Documentation of SO2 objective estimation for the zone IT0445 - year 2018

INTRODUCTION

The objective estimate is applied for the assessment of the critical level of SO2 in the presence of values below the lower assessment threshold.

PROCEDURE

This evaluation was carried out by applying a corrective factor K to the annual and winter averages of the urban background station (BZ6). The correction factor was calculated from the ratio of the annual averages of SO2 in the area of the BZ6 station and in the area of the background near-city rural station (RE1). These annual averages have been determined with a model based on the emissions inventory and on the meteorological data of 2013 of the Province of Bolzano.

CALCULATION OF THE FACTOR K

Ratio between the 2013 annual averages for SO2 of the BZ6 and RE1 areas

The corrective factor K is given by the ratio between the average annual values of SO2 in the BZ6 area and in the RE1 area obtained from the aforementioned 2013 model:

$C_{areaBZ6}$ = 2,1 µg/m³ (annual average)
$C_{areaRE1}$ = 0,5 µg/m³ (annual average)

$K = C_{areaBZ6} / C_{areaRE1}$ = 2,1 µg/m³ / 0,5 µg/m³ = 4,2

CALCULATION OF THE ANNUAL AND WINTER AVERAGE OF SO2

The annual average and the winter average of SO2 for the IT0445 zone are determined by dividing each year the corresponding aggregate value of the BZ6 station by the K factor calculated above:

$C_{a.avg\ IT0445} = C_{a.avg\ BZ6} / K = C_{a.avg\ BZ6} / 4{,}2$

$C_{w.avg\ IT0445} = C_{w.avg\ BZ6} / K = C_{w.avg\ BZ6} / 4{,}2$

$C_{a.avg\ IT0445}$ = average annual concentration in the IT0445 area
$C_{w.avg\ IT0445}$ = average winter concentration in the IT0445 area

ESTIMATE of the annual average of SO2 in 2018

The estimate of the annual average SO2 for the AQR 2018 results by dividing the annual average SO2 of the BZ6 by the corrective factor K:

$C_{a.avg\ BZ6}$ = 1,1 µg/m³

$C_{a.avg\ IT0445} = C_{a.avg\ BZ6} / K$ = 1,1 µg/m³ / 4,2 = 0,3 µg/m³

ESTIMATE of the winter average of SO2 in 2018

The estimate of the winter average SO2 for the AQR 2018 results by dividing the winter average SO2 of the BZ6 by the corrective factor K:

$C_{w.avg\ BZ6}$ = 1,5 µg/m³

$C_{w.avg\ IT0445} = C_{w.avg\ BZ6} / K = 1,5\ \mu g/m^3 / 4,2 = 0,4\ \mu g/m^3$

CONCLUSION

Both the winter average measured at the background urban station BZ6 (IT2096A) in Bolzano and the one estimated for the area IT0445 (SOUTH TYROL) corresponding to the area of the near-city rural station of background RE1 (IT0505A) in Renon are lower than the evaluation threshold of 8 $\mu g / m^3$.