

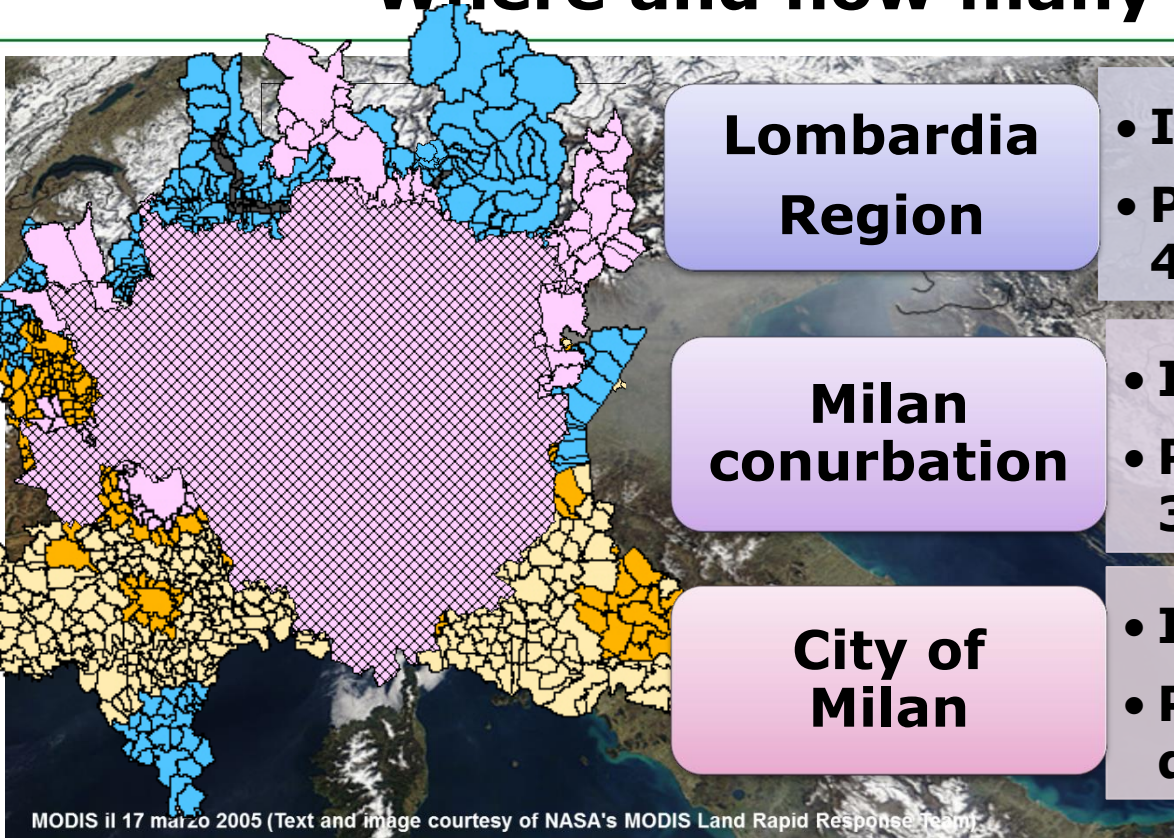
# Milan and Lombardia air quality: analysis and prospective in reference to measures to reduce the impact of traffic

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LA CALIDAD DEL AIRE URBANO: PROBLEMAS Y POSIBLES SOLUCIONES

Valencia February 5<sup>o</sup>, 2016

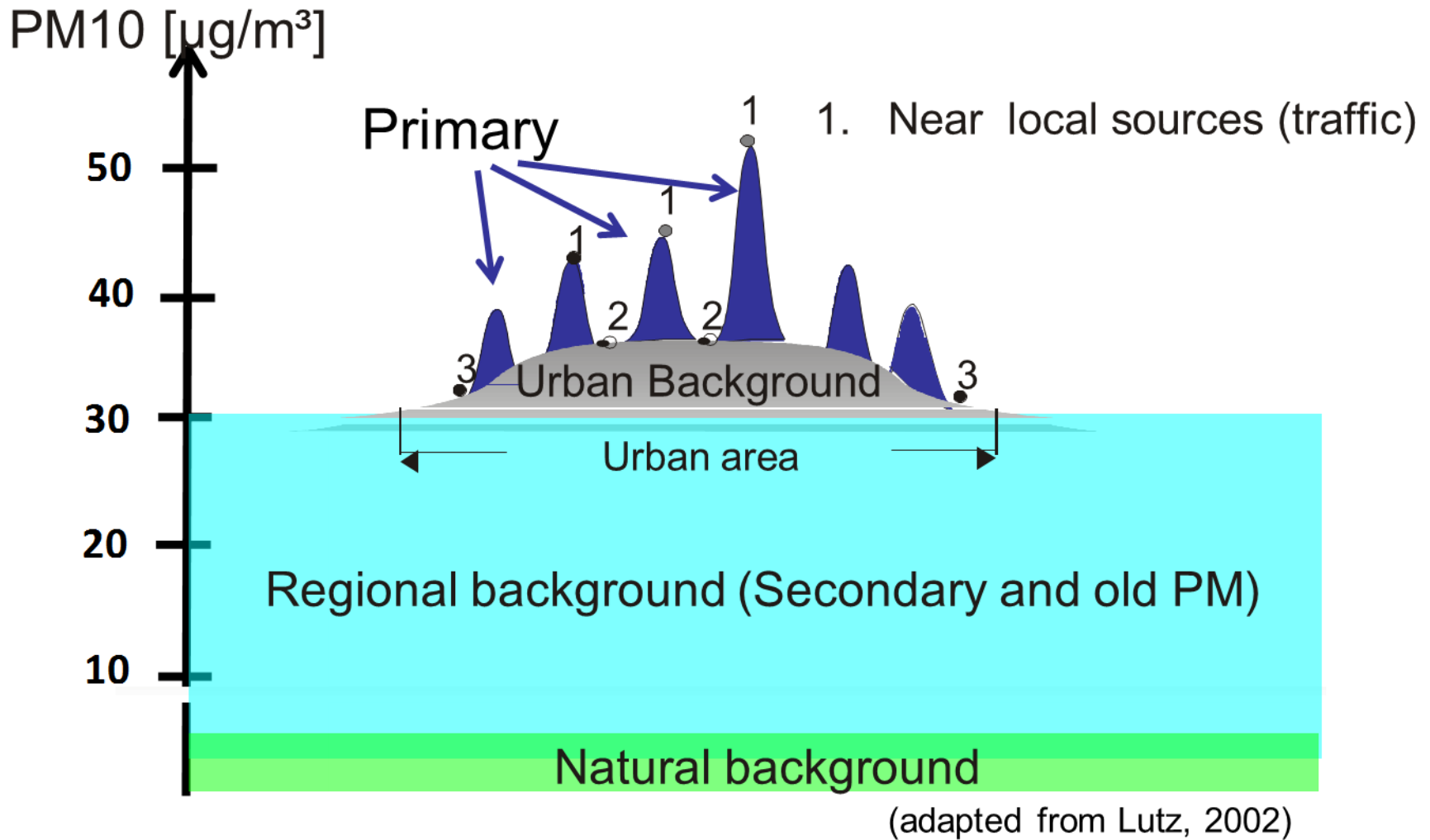
# Milano and Lombardia: Where and how many



