

Editorial

Time after time, we are reminded of the deleterious impacts of human activities on the environment. The oil spill in the Gulf of Mexico is one of the latest dramatic examples. Media all over the world are relaying this disaster.

But when dealing with day to day environmental issues, it can be harder to raise media attention and through this public awareness. Monitoring air quality faces this problem: it only reaches headlines when a pollution episode occurs while the impact on human health of everyday pollution concentration is also a major source of concern, comparable to the effect of passive smoking.

Moreover, despite the efforts already made, levels of pollution remain high, especially in urban areas, close to traffic.

For instance, in the Paris agglomeration, between 3 and 4 million of people are exposed to levels of pollution above the European regulations due to nitrogen dioxide (NO₂) and particles (PM₁₀) levels. Close to high-traffic roads, NO₂ levels are not only exceeding the limit value, around twice the air quality objective, but are also rather stable above it. Increases have even been monitored by some stations. Meanwhile the decrease observed for the background levels seems to have come to an end. This is a great challenge for the coming years, especially with the air quality objective becoming a limit value in 2010.

This situation is not specific to Paris. For all local authorities, it has become both an emergency and a challenge to find effective solutions to fight air pollution and comply with European regulation.

Within CITEAIR II, our ambition is to support these cities, by providing a set of tools and guidelines to assess scenario, monitor air pollution, and raise public awareness:

- An air quality index both for traffic and background conditions which will take into account fine particles as they are now regulated under the CAFÉ directive (*read below*).

- A mobility indicator to describe the mobility status of a city and the related impact on air quality and greenhouse gas emissions (*read below*).

- An air quality forecast, simple and generic enough for any city willing to use it, and be implemented on our website (*read below*).

- A guidebook on integrated emission inventory, providing a better and integrated understanding when designing mitigation measure for air pollution together with climate change (*read below*).

The last developments, especially on forecasts, were presented during the 2nd CITEAIR II conference, held on June 1st and 2nd in Ljubljana.

The platform airqualitynow.eu for public information now provides near real time air quality information for the citizens of 84 cities (4 of the 5 biggest cities and half of the cities over one million inhabitants). The CITEAIR team thanks all the participants for this effort as well as the four media permanently displaying this information!

Karine Léger, Airparif
Lead Partner CITEAIR II

Common Air Quality Index

The Common Air Quality Index (CAQI) has been around since late 2005. It is used by the website www.airqualitynow.eu where more than 80 European cities present, in real time, their air quality data, which they can compare with their peers. In autumn 2009 the European Environment Agency (EEA) started to apply this index in the part of their 'Eye On Earth' website related to air quality.

Airqualitynow.eu
number of
participating cities

- March 2006 : 7
- Dec 2006 : 16
- Dec 2007 : 26
- June 2010 : 84

The fact that the website has gained quite a following (we started with less than 10 cities) implies the index is accepted for the purpose it was designed for: **comparing air quality – in real time- across borders.**

In 2005 the CAQI was derived from existing indices found in literature and the EU air quality directive. It was first tested on data from four project cities as we could not image the scale of its future application. Some additional tests were made using the EU data base (Airbase) in order to better adjust the PM10 grid.

'In the Paris agglomeration, between 3 and 4 million of people are exposed to levels of pollution above the European regulations due to NO₂ and PM₁₀.'



After five years of functioning and with an increased number of cities, it was time for an evaluation and some updates. Moreover, with regard to the CAFÉ Directive of 2008, there are now limit values for PM_{2.5} and EU Member States have to start monitoring them. For this reason, these pollutants must be included in the CAQI calculation. We decided to use Airbase data from across Europe to get a good picture of how it works out in practice. A set of 31 background and 27 traffic stations were used from 9 countries. The selected year was 2006 and only the stations that had PM_{2.5} were included, in order to be able to do the evaluation and the revision at once. The results for the hourly index are shown in the table enclosed.

- The results show that most of the hours come in the low and very low pollution classes. Traffic readings are slightly higher but the difference is not so big. This is partly due to the fact that at background sites, O₃ is occasionally a problem whereas it is not considered for traffic (due to the presence of fresh exhaust).

- Looking at NO₂ and PM₁₀ only we observe that the traffic sites are, as expected, more polluted. The fact that most of the hours are at the good end of the index scale is correct from the exposure perspective. Hourly exposure is generally not worrisome, except for sensitive people. Air pollution becomes dangerous through medium to long-term exposure even for medium and low concentrations.

- The grid for the new pollutant PM_{2.5} was based on the grid for PM₁₀. Data analysis showed that multiplying the PM₁₀ grid by 0.6 gave an appropriate grid. Appropriate in the sense that adding a new pollutant doesn't result in jumps in the index results.

From an awareness raising perspective, slightly higher readings might be desirable. The daily index is slightly higher. As the averaging time goes up and the daily index is determined by the highest value of either of the pollutants occurring during the day the final result tends to be somewhat higher.

