

INDICATOR SHEET

1. Indicator name

Ozone levels in the province of Girona (93.2 annual ozone percentile)

Update date:	13-11-2024	Version:	v.1.
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2. Field

Main Area	Environment and environment
Sub-Scope	Air quality

3. Definition

The indicator shows the value of the 93.2th percentile of the daily maximum values of the 8-hour moving average of ozone, which represents the value below which 93.2% of the daily maximum data is located. This indicator is used to assess long-term exposure to ozone and identify periods with higher concentrations.

Why is the 93.2 percentile used?

Spanish European regulations establish a target value for the protection of human health for ozone of 120 µg/m³, calculated as the maximum daily value based on the values of the average ozone concentration of the 8 hours prior to each hour.

The 93.2nd percentile has been established as an indicator because, in a year with 365 days, day number 26 corresponds approximately to the point that leaves 93.2% of the data below (365 days * 0.068 = 25 days). That is why this indicator can also be referred to as **the 26th daily high of the previous 8-hour moving average of O3 (26th 8-hour high)**

In this way, the 93.2 percentile makes it possible to identify the value of ozone concentration that should not be exceeded by more than 25 days a year, on average, over a period of three years, in order to comply with Spanish and European regulations.

4. Calculation formula

This is not the case, since the indicator is based on modelling data through the air quality forecast model of the CALIOPE system over Catalonia at 1 km horizontal resolution (<http://www.bsc.es/caliope/es>)

5. Reading

This indicator makes it possible to compare ozone levels between different municipalities or areas in the province of Girona. The information facilitates the analysis of temporal trends and the identification of areas with higher concentrations of ozone, which may represent a health risk.

With the support of:

6. Periodicity

Annual

7. Source

Department of Territory, Housing and Ecological Transition.

8. Limitations

Geographical ☐ Temporary ☒ Statistical secrecy ☐

Description of limitations

- **Geographical:** Not applicable. The indicator covers the entire province of Girona.
- **Temporary:** Data are available for the years 2017 to 2022.
- **Statistical secrecy:** Not applicable.
- **Description of limitations:** The data are based on air quality prediction models, which may have a certain margin of uncertainty.

9. SDG

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
☐	☐	☒	☐	☐	☐	☒	☐	☐	☐	☒	☐	☒	☐	☐	☐	☒

3.9; 7.2; 11.6; 13.2; 17.17

SDG 3.9: Health and well-being

Substantially reduce the number of deaths and illnesses caused by hazardous chemicals and by air, water and soil pollution and pollution.

Tropospheric ozone is an air pollutant that can cause respiratory and cardiovascular problems, and even increase premature mortality. Ozone monitoring makes it possible to identify areas with high pollution and implement measures to reduce it, protecting the health of the population.

SDG 7.2: Affordable and clean energy

Significantly increase the share of renewable energy in the global energy mix.
Air pollution, including tropospheric ozone, is related to the combustion of fossil fuels. Ozone monitoring can help assess the impact of energy sources and promote the transition to renewable sources, which do not generate emissions of ozone precursors.

SDG 11.6: Sustainable cities and communities

Reduce the negative environmental impact per capita of cities, paying special attention to air quality and the management of municipal and other types of waste.

Ozone is an important pollutant in urban areas. Ozone monitoring in cities makes it possible to assess air quality and take measures to improve it, such as promoting public transport, restricting polluting vehicles or creating green areas.

SDG 13.2: Climate action

Incorporate climate change measures into national policies, strategies and plans.

Although tropospheric ozone is not a direct greenhouse gas, its precursors (NO_x and VOCs) are. In addition, ozone can affect the ability of plants to absorb CO₂, indirectly contributing to climate change. Ozone monitoring can contribute to assessing the effectiveness of climate change mitigation policies.

SDG 17.17: Partnerships to achieve the goals

Promote and implement public, public-private and civil society partnerships, based on the experience of partnerships and shared resources.

Ozone monitoring requires collaboration between different actors, such as public administrations, research centres, companies and citizens. The participation of all actors is essential for data collection, interpretation of results and implementation of measures to improve air quality.

10. Comments and observations

It should be borne in mind that for the counties of Cerdanya, Osona and La Selva, the county values are calculated based on the municipalities in the province of Girona.

Additional information:

- European and Spanish regulations establish a **target value** for the protection of human health for ozone of **120 µg/m³, calculated as the maximum daily value of the 8-hour moving averages**, which must not be exceeded by more than **25 days a year**, on average, over a period of three years.
Thus, the P93.2 percentile (26th day) is an indicator used to assess long-term exposure to ozone and identify periods with higher concentrations.
- The World Health Organization (WHO) recommends a more restrictive value of 100 µg/m³ for the maximum annual daily average of 8 hours of ozone.

Differences between the regulations and the WHO: European regulations establish a target value based on the number of days that a certain level of ozone is exceeded, while the WHO recommends a limit value for the average annual ozone concentration.