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The NCEA's recommendations on Climate Change in Environmental Assessment

The climate in the Netherlands is changing – that much is clear – but there is still uncertainty about the speed and extent of the change, and about the magnitude of the impacts: hence the need to test the climate resilience of spatial planning and spatial strategies. The environmental assessment (EA) procedure is potentially very useful in such testing, as it can be used to ascertain the contribution of plans and projects to abating greenhouse gas emissions and the feasibility of responding to the impacts of climate change. This article describes how the NCEA currently recommends dealing with the theme of climate change.

Since the beginning of the previous century the temperature has risen worldwide by 0.74 ± 0.18 °C (IPCC, 2007). According to a recent KNMI study, the Netherlands has warmed up by 1.7 ± 0.3 °C since 1900, which is more than twice the global rate (KNMI, 2008). It seems very probable that most of the temperature rise since the mid 20th century has been caused by the rise in the concentration of

greenhouse gases in the atmosphere. The repercussions of climate change are also becoming more visible worldwide and in the Netherlands (PBL, 2008). Climate change has thus moved towards the top of the political agenda. In addition to its policy to mitigate greenhouse gases, central government has collaborated with lower tiers of government to draw up a national adaptation strategy

whose title translates as ‘Make room for climate change’, which describes how the spatial planning of the Netherlands will be made ‘climate-proof’. It is generally agreed that it is necessary to test spatial planning and spatial strategies in terms of their climate resilience (EU, 2007; VROM board, 2007; Delta Commission, 2008). The EA procedure is clearly potentially very useful for carrying out such testing, as it can and must explicitly state the impact of the policy strategies.

The NCEA requires that the EA pays attention to mitigation, if the proposed activities contribute significantly to the greenhouse gas emissions in the Netherlands: for example, industrial projects, power stations, infrastructure projects, agricultural projects, greenhouse horticulture projects, housing projects, waste processing projects, groundwater abstraction projects and airport projects.

In such cases, insight must specifically be provided into:

- greenhouse gas emissions (not only CO₂ but also CH₄, N₂O and F gases) and the mitigating measures possible;
- the energy efficiency of the initiative and the feasibility of joining up the functions, i.e. of passing on residual heat and energy to another function. In the case of the building of CO₂ capture-ready power stations, the NCEA requires insight to be provided about the possible location of the pipelines, the storage location, the alternative efficient uses and their environmental risks, and the possible ways these risks could be reduced;
- the contribution made by the initiative towards achieving national, provincial, local and/or sectoral policy aims or target values for reducing greenhouse gas emissions;
- the chain-related aspects, by augmenting the insights into the greenhouse gas emissions directly associated with the initiative with insights into the emissions associated with the inputs and outputs.

Adaptation

When preparing its advice, the NCEA always investigates whether adaptation to climate change is or should be a significant factor in the decisions for the initiative in question. This will depend on the following specific circumstances:

- the local climatological impacts in the long and short term;
- the nature of the area in which the adaptation must take place;
- an estimate of the risks;
- how the additional short-term costs relate to the costs avoided in the longer term, i.e. costs that increase as a result of management and maintenance, costs of later compulsory modifications, and costs incurred because there is now no room for other functions, such as water storage.

If adaptation is deemed to be a factor of significance, the NCEA requires information to be given on how the initiative can best respond to the impacts of climate change: how the

risk of damage can be limited, and at the same time how the quality of life, the spatial quality and the safety can be maintained or enhanced. We also require information to be given about whether the project might hamper necessary adaptation measures in the future, for example by taking up space and thereby making it no longer possible to store water. It is also important to know whether the project might aggravate the consequences of climate change.

Examples include:

- the repercussions of a dike breach, caused by building in a deep polder that is prone to flooding;
- the repercussions of heat stress caused by felling trees and draining away water in cities;
- the repercussions of flooding caused by enlarging the paved-over area in urban areas.

