

Environmental Balance 2004

Summary

Environmental Assessment Agency

National Institute for Public Health and the Environment

with

Transport Research Centre (AVV)

Statistics Netherlands (CBS)

Netherlands Bureau for Economic Policy Analysis (CPB)

Netherlands Energy Research Foundation (ECN)

Royal Dutch Meteorological Institute (KNMI)

National Aviation and Space Exploration Laboratory (NLR)

National Institute for Coastal and Marine Management (RIKZ)

National Institute for Inland Water Management

and Wastewater Treatment (RIZA)

Netherlands Institute for Spatial Research (RPB)

Wageningen University and Research Centre (WUR)

Foreword

Each year the Netherlands Environmental Assessment Agency at the National Institute for Public Health and the Environment (RIVM) publishes an Environmental Balance. The Environmental Balance describes and analyses trends in the state of the environment in the Netherlands and the effectiveness of Dutch environmental policy. It also evaluates the degree to which targets for a large number of environmental problems are being met under currently adopted policies and the costs of the policies to government and society.

This is the tenth Environmental Balance. In this Environmental Balance the Environmental Assessment Agency points to the increasing tensions between national and EU policies. Although emissions of environmental pollutants have declined, under current national environmental policy, various European obligations will not be met. Nevertheless, in most cases the distance to target decreases. The process of decentralizing Dutch environmental policy, and at the same time implementing European directives is a growing source of tension, both within the Netherlands itself and between the Netherlands and the EU.

This summary is also available on the Internet at <http://rivm.nl/environmentalbalance>. During the course of 2004 a detailed quantitative statement of the new emission figures and a great many other environmental indicators will become available in English in the Environmental Compendium, which can be found at www.environmentaldata.nl.

The Environmental Balance is compiled in collaboration with many other research institutes and policy assessment offices. These are listed on the title page. Data have also been made available by the Emissions Registration – a broad coalition of organizations under the auspices of the Spatial Planning, Housing and Environment Inspectorate – and the Waste Management Council

The Director of the Netherlands Environmental Assessment Agency – RIVM,



Prof. N.D. van Egmond

Summary: putting the environment into perspective

The main causes of environmental problems in the Netherlands are the increasing mobility, growing spatial pressures, energy consumption and agricultural practices. Technical measures have reduced pressures on the environment on a number of fronts, despite economic growth, but this has not yet led to the restoration of collective goods such as quiet, nature and the landscape. If we are to prevent further erosion of nature and environmental quality, continued efforts will be needed to accommodate economic growth while still reducing environmental pressures.

The Netherlands is more often failing to meet European obligations. The implementation of European directives, such as the Nitrate Directive and the Water Framework Directive, is a growing source of tension. As a result of the decentralization of Dutch environmental policy, the tension between this policy and the EU environmental policy (sectoral and based on compulsory standards) will increase. The role of the central government in steering this decentralization process is still not clear and there is little consistency between the objectives and instruments of environmental, nature, spatial planning and water management policies. Central government does not yet have a clear strategy for managing relations with the EU and fulfilling its function as an intermediary between the EU and the regions.

