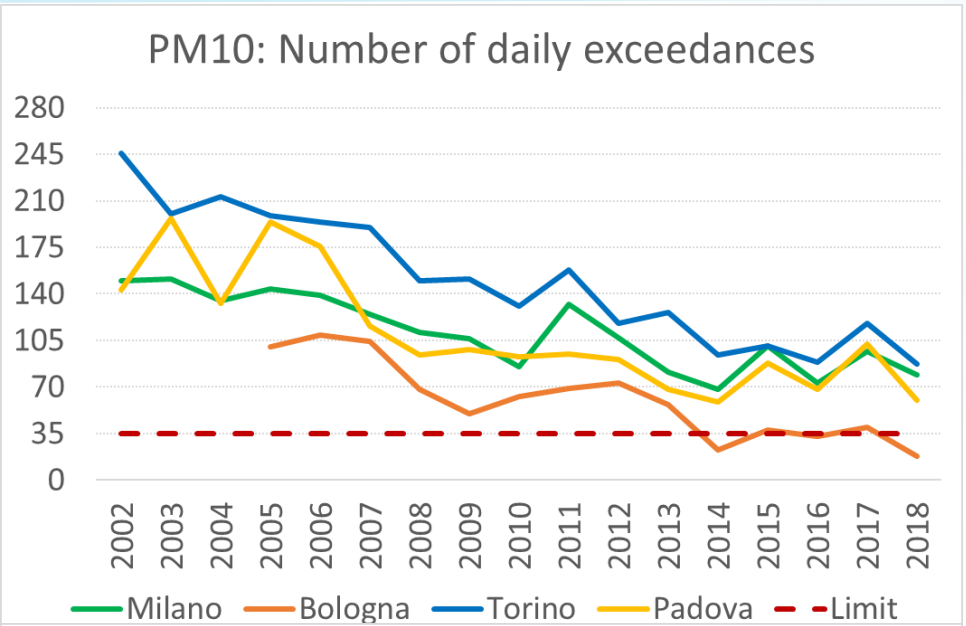
- **Inhabitants: 10 milion**
- **Population density: 419inab/km2**

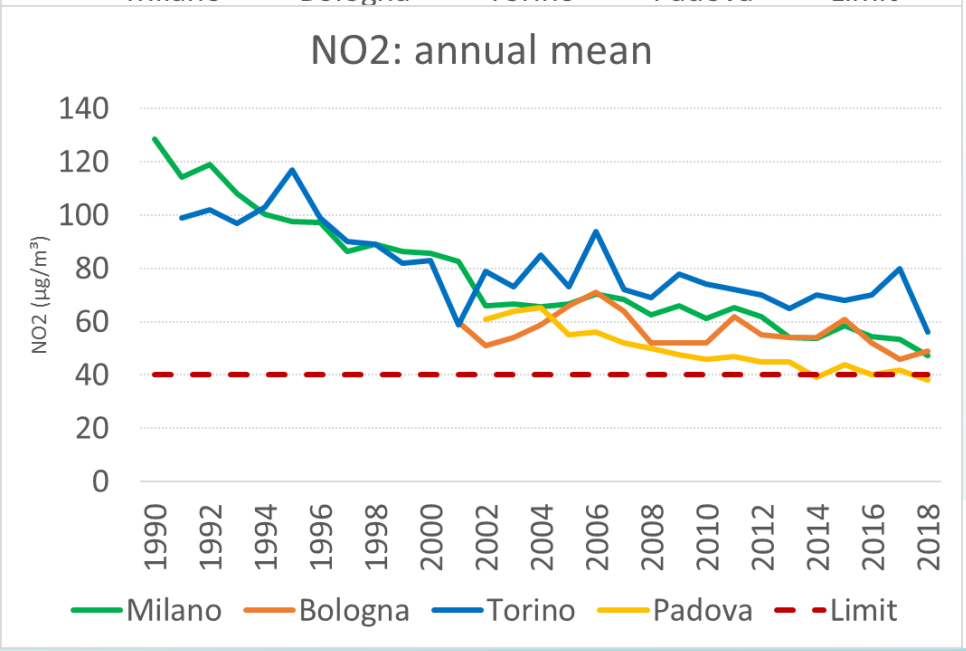
City of Milan

- **Inhabitants: 1,3 milion**
- **Population density:7.272inab/km²**

- Po Valley: closed by mountains exceeding 2500 m a.s.l. on three sides (highest peaks exceeding 4000 m a.s.l.)
- Meteorological conditions often adverse to air pollution dispersion

AIR QUALITY: Concentrations are decreasing, but:





