AIR 8

OZONE IN AMBIENT AIR (HEALTH)

Tropospheric ozone (O_3), the main oxidizing gas resulting from photochemical pollution, can reach high concentrations in summer. In terms of effects on human health, it mainly affects the respiratory tract, in particular among the most sensitive people (children, elderly people, asthmatics, etc.).

Rarer peaks since 2009

The annual mean concentrations of O_3 in ambient air in Wallonia were generally stable between 2007 and 2014. They showed an mean value of 46.6 µg/m³ over this period, which was lower than the mean value of 49.6 µg/m³ calculated for the period 2000-2006[1]. On the other hand, seasonal peaks of concentration observed in hot, sunny and not very windy weather, mainly responsible for health impacts, became rare after 2009. In 2014, the total number of days at all air quality monitoring stations with at least one exceedance of the target value for the protection of human health was 16, while no exceedances of the information and alert threshold were observed.

Three regulatory concentrations (Directive 2008/50/EC)[2]:
- *target value: 120 µg/m³ for the daily maximum of the averages over 8 hours. Maximum 25 days of exceedance per calendar year, running average calculated over three years;*
- *information threshold: 180 µg/m³ on average over one hour; in Wallonia, information to the public, health care providers and the media when there is a risk of exceedance;*
- *alert threshold: 240 µg/m³ on average over 1 hour.*

It should be noted that the WHO[3] guideline is 100 µg/m³ on average over 8 hours.

More ozone in the countryside than in the city

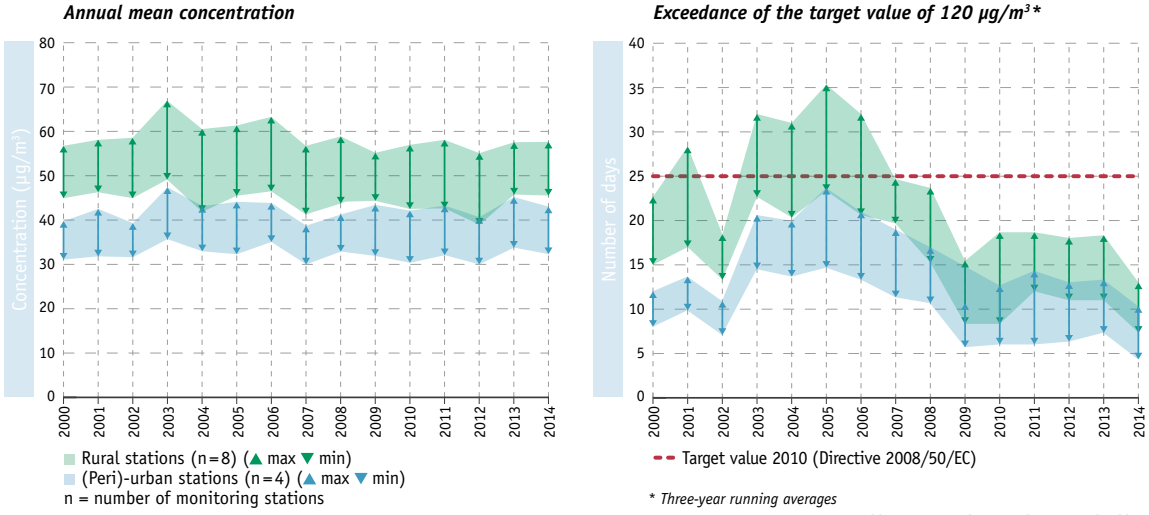
Background concentrations and seasonal peaks are higher in rural areas than in urban areas[4]: where O_3 destruction reactions are reduced due to lower NO (less traffic) and higher VOC (vegetal terpene) concentrations.

Monitoring and communication

While the weather conditions (few prolonged periods of very hot and sunny) have undoubtedly favoured this compliance with the standards, various measures have been taken in Wallonia to reduce emissions of O_3 precursor gases[5] through (i) the Air-Climate Plan (*Plan air-climat*) (2008-2012) followed by the Air Climate Energy Plan 2016-2022 (*Plan air climat énergie 2016-2022 - PACE*)[6], which defines measures to be implemented by 2022 and (ii) the Programme for the Progressive Reduction of SO_2, NO_x, VOCs and NH_3 Emissions[7]. These measures are paying off, given the reductions in emissions.
In addition, the Walloon Plan for High Heat and Ozone Peaks (*Plan wallon forte chaleur et pics d'ozone*) determines the short-term actions to be taken to reduce the health effects of exposure to O_3. Focused on communication, these actions are adjusted according to weather forecasts and the expected and measured O_3 concentrations (caution, warning and alert phases).

[1] The years 2003 and 2006 were characterised by summers conducive to the formation of O_3. | [2] Transposed into Walloon law by the Walloon Government Decree of 15/07/2010 | [3] WHO, 2006 | [4] → Map 22 | [5] → AIR 3 | [6] → AIR Focus 3 | [7] Walloon Government Decree of 25/03/2004

Fig. AIR 8-1 Ambient air pollution of tropospheric ozone in Wallonia



SOERW 2017 – Sources: SPW - AwAC; ISSeP