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

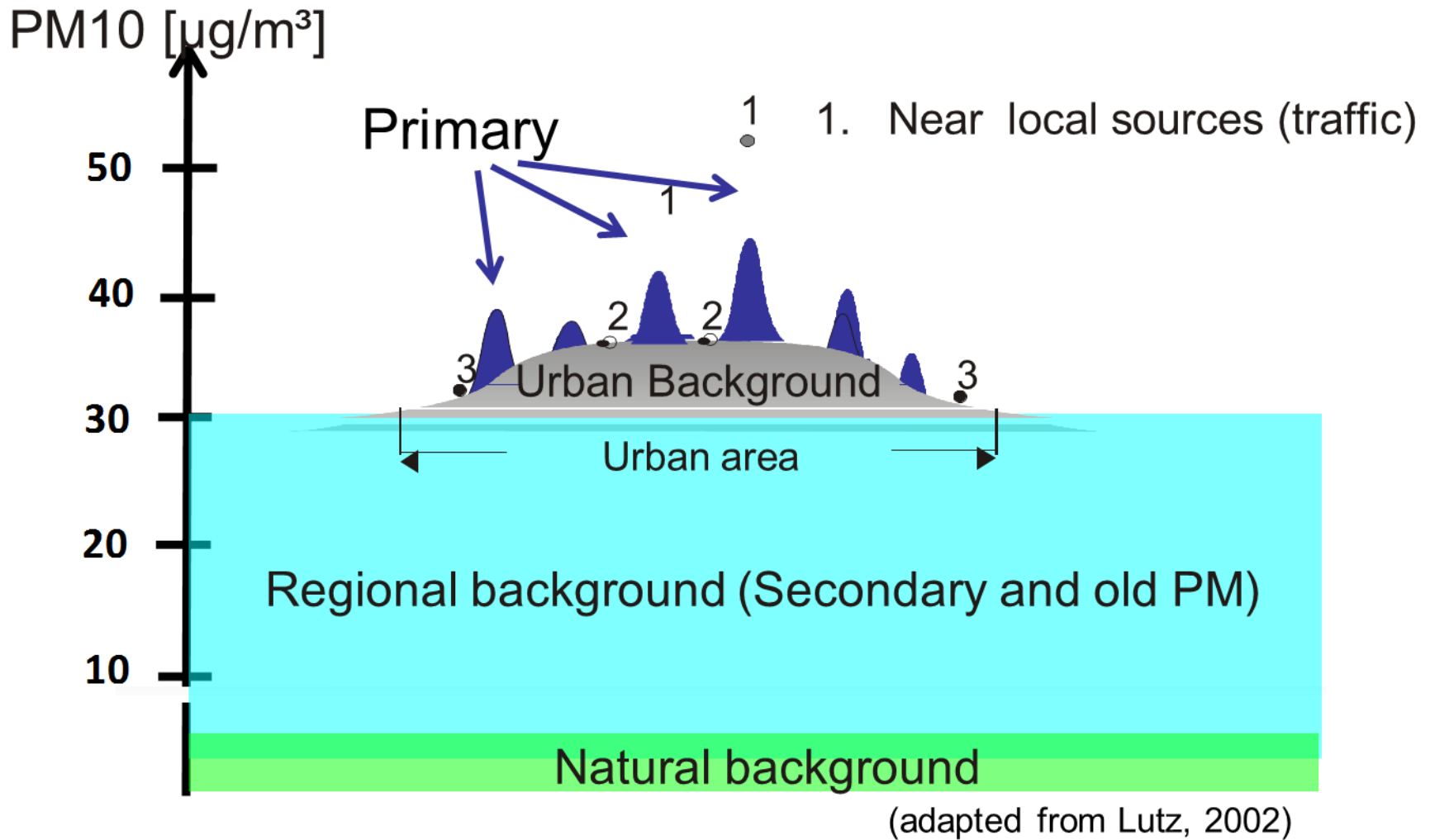
Medidas para mejorar la calidad del aire y reducir el impacto del tráfico en Milán y Lombardía

# Milano and Lombardia



Important regional background => not only local measure!  
**Actions needed on the whole valley**

# Milano and Lombardia

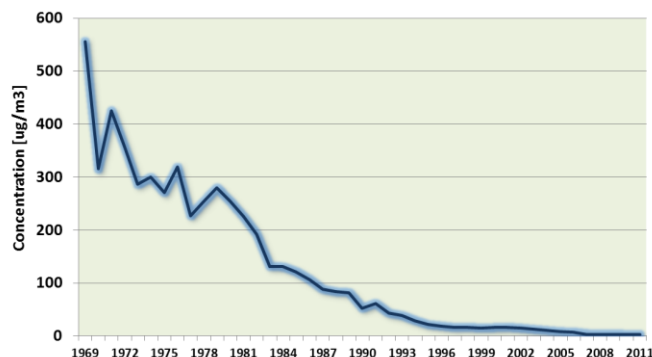


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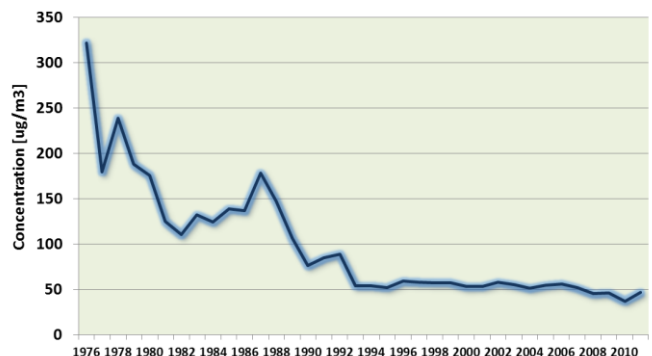
# Air Quality