- Widespread **PM10** daily limit exceedances (79 in Milan in 2018)
- **NO2** annual limit exceedances, especially in traffic stations (2018 worst annual mean 59 µg/m3)
- **B(a)P** standard non achieved where wood burning is more diffuse(outside downtown)
- Widespread exceedances of both health and vegetation **Ozone** protection standards (above all leeward of the town)

Po Valley Emissions by macrosector

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Pm10: Primary

Sector	NOx	NH_3	PM10	NMVOC
Energy production and refineries	7 %	0 %	1 %	0 %
Residental combustion	9 %	0 %	55 %	8 %
Industrial combustion	15 %	0 %	3 %	1 %
Production processes	3 %	0 %	3 %	5 %
Extraction and distribution of fuels	0 %	0 %	0 %	3 %
Solvent use	0 %	0 %	1 %	25 %
Road Transport	53 %	2 %	23 %	7 %
Other mobile sources	11 %	0 %	5 %	1 %
Waste treatment and disposal	1 %	1 %	0 %	0 %
Agriculture	1 %	97 %	6 %	18 %
Other sources and sinks	0 %	0 %	2 %	32 %

The most from wood

Source: Life project PREPAIR

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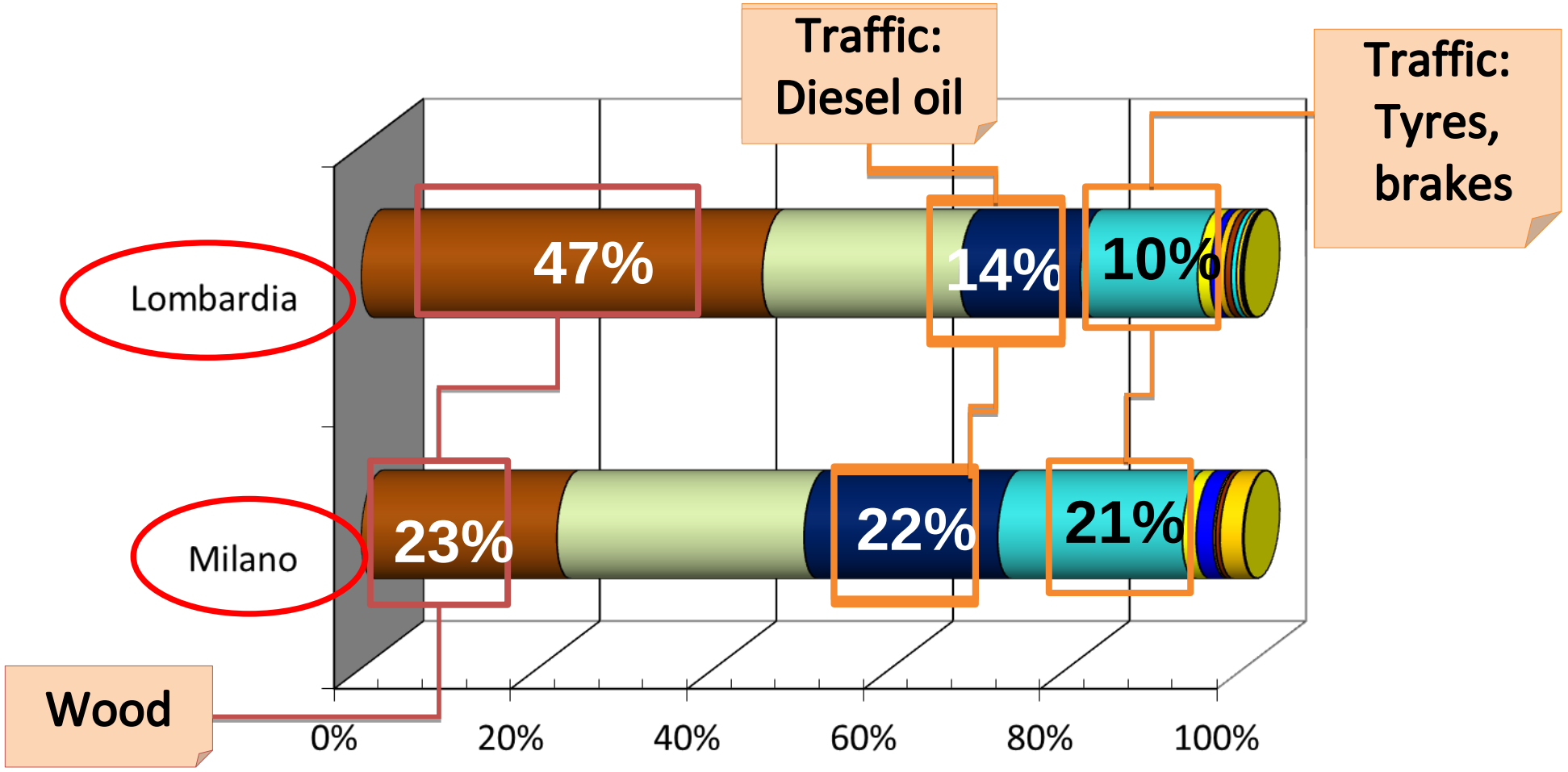
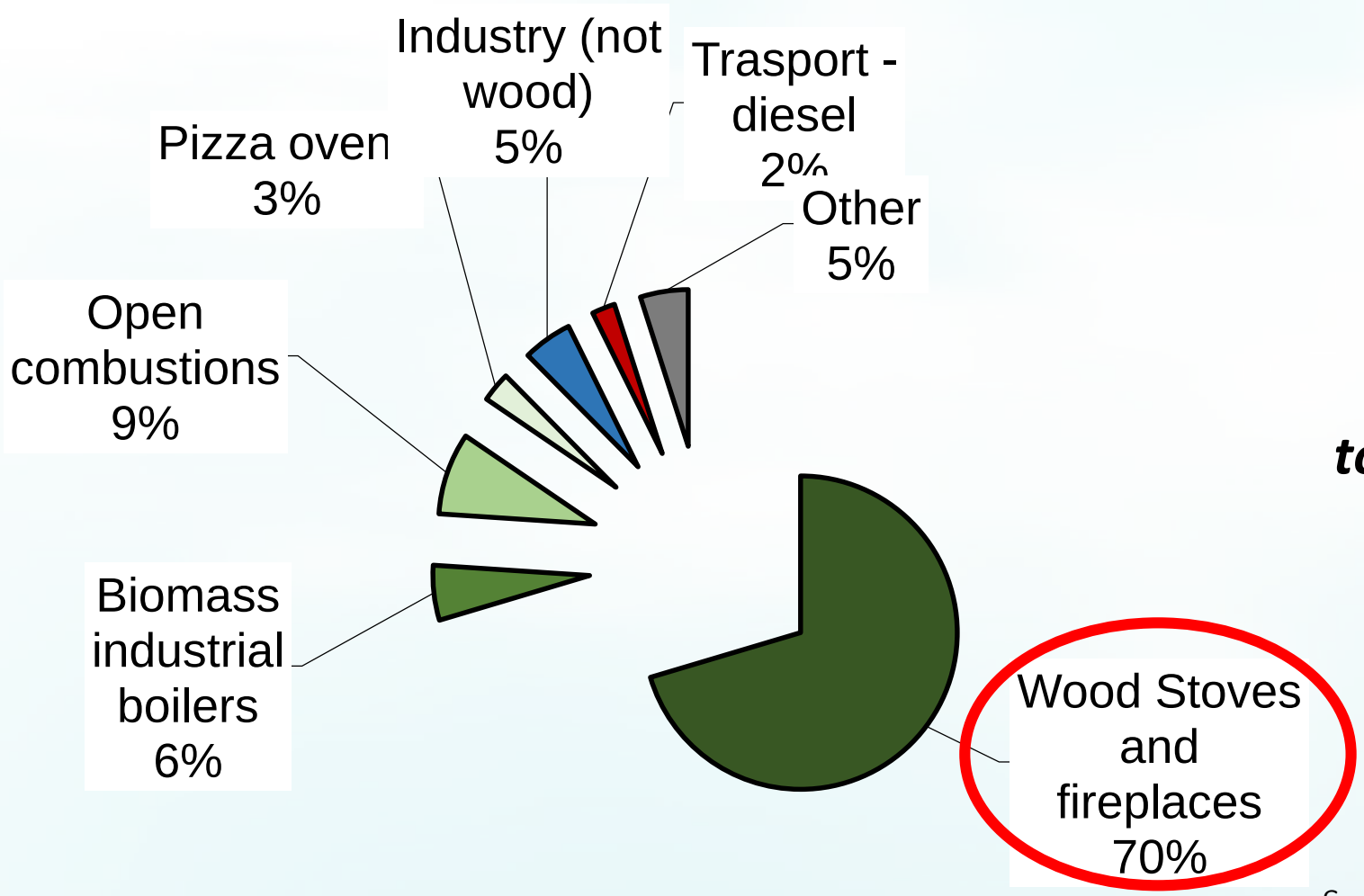
Primary PM10 Emissions by fuel in Lombardia and in Milan