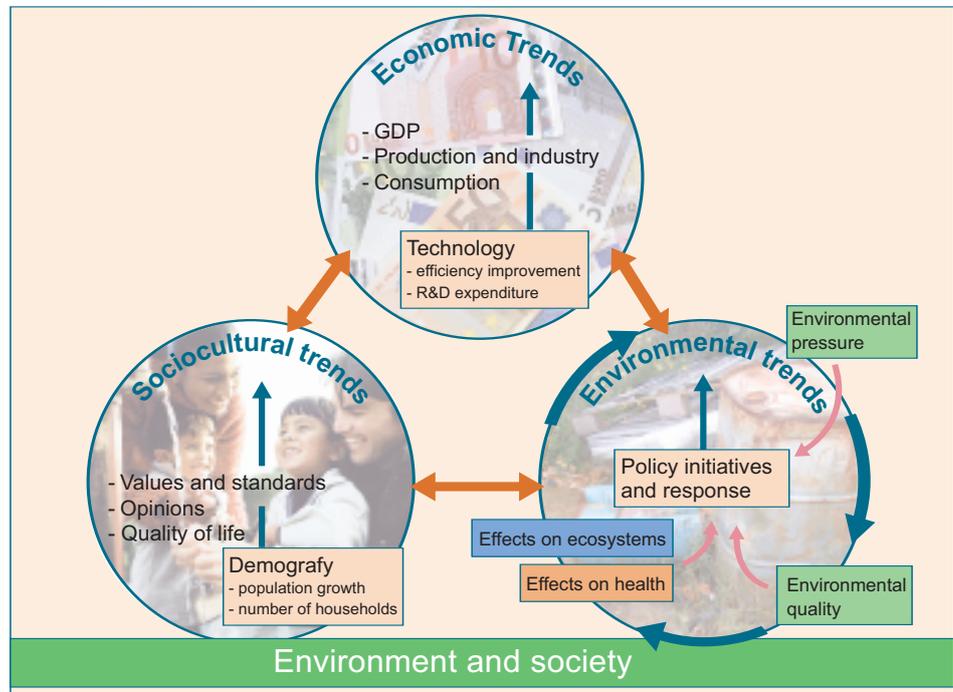


Figure 1 Schematic presentation of the interactions between societal trends and the environmental chain.

Many environmental targets will not be met given the current rates of progress

Emissions of most pollutants have fallen in recent decades, and air and water quality has improved considerably. However, under presently adopted policies, the improvement, in most cases, will be not enough to meet the European targets for 2010 (Table 1). In almost all cases, though, the distance to targets is reduced. Under current policies, the targets for climate (domestic Kyoto targets), renewable energy and waste management, and the European obligation for ammonia, are expected to be achieved. Meeting the targets for waste management and renewable energy seems more plausible now than it did when the Environmental Balance 2003 was brought out, but the targets for soil remediation look less likely to be achieved.

The pressure on the environment has not yet fallen to a level at which damage is ruled out. Risks to health have generally declined, but there is little sign of any restoration of Dutch ecosystems and, despite a limited expansion of the area of natural habitat, species diversity is still shrinking.

Table 1 Environmental trends, achievement of policy targets for 2010 (EU: European obligations) and budgeted expenditure on the environment (in millions of euros, 2004 prices).

Theme	Trend 1985–2003	Target achievement	National budget 2004–2008 av. per year	Environ- mental costs to society 2003
Climate: domestic target	Yellow	EU	950	1150
Climate: foreign reductions	-	EU		
Energy efficiency	Green	Yellow		
Renewable energy	Green	EU	15	1800
CO ₂ footprint	Red	-		
Emissions of NO _x , SO ₂ , VOC	Green	EU		
Emissions of NH ₃	Green	EU		
Deposition of N / acid on nature	Green	Yellow		
Air quality	Green	EU	60	1090
Nutrient loss agriculture	Green	EU		
Nitrate in groundwater	Green	EU		
Pesticides	Green	Yellow		
Surface water quality	Green	Red	10	not known
Organic farming	Yellow	Red		
Noise	Yellow	Red	130	390
External safety	Red	Red	2.5 ¹⁾	130
Soil remediation	Yellow	Red	275	630
Waste management	Green	Green	35	3500

In column 2 green indicates: reduction in environmental pressure and/or improvement in environmental quality; yellow: little or no change; red: increase in environmental pressure and/or lowering of environmental quality.

In column 3 green indicates: targets expected to be achieved under currently adopted policies; yellow: achievement of targets doubtful or not yet able to be determined; red: targets not expected to be achieved under currently adopted policies.

1) The external safety budget for 2002–2010 is 600 million euro, mainly reserved in supplementary budget items and in the FES/BIRK fund for infrastructural investments.

The Netherlands has the highest density of people, industry, livestock and traffic in the European Union. In many cases, a higher degree of technical measures than the EU average will be needed to meet European environmental quality standards. At the moment, levels of pollution on soil, groundwater, surface water and natural habitats in the Netherlands are the highest in Europe. It is primarily on these fronts that the Netherlands has difficulty in meeting its EU obligations; failure to meet EU obligations can lead to infringements and heavy fines. Failure by the Netherlands to meet the stated goals can partly be explained by the rising costs of extra reduction measures, as in the case of NO_x .

In 2003 Dutch government expenditure on the environment fell from about 3 to 2.5 billion euro. The majority of this was spent on climate policy, despite efficient savings on climate subsidies in 2003 and 2004.

In its 2002 policy implementation plan, the Dutch government indicated that many of the national targets announced in the Fourth National Environmental Policy Plan (NEPP4) would not be achieved by 2010, mainly due to a shortage of money. People and habitats will thus be exposed to more noise and air pollution for longer. The implementation paper explains that objectives and targets in the NEPP4 should not be seen as compulsory, but as a lead for improving the environmental situation.

