From Insight to Action: How the CityTRAQ assessment & scenario tools strengthen local policy

How data and models lead to tools that support local policies. Tools developed within EU projects such as CityTRAQ and HungAIRy, as well a tool from the Netherlands, were explained and demonstrated. All these tools reveal that countries, regions and cities are looking towards data-based solutions and that EU-funded projects are successful examples of this. The integration of data from other domains (such as health, mobility, climate, etc.) may increase the public support for air quality measures and represents the future, for example through the use of digital twins.

1.1 Introduction

The session started with a short introduction on how different kinds of data, such as measurements from reference stations, emission data, and data on building dimensions (street canyons), are combined with models to provide high-resolution concentration maps. These data, models and concentration maps form the basis of two tools that were developed within the CityTRAQ project. These tools support local authorities in developing air quality plans and implementing measures to address hotspots of particulate matter, nitrogen dioxide, etc.

1.2 Assessment tool CityTRAQ

GIM (an expert in geographic information) developed the assessment tool and gave a short explanation of it. With this tool, local authorities can gain, at a glance, an overview of the location of hotspots, their contributing sectors, neighbouring emission sources (industry and traffic), and whether vulnerable locations (kindergartens, schools, residential healthcare centres) are exposed to high concentrations of pollutants. This helps local authorities to prioritise the different hotspots, and, based on the sector contributions and sources, they can start looking for solutions.

1.3 Planning tool CityTRAQ

VITO (a Flemish research centre) developed the planning tool and gave a short explanation of it. With this tool, local authorities can explore different measures to address the detected hotspots. Traffic measures, such as a cut in the street, circulation plans, low-emission zones, etc., as well as measures related to point sources such as industry, households, and power generators, can be calculated. Difference maps between the current situation and the situation after implementing the measures are the results of these calculations. Using these results, local authorities can explore different measures and select the most effective ones.

1.4 Demonstration assessment and planning tool

VMM (Flanders Environmental Agency), together with VITO, gave a live demonstration of the tools using a case study from a neighbourhood in Flanders. Using the concentration maps from the assessment tool, hotspots of nitrogen dioxide (concentrations > EU2030) were identified within this neighbourhood on roads running through the centre.

An analysis of the sector contributions showed that traffic was the sector contributing the most and, enhanced by the street canyon effect, accounted for up 60% of the nitrogen dioxide concentration. When traffic data and information on vulnerable locations were combined within the concentration maps, it was

concluded that more than 1 million vehicles per year passed through the centre and that many vulnerable locations were situated there.

The demonstration of the planning tool calculated a traffic measure. The amount of traffic in the neighbourhood was reduced by 80% and redirected towards an existing ring road surrounding the neighbourhood. Difference maps showed a decrease in nitrogen dioxide, with concentrations achieving the EU 2030 limit value. The increase in concentrations resulting from the redistribution of traffic to the ring road was smaller due to the lower impact of street canyons there. This was because fewer buildings are located alongside this ring road, and therefore fewer vulnerable locations are exposed.

The conclusion was that the assessment tool showed that inhabitants and vulnerable locations are exposed to nitrogen dioxide concentrations exceeding the EU 2030 limit value due to high traffic volumes. Using the planning tool, it could be shown that redirecting 80% of this traffic to the surrounding ring road would allow the EU limit value of nitrogen dioxide to be achieved, resulting in fewer people being exposed to high concentrations. Less traffic in the centre also results in lower particulate matter concentrations and creates more space for, for example, climate adaptation measures (depaving, infiltration, blue-green nature-based solutions, etc.).

1.5 HungAIRy by HungaroMet Nonprofit

HungaroMet Nonprofit (Hungarian national meteorological and air quality monitoring organisation) presented the EU project HungAIRy. This eight-year project aims to adress one of the most significant environmental challenges by improving unfavourable air quality in 10 Hungarian municipalities across eight regions of the country. The project is being implemented through the development of emission databases, comprehensive awareness-raising activities, and the establishment of a national network of experts and consultants.

As part of the project, a GIS database and a high-resolution air quality modelling tool are being developed to support the biannual review of municipal air quality plans. The decision-support system makes it possible to estimate the impact of different measures and to identify key areas where effective measures can be taken. This modelling tool was explained and demonstrated.

1.6 GCN tool by RIVM

The RIVM (the National Institute for Public Health and the Environment of the Netherlands) developed the GCN tool and provided a short explanation of it. This tool is based on data from the Emissions Register and insights into the distribution of emission sources across the Netherlands.

The GCN tool shows the calculated emissions from different sources within a municipality. It also provides the concentration levels of various pollutants and indicates which sectors contribute to these concentrations. Each year, RIVM updates the data based on the latest scientific insights. It also calculates the expected situation in 2030. These projections include the effects of policies that have already been implemented, as well as the expected impacts of policies by the national government, provinces, and municipalities that are yet to be implemented.

1.7 Conclusions

- European countries, regions and cities face air quality challenges, and data-driven policies are the way forward for tackling local hotspots.
- Similar tools in Belgium, Hungary and the Netherlands show that countries in the EU are already implementing these data-driven policies using data- and model-based tools.
- This demonstrates that a European ecosystem related to these tools is growing, of which FAIRMODE is one example.
- The integration of more data from other domains (health, mobility, climate, etc.), for example through digital twins, represents the future and will help generate more public support. Measures driven solely by air quality considerations are rare. By systematically mapping data – and thereby demonstrating co-benefits for health, mobility, and climate – broader support for the implementation of air quality measures can be strengthened.