Source: www.inemar.eu

B(a)P emissions by fuel in Lombardia



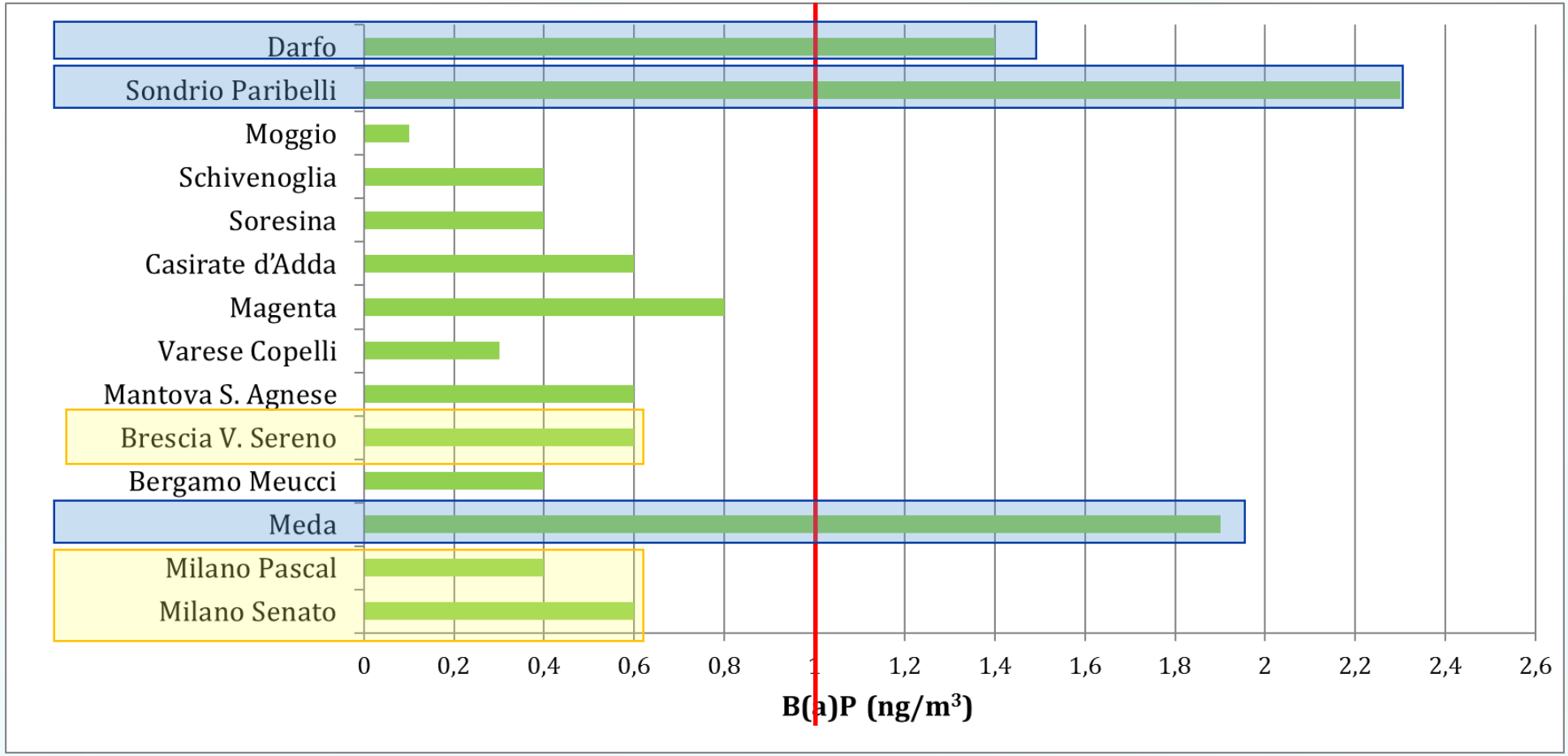
Wood combustion for domestic heating is the first source of BaP

Wood combustion is important also from a toxicological point of view

Source: www.inemar.eu

Have we evidence of the emission data in the real world ?

