

Outdoor Air Pollution

Extract from France's 2021 Environmental Performance Review



Outdoor Air Pollution

Air quality is improving with reductions in pollutant emissions. This is due to application for several years of strategies and action plans in various sectors. Lockdowns due to the Covid-19 pandemic accentuated the trend in 2020. However, air quality regulatory thresholds set for the protection of human health are still being exceeded, particularly for ozone. Other pollutants exceed regulatory limits less frequently than in the past and concern fewer areas.

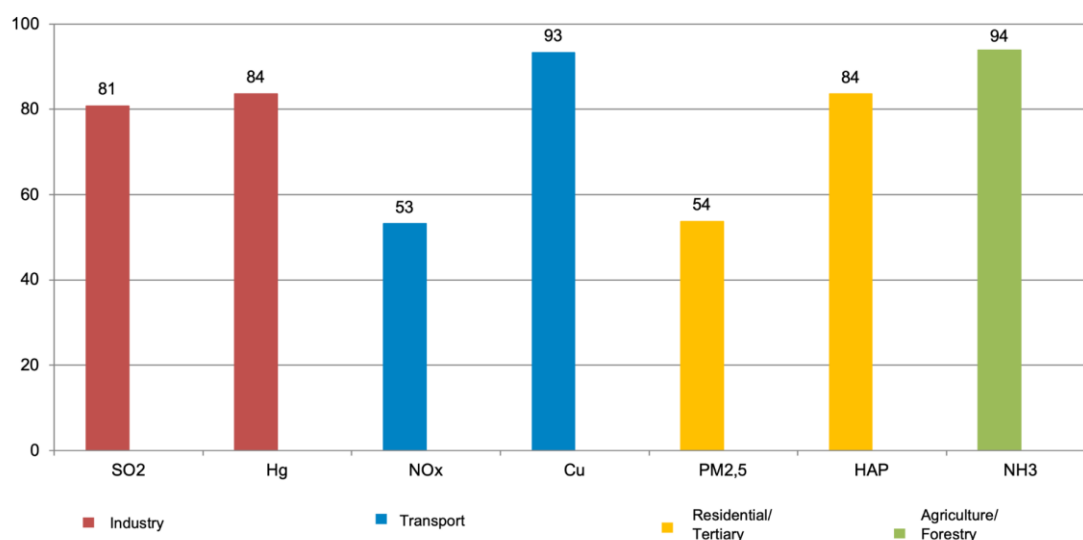
Outdoor air pollution is defined as the presence of gases and particles that have adverse effects on human health and the environment. These substances can be released directly into the atmosphere by human activities and by natural phenomena such as volcanic eruptions. Air pollution can cause and aggravate benign conditions (fatigue, nausea, eye and skin irritation), serious diseases (asthma, allergies), and even fatal pathologies (cancer, cardiovascular diseases). Short- and long-term impacts on health are possible.

While air pollution was the main environmental concern for the French population in 2010, the climate is now the major preoccupation. At a record low level in 2020, it still ranks as the second highest concern.

DECREASE IN EMISSIONS OF AIR POLLUTANTS

Annual estimates of pollutants emissions by sector of human activity are carried out in France every year. In 2020, agriculture was responsible for 94% of ammonia (NH₃) emissions, while residential and tertiary building heating was responsible for 54% of emissions of particulate matter with a diameter of less than 2.5 µm (PM_{2.5}) mainly due to wood combustion (Figure 1).

Figure 1: Sectors with majority emissions of selected pollutants in 2020 (e)
In %



(e) = preliminary estimate.

Notes: industry = energy, manufacturing, construction and centralised waste treatment; transport = road and other domestic transport (air, rail, inland waterway and maritime).

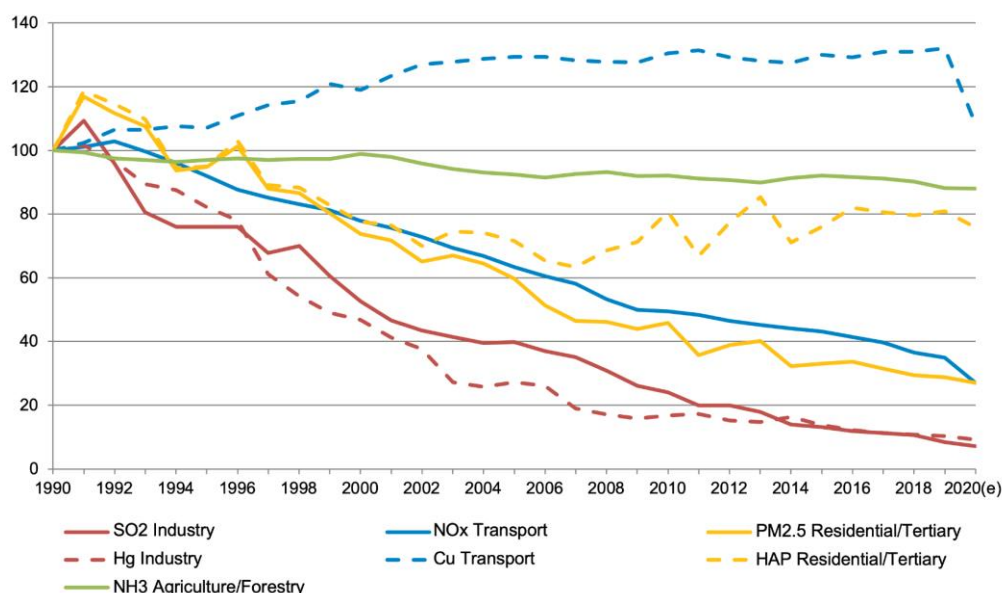
Scope: Metropolitan France.

