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

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Milano and Lombardia: Where and how many

- Lombardia Region
  - Inhabitants: 9.9 million
  - Population density: 4191 inab/km²

- Milan conurbation
  - Inhabitants: 3.6 million
  - Population density: 3141 inab/km²

- City of Milan
  - Inhabitants: 1.3 million
  - Population density: 7272 inab/km²

- 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

Guido Lanzani
Valencia 5º, 2016
Important regional background => not only local measure!

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

Actions needed on the whole valley
Air Quality
Concentrations are decreasing but:

- 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)

- Lombardia
  - Wood: 22%
  - Traffic: Diesel oil: 14%
  - Traffic: Tyres, brakes: 13%

- Milano
  - Wood: 22%
  - Traffic: Diesel oil: 22%
  - Traffic: Tyres, brakes: 21%
NOx emissions by fuel (tons/year)

- Lombardia:
  - Traffic: diesel
    - 57% fuel
    - 17% natural gas
- Milano:
  - Traffic: diesel
    - 63% fuel
    - 26% natural gas

Key:
- Green: wood
- Cyan: tyres and brakes
- Other: wood
- Orange: without fuel
- Yellow: natural gas
- Brown: fuel oil
- Blue: petrol
- Light blue: refinery gas
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**

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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

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Station Map
Some insights: cycling

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