MNP report 500093004/2006

New insights into the scale of the particulate matter problem in the Netherlands

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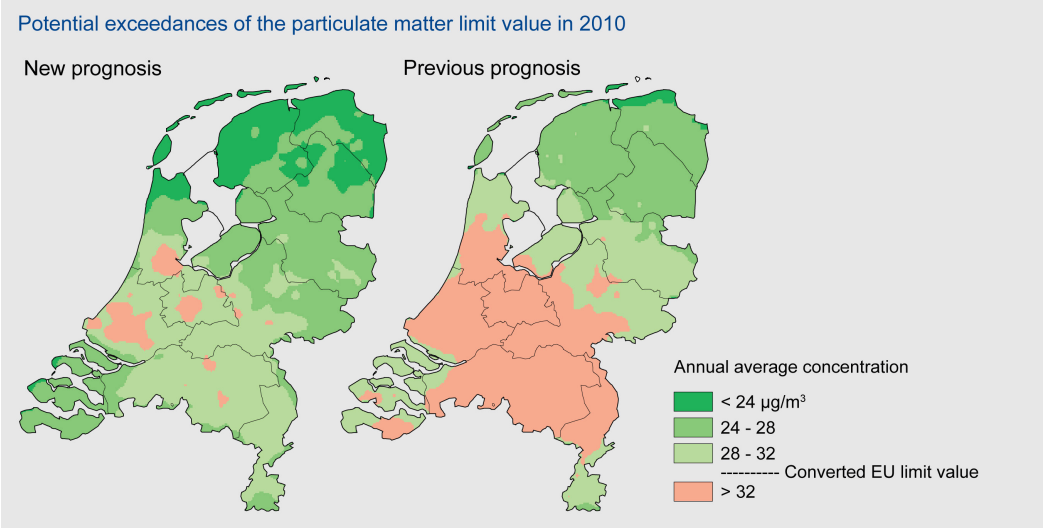
Netherlands Environmental Assessment Agency
P.O. Box 303
3720 AH Bilthoven
Tel: +31 30 2742745; www.mnp.nl

In cooperation with the National Institute for Public Health and the Environment

English translation of MNP report 500093003/2006,
Nieuwe inzichten in de omvang van de fijnstofproblematiek.

The magnitude of the particulate matter problem is smaller than previously ascertained

- There are strong indications that the concentration of particulate matter in the Netherlands is currently 10-15% lower than was previously assumed. The most important reason for this change is the lower concentrations that have been measured in the past two years and the plausibility that has been attributed to these measurements. Based on these lower concentrations, the magnitude of the particulate matter problem is smaller than has been assumed until now.
- The number of locations where it is expected that the European limit value for the 24-hour average particulate matter concentration will be exceeded in 2010 has been reduced by more than half with respect to previous estimates. The remaining bottlenecks are primarily in the large cities in the urban agglomerations of the western part of the country, in the southern part of the Netherlands and along a number of busy highways. The number of bottlenecks in the new prognosis is disproportionately lower because in previous estimates there were many locations where the concentrations were just above the European limit value.
- The expected health effects will change little as a result of the new insights. The long-term exposure and the accompanying health effects are now estimated to be 10-15% lower.
- The national policy (*prinsjesdagpakket*) that has been implemented will still be effective; the traffic-oriented component will certainly continue to be as cost effective as was previously assumed.
- The limit value is currently being exceeded on a large scale. The original picture indicated that this would change little during the next 20 years. This expectation has now been modified; the limit value will now be realised sooner than was previously thought. With extra local, national and European policy, the problem can be solved by 2015. However, this still requires postponement (derogation) from the European Commission, because the Netherlands should actually have realised the limit value in 2005.
- During policy implementation, high demands are placed on the precision with which the concentrations can be ascertained by the combination of measurement and calculation. It is advisable to take account of the unavoidable uncertainties in determining air quality as part of policy development and implementation in practice.



Indication of the exceedances of the limit value for the 24-hour average particulate matter concentrations in 2010 according to the new (left) and the previous (right) prognosis. This limit value is the number of days with a 24-hour average particulate matter concentration above 50 µg/m³; this must not be above 35 days. This limit value is equivalent to an annual average particulate matter concentration of 32 µg/m³. This is shown in the figure with 'Converted EU limit value'.

Introduction and methods

Every year, the Netherlands Environmental Assessment Agency (MNP) publishes maps of the concentrations of air pollutants for which air quality limit values have been established in European legislation. These maps, also called GCN maps, are intended to provide a general picture of the air quality in the Netherlands. GCN stands for Generic Concentrations in the Netherlands. This concerns maps for both the future and for past years. This year (2006), maps for the period 2010-2020 and for 2005 are being published.

Based on new insights, the MNP corrected the background level downwards, as is shown on the GCN maps. The reason for this correction is that the measurement results of particulate matter in the rural area have shown a major decline during the last two years. This decline cannot be explained by the influence of weather conditions or by changes in the emissions of particulate matter. In the near future, the MNP will publish a report which describes the extensive calculations and sensitivity analyses that were used to reach this conclusion.

Governmental background
The GCN maps are used as input, supplemented with detailed calculations, to map out local air quality. This method is used especially to ascertain the situation near roads. Municipalities, provinces, the Dutch Directorate for Public Works and Water Management and other parties apply the results of these combined calculations when reporting exceedances of limit values as stipulated in the Air Quality Decree. The results are also used in spatial planning.