## Concentrations are decreasing but:

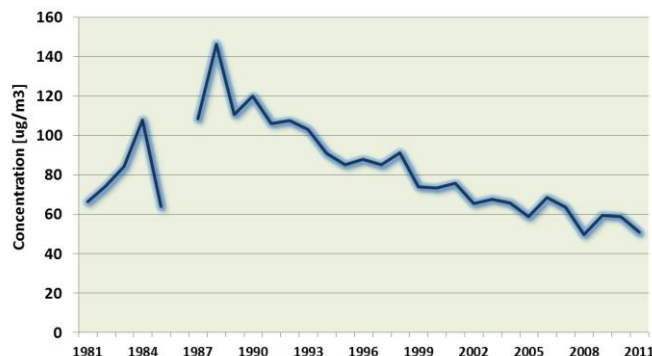
Milan - annual mean sulphur dioxide



Milan - annual mean particulate matter

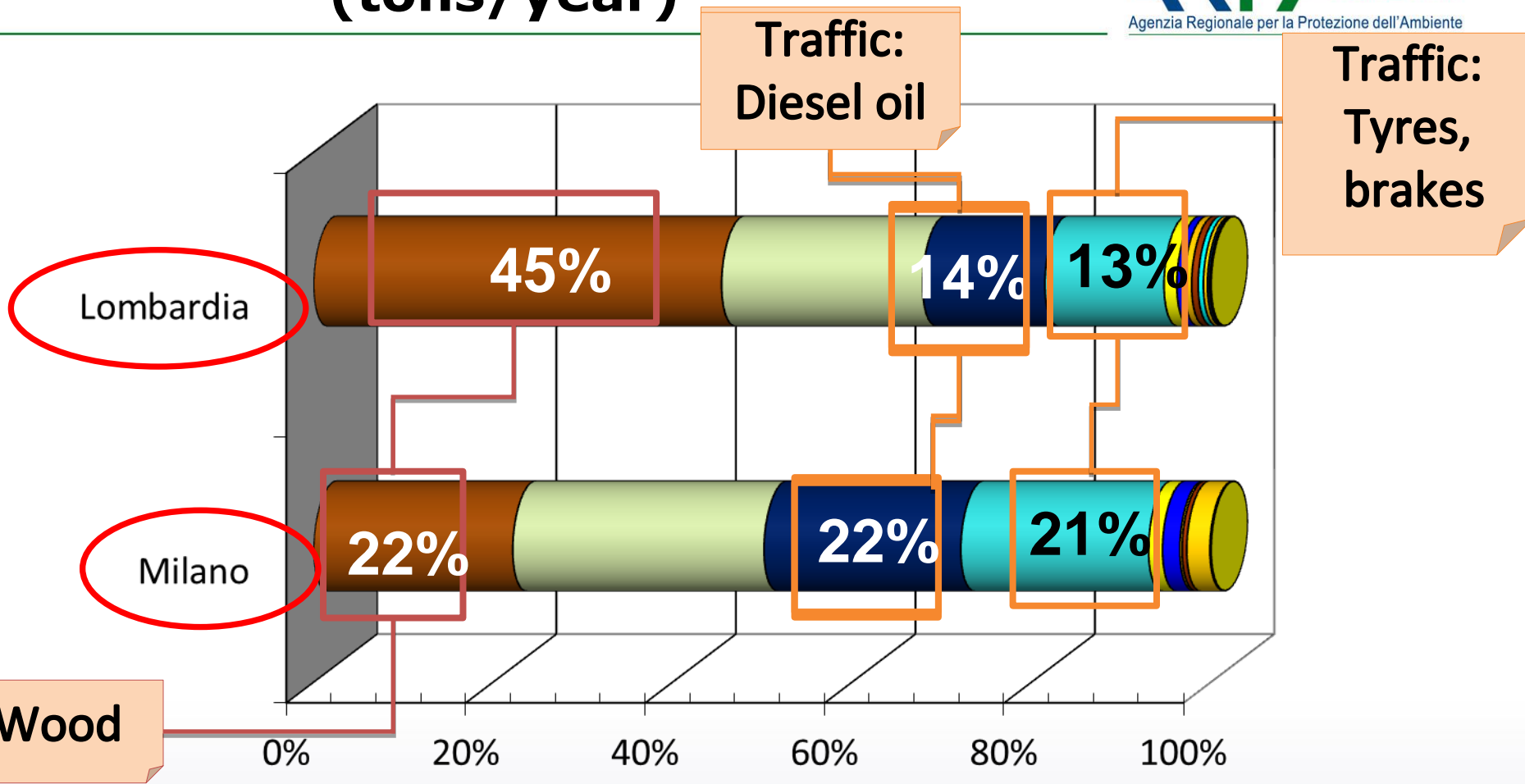


Milan - annual mean nitrogen dioxide



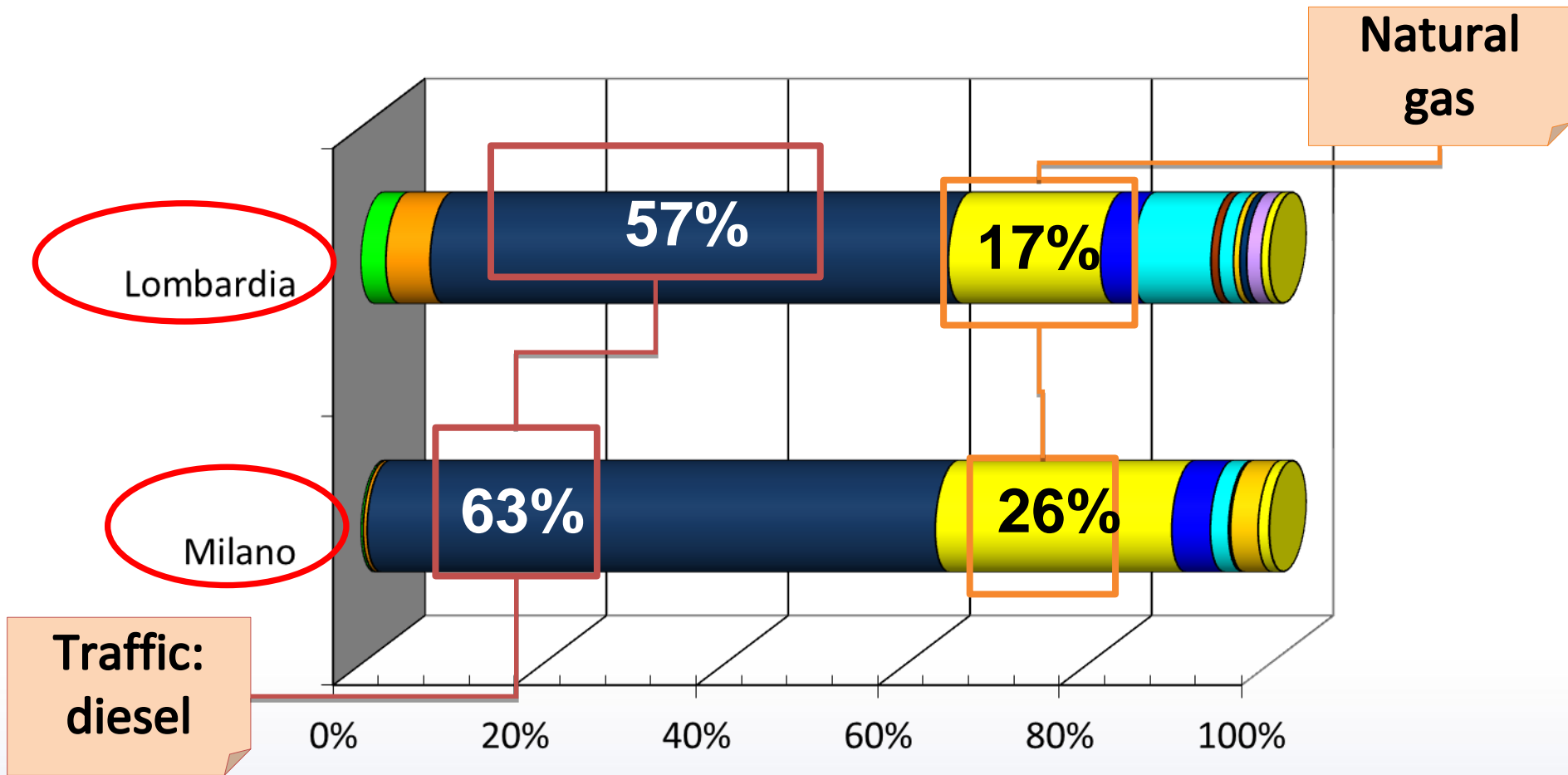
- Widespread **PM10** daily limit exceedances (80-100 every year)
- **NO2** annual limit exceedances, especially in traffic stations (annual mean in city from 39 to 62 µg/m3)
- **B(a)P** standard non achieved where wood burning is more diffuse (outside downtown)
- Widespread exceedances of both health and vegetation **Ozone** protection standards (above)