Progress with decoupling, but demand for energy still rising

The decoupling of pressure on the environment stemming from economic growth is progressing (Figure 2). With the exception of climate change and noise, environmental pressures are falling in absolute terms, a trend brought about mainly by technical measures, while mobility and energy consumption have kept on rising. Combining a

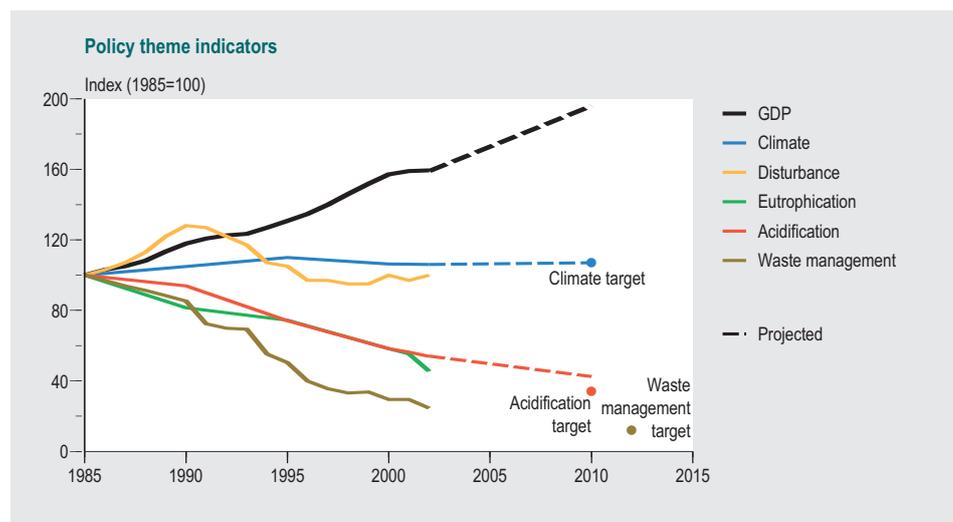


Figure 2 Pressure on the environment falls while the economy grows, 1985-2010.

growing economy with falling pressures on the environment will require continued attention to policy.

As incomes rise, consumer demand for energy will continue to grow, especially concerning electricity and mobility. Of the three-fold rise in total energy consumption by consumers in the period 1960-2000, 40% can be explained by population growth, about 50% by growth in incomes and about 10% by changes in consumption patterns.

In recent years the price effects of taxes on fuel and energy have not been enough to counteract the effects of income growth. Consumption of electricity by households continues to rise, despite the real growth in electricity prices due to the regulatory energy tax.

A recent opinion poll revealed that in contrast to what politicians and opinion leaders tend to think, the majority of the Dutch population considers the environment more important than the economy. But this is not always reflected in people's behaviour. The public shows little support for policies that seek to influence their behaviour.

Climate change increasingly noticeable

Changes in the climate of Europe and the Netherlands are becoming increasingly apparent from the impacts on plants and animals. The dry and exceptionally hot summer of 2003 may also be part of the general trend: the ten years with the highest temperatures experienced worldwide have all occurred since 1990. The observed warming of the earth over the past 50 years is probably largely a consequence of the increased greenhouse effect caused by human activities; international agreements have been made to combat this trend. The target reductions in greenhouse gas emissions as agreed in Kyoto can be seen as a first modest step towards protecting the global climate system.

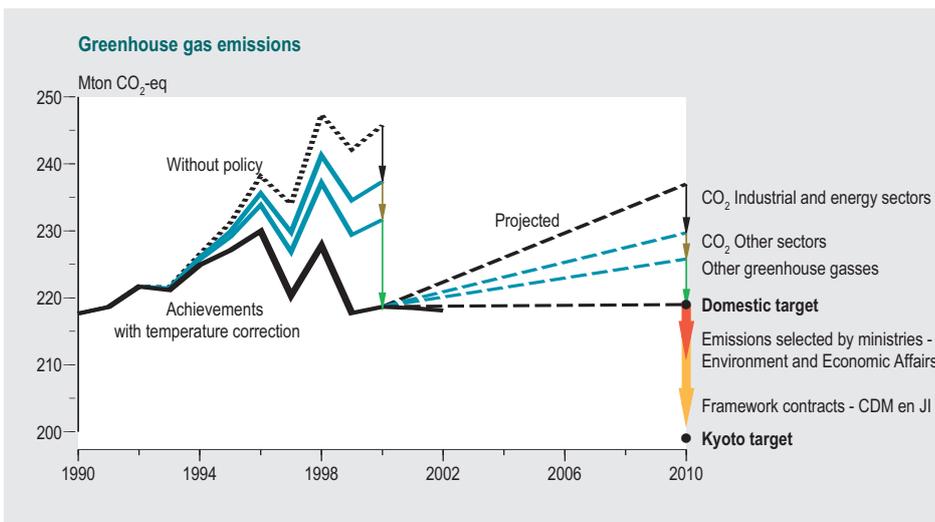


Figure 3 Greenhouse gas emissions in the Netherlands and effects of current policy, 1990-2010.