Decisions of the Litigation Section of the Council of State have also shown that since the Air Quality Decree went into force in 2001, a judicial regime has gone into effect where construction and expansion plans can be blocked or must be modified due to exceedances of the European limit values for particulate matter. One point of attention is the limited precision with which the concentrations of particulate matter can be ascertained at the local scale. For the time being, this is not being taken into account in policy development and implementation, particularly as part of its interpretation by the Council of State.

Methodology
The process of ascertaining particulate matter concentrations is based on the combination of the results of measurements and the results of calculations using models. The particulate matter concentrations that are calculated with models are calibrated to the measurement results of particulate matter from the Dutch National Air Quality Monitoring Network of the RIVM (National Institute for Public Health and the Environment). The method for ascertaining the particulate matter concentrations is as follows:

- The large-scale background level of particulate matter is based not only on the results of calculations with the OPS atmospheric dispersion model, but also on measurement results. In this way the contributions of unknown sources and components such as sea salt and soil dust are taken into account. Emission data from the Dutch Emission Inventory and meteorological data are important input parameters for the model calculations.
- The concentrations in urban agglomerations are, during the same calculation process, ascertained by adding the concentration contribution from urban sources to the large-scale background level. The calculations are compared with the results of measurements that are conducted in a limited number of urban agglomerations.

- The concentrations in high-traffic areas, such as busy streets and highways, are then ascertained by increasing the concentration at the agglomeration level with the extra contribution made by road traffic; this is done by using the CAR dispersion model for local air quality. Here as well, the calculated concentrations are compared with the measured concentrations in a limited number of streets. The present analysis takes account of the difference that was found between the measured results and the results of calculations.

The new GCM calculations are based on the most recent information about the emissions and their spatial distribution. The prognosis of the particulate matter concentrations for 2010 and thereafter are based on new scenarios in which expectations for societal developments, technology and policy changes have been implemented.

Uncertainties
The model instruments calculate concentrations at or above the limit value with an uncertainty margin less than 50%. The measurements have an allowable uncertainty margin of 25%. This satisfies the requirements that were established in the first air quality daughter directive of the European Union. The size of the margin is determined by the uncertainties in the measurements, the emissions and the model parameters. In this way, the amount of exceedance of the limit values also is given an uncertainty margin. During judicial evaluation, however, these uncertainties are not currently taken into account.

The relatively large uncertainties in determining the particulate matter concentrations entail a certain risk. For example, building projects can be suspended in cases where the estimated concentration lies just above the limit value, and the actual concentration lies just below. It can also happen that projects are allowed to proceed at locations where the estimated concentration lies just below the limit value, but the actual concentration lies just above.

Further refinements and modifications of the measurement methodology prescribed by the European Union may result in modification of the particulate matter level in the future.

Changes in the measurements of particulate matter

Since 1992, the RIVM has been conducting particulate matter measurements in the Dutch National Air Quality Monitoring Network (LML). Between 2003 and 2005, the RIVM expanded the monitoring network for particulate matter with new stations and other measurement apparatus in streets, in the urban background and in the rural area. The measurement results from this expanded and renewed monitoring network have shown a sharp decrease in concentration of 15% at the regional measurement stations. It has been ascertained that:

- the measurement series in the rural area, after processing the meteorological variability, shows a statistically significant discontinuity. The concentrations in the rural area are now 3 - 4 μg/m^3 lower than they were previously (*Figure 1*). In 2003, the concentrations were high due to exceptional weather conditions;
- the concentrations in urban and heavy-traffic areas have remained approximately the same in recent years as the concentrations during the period before 2003. In this measurement series, there was no discontinuity in the trend;
- due to the different progression of measurements in the urban and rural environments, there is now a concentration difference between them of 8–10 μg/m^3. During the period before 2003, this difference was only 2-5 μg/m^3 (*Figure 2*);
- the seasonal progression in the relationship between the concentration in the urban environment and the rural environment has changed significantly.

The concentration difference between the urban and rural environments that was found during the past two years was supported by comparisons with European reference apparatus. During this period, more data were also collected from comparative measurements with neighbouring countries. However, these measurement campaigns are not yet sufficient to establish the absolute levels. The correction factor, which ensures comparability between the measurement instruments in the measurement network and the reference apparatus, is therefore based on the EU recommended value of 1.3.