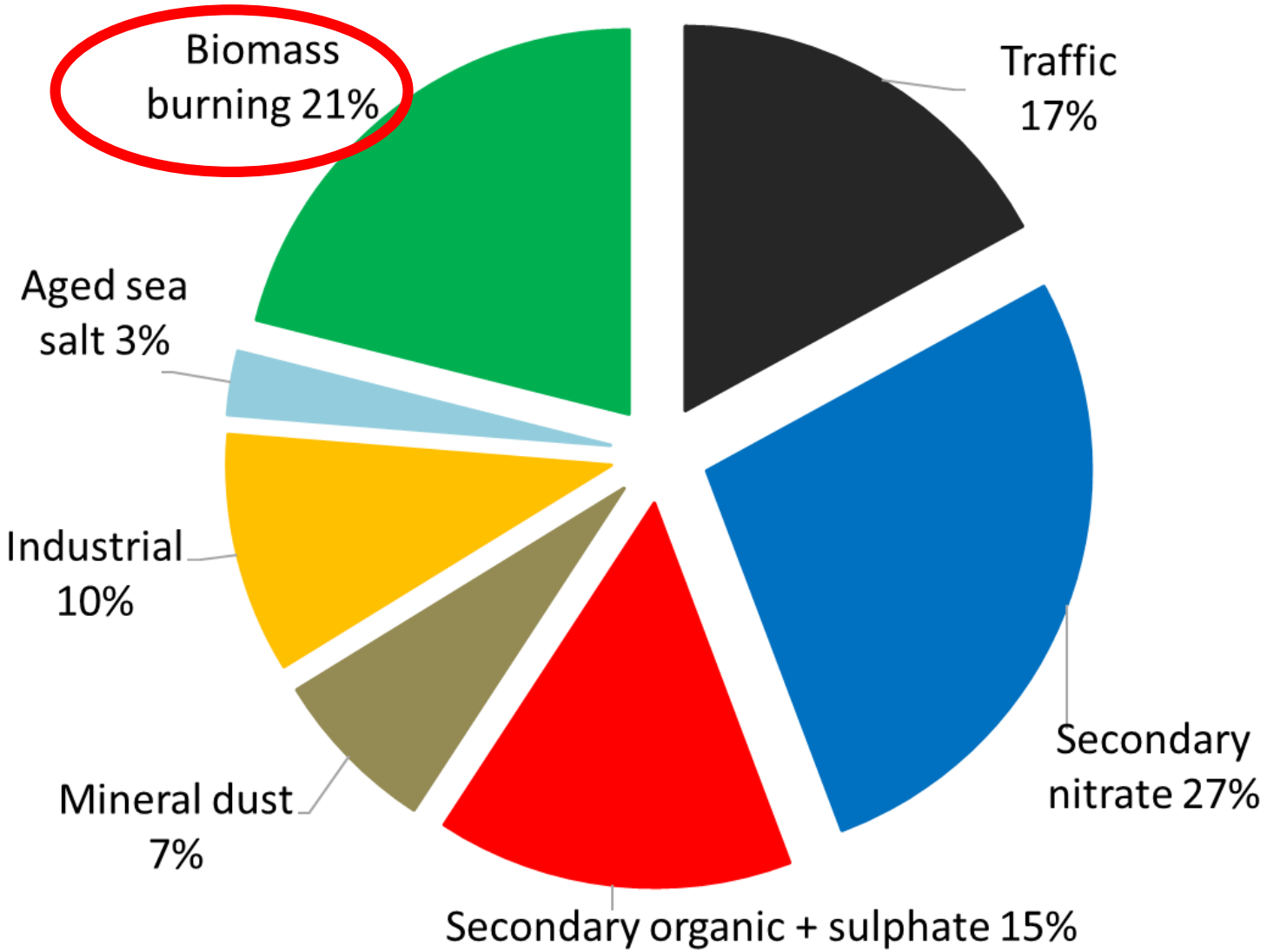
B(a)P concentrations in Lombardia (yearly average)



The highest values are not measured in the cities but in the areas where wood burning is more widespread

Have we evidence of the emission data in the real world ?

Milano, PM10 source apportionment



Source: Life project AIRUSE

Have we evidence of the emission data in the real world ?

