

The Effectiveness of Strategic Environmental Assessment in the Netherlands

An analysis of three cases



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Master Thesis

October 2011

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Master Thesis

What is the effectiveness of the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan and which factors contributed to their effectiveness?

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Executive Summary

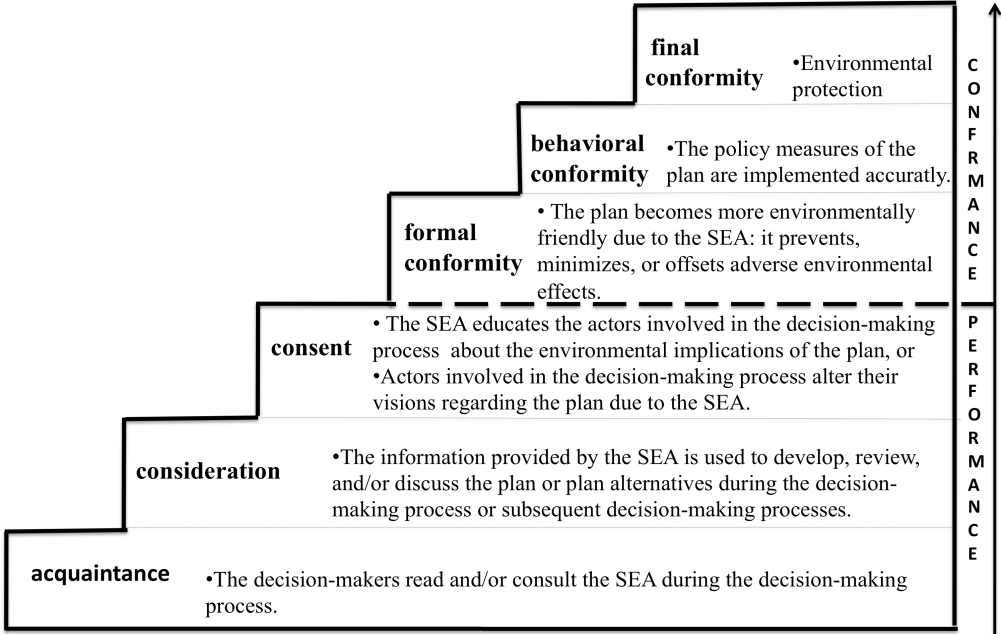
Strategic Environmental Assessment (SEA) is a policy tool that facilitates the integration of environmental values into strategic decision-making. SEA has three main objectives. First, SEA aims to facilitate an informed decision-making process by means of providing decision-makers with information regarding the environmental implications of decisions. Second, SEA aims to contribute to the design of environmentally friendly decisions that prevent, minimize, or offset adverse environmental effects. Third, SEA aspires to contribute to the protection of the environment.

This research evaluates the effectiveness of three SEAs conducted of strategic plans designed by the Dutch government. The objective of this research is to answer the following research question: *What is the effectiveness of the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan and which factors contributed to their effectiveness?*

Answering this question implies three main steps: (1) the establishment of an SEA effectiveness assessment framework; (2) the evaluation of the effectiveness of the three SEAs; (3) explaining SEA effectiveness by means of assessing the influence of factors related to the SEA content, process, or context on SEA effectiveness.

Establishment of an SEA effectiveness assessment framework

As a point of departure, the evaluation of the effectiveness of the three SEAs requires a specification of criteria determining SEA effectiveness. Accordingly, an SEA effectiveness assessment framework has been established based on the objectives of SEA derived from SEA literature and SEA legislation. The SEA effectiveness assessment framework makes a distinction between two types of SEA effectiveness: performance effectiveness and conformance effectiveness. Performance effectiveness relates to the influence of the SEA on the decision-making process and the actors involved in it. Conformance effectiveness concerns the influence that the SEA has on the final decision and environment.



The different levels of SEA effectiveness and the corresponding indicators
 Adapted from: Aardema, 2002; Herweijer, Hummels, and Lokhuizen, 1990; Mastop and Faludi, 1997

The above figure indicates that both performance and conformance effectiveness comprise successive steps that indicate the tool's impact on decision-making. Performance effectiveness consists of the levels 'acquaintance', 'consideration', and 'consent'. There exist also three successive steps of conformance effectiveness: 'formal conformity', 'behavioral conformity', and 'final conformity'. The

extent to which an SEA attains the various effectiveness levels indicates the degree of goal attainment of the tool. The attainment of 'acquaintance', 'consideration', and 'consent' reflect the extent to which the SEA is successful in facilitating an informed decision-making process. The attainment of 'formal conformity' reflects whether SEA promotes the design of environmentally friendly plans that prevent, minimize, or offset adverse environmental effects. 'Behavioral conformity' implies that the policy measures of the plan are implemented accurately. 'Final conformity' indicates whether SEA contributes to the protection of the environment. Due to the long time scale, the importance of after-linked decision-making, and the need to assess how the plan has influenced several environmental indicators, 'behavioral conformity' and 'final conformity' have not been evaluated in this research.

The effectiveness of the three SEAs

The SEA of the National Waste Management Plan ('LAP') was used to assess the environmental effects of waste processing techniques and waste incineration scenarios. The SEA was effective; the effectiveness levels 'acquaintance', 'consideration', 'consent', and 'formal conformity' have been attained. The environmental information was actively used during the decision-making process in order to develop, review, and discuss minimum standards for waste processing techniques ('consideration'). As a result, many minimum standards conform to, or are based on, the outcomes of the SEA ('formal conformity'). The SEA regarding capacity planning for waste incineration informed decision-makers but was less extensively used during planning.

The SEA of the Third Structure Scheme Electricity Supply ('SEV III') was used to assess the environmental implications of locations for electricity facilities. The effectiveness of the SEA was mediocre. While the first four levels of SEA effectiveness have been realized, their attainment is limited. 'Consideration' was limited; the information provided by the SEA of the SEV III regarding the locations for power plants, HV tracks, and landing locations for wind-energy was mainly used to review the selected locations and to determine whether the locations or tracks would not violate environmental legislation. The environmental information did not have much influence on the final decision ('formal conformity'). Due to the political context and liberalization of the electricity market, the environmental information was not explicitly used to develop and discuss strategic policy options. Decision-makers want to give electricity producers freedom to determine the location, type, and capacity for electricity generations, within the boundaries of the (environmental) law, and accordingly did not use the information to make explicit (environmentally friendly) strategic policy choices regarding electricity generation in the Netherlands.

The SEA of the National Water Plan ('NWP') evaluated the environmental implications of various policy proposals regarding water management. The effectiveness of the SEA was mediocre. All three stages of performance effectiveness have been attained and the SEA has also marginally influenced the content of the final plan ('formal conformity'). However, 'consideration' was limited since the SEA was not used to develop and discuss policy alternatives, but only to review the environmental benignity pre-defined policy measures.

The analysis indicates that 'formal conformity', and the environmental importance thereof, is higher when the attainment of 'consideration' is significant and the SEA is used to develop, review, and discuss policy options. Furthermore, the environmental significance is dependent on the content of the SEA. Attainment of 'consent' and 'formal conformity' will be more significant when the SEA focuses on strategic issues. SEA's potential in enabling the design of plans that prevent, minimize, or offset adverse environmental effects and enhancing environmental protection will be greater when it gives rise to new objectives and vision statements of the plan, compared to new ideas or changes regarding locations or the specific design of projects.

Understanding SEA effectiveness

Based on a literature survey, a list has been composed consisting of thirteen factors related to the SEA process and content deemed to influence the effectiveness of SEA (see table below).

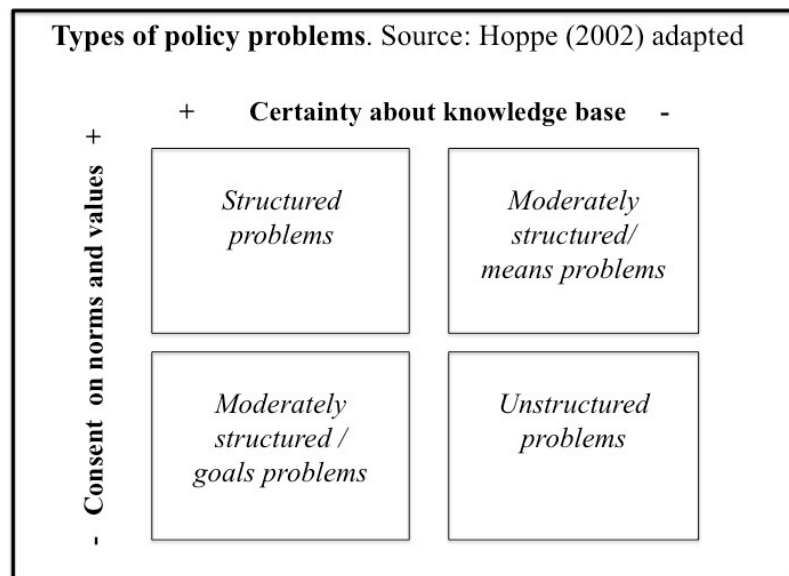
The research indicates that the factors 'integration' and 'timing' are essential for SEA effectiveness. They directly influence the effectiveness level 'consideration', and consequently increase the chance that the SEA influences the knowledge and visions of stakeholders ('consent') and the final plan ('formal conformity'). The case studies of the NWP and SEV III indicate that a late start of the SEA,

and thus the difficulty to integrate the SEA into the decision-making process, will significantly limit the effectiveness of the SEA, regardless of the quality of the SEA report and process.

The factor 'quality' can enhance the likelihood that the SEA is consulted and used during planning ('acquaintance' and 'consideration') and influences visions ('consent') and decisions ('formal conformity'). The factors independent review, experience, and financial resources positively influence the quality of the SEA report. The factors scoping, pragmatism, transparency, stakeholder participation, and tiering positively influence the attainment of the effectiveness levels 'acquaintance' and 'consideration'. They increase the likelihood that decision-makers read, consult, and use the environmental data to develop, review, and discuss the plan during decision-making. It is difficult to draw robust conclusions regarding the relevance of the factor 'evaluation of social and economic effects' because only the SEA of the NWP assessed some social and economic effects and the opinions of respondents regarding this issue diverge. Finally, contradictory to SEA literature, the outcomes of the research indicate that public participation is not very important for the effectiveness of SEA because the assessment topics are often too abstract, technical, or complex for public deliberation.

- | Factors deemed important for SEA effectiveness | |
|--|---|
| 1. | Stakeholder participation |
| 2. | Public participation |
| 3. | Integration |
| 4. | Transparency |
| 5. | Timing |
| 6. | Quality |
| 7. | Independent review |
| 8. | Pragmatism |
| 9. | Scoping |
| 10. | Tiering |
| 11. | Experience |
| 12. | Financial resources |
| 13. | Evaluation of social and economic effects |

It has been assessed whether the SEA implementation context influenced the effectiveness of the three SEAs and whether the importance of the factors for SEA effectiveness depends on the SEA implementation context (i.e. whether it is 'context-specific') or characteristics of the plan. The SEA implementation context consists of the characteristics of the decision-making culture and the type of policy problem. The former regards the willingness of decision-makers to take other (environmental) values into



account and their readiness to share decision-making powers with other actors (Runhaar and Driessen, 2007). The latter is based on two dimensions: the degree of certainty about the knowledge base and the consent on norms and values regarding the plan. Based on these two dimensions, four types of policy problems can be distinguished (see figure).

The policy problems dealt with in the LAP were 'moderately structured, goals problems' and the decision-making process was open. Decision-makers involved stakeholders in the planning process in order to decide on minimum standards for waste processing.

The decision-making process of the SEV III was 'closed'. Decision-makers perceived the policy-problem dealt with in the SEV III as structured because the objectives of the plan were determined and scientific certainty was low. Due to the liberalization of the electricity market, the Ministry had decided that it would not decide on the fuel-mix and capacity for electricity generation. Yet, stakeholders deem that the SEV III relates to 'moderately, structured goals problems'. They argue that there were many conflicts regarding electricity generation.

The NWP contained many different policy problems and had an 'open' decision-making culture.

The research indicates that decision-makers' perceptivity to environmental values significantly influences the potential effectiveness of the SEA. Political will to take environmental considerations into account determines whether the SEA is pro-actively used to develop, review, and discuss policy options ('consideration') and increases the chance that the decision will become more environmentally benign ('formal conformity'). The research indicates that political will to respect environmental values is the major reason for the effectiveness of the SEA of the LAP and the limited effectiveness of the SEA of the SEV III.

No relationship can be identified between the degree of certainty about the knowledge base and the level of consent on norms and values regarding the plan and SEA effectiveness.

The analysis indicates that 11 factors were equally important for the effectiveness of each SEA. The importance of the factors 'experience' and 'stakeholder participation' varied per case. Explanations for their varied influence on SEA effectiveness are looked for in the implementation context and plan. The factor 'stakeholder involvement' is dependent on the type of policy problem. Stakeholder participation is important when scientific uncertainty regarding the problem is low and decision-makers require stakeholders' knowledge in order to develop solutions to the policy problem (see LAP). Furthermore, stakeholder involvement depends on the characteristics of the plan. It is important when the implementation of the plan is dependent on stakeholders' support and conduct. Yet, stakeholder involvement requires an open decision-making culture. Stakeholder involvement is fruitless in a closed decision-making process when decision-makers are not willing or able to respond to the input provided (see SEV III). The research also indicates that the relevance of the factor 'experience' is more important when a complex, specific assessment technique is applied, when an SEA is conducted for a plan for which no previous SEAs have been conducted, and when there are time constraints.