The report underpinning the evaluation and revision is in progress but a draft is already available and open to comments and opinions:

<http://www.citeair.eu/index.php?id=9>.

Common Air Quality Index - Evaluation results for the hourly index

Background						
Dominant pollutant	Occurrence	Index class	Overall index	Sub-indices		
				PM ₁₀	O ₃	NO ₂
PM ₁₀	49%	0-25	27%	55%	64%	92%
O ₃	45%	25-50	51%	32%	33%	8%
NO ₂	6%	50-75	17%	10%	3%	0%
		75-100	4%	2%	0%	0%
		" >100"	1%	1%	0%	0%
Traffic						
Dominant pollutant	Occurrence	Index class	Overall index	Sub-indices		
				PM ₁₀	O ₃	NO ₂
PM ₁₀	67%	0-25	35%	48%	-	63%
O ₃	-	25-50	41%	34%	-	30%
NO ₂	33%	50-75	18%	14%	-	6%
		75-100	5%	4%	-	0%
		" >100"	1%	1%	-	0%

Traffic and Mobility Indicator

The work carried out within CITEARI II to create a Traffic & Mobility indicator, as a contribution to sustainable urban development, is currently in progress.

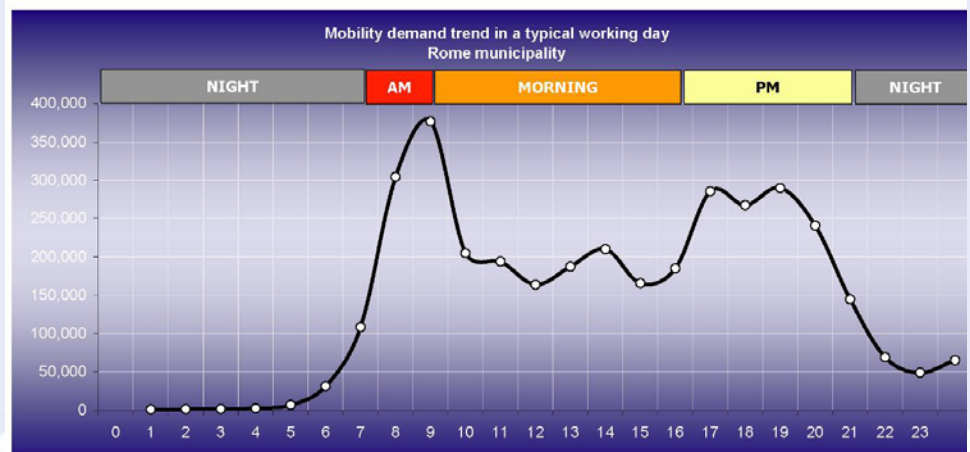
A lot has been done to investigate how the mobility status in a city and its related impacts on the citizens and the environment could be best assessed. As a result, a bi-level modular structure has been proposed in order to:

- first assess the mobility status of a city with input data mainly related to traffic;
- and then make the link with its impacts on public exposure to poor air conditions, air quality and climate change.

The first input to calculate the mobility indicator comes from traffic measurements (with special attention given to travel times, vehicle speed and flows). With regard to this data, a set of possible mobility indicators has been defined. On the assumption that the measured roads are a significant sample of the whole urban network, the proposed indicators are thus based on roads where traffic data is available (e.g. loop detectors, ocr. cameras).

Such data could be monitored in the different cities with any type of technology, according to the availability of tools and infrastructure.

Second, an evaluation method concerning the environmental impacts of mobility on citizens has been proposed by linking the mobility indicator with other CITEAIR results:



ARMAAG new CITEAIR II partner

The CITEAIR II consortium is very pleased to welcome ARMAAG as new partner in the project, and to give a new start to a relationship established already a few years ago.



ARMAAG Foundation (Agency of Regional Atmosphere Monitoring of Gdansk Agglomeration) was founded in 1993 in Gdańsk as a result of agreement of four cities: **Gdańsk, Gdynia, Sopot, Tczew** and also "Nederpol" Company.

It is a non-governmental organisation aimed at monitoring air quality in the Gdańsk Agglomeration and at informing the public and institutions. Moreover the ARMAAG Foundation takes part in public debates and provides advice on Air Repair Programmes.

At the time being ARMAAG runs 10 automatic monitoring stations. Measurement results are transmitted on-line and made available on ARMAAG website www.armaag.gda.pl. ARMAAG also displays real-time air quality indices, monthly and annual reports, data analyses and air quality forecasts for the next day.

The history between ARMAAG and CITEAIR started during the first CITEAIR project. ARMAAG decided to provide the air quality data of 4 cities to airqualitynow.eu, and then organised a workshop in Gdansk in 2007. ARMAAG is replacing the Burgas foundation which unfortunately had to leave the project due to local circumstances.

