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D6.1. Handbook of best practices in air



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D6.1

Handbook of best practices in air

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Executive summary

The LIFE GreenMe5 project involves the organization of thematic events, called Green Innovation Camps (GIC), in each of the partner cities and of each of the 5 pillars of the Green City Accord (biodiversity, air quality, waste management, water and noise). In those GIC, members of the partner cities (Transnational Expert Team) and local stakeholders, together with external experts in the specific thematic field, identify and exchange innovative actions to improve environmental management in the area to be addressed.

This report reflects on the discussions of the GIC held in Vilnius on 24-25 April 2024, focusing on air quality, and presents some of the good practices exposed in the event.





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Introduction



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1. Introduction

LIFE GreenMe5 and Green City Accord

Green City Accord is a movement of European cities committed to environmental conservation. The signatory city authorities agree to take action to make their cities greener, more resilient and healthier.

The agreement includes five pillars related to the most important areas of urban environmental management: water, air quality, waste, noise and biodiversity. The initiative was launched by the European Commission in October 2020 and already involves more than 100 cities across Europe.

LIFE GreenMe5 aims to facilitate the implementation of the GCA in five municipalities. The philosophy of the project is based on the idea that the exchange of experiences and cooperation between the participating cities will serve to improve their capacities and find solutions to common challenges.

The project will establish a multi-governance approach to the implementation of the Agreement, integrating all municipal departments and stakeholders. For this purpose, interdepartmental, supra-municipal and local working structures have been set up. LIFE GreenMe5 will support the participating cities in the elaboration of the mandatory reports that are part of the political commitment.

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This project, co-financed by LIFE funding, involves the Federation of Municipalities of the Region of Murcia, leader of the project, the municipalities of Murcia, Cieza (Spain), Arezzo (Italy), Vilnius (Lithuania) and Helsingborg (Sweden), and the company specialized in developing sustainability and environmental projects through European funding EuroVértice (Spain).

Under LIFE GreenMe5, pilot actions will be implemented to improve indicators in the five GCA areas - biodiversity, air quality, waste management, water and noise - with the aim of transferring them as good practice for implementation in other European cities.

These actions include measures in streets to reduce noise pollution and improve air quality, a manual to reduce food waste in schools, measures to improve green coverage or a door-to-door collection system for high-value and high-risk waste.





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What are the Green Innovation Camps?

Along the LIFE GreenMe5 project, coinciding with the meeting of the Steering Committee, each partner country will organise a Green Innovation Camp (GIC). These two-day thematic workshops will focus on one of the five pillars of the Green City Accord: biodiversity, air quality, waste management, water and noise.

The GICs involve members of the Transnational Expert Team (members of the partner cities) and local stakeholders, together with external experts in the specific thematic field. The objective of each GIC is to identify and exchange innovative actions to improve environmental management in the area to be addressed in each of the cities. For municipal technicians, it is an opportunity to explore other geographical contexts and share good practices and ideas to improve together the implementation of the Green City Accord.

Innovative methodologies and techniques of design thinking will be applied in the Green Innovation Camps, such as the SCAMPER method, graphic brainstorming, character charts, mind maps, infographs and diagrams.





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Introduction to the series of handbooks of best practices produced by the LIFE GreenMe5 project

This is the first of a series of handbooks in which you can find in an agile way the best practices shared by the partners of the LIFE GreenMe5 project. The aim is to compile the learnings and experience of the Green Innovation Camps.

This first volume is the result of the meeting held in Vilnius on 24 and 25 April 2024, focusing on air quality.

In the 24th of April, in Vilnius, in addition to speakers from the five municipalities, other partners presented their expertise working with air quality: Kęstutis Kupšys, member of the European Economic and Social Committee; Anton Nikitin, Vilnius Municipality Sustainability Officer, and Linas Vaitkevičius, ID Vilnius environmental expert working on the pilot project Street of Changes/ City Lungs.

In addition, a round table discussion was held in which project partners and experts from Vilnius discussed how to improve the air pollution situation in cities.

On the afternoon of the 25th of April, project partners moved to the Fabijoniškės gymnasium to attend a talk about the use of citizen science for air quality, by the Citizen science expert and member of Human Computation Institute (US) Eglė Marija Ramanauskaitė. Then, members of the project partners and 4 teachers of the school participated in a “Do it yourself” activity in which they produced their own air sensors.

After that, a community event was organized in the Fabijoniškės district, with the participation of project partners and people from the neighborhood where the pilot action in Vilnius will be developed. Different activities were organized for the population, all of them following a New European Bauhaus approach, e.g. taking into account the principles of sustainability, inclusion and beauty. People from the area participated planting trees in the area, writing their desires for air cleaning measures for the pilot street, and playing on educational activities and games. They also voted for their favorite design of those proposed by the Art Academy and Vilnius Tech students. The students' proposals will not constitute the final design of the pilot measures but they do hope to give an idea of the aesthetics and content that the inhabitants hope to obtain from the intervention.

Over the next two years, four more GIC will take place in which the focus areas of the Green City Accord will be discussed. The organizing municipality will be the one with the most experience and expertise in the subject matter:

- MURCIA (M14): water management.
- HELSINGBORG(M20): noise prevention.
- AREZZO (M26): waste management.
- CIEZA (M32): nature and biodiversity.





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What will you find in this document?

In this document you will find, in addition to a brief overview of aspects related to air quality in Europe, such as the current situation, legal framework, Green City Accord commitments and indicators, the best practices discussed at the Air Green Innovation Camp that took place in Vilnius on 24 and April 2024.

