Environmental monitoring is an important tool in the overall environmental management strategy. In particular, a planned monitoring strategy can help in quantifying the level of impact that has occurred during country/region development and enables the predictions of potential air pollution changes to be verified. A quantitative assessment of environmental change following industrial activities is important when future environmental liabilities need to be considered. Additionally, environmental monitoring data can enable a better understanding of the processes by which impacts may arise.

Traditional environmental monitoring systems are characterized by bulky nodes, expense (in the range of USD 1 million), and disperse (tens of kilometers) nodal allocation. Traditional systems rely on extrapolating localized measurements to project air quality information over a large geographical area. Therefore, along with the high cost, traditional networks suffer from inaccurate predictions/assessment to regional mapping of air quality information, as well as non-flexible gas monitoring and selection.

As a result, many research institutes and governmental agencies worldwide are actively involved in research activities for finding more robust and cost-effective alternatives. The underlying technology for those activities is the utilization of wireless sensor networks (WSN). WSN promise to bring low cost, large scale advanced remote monitoring and automated applications to a wide range of technical areas and industries. In addition to lowering capital and operating expenses, WSN provides improved reliability, increased installation flexibility and scalability.

The project aims to architect, design, and develop an innovative solution utilizing the WSN. The solution under consideration is ubiquitous and cost effective and provides real-time data transmission and remote/online data processing and accessibility. Innovative, smaller, inexpensive and with different sensing capability, sensor nodes are integral to the solution. Such sensors are emerging, but not yet mature, and therefore substantial effort will be invested in working with sensor vendors to ensure the design and development of the right sensor nodes.

The project also includes research activities related to innovative network architecture for robustness and cost effectiveness as well as software development activities for data processing, information presentation and dissemination. This will ensure that localized and personalized information can be delivered to diverse customers.