Conclusion and Recommendations

Based on the above outcomes of this research several general conclusions are made. First, due to a lack of will or knowledge, SEA is often not used to develop decisions. It is mainly perceived as a tool that facilitates an informed decision-making process and that must be used to review the environmental benignity of pre-defined decisions. Accordingly, the influence of the SEA on the final decision ('formal conformity') is often limited. Another observation regards the fact that the SEAs were not used to evaluate many strategic issues regarding goals, vision statements, and technical options of the plan having profound environmental impact. Generally, these issues were not evaluated in the SEA because they were already decided at higher governmental levels and because SEA regulation only requires decision-makers to conduct an SEA when the decision sets a concrete frame of reference for future activities that can negatively affect the environment. It is often difficult to predict whether, and how, abstract and strategic decisions will negatively affect the environment.

The research presents several recommendations that could enhance the effectiveness of SEA. First, the effectiveness of SEA can be increased through capacity building and the improvement of the perception and understanding of the tool. This approach assumes that knowledge and understanding of the tool will foster political will and understanding to use SEA effectively.

Second, SEA can become more effective and become a more forceful environmental protection tool if its legal basis becomes more compelling. SEA regulation is now ambiguous with regards to the relation between the SEA and decision-making and does not define how, and to what extent, decision-makers must use the information from the SEA to influence their decision. Stricter legal requirements can foster the political will and need to take environmental considerations from the outset of the decision-making procedure into account and can motivate decision-makers to use the SEA to develop an environmentally friendly plan.

While the paths that can be followed in order to increase the effectiveness of SEA differ, all recommendations aim to ensure that SEA becomes a more sophisticated and powerful environmental protection tool. If the recommendations were to be taken into account, the effectiveness of the tool could become more significant.

Acknowledgments

I would like to thank my supervisors prof. dr. P.P.J. Driessen and dr. B. Schijf for their valuable contributions, insights, corrections, and time during the research project. Also, I would like to show my appreciation towards the Netherlands Commission for Environmental Assessment, for providing support and the opportunity to learn more about Strategic Environmental Assessment. Finally, I want to express my gratitude to all the people I was able to interview and who were very helpful in providing me with information required to successfully execute this research.

List of acronyms

Institutions

EU	European Union
EZ	Ministry of Economic Affairs
IAIA	International Association for impact Assessment
LNV	Ministry of Agriculture, Nature, and Food Quality
NCEA	Netherlands Commission for Environmental Impact Assessment
UN	United Nations
VROM	Ministry of Housing, Spatial Planning, and the Environment
V&W	Ministry of Transport, Public Works, and Water Management

Abbreviations

AA	Appropriate Assessment
BAU	Business as usual scenario
EA	Environmental Assessment
EIA	Environmental Impact Assessment of Projects
EMS	Ecological Main Structure
LAP	National Waste Management Plan
LCA	Life Cycle Analysis
NWP	National Water Plan
NEPA	National Environmental Policy Act
PPF	Paper and Plastic Fraction
PPP	Policies, Plans, and Programs
RDF	Refuse-Derived Fuel
SEA	Strategic Environmental Assessment
SEV III	Third Structure Scheme Electricity Supply
OWF	Organic Wet Fraction

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Chapter One

Introduction

1.1 Background of the research

Strategic Environmental Assessment (henceforth referred to as SEA) is a policy tool that facilitates the integration of environmental values into strategic decision-making. It is aspired that the assessment of the environmental effects of strategic decisions will increase the "integration of environmental considerations in all relevant policy fields in order to effectively contribute to environmental protection and sustainable development" (Stoeglehner, 2010: 217).

SEA has evolved from project environmental impact assessment (from now on referred to as EIA)¹. While the introduction of EIA enabled environmental values to be recognized at project level, EIA practitioners observed that many significant decisions were already taken at policy, plan, or program level without any concern for the environment. "Particularly at policy and planning levels a cascade of small, incremental decisions happens in the absence of a systematic impact assessment approach, in a way that could subsequently influence project environmental planning and design" (Partidatio, 2000: 649). Accordingly, in order to increase the environmental benignity of strategic decisions that have a profound impact on the environment, it is essential that environmental values and interests will be considered during the earliest stages of decision-making.

This research will focus on the effectiveness of SEAs conducted of strategic plans designed by the Dutch government. A strategic plan is defined as "a strategy or a design to carry out a general or particular course of action, incorporating policy ends, options, and ways and means to implement them" (Morrison-Saunders and Arts, 2004:226). Because this research focuses on SEAs conducted of public plans, the text will from this point forward refer to SEAs of plans. Yet, it must be acknowledged that, while not addressed in this research, one can also conduct an SEA of policies and programs.

This chapter continues with an overview of the legal basis for SEA in the Netherlands (section 1.2). Subsequently, the notion of SEA effectiveness will be discussed shortly (section 1.3). Section 1.4 will describe the knowledge gap in relation to SEA effectiveness and explanations for SEA effectiveness. Finally, the conceptual framework of the research will be presented in section 1.5.

1.2 SEA in the Netherlands

The Netherlands has sufficient experience conducting environmental impact assessments of strategic plans. The EIA Decree of 1987 already noted that an SEA had to be conducted for public plans and programs that could have a significant effect on the environment.

The EU SEA Directive supplemented the EIA Decree of 1987 in 2006. The Directive applies to public plans and programs, prepared by national, regional, or local authorities, which will likely have significant environmental effects (ibid). Article three of the Directives notes that it is mandatory to conduct an SEA for all plans and programs "prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning, or land use"(EU SEA Directive 2001/42/EC) that set a framework for projects². With regards to plans and programs not included in the above list, the SEA Directive obliges EU

¹ Principle 17 of the Rio Declaration on Environment and Development (1992) calls for the universal adoption of project-EIA: "environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent National Authority"(UNCED, 1992).

² The respective projects are listed in Annexes I and II of Directive 85/337/EEC.

Member States to assess whether the decisions are likely to have significant environmental effects by means of a screening procedure.

The European SEA directive was adopted by the Netherlands in 2001 and transposed into Dutch environmental legislation in 2006. In line with the EU SEA Directive, Dutch EIA regulation (*'Besluit m.e.r.'*) identifies Dutch strategic plans for which an SEA needs to be conducted. Yet, when it is established that it is mandatory that an SEA needs to be conducted for a plan ('screening'), it must also be determined whether the SEA will evaluate the whole plan or only several aspects. In line with the EU SEA Directive, Dutch law states that an SEA must be conducted for policy proposals that meet several criteria (see table 1). First, the decision must set a concrete frame of reference for future conduct. Second, the activity should negatively affect the environment. Dutch EIA legislation provides two lists, the C and D list, with an overview of activities from which it is expected that they will negatively affect the environment³ (VROM, 2006). In the C-list, activities are included for which it is mandatory to conduct an EIA. The D-list notes activities for which it is mandatory *to assess* whether or not they will negatively affect the environment and an EIA thus needs to be conducted. The C and D lists each have four columns with: (1) a description of the activities that can negatively affect the environment; (2) the indicative thresholds of the activity that must be reached; (3) the strategic plans that set a frame of reference for the activities; (4) the decisions for which an EIA needs to be conducted or for which it must be assessed whether an EIA needs to be conducted (VROM, 2006). It is mandatory to conduct an SEA for a plan if it is included in column three or when it sets a frame of reference for the decisions listed in column four.

Finally, an SEA must be made for decisions that can significantly affect nature sites that are designated as protected areas by the European Habitat and Birds Directive (i.e. Natura 2000 sites) (VROM, 2006)⁴. This evaluation, that focuses only on the effects of the decision on Natura 2000 sites, is known as an 'appropriate assessment' (henceforth referred to as AA).

In all, in line with table 1, an SEA must be conducted when one answers the first three and/or the fourth question with 'yes'.

Characteristics of the plan	Selection criteria
It sets a concrete frame of reference...	1. Is the decision concrete enough? 2. Can a causal relation be found between the decision and effects on the environment?
With potential significant negative effects on the environment, and /or..	3. Does the plan regard an activity that is noted in the C or D list of the <i>'Besluit m.e.r.'</i> ?
For which an appropriate assessment is mandatory	4. Does the plan encapsulate an activity of which negative effects on Natura 2000 sites cannot be excluded?

Table 1. The selection criteria for deciding whether an SEA must be conducted.

Source: Royal Haskoning, 2009: 11; Dutch Environmental Protection Act, article 7.2

Figure 1 provides an overview of the SEA process according to the EU SEA Directive. It indicates that once it is determined that an SEA must be conducted, alternatives to the plan or program will be developed. The alternatives and their environmental effects must be described in the environmental report. "The core of the environmental report contains the appraisal of the likely significant secondary, cumulative, synergetic, short, medium and long-term permanent and temporary, positive, and negative environmental effects on issues such as biodiversity, population, human health, flaunt, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape, and interrelations between these factors" (Stoeglehner, 2004). Subsequently, there is an opportunity for consulted parties to react on the plan. Decision-makers must take the environmental report and the opinions expressed by consulted parties into account when making a final decision and have to report how they did this. Finally, the environmental effects must be monitored after the implementation of the plan or program.

³ The C-list provides an overview of the activities from which it expected that, when a certain threshold has been reached, negative effects on the environment will occur. The D-list notes the activities for which it must be determined whether negative effects upon the environment can be expected (see Ministry of VROM, 2006).

⁴ See article 19j.2 of the 1997 Dutch Environmental Protection Act.

Screening	Determination if a plan or program has to undergo an SEA according to the SEA Directive
Scoping	Decision on the range of the environmental analysis and assessment including aspects of contents, methods, time, and space of the appraisals, etc.
Appraisal of alternatives	Development, appraisal, and assessment of reasonable alternatives
Environmental Report	Documentation of the assessment of the environmental impacts of the plan or program taking into account the framework for contents according to Annex I of the SEA Directive.
Consultations	Opportunity for the consulted parties (environmental authorities, public, affected EU Member States) to express their opinion about the environmental report and the draft plan or program during the planning and SEA process.
Decision-making	Consideration of the environmental report and the results of the consultations during the preparation of the plan or program and before its adoption or submission to the legislative procedure, so the decision makers are not bound by the results of the SEA.
Information on the decision	Information of all partners involved in the SEA process about the adopted plan or program including all statements summarizing how environmental considerations and the results of the SEA process have been integrated into the plan or program and introducing the monitoring measures decided upon
Monitoring	Monitoring of all the significant environmental effects of the plan or program implementation in order to, inter alia, identify unforeseen adverse effects, and to be able to undertake appropriate remedial action

Figure 1. The SEA process according to the 2001 EU SEA Directive. Source: Stoeglehner, 2004: 218

1. 3 SEA effectiveness: an introduction

SEA evaluation studies generally make a distinction between substantive and procedural effectiveness of SEA. Substantive SEA effectiveness is defined in this research as the extent to which the SEA is able to accomplish its purposes and produces expected results⁵. Cashmore, Gwilliam, Morgan, Cobb, and Bond (2004) note that when the procedural effectiveness of SEA is assessed, one evaluates whether the SEA is undertaken in line with established procedures and criteria. In the environmental assessment (EA) field evaluation studies have focused overwhelmingly on the procedural effectiveness of the instrument. For this reason, Frost (1997) notes that "it is almost as if those involved with EA would rather concentrate on the procedures than dare look at the end results"(ibid:141). Kohoff, Schijf, and Verheem (2009) also observed that only very few broad-based reviews of SEA practice⁶ and few case studies regarding SEA effectiveness have been published. Of these limited studies, only a small number has focused on the substantive effectiveness of SEA. The majority of SEA evaluation studies that have been conducted have thus mainly focused on the procedural and legal requirements of SEA systems in different countries (Kolhoff et al., 2009). Such studies tend to show the legal requirements for SEA, by whom an SEA procedure is initiated, whether an independent agency reviews the assessment, and the degree of participation by the public during SEA (ibid). However, "such studies yield important lessons but give little insight into how effective SEA is in influencing decision-making" (ibid: 143). The SEA evaluation studies that focus on procedural effectiveness often apply 'good practice criteria', procedural aspects expected to be important for SEA effectiveness⁷. Yet, the relevance of such procedural criteria is in many cases speculative and based on experiences from the field, rather than on empirical evidence. Accordingly, it can be questioned

⁵ Definition retrieved from www.dictionary.com (access 14-12-2010)

⁶ For instance, Sadler and Verheem, 1996; Therivel and Partidario, 1996; Dalal-Clayton and Sadler, 2005.

⁷ For instance, see the SEA performance criteria published by the International Association for Impact Assessment published in 2002. Available on the website of the IAIA: www.iaia.org.

whether procedural effectiveness will guarantee substantive SEA effectiveness in every decision-making context.

In sum, it must be concluded that the majority of SEA evaluation studies have disregarded the question of SEA's substantive effectiveness. Cashmore et al. (2004) look at the origins of EIA in order to explain this phenomenon. It is found that EIA "emerged from the vague aspirations for proactive and interdisciplinary management contained in NEPA [National Environmental Policy Act, a United States environmental law]", but that NEPA has always been interpreted as procedural legislation since it "requires federal agencies to follow a set of action rather than mandating a specific set of environmental protection" (ibid: 296).

