

# Local air pollution

## Innholdsfortegnelse

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There has been a general improvement in local air quality in Norway since the 1990s. But there are still problems in several towns, and Norway's national targets for local air quality were not achieved in 2016.



Heavy traffic on a cold winter day. Foto: iStockphoto

## STATE

### Limit values and target levels exceeded every year

In Norway, particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO<sub>2</sub>) are the most important components of local air pollution. Other pollutants such as sulphur dioxide (SO<sub>2</sub>), ground-level ozone, carbon monoxide (CO), polycyclic aromatic hydrocarbons (PAHs) and benzene can also contribute to poor local air quality.

Norway has national targets for concentrations of particulate matter (PM10 and PM2.5) and NO<sub>2</sub>. In several towns these targets are not being met. In addition there are legally binding limit values laid down by the Pollution Regulations.

There has been a downward trend in levels of particulate matter in several towns, but in others levels vary from year to year, and the limit values are exceeded some years. The limit values for NO<sub>2</sub> are regularly exceeded in Oslo and Bergen.

## IMPACT

### Air pollution is harmful to people, plants and animals

The health risks associated with local air pollution depend on the concentrations of pollutants and exposure time. Children, pregnant women, the elderly and people with asthma and respiratory diseases or those suffering from cardiovascular disease are particularly vulnerable. It is well documented that air pollution contributes to death and loss of healthy life years in Norway.

## Health risks greatest for particulate matter and NO<sub>2</sub>

Particulate matter is the air pollutant that poses the most serious health risk, although NO<sub>2</sub> is also a significant factor, especially in Norway's largest towns. Exposure to these substances increases the frequency of various types of respiratory diseases. Particulate matter can also cause cardiovascular disease and higher mortality.

Particulate matter consists of particles of such small size that they can be inhaled. The largest of them are stopped in the upper airways, but smaller particles with a diameter of less than 10 µm (called PM<sub>10</sub>) can penetrate deep into the lungs.

Other air pollutants are also harmful. SO<sub>2</sub> can result in lung disease in healthy people as well as asthma patients. Benzene and other aromatic compounds such as PAHs are carcinogenic. CO reduces the capacity of the blood to transport oxygen and can cause headaches, nausea and other problems for heart patients.

## Effects on ecosystems and vegetation

Local air pollution can be harmful to ecosystems and vegetation. NO<sub>2</sub> and SO<sub>2</sub> both contribute to acidification and eutrophication of lakes and rivers. CO, NO<sub>2</sub> and VOC also contribute to the formation of ground-level ozone, which can damage vegetation and various types of materials. SO<sub>2</sub> is also corrosive and erodes buildings and historical monuments.

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## DRIVING FORCES

### More transport means more pollution

Road traffic, domestic heating, long-range pollution and industry are all sources of local air pollution. Important factors influencing the emission trends from these sources include:

- economic growth, which results in a higher volume of traffic
- the siting of workplaces and homes, which influences transport needs
- road construction, which influences traffic volumes
- car ownership, which increases mobility
- the size of people's homes, which influences heating needs
- the technology available – abatement technology and efficiency improvements can reduce emissions

Economic growth, expanding international trade, changes in land use patterns and rising private consumption all result in a larger volume of transport. A higher volume of transport reduces the effect of stricter emission limits and improved vehicle technology.

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## PRESSURE

### Road traffic the dominant source of local air pollution

In Norway, road traffic is the dominant source of local air pollution, including both exhaust emissions and asphalt dust generated by studded tyres. Fuelwood use is another important source of particulate matter.

#### Road traffic

Road traffic is an important source of particulate matter, though the proportions vary during the year and from place to place. During dry periods in winter and spring the resuspension of asphalt dust contributes to the largest concentration of particulate matter.

NO<sub>x</sub>-emissions from vehicle exhaust accounts for the largest part of the concentration levels of NO<sub>2</sub>. Diesel vehicles produce higher emissions of both NO<sub>x</sub> and particulate matter than petrol vehicles. Stricter European requirements have been introduced, and NO<sub>x</sub>-emissions from both newer diesel and petrol vehicles are therefore considerably lower than they used to be. The proportion of NO<sub>2</sub> in NO<sub>x</sub>-emissions, however, has increased. We therefore do not see a corresponding decrease in NO<sub>2</sub> concentrations.

## Wood-burning, industry and long-range pollution

Wood-burning results in emissions of particulate matter and PAHs, especially on cold days in winter, when many people use wood-burning stoves. Other important sources of local air pollution are industrial emissions and long-range transport of pollution from other European countries.

### RESPONSE

## Measures and instruments

Norway has set national targets for the concentrations of particulate matter and NO<sub>2</sub> in outdoor air. In addition, there are legally binding limit values, which are the same as those that apply in the EU. These are set out in Chapter 7 of the Pollution Regulations.

In Norway, the municipalities are responsible for control and enforcement of legal requirements relating to local air quality. A number of measures have been implemented to improve local air quality. Examples of such measures include restrictions on the use of studded tires, speed reductions, road maintenance and the replacement of old, polluting stoves. Examples of measures against NO<sub>2</sub> are low emissions zones and time and environmentally differentiated tolls. In addition, measures that reduce emissions from ships may have an effect in port areas.

Traffic-reducing measures implemented to reduce greenhouse gas emissions, noise or increase accessibility for public transport will also reduce NO<sub>2</sub> levels. In order to get good results a comprehensive use of instruments and good cooperation both locally, regionally and nationally is necessary.

### Reducing emissions from road traffic and vehicles

Measures to reduce traffic are most effective when used in combination, for example road pricing combined with parking restrictions and improvements in public transport.

The Planning and Building Act can be used actively to influence the location of workplaces and housing and reduce the need for transport, and to encourage a switch to environmentally sound forms of transport.

### Technical measures

Technical measures can be used to reduce emissions from individual vehicles. The European emission limits for vehicles are being made increasingly stricter, and the petrol and diesel quality is being improved. The use of studded tyres can be discouraged through local regulations imposing a charge on their use. Emissions from road traffic can also be reduced by encouraging the use of alternative fuel types such as gas, hydrogen or electricity.

### Reducing emissions from wood-burning stoves

Since 1 July 1998, new wood-burning stoves have had to meet legal standards for emissions of particulate matter. To encourage the replacement of old, polluting stoves, municipalities can introduce a system of partial rebates. Such schemes have for example been introduced in Oslo and Bergen. Older stoves can also be retrofitted with equipment to reduce emissions.

### Reducing long-range pollution

Long-range air pollution is being reduced through international agreements and EU directives. These include the Convention on Long-range Transboundary Air Pollution, the EU directive on emissions to air from large combustion plants, and the EU directive on national emission ceilings for certain pollutants (or NEC Directive).