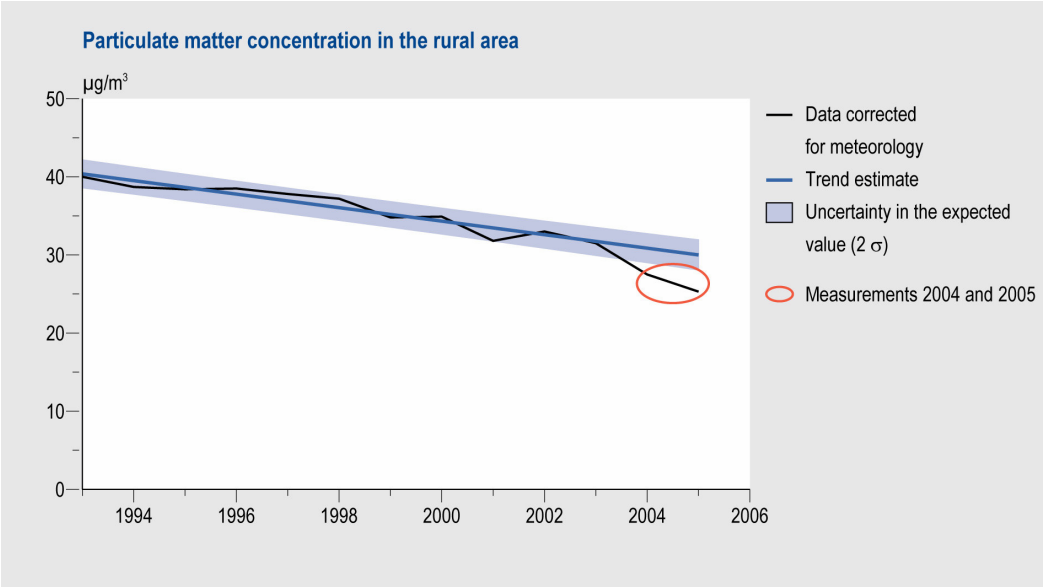


Figure 1 The black line shows the average particulate matter concentration in the rural area based on measurements and corrected for the influence of weather. The blue line indicates the trend in the measurements as a linear regression line. The blue band shows the 95% confidence interval. This means that an annual average concentration will fall outside these limits once every 20 years due to random effects; this is equivalent to a 5% probability. The years 2004 and 2005 lie significantly outside this band; the data for these years are enclosed in the red ellipse. The probability that this could take place exclusively due to chance is significantly less than once every 400 years.

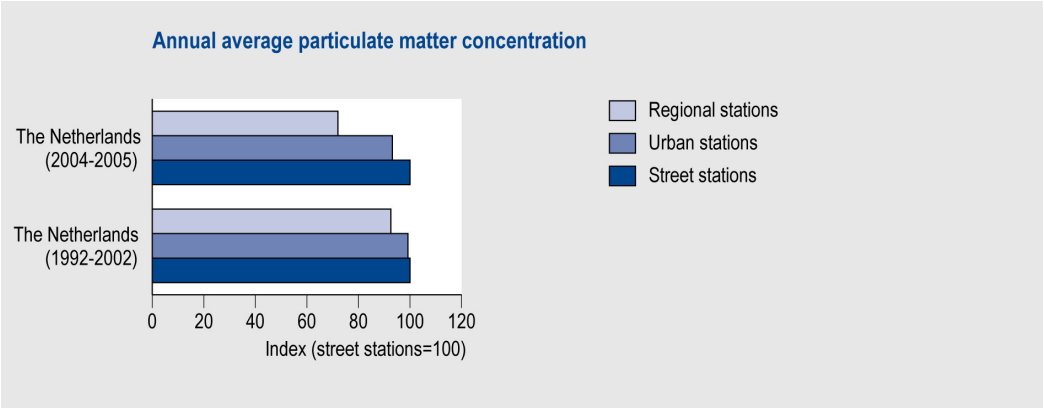


Figure 2 Average particulate matter concentrations for the urban, street and regional measurement locations in the Netherlands. The figure shows the average situation during the years 1992 through 2002 and during 2004-2005. The difference in concentration between the urban/street and regional stations in 2004-2005 averaged 8-10 µg/m3, while the difference during the period before 2003 averaged 2-5 µg/m³. Source: Dutch National Air Quality Monitoring Network (LML).

Discontinuity not yet explained

There are four possible explanations for the ascertained shift in concentration:

1. **A sudden change in the emission of particulate matter**. This explanation is only plausible if there has been a strong and structural decline in the emission of particulate matter in the Netherlands and abroad during a short period of time. The particulate matter emissions from traffic in the urban environment must have increased sharply at the same time to compensate for the declining concentration in the rural environment. After all, the concentrations in the urban environment are determined by adding local traffic emissions to the background level;
2. **A change in the weather conditions.** Differences in meteorological conditions can lead to a variation in the annual average particulate matter concentration of up to 5 µg/m^3. For this reason, the measurement results in Figure 1 are shown with a correction for the weather conditions, which vary from year to year;
3. **A change in the measurements of particulate matter and/or the measurement method.** The configuration of the particulate matter monitoring network has changed, and a new type of measurement instrument has been employed. These changes could have affected the measured levels;
4. **A change (not yet understood) in the atmospheric chemistry in areas with intensive animal husbandry**. In this explanation, there is a sudden and drastic change in particulate matter that is formed in the atmosphere from ammonia, nitrogen oxides, sulphur dioxide, and to a lesser extent chloride. This inorganic aerosol is hygroscopic and the effect of small temperature fluctuations on the concentration of this particulate matter component is therefore large. The effect can take place both in the ambient outside air and the air inside the measurement instrument.

The first two explanations are less probable. The average anthropogenic contribution of the Netherlands to the particulate matter concentration is approximately 5 µg/m^3, and that of other countries is about 10 µg/m^3. The magnitude of the emission changes must have been extraordinarily large to explain the progression in the concentration that was found. In addition, 2004 and 2005 did not deviate meteorologically. The plausibility of the third and fourth explanations must be investigated further.

