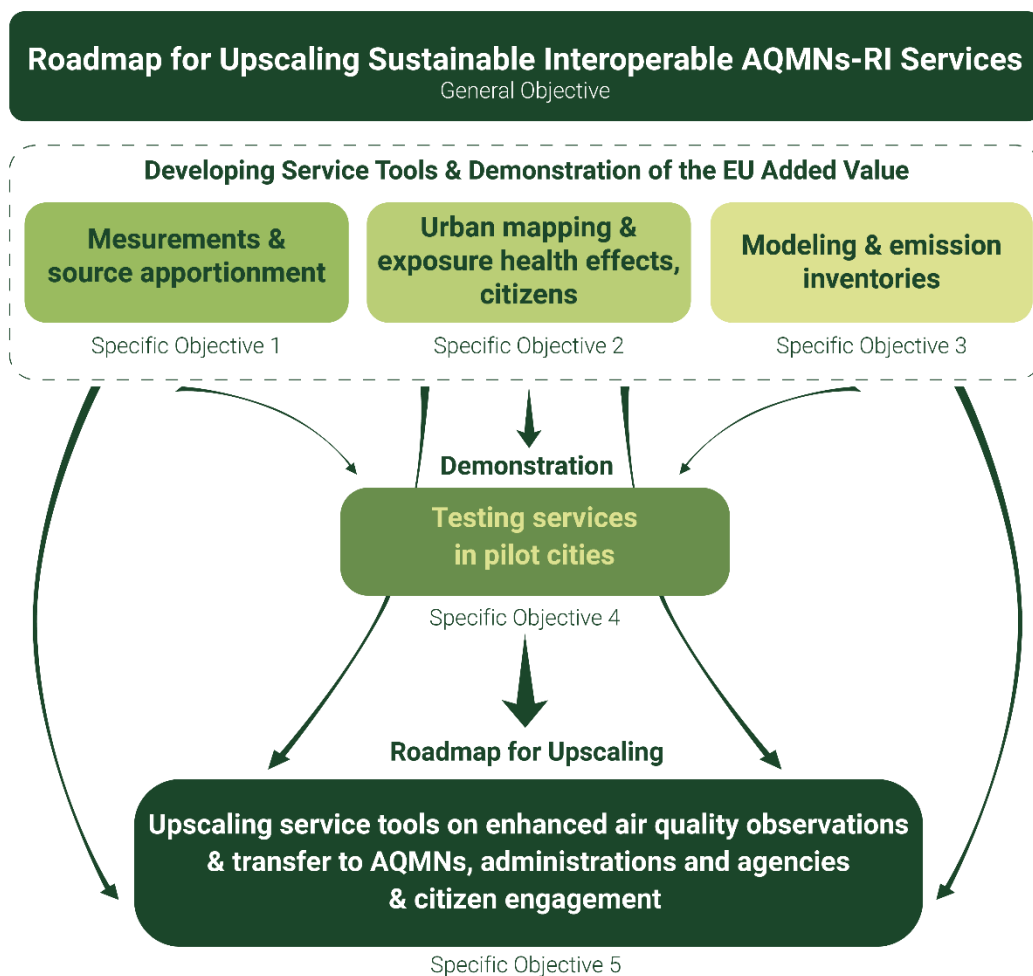


RI-URBANS

OBJECTIVES – extended

RI-URBANS focuses on human exposure to outdoor ambient nanoparticles (also known as ultrafine particles, UFP, particles <100 nm; measured in number concentration, equivalent to nanoparticles in the call) and atmospheric particulate matter (PM; measured in mass concentration). PM is responsible for an estimated 379,000 premature deaths annually in Europe. The impact of nanoparticles is not included in this estimate because of insufficient exposure and health data.

This project builds upon existing initiatives for advanced research-driven observations of aerosol properties currently carried out in European cities to identify, develop and test the innovative Service Tools (STs), which will serve more effective air quality monitoring by Air Quality Monitoring Networks (AQMN) in a 2030 horizon timeline.



The specific objectives of RI-URBANS are:

- **SOBJ1.** To further develop advanced and innovative tools within the Research Infrastructure (RI) framework and respond to current gaps that prevent more efficient reduction of air pollution and protection of human health. We aim to **develop 7 Service Tools (STs)** and compile, interpret and show the added value of obtaining **datasets from 10 to 15 urban supersites on novel air quality metrics and their source contributions.**
- **SOBJ2.** To support standard AQMNs with advanced tools to characterize air pollutants, identify pollutant sources and analyse exposure and health effects studies, with both epidemiological and oxidative potential approaches. We aim at providing 3 additional STs (health effects evaluation of novel air quality metrics, mobile measurements and modelling tools for fine-spatial scale mapping pollutants, and citizen's engagement for air quality monitoring). We also aim to analyse the **health effects associated with the novel air quality metrics and source contributions** for at least 5 datasets using epidemiological tools and with the oxidative potential for 3 datasets. To further develop the use of tools and information systems in the hands of **citizens and communities to monitor air pollution, increase citizen's involvement and support decision-making** by air quality managers and regulators, at least 3 cities will test the STs developed to this end in a pilot study.
- **SOBJ3.** To improve **air quality modelling tools and urban-scale emission inventories** by assimilating measurements and source contributions from above. For some PM and nanoparticles components (mostly the secondary ones), high resolution regional models are required to provide source contributions, and for all of them, regional background and long-range transport inputs are required for appropriate air quality policy assessment. We will supply 2 STs (air quality modelling and emission inventory improvement tools) that will be demonstrated in at least 3 cities in one pilot study.
- **SOBJ4.** To **scientifically and technically demonstrate the added value of implementing AQMNs-RIs** interoperable and sustainable services for enhanced urban air quality observations. The 12 STs referred to above will be tested in **9 cities** grouped in 5 case studies (each city involved in 2 pilots), where one city with experience in a specific ST will supply support to replicate the ST in the other 2 cities of the pilot. Every city will support at least the replication of an ST and will replicate at least one other. Furthermore, at least 5 additional cities will be invited to replicate these STs (at least 2 have already been accepted at the proposal stage).
- **SOBJ5.** To provide the **roadmap for sustainable implementation** of interoperable AQMNs-RIs service tools, covering instrumentation, modelling tools, data management, health effects assessment, citizen involvement and transfer to air quality and health administrations and agencies. The roadmap will be devised to be implemented at least in the 9 pilot cities and the 5 replication cities.



Furthermore, we will present it by means of in-situ presentations and a dedicated workshop for stakeholders.

Therefore, RI-URBANS combines scientific and technical work to develop Service Tools (STs) that will support the capacity of the AQMNs to evaluate, predict and provide observations to support policies to mitigate the impact of poor air quality on human health. This project addresses all aspects of sustainability, including efficient curation, preservation and provision of access to data, training and capacity building and the way the use of tools will be secured in the future.

The pilot implementation in 9 diverse cities is used to demonstrate the integration of complementary measurement systems and methods as well as data quality control, managing and communication using FAIR principles. The final goal is to provide upscaling and sustainability to the AQMNs-RI interoperable services offered in the proposal, using advanced instrumentation, modelling and source apportionment, and integrating citizen's observatories and mobile measurements. The project is developed in close consultation with stakeholders, including representatives of AQMNs (strongly involved in all pilots), to increase the usefulness of the developed services and the likelihood of future incorporation of services in networks.