Good practices have been divided into five categories:

- Reducing pollutants from the source.
- Mitigating the effects of air pollution.
- Measuring and monitoring air quality.
- Citizen science for collecting data on air quality.
- Communicating air quality data to the population

In each category there is a brief summary of what was discussed at the conference in relation to that topic and a sheet for the most innovative or relevant good practices presented.





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Air quality in Europe



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2. Air quality in Europe

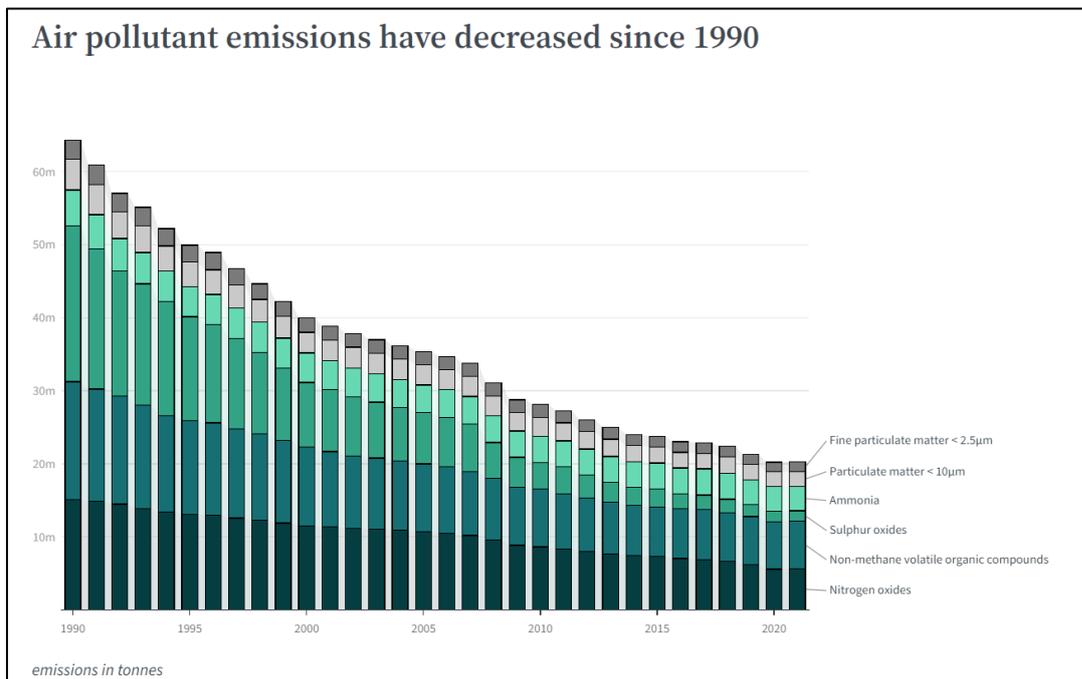
Situation

Since the 1980s, the EU has been taking stringent measures to reduce air pollution, and emissions of the main air pollutants have decreased considerably.

However, according to the latest data from the European Environment Agency, in 2021, 97% of the urban population was exposed to concentrations of fine particulate matter (PM2.5, the deadliest air pollutant of all) higher than the latest World Health Organization (WHO) guidelines. In other words, in general, the air we breathe contains pollutants that can be extremely harmful to both humans and the environment.

Indeed, air pollution causes hundreds of thousands of premature deaths each year. Exposure to fine particulate matter caused 238,000 such deaths in 2020, a rate more than 12 times higher than the number of road traffic fatalities (18,800 in the same year).

Reducing air pollution is therefore essential to protect human health and the planet. With this in mind, the EU has a target of eliminating pollution by 2050 and is working on a new set of rules to make this a reality.



Source: European Environment Agency (EEA)

The main pollutants include particulate matter, ammonia, methane, ozone, nitrogen oxides, sulphur dioxide and non-methane volatile organic compounds. Each of these is harmful in



its own right and some can even react chemically with each other to become particulate matter or ozone.

To get an idea of the complexity of the challenge, it is enough to know that energy consumption and agriculture are the largest source of air pollution in Europe. This means that the improvement of air quality will necessarily be linked to a change in the production model. To give just one example, agriculture was the principal source of ammonia and methane in 2020, responsible for 94% and 56% of total emissions, respectively. Ammonia emissions fell by only 8% from 2005 to 2020. This was the lowest percentage reduction of all pollutants in that period.

Legal framework

The main legislative tool currently at the disposal of the European Union to guarantee air quality is Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.

This directive establishes air quality objectives, setting thresholds, limit values and target values for the following pollutants: sulphur dioxide, nitrogen dioxide, particulate matter, lead, benzene and carbon monoxide. It includes pollutants such as particulate matter below 2.5 µg. For fine particulate matter (PM 2.5), responsible for the highest number of premature deaths in Europe, the annual limit value was set at 25 µg/m³.

This regulation includes the obligation for national authorities to designate specific bodies to monitor air quality, the need to introduce air quality plans when pollution levels exceed thresholds in certain areas, including specific measures to protect vulnerable groups, among other aspects.

Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air should also be taken into account. It sets target values for these pollutants.

Finally, Commission Directive 2015/1480/EU of 28 August 2015 lays down rules on reference methods, data validation and location of measurement points for ambient air quality assessment, modifying several annexes to the above-mentioned Directives.