Consequences for the particulate matter prognosis

The GCN maps are used as a basis to determine the particulate matter concentrations at the agglomeration level and the street level. They are largely based on the historical measurement series of particulate matter. Due to the discontinuity in the measurement series, the measurements from 1992-2003 must be distinguished from the 2004-2005 measurements. The most recent measurement series is assumed to have the greatest significance. The reasons for this are the following:

- The uncertainties in the 1992-2003 measurement series are larger than those in the measurements from the past two years;
- The ascertained differences between the urban/street environment and the regional environment during the past two years are realistic because they are supported by comparative measurements with reference apparatus. Moreover, these differences are more in accordance with the situation that is encountered in Germany and the United Kingdom (*Figure 3*);
- For recent years, there is more agreement between the measurements in the rural area in the Netherlands and Germany (*Figure 3*). The measurements in Belgium are more difficult to compare due to the urban or industrial character of the Belgium measurement stations in the Dutch-Belgian border region;
- For the most recent years, the measurements at the regional background level, the urban agglomerations and in local, heavy-traffic environments have been more in accordance with the contributions of the various sources at these respective scale levels than those from previous years. The model calculations, based on the large-scale background level, with which the urban and local particulate matter concentrations are estimated, are then more compatible with the measurements for these recent years.

Based on the above considerations, the MNP has based the new central GCN map on the measurements during 2004 and 2005. This new GCN map can be seen as the most scientifically responsible estimate of the background level of particulate matter in the Netherlands. It is inherent to the chosen methodology that structural changes in the measured levels can lead to new modifications in the future. Research must be conducted into how the sensitivity of the methodology for such intrinsic changes can be reduced.

In the central GCN map for future years, the many-year variability in weather conditions has been taken into account. On average for the Netherlands, the prognosis of the concentration in the year 2010 is approximately 4 µg/m³ lower than was indicated last year. In the section *Consequences for air quality and the number of bottlenecks*, this picture is worked out in greater detail. The reason for the discontinuity has not yet been found. It is therefore uncertain whether the measured levels in 2004 and 2005 will also be found in the future.

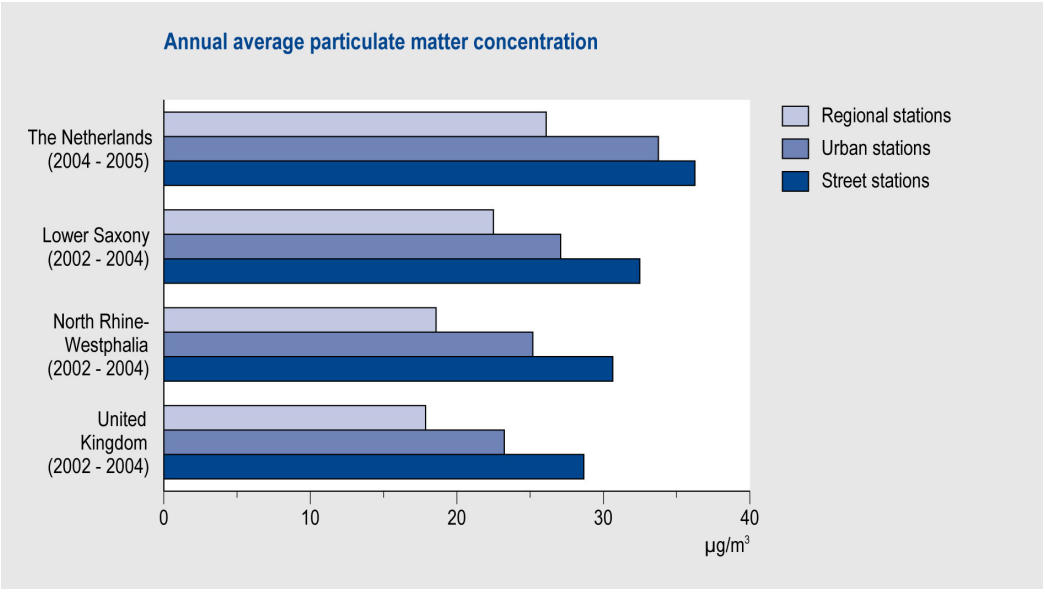


Figure 3 The differences in concentration between particulate matter measurements in the urban/street and regional environments in the Netherlands, two federal states of Germany and the United Kingdom. The picture that has been found during the last two years in the Netherlands is more in accordance with the measurements in the measurement networks in these other countries. Source: AIRBASE, LML.

Changes in emissions and the emission prognoses[1]

It is not only the measurement values in the atmosphere that have changed. New insights have also been acquired into the emissions of particulate matter and their spatial distribution. This applies especially to traffic emissions. The emissions in the Rijnmond area near Rotterdam have therefore been modified because a number of measures have been taken to counteract windblown dust from the bulk goods storage and trans-shipment sector.

In addition to updating the information, the emission prognoses have also been revised. The most important changes are the revised scenario insights into future developments, especially the development of traffic, and the intensification of the particulate matter control policy. The expected growth in emissions from road freight traffic and inland shipping has been revised downward. The most important reasons for this are lower estimated growth in world trade and a continuing shift towards a service-based economy in the Netherlands.