We advise that spatial modifications be linked to the targets given in the national adaptation strategy, which are:

- increase resistance: required in order to be able to withstand extreme circumstances;
- increase resilience: required in order to be able to recover quickly as soon as circumstances return to normal;
- increase adaptability: required in relation to the uncertainty about the extent and speed of climate change.

A climate-proof spatial development has low vulnerability (high resistance and resilience) and high adaptability. To this end, the following guiding principles are recommended:

- Risk management: dealing strategically with uncertainty and damage mitigation. For example, building a second dike behind the primary dike, or compartmentalising to protect the crucial and/or most vulnerable functions. Other possibilities: reinforcing dikes, enlarging the sluice and discharge capacity, installing emergency pumps so excess water can be rapidly pumped out of economically valuable or ecologically vulnerable areas, and making dwellings and greenhouses floatable.
- Natural processes: exploiting the properties of natural systems and giving these systems space (e.g. the ‘Room for the Rivers’ idea, and sand supplementation for the coast in combination with nature development). Using natural processes and giving these processes space also creates opportunities for improving the spatial quality of areas. So, in urban areas, large-scale park structures in combination with water can create a more attractive environment in which to live and work and also contribute to improving air quality and provide emergency floodwater storage.

It should be remembered that the need for spatial and technical measures will vary, depending on the type of area. The most important adaptation tasks per type of area are:

The area flanking the Rhine and Meuse

- increasing the discharge capacity;
- enlarging the storage capacity;
- improving dike safety.

Coastal area

- management more attuned to natural processes;
- strengthening coastal defences along the shore or further inland;
- improving dike safety.

Higher-lying areas of the Netherlands

- preventing flooding in river and brook valleys;
- combating desiccation;
- interaction between agricultural and nature targets.

Low-lying areas of the Netherlands

- combating declining safety;
- combating lack of water storage capacity during extreme precipitation;
- combating shortage of good-quality fresh water during extreme drought;
- combating water quality problems resulting from the inflow of chemically alien water from elsewhere and from upwelling saline water;
- interaction between agricultural and nature targets.

Urban area

- increasing the capacity to store and discharge water;
- combating the effects of temperature rise;
- combating the effects of longer periods of drought (shortage of cooling water, repercussions for trees and building foundations).

In its advisory reports the NCEA requires information to be given about how account has been taken of the properties and specific vulnerability of the area in relation to climate change, when choosing the location and the layout. And with regard to possible measures, it advises linking up with the adaptation options as inventoried and assessed for effectiveness in the context of the 'route planner project' (www.klimaatvoorruimte.nl and www.programmaark.nl).

Integrity and synergy

The adaptation to climate change must take place in different sectors and in different places. There is a danger that one measure will negate another, so a complete assessment of the various interests at stake is important and, preferably, it is also attempted to achieve synergy between the different adaptation and mitigation measures. For example: home insulation is not only good preparation for the increasing frequency of heat waves; it also helps save energy and thus reduces CO₂ emissions.

Coping with uncertainty

There is still much uncertainty about the speed and degree of climate change, and the strength of their impacts. The NCEA therefore advises the following:

- To start off with the range of possible effects of climate change established on the basis of the four climate scenarios of the Royal Netherlands Meteorological Institute (KNMI).

- When considering location and design for specific large-scale strategic investments¹, to take account of the possible occurrence of the worst-case scenario of the Netherlands Environmental Assessment Agency, which assumes a sea-level rise of 1.5 metres by 2100².
- Wherever possible to opt for no-regret measures. These are measures that are necessary anyway in relation to climate change (even for the least dramatic of the four KNMI scenarios) and measures that are worth implementing because they also serve very different non-climate aims.

To handle the relatively large uncertainty surrounding the climate change issue requires a form of risk management. The NCEA advises that in addition to the decisions of projects and plans, there should also be a set of mitigating measures in reserve, to be deployed in accordance with the impacts that actually occur. In the decision-making stage, there should be an indication of how and in what time frame an evaluation study will be carried out so that the predicted and actual impacts can be compared.