Darfo Project, PM10 source apportionment

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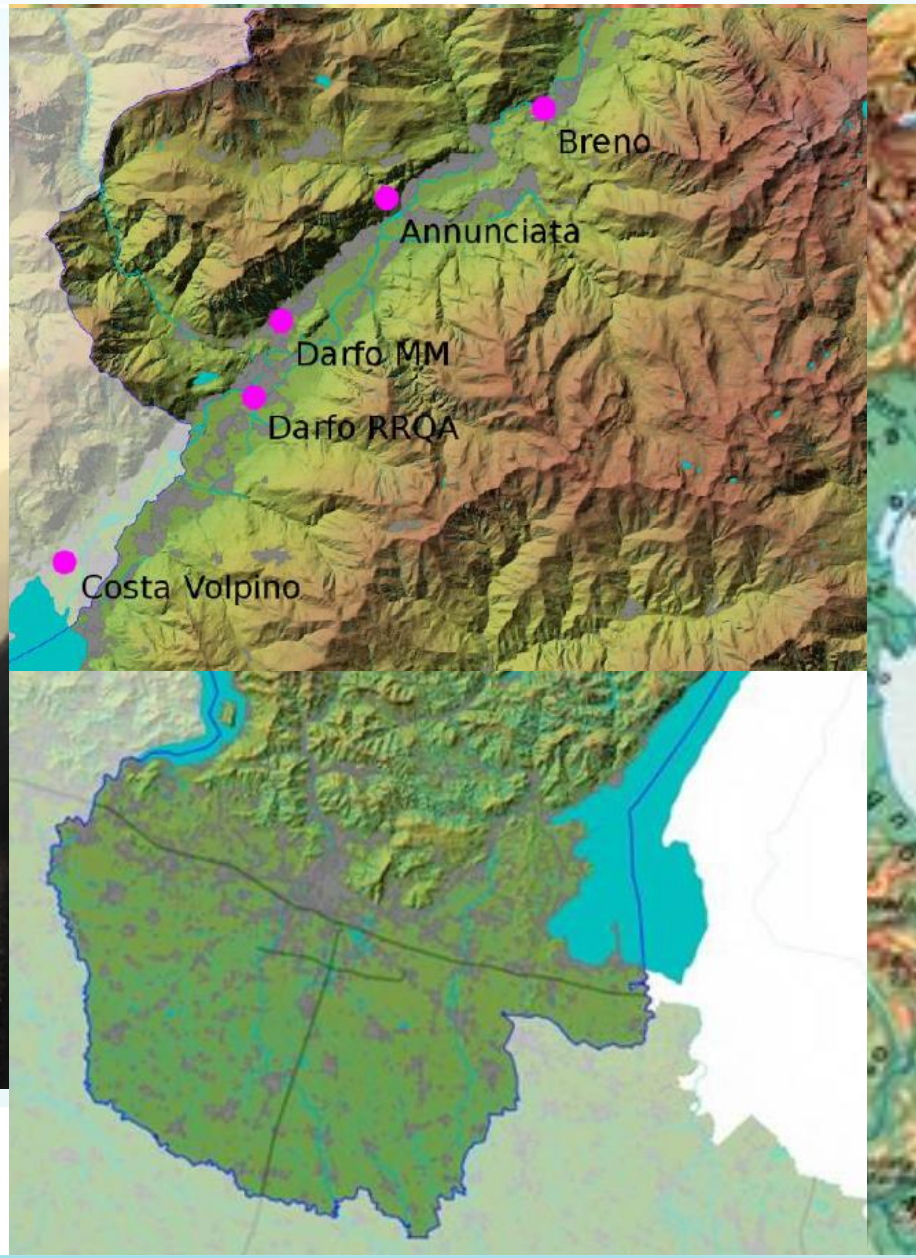

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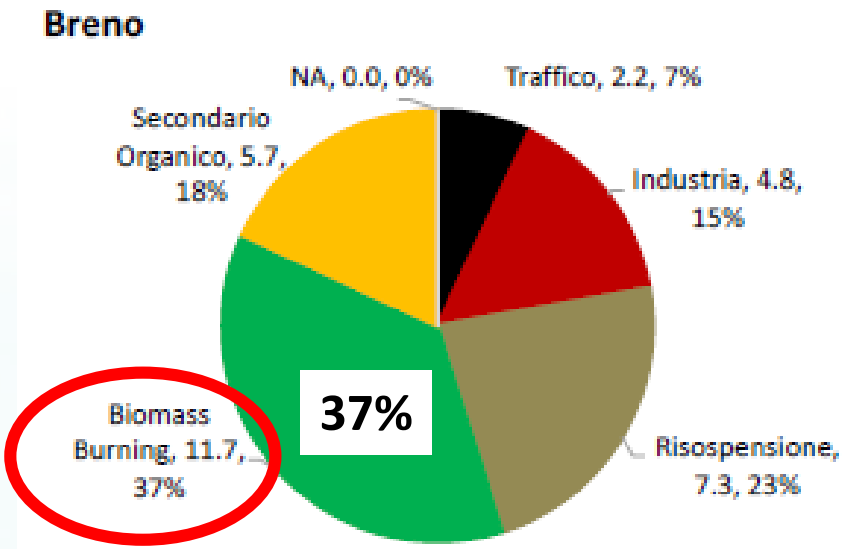