Approved policy
In the autumn of 2005, the Dutch Cabinet presented an extra package of measures, including subsidies for soot filters on both new and older vehicles. In addition, as part of the *Traffic Emissions Policy Document*, the *Mobility Memorandum* and the *Urban Renewal Innovation Programme*, extra measures are being taken to improve air quality. The new emissions estimate includes only the concrete policy resolutions that have been sufficiently instrumented and for which the financing has been arranged. At the European level as well, the control policy has been intensified. For example, new norms have been established for the emissions from passenger cars and light commercial vehicles: the Euro-5 norms. This means that new diesel vehicles will be required to have soot filters beginning in 2010.

In advance of these new norms, some automobile manufacturers have already starting providing their new diesel vehicles with a soot filter as part of the standard equipment.

The approved policy will lead to significant reductions in the emissions of particulate matter in the Netherlands. It is expected that in 2010, the emissions will decline by 15-20% (8 million kg) with respect to the year 2000 (*Figure 4*). After 2010, the emissions will stabilise. With respect to the estimate made last year, the emissions during the period 2010-2020 are about 10% lower. The new scenario insights and the policy changes contribute about equally to this reduction.

[1] This report addresses only the emissions in the Netherlands of *primary* particulate matter. However, a good understanding of the entire particulate matter issue also requires information about emissions abroad and about the precursors of secondary particulate matter (ammonia, nitrogen oxides and sulphur dioxide). The emissions of these substances in the Netherlands will decline in the future even more than the emissions of primary particulate matter. These aspects will be discussed in greater detail in the complete report on the GCN maps (in preparation).

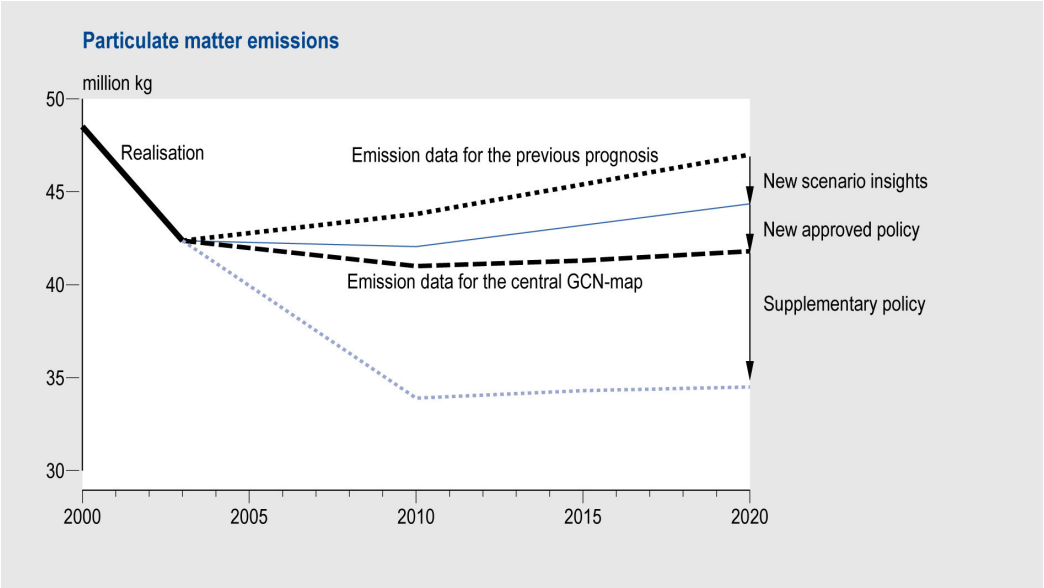


Figure 4 Emission of primary particulate matter in the Netherlands according to the previous prognosis and the central GCN map 2000-2020.

Effects of the implementation of supplementary European and national policy

In addition to the limit values for particulate matter, the Netherlands must also satisfy the provisions in the EU National Emissions Ceiling Directive (NEC). A supplementary calculation was therefore conducted concerning the extent to which the emissions will change if the Netherlands should satisfy the NEC directive in 2010. During these calculations it was assumed that the Netherlands would also implement the less concrete portion of the package of measures approved in the autumn of 2005 and will also fully implement the European Thematic Strategy, recently proposed by the EU. As a result of this extra policy, the emissions of particulate matter could decline by an additional 15% in 2010 (6 million kg). These extra measures mean, among other things, that combination air filters will be installed in intensive stock production facilities and crust-forming agents and other measures will be used in the bulk goods storage and trans-shipment sector.

Consequences for air quality and the number of bottlenecks

The limit value for the *24-hour average* particulate matter concentration was exceeded on a large scale in cities in 2005. The ascertained change in the measured results of 10-15% was already included in the GCN map for 2004. The number of exceedances in 2005 therefore does not deviate very much from 2004. However, with respect to the period before 2003, the number of exceedances in these more recent years is significantly lower.

According to the new prognosis in the central GCN map, the annual average concentrations will decline in the Netherlands by about 4% on average during 2005-2010; this is more than 1 µg/m^3. This decline will continue during the period 2010-2020. However, due to the altered insights into the particulate matter measurements, the decline with respect to the previous prognosis will be greater: the expectation for 2010 now includes an additional 10-15% decline. The previous prognosis was based on a long series of measurement data. The new prognosis is based on the shorter measurement series from 2004-2005.

In 2010, the highest concentrations will be expected primarily in the regions of Rijnmond, Amsterdam, Utrecht and at several locations in the province of North Brabant (*Figure 5*). In comparison with the estimate made last year, it is especially the situation in North Brabant that is clearly more beneficial. The presented map shows the background concentration with the additional contribution of local sources from city and highway traffic (see the Methodology section) and in this way provides a picture of the potential exceedance situations. In addition, the calculations have shown that in the year 2005, the limit value for the 24-hour average was exceeded south of the line Amsterdam-Arnhem on nearly all highways and on a large number of city streets.