It should be noted that in October 2022 the Commission presented a proposal to update and merge the existing ambient air quality Directives (2004/107/EC and 2008/50/EC). In May 2024, negotiators from the European Parliament and the Council of Europe reached a provisional political agreement on updating air quality legislation. At the time of writing this deliverable, this agreement still had to be adopted by the Parliament and the Council, after which the new law must be published in the EU's Official Journal to enter into force 20 days later. Thereafter, EU countries would have two years to implement the new rules.





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The main objective of this revision is to set stricter binding 2030 limit and target values for all air pollutants; establish air quality provisions that will help the EU meet its 2050 pollution-free target.

The new legislation will update existing air quality standards to align them more closely with the WHO's 2021 recommendations, which are based on the latest scientific research on the health effects of air pollution.

For example, for fine particulate matter (PM_{2.5}) the annual limit value would be reduced from 25 µg/m³ to 10 µg/m³ (the WHO guidance value is 5 µg/m³).

The proposal requires the Commission to regularly review the scientific evidence to verify whether the revised air quality standards are proving effective in protecting human health.

GCA commitments and indicators on Air Quality

Under the Green City Accord, cities commit to significantly improve air quality by moving towards compliance with WHO air quality guidelines and ending exceedances of EU air quality standards as soon as possible.

To this end, the signatory municipalities have agreed to fulfil a number of commitments:

- Take action, implement policies and enforce regulations to achieve ambitious reductions in air pollutants from sources within our control.
- Integrate air quality impacts and co-benefits into the development of other relevant policies and plans, in particular, Sustainable Energy and Climate Action Plans (SECAPs) under the Covenant of Mayors for Climate and Energy – especially in transport or energy-related mitigation actions, Sustainable Urban Mobility Plans (SUMPs), the deployment of renewable energy, and spatial planning processes.

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In addition, they will consider implementing the following actions and measures:

- Creating low or zero emission zones, implementing vehicle restrictions or financial incentives (such as road or parking charging) and supporting cycling and the use of electric vehicles.
- Making public transport more attractive, more accessible and cleaner.
- Addressing air pollution from energy consumption, by promoting energy efficient buildings with clean heating and cooling systems and renewable energy installations.
- Regularly monitoring air quality across the city and making the data available to the public in a timely and accessible manner.
- Working with relevant institutions to ensure high quality emissions inventories, models, and analysis.





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- Collaborating with relevant institutions for more research on the local health impacts of air pollution, local benefits of air quality improvements, and local economic implications.
- Raising awareness of air pollution to help citizens reduce their exposure.

To check how air quality is evolving in each city, indicators will be used:

- PM2.5 concentration levels [highest annual mean observed at (sub) urban background stations].
- PM10 daily concentration levels [highest number of days exceeding the WHO recommendation of 45 $\mu\text{g}/\text{m}^3$ per year, observed at any (sub) urban background or traffic station].
- NO2 concentration levels (highest annual mean observed at traffic stations).

The mandatory indicators are to be used in:

- Establishing the baseline – covering both the starting point in each area as well as the targets to be achieved by 2030 - within two years after signing the GCA.
- Reporting changes compared to the baseline every three years.





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**Best practices discussed in the Air
Green Innovation Camp – Vilnius -
April 2024**



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3. Best practices discussed in the Air Green Innovation Camp – Vilnius -April 2024

For ease of reference, the best practices have been divided into five categories. The first two are related to the two measures that should be taken. In order to improve air quality, as a first priority, the emission of pollutants from the source should be reduced. Simultaneously, but as a second priority, the effects of air pollution on citizens and the environment should be mitigated.

The last three categories are directly related to each other. On the one hand, the measurement and monitoring of air quality, are essential to adopt the most accurate measures adapted to each situation. On the other hand, there is the citizen's contribution. Citizen science tools allow not only to supplement official air quality data collection, but also to raise awareness through action. Lastly, communicating the data on the population should be key for every city.

This leaves the following sections:

- Reducing pollutants from the source.
- Mitigating the effects of air pollution.
- Measuring and monitoring air quality.
- Citizen science for collecting data on air quality.
- Communicating air quality data to the population





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Reducing pollutants from the source

What was discussed?

The first intervention of the GIC was given by Kęstutis Kupšys, member of the Civil Society Organisations Group of the European Economic and Social Committee (EESC). This is an independent body that issues opinions agreed by consensus among its members, which are sent to the European institutions and published in the Official Journal of the European Union.

After reviewing the Ambient Air Quality Directives in 2021, the EESC recommended to the European Commission (EC) that air quality standards should be aligned as closely as possible, by 2030 at the latest, with the air quality guidelines updated by the World Health Organisation (WHO). For this purpose, a separate framework with clear limit values, enforcement mechanisms and management rules should be established.

According to the European Economic and Social Committee, the European Commission should be as ambitious as possible because **there is no safe level of air pollution** and there is an urgent need to improve environmental protection to guarantee fundamental rights, both within the European Union and beyond. Citizens have the right to a healthy environment in order to preserve their quality of life. The EESC also considers it necessary to involve people through citizen science and to compensate adequately those who suffer from health problems due to poor air quality.

In the end, a joint proposal was reached between the EESC, the European Commission and the Parliament. It is not as ambitious as they intended, but according to Kupšys, it was an improvement on the initial proposal. The final text, still to be adopted by the European Parliament at the time of writing, contains significant exceptions related to background pollution, due to the difficulty of separating natural and human pollution.





