

# WOOD COMBUSTION IMPACT ON WINTER LOCAL AIR QUALITY IN A INDUSTRIAL/SEMI-RURAL SITE NEAR BRINDISI (ITALY)

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Forest fires, slash and burn agriculture and residential wood combustion have a significant impact on natural and man-made environments on local and global scales. Although rapid progress has reduced emissions in some types of modern wood heaters, “older” conventional wood stoves and fireplace inserts are still the predominant appliance in use today. Wood combustion affects the winter local air quality with the emissions of wide variety of air pollutants as fine particles, volatile organic compounds and carbon monoxide. Aim of this work is to show that the biomass combustion emissions, due to agricultural activities and residential heating by fireplaces, are the reasons for the high daily PM<sub>10</sub> and B(a)P concentrations, measured throughout the year in an industrial semi-rural site, located in south Italy.

During 2014 in a regional air quality monitoring station placed at Torchiarolo (BR), a small town 6 Km south from a large coal fired power plant (2640Mwe), we monitored daily the following pollutants: Benzene, PM<sub>10</sub>, IPA<sub>TOT</sub> and B(a)P (a carcinogen IPA).

In this station a lot of daily limit value exceedances related to PM<sub>10</sub> (50 µg/m<sup>3</sup>) have been recorded; Benzo(a)Pyrene also reached the mean annual value of 1.1 ng/m<sup>3</sup>, exceeding the annual limit of 1 ng/m<sup>3</sup> (D.Lgs. 155/2010).

Figure 1 and Figure 2 show the daily mean concentrations of PM<sub>10</sub> and B(a)P related to the temperature trend during the year.

It can be notice that the increase of PM<sub>10</sub> is inversely related with temperature. Also as regards B(a)P there is a strong seasonal trend with values from 0.03 ng/m<sup>3</sup> in summer to 10.2 ng/m<sup>3</sup> during winter.

In particular, seasonal B(a)P distribution related to wind directions (Figure 3), shows that the major contribution (6 ng/m<sup>3</sup>) comes from SW during winter and from E (0.35 ng/m<sup>3</sup>) during summer: in both cases the station is not down-wind to the industrial plant. This evidence demonstrates that there is a local sources related to biomass burning.

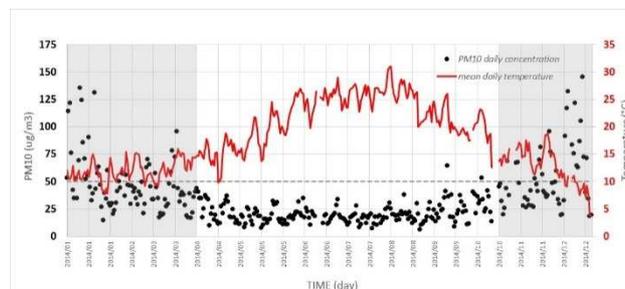


Figure 1. PM<sub>10</sub> daily mean concentrations (points) VS temperature (straight line), monitored at Torchiarolo during 2014

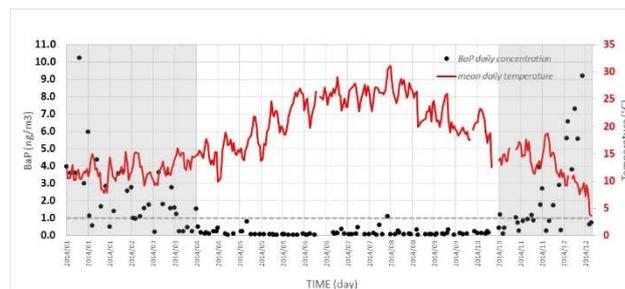


Figure 2. BaP daily mean concentrations (points) VS temperature (straight line), monitored at Torchiarolo during 2014

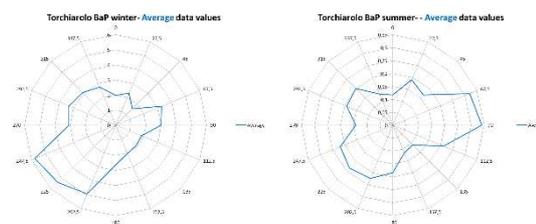


Figure 3. Concentration B(a)P distribution, depending on wind direction, during winter (left) and summer (right)

## References

Regional Air Quality Recovery Plan, resolution of Apulia Region n. 1093, 2013/06/11