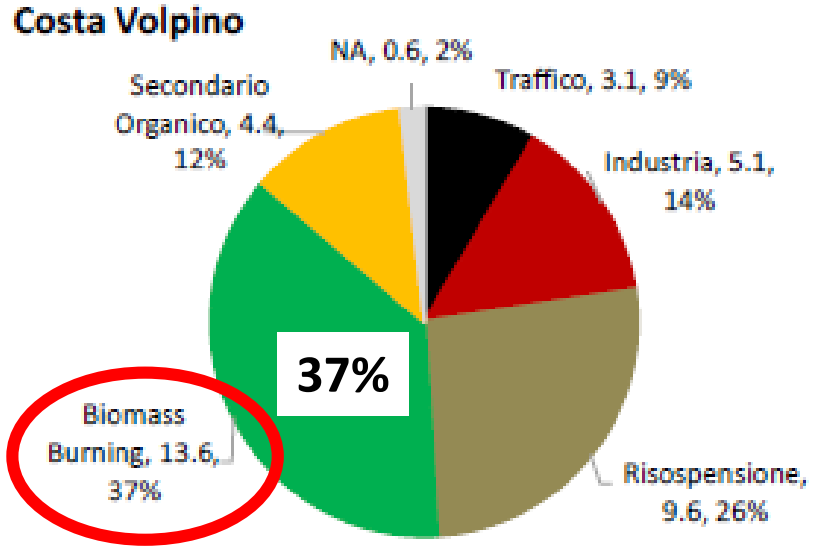

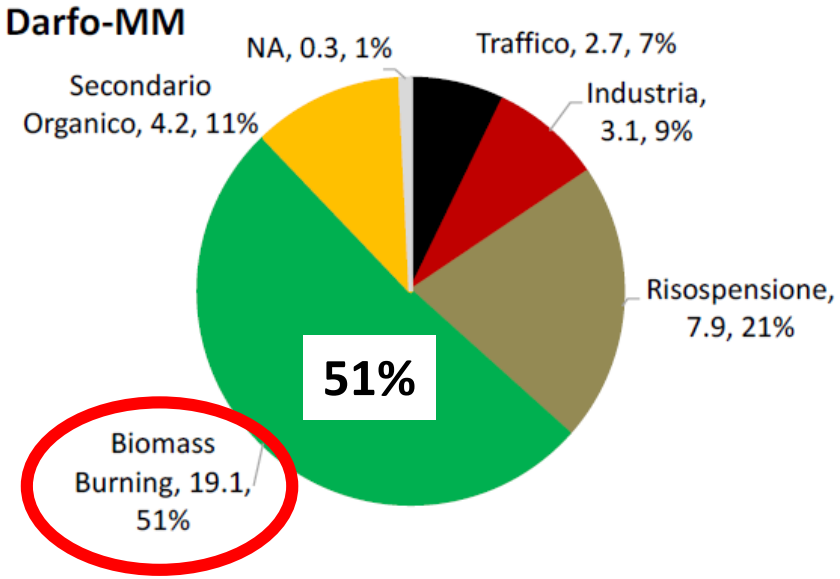

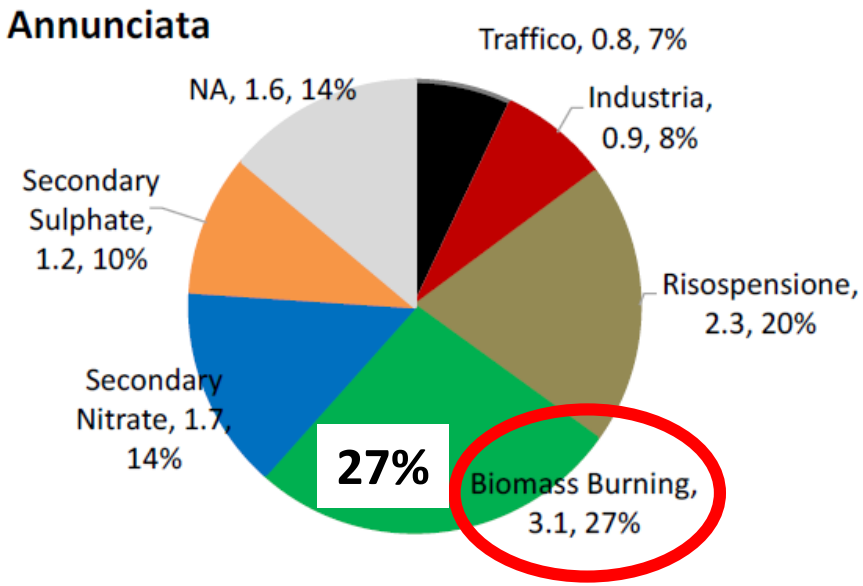

Similar results in rural plain (Lomellina Project)

A path towards a reduction of the impact of biomass burning

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Identification of different emission classes of stoves