# Primary PM10 emissions by fuel (tons/year)



- wood
- without fuel
- diesel
- tyres and brakes
- natural gas
- petrol
- other
- fuel oil
- refinery gas
- gas oil
- coal
- kerosene
- LPG

# NOx emissions by fuel (tons/year)



wood

tyres and brakes

other

without fuel

natural gas

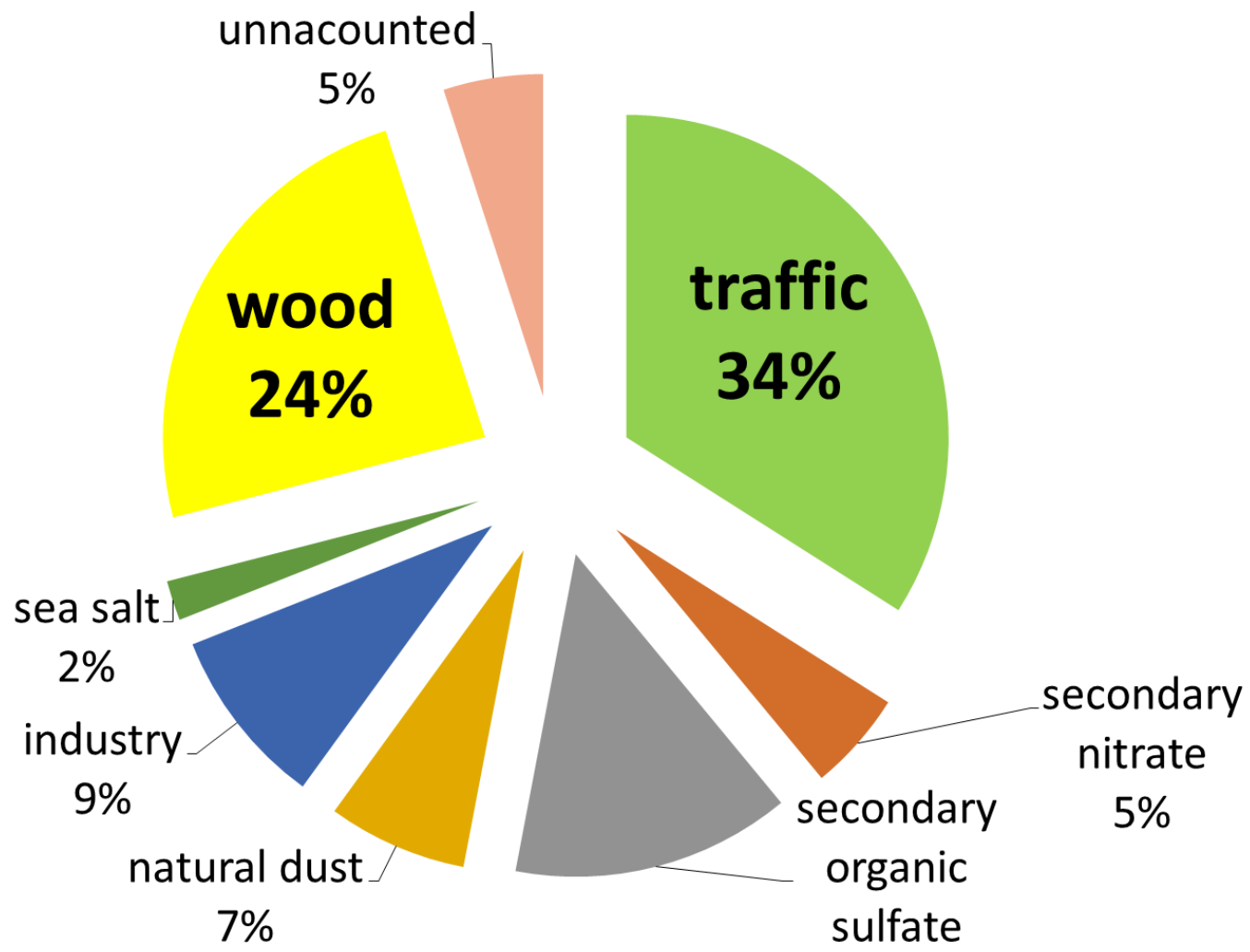
fuel oil

diesel

petrol

refinery gas

# Milano PM10 source apportionment from AIRUSE project:



Also the results of source apportionment studies confirm traffic as first source of PM in city , followed by wood combustion



# PRIA: Regional plan of actions on air quality

## TRANSPORT AND MOBILITY

40 measures

- Big LEZ: limitations up to euro 3 diesel cars
- Area C in Milan centre
- Bikes and car sharing
- 2 new underground lines
- Highway speed limits reduction (under study)

## STATIONARY SOURCES

37 measures

- Promotion of energy efficiency and rational use of energy
- Wood combustion rules and limitations
- Industrial plants and waste treatment: BAT and limitations to resettle of new plants