1.4 Knowledge gap

The expectations of SEA in "the promotion of environmental improvement and the promotion of sustainable development are high" (Runhaar and Driessen, 2007: 2). Nevertheless, only few critical evaluation studies regarding the substantive effectiveness of SEA have been conducted (see Runhaar and Driessen, 2007, Nitz, and Brown, 2001). The lack in empirical studies on SEA's substantive effectiveness constitutes a significant knowledge gap, since without it the success and influence of the tool remains speculative. "Discussions on the effectiveness of SEA that centre on the quality of the SEA process, the comprehensiveness of the SEA report, or the participatory methods used- that is, 'has a good SEA been conducted'- is a narrower approach to effectiveness, ignoring whether the SEA has contributed to the implementation of an environmentally sound and sustainable planning outcome" (Stoeglehner, Brown, and Kornov, 2009: 112).

The second knowledge gap relates to explanations for SEA effectiveness. Understanding why and how an SEA is effective (i.e. which factors are important for SEA effectiveness) is crucial for the further development and success of the tool. It must be stated that while there are many studies that present theories about factors that contribute to SEA effectiveness, there is a lack of empirical information regarding this question. In addition, the studies often disregard the context in which the SEA operates. "In recent years several scholars have highlighted the need to understand the implementation context of SEA as well as to adapt SEA to such context in order to ensure successful implementation of SEA" (Hilding-Rydevik and Bjarnadottir, 2007: 667). It must be known whether or not the context in which SEA operates can have a discriminating function regarding the factors important for SEA effectiveness and the potential effectiveness of SEA.

All in all, more knowledge is needed regarding the question which factors contribute when, and in which SEA implementation context, to SEA effectiveness.

1.5 Conceptual design of the research

Below, the conceptual research design will be presented.

The research context

In 1996 the International Association for Impact Assessment (IAIA) published the first study on SEA effectiveness worldwide. The Netherlands Commission for Environmental Assessment (NCEA) cooperated with the IAIA in making this study and contributed to the analysis by means of evaluating the effectiveness of three Dutch SEA's: the SEA of the Dutch Ten-Year Program on Waste 1992-2002, the Second Structure Scheme Electricity Supply, and the Fourth Note Water Management. The study aimed to benchmark progress, evaluate performance, and identify enabling conditions and components of sound practice in order to improve SEA effectiveness (Sadler and Verheem, 1996). At present, the IAIA and the NCEA aim to conduct an update study on SEA effectiveness in which cases will be evaluated that are similar to the cases assessed in the 1996 effectiveness study. Accordingly, the SEA of the National Waste Management Plan 2002-2012⁸, SEA of the Third Structure Scheme Electricity

⁸ It must be noted that this is not the most recent National Waste Management Plan. An SEA has not been conducted for the most recent National Waste Management Plan (LAP 2: 2009-2021) and it can therefore not be evaluated in this research.

Supply, and the SEA of the National Water Plan 2009-2015 must be examined. The outcomes generated by this research will be used for this second study on SEA effectiveness.

Research objectives

This research had five objectives:

- I. To develop a methodology for evaluating the effectiveness of SEA
- II. To determine the effectiveness of three SEAs conducted of Dutch public plans. The SEAs and their respective strategic plans that are assessed are: the National Waste Management Plan, the Third Structure Scheme Electricity Supply, and the National Water Plan.
- III. To identify factors that influenced the effectiveness of the three SEAs.
- IV. To determine whether the three SEAs differ with regards to the factors important for SEA effectiveness and, when applicable, assess how this can be explained.
- V. To analyze the influence of the SEA implementation context, based on the degree of consent on norms and values, certainty about the knowledge base, and the characteristics of the decision-making process, on the potential effectiveness of SEA and factors important for SEA effectiveness.
- VI. To provide recommendations aimed at improving the effectiveness of SEA in the Netherlands.

Research Issue

The research objectives described above correspond to the central research question and various sub-questions that are answered in the research.

The central research question

What is the effectiveness of the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan and which factors contributed to their effectiveness?

The sub-questions

1. What is SEA effectiveness and which methodological approach can be developed in order to evaluate it?
2. What is the effectiveness of the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan?
3. Which factors influenced the effectiveness of the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan?
4. Based on the outcome of sub-question three, is there a difference with regards to the factors that are important for the effectiveness of the three SEAs and, if so, how can this be explained?
5. To what extent did the SEA implementation context influence the potential effectiveness of the SEAs and the factors important for their effectiveness?
6. Based on the outcomes of questions two, three, four, and five, what recommendations can be made in order to improve the effectiveness of SEA in the Netherlands?

Societal relevance of the research

SEA is recognized as a decision-aiding tool that can facilitate the integration of environmental values into decision-making with a view to promoting environmental protection and sustainable development (article 1 one the EU SEA Directive, 2001). Sustainable development, "the development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (WCED, 1987:43), implies a balance between economic, social, and environmental interests. During political decision-making processes, long-term environmental interests tend to be underrepresented and disregarded compared to short-term economic and social interests. By way of systematically incorporating environmental aspects of plans into decision-making processes, it is aspired that plans will reflect a balance between social, economic, and environmental values. Accordingly, from a societal point of view, this research is interesting because it provides

recommendations aimed at increasing the effectiveness of this environmental policy tool. The research is thus partly an analysis *for policy*. The societal relevance of this study can be illustrated with a quote by Sadler and Verheem (1996): “in evaluating effectiveness, the concern is with how well SEA actually works, and what realistically could be done to improve the processes under review” (ibid: 18). Accordingly, it could be stated that the purpose of evaluating the effectiveness of SEA is “problem-solving rather than fault-finding” (Sadler, 1996: 41).

Scientific relevance of the research

From a scientific point of view, this research contributes to empirical data building regarding SEA effectiveness. It could be argued that evaluating the effectiveness of SEA in the Netherlands is an analysis *of policy*. The empirical findings of this research can provide insights regarding the relation between the effectiveness of SEA, the SEA implementation context, and factors related to the SEA content or procedure.

Finally, it is aspired that the SEA effectiveness assessment framework developed for this research will contribute to scientific literature. The SEA effectiveness assessment framework constitutes a new approach to the evaluation of this policy tool.

1.6 Reading Guide

The thesis continues in chapter two with the presentation of the assessment framework that will be used to evaluate the effectiveness of SEA. In chapter three the methodological approach and technical research design of the research are described. Chapter four to six describe the case studies: the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan. The case studies consist out of a description of the SEA implementation contexts, the assessment of the effectiveness of the SEAs, and an overview of the factors that influenced the effectiveness of the SEAs. Each chapter ends with a discussion in which the main results of the case studies are summarized and critically reflected upon. In chapter seven the cases will be compared with each other and SEA literature. Finally, chapter eight will reflect on the implications of this research for SEA practice and theory. The chapter concludes with an overview of recommendations for SEA practice.

Chapter Two

Framework for the assessment of SEA effectiveness

2.1 Introduction

In this chapter the theoretical background of this research will be laid out. First, the SEA effectiveness evaluation framework will be presented (section 2.2) Second, it will be discussed how SEA effectiveness can be explained (section 2.3). It will be demonstrated that explanations for SEA effectiveness can be found both in the SEA itself and in the SEA implementation context. The chapter concludes with an analysis of the implementation context of SEA (section 2.4).

2.2 Evaluating the effectiveness of SEA

Effectiveness can be defined as the extent to which something accomplishes a purpose or produces expected results⁹. Accordingly, the substantive effectiveness of SEA is defined in this research as the extent to which SEA is able to accomplish its purpose and produces expected results. Since SEA effectiveness thus depends on the purposes and expected results of the instrument, the following section provides an overview of the different objectives of SEA.

2.2.1 The objectives of SEA

By means of providing information on the environmental implications of proposed decisions SEA enables informed and environmentally friendly decision-making (Fischer, 2003). It is aspired that SEA will lead to the design of plans or programs that avoid, minimize, or offset adverse environmental effects, which consequently should give rise to protection of the environment. In the following sections these objectives of SEA will be discussed separately.

Objective of SEA: Supporting informed decision-making

The immediate purpose of SEA is to improve informed decision-making by means of providing information about the environmental implications of the proposed action and its alternatives.

The SEA procedure consists of several obligations. First, "an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or program and reasonable alternatives, taking into account the objectives and the geographical scope of the plan or program, are identified, described, and evaluated" (article 3 of the EU SEA Directive, 2001). The alternatives evaluated in an SEA will depend on the content of the decision. Generally, three types of alternatives can be distinguished that can be assessed in SEA: system, site, and technical alternatives. System alternatives refer to questions regarding, amongst others, the need and demand of the policy and the objectives and vision statements of the decision. Site alternatives refer to the geographical locations for projects (Stoeglehner, 2010). Finally, technical alternatives regard the design of concrete projects (ibid). It is deemed that "the level of strategicness decreases from system to site to technical alternatives" (ibid: 222).

It must be emphasized that the concept of 'strategy' should be at the analytical heart of SEA (Wallington, Bina and Thissen, 2007). "SEA shall be oriented on the original meaning of strategy, which implies 'the art of the general' or assessing the broader contexts, not the details" (Noble, 2000 as cited in Stoeglehner, 2010: 222). SEA should therefore mainly be used to address system alternatives since these allow for the consideration of environmental concerns during the earliest stages of decision-making (Stoeglegner, 2010).

⁹ Definition retrieved from www.dictionary.com (access 14-12-2010)

Once the environmental assessment report is concluded, authorities and the public must be consulted and given the opportunity to express their opinion on the draft plan and the accompanying environmental report (see article 5 of the EU SEA Directive).

The environmental report and opinions of the public must be taken into account during the preparation of the plan and before its adoption or submission to the legislative procedure (article 8, EU SEA Directive). It must be noted that the term 'take into account' is ambiguous and that SEA regulation does not indicate how the environmental report is to be used and given particular weight during decision-making (Polonen, Hokkanen, and Jalava, 2011). Yet, SEA literature often promotes the tool's potential to aid with the development of policy. Decision-makers can use the information provided by the SEA as a reference during the decision-making process. Planning is an iterative process during which the content of the plan is continuously altered. Decision-makers can, together with stakeholders and environmental experts, use the environmental data to develop, review, and discuss policy options that meet decision-makers' goals and that are environmentally benign. The environmental information can also explicitly be used as a reference during deliberations and discussions between decision-makers, stakeholders, and the public in order to identify interests related to the plan and assess their environmental effects. SEA has thus the potential to facilitate a communicative process in which aspects of values, power, and interests are addressed (see Stoeglehener, 2010).

It must be recognized that the information provided by SEA can also inform subsequent decision-making. In this case, the information provided by the SEA can indirectly support decisions that are not directly assessed by the SEA (Runhaar and Driessen, 2007; ten Heuvelhof and Nauta, 1996). The SEA can serve as a reference during both project-, program-, and/or plan-level. With regards to the projects, SEA can "help to clarify and establish an integrated policy framework of goals, objectives, and principles against which project EIA can be conducted effectively" (Sadler and Verheem, 1996: 31). With regards to programs and plans, the SEA can provide a framework for future programs or plan at the same administrative level.

Objectives of SEA: Contributing to the design of plans that avoid, minimize, or offset adverse environmental effects & protection of the environment

"Unless a strategic action is perfectly sustainable or environmentally benign [...], which would be very nice but also very unlikely" (Therivel and Minas, 2002: 82), SEA aims to cause decision-makers to amend, delete, or add elements to the strategic plan, based on the insights they have acquired from the SEA. It is aspired that through SEA the environmental quality of strategic decisions will be improved (Bina, 2008).

A study by Jesse (2008) focuses on the substantial influence that SEA and EIA must have on decision-making and discusses how this influence should be strengthened. She notes that in EA literature and practice there is much debate regarding the substantive influence that the instruments must have on decision-making. Jesse (2008) argues that in practice EA is often perceived as a decision-aiding tool that facilitates informed decision-making, but that it does not necessarily have to lead to environmentally friendly decision-making. However, Jesse (2008) convincingly shows that many international documents and legal instruments explicitly promote a substantial goal of the instrument, implying that the decision for which an EA has been made must become more environmentally friendly. In her study, Jesse (2008) examines the notions of EA in the documents¹⁰ of international organizations such as the UN (Biodiversity Convention), UNEP (principles of EIA), UNECE (Convention of Espoo, Convention of Aarhus, Protocol of Kiev), World Bank, OECD, as well as from private bankers (Equator-principles). "The documents of international organizations [...] show a (strikingly) hard consensus on the so-called principles of EA" (ibid: 437) and "the various formulations imply that environmental pollution and other environmental harms should be prevented, or reduced as much as possible" (ibid: 439). The EIA principles of best practice of the IAIA (1999), which are recognized by almost all practitioners, also reflect the instrument's substantive objective. For instance, principle two of the IAIA states that the goal of EIA is to "anticipate and avoid,

¹⁰ It is noted by the author that "the nature [...] of these document differs: some documents have a independent judicial binding status, other have an internal binding character that can be regarded as soft law" (Jesse, 2008: 68).

minimize, or offset the adverse significant biophysical, social, and other relevant effects of development proposals" (IAIA, 1999).

The author finds that a substantive aim of SEA also underlies the EU SEA Directive. In line with article 174 of the Treaty establishing the EU, the objective of the SEA Directive, as an instrument of EU policy, "is to contribute to, *inter alia*, the preservation, protection, and improvement of the quality of the environment, the protection of human health and the prudent and rational utilization of natural resources and that it is to be based on the precautionary principle" (preamble of EU SEA Directive 2001/42/EC).

In addition, article 1 of the EU SEA directive explicitly states that protection of the environment is the objective of the SEA Directive:

"The objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programs with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programs which are likely to have significant effects on the environment" (ibid).