Source: Citepa, April 2021, Setcen format

Fact Sheet: Outdoor Air Pollution

Between 1990 and 2020, emissions of most pollutants decreased. Industrial emissions of sulphur dioxide (SO₂) decreased by 93%, due in particular to a drop in the use of oil for electricity production, improved energy efficiency, and caps on sulphur content in fuels. Nitrogen oxides (NO_x) emissions by transport dropped by 73% despite increases in road traffic and the vehicle fleet. The decrease is owed to technological developments on motors in response to European regulations for vehicle emissions, the renewal of the fleet, and the gradual fitting of vehicles with catalytic converters since 1993. On the other hand, copper emissions, also from transport (wear on brake pads and overhead lines), have increased due to trends in road traffic without any offset from technical developments (Figure 2). In 2020, due to the COVID-19 pandemic, exceptional measures reduced travel and economic activity, accentuating reductions already observed for certain pollutants and causing a temporary drop for some pollutants emitted in high quantities by transport.

Figure 2: Emissions trends in selected sectors for selected pollutants
Base index value 100 in 1990



(e) = preliminary estimate.

Notes: industry = energy, manufacturing, construction and centralised waste treatment; transport = road and other domestic transport (air, rail, inland waterway and maritime).

Scope: Metropolitan France.

Source: Citepa, April 2021, Secten format

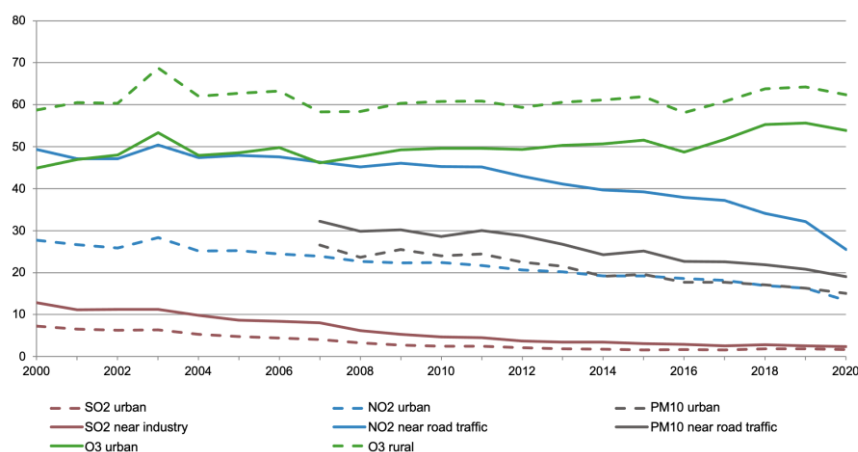
IMPROVEMENT OF OUTDOOR AIR QUALITY, EXCEPT FOR OZONE

Once emitted into the air, these substances evolve in the atmosphere, influenced by weather conditions. They are particularly affected by wind, rain and temperature variations. Physico-chemical reactions can also transform them into other pollutants, such as ammonia. As a result, air quality does not only depend on emissions of pollutants from human activities. It is also dependent on reactions occurring in the atmosphere and natural emissions, as well as transboundary pollution.

Concentrations of pollutants are higher in urban areas where the population is close to sources of emissions such as road traffic and industry. Concentrations of ozone (O₃) are higher in rural areas, explained by the way it is formed (Figure 3). Average O₃ levels depend on meteorological conditions and the transport of polluted air masses over long distances, O₃ is formed by chemical reactions between various pollutants (mainly NO_x and volatile organic compounds) in the lower atmosphere by solar radiation.

Fact Sheet: Outdoor Air Pollution

Figure 3: Trends in annual average concentrations of selected pollutants
In $\mu\text{g}/\text{m}^3$



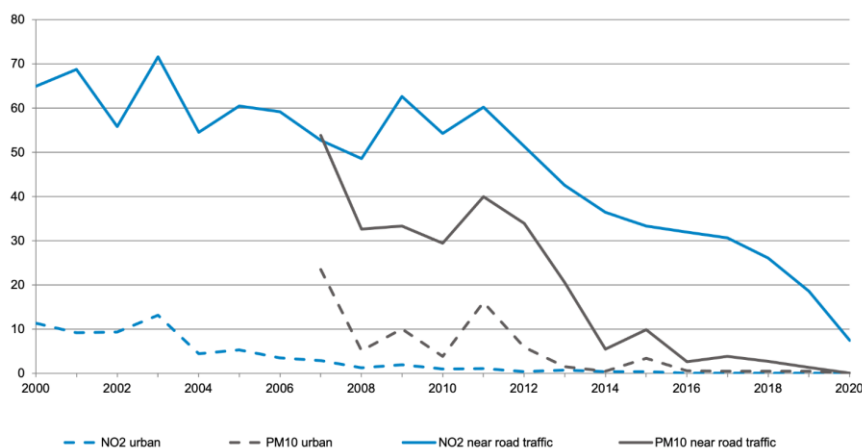
Note: the method for monitoring PM_{10} was changed in 2007 to reflect the European method. As a result, PM_{10} concentrations between 2000 and 2006 cannot be compared with those measured between 2007 and 2020.