## AGRICULTURAL AND BREEDING SECTOR

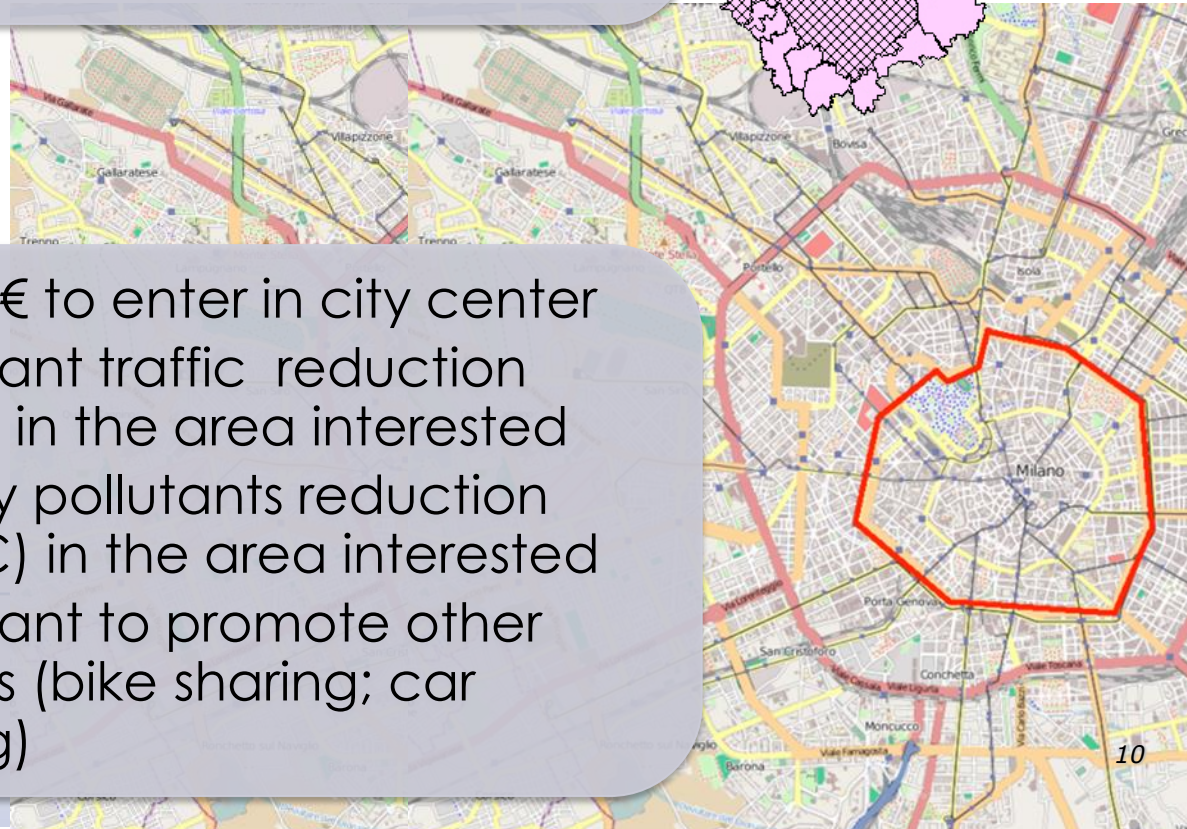
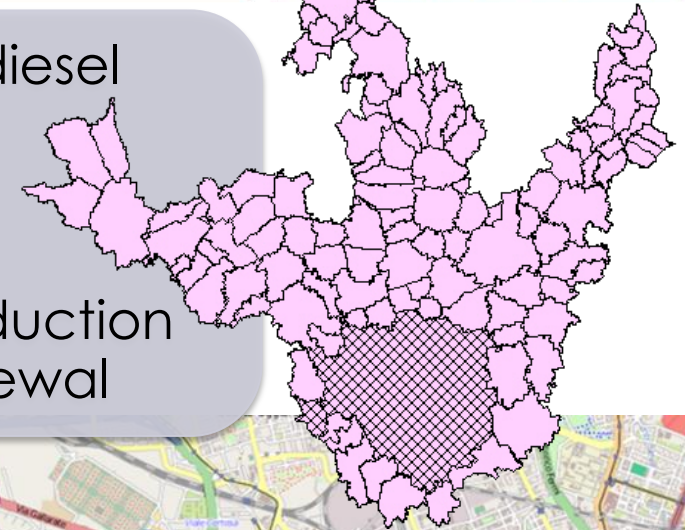
14 measures

- Anaerobic digestion of manure and direct injection in the field

# Some insights: LEZ and "Area C"

## LEZ in Conurbation

- Limitation up to Euro 3 diesel car
- Area of 3.6 million of inhabitants
- Important emissions reduction and speed up fleet renewal

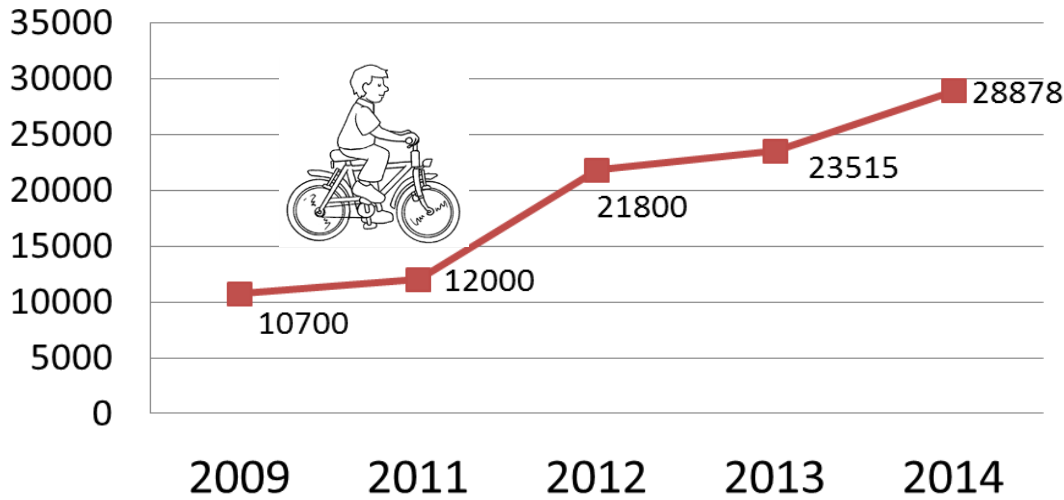


## AREA C in city center

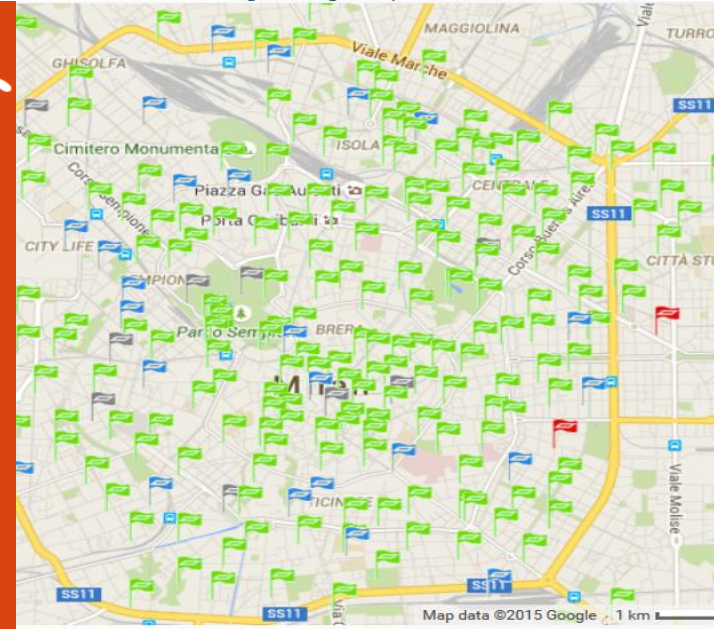
- Pay 5 € to enter in city center
- Important traffic reduction (-30% ) in the area interested
- Primary pollutants reduction (ex. BC) in the area interested
- Important to promote other actions (bike sharing; car sharing)