The SEA Directive reflects the environmental protection objective of the instrument¹¹. In view of this, SEA cannot be regarded as an instrument that must solely inform decision-making. Rather, the ultimate objective of the instrument is to protect the environment and this must be reflected in decision-making in terms of the adoption of environmentally friendly decisions (Jesse, 2008)¹².

In line with the arguments put forward by Jesse (2008), this research considers 'the design of environmentally friendly decisions' and 'environmental protection' direct objectives of SEA. An environmentally friendly decision is defined as a decision that avoids, minimizes, or offsets adverse environmental effects (see IAIA, 1999)¹³.

2.2.2 Indirect effects of SEA

In addition to the direct objectives of SEA, the tool may also give rise to indirect *effects* that can enhance environmental protection. These benefits of SEA are often described in SEA literature but not explicitly stated as objectives of SEA in SEA regulation and are therefore not regarded as such in this research.

Institutionalizing environmental values in political decision-making structures

"SEA is a distinct decision support instrument that may have a 'greening' potential, both directly and indirectly, in the form of making direct changes to the PPPs [policies, plans, or programs] concerned, but also in more subtle, long term, unintended, and less instrument ways" (Fischer, 2009: 10). It is argued that regardless of whether the SEA has changed the strategic decision, it might still prove to be effective in the long run. This is due to the fact that SEA can increase environmental awareness and learning among the actors that participate in the assessment (Jay et al., 2007). Environmental education and awareness are "likely to contribute to greater consideration of environmental concerns in the future, both by proponents, whose plans might become more environmentally acceptable from the outset, and by decision-makers, who may come to demand higher standards of environmental protection" (ibid: 294). When the public engages in the SEA and decision-making process it can also

¹¹ "It must be noted that the European Court of Justice has not yet provided a statement regarding the objectives of this Directive" (Jesse, 2008: 204).

¹² For a more extensive analysis of the substantive objective of EIA and SEA and an examination of how this reflects itself in international legal documents see: Jesse (2008). *'A new perspective upon environmental impact assessment'*. Zutphen: Koninklijke Wothmann.

¹³ It must be emphasized that this does not imply that the most environmentally friendly alternative must be selected. Rather, SEA must ensure that the decision prevents, minimizes, or offsets adverse environmental effects.

become more aware of environmental challenges and consequently societal debate regarding environmental protection and sustainable development can be triggered.

Thus, SEA can be regarded a political process that has the ability to induce ecological rationality in political decision-making processes (see Bina, 2007). In fact, Fischer argues that SEA "may present one of those 'crucial institutional challenges to the *status quo*', potentially leading to more sustainable and environmentally conscious patterns of development to emerge" (Fischer, 2009: 10).

The distinction between the direct objectives and indirect effects of SEA can be described with the concepts of single- and double-loop learning¹⁴. Single- and double-loop learning are complementary and interrelated with regards to their influence on environmental protection and sustainable development (Wallington et al., 2007). Single-loop learning refers to learning on a project- or case-level and occurs when "errors are detected and corrected without fundamentally questioning or altering the underlying values or assumption" (Argyris and Schon, 1978 as cited in Wallington et al., 2007: 575). Single-loop learning can take place in SEA practice when undesired environmental effects are detected and the planning is adapted accordingly.

Double-loop learning occurs when the cumulative of single, project-level learning experiences give rise to changes on the macro, institutional-level (see Argyris and Schon, 1978). Due to the learning experiences at a project scale, the manner in which decisions are made and the type of development that is desired can be questioned (Wallington et al., 2007). Hence, "even in a single-loop context, where a given SEA may have only limited direct influence in terms of making the plan in question 'greener', the overall SEA may still indirectly affect planners' values in a subtle, drip-feed manner, lead to gradual changes in institutional structures and departmental traditions, and improving environmental awareness among stakeholders" (ibid: 38).

2.2.3 Reflection on the impacts of SEA

In its totality, SEA has several direct *objectives* and it may give rise to indirect *effects* (i.e. institutionalizing environmental values in political decision-making structures). In figure two these objectives and effects of SEA are depicted.

¹⁴ It must be noted that the terminology used to describe the phenomena of single- and double-loop learning differs among researchers. Some refer to the two types of learning as respectively procedural and transformative learning. In addition, double-loop learning is sometimes defined as deep learning.

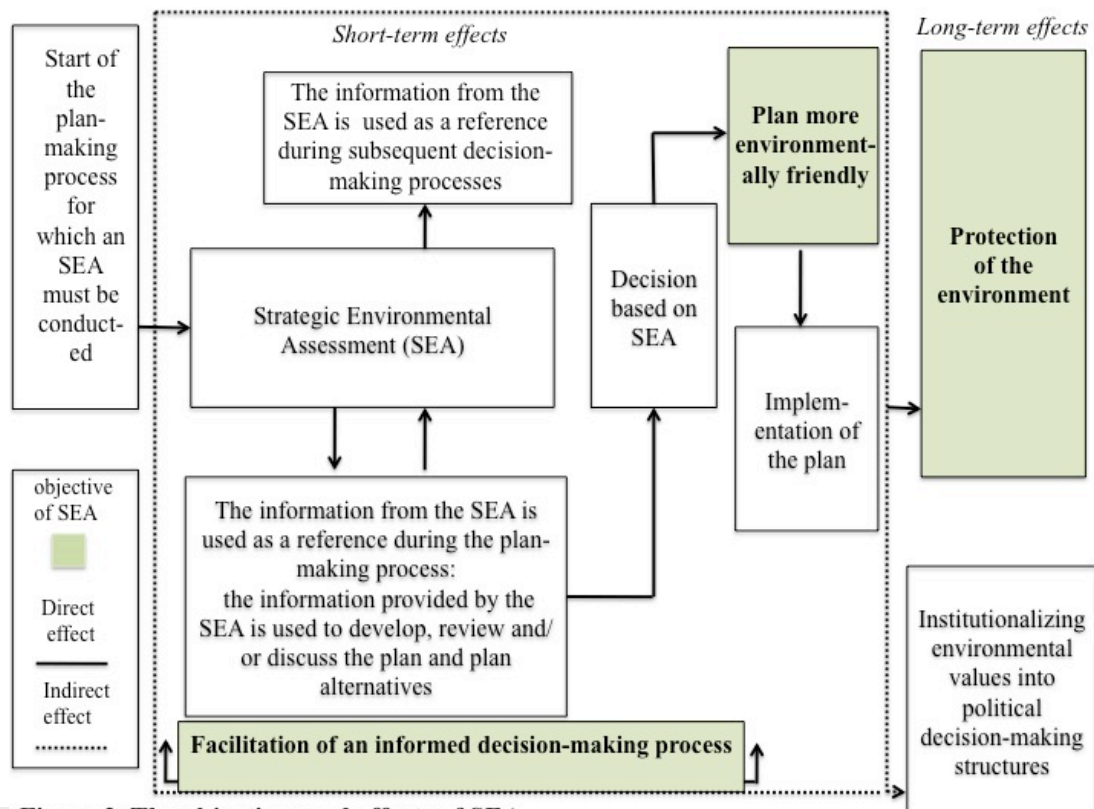


Figure 2. The objectives and effects of SEA

2.2.4 Evaluating effectiveness: lessons from planning evaluation theory

Planning evaluation theory has inspired the approach that will be used in this research in order to assess the effectiveness of SEA. In planning evaluation theory a distinction is made between the evaluation of plans based on their performance and conformance (see Faludi, 2000; Barrett and Fudge, 1981). A description of conformance and performance effectiveness is provided below.

When evaluating the conformance effectiveness of a plan, one assesses whether there can be found "a determinate relationship between intention and outcome" (Faludi and Alexander 1989: 189). Mastop and Faludi (1997) distinguish between three different types of conformance effectiveness. First, there is 'formal conformity'. It occurs when policy statements are directly taken over by (lower) governmental levels and it reflects itself on paper in the policies, plans, or projects of other, or lower, governmental levels. Second, 'behavioral conformity' occurs when "the recipients behave in accordance with their declared intentions" (Mastop and Faludi, 1997: 825) and thus implies that the decision is implemented accurately. The third, and ultimate, type of conformance is 'final conformity'. When assessing 'formal conformity', one evaluates whether the plan has attained its objectives and this can be looked for in the material reality (see Mastop and Faudi, 1997; Aardema, 2002). In its totality, the three different types of conformance effectiveness constitute a gradual scale.

Yet, it is being argued that evaluating effectiveness of plans based on the outcome of a planning process (i.e., conformance effectiveness) is not sufficient in order to determine their complete contribution (see Faludi, 2000). Planning is not only aimed at influencing a decision-making outcome, but also concerned with coordinating and informing decision-making processes in order to gain "a better understanding of the problems with which we are faced now and in the future, in order that we can make better decisions" (Centre for Environmental Studies, 1970:16). Accordingly, conformance effectiveness does not necessarily reflect a plan's only contribution to the decision-making process. It does not provide insights into how the strategic plan has been weighted, taken into account, and whether it helped clarifying the various choices during the decision-making process (see Faludi, 2000).

Thus, to complement the notion of 'conformance', planners invented the notion of 'performance'¹⁵ in order to be able to appraise the complete contribution of a plan to a decision-making process. Performance refers to the fact whether the plan is " 'working through' by diffusion into deliberations which follow their adoption" (Mastop and Faludi, 1997: 815). According to the theory by Faludi (2000) and Mastop and Faludi (1997), performance predominantly resides itself in the process and not in the final (material) outcome of the plan. When applying this perspective, the focal point of the evaluation lies on the influence of the strategic plan on the decision-making *process* and the behavior of the actors to which the strategic plan is addressed (*do, when, and how do they use it*) (See Mastop and Faludi, 1997).

It must be noted that performance can occur both with regards to the planning object itself and during subsequent decision-making. On the one hand, state-level decisions can have a top-down influence on the decision-making processes and decisions of provinces and municipalities (vertical tiering) (Spit and Zoete, 2005). On the other hand, decisions can also be used by other sectors at the same governmental level (horizontal tiering) (ibid).

Herweijer, Hummels, and van Lohuizen (1990) identify three gradual stages of performance¹⁶: acquaintance, consideration, and consent. The first stage of performance effectiveness is 'acquaintance' and encapsulates the notion that the decision-makers become acquainted with the content of the plan. Detailed knowledge regarding the content and background of the plan is not required, but the respective actors must understand the content and visions of the plan. The second stage of performance is 'consideration', which implies that the information provided in the plan must serve as a frame of reference when the actors make a decision. There exist multiple manners in which this can take place. For example, the policy-maker can refer to the plan during (subsequent) decision-making processes. Finally, the last stage of performance, 'consent', occurs when the actors acknowledge the content of the plan and allow themselves to be influenced by it. When 'consent' is attained, the decision-makers, for example, use a problem definition, vision, or solution in line with the information provided by the plan (Herweijer et al., 1990). Faludi (2000) argues that once the decision-makers have acknowledged the plan, there exist two options. On the one hand, it is possible that once the decision-makers have acknowledged the plan they will also conform to the plan ('formal conformity'). On the other hand, it is also possible that decision-makers are influenced by the plan (Faludi, 2000) but decide not to conform. In the latter situation, there will be a deliberate departure from the plan.

Based on the three stages of performance identified by Herweijer et al. (1990) and the three types of conformance identified by Mastop and Faludi (1997), Aardema (2002) has developed a gradual scale regarding the impact that a plan can have (see figure 3). It is a cumulative scale and each level reflects a (higher) form of impact (i.e. effectiveness) compared to the former level. The figure illustrates that the effectiveness of a plan can reflect itself as performance and conformance. The scale signifies that "final conformity is not the ultimate measure of whether a strategic plan has been effective, nor are formal, behavioral, or final disconformities necessarily counter-indications" (Mastop and Faludi, 1997: 829). In addition, it must be noted that while the first three steps regard the actions of individuals in the policy process, the other three levels "are policy accomplishments that go beyond the control of individual policy makers" (Webber, 1991: 11).

¹⁵ The Dutch term invented to describe this phenomenon is 'doorwerking'. The term 'doorwerking' has, however, no direct English equivalent and will therefore be translated as 'performance' in this research.

¹⁶ The notions (and different levels of) of performance and conformance are in line with the seven standards of policy utilization model by Knott and Wildavsky (1980). Their model implies seven gradual levels of knowledge utilization in policy processes. "Each of the seven stages of knowledge use (reception, cognition, reference, effort, adoption, implementation, and impact) reflects a link in the chain of utilization and summarizes the extent to which information is processed cognitively by the policy makers and the implications that this has in the policy process (Webber, 1991).