The new prognosis predicts a clear improvement in the situation. The number of bottlenecks for air quality, i.e. locations where an exceedance of the limit value is calculated,[2] is expected to be more than 50% smaller in 2010 than in 2005 (*Figure 6*). Some policy measures also have an effect over the longer term. Due to time-lag effects, the number of bottlenecks will also decline further after 2010. Between 2010 and 2015, the number of bottlenecks will be reduced by half; after this the situation will stabilise.

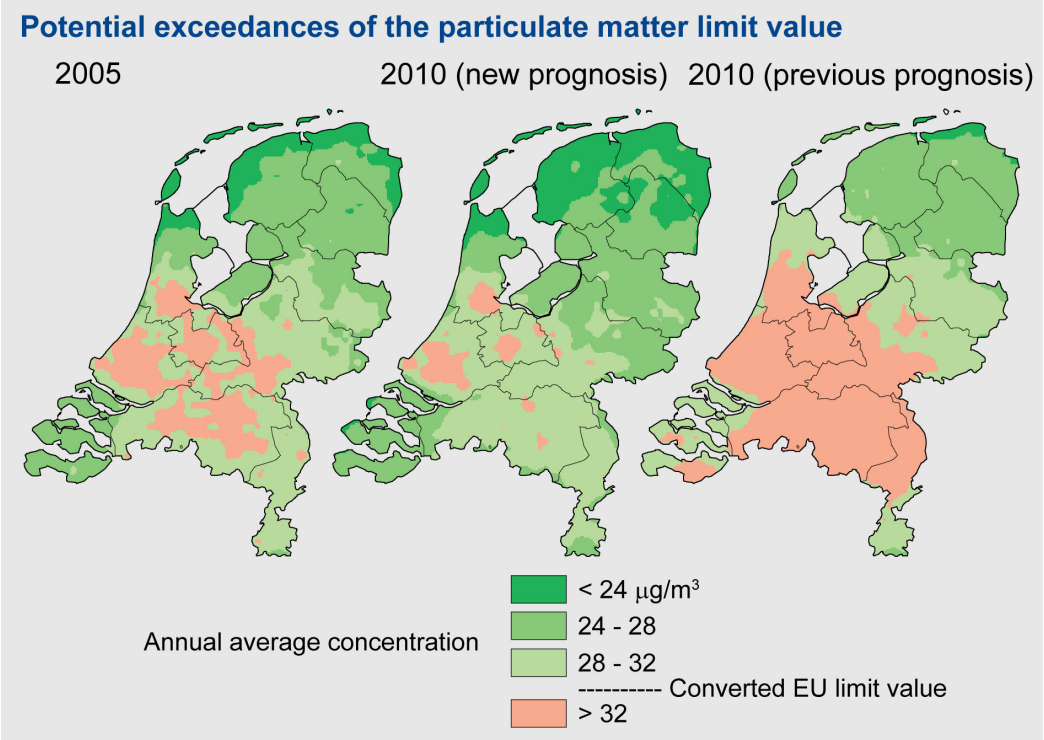


Figure 5 Large-scale background concentrations of particulate matter supplemented with an indication of the local contribution. Together this provides an indication of the potential exceedances of the limit value for the 24-hour particulate matter concentrations for 2005 (left), for 2010 with the current prognosis (middle) and for 2010 with the previous prognosis (right). This limit value is the number of days with a 24-hour average particulate matter concentration above 50 µg/m³; this number of days must not be more than 35. The limit value appears to correspond with an annual average particulate matter concentration of 32 µg/m³. This is indicated in the figure with 'Converted EU limit value'.

[2] Of all highways in the Netherlands, 164 road sections with the highest air pollution have been calculated in the model. This concerns a total length of 505 km of highway. These highways are located largely in the urban agglomerations of the western part of the Netherlands, in the Arnhem-Nijmegen region and near the North Brabant cities of Breda, Den Bosch and Eindhoven. The analysis of the urban situation is based on 1269 moderately busy to very busy streets in Amsterdam and Utrecht. These two cities are representative for other polluted cities in the Netherlands.

Compared to the relatively small concentration reduction (15%), the effects expressed in numbers of bottlenecks are much greater. This is because in the previous prognosis there were many locations where the concentration was just above the limit value. A relatively small decline in the concentration then leads to a disproportionate decline in the number of bottlenecks. With the new insights, the expected number of exceedances of the limit value has declined sharply. Nevertheless, exceedances will still take place in the future. Possible exceedance situations are expected along a number of highways (near Utrecht, Amsterdam, Den Bosch, Eindhoven and the Rijnmond area), but after 2010 this will decline further.

In the cities, bottlenecks will continue to exist with the current policy, especially on busy streets in large cities, in the urban agglomerations of the western part of the Netherlands and in the southern part of the country. The expectation is that after 2010, the bottlenecks will be concentrated around Amsterdam and Rotterdam. This has to do with the proximity of the harbours and the growth in the related business and transport activity.