# Some insights: bike sharing

## Subscribers bikeme



Station Map



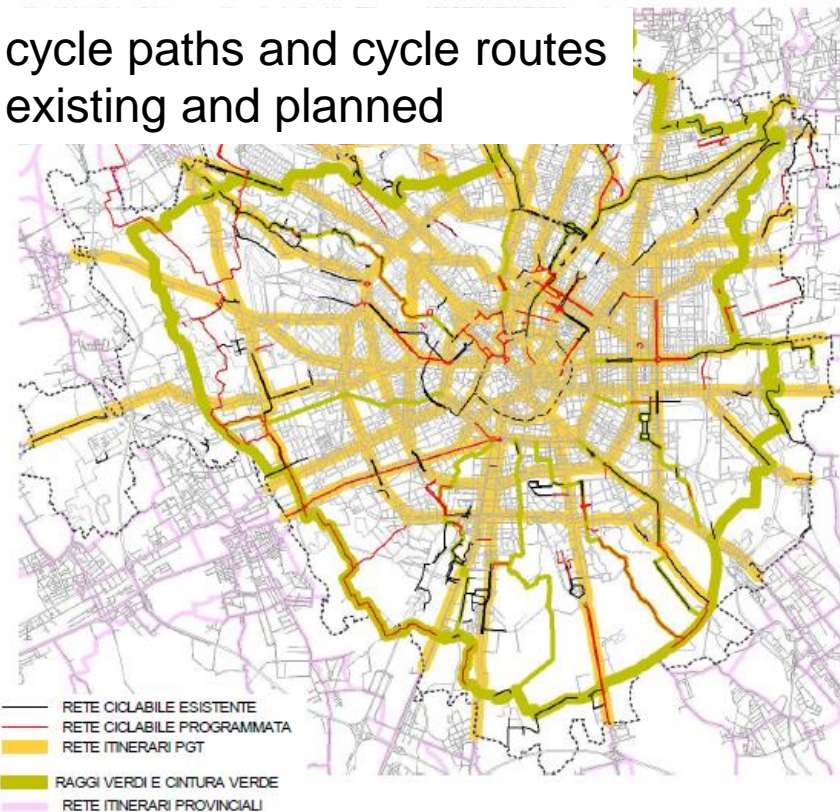
# Some insights: cycling



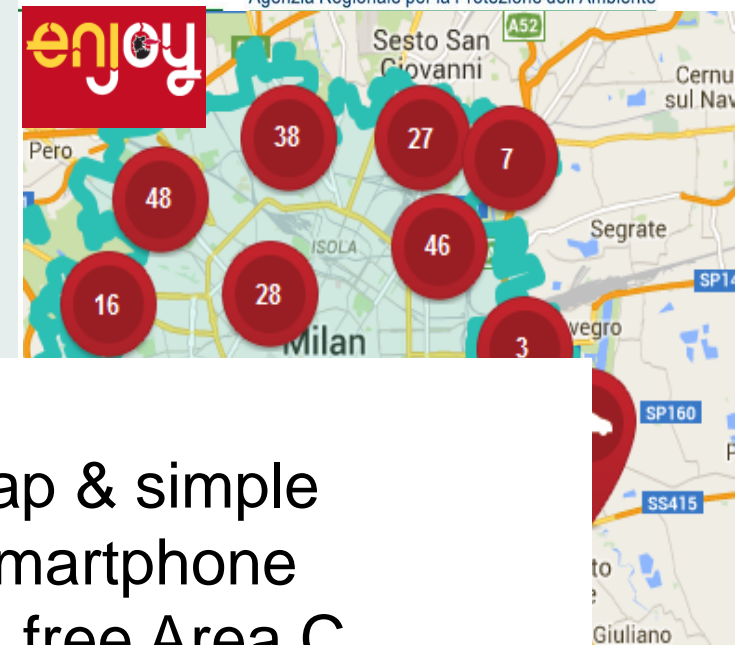
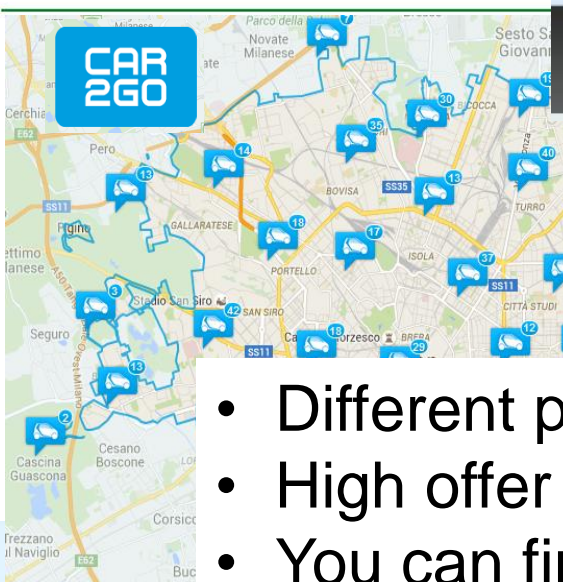
- Cycle routes: from 28 km of 1993 to 167 of 2013 (data from Milano Urban Mobilty Plan)
- Safety during cycling
- Security of parking



