

OUTDOOR Air Quality and Health

Breathing is vital for everyone (up to 12,000 litres of air/day/person!) – we don't have a choice; **however, the choices of national and local policies, and individual behaviour have an impact on the quality of the air that we breathe.** There is a consensus on the health effects of improved air quality. According to the WHO¹, Europeans could live 8 to 9 months longer if outdoor air quality were improved. This improvement could, moreover, happen very quickly if suitable public policies were implemented. Furthermore, active air quality policies often make a city more attractive and competitive, improve citizens' quality of life, boost tourism, etc.



Although nowadays it is pollution peaks that attract media attention, it is in fact **the background pollution to which we are exposed on a daily basis that is the most harmful in the long term.** Degradation of air quality is a result of the combination of a cocktail of pollutants, of which particles (PM = particulate matter) are a major component, with deeply worrying effects on health. These particles can become embedded deep in the lungs and cause or exacerbate a number of diseases, including asthma, bronchitis, certain cancers and cardiovascular diseases. Even in low concentrations, they have an impact on health, with a "dose-response" gradient which is inversely proportional to the size of the particles (the finer the particles, the more harmful they are).

Spotlight on particles (PM10 and PM2.5)

PM10 and PM2.5 are the two categories of particles monitored (PM10 = particles of an average diameter of less than 10 micrometers (μm)). The sectors that emit the highest levels of PM10 in France are the residential/tertiary sector (33% in 2013), the manufacturing industry (29%), and agriculture (20%). Road transport contributes to 10% of emissions, mainly given off by diesel engines. Transport plays a major role in this all along main roads and in city centres.

Fine particles (PM2.5) are particularly harmful to health. They penetrate deep down into the respiratory system, to the pulmonary alveoli, and some ultrafine particles seem to be able to get into the blood flow, which carries them towards other organs. According to the WHO, it is not possible to identify the threshold under which particles do not have an effect on health, but in 2005 it published guideline values. French regulations, based on European regulations, are less stringent (see table hereinbelow).

	PM10	PM2.5
WHO maximum guideline values	20 $\mu\text{g}/\text{m}^3$ annual mean	10 $\mu\text{g}/\text{m}^3$ annual mean (and 25 $\mu\text{g}/\text{m}^3$ over a 24-hour peak)
French regulations	40 $\mu\text{g}/\text{m}^3$ annual mean (and 50 $\mu\text{g}/\text{m}^3$ not to be exceeded by more than 35 days/year)	25 $\mu\text{g}/\text{m}^3$ annual mean (since January 2015)

¹ *Ambient (outdoor) air quality and health.* Fact sheet no.313, WHO, 2014. The WHO also passed a resolution on air pollution in May 2015:
http://apps.who.int/gb/ebwha/pdf_files/WHA68/A68_R8-en.pdf



Local authorities have a number of levers available to them to improve air quality. The Healthy Cities hereinbelow present some specific examples.

Promoting cleaner mobility

Contrary to popular belief, a person driving a car is far more exposed to air pollution than a cyclist or a pedestrian. So-called "Zones de rencontre" (meeting zones - 20 km/h speed limit) and "Zones 30" (30 km/h speed limit) help to reduce the impact of vehicular traffic and leave more space for pedestrians and cyclists. Over the last 15 years, new trams, metros, cycle paths, pedestrian-only city centres and bicycle sharing systems have popped up all over French cities. For example, in order to facilitate non-vehicular mobility between 2 municipalities, **La Brie Francilienne** has created a 3 kilometre long "voie verte" (greenway).

The aim of the mobility plan for the municipal staff of **Chamalières** is to reduce the impact of cars and thus take action against air pollutants. It encourages staff to use alternative modes of transport. Half of public transport costs is covered (mandatory by law) and employees get an extra 15% off their bus pass. In order to facilitate the mobility of walkers and cyclists in the event of bad weather, bus tickets are available. A carsharing site has also been created.



The City of **Nantes** has implemented an action protocol in the event of air pollution peaks, in collaboration with Air Pays de la Loire. Residents are encouraged to use public transport by buying a "one hour" ticket valid, as an exception, for their journeys over an entire day. Moreover, works to make public roads safer, alongside substantial support given to associations, have encouraged the city's inhabitants to get around by bike and on foot.

Encouraging local procurement of goods

The provision of supplies for central kitchens is often carried out through standard procedures that only evaluate price, without taking into account the origin of food products. The City of **Loon-Plage** has developed a number of short circuits for its central kitchen, which supplies 600 meals every day. The first circuit goes through a local butcher that purchases their meat from farms in the local area. A second circuit involves potatoes delivered by a tractor and a back-to-work organisation supplies many of the other vegetables.



Rennes and the water authority have launched a programme entitled "Eau en saveurs" to supply canteens locally, over three years at a rate of €50,000/year. It initially involves dairy products and pork. Local producers and farmers are obliged to respect the water from the Rennes basin, and therefore preserve high-quality water, by not using pesticides, for example.

Reducing emissions from inefficient wood heating and the burning of green waste

Following a study into resident habits, **Grenoble** Alpes Métropole has put in place a communication plan to encourage good practices, and financial support to replace residents' inefficient wood heating appliances.

Combating wastage

Waste, and the disposal thereof, is a major source of air pollution. **Saint Joseph de la Réunion** has organised activities on combating food waste in schools. The City of **Roubaix** is leading a "Zero Waste" initiative aimed at reducing household and office waste and encouraging people to repair equipment and avoid excessive packaging when buying goods.

Developing industrial sites

In response to changes in European regulations on pollutants produced by docked boats, the port of **Marseilles** is testing out a system whereby boats are connected up to HV terminals (11,000V) during berthing. In addition to reducing the air pollution endured by the people of Marseilles, this system will reduce sound pollution and improve the quality of the air breathed by the people who work at the port.