Domestic Kyoto target within reach

Current climate policies are having an effect: without them, greenhouse gas emissions would be about 10% higher than at present. Emissions have been curbed mainly through energy savings and lower emissions of non-CO₂ greenhouse gases. If the announced additional reduction in N₂O emissions in the chemicals industry are indeed to be achieved, current policies will probably be enough to achieve the domestic Kyoto targets in 2010. However, the existing monitoring method and the basic data set on national greenhouse gas emissions have been shown to require more accuracy. Better data are needed to reduce the risk of not achieving the domestic Kyoto target.

Foreign reduction target via Kyoto mechanisms still doubtful

It is still too early to say whether, under current policies, the Netherlands will be able to meet its foreign reduction target of 20 Mton CO₂-eq per year via Joint Implementation (JI) and the Clean Development Mechanism (CDM). Although the Netherlands has already signed framework contracts for about 75% of the planned reductions abroad, most of the proposals are still awaiting international approval. This casts some doubt on whether the Netherlands will fully achieve its Kyoto target of 6% emission reductions in 2010.

The most cost-effective measures for government are instruments to reduce emissions of non-CO₂ greenhouse gases and the JI and DCM to reduce emissions abroad, while the introduction of CO₂ emission trading across Europe may deliver financial benefits to industry. The public sector share of the total cost of climate policy is large compared with other environmental themes (*Table 1*).

Additional measures needed to meet European acid emission ceilings

Under current policies the Netherlands is not expected to comply with the compulsory emission ceilings for sulphur dioxide (SO₂), nitrogen oxides (NO_x) and volatile organic compounds (VOC) in 2010 (*Figure 4*).

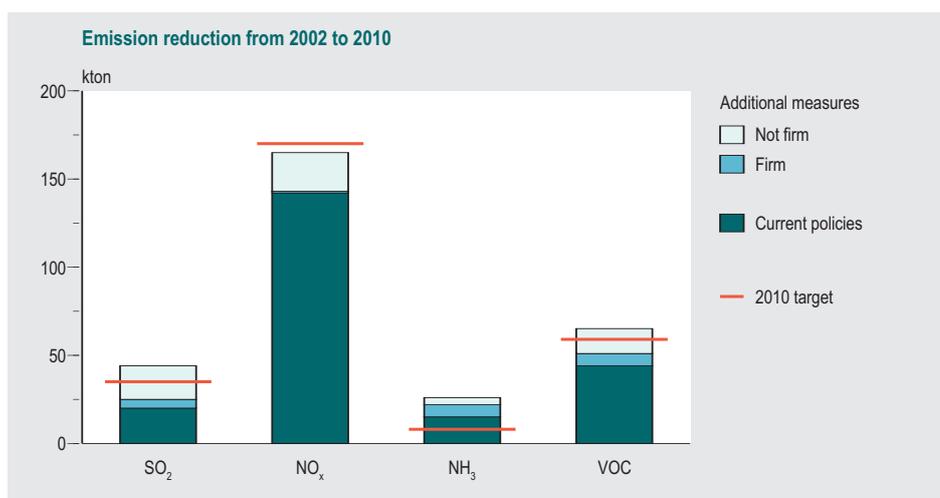


Figure 4 The required emission reductions for nitrogen oxides (NO_x) are particularly hard to achieve.

Even with the proposed additional measures in the government's plan, 'Sink or Swim', the prospect of meeting these ceilings remains uncertain because the proposals still need to be fleshed out and given adequate finance and policy instruments. Like other member states of the EU, the Netherlands has greatest difficulty in achieving the required emission reductions for NO_x by 2010. The main problem is that the key regulations (NO_x emission trading and European emission standards for road traffic) are already set and have, moreover, proved less effective than anticipated (see *text box*). Dutch efforts should now focus on smaller stationary sources, traffic pricing and/or subsidies for the early introduction of cleaner cars.