Scope: France excluding Mayotte.

Source: Geod'air, June 2021. Treatment: LCSQA; SDES

Average annual concentrations of SO_2 , nitrogen dioxide (NO_2), particulate matter less than $10\ \mu\text{m}$ in diameter (PM_{10}) and $\text{PM}_{2.5}$ have decreased since 2000. The percentage of monitoring stations where concentrations exceed regulatory limits for health protection has decreased. Some parts of the country are still higher, particularly close to road traffic (Figure 4). Thresholds were exceeded in between 2 and 54 municipalities for 3 pollutants: NO_2 , PM_{10} and O_3 .

Figure 4: Trends in the percentage of monitoring stations for which concentrations are not in compliance with regulatory limits for the protection of human health
In %



Note: the method for monitoring PM_{10} was changed in 2007 to reflect the European method. As a result, PM_{10} concentrations between 2000 and 2006 cannot be compared with those measured between 2007 and 2020.

Scope: France excluding Mayotte.

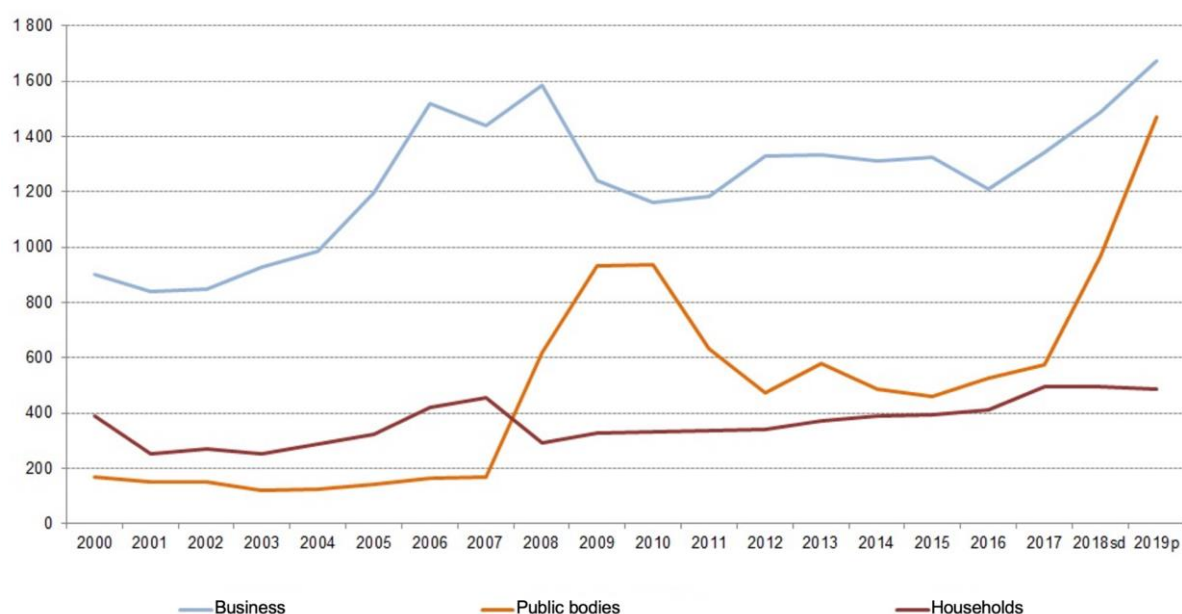
Source: Geod'air, June 2021. Treatment: LCSQA; SDES

FINANCIAL EFFORTS TO REDUCE POLLUTION EMISSIONS

Financial resources spent on air quality and climate protection in 2019 were estimated at €3.6 billion. This amount has increased by 2.5 since 2000. In 2019, companies financed 46% of this expenditure (equipment for smoke treatment), households 17% (condensing boilers) and public authorities 41% (aid for the purchase of low-emission vehicles) – (Figure 5).

Figure 5: Trends in funding expenditure for air protection

In millions of current euros



sd = semi-definitive, p = provisional data.

Scope: France.

Source: SDES, satellite environment account, 2021

FOR MORE INFORMATION

- *Bilan de la qualité de l'air extérieur en France en 2020*, SDES, Datalab, October 2021, 47pp.
- *Atmo France* - Fédération des associations agréées de surveillance de la qualité de l'air
- *Geod'Air* - national air quality reference database