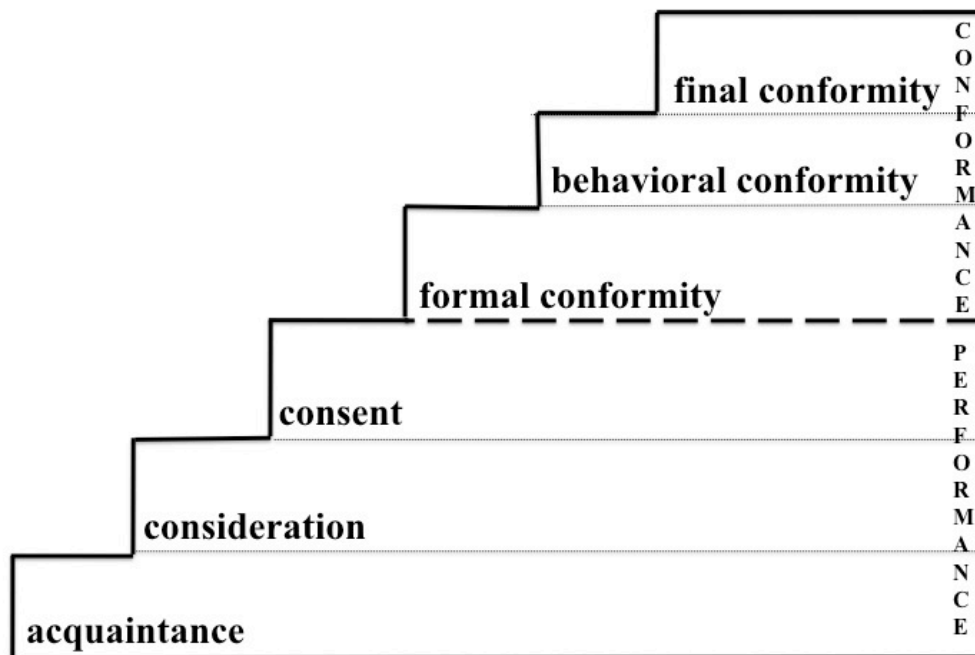


Figure 3. The gradual levels of influence that a plan can have

Sources: Aardema, 2002; Herweijer, Hummels, and Lohuizen, 1990 ; Mastop and Faludi, 1997

2.2.5 SEA effectiveness assessment framework

As stated above, this research applies lessons from planning theory in order to evaluate the effectiveness of the SEAs. The 'gradual impact scale of plans' depicted by Aardema (2002) (figure 3) is deemed useful for assessing the effectiveness of an SEA. After all, like a plan, an SEA constitutes a source of knowledge that can guide and influence decision-making processes and outcomes.

It is proposed that the different levels of influence an SEA can have on the decision-making process correspond to the different objectives of SEA. It must be emphasized that this research regards SEA effectiveness as the attainment of the *objectives* of SEA. The indirect effects (i.e. institutionalizing environmental values into political decision-making processes) will not be included in the SEA effectiveness assessment framework¹⁷.

The attainment of performance effectiveness relates to SEA's objective 'supporting an informed decision-making process'; 'formal conformity' links to the objective 'designing plans that avoid, minimize, or offset adverse environmental effects'; and 'final conformity' corresponds to the objective 'environmental protection' (see figure 4). Below, a description of each level of SEA effectiveness is provided.

¹⁷ While the indirect effects of SEA are not included in the SEA effectiveness evaluation framework, a reflection is given on the potential and success of the SEAs in giving rise to double-loop learning (see chapter eight).

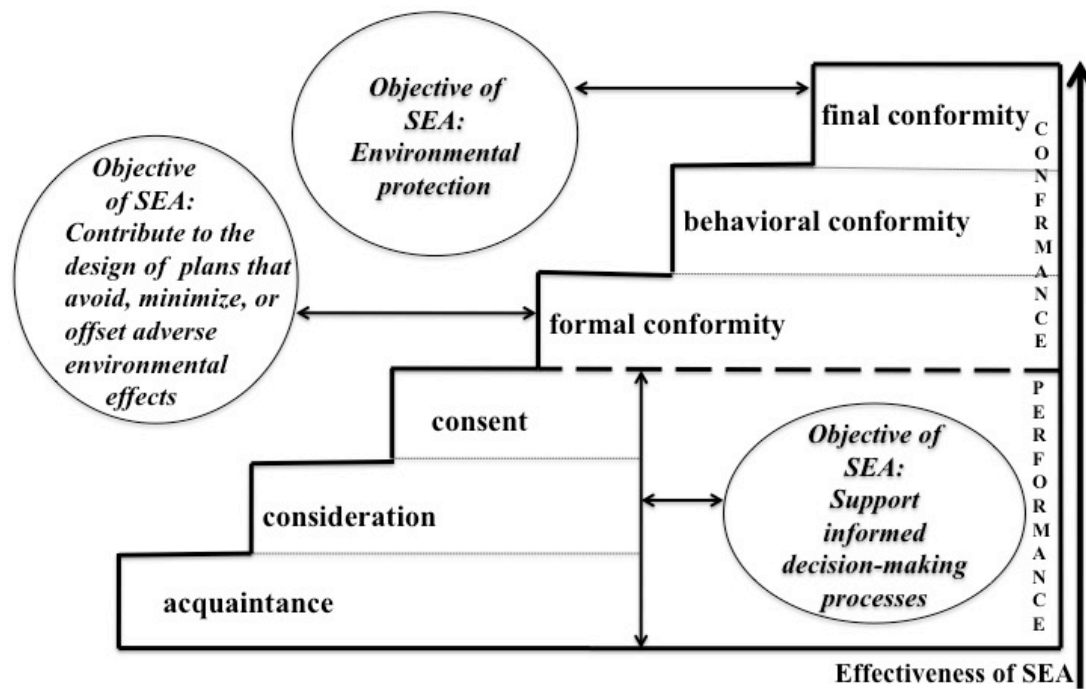


Figure 4. The different levels of SEA effectiveness and their relation to the objectives of SEA.

Adapted from: Aardema 2002; Herweijer, Hummels, and Lokhuizen, 1990; Mastop and Faludi, 1997

Acquaintance

As a point of departure, 'acquaintance' must be established. 'Acquaintance' signifies that the decision-makers have become familiar with the content of the SEA by means of reading and/or consulting it during the decision-making process (see Faludi, 2000).

Consideration

Subsequently, it must be assessed if 'consideration' has been attained, meaning that the SEA was used as a reference during the decision-making process to develop, consider, and discuss the plan and plan alternatives (see Mastop and Faludi, 1997). As noted previously, SEA allows decision-makers to systematically assess the impacts of the plan, to identify alternative policy options that can be implemented in order to attain similar policy objectives, and to discuss the plan (with stakeholders). Questions such as 'was the SEA consulted during the decision-making process?' and 'did the decision-makers use the information from the SEA as a frame of reference in order to develop, consider, and discuss the proposed actions and alternative development options?' must therefore be answered. It must be noted that in certain SEA implementation contexts, the SEA procedure could facilitate a communicative process in which stakeholders and the public can share their visions and interests concerning the plan. If this is the case, the SEA can be used to structure the debate and the information from the SEA can be used for argumentation.

Furthermore, as stated previously, the information provided by SEA can also inform and facilitate decision-making processes, other than the decision for which the SEA is conducted (see ten Heuvelhof and Nauta, 1997). On the one hand, the SEA carried out for a plan can be used at lower planning or EA levels when developing programs or projects. On the other hand, the SEA might also serve as a reference for plan- and SEA-making at the same administrative level (see Arts and Voogd, 2005).

Consent

The highest level of performance effectiveness is 'consent', meaning that the actors involved in the decision-making process acknowledge the content of the SEA, are influenced by it, and change their knowledge and/or visions accordingly. It is deemed that the SEA has influenced actors when (1) they

have learned more about the environmental implications of the plan and/or when (2) they have altered their visions regarding the plan. With regards to the first aspect of 'consent', the information provided by the SEA can educate actors involved in the decision-making process about the environmental and sustainability issues related to the decision. With regards to the second aspect of 'consent', actors can modify their interpretations and ideas about the plan due to the SEA (see Ten Heuvelhof and Nauta, 1996). For example, the actors reconsider the need for the proposed decision due to the information provided by the SEA (Ten Heuvelhof and Nauta, 1996).

The 'consent' level of performance can be perceived as an 'intersection'; a critical situation in which two possibilities exist. Once the actors in the decision-making process have acknowledged the SEA and are influenced by it they can either (1) allow themselves to be influenced by the SEA and change their proposed actions accordingly or (2) allow themselves to be influenced by the SEA but still decide not to conform (Faludi, 2000). In the latter situation, the plan will not conform to the SEA but there will be a deliberate departure from it. The insights retrieved due to the SEA can be used for subsequent decision-making but the respective plan shall not reflect the new insights. In the former situation, the SEA will attain the fifth level of SEA effectiveness: formal conformity.

Formal conformity

'Formal conformity' is attained when the SEA has led to direct changes in the plan that will make it more environmentally friendly. One determines 'formal conformity' "by comparing the strategic action before and after the SEA is carried out, noting any sustainability or environment-related changes" (Therivel and Minas, 2002: 82). In line with this approach, Therivel and Minas (2002) identify three criteria for 'formal conformity'. First of all, the SEA must identify environmental effects of the plan and detect potential changes or alternatives to the plan. Second, the changes or alternatives of the plan that are proposed in the SEA ought to make the plan more environmentally benign and accordingly must avoid, minimize, or offset adverse environmental effects. Finally, these proposed changes must be included in the final strategic plan. If these three criteria are met the strategic plan will be more environmentally benign as a result of the SEA. The changes in the strategic plan caused by the SEA, which make the plan more environmentally friendly, are indicators for 'formal conformity'. Theoretically it is of course possible that conformity of the strategic plan with the SEA is coincidental (see Faludi, 2000). Therefore, a causal link between the SEA and the changes made in the strategic plan must be established. A causal link can be found by means of looking for explicit references to the SEA in the text of the final plan. This will be further discussed in chapter three (methodology).

Behavioral conformity

'Behavioral conformity' implies that the (environmentally friendlier) policy measures that avoid, minimize, or offset adverse environmental effects described in the plan are implemented accurately. Evaluating 'behavioral conformity' can be a challenging task. As mentioned previously, a strategic plan sets out a general course of action, incorporating policy ends, options, and means to implement them (Mastop and Faludi, 1997). The decisions and actions to which SEA applies often have a high level of abstraction. A strategic plan as such can therefore often not be directly implemented; it must be translated into programs and projects first. Accordingly, the attainment of 'behavioral conformity' is dependent on after-linked decision-making and implementation by parties other than the leading authority (Arts, 1998).

In order to measure this level of SEA effectiveness one would have to assess how the plan informs programs and plans and whether the ideas and suggestions promoted in the plan are directly adopted. It can, amongst others, be assessed whether the recommendations for procedures in follow-up tiers (e.g. program or project-level) are respected and whether the envisaged actions are in line with those described in the plan (see Partidario and Fischer, 2004).

Final conformity

The ultimate level of SEA effectiveness is 'final conformity': the protection of the environment as a result of the implementation of plans that, due to SEA, avoid, minimize, or offset adverse environmental effects. When evaluating 'final conformity', one must determine whether the predicted environmental effects of a plan are in line with its actual effects on the material reality. This can be

done by means of measuring several environmental indicators and quality standards and establishing a relationship between these and the policy proposals in the plan (Partidario and Fischer, 2004). Second, it must be evaluated to what extent the changes can be attributed to the plan as opposed to the influence of other factors (see Rossi, Lipsey, and Freeman, 2004). "The challenge is both to recognize the impacts and to differentiate the impacts of EIA from the effects of other factors, such as other environmental statutes, interaction between stakeholders beyond the scope of EIA, technological innovations, and the markets" (Polonen et al., 2011: 122). For instance, contextual circumstances, such as policies, in which the plan or program has been implemented, might also have been altered and this can also have an effect on the environment (Partidario and Fischer, 2004). All in all, measuring 'final conformity' is a challenging task. "It is very difficult to connect the application of an instrument such as SEA with 'greener' outcomes, in terms of e.g. enhanced environmental sustainability 'on the ground'" (Fischer, 2009: 6).

Reflection on the SEA effectiveness assessment framework

The description of the different levels of SEA effectiveness implies that each level indicates a higher level of utilization and/or influence of the SEA. Figure 5 summarizes the different levels of SEA effectiveness and the corresponding indicators. It is argued that each step of the ladder reflects a higher level of the attainment of the objectives of SEA. While the levels related to conformance effectiveness indicate high levels of goal attainment, and thus SEA effectiveness, it must be emphasized that non-conformity does not imply ineffectiveness. Attainment of performance effectiveness, but no conformance effectiveness, indicates that the first objective of SEA 'enhancing an informed decision-making process' is attained. An SEA can therefore be effective when it plays a tangible role in the choices of decision-makers and/or other actors to whom the plan appeals, irrespective of whether the final strategic plan will correspond with the SEA or not (see Mastop and Faludi, 1997).

