Air pollution has adverse effects on human beings, ecosystems and materials. Air quality measurements provide information on the nature of the pollution and on the temporal and spatial variation of the concentrations. Besides, insight into the contributing sources is obtained. This information may be used to develop an environmental policy and legislation. TNO has expertise in all relevant aspects of Air Pollution Research. This expertise is essential to set up and implement an Air Quality Monitoring Network (AQMN).

**AQMN - Design**

The general approach to the design of an AQMN is illustrated in figure 1. Basis for the design is a detailed assessment of present air quality and the impact of expected future developments. Ambient air concentration patterns, in space and time, are derived from available monitoring data and model calculations of the dispersion of air pollutants originating from industrial, natural and human activities. Information on local emissions, topography and climatology is gathered for this purpose. Results of the air quality assessment are then compared with air quality standards and environmental policy plans in order to select the pollutants to be monitored and to optimize the number of monitoring stations and their location.

**AQMN - Results**

The result of the AQMN-design study will provide complete insight in all aspects needed to implement the network. This includes recommendations on:

- Minimum requirements for monitoring equipment and additional laboratory facilities.
- Lay-out and instrumentation of monitoring stations.
- Selection of monitoring sites.
- Data communication and data management.
- Data analysis and dispersion modelling.
- Network organization, staff requirements and training demands.
- Quality Assurance & Quality Control
- Maintenance and repair.
- Implementation schedule.

TNO does not supply any equipment and can therefore act as an independent consultant to assist in the supplier’s selection procedure. TNO can also supervise the implementation of the network. Furthermore, based upon extensive experience in data analysis, TNO can assist in handling and interpretation of air quality.
data using computer models. Training of the network supervisor and staff is an essential element in the TNO approach.

**TNO’s expertise**

TNO has a long and extensive experience in Air Quality Monitoring. Since 1973, TNO is involved in the Dutch National Emission Inventory, but also in many international projects to develop emission inventories in other countries. In addition, TNO has carried out many air pollution measuring projects, both complex industrial emission measurements and ambient air assessments in the Netherlands and abroad. Data on emissions and air quality are analysed to obtain a coherent picture of the environmental situation.

TNO has developed and applied numerous air pollution dispersion models. Operational models on a global, continental, regional, urban and local scale are available. Since most of these models were developed in-house, optimum flexibility of applications is possible.

Finally, TNO is experienced in the synthesis of scientific and technical knowledge into information that can be used directly by policy-makers and staff responsible for environmental management. All this expertise is necessary in order to design an AQMN. TNO has already developed AQMN for regions and countries in Europe and in the Middle East.

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**Figure 2 General approach to AQMN-design**