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Best practices presented

Helsingborg's roadmap for improving air quality

Presented by:

Torsten Nilsson (*Inspector and AQM operator in Helsingborg Municipality*)



Implemented in the framework of the project:

Air Quality Action Plan (AQAP)

Year:

2007-2016

More info:

helen.wiklund@helsingborg.se

DESCRIPTION:

The topography, the presence of a nearby port and an international logistics hub means that the city of Helsingborg, Sweden, has a number of conditions that affect air quality negatively.

As a result, the recommended NO₂ limits were exceeded in 2003 (24h value, 60 micrograms/m³ more than seven days in a year), which made the Swedish government announce that Helsingborg must take action and present an action plan. The County Administrative Board led the work and summoned the regional stakeholders and the municipal administrations to develop an Air Quality Action Plan (AQAP) in 2007. In 2009, the AQAP was adopted by the County Administrative Board.

The AQAP contained ten items with measures that were mandatory for the municipality to implement:

1. New bicycle plan.
2. Bus priority vision.
3. Increased capacity for regional trains.
4. New parking policy.
5. Review of traffic signals.
6. Reduction of polluting traffic in the city centre (1).
7. Reduction of polluting traffic in the city centre (2).





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8. Environmental zone for heavy traffic.
9. Environmental requirements in procurement.
10. A local action program for behavioral measures.

Concrete actions included, for example, the planning of new cycle paths, doubling the number of daily public buses and regulating heavy traffic through central parts by implementing environmental zones.

The improvement of air quality monitoring, with air quality measurement stations both at street level (NO₂, PM 2.5 and PM10) and at roof top level (NO₂, SO₂ and ozone), as well as the use of national data management tools (EDB) that can help calculate the effects of measures and supplement measurements, should be highlighted in this action plan.

This has made it possible, for example, to determine the real impact of traffic reduction and the switch from diesel to gas buses on air pollution.

Since the AQAP came into force, air pollution levels have been reduced therefore the implementation of the AQAP is considered a success. The traffic situation at the busiest street through the central districts of the city has reduced from 21 000 vehicles per day to 14 000 vehicles per day.





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Vilnius, Sustainable Urban Mobility Plan

Presented by:

Anton Nikitin (*Vilnius Chief Sustainability Officer*).

Implemented in the framework of the project:

Vilnius City Master Plan
Strategic Development Plan
SUMP
SECAP
CCC&GCAP
Green City Accord

Year:

2018-2030

More info:

<https://judu.lt/darnus-judumas-vilniuje/dokumentai/>



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DESCRIPTION:

Air pollution in Vilnius is mainly caused by transport, so an important part of the local administration's effort has been to reduce its impact through an ambitious Sustainable Urban Mobility Plan. This has been based on four principles:

- Street transformations.
- Prioritizing walking, cycling and micro mobility.
- Public transport system development.
- (Car) mobility management.

The clearest proof of its effectiveness is that from 2022 onwards the trend in air pollution has been reversed.

Regarding the transformation of streets, it is assumed that traffic-calmed streets are 50% safer and up to 10dB quieter. Street redesign is conceived as an opportunity not only to optimize transport, but also to protect green spaces and the quality of life of citizens.



Wider sidewalks for pedestrians and a friendlier environment for vulnerable street users encourage social connections and the development of community initiatives by residents. In fact, an [urban design guide](#) has been published with twelve principles that make streets more liveable.

Vilnius street design manual: 12 rules



<p>01 A TREE ALWAYS COMES FIRST</p>	<p>02 TREES AND SHRUBS – BETWEEN CARS AND PEDESTRIANS</p>	<p>03 CARRIAGEWAYS WITHOUT ANY EXCESS WIDTH</p>
<p>04 SAFE PEDESTRIAN CROSSINGS (UNINTERRUPTED PEDESTRIAN MOVEMENT)</p>	<p>05 LIGHTING – FOR PEDESTRIANS FIRST</p>	<p>06 ALL STREET ELEMENTS – BLACK</p>
<p>07 PAVEMENTS ESTABLISH THE PRIORITY OF PEDESTRIANS</p>	<p>08 CAR PARKING SPACES SET UP ON MOST STREETS, USUALLY PARALLEL</p>	<p>09 SURFACES THAT CREATE STREET CHARACTER</p>
<p>10 VISUAL NEATNESS – NO EXCESS ELEMENTS</p>	<p>11 A METRE OF A STREET – FOR OWNERS</p>	<p>12 SMALLEST POSSIBLE INTERSECTIONS AND TURN RADIUS</p>

This is directly linked to the prioritization of walking, cycling and micro mobility. By 2027, 15 to 20 new kilometers of cycle lanes will be added each year to complete a network of more than 160 kilometres. It has already been proven that in areas with a developed cycling network, 5% of journeys are made by bicycle.

As for public transport, it is planned to improve gradually, so that by 2028 the service will be 54% more frequent, with 12 new routes and 23.8 million more kilometers traveled in this way. By 2030 it is expected that 60% of buses will be electric and 40% will use alternative fuels, with an additional 23.4 kilometers of A (bus) lanes.





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Vilnius, reducing the impact of energy consumption on air pollution

Presented by:

Anton Nikitin (*Vilnius Chief Sustainability Officer*).