Due to the new insights, there will be virtually no changes in the health effects for short-term exposure in the Netherlands. This means that several thousand people will die prematurely due to short-term exposure to particulate matter. For long-term exposure, the health effects are approximately 10-15% smaller than published previously. However, the uncertainties in these relationships are large, and the previous conclusion therefore remains unchanged: ten thousand to several tens of thousands of people will possibly die approximately ten years prematurely due to the long-term exposure to particulate matter.

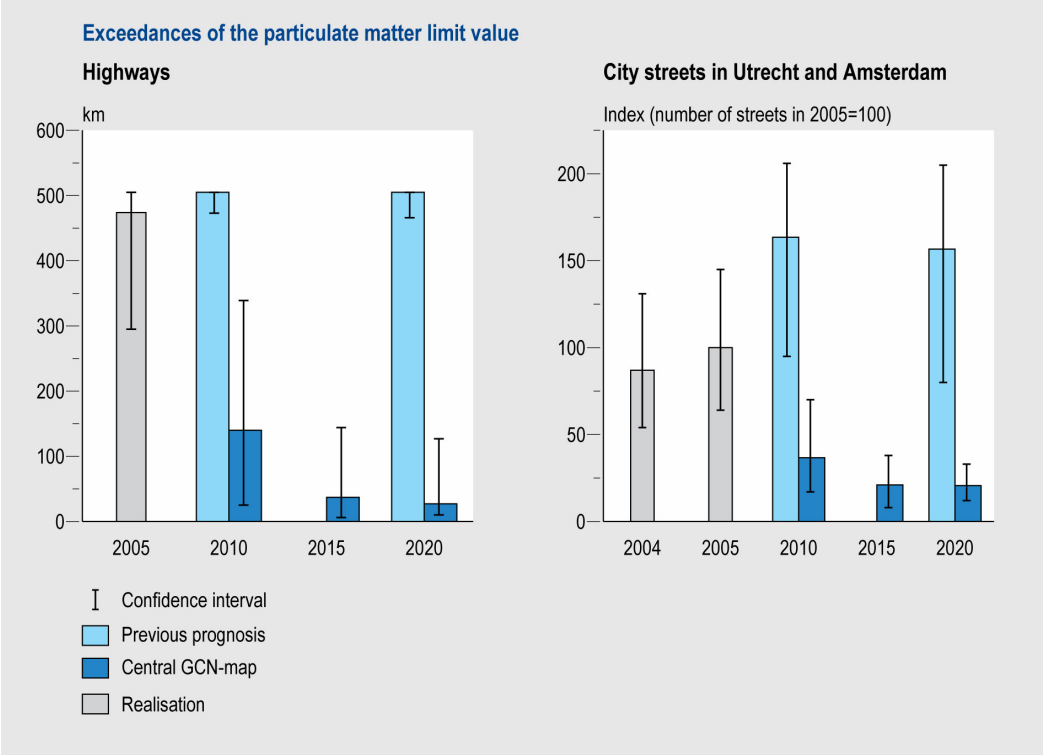


Figure 6 Exceedances of the limit value for the 24-hour average particulate matter concentration. On the left the number of kilometres of highway along which exceedances occur. On the right the exceedances along city streets in Amsterdam and Utrecht. These calculations may require correction for the observed differences between the calculated and measured concentrations in heavy traffic environments. The graph shows the actual exceedances during the past year, the prognosis according to the current central GCN map and the previous prognosis.

Consequences for policy

In the autumn of 2005, the Dutch Cabinet presented a package of measures to improve air quality and satisfy international obligations. A previous evaluation of the Netherlands Environmental Assessment Agency concluded that the policy package is expensive but largely cost effective. With the new insights, the above package of measures is still a *no-regret* policy to further reduce the emissions and to reduce both the number of bottlenecks and the negative health effects. The effectiveness of national and local measures on reducing the number of bottlenecks will increase because we now understand that the particulate matter problem occurs on a smaller scale than was previously thought. This means that it will be possible to meet the limit values sooner, i.e. before 2020 instead of after 2020. The particulate matter problem in the Netherlands can possibly be solved by 2015 with supplementary local and national measures and additional European efforts. In this case, however, the European Commission must provide the Netherlands with derogation of five to ten years to satisfy the European limit values.

The new *Air Quality Decree 2005* offers the possibility of taking a 'balance approach'. This means that a limited increase in the concentrations caused by construction projects is allowable if this is compensated by measures taken elsewhere. In this way, the air quality balance in the region will still improve. The balance regulation must be worked out in greater detail, but it is expected that the GCN maps will be an important reference framework for this process.

For the time being, the particulate matter problem has not been solved. As a result, during the next 10-15 years there will still be situations where exceedances of limit values occur. The proposed balance regulation will probably be useful in that case.

Bottlenecks for nitrogen dioxide and the finer fraction of particulate matter, $PM_{2.5}$

The European limit value for nitrogen dioxide, like the limit value for particulate matter, will be exceeded now and in the future in the Netherlands. For nitrogen dioxide, the administrative system, and the role of the GCN map in the system, does not deviate significantly from that of particulate matter. There are also significant uncertainties in the calculations for nitrogen dioxide. In comparison with the previous particulate matter prognosis, the nitrogen dioxide issue was smaller and more controllable. However, the new insights into the magnitude of the particulate matter problem have resulted in the number of calculated bottlenecks for nitrogen dioxide to be three times as high as that for particulate matter along highways and twice as high in inner cities. In the more distant future, the number of bottlenecks for nitrogen dioxide will decline. With maximum supplementary local policy for cities and highways, it is expected that these bottlenecks could be solved in 2020.