cycle paths and cycle routes existing and planned



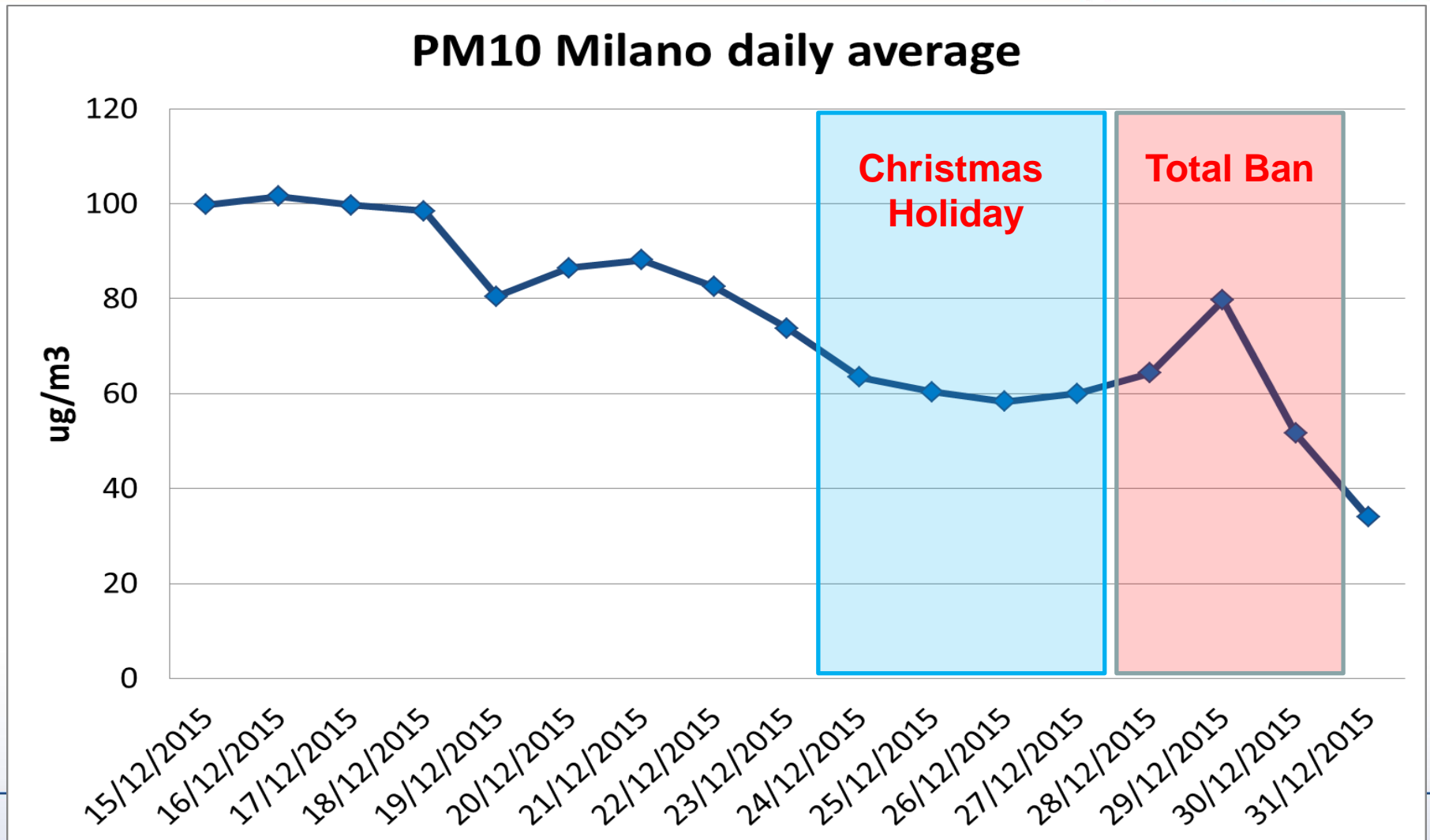
# Some insights: car sharing



- Different private companies
- High offer (1600 cars) quite cheap & simple
- You can find the nearer car by smartphone
- Public contribution: free parking, free Area C entrance
- More than 195.000 subscribers

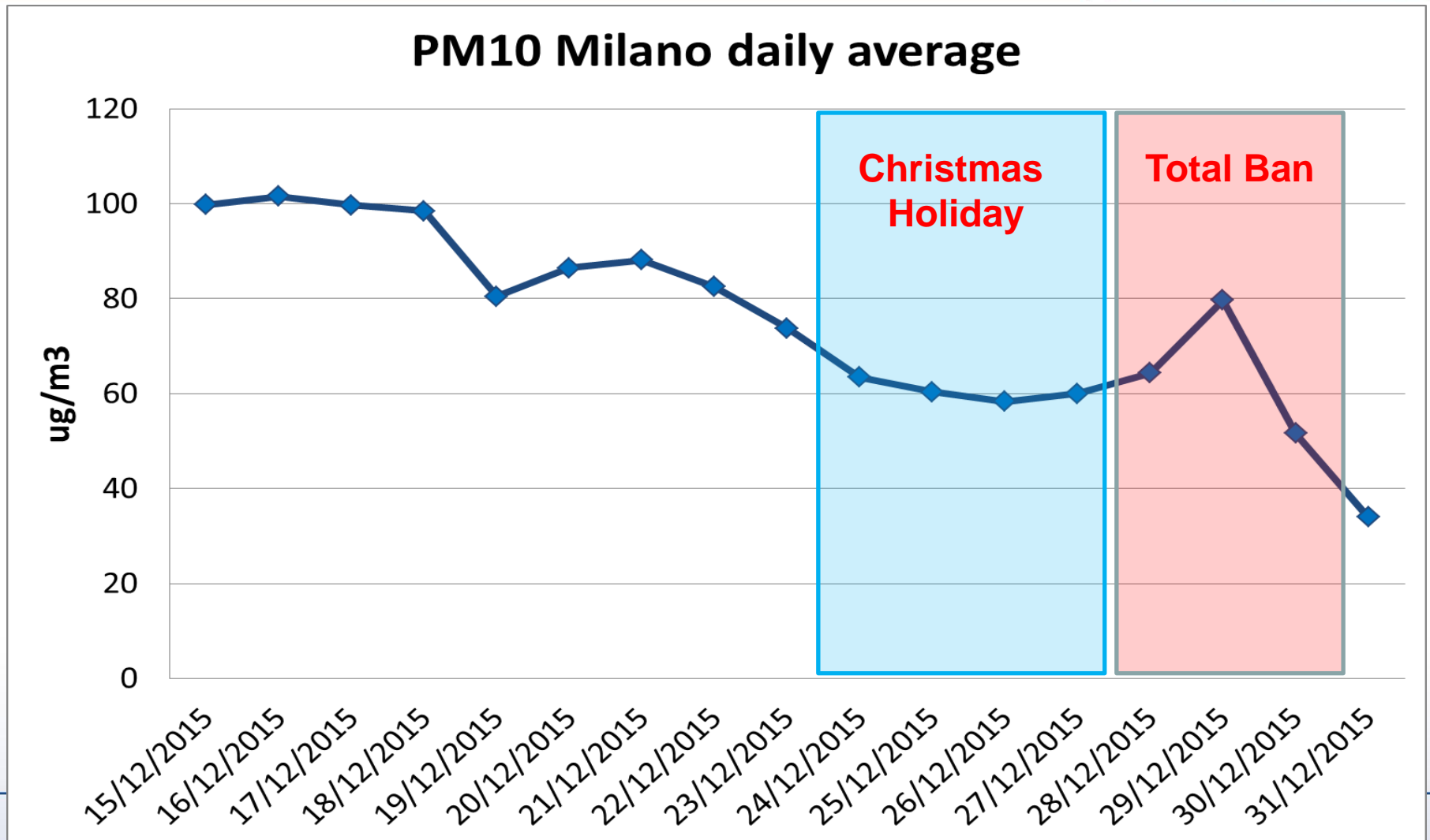


# Traffic total ban as "emergency" action



The last episode: Milano, 28, 29 30 dec. 2015 after more than 30 days of consecutive exceedings: **TOTAL BAN** from 10 am to 16 pm