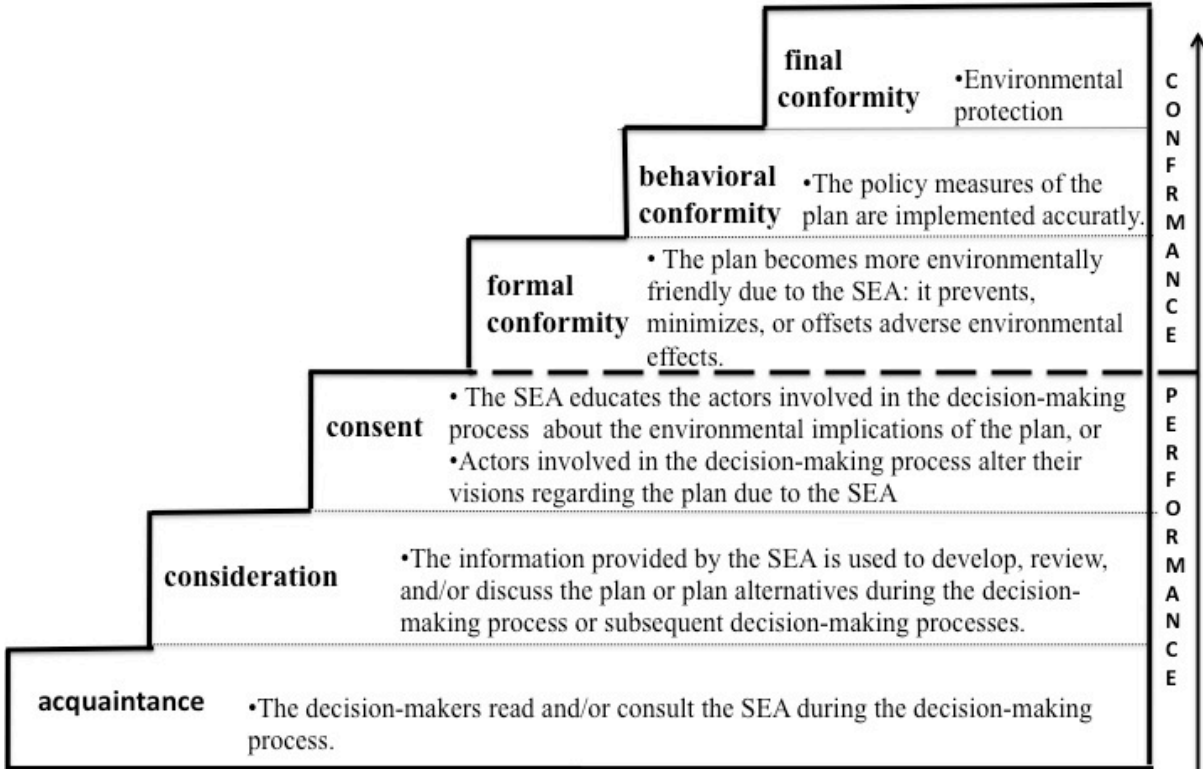


Figure 5. The different levels of SEA effectiveness and the corresponding indicators
Adapted from: Aardema, 2002; Herweijer, Hummels, and Lokhuizen, 1990; Mastop and Faludi, 1997

2.3 Factors contributing to SEA effectiveness

Once the effectiveness of an SEA has been determined it is also important to understand why it has or has not been effective.

Many SEA evaluation studies try to identify factors that contribute to SEA effectiveness¹⁸. Table 2 provides an overview of 13 factors that are believed to positively influence the effectiveness of SEA, as found in the studies that have been consulted¹⁹. The factors influencing SEA are related to the SEA content or SEA procedure. In order to have an accurate understanding of the explanations for the effectiveness of the three SEAs that are studied in this research, it is relevant to assess how these 13 factors were represented during or in the SEA. In the following section each factor shall be discussed separately.

¹⁸ It must be noted that the evaluation studies that have been studied often do not explicitly state their definition of SEA effectiveness. As the factors identified as important for SEA effectiveness will depend on one's definition of 'SEA effectiveness', it was difficult to deduct from the studies what the exact influence of the factors is on SEA. Accordingly, this research tries to provide more insights into the exact influence of factors on (the different levels of) SEA effectiveness.

¹⁹ The majority of the studies are based on case study analysis. Yet, it is sometimes difficult to distinguish between the conclusions the authors draw from the cases and the recommendations they make based on their own practical experience within the SEA field. While practical experience can significantly provide insights into the factors that impede and facilitate SEA effectiveness, it must be noted that these conclusions are not based on scientific analyses.

Factor	Found in	Operational definition	Indicators	Questions	Source
Stakeholder participation	Sadler and Verheem, 1996; Runhaar and van Nieuwaal, 2010; MEGJ/MIRI, 2003; Fischer and Gazzola, 2006; Hilden et al., 2004; Arbter, 2003; Aschemann, 2004	The participation of the representatives of organizations, communities, or interest groups that have a direct stake in the plan.	Provision for stakeholder participation during the SEA	Did the SEA process have mechanisms for enabling stakeholder participation?	Document analysis, interviews
Public participation	Fischer and Gazzola, 2006; Partidario, 1999; Sadler and Verheem, 1996; Aschemann, 2004; Dalal-Clayton and Sadler, 2008	The participation of "the broader, relatively undifferentiated, collectivity of unorganized individuals who may have some interest or be affected relatively indirectly by a decision" (Dietz and Stern, 2008: 61).	Provision for public participation during the SEA	Did the SEA process have mechanisms for enabling public participation?	Document analysis, interviews
Integration	Fischer and Gazzola, 2006; Hilden et al., 2004; Sheate et al., 2001; Therivel and Minas, 2002; Arbter, 2003	The cooperation and communication between SEA- and decision-makers during the decision-making process.	Frequency of communication between SEA- and decision-makers about their work during the decision-making process Cooperation between decision- and SEA-makers during the decision-making process	How often did the decision- and SEA-makers consult and inform each other about their work? Did the decision- and SEA-makers co-operate during the decision-making process?	Interviews
Transparency	MEGJ/MIRI, 2003; Fischer and Gazzola, 2006; Arbter, 2003; Runhaar, 2009; Runhaar and van Nieuwaal, 2010; Aschemann, 2004	An SEA process in which the roles and responsibilities of the actors involved in the SEA and decision-making process are clearly defined An SEA report in which the objectives, content, methodological approach, and results of the SEA are made explicit	Roles and responsibilities of the actors involved in the SEA and decision-making process are clearly defined The objectives, methodological approach, and results of the SEA are made explicit	Were the roles and responsibilities of the actors involved in the SEA and decision-making process clearly defined? Are the objectives, methodological approach, and results of the SEA made explicit in the SEA report?	Interviews, document analysis

Factor	Found in	Operational definition	Indicators	Questions	Source
Timing	Sheate et al., 2001; Aschemann, 2004; ten Heuvelhof and Nauta, 1996; Runhaar and Driessen, 2007; Therivel and Minas, 2002; Partidario, 1999; Hilden et al., 2004	The start of the SEA process and its relation to the decision-making process	Timeframes of the planning process and the SEA	When did the SEA start in relation to the planning process?	Interviews
Quality	Runhaar and van Nieuwaal, 2010; Fischer and Gazzola, 2006; MEGJ/MIRI, 2003; Hilden et al, 2004; Sheate et al., 2001	The quality of the SEA is based on the validity of the data and methodological approach.	Assessment by the NCEA.	Is the data that is used for the SEA valid? Is the methodological approach of the SEA valid?	Review by the NCEA
Independent review	Shaete et al., 2001; Dalal-Clayton and Sadler, 2008	Review of the quality of the SEA by an independent body	Review of the SEA by an independent body?	Did an independent body review the quality of the SEA?	Document analysis
Pragmatism	Therival and Minas, 2007; Sadler, 2001; MEGJ/MIRI, 2003; Sadler and Verheem, 1996; Aschemann, 2004	An SEA report that provides information that is adapted to the decision-makers' needs and understandable for all actors involved in the decision-making process (also those without technical expertise regarding the plan).	Opinion of decision-makers regarding the utility and comprehensiveness of the SEA report Decision-makers', stakeholders', and the public's understanding regarding the content of the plan	Is the SEA adapted to the decision-makers' needs? Is the information provided in the SEA report understandable for all actors involved in the decision-making process, also for those without technical expertise regarding the plan?	Interviews
Scoping	Sadler and Verheem, 1996; MEGJ/MIRI, 2003; Dalal-Clayton and Sadler, 2008	The stage during which the likely extent (geographic, temporal, and thematic) and level of detail of the assessment and the information to be included in the SEA" (Fischer, 2007: 29) are determined.	Determination of the extent (geographic, temporal, and thematic) and level of detail of the assessment and the information to be included in the SEA before the start of the assessment process	Was the extent (geographic, temporal, and thematic) and level of detail and the information to be included in the SEA determined before the start of the SEA?	Interviews, document analysis

Scoping	Sadler and Verheem, 1996; MEGJ/MIRI, 2003; Dalal-Clayton and Sadler, 2008	The stage during which the likely extent (geographic, temporal, and thematic) and level of detail of the assessment and the information to be included in the SEA" (Fischer, 2007: 29) are determined.	Determination of the extent (geographic, temporal, and thematic) and level of detail of the assessment and the information to be included in the SEA before the start of the assessment process	Was the extent (geographic, temporal, and thematic) and level of detail and the information to be included in the SEA determined before the start of the SEA?	Interviews, document analysis
Factor	Found in	Operational definition	Indicators	Questions	Source
Tiering	MEGJ/MIRI, 2003; Fischer and Gazzola, 2006; Sadler and Verheem, 1996; Hilden et al., 2004	Decisions set at a high, strategic level are directly linked to lower, more concrete program and project decisions.	Identification of relations between the plan and decisions that will be conducted at lower project levels in the SEA report	Does the SEA discuss and identify clear relations between the plan and subsequent decisions at program and project level?	Document analysis
Experience	Therivel and Minas, 2003; Fischer and Gazzola 2006; Dalal-Clayton and Sadler, 2008	The knowledge or practical wisdom that SEA- and/or decision-makers gained during previous SEAs.	The SEA-maker's practical knowledge about SEA, gained from conducting SEAs The SEA- or plan-makers practical knowledge about the SEA gained from conducting comparable types of SEAs for similar plans.	Did the SEA-maker have experience in SEA? Did the SEA- and decision-makers have, and use, experience gained from conducting comparable SEAs for similar plans?	Interviews
Financial resources	Fischer and Gazzola (2006)	The financial budget available for the SEA that enables it to fulfill its objectives.	Financial budget available for the SEA Opinion of SEA- and decision-makers regarding whether the financial budget was sufficient in	What was the budget available for the SEA? Was the financial budget of the SEA sufficient in order for it to fulfill its objectives?	Desk research; interviews

Table 2. Factors deemed important for SEA effectiveness.

The table provides an overview of respectively: the factors, the articles in which the relevance of the factors are discussed ('found in'), the operational definitions of the factors, the indicators²⁰ of the factors, questions that must be answered in order to learn more about the factors, and the sources that must be consulted in order to answer the questions.

²⁰ An indicator is a "sensory, perceptible phenomenon that provides us with information on the (not directly perceptible) phenomenon" that is studied (Verschuren and Doorewaard, 2005: 102).

Stakeholder participation

Stakeholder participation is defined in this research as the participation of the representatives of organizations, communities, or interest groups that have a direct stake in the plan (Dietz and Stern, 2008; Gastil, 2008). It must be emphasized that in this research the general public ('public participation') is excluded from the factor 'stakeholder participation'. Yet, public interest groups and organizations that *represent* public concerns are recognized as stakeholders. It is considered important to regard the participation by stakeholders and the public as two separate factors since the actors belonging to the two groups will likely differ with regards to their knowledge base, interests, power, and ability in influencing decisions regarding the plan and SEA.

Runhaar (2009) notes that stakeholder participation is important since decision-makers are no longer able to steer society in a hierarchical way and make decisions based on rational calculations. Decision-makers are dependent on support from stakeholders who "control critical resources such as land, real estate, or the ability to protest" (ibid: 201). Policy-making becomes increasingly a multi-actor activity, "implying that decision-making often encompasses negotiation between public decision-makers and stakeholders" (Runhaar and Driessen, 2007: 5). More and more decision-makers are aware of the fact that opposition against them might be provoked when the values and interests of important stakeholders are not sufficiently taken into account during the decision-making process (Runhaar and Driessen, 2007). Consequently, stakeholder participation is also important in SEA as it can enhance support for, and increase the legitimacy of, the assessment, which can facilitate the implementation of the plan when it is based on the outcomes of the SEA.

Another justification for stakeholder participation regards the provision of information. Stakeholders often possess specialized knowledge that can be used to fill information gaps needed to conduct an SEA.

There are several empirical studies that have demonstrated the relevance of the inclusion of stakeholders in SEA in order to increase SEA effectiveness (e.g. Sadler and Verheem, 1996; Hilden et al., 2004; Sheate et al., 2001; Runhaar and Driessen, 2007; Arbter, 2003; Runhaar and van Nieuwaal, 2010). The studies find that when stakeholders are able to participate in the SEA process, their acceptance of the outcomes of the SEA will increase (Arbter, 2003; Runhaar and van Nieuwaal, 2010; Runhaar and Driessen, 2007).

Public participation

Public participation is defined in this research as the participation of "the broader, relatively undifferentiated collectivity of unorganized individuals who may have some interest or be affected relatively indirectly by a decision" (Dietz and Stern, 2008: 61). Principle 10 of the 1992 Rio Declaration states that "environmental issues are best handled with the participation of all concerned citizens at the relevant level"²¹. Practice has also indicated that it is important that SEA explicitly addresses the public's inputs, concerns, and interests (Sadler and Verheem, 1996; Bina, 2008). In literature there can be found various rationales for public participation in EA. First, public participation can enhance the legitimacy and acceptance of the SEA outcome, which can, subsequently, enhance the implementation of the plan when it is based on information from the SEA. Second, the public can contribute to the knowledge base of SEA by means of the provision of local knowledge. Finally, the public's input can be used to relate environmental effects to social interests and priorities. "SEA requires balancing data with discussion about the objectives and values at stake" (Bina, 2008: 731). In addition, when "the consequences [of decisions] are uncertain, science cannot provide a 'rational' unambiguous answer about what options to choose" (Dietz and Stern, 2008: 56). Public participation can be helpful in such situations, where science is uncertain, and trade-off between choices and risks must be made. Public participation "may help to find a fair balance or a mutually acceptable trade-off between the extremes of too much and too little caution in environmental protection. Technical expertise is necessary, not sufficient, for confronting this dilemma" (ibid: 56).