Vehicle measures less effective in practice

Road vehicle emissions of NO_x, VOC and fine particulates are subject to European emission standards. Cars are tested for compliance with these emission standards in an EU-prescribed test cycle. This test cycle, however, does not properly represent actual driving behaviour. In practice, NO_x and particulate emissions are higher than indicated by the test, and continual alterations to the test conditions for measuring noise means that cars have hardly become any quieter. The EU has signed agreements with the car manufac-

turers on CO₂ emission standards for new models to be introduced before 2010. Actual emissions of CO₂ are also thought to be higher than measured in the tests; for one thing, extra fuel consumption for air conditioning and other electrical equipment does not have to be included in the test. To get a more accurate indication of the effectiveness of measures taken, the EU should bring the test conditions more in line with real driving conditions.

Traffic measures cost-effective for NO_x emissions and hotspots

Traffic measures are very effective and cost-efficient in reducing local air pollution at hotspots (e.g. nitrogen dioxide), but are relatively expensive as a contribution to meeting the country's emission targets. In contrast, measures taken by industry, refineries and the energy sector are cost-effective in achieving national emission targets for NO₂. Traffic measures are most cost-effective if their contributions to relieving local NO₂ emission on hotspots, as well as meeting the NO₂ ceiling, are taken into account. In addition to these source-directed measures, use can be made of mitigating measures. Of these, the costs of covered motorways and tunnels are high; speed restrictions on certain stretches of road and traffic plans are relatively cheap.

Natural habitats slightly less exposed to nitrogen deposition

Emissions of ammonia (NH₃) have fallen substantially over the last few decades. Under current policies, NH₃ emissions are expected to fall to about 120 kton in 2010. This would be enough to meet the national emission ceiling for 2010, but not the tighter NEPP4 target (100 kton). Helped by this reduction, the area of natural habitat where species diversity is protected against the effects of excess nitrogen deposition will rise to about 10-30% of the total in 2010 (*Figure 5*). At the moment, an average of 40% of natural habitats in Europe are protected against nitrogen deposition. Within the Netherlands there are strong regional differences, but nitrogen deposition levels across the country will remain too high over the long term for a sustainable recovery of sensitive natural habitats, such as heath and bog pools. Restoration of these sensitive habitats will require direct intervention, such as dredging and other measures described in the national Forest and Nature Restoration Plan.

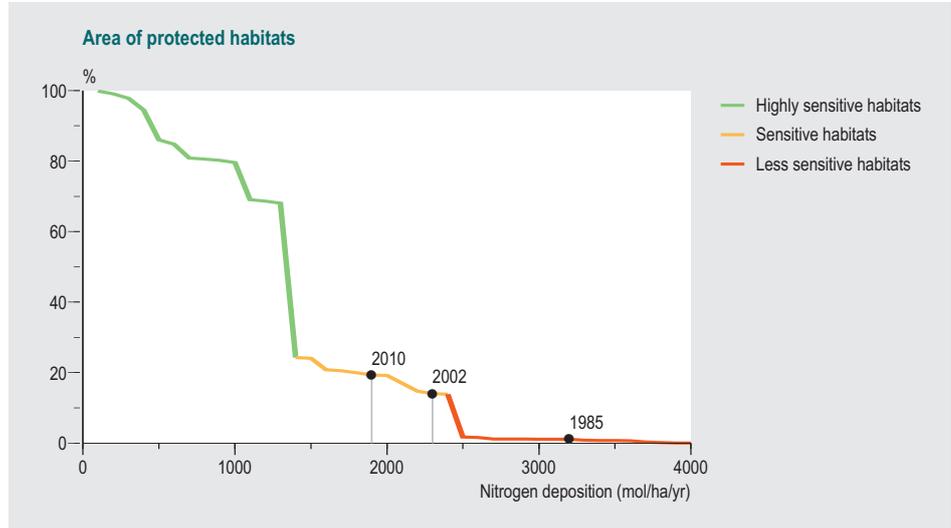


Figure 5 Slight increase in area of habitat protected against nitrogen deposition.

Relocating farms to remove ammonia emissions and provide extra habitat protection can be effective in helping to solve local problems, but is not an effective instrument for curbing NH_3 emissions at a regional or national scale.