Planning horizon

When developing strategic spatial policy it is logical to consider climate change in association with other spatial aspects. It can be observed that the time horizon of climate change rarely agrees with the planning horizon of current spatial planning policy. The NCEA considers that differentiated planning horizons of 20, 50 and 100 years are essential in order to make it possible to invest intelligently for a climate-proof Netherlands, especially in light of the existing uncertainties. Clearly, the planning horizon also depends on the duration of an initiative.

Manner of presentation

The NCEA's advice is that in principle an EA should contain a separate section on climate change, because the approach of mitigation and adaptation:

- operates on a different scale in space and time compared to the more traditional environmental themes in EIA (water, safety, biodiversity, traffic and transport, the environment (for humans and wildlife), health, energy, etc.);
- demands that managerial considerations transcend and integrate themes.

The climate change theme certainly has to be explicitly dealt with in the SEA report for example for long-term structural design planning and in EIA/SEA reports for industrial projects, power stations, infrastructure projects, agricultural projects, greenhouse horticulture projects, housing projects, waste-processing projects, groundwater abstraction projects and airport projects. In other cases it suffices to give less prominence to the aspect of climate change and, insofar that it is relevant, to deal with it along with the relevant traditional environmental aspects associated with the initiative.

In conclusion

The EA procedure offers good possibilities for obtaining insight into the contribution of plans and projects to mitigating greenhouse gas emissions and the feasibility of responding to the impacts of climate change. The attendant important aspects have been described in this article. An overview – in Dutch – of the scientific insights into climate change and Dutch policy on climate change, as at July 2008, is on the NCEA website (www.commissiener.nl). The NCEA hopes that the overview will be helpful to competent authorities, initiators of projects and those writing EIA reports. More information on climate change is available in Dutch – via www.klimaatportaal.nl.

References

- Delta Commission - *Samen werken met water* - 2008, the Netherlands.
- European Union - *Groenboek klimaatadaptatie* - 2007, Brussels.
- Intergovernmental Panel on Climate Change - *Fourth Assessment Report* - 2007, Geneva.
- KNMI - *De toestand van het klimaat in Nederland* - 2008, the Netherlands.
- Planbureau voor de Leefomgeving - *Milieubalans 2008* - the Netherlands.
- VROM council - *De hype voorbij. Klimaatverandering als structureel ruimtelijk vraagstuk* - 2007, the Netherlands.

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- *Authors: Geert Draaijers and Aad van der Velden, respectively technical secretary and vice chairman at the NCEA.*
 - *This article has previously been published (in Dutch) in TOETS magazine, no. 05-08.*
 - (1) *The national adaptation strategy states that central government, together with KNMI and the planning offices, will research a number of yet to be selected strategic issues, to ascertain the threat from more extreme conditions, and will work out which areas and sectors are the most vulnerable.*
 - (2) *Based on slightly different assumptions, the Delta Commission arrives at a worst-case scenario of a 1.3 metre rise in sea level by 2100.*

More information

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Role NCEA

On a regular basis, NCEA organises working groups to discuss new developments relevant to EIA/SEA. These working groups consist of well known experts from universities, businesses and government. They discuss the latest developments and advise on how to deal with a specific theme in EIA/SEA. In 2007, the working group on Climate Change was called together and in 2008 they issued their advice. The members of the working group were: Pieter Bloemen (Ministry of Housing, Spatial Planning and the Environment), Jos Bruggink (Energy Research Centre of the Netherlands), Ekko van Ierland (Wageningen University Research Centre), Gert de Roo (Groningen University), Joop Oude Lohuis (Netherlands Environmental Assessment Agency), Wim Turkenburg (Utrecht University), Aad van der Velden (chairman) and Geert Draaijers (secretary).