Implemented in the framework of the project:

Vilnius City Master Plan
Strategic Development Plan
SUMP
SECAP
CCC&GCAP
Green City Accord

Year:

2020-2030

More info:

<https://www.interregeurope.eu/neba/news-and-events/news/good-practices-from-vilnius-and-turin-presented-in-vienna>

<https://vkj.lt/en/news/hot-tests-in-the-vilnius-combined-heat-and-power-plant-have-started/204>

<https://amiestas.lt/>

<https://ceenergynews.com/renewables/lithuania-reaches-over-1-gw-of-solar-capacity-lea-confirms/>



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DESCRIPTION:

Within the policies related to the improvement of air quality in the city of Vilnius, the most important are those that have an impact on the consumption of energy:

- Heating sector
- City renewal
- Solar power
- Energy consumption in water management





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By applying complex solutions, Vilnius aims at decreasing energy needs. By renovating old buildings the city reduces the needed amount of energy for heating which directly contributes to less fuels used. E.g. during summer months city primarily uses biofuels as its heating energy resource. Expansion of solar power resources contributes to more efficiency and green energy share.

In relation to the heating sector, two initiatives are being tested: a low-temperature network and the use of waste heat [from industrial activity] for heating. At a horizon of 2030, the implementation of community district cooling projects and the ecological production of hydrogen are also planned.

The goal of limiting the impact of energy consumption on air pollution is to use electricity more efficiently and to obtain it from renewable sources, with a special emphasis on the use of solar energy. To this end, 318 municipal institutions are expected to use this energy source in the near future. By the end of 2023, one hundred remote solar power plants will power more than half of the municipality's schools and kindergartens.

Finally, it is proposed that by 2032, complete water management will be independent of external energy sources. Already in 2022, 23% of the energy consumed for this purpose came from the use of sewage sludge and the use of treated wastewater to generate thermal energy is being tested.





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Actions to stop the burning of agricultural residues

Presented by:

Miguel Ángel Piñera Salmerón (*Environmental Technician of Cieza Municipality*)

Implemented in the framework of the project:

Additional local efforts based on regional regulation

Year:

2016 – present

More info:

[https://sede.carm.es/web/pagina?IDCONTENIDO=4143&IDTIPO=240&RASTRO=c\\$m40288](https://sede.carm.es/web/pagina?IDCONTENIDO=4143&IDTIPO=240&RASTRO=c$m40288)

[https://www.carm.es/web/descarga?ARCHIVO=ESAN3-23.pdf&ALIAS=ARCH&IDCONTENIDO=181835&IDTIPO=60&RASTRO=c80\\$m1174,1396,1398,1230,1226](https://www.carm.es/web/descarga?ARCHIVO=ESAN3-23.pdf&ALIAS=ARCH&IDCONTENIDO=181835&IDTIPO=60&RASTRO=c80$m1174,1396,1398,1230,1226)

https://regenerate.eu/upload/file/2022_03_05_guias-buenas-practicas-esp/guia-de-reutilizacion-de-restos-de-poda-en-sistemas-agrosilvopastoriles-mediterraneos.pdf



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DESCRIPTION:

With a registered presence in the municipality since the 3rd century A.D., Cieza has a historical and economic link with stone fruit and, in particular, with the peach.

At present, not only is 70% of its irrigated cultivated area occupied by peach trees, representing 5,861 hectares, but it also has a Protected Geographical Indication that guarantees its origin and more than 10,000 people depend directly or indirectly on the production of this fruit (180 million kilos per year).

In relation to air quality, all of the above is a great challenge, as poor practice in the disposal of pruning waste can directly affect air quality. Not surprisingly, agricultural





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burning is one of the main factors affecting air quality in Cieza. In order to prevent them, the town council has implemented a series of actions.

One of them is the promotion of vegetable waste shredding and the generation of biochar through training for farmers. Regarding the first of these, a local association of people with mental health problems (AFEMCE) acquired a shredder and offered its services to local farmers.

Biochar is charcoal generated by heating biomass, such as agricultural residues, wood chips or crop residues, under low-oxygen conditions. Its use in agricultural soil has advantages such as improved water retention, soil structure rehabilitation, increased microbial activity, neutralisation of soil acidity, reduced heavy metal toxicity and increased nutrient availability.

Finally, containers have been installed for the deposit of plant waste, although the aim is to raise awareness among farmers so that they can manage their own agricultural waste.



Agreement to shred small farmers' prunings

Presented by:

Manuel Valls (Deputy Head of European Programmes Department of the Municipality of Murcia).

Implemented in the framework of the project:

Circular Economy Strategy of the municipality of Murcia

Year:

2019- present (Yearly updated)

More info:

<https://www.asajamurcia.com/noticia/202401/24/el-convenio-para-triturar-podas-de-pequenos-agricultores-permite-gestionar-890>

<https://www.murcia.es/documents/11263/15287728/N%C2%BA+333.-+2022.pdf>



DESCRIPTION:

In addition to being a service city of almost 450,000 inhabitants, the municipality of Murcia has an important agricultural area and tradition. For centuries, the burning of pruning waste has been deeply rooted among local farmers.

However, in recent years this practice has led to major pollution problems in the city, which have worsened over time as the frequency of Saharan dust intrusions has increased due to climate change and the number of private combustion vehicles and travel has soared. This, together with anticyclonic conditions and frequent thermal inversions in the winter months, means that smoke from agricultural burning frequently increases the levels of particulate pollution such as PM10, with the serious consequences this has on the health of the population.