It must be stated that while the above studies (Bina, 2008; Sadler and Verheem, 1996) conclude that public participation is an important factor; it is not always clear how they have come to this

²¹ Retrieved from: <http://www.unep.org> (access 08-04-2011).

conclusion. While the authors support public participation, they do not indicate a direct causal link between public participation and SEA effectiveness. It could therefore be questioned whether public participation is, in fact, a key to success or whether it is based on normative speculations about SEA practice. The study by Therivel and Minas (2002), for instance, shows that contrary to 'best practice SEA principles' public involvement does not positively influence SEA effectiveness²². In addition, one could, in some cases, even question whether public participation is desirable. Involving all citizens in an active way during the SEA preparation process might not be feasible (MEGJ/MIRI, 2003). In addition to practical challenges inherent to public involvement, it also appears that the general public is less inclined to participate in the assessments of strategic plans due to their abstract nature (see MEGJ/MIRI, 2003). Thus, regardless of the fact that several studies highlight the relevance of public involvement in SEA, it could be questioned whether this factor in fact facilitates SEA effectiveness.

Integration

Integration takes place when decision- and the SEA-makers communicate with each other about their work and when the two groups co-operate during the planning process. Integration thus establishes clear links between the SEA and proposed strategic plans (see MEGJ/MIRI, 2003).

Based on 17 case studies²³, Hilden, Furman, and Kaljonen (2004) concluded that co-operation between the planners and the actors carrying out the impact assessment is a necessary condition for SEA effectiveness. The study shows that "poor integration leads to mismatches and waste of time and energy on unimportant studies, and also to a lack of sensitivity to the changes taking place during the planning process" (Hilden et al., 2004: 526). The study by Therivel and Minas (2002) regarding the effectiveness of environmental and sustainability appraisals of development plans in the U.K. also found that plans were most likely to become more sustainable when there was an integrative plan-preparation and SEA process. This is likely caused by the fact that "appraisals carried out jointly between local authority personnel and consultants are most likely to increase the planners' understanding of environmental sustainability issues (suggesting a skills transfer) and [...] their understanding of the plan" (ibid: 86). Finally, Arbter (2003) argues that Austrian SEAs were more effective in integrating environmental aspects into the final plan or program when there was continuous interaction between the planners and SEA-makers. The author concluded that the "integration of planning and SEA can be regarded as a starting point to tackle one of the main challenges of all assessment procedures, namely that the results of the assessment are really taken into account in the final planning decision" (Arbter, 2003: 3)²⁴. Therefore, lack of integration may lead to mismatches between the strategic plan and the SEA and diminishes the utility, influence, and thus effectiveness of the SEA.

Transparency

An SEA should be transparent, both with regards to the process and content of the environmental assessment (Fischer and Gazzola, 2006). A transparent SEA process indicates that during the SEA the roles and responsibilities of actors involved in the assessment and planning process are clearly defined. For instance, Arbter (2003) concludes, based on an evaluation of seven Austrian case studies, that "the share of tasks and the influence of the participants must be clear" (ibid: 180).

Furthermore, the SEA report should be transparent. In a transparent SEA, the objectives, content, methodological approach, and results of the SEA are made explicit. Choices regarding the selection of alternatives and assessment methods ought to be made explicit and a lack, or uncertainty, of data must

²² The study by Therivel and Minas (2002) constitutes a statistical analysis, based on the answers derived from approximately 234 questionnaire surveys. The study indicates that there is no significant correlation between public consultation and changes to the plan ('formal conformity').

²³ The study is based on 17 case studies collected by survey from Member Countries of the United Nation's Economic Commission for Europe (UN/ECE).

²⁴ It must be noted that Arbter (2003) does not demonstrate a causal relation between integration and SEA effectiveness. Conclusions are based on an analysis of the characteristics of two generations of SEA. The author observes that the young SEA generation is more effective and that the assessments conducted are more integrative, in comparison to the older SEA generation. Other factors could also have caused the increased level of SEA effectiveness (e.g. learning, political will, or environmental pressure).

be acknowledged (ibid). When transparency is deficient, the public and political confidence in the SEA will decrease which can, in turn, limit the use and the influence of the SEA on the decision-making process (Arbter, 2003). The level of transparency regarding the data used for the environmental assessment can be increased by means of including references to supporting documents that provide deeper levels of detail (MEGJ/MIRI, 2003).

Timing

Timing refers to the start of the SEA process in relation to the decision-making process. It is deemed important to start the SEA early in order to allow decision-makers to have access to relevant assessment data in time so that they can use the information when designing the plan. An early start thus enables the SEA procedure to be parallel to the decision-making procedure and facilitates a correlation between the two processes (VROM, 2006). "When the preparatory [planning] processes have different time schedules from that of the assessment process, the links between the processes may be lost in practice and opportunities to influence decision-making will be lost" (Hilden et al., 2004: 529).

Many SEA evaluation studies emphasize the importance of accurate timing (see Achemann, 2004; Therivel and Minas, 2002; Hilden et al., 2004; Runhaar and Driessen, 2007; Ten Heuvelhof and Nauta, 1996). Hilden et al. (2004) find that linking the environmental assessment and the preparation of the plan was a necessary condition for SEA effectiveness in all the seventeen case studies that they assessed. Based on a quantitative analysis, Therivel and Minas (2002) conclude that of the plans that did not change as a result of the sustainability appraisal ('formal conformity'), nearly 80 percent was carried out when the plan had already been completed. Of all plans that did change as a result of the sustainability appraisal, seventy percent was conducted simultaneously to the plan-making process (ibid). The authors note that when the plan and sustainability appraisal are prepared at the same time, it will improve the planners' awareness of environmental aspects related to the plan (Therival and Minas, 2002). Aschemann (2004) observes in a case study that a too late start of the scoping procedure was one important reason for the lack of influence (effectiveness) of the SEA. "The work on drafting the land-use plan began a few months earlier than the SEA scoping stage and decisions for important frame conditions of the plan revision had already been made" (ibid: 171). Sheate et al. (2001) also conclude that "successful SEAs have been the start rather than the end of a process of integration, and may be a catalyst for developing further guidance and training" (Sheate et al., 2001 as cited in MEGJ/MIRI, 2003: 23).

While many studies emphasize the importance of an early start, it must be stated that some critical comments can be made regarding the importance of this factor. First, it might be possible that the plan has not been crystallized. This will make it difficult to determine the scope and level of detail of the SEA (VROM, 2006). Also, in case the plan fundamentally changes during its preparation process, the SEA has to change drastically as well. This can lead to a misuse of time and financial resources. Second, it could be argued that a late start of the SEA process has an advantage since the content of the plan will be more concrete and worked out.

Quality

The quality of the SEA is based on the validity of the data and methodological approach. Several studies and theories have indicated that good quality information can influence actors and the decisions they make²⁵ (Fischer, 2007). Accordingly, it is deemed that a high quality SEA can improve the quality of the decision-making process and the decision.

It is important that valid data is available for the assessment. "A lack of right data can prevent particular analyses and assessments being done" (Joao, 2005: 694), which consequently diminishes the quality of the assessment. When gaps in data exist, they must be notified clearly in the SEA report. Also, the assessment method, whether qualitative or quantitative, should be applied rigorously (Sheate et al., 2001).

²⁵ For instance, the 'information processing model' by Barlett and Kurian (1999).

Independent review

Independent review occurs when an independent body reviews the quality of the environmental report. Sheate et al. (2001) finds that an independent review of the SEA can be important for SEA effectiveness. It is argued that independent review can motivate decision-makers to carry out a high quality SEA (ibid). Moreover, it increases the accountability of the SEA and ensures that those responsible for the SEA do their jobs well (ibid).

Pragmatism

A pragmatic SEA report provides information that is adapted to the decision-makers' needs and that is understandable for all actors involved in the decision-making process (also those without technical expertise regarding the plan). Several studies emphasize that a pragmatic SEA can increase decision-makers' understanding and usage of the SEA ((MEGJ/MIRI, 2003; Kolhoff et al., 2009; Therivel and Minas, 2002).

While scientific complexity is inherent to an SEA, practice has illuminated that too much, too detailed, and complex data will not enhance decision-makers' ability for understanding the implications of the decision correctly (MEGJ/MIRI, 2003). Technical complexity in information can be difficult to understand for decision-makers and stakeholders, who do not necessarily have technical expertise (Kolhoff et al., 2009). Therefore, information needs to be presented in an understandable and accessible manner (ibid). The SEA can be made practical and comprehensive when clear data sets and indicators are used to assess the effects of the plan and its alternatives (MEGJ/MIRI, 2003). Also, the potential utility of the SEA can be increased when a non-technical summary is included in the report and when the impacts and effects of proposed decisions are translated into understandable impacts on the decision-makers' and stakeholders' interests and visions (Kolhoff et al., 2009).

Scoping

Scoping is a procedural requirement during which "the likely extent (geographic, temporal, and thematic) and level of detail of the assessment and the information to be included in the SEA" (Fischer, 2007: 29) are determined. During this stage plan alternatives are also defined. "The purpose of generating alternatives is to show the range of options open for decision-makers, depending on the type of plan assessed" (MEGJ/MIRI, 2003: 28).

Scoping ensures an efficient process because it enhances the chance that the SEA focuses on what is necessary and it thus prevents the production of 'data graveyards' (Sommers, 2005). Accordingly, it increases the chance that the data generated by the assessment will be useable, understandable, and streamlined.

Tiering

Tiering means that decisions at a high, strategic level are directly linked to lower, more concrete program and project decisions. Tiering implies that the SEA explains "how the plan sets a framework for other activities, what issues are addressed in other assessments, and what matters are more appropriately assessed elsewhere in the planning system" (Fischer, 2009: 14).

Tiering increases the chance that the SEA will be structured, transparent, and focused. In addition, a tiered process enhances the efficiency of EIAs because it narrows the range of alternatives and reduces the chance for overlap and duplication to occur (Sadler and Verheem, 1996).

Many authors consider tiering to be an important condition for SEA effectiveness (e.g. Fischer and Gazzola, 2006; Sadler and Verheem, 1996; Hilden et al., 2004; MEGJ/MIRI, 2003; Sadler and Verheem, 1996). Based on a qualitative in-depth case study analysis of 17 SEAs conducted for transport planning, Hilden et al. (2004) found tiering to be a necessary condition for SEA effectiveness. The data from their analysis suggests that the poor identification of links from the strategic level to the project level greatly reduces the effect of the assessment (ibid).

It is argued that tiering is especially relevant for the influence that the SEA has on subsequent (program or project) decision-making and EA. Accordingly, tiering requires broad and intensive participation of actors working at other tiers during the SEA process in order to increase the chance that they will accept and apply it during subsequent decision-making processes (ibid). However,

tiering can be a challenging enterprise. An empirical quality review of 117 EU Directive based SEA reports for English spatial plan core strategies by Fischer (2010) concludes that tiering is one of the main shortcomings of current SEA practice.

Experience

Experience is defined in this research as the knowledge or practical wisdom that SEA- and decision-makers have gained during previous SEAs. Based on a quantitative analysis of the effectiveness of sustainability appraisals, Therivel and Minas (2002) find that the authorities with more experience in undertaking appraisals are more likely to change the plan ('formal conformity'): "50% of authorities that had completed one appraisal changed their plan, rising to 66% for two appraisals, 64% for three and 69% for four or more" (ibid: 87). The results imply a learning effect; the SEA-and decision-makers become more familiar with assessment techniques (ibid). The authority conducting the SEA can learn, and apply lessons, from the SEA conducted for previous plans.

It will be investigated in this research whether the experience of the authorities in conducting SEAs of similar type of strategic plans also positively influences the instrument's effectiveness.

Financial Resources

The financial resources regard the financial budget available for the SEA that enables it to fulfill its objectives (see Fischer, 2007). Based on an analysis of the SEA implementation context in Italy, Fischer and Gazzola (2006) found that 'sufficient financial resources' is one of the necessary criteria for SEA effectiveness in Italy. Yet, while financial resources can enable one to conduct a high quality SEA, it is argued that sufficient financial resources do not guarantee SEA effectiveness. Rather, the lack of financial resources can disable SEAs from being conducted comprehensively, which in turn negatively affects the quality of the SEA.

The evaluation of social and economic effects

More and more SEAs address and assess the environmental, social, and economic impacts of plans (often referred to as 'sustainability assessments'). While the 2001 SEA Directive of the EU only obliges Member States to assess the environmental effects of plans and programs, practice indicates a trend away from conventional 'environmental' assessments towards integrated and holistic 'sustainability' assessments. In fact, at the International Association for Impact Assessment (IAIA) Annual conference in 2002 in The Hague, it was stated that "sustainability assessment is widely regarded as the next generation of SEA" (Fuller, 2002). The potential importance of comprehensive sustainability assessment can be explained by the "increasing need to face the inter-dependency of effects in carrying out the assessment, since environmental effects cannot be assessed properly when neglecting the interconnection with social and economic aspects" (Arbter, 2003: 178). A particular advantage of a comprehensive assessment for decision-makers, and other actors involved in the SEA process, is the access to an extensive array of information. This enhances their ability to have an integrated perspective regarding the policy problem and simultaneously allows them to make informed trade-offs and choices (Kolhoff et al., 2009). It must be noted that for an integrated assessment to take place it is essential that a diversified group of stakeholders is involved in the SEA process and that the cooperation between them is strong.

Nevertheless, while a number of authors have claimed that the additional evaluation of social and economic effects can increase the effectiveness of SEA, empirical evidence remains thin. In fact, "the usefulness of the integration of different substantive aspects through SEA is currently more an assumption than a proven fact" (Fischer, 2007: 15). Furthermore, it could be debated whether sustainability assessments are in fact desirable. Opponents argue that the evaluation of social and economic effects goes against the 'rationale' of environmental assessment (i.e. the integration of *environmental* concerns into the decision-making process). "In an aggregate assessment the environmental effects may get snowed under the economic and social ones, which tend to be of more interest to decision-makers" (Kolhoff et al., 2009: 150).