Dutch manure policy effective, but rejected by the EU

Since the introduction of the Mineral Accounting System (MINAS) in 1998, nitrogen and phosphate surpluses in agriculture have fallen by about 30%, mainly as a result of

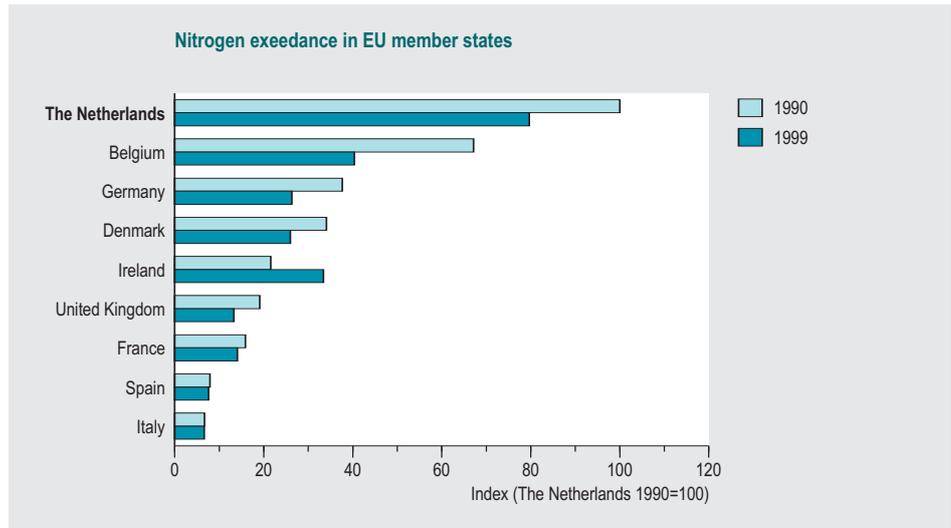


Figure 6 Relative extent of the nitrogen exceedance (kg N/ha) in the Netherlands compared to a number of European countries, 1990 and 1999.

lower fertilizer applications. In the regions with dry sandy soils, however, the current MINAS 'loss standards' for nitrogen are still too high to bring nitrate concentrations in the shallow groundwater down to 50 mg per litre. Under the current phosphate loss standards, still more soils will become saturated with phosphate. The European Court of Justice has irrevocably rejected the Dutch system of loss standards as an instrument for implementing the Nitrate Directive, and the Dutch government intends to introduce a new system conforming to the Directive based on use standards in 2006. With respect to a possible new Dutch derogation request for a maximum nitrogen input of 250 kg/ha on grassland (instead of 170 kg/ha), it is of concern that, currently, about half of the Dutch farms apply more than 250 kg/ha to grassland in the form of animal manure.

Water quality needs constant vigilance

Since 1997 nitrogen concentrations in surface waters directly affected by agricultural activities have gradually declined. Phosphate concentrations, however, have not fallen since 1991. As a result, water quality standards are still exceeded in many regional water bodies and many additional measures will be needed to meet existing national water quality targets. Exactly how much extra effort will be needed to reduce nitrogen and phosphate under the Water Framework Directive (WFD) is still unclear. Even if the Netherlands complies with the Nitrate Directive after 2006, assuming current water quality objectives, it will still not automatically fulfil its obligations under the WFD for either nitrate or phosphate.

Towards a healthy living environment?

The air is becoming even cleaner. Over the last ten years average concentrations of NO₂ and fine particulates have fallen by 20% thanks to emission reductions in the Netherlands and in Europe. Although this improvement is set to continue, currently adopted policies do not go far enough in meeting the European limits for particulates and NO₂ in 2005 and 2010, respectively. Once a widespread phenomenon, high NO₂ concentrations are now a local problem, mainly along busy motorways and urban roads. Local pockets where NO₂ concentrations exceed the limit are found in urban areas in all the European countries (*Figure 7*).

At present, everyone in the Netherlands is exposed to levels of air pollution that may affect human health. In 2001 an estimated 5000 people died prematurely as a result. If all EU air quality limit values for 2005 had been complied with, this number would have been 5% lower.

The public will be exposed to noise, safety risks and polluted soil for longer than originally anticipated in the Fourth National Environmental Policy Plan (NEPP4), the main reason being the limited availability of funding in the national budget. With the current budget, measures to prevent noise impacts along motorways and railway lines will be completed as late as 2020. This can be brought forward only if the current noise reduction projects in the Multi-year Programme for Infrastructure and Transport are supplemented by additional measures (noise barriers or reductions at source).