Aware of this problem, since 2019, Murcia City Council has an agreement with the Agricultural Association of Young Farmers (ASAJA) with the aim of helping small farmers in the municipality in the sustainable management of their agricultural waste through a



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pruning shredding service. Since then and until January 2024, 2,649 services have been provided and 890 tonnes of plant waste have been managed.

The shredding of waste is carried out in the orchard of the farmer requesting the service. ASAJA makes the shredder, a tractor and a portable shredder available free of charge, specialised machinery for use on fruit and citrus pruning waste from small orchards in the districts of the municipality of Murcia, with branches of a maximum diameter of 10 centimetres. It is not, however, suitable for garden pruning waste or ornamental trees.

During the provision of the service, awareness is raised about waste management in the garden and the best conditions for shredding and the benefits of shredding are explained.

The objectives of the project are to improve the air quality of the urban environment near agricultural areas, to contribute to the adaptation and mitigation of the municipality to climate change by reducing CO₂ emissions, to improve soil resilience and biodiversity through new agricultural practices, to provide farmers with an alternative management system to burning and to promote circular economy practices in the municipality.

Although it is not yet a widespread practice, following the example of the City Council, some small landowners have joined the initiative by buying shredders for joint use.





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Mitigating the effects of air pollution on human and environmental health

What was discussed?

In relation to the consequences of poor air quality on human and environmental health, the European Economic and Social Committee (EESC) strongly supports the right to compensation for people who have suffered health damage as a result of air pollution. Furthermore, it considers that there is a need to sanction natural and legal persons who violate air quality standards.

It emphasizes that human health and environmental quality cannot be separated - the health of ecosystems, animals and people are interconnected - and that the European Union should safeguard this right.





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Best practices presented

Green Wave Initiative

Presented by:

Anton Nikitin (*Vilnius Chief Sustainability Officer*)

Implemented in the framework of the project:

Vilnius City Master Plan
Strategic Development Plan
SUMP
SECAP
CCC&GCAP
Green City Accord

Year:

2022 – present

More info:

<https://zalias.vilnius.lt/>



DESCRIPTION:

Planting 100,000 trees, 10 million bushes and 300,000 vines, as well as maintaining existing green spaces, is the ambitious target that Vilnius City Council has set in the Green Wave Initiative.

Part of the essence of the project is that it involves citizens, organizations, public administrations and the private sector. The way to carry it out: donating trees to be planted by professional landscapers and planting them personally in neighborhoods, workplaces and selected places in the city with the assistance of specialized personnel provided by the City Administration.

The plants used are tested and well-rooted varieties in Vilnius, adapted to the Lithuanian climate and urban conditions: maples, lime trees, acacias, pines, spireas, syringas, sorbarias, ivy and other creepers, with a special focus on self-propagated trees.

Decisions on the method and locations of planting are made based on an essential principle: simplicity is the basis of elegance and comfort.





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One of the most challenging projects and the first of the Green Wave is the reconstruction of Konstitucijos Avenue, by laying out a corridor of green trees, while preserving the current number of traffic lanes.





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Measuring and monitoring air quality

What was discussed?

One of the main obstacles to measuring air pollution is the high cost of certified stations, which limits the number of stations available. In response to this situation, it is suggested that, although official stations are those that can activate air quality protocols, other low-cost units can be used to compare the differences between different areas of the territory to support the planning of appropriate mitigation actions.

Reporting of measurements can be important even in municipalities without pollution problems. Citizens also have the right to know that their situation is safe, according to European standards.





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Best practices presented

Airqino, a low-cost air quality monitoring network

Presented by:

Alessandro Forzoni (*Director Environment, Climate and Civil Protection Service of the Municipality of Arezzo*)

Implemented in the framework of the project:

AIRQINO

Year:

2022

More info:

<https://airqino.live/arezzo>
www.airqino.it



DESCRIPTION:

One challenge in successfully measuring air pollution is that precision monitoring stations are very expensive, limiting the number of units that can be distributed across the study territory. However, to be able to fulfil their function, and to adapt quickly to changes in order to maintain the quality of life of their inhabitants, smart cities need a huge amount of real-time data (big data).

In response to the issues described above, in 2022, the Italian National Research Council (CNR) launched the Airqino project. The objective was to develop a multi-sensor device, compliant with the specifications of Directive 2008/50/EC on ambient air quality and cleaner air for Europe, at a low cost that would allow the sensor network to become widespread and inform citizens of air quality in real time.

Each Airqino unit, as the already developed device is also called, costs around 3,000 to 4,000 euros, depending on the number and type of sensors, and can be renewed after two years at a cost of 2,000 euros. They can provide input data for microclimate models and thus evaluate nature-based solutions. Each unit has a multi-sensor motherboard, high-resolution sensors (accuracy 5-15%), on-board microprocessor, 3G/4G modem and measures T°Rh, PM_{2.5}, PM₁₀, CO₂, O₃, NO₂, CO, VOC and SO₂.





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In the case of Arezzo, thirty sensors have been installed throughout the city, at a cost so far of between 35,000 and 40,000 euros, plus maintenance. Real-time data can be accessed via Airqino.live.





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EDIAQI, investigating indoor air quality

Presented by:

Lina Davulienė (Center for Physical Sciences and Technology)

Implemented in the framework of the project:

EDIAQI

Year:

2022-2026

More info:

<https://ediami.eu/>



DESCRIPCIÓN:

Indoor air pollution is an emerging threat that claims millions of lives every year. Poor indoor air quality, combined with contamination by biological agents related to dampness and mould, increases the risk of respiratory diseases by 50%.