Italian Decree n. 186 2017.11.7

5 classes defined on the base of PM10, NOx, CO and OGC emissions and energy yield for wood and pellets stoves, towards measures of bans and incentives

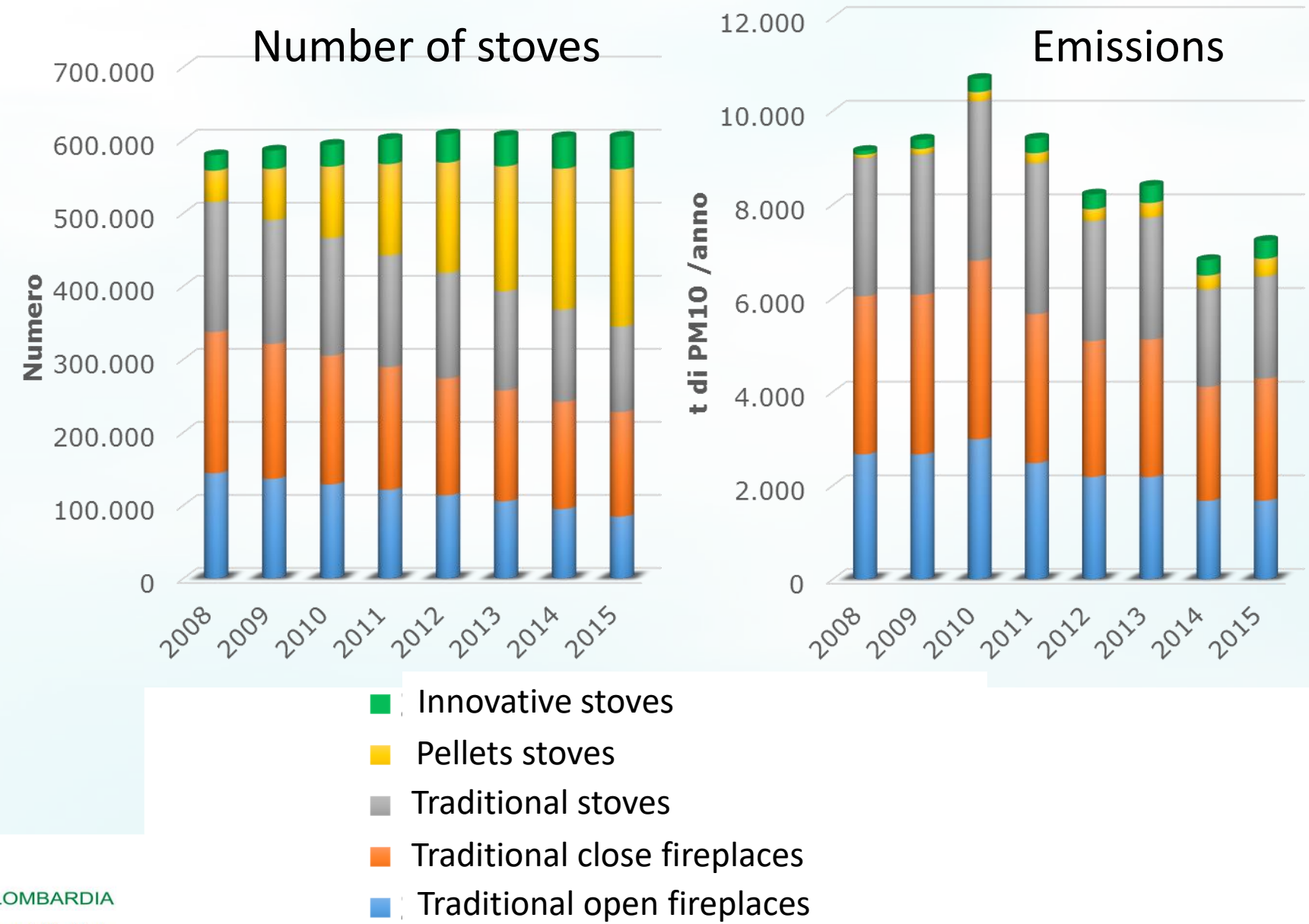
Incentives for substitution of old appliances (National «CONTO TERMICO»)

Po Valley Agreement: Rules for installation, maintenance and use of the stoves and fireplaces step by step more ambitiuos

Key implementation challenges

- **Cultural – INFORMATION is a KEY FACTOR** (people don't believe in the impact of this source but not always know the importance of a correct use, avoiding in particular to burn improper materials)
- Legal
- Economical
- Technological (the BAT stoves should still improve to «be comparable» to natural gas in the cities)

A path towards a reduction of the impact of biomass burning



Thank you for your attention