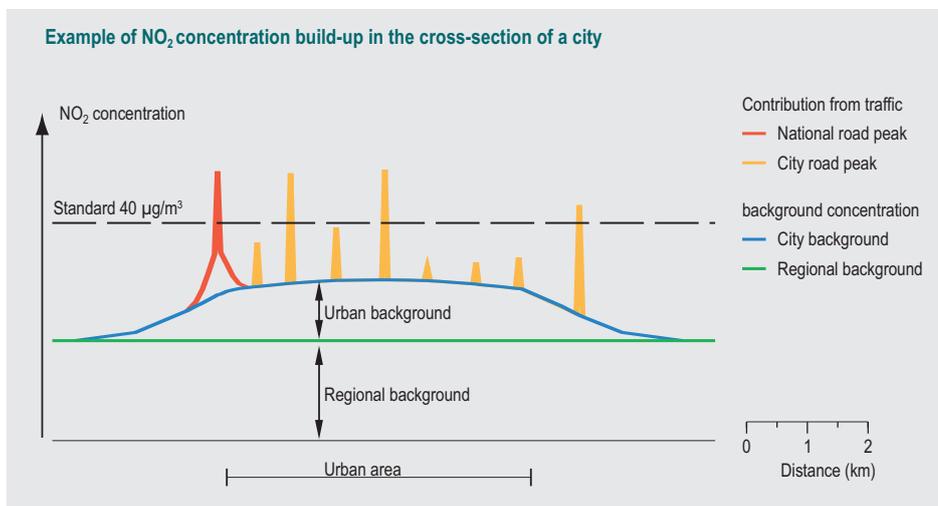


Figure 7 Build-up of NO₂ concentration in an urban area showing the local influence of roads.

Strict EU rules leave few options open

Houses are still built near motorways and busy roads and within the risk contours for industrial activities and air traffic. Consequently, more people are exposed to health and safety risks than if their houses had been built elsewhere. In a densely populated country like the Netherlands, intensive use of space can easily create situations in which EU environmental limits are exceeded. Possible solutions for resolving conflicting interests are being sought through experimental urban environmental measures at the local level. Under the strict system of EU limit values, these options are only possible with local exemptions (derogation).

Decentralization of environmental policy requires more from central government

In decentralizing decision-making powers, central government seeks to anchor environmental policies within integrated spatial policies at the regional and local levels. For the urban environment, important steps have been taken towards an integrated policy and bundling of resources. National policies for rural areas need to be more coherent: central government has set objectives, developed instruments and created administrative and organizational frameworks for environment, nature, water and spatial planning policies; however analyses reveal poor coordination.

Central government does not have a consistent vision of the decentralization process or of its own role in this process, and has no clear framework for assessing content or procedures. Eight evaluation studies show that governmental steering of regional and local area-based policies is largely based on different sectoral objectives – often inconsistent with each other –, a plethora of overlapping area categories and a complex set of regulations and financial mechanisms. This not only restricts the freedom of local authorities, but also raises administrative costs and involves lengthy procedures.

Analyses show that many regional and local area-based policies contain no measurable quality objectives, and lack adequate monitoring systems. This makes it difficult to evaluate the effectiveness of area-based policies and to investigate the contribution of the regional and local policies to the EU obligations on national level.

Decentralization: putting the quality of the living environment at risk?

Integrated area-based policies involve balancing a range of interests. The new integrated central government regulations make sectoral environmental standards for both urban and rural environments more flexible, and thus partly negotiable. In practice this means that – unintentionally – environmental quality may, in some cases, have to give way to more powerful political and economic interests at the regional and local levels, as revealed by recent evaluations of area-based policies for both the urban and rural environment. As the quality of the living environment becomes more an expression of regional and local ambitions and choices, regional and local differences in environmental quality and related health risks may widen.

Growing tension with EU policy

The proportion of European directives not implemented by the Netherlands has risen sharply over the last two years. This puts the Netherlands among the slower countries in Europe. The process of implementing the Nitrate Directive and the Water Framework Directive lead to additional tensions, both within the Netherlands itself and between the Netherlands and the EU (Nitrates Directive). The main causes for this are the uncertainty about the remaining ‘room to move’ for national policy and an insufficient grasp of the social consequences of the implementation of the directives. A further source of tension with EU policy (sectoral, regulatory, and compulsory standards) is the process of decentralizing the environmental policy to the level of provinces and