Despite this, current knowledge about the problem - sources of pollution, indoor-outdoor relationships or ventilation/filtration - is rather limited because air quality monitoring in the European Union focuses on outdoor air quality.

EDIAQI is a Horizon Europe funded project involving 18 organizations from 11 different countries. Its aims are:

- Validating user-friendly indoor air quality monitoring solutions and providing standardized guidelines for interventions to improve indoor air quality;
- Gathering data and ensuring access to relevant stakeholders, including both physical-chemical and microbiological properties, as well as characterization of main sources of indoor air pollutants for relevant and representative indoor environments;
- Supporting policy-makers with evidence for revising indoor air quality standards and supporting regulatory measures for control and monitoring;
- Science-based evidence for supporting the Zero-Pollution Action Plan of the European Green Deal.

As part of the project, a campaign was launched in Vilnius to measure the impact of vehicles on indoor air quality and exposure in schoolchildren, using air stations in





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different urban areas of the city, measuring particles of a wide range of diameters. The results made it possible to establish indoor air pollution limitations.





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Citizen science for collecting data on air quality

What was discussed?

As better-informed people are more motivated to act and are more likely to sustain changes in their habits over the long term, citizens need to know how their lifestyles, actions, consumption patterns and pollution levels relate to each other. This is why the European Economic and Social Committee is calling for increased funding for citizen science projects related to pollution under the Horizon Europe programme.

In the discussion, it is commented that generally people think that it is not possible to do science without being a scientist. However, any person, even young children, can collect data that can be useful if managed and statistically validated. Such experiences can even influence the future careers of schoolchildren.





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Best practices presented

Citizen measurement and mapping of NO₂ pollution in Vilnius

Presented by:

Kęstutis Kupšys, (Member of the Civil Society Organisations Group of the European Economic and Social Committee - EESC).

Implemented in the framework of the project:

Curious Noses CEE (Central and Eastern Europe)

Year:

2020

More info:

<https://goo.su/KjmHVRR>

https://vartotojaujansas.lt/wp-content/uploads/2024/07/Lithuania_ALCO_policy_paper_NO2_July2020.pdf

<https://www.15min.lt/en/article/society/better-not-to-return-to-some-schools-after-the-lockdown-what-the-swiss-would-say-528-1322284>



DESCRIPCIÓN:

In 2020, with funding from the private European Climate Foundation, the Lithuanian Consumers' Alliance placed 500 tubes in the city of Vilnius to sample NO₂ pollution at more than 400 locations.

Beforehand, they identified the places that could be the most sensitive for such measures. The aim was to produce an updated map of pollution in the city through citizen science. The project was not intended as a scientific breakthrough but as a tool to raise awareness and influence policy decisions. The campaign was also carried out in other cities and countries (Poland and Slovakia).

In Vilnius, the project showed a critical value at a sampling point next to a motorway, very close to a school, which could be used to put pressure on the authorities not to build educational institutions next to busy roads.





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“Do it yourself” activity for producing an Air Quality Station

Presented by:

Vilniaus universiteto metodinis STEAM centras

Implemented in the framework of the project:

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Year:

2024

More info:

<https://greenme5.fmrn.es/>



DESCRIPTION:

The Green Innovation Camp itself included a citizen science activity that is a good practice to be replicated by other European cities with their stakeholders or citizens.

Thanks to the "Vilniaus universiteto metodinis STEAM centras", GIC participants had the opportunity to design their own air quality measurement station. The device allows measuring temperature, humidity, atmospheric pressure, dust density (ng/m³) and a noise and air quality index (qualitative, not quantitative).

Participants were given a short training, materials and an instruction sheet on how to build them.

Although the device built does not report data with detailed precision, it does allow citizens to get an idea of the quality of the air they are breathing depending on the environmental characteristics at that moment. Furthermore, if a platform had been set up to enter the data and distribute it among many people, it could also be used to obtain massive data on the state of air quality in different cities or parts of a city without mobilising too many financial and human resources.





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Communicating air quality data to the population

What was discussed?

The discussion highlights that data must be organized in a way that allows it to be understood and interpreted by citizens. This is a challenge for local technical and political staff, who must work on how to adapt the information. In any case, citizen science can contribute to the understanding of the current air quality situation. It is a tool that democratizes knowledge and ownership of data and therefore builds trust in the information collected.





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Best practices presented

Website based on an open access air quality database

Presented by:

Torsten Nilsson (*Inspector and AQM operator of Helsingborg*)

Implemented in the framework of the project:

Collaboration between the Swedish Environmental Protection Agency and the Swedish Meteorological and Hydrological Institute.

Year:

2019-Present

More info:

<https://natmodluft.smhi.se/>



DESCRIPTION:

Since the beginning of 2000, the Swedish Meteorological and Hydrological Institute in cooperation with municipalities has developed an open access website through which citizens can see the limits and values for different pollutants.

It has proven to be a useful instrument, for example, to calculate the effects on air pollution of reducing traffic volume or of switching from diesel to gas buses, i.e. to measure the real impacts of the Air Quality Action Plan.

In turn, in a development project, SMHI has calculated air concentrations of nitrogen dioxide and particles PM10 and PM2.5 over the entire country of Sweden down to a resolution of 50 x 50 meters. The calculations describe the concentrations people are exposed to in their everyday lives and take into account even the buildings and street environment is affecting the spread of pollution. The tool is presented on the SMHI webpage.