The European Commission has also approved new legislation for a finer fraction of particulate matter, the $PM_{2.5}$. In the Netherlands, the information (measurements, emission data and control measures) on $PM_{2.5}$ is currently limited. The scarce data and internationally-reported measurements of the concentration ratios of $PM_{2.5}$ and PM_{10} have led to the tentative conclusion that the current norms for PM_{10} are slightly more stringent than the proposals for $PM_{2.5}$. As a result, there will probably not be any new bottlenecks resulting from the $PM_{2.5}$ legislation. It is expected that the bottlenecks for both particulate matter fractions, especially regarding traffic policy, will be reduced at about the same rate. As a result, the $PM_{2.5}$ problem could be solved by 2015 with supplementary local, national and European policy.

Effects of supplementary policy

On the central GCN map, the downward trend in particulate matter concentrations during the period 1992-2003 will continue in the future, although the decline will not be as rapid (*Figure 7*). While the annual average decline in the past was approximately 1 µg/m³, during the next five years this will be 0.2 µg/m³ on average and 0.1 µg /m³ on average for the period 2010-2020. The most important cause of this lower rate of decline, especially in the Netherlands, is that a relatively large number of less-costly control technologies have already been implemented.

Besides the central GCN map, an analysis has also been conducted into the effects of supplementary control policy. In this analysis, it has been assumed that the NEC ceilings in the Netherlands and abroad will be realised in 2010. It was also assumed that the recently proposed European Thematic Strategy for Air Quality will be fully implemented beginning in 2010.

If the above supplementary policy is assumed, particulate matter concentrations will be approximately 5% lower in comparison with the central GCN map. The number of bottleneck situations in 2010 along highways and in cities will be reduced by half and two-thirds, respectively, in comparison with the central GCN map. Compared with the current situation, the problem in 2010 will be greatly reduced; after 2010 it will have almost disappeared along the highways.

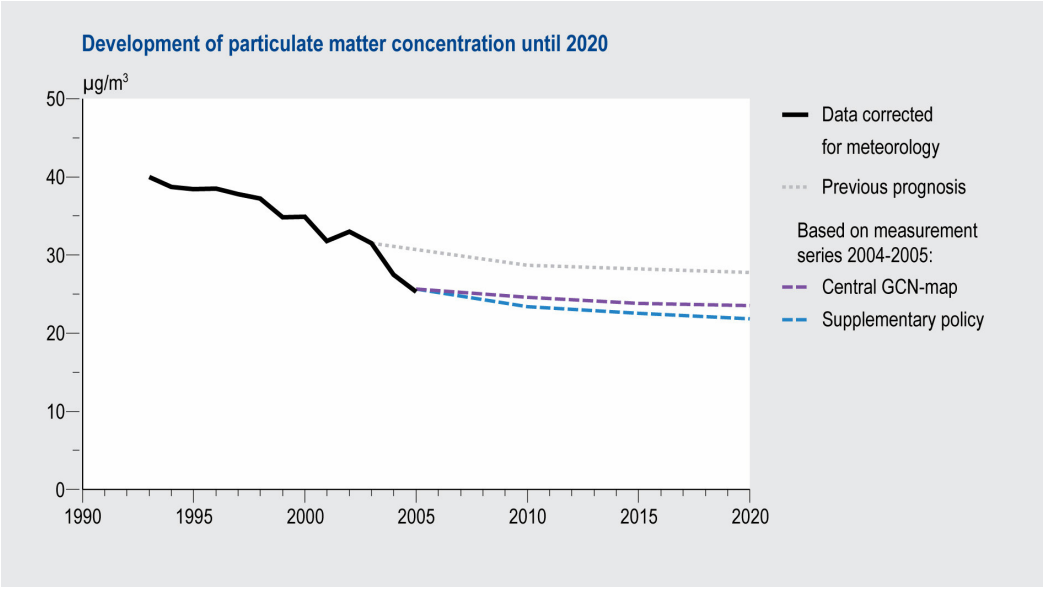


Figure 7 Average particulate matter concentrations in the Netherlands based on measurements according to the central GCN variant and those based on supplementary policy. For purposes of comparison, the previous prognosis from last year is also shown.

Recommendations

The current determination of the particulate matter concentration is based on the combination of measured results and the results of calculations with models. The limited number of monitoring stations and the uncertainties in measurements, emission figures and model calculations result in significant uncertainty in determining the particulate matter concentrations at the street level. The current system is subject to new scientific insights and unforeseen developments in the background concentration level. This level is largely determined by sources outside the Netherlands. In general, we recommend that these uncertainties should be taken into account in policy development and implementation. In field of tension between economics, ecology and health, extra importance could be given to the principle of prevention.

We have observed a tendency that calculations that are being made for policy support purposes are being conducted in an increasingly refined fashion. However, there is little attention to the fact that the relative uncertainties then increase disproportionately. We recommend that more use should be made of generalisations, such as general calculation rules, to ascertain air quality and policy effects. In addition, the reduction of negative health effects and exposure should be the most important criteria for establishing priorities in the policy to be implemented. Such an approach could even be applied in the planned ministerial decree for a 'balance' approach.