# Traffic total ban as "emergency" action



Concentrations much more correlated to meteorological conditions!  
The decrease of traffic for the Christmas Holiday more widespread

# Traffic total ban as “emergency” action

Not (so) efficient or effective BUT:

- Great attention from the media (more than 500 interviews in 3 days, national media included)
- Important increase in public awareness
- Air quality has returned to the center of political discussion

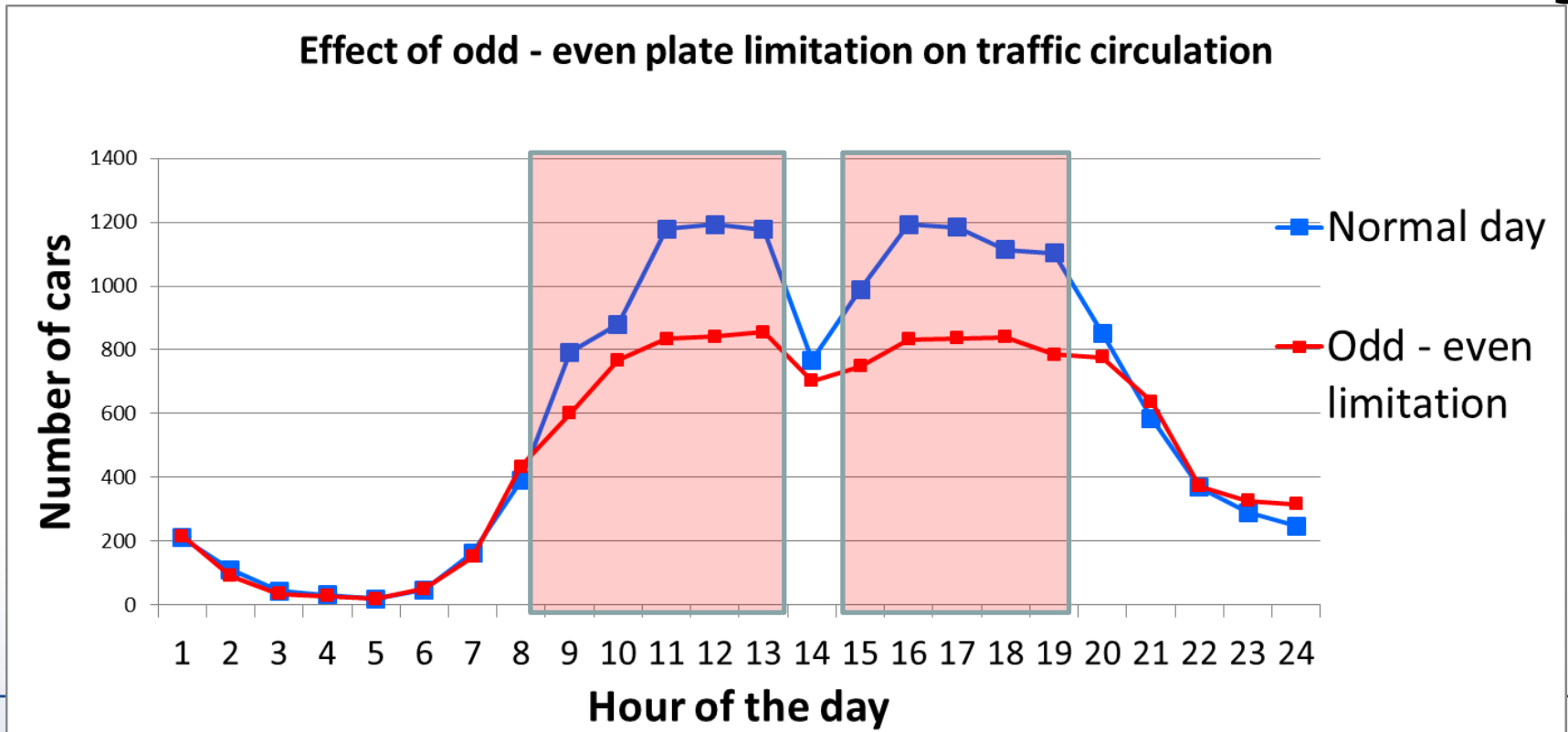


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# Odd – even plate limitation as “emergency” action

- A day can circulate only odd plate cars, the day after only even
- Traffic decrease is not of 50% but of 20% on average



Also in this case, if spatially or temporally limited, it is not very effective

# Speed limits limitations (under study)

## Decrease of limits on highways (es. from 130 to 110 km/h)

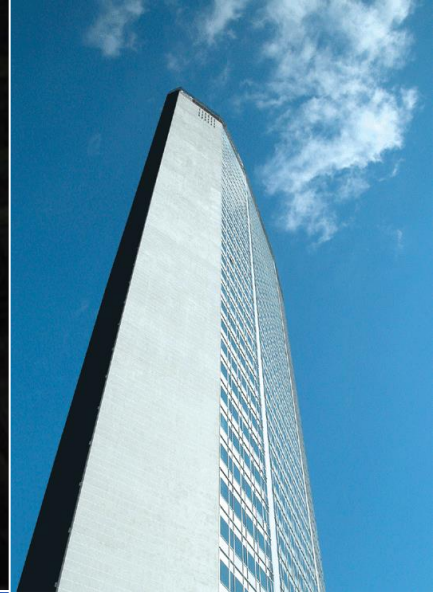
- Efficient in reducing NOx emission and (partially) PM10 emissions
- Not popular
- Quite difficult enforcement (but «tutor» system is very effective)

## Decrease of limits in city center (from 50 km/h to 30 km/h)

- Tailpipe exhaust emissions can increase
- Decrease in resuspension
- Decrease in tyres and brake emissions
- (Decrease in noise)
- (Possible increase in the quality of the conurbation)
- Not always popular
- Difficult enforcement

# Summary and Conclusions

- It is necessary to work on all the sources
- Traffic remain (one of) the most important
- It is necessary a structural approach
- Short term measures can be useful to increase public awareness
- Technological improvements can reduce traffic emissions **but**
- The decrease of the kilometers done must be pursued
- Road pricing can help to develop alternative way for moving
- The availability of public service is a key factor



Thank You for Your attention