The ExpAIR project

Assessing the individual EXPosure of the people of Brussels to urban AIR pollution

BRUSSELS ENVIRONMENT

IBGE-BIM

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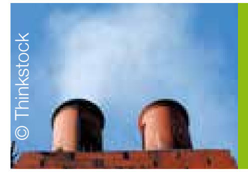
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AIR POLLUTION

Even though the levels of certain pollutants have fallen sharply over the past 20 years, air pollution remains a worrying problem for the health of people living in Europe. A number of studies show that exposure to air pollutants can reduce life expectancy by several months.

TWO TYPES OF POLLUTION

This phenomenon is all the greater in major cities like Brussels, whose inhabitants face:

- indoor air pollution, found in buildings and homes;
- outdoor air pollution, emitted mainly by vehicles using a very dense urban network and by heating installations.


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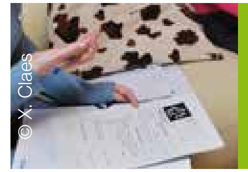
Information on the individual exposure of the people of Brussels to indoor and outdoor air pollution remains incomplete at the moment. More advanced studies therefore need to be conducted to assess this exposure.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THE ExpAIR PROJECT

In 2013, Brussels Environment has launched the ExpAIR project (individual EXPosure to urban AIR pollution in Brussels).

TWO OBJECTIVES

- **To assess** the individual exposure of the people of Brussels to air pollution by measuring the pollutants most widely found in indoor and outdoor environments. These are known as the reference pollutants.
- **To inform** and increase awareness among the people of Brussels so that they can reduce their exposure to urban pollution, amongst other things by opting for more environmentally friendly means of transport and/or heating systems.

The ExpAIR project aims to measure air pollution in Brussels more precisely and to encourage the inhabitants of the city to contribute towards reducing it.


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TWO REFERENCE POLLUTANTS

There are many harmful substances in the air resulting from our activities: fine particles, carbon monoxide (CO), carbon dioxide (CO2), nitrogen oxides (NO_x), sulphur oxides (SO_x), volatile organic compounds (VOCs), etc.

The ExpAIR project has taken two reference pollutants for outdoor and indoor air.

BLACK CARBON PARTICLES

Fine particles are among the pollutants that are the most dangerous for health. The ExpAIR project focuses on a sub-category of fine particles: black carbon. This has the following properties:

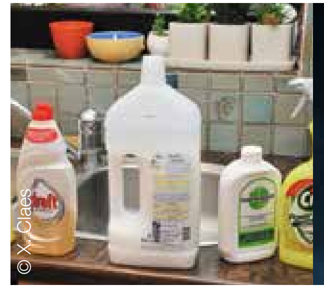
- it is a very good indicator of the pollutants emitted by fuel combustion, mainly in transport – more specifically diesel engines – and building heating;
- black carbon poses health risks (cardio-respiratory disorders, cancer, etc.), because it penetrates deeply into the lungs and the particles are very small (diameter 100 times smaller than that of a hair).

VOLATILE ORGANIC COMPOUNDS (VOCs)

Volatile organic compounds are usually the most critical pollutants found in our homes. Indoor ventilation that is often inadequate causes far higher concentrations of VOCs inside than outside.

Examples of VOCs:

- benzene: from cigarette smoke, combustion in the kitchen, etc.
- formaldehyde: gaseous fumes given off by binders or adhesives found in chipboard, cleaning products, cosmetics, etc.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VOCs can cause health problems (irritation of the respiratory tract, cancer, etc.), the severity of which depends on the composition of the product and the quantity of pollutants inhaled.

Black carbon particles and volatile organic compounds are the two reference pollutants chosen to measure air pollution in Brussels in the ExpAIR project.


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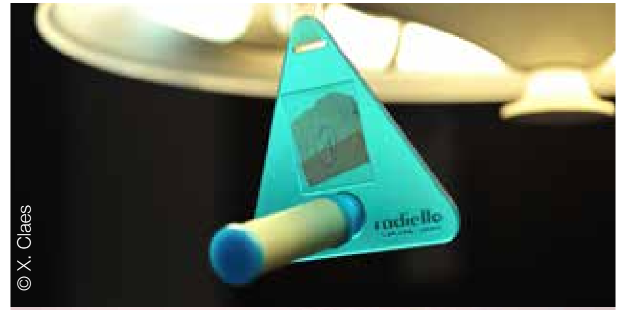
COLLECTING MEASUREMENTS

A measuring campaign is to be carried out to assess the individual exposure of the people of Brussels to black carbon particles and VOCs. A representative sample of inhabitants will be selected to wear portable measuring devices (aethalometers and radiellos) for five consecutive days.

Each participant will then have to fill in a questionnaire to establish the relationship between the measurements taken with the device and their environment and the sources of pollution encountered. Once the data have been collected, participants will be informed of the results of their tests. They will be given advice and tips so that they can adapt their behaviour with a view to reducing their exposure to pollutants.

A representative sample of people in Brussels will be able to assess their exposure and take part in the collection of measurements.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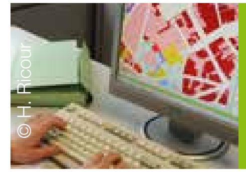
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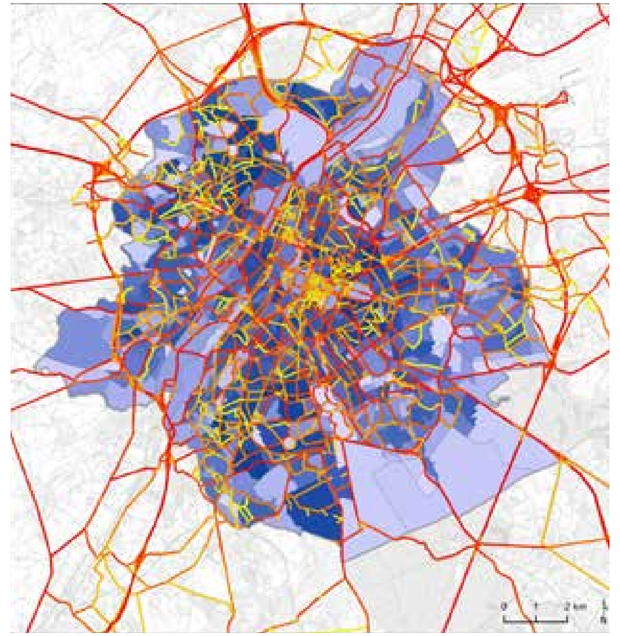
BLACK CARBON CARTOGRAPHY

The ExpAIR project will develop a cartographic model to show in great detail the black carbon concentrations in the Brussels-Capital Region as a whole.

This modelling will take account of the various emitters, including traffic and heating systems. It will also be based on the data obtained by the network of fixed measuring stations (spread across the territory), and on the data provided by the portable aethalometers.

NO_x EMISSION



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The results of the ExpAIR project will be presented on maps similar to that shown above, which offer the possibility of zooming in to street level.


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ASSESSING PERSONAL EXPOSURE

When the project is complete (end of 2015), the people of Brussels will therefore be able to assess their individual exposure to air pollution using the Brussels Environment website. Depending on the levels reached, they will benefit from recommendations to reduce the risks for their health.

The people of Brussels will be able to assess their personal exposure to urban pollution.

MORE DETAILS

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