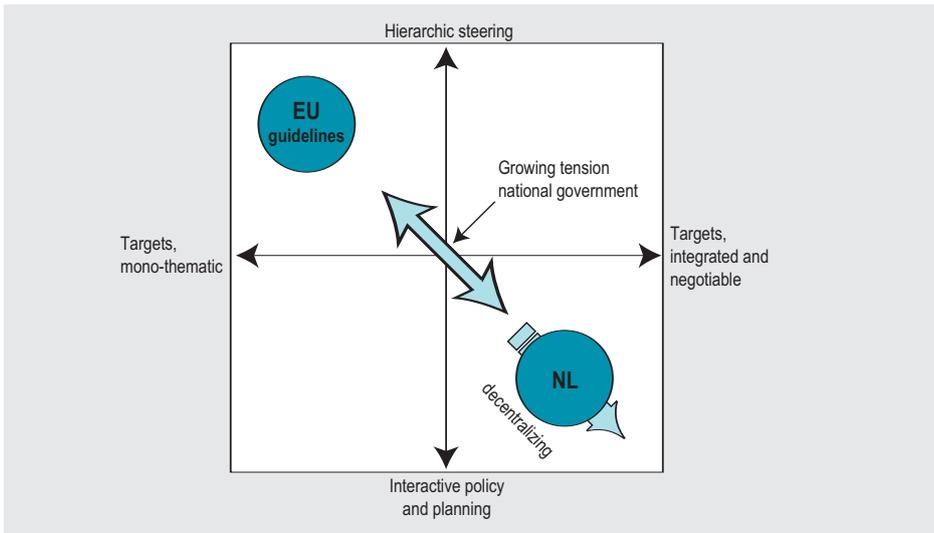


Figure 8 Illustration of growing tension between the character of the EU directives and the decentralization of policy, and policy implementation, in the Netherlands.

municipalities (integrated planning, targets partly negotiable). On the level of central government there is, as yet, no clear strategy for resolving this issue when dealing, on the one hand, with the EU and, on the other, with the Dutch regions about the allocation of responsibilities and liabilities.

Table 2 Key Environmental Quality Data for the Netherlands

	Unit	1990	2000	2002	2010 target NEPP4 or EU
Social trends					
Index (1985=100)					
Population		103	110	111	
Vehicle-kilometres road traffic		120	153	160	
Energy consumption		113	126	129	
Livestock		102	92	86	
Waste		108	125	125	
Gross Domestic Product		118	157	159	
Environmental costs/GDP	%	1.9	2.5	2.3	
Environmental exp. central gov./ Tot. exp. central gov.	%	0.7	1.5	2.3	
Green taxes	%	8.6	13.8	12.9	
Emissions					
Climate change					
CO ₂ ¹⁾	Mton	165	176	180	
Total greenhouse gases ¹⁾	Mton CO ₂ -eq	215	218	217	199/219 ²⁾
Acidification					
SO ₂	kton	191	75	67	46
NO _x	kton	583	419	397	231
VOC	kton	488	262	232	155 ³⁾
NH ₃	kton	249	152	136	100
Eutrophication					
Phosphate	million kg	97	61	47	
Nitrogen	million kg	494	432	344	
Environmental quality					
Acidification					
Acid deposition	mol/ha	4800	3400	3000	23004)
Eutrophication					
Total nitrogen deposition	mol/ha	3200	2500	2200	16504)
P surface waters	mg P/l	02-0.5	0.1-0.3	0.1-0.3	0.15
N surface waters	mg N/l	4-5	4-5.5	2-5	2.2
Shallow groundwater					
Natural habitats on sandy soils	mg NO3/l	30	20	10	
Agriculture on sandy soils	mg NO3/l	1506)	105	95	

Table 2 Key Environmental Quality Data for the Netherlands (continued)

	Unit	1990	2000	2002	2010 target NEPP4 or EU
<i>Air quality</i> ⁵⁾					
Exposure to fine particulates	µg/m ³	42 ⁶⁾	31	32	
Exposure to NO ₂	µg/m ³	27	21	20	
Exposure to ozone					
No. days limit exceeded		38	9	5	
No. people affected by noise	%	50	43	42	
<i>Waste</i>					
Landfill	billion kg	14	5	5	2 ⁷⁾
<i>Natural habitats</i>					
Area protected against					
- acid deposition	%	5	10	10	20 ⁸⁾
- nitrogen deposition	%	10	10-20	10-20	20 ⁸⁾

1) Temperature corrected.

2) Total Kyoto target/Kyoto domestic target.

3) If EU directives are adopted for products that contain VOCs, and for mopeds and scooters; otherwise, a target of 163 million kg will apply.

4) Average for Dutch habitats; reformulated NEPP targets.

5) National average. Local hotspots may contain concentrations substantially above the limit (see Appendix 2)

6) 1992.

7) Target for 2012 in the Waste Management Plan.

8) Level of protection derived from deposition targets.