- the Air Quality Index (CAQI) for the impact on the citizens' exposure to air pollution,

- the emissions of air pollutants and green house gases for the environmental impact of transport.

So far the methodology has been tested with data from the city of Rome and to do this all the technological instruments now in use at the Mobility Agency of Rome have been deployed to gather data both for private vehicles and public transport vehicles.

Additional tests and a common tool for the calculation of the indicator will be carried out for Rotterdam, Maribor and Paris.

Towards Integrated Air Quality and CO₂ Emission Inventories

Many initiatives that aim to both clean the air and protect the climate are emerging.

From a policy perspective, the most important linkages between climate change and air pollution exist at the level of emission sources. Air pollutants and greenhouse gases are often emitted by the same sources and hence changes in the activity levels of these sources affect both types of emissions.

In the context of the CITEAIR II project an existing emission inventory for air pollution emissions is to be fed with data on green house gases so the inventory can be used to monitor both air quality and climate action plans.

Jointly addressing pollutants and CO₂ will provide local authorities with better information on how to deal with both challenges.

In short: CITEAIR II will elaborate common guidelines on how to develop essential baseline information to formulate and monitor a climate change programme consistent with Air Quality issues. Work on this integrated emission inventory should be finished after the summer.

Based on this, a set of indicators to assess a city or a sector performance (e.g. is one energy or pollutant efficient) will be developed after the summer.

Urban Air Quality Forecast

The overall CITEAIR II methodology to support European cities with forecasting the Air Quality is following a "3-level approach". This should facilitate its use by any city independently of the forecasting tools already available or not (www.citeair.eu/index.php?id=21).

The level 1- forecast is a statistical forecast. The main work has consisted in the definition of a list of predictors for a multiregression forecast based approach and the development of generic tools for cities to check the results of the predictions. The approach was initially tested on data from Rotterdam and Seville.

The analysis of the results shows that the optimum list of predictors for the forecast of the Air Quality concentrations and indices depends on the specific situation in the cities. Therefore, in order to be as generic as possible and make the level-1 forecast usable for all cities, a short statistical model with a limited list of predictors has been developed. It is based on past measurements, simulations values from the Chimere model, and on the type of the day considered (week end or working day).

This generic tool has been applied to the data from Rotterdam, Seville and Prague, and will be tested for a set of cities such as Maribor, Gdansk, Berlin and Paris for additional validation. The objective is to test the robustness of this "short" statistical model and the possibility to apply it to all cities interested, and especially to the CITEAIR partners.

The final goal would be to make the forecast of the common air quality index available on www.airqualitynow.eu either from this generic approach or from local

concentrations when they exist and if the cities are willing to publish them to the website.

Other Air Quality News

Health impacts of air pollution need better communication

Reductions in air pollution in European cities significantly decrease the number of premature deaths, according to researchers. However, these results need to be communicated effectively to policy makers in order to have an impact... Read the whole article on the European Commission website:
<http://ec.europa.eu/environment/integration/research/newsalert/pdf/188na3.pdf>.

Air quality co-benefits should be considered in climate policies

Measures to reduce greenhouse gas (GHG) emissions have the additional benefit of reducing air pollutants. However, these benefits are rarely included in the design and evaluation of climate change policies. A new study suggests that considering these benefits in climate change policy could reduce the cost of such policies, and engage stakeholders who are otherwise unmotivated to tackle climate change. Read the whole article on the European Commission website:
<http://ec.europa.eu/environment/integration/research/newsalert/pdf/190na1.pdf>.

Dunkerque 2010

CITEAIR took part in the 6th European conference on sustainable cities and towns in June.



CITEAIR II Workshop and Networking event Ljubljana (1-2 June 2010)

At mid term of the project, advanced results of CITEAIR II were presented at the second conference of the project in Ljubljana on 1st and 2nd June, under the title "Getting ready for the future – Cities for cities: tools for improving air quality and tackling climate change"...

The event attracted an international audience with 67 registrants from 19 countries and performed as a forum for representatives from cities and research institutions to exchange their views on approaches and tools to improve the urban air quality, reduce greenhouse gases and inform the public on the state of the environment in real time.

The official welcome was given by Mr. Zoran Kus, Secretary of State, Ministry of Environment and Spatial Planning of the Republic of Slovenia and Mrs. Alenka Loose, Head of Environment Protection Department of the City of Ljubljana. Zoran Kus expressed his conviction that the conference attended by leading European experts in the field will provide a fruitful ground for exchanges of knowledge and good practices and strengthening of networking.

Expressions of experience when dealing with air pollution and public information were provided by the following speakers:

- o Silvo Žlebir, Head of Environmental Agency of Slovenia
- o Dr. Ulrich Teichmann, City of Munich
- o Beate Arends, Provincie Zuid-Holland
- o Bert Jansen, European Environmental Agen
- o John E. White, US Environmental Protection Agency

Presentations made, press release and minutes available on www.citeair.eu



CITEAIR II partners