A survey conducted in **La Rochelle** has helped to build a picture of the people who live close to the port area. It has been followed up by awareness-raising actions and both quantitative (dusts and volatile organic compounds) and qualitative (air quality observatory based on the participation of "noses" recruited from the neighbourhood's residents) measurement campaigns. Satisfactory results helped to reassure certain residents. An annual data presentation provides an opportunity to strengthen dialogue and present specific technical advancements capable of limiting the impact of port activities.

Creating more green spaces

Green spaces encourage people to get around on foot and by bike and can assuage heat islands that accumulate in urban areas during the summer. An old industrial site, located close to the city centre and privileged natural areas, is currently being redeveloped in **Châteauroux**. Roads exclusively for pedestrians and bikes have been developed, and cars will eventually be prohibited over the entire site. The City of **Cannes** is currently developing a new 75 hectare green lung in the lower valley of the Siagne by turning it into a space devoted to agriculture, nature and relaxation.

Informing residents

Nantes has been working to inform and raise awareness among vulnerable populations during pollution peaks. More specifically, during a pollution episode, identified officers put up notices (either "information/recommendation" or "alert" notices) in each municipal facility concerned: multi-use daycare centres, schools, leisure centres, gyms, EHPAD nursing homes, etc.

As part of its "Gouv'airnance" project, **Marseilles** has created a dynamic mapping tool for air quality. In a second phase, a website will be developed to inform residents on: l'air à Marseille – quels enjeux ? ; Qui fait quoi ? ; Et moi, que puis-je faire ? (The air in Marseilles - what are the challenges?; Who does what?; And me, what can I do?) www.air-marseille.eu.

An "Air Village" was set up in **Orléans** in May 2015. Conference debates, storytelling sessions and workshops have given the public an opportunity to learn about actions to take to improve air quality.

Carrying out studies to improve understanding

The City of **Rennes** currently exceeds carbon dioxide thresholds. The main source having been identified (traffic), a study is currently underway to identify the action levers that can be applied to road traffic management. Traffic, weather and air quality data are collected (under normal conditions and under experimental conditions of voluntary traffic changes), and analyses to assess possible actions and quantitatively assess their effectiveness are carried out.

A number of French framework documents on air quality exist. The most important ones for municipalities are:

Regional Air, Energy and Climate Plan (PCAET)

Must contain an air component before the end of 2016 for local authorities of over 50,000 inhabitants and before the end of 2018 for other local authorities of over 20,000 inhabitants.

Atmosphere Protection Plan (PPA)

Concerns conurbations of over 250,000 inhabitants and areas where the regulatory limit values are exceeded or are likely to be exceeded.

Urban Mobility Plan (PDU)

Organising the transport/parking of people and goods (mandatory for conurbations of over 100,000 inhabitants). Can facilitate urban mobility. An

Administration Mobility Plan (PDA) covers the staff of a local authority.

The Climate and Energy Plan of the **Grenoble metropolitan area**, extended to air quality in 2012, sets target results to reach for air quality in the region, i.e. -40% of particle emissions and -65% of nitrogen oxide emissions, by 2020, compared to 2005. **Villeurbanne** has voluntarily committed to a PCAET that will be adopted in 2016 in an exemplary manner over the community's entire heritage. The Town will continue to reduce air pollutants (already by 5% in three years) and will review its Administration Mobility Plan. For the **Urban Community of Dunkirk**, the 2015-2020 Regional Climate and Energy Plan (PCET) is based on a participatory approach. A number of actions are underway, such as a diagnosis for identifying effective actions to reduce inequalities, and the creation of strategic maps on environmental health. In its Climate Plan, **Metz** has committed to reduce its emissions of air pollutants by 20%. Within the local authority, the promotion of eco-mobility, the removal of fuel boiler rooms from the City and new HQE operations will be implemented.

In conclusion

It is important that Healthy Cities set an example in terms of health promotion by improving air quality. This public policy is easier to assess than other health policies.

Since we know that pollutant emissions (from motorised transport, industry, agriculture, the residential sector, etc.) are the main parameter that causes pollutant concentrations in air to vary, it is not necessary to measure their health impact in terms of mortality – we only need monitor changes in air quality – what is known as "assessment through triangulation of data".

Moreover, local authorities can facilitate resident access to data and also provide reliable and non-alarming information. Positive messages on the health impact of improved air quality will be more effective, particularly those that explain that a change in individual behaviour will have a positive effect on health for all!

We would like to thank...

The Working Group of the French Network of WHO Healthy Cities (RFVS-OMS)

Chair: City of **Grenoble**, Vice-Chair: City of **La Rochelle**

Other members: The Cities of **Aix-les-Bains, Bourgoin-Jallieu, Lille, Lyon, Nantes, Rennes, Valence**, and the intermunicipality of **Saint-Quentin-en-Yvelines**.

AND **ADEME, Air Rhône-Alpes, CSTB, Directorate-General for Health (DGS) & EHESP School of Public Health**.

For their financial support: Directorate-General for Health & INPES.

For their help in distributing this leaflet: EHESP School of Public Health

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Page 1 ZH RFVS taken in Grenoble; Page 2 ZH RFVS taken in Milan; Page 2 City of Rennes.

First version of the leaflet and page layout - Zoë Heritage RFVS. Proofreading and changes - the working group.

For further information:

The actions of the French network of WHO Healthy Cities www.villes-sante.com/qualite-air

General public booklet "Changeons d'Air ! Bonnes pratiques et bonne idées contre la pollution atmosphérique" FNE/MACIF

Downloadable from www.fne.asso.fr

ADEME: General public leaflets & its AACT-AIR call for proposals www.ademe.fr

December 2015