High-resolution national model calculations of air pollution can be used in several ways. On the one hand, levels can be compared in different parts of the country, and on the other hand, the data can provide information on where the levels of particles or nitrogen dioxide are at risk of being high, and thus provide support in choosing a measurement





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site. The calculations can help municipalities in their air protection work and also form a basis for other experts and an interested public.





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Intelligent City Lungs

Presented by:

Anton Nikitin (*Chief Sustainability Officer of Vilnius*)

Implemented in the framework of the project:

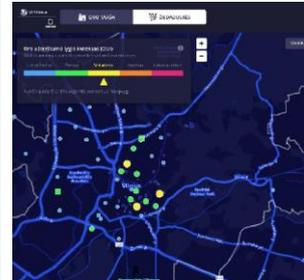
Open data of Vilnius city

Year:

Ongoing

More info:

<https://miestoplauciai.vilnius.lt/orotarsa/>



DESCRIPTION:

Vilnius has an intelligent urban lung that, through 34 sensors, allows to know its air pollution levels in real time (concentration of pollen, particles, carbon monoxide, ozone and other compounds).

This system collects and presents information to citizens through a website with an open data policy. This is a first step that is intended to be taken further through e-democracy initiatives.



Campaign to minimize environmental and health problems associated with small-scale wood burning

Presented by:

Torsten Nilsson (*Inspector and AQM operator of Helsingborg*)

Implemented in the framework of the project:

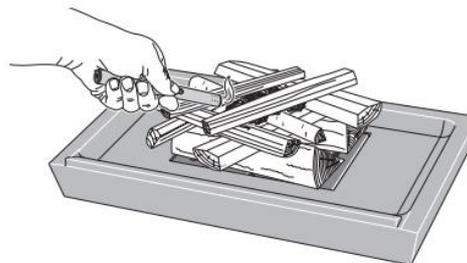
Developed by the National Energy Agency and the Swedish Environmental Protection Agency. The campaign is distributed by the municipalities and the Fire and Chimney Controllants.

Year:

2017-present

More info:

<https://www.naturvardsverket.se/vagledning-och-stod/luft-och-klimat/vedeldning/elda-med-ved-i-kamin-spis-och-ugn/>



DESCRIPTION:

Burning wood produces emissions of polycyclic aromatic hydrocarbons (PAHs) and small particles that can cause problems for the respiratory tract and the cardiovascular system. In addition, some polycyclic aromatic hydrocarbons, such as benzo(a)pyrene, are carcinogenic. Particularly sensitive to these emissions are children and the elderly, as well as people with respiratory problems.

To reduce these problems, the Swedish Environmental Protection Agency and the Energy Agency has developed a communication and awareness campaign to minimise the air quality problems caused by small-scale wood burning. In cooperation with master chimney sweeps, it has launched a website with techniques, such as "top lighting", that effectively reduce smoke emissions.



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Burning in this way reduces the emissions of small particles (PM2.5) and the production of soot that spreads in the Arctic region, accelerating ice melting and contributing to global climate disruption, and reduces the risk of fire.





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4

Conclusions



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4. Conclusions

The 1st GIC has garnered significant interest and engagement from the participants. Following the workshop, a questionnaire was distributed to attendees, soliciting their insights on several key points:

- What did you learn and find relevant, useful and interesting for your own city to adapt (this can be methods, practices, attitudes, etc.)?
- Why is it relevant to your city and for the GCA implementation?
- What actions will you do locally in the next weeks to adapt the learnt issue, to feed the GCA implementation procedure (desk research, pitch for the LAG, organization of a meeting with someone, check local regulation, etc.)?
- Any other comment or feedback for the next GIC (about the content, about the format, about the duration, etc.)?

This feedback provided valuable insights into the participants' perspectives on the themes and organization of the event.

The good practices discussed, several of which are included in this document, were particularly compelling to the attendees. Topics such as citizen science and the involvement of citizens in the design, implementation, and monitoring of actions were highly appreciated. Emphasizing the importance of sharing information with citizens, acknowledging their right to know about the quality of the air they breathe, was a key takeaway.

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Participants also valued the opportunity to learn about the differences and similarities in air quality measurement methods between cities. Additionally, the outdoor event format, which allowed people of all ages and entire families to engage in the solution process, was praised.

The consensus among participants highlighted the necessity of political support to establish a long-term roadmap and ensure the success of projects. All attendees expressed their intention to share the information and insights gained with their municipal teams, showing the catalytic impact of such events.

The new Air Quality Directive reinforces the goals, objectives, and standards that cities must meet in the coming years. Therefore, it is crucial for European cities to learn from each other's experiences and improve their environmental management practices. This document provides some ideas, reflections and best practices that can be imported by other European cities.

Firstly, diagnosing the sources of pollution in each city and implementing measures to reduce pollution at its origin is essential. Simultaneously, considering that many anthropogenic activities generate unavoidable emissions, cities must plan measures to mitigate the effects of pollution on human health and the environment. Understanding





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different measurement methods, along with their respective advantages and disadvantages, is crucial. This knowledge allows for appropriate investment decisions based on specific needs. For example, varying levels of accuracy are required depending on whether the goal is to report official data comparable with other European cities or to compare air quality across different city areas.

Finally, there was unanimous agreement on the importance of involving citizens in the process. This includes their participation in the selection and design of actions, strategic planning, implementation, and monitoring through citizen science, as well as ensuring their access to data.