2. 4 The influence of the SEA implementation context on SEA

This research examines whether the SEA implementation context can have a discriminatory function with regards to the potential effectiveness of SEA and the factors required for SEA effectiveness.

In the previous section, 13 factors considered important for SEA effectiveness have been described. It is hypothesized that not every factor will be (equally) important for each SEA. It might be possible that the SEA process design (i.e., factors important for SEA effectiveness) depends on the SEA implementation context. It is speculated that particularly the importance of an interactive approach to SEA, hence the significance of the factors 'stakeholder participation' and 'public participation', depends on the SEA implementation context. While some emphasize the importance of 'stakeholder participation' and 'public participation' for support and access to information, others consider participation to be a source of delay, leading to increased costs of the SEA and less rational decisions due to the fact that scientists are obstructed in their production of objective knowledge (Wiklund, 2005). The origins of this clash in opinions regarding the relevance of these two factors must be searched for within the theoretical perspectives on political decision-making. In the following section a background discussion is provided.

2.4.1 Perspectives on SEA process design: deliberative or rational?

The procedures of SEA are still mainly based on a cognitive-instrumental, rational approach on planning; it is assumed that the provision data on the environmental implications of decisions and their alternatives will lead to rational decisions by decision-makers (Kronov and Thissen, 2000). "A rational decision is defined as one in which the option that most satisfactorily achieves the stated objective(s) is selected, based on a complete understanding of the consequences of all relevant alternatives and consensus about the goals that govern the decision" (Cashmore et al., 2004: 298). However, the rational-technical approach towards SEA is increasingly criticized.

First of all, a weak spot of the rational approach is that it ignores that planning is often not a top-down process, but rather an interactive decision-making process in which many parties participate and influence the outcome of the decision-making process. In practice, it is often the case that "the result of the planning process is determined by many different actors (e.g. responsible authorities, proponents, the community, or special interest groups) who have different roles and stakes in the planning and decision-making process" (Morrison-Saunders and Arts, 2004: 27).

A second point of critique on the rational approach is that the scientific information provided by SEA is not sufficient in order to deal with strategic decisions. "Scientific knowledge itself creates boundaries between what is included and what is not" (Connelly and Richardson, 2005: 396). Especially at a strategic level, many problems have to be addressed that cannot be solved by scientific knowledge alone. Solving complex environmental problems and discussing future visions does not solely entail a rational scientific process; it is also about values. Information about values can only be retrieved by means of participation and dialogue with all actors who are potentially affected by a decision.

A final point of criticism on the rational planning approach is related to the notion that planning is not a value-free activity. "Values and value conflicts as well as power relations influence the way an environmental assessment is carried out" (Stoeglegner, 2010:220). "Decision-making rarely proceeds in the detached way implied in the rational model, in which impartial use is made of the information presented; decisions reached are likely to depend on underlying interests, reflecting the norms and values of decision-makings who are usually operating within a political arena" (Jay et al., 2007: 293). Elling (2008), for instance, argues that the main actors involved in EA practice, the planners and the authorities, have predefined targets that do not focus on maximum environmental protection but rather on making a profit and creating maximum legitimacy of decisions. The planners and decision-makers will "champion environmental values as a means of realizing their objectives" (Elling, 2008: 249). Public and stakeholder participation could ensure that the values and rationalities of the developer and decision-maker are scrutinized and balanced with other values (Connelly and Richardson, 2005).

Based on the points of critique on the rational approach, there are many that propose a collaborative-communicative approach to SEA. The collaborative-communicative perspective is based on the notion of Habermas' concept of democratic deliberation. "Deliberative politics is understood to involve collective searches for common interests" (Wiklund, 2005: 284) and "the deliberative process [...] is a process in which actors' initial private interests are transformed to take into account the views of other actors" (Habermas, 1990 as cited in Wiklund, 2005: 284). Deliberative process are instrumental in purpose and the emphasis lies on 'the significance of voice' (see Wiklund, 2005); all that are potentially affected by a decision should be able to participate or be represented during the discussions, negotiations, and other forms of consensus seeking.

The communicative perspective is lately widely promoted within planning practice and more and more practitioners accordingly call for "EA that is re-conceptualized as a form of transactive, civic exploration reliant on mutual learning of all EA participants" (Cardinall and Day, 1998 as cited in Connelly and Richardson, 2005: 399). When upholding this approach, predefined objectives do not control and dominate the assessment in advance; there is room for the development of alternatives that respect environmental values. It is emphasized that SEA is a political decision-making process and that consensus building and communicative processes between citizens, stakeholders, and decision-makers, leading to integrated and shared visions, should be encouraged (see Stoeglehner, 2010). A communicative process is especially relevant if SEA wants to contribute to long-term sustainability and the institutionalization of environmental values into political decision-making structures ('double-loop learning'). "SEA can only provide for a fundamental value added to environmental protection and decision making processes if not only the decision making is improved on the level of facts but also value systems are agreed on between decision-makers, the public, and planners, which calls for double loop learning" (Stoeglehner, 2010: 221).

2.4.2 The SEA implementation context

The promotion of a deliberative approach in EA is a significant trend (see Fischer, 2009; Runhaar and Driessen, 2007). It appears that in the SEA community two camps exist: one promoting the traditional, rational-technical approach and the other favoring the collaborative-communicative approach to SEA. But does the rational approach have to exclude the deliberative approach? Fischer (2009) observes that "a 'broad brush' approach appears to be prevailing in the current debate on how to conduct SEA effectively" (ibid:12) and that insufficient attention is being paid to the SEA implementation context. It is argued that while there are some situations in which a rational-technical approach is desired, there are also cases in which the deliberative-communicative process must be followed (see Runhaar and Driessen, 2007; Elling, 2008, Fischer, 2009). "There are many situations in which 'interactive' or 'deliberative' policy analysis is not employed or where it is not required [...]; much depends on the characteristics of the plan, program, or policy" (Runhaar and Driessen, 2007: 5). There are contexts in which "traditional rationalistic problem-solving is recommendable, and there are cases in which the argumentative [approach] [i.e. deliberative approach] is most useful" (Elling, 2008:233).

Based on the analytical framework by Runhaar and Driessen (2007), the 'SEA implementation context' encapsulates three variables: (1) level of certainty about the knowledge base (low or high), (2) the degree of consent on norms and values²⁶ regarding the policy issue (low or high), and (3) characteristics of the decision-making process. The first two variables determine the type of policy problem. The latter concerns "the extent to which decision-makers are open to other [environmental] values and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6). A description of each variable is provided below.

The policy problem

The type of policy problem that the plan deals with depends on two factors: the level of certainty of the knowledge base and the degree of consensus on norms and values pertaining to the plan. Figure 6

²⁶ Norms refer to a desired standard (www.dictionary.com, access 10-08-2011) and values are defined as the "principles or standards held by individuals or groups which are embodied in their conception of what is good" (Connelly and Richardson, 2005: 392).

provides a visual representation of the four different types of policy problems that can be distinguished based on these two dimensions²⁷. First, there are structured policy problems. Structured policy problems occur when there is a high level of certainty about the knowledge base and when there is also consensus on norms and values. In contrast, there is neither consensus on the knowledge base regarding the policy problem nor is there agreement on norms and values when a policy problem is unstructured. Furthermore, there exist two distinct types of moderately structured problems. 'Moderately structured, means problems' are policy problems about which there is a low degree of scientific certainty (e.g. regarding the origins of the problem and the means to solve it), but there is no conflict of norms and values. In the other variation, 'goals problems', there is certainty about the knowledge base, but no consensus pertaining to the norms and values related to the plan.

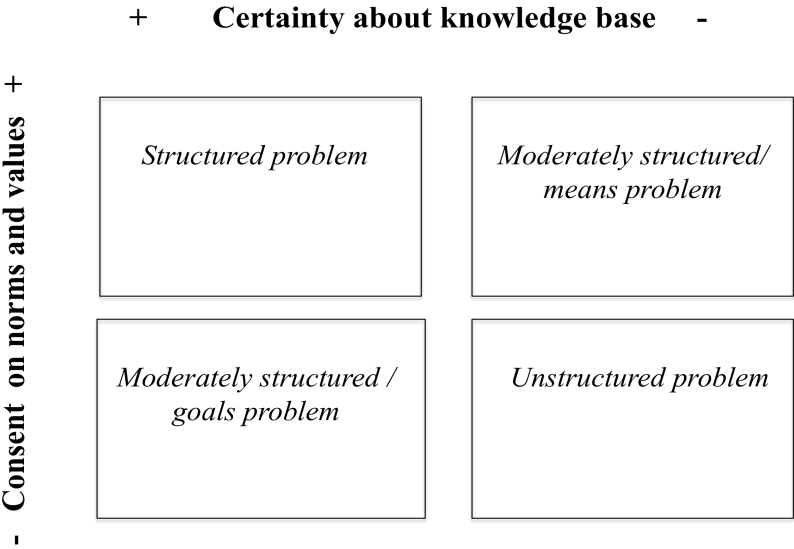


Figure 6. Types of policy problems.
Adapted from: Hoppe, 2002

Characteristics of the decision-making process

Another aspect related to the SEA context concerns 'the characteristics of the decision-making process'. This factor links to "the extent to which decision-makers are open to other [environmental] values and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6). With regards to the first, it is speculated that decision-makers' willingness to take environmental values into account depends on the objectives of the plan. With regards to the latter, decision-making styles can be characterized as top-down and closed or interactive and open.

Reflection on the SEA implementation context

Runhaar and Driessen (2007) find that the type of policy problem ('the structuredness of the policy problem') has a discriminatory function with regards to the factors (i.e. approach) that are needed for SEA effectiveness. It is suggested that the SEA implementation context significantly determines whether or not an interactive or deliberative environmental assessment procedure is required (see Runhaar and Driessen, 2009: 5). The authors argue that "interactions and negotiations with, and input from, stakeholders are required when the stakes of the various actors involved are high, norms and values diverge, and there is uncertainty about the causes of the policy problem or the impacts of alternative policy programs- that is, when 'unstructured' policy problems are at issue" (ibid: 5). In

²⁷ It must be noted that politicians or decision-makers can use this model subjectively in order to justify, for example, a closed decision-making process. This research has aimed to provide an objective classification of the type of policy problem.

addition, when stakeholder involvement is desired the manner in which they are involved depends on the policy context. On the one hand, in the case of 'moderately structured, means problems', stakeholders could help decision-makers with finding solutions for the policy problem. On the other hand, when an SEA implementation context is characterized by a 'moderately structured, goals problem', discussions and interactions with stakeholders are required in order to identify goals and streamline stakeholder preferences (ibid). In addition, dialogue and interaction among stakeholders and decision-makers increases the chance that the stakeholders support the decision-making process. In 'unstructured' policy situations stakeholder involvement is both needed for retrieving specific information, identifying solutions, and gaining support. Runhaar and Driessen (2007) find that 'structured' policy problems do not necessarily require intensive stakeholder participation. When the decision-makers are certain about the manner in which the policy problem can be solved and the policy will not lead to conflicts regarding norms and values, a more traditional top-down SEA and decision-making process might be preferred. Stakeholder participation is in this case not necessary and would thus not be a cost-effective factor.

In addition, the authors argue that the characteristics of a decision-making process influence the potential value of a participative approach. When an interactive and deliberative approach is upheld, but the decision-makers do not acknowledge the stakeholders' and public's input, the actors might become frustrated which can, subsequently, negatively affect the efficiency of the decision-making process and increase the chance for policy paralysis (ibid).

Chapter Three

Research Strategy & Methodology

3.1 Introduction

The following chapter will elaborate on the methodological approach that is used in order to achieve the objectives of this research. Firstly, an overview will be given of the two research strategies: desk research and case study analysis (section 3.2). Secondly, a description of the research material used for this research is provided (section 3.3). Finally, it will be explained what methodology is applied for the attainment of each of the research objectives (section 3.4).

3.2 Research strategy

The research strategy encapsulates the decisions regarding the way in which the research is carried out (see Verschuren and Doorewaard, 2005). The research strategies chosen for this research are 'desk research' and 'case study analysis'.

Desk Research

A literature survey, an analysis of literature, was conducted in order to develop the SEA effectiveness assessment framework and the analytical framework consisting of factors that can influence SEA effectiveness. In addition, desk research has been carried out in order to determine 'formal conformity' effectiveness and to describe the implementation context of each SEA.

Case study analysis

In order to determine the effectiveness of the three SEAs, to describe their implementation context, and to identify the factors that influenced their effectiveness, a comparative, in-depth case study analysis has been conducted. A case study can be regarded as "an intensive study of a single unit for the purpose of understanding a larger set of (similar) units" (Gerring, 2004:342). One of the main strengths of a case study analysis is the depth of the analysis of the research object (ibid). Accordingly, "the value of a case study approach is that it has the potential to deal with the subtleties and intricacies of complex social situations" (Denscombe, 1998:35). The type of inference made about the cases will be descriptive, qualitative, and will focus on the comparison and interpretation of the results (see Verschuren and Doorewaard, 2005; Gerring, 2004). This research will have a small number of research cases, which is a characteristic of a case study analysis (Verschuren and Doorewaard, 2005).

A known weakness of the case study method is the limited empirical generalizability of the findings. This implies that the conclusions regarding the cases that are studied in this research cannot be extrapolated to the entire population from which the sample is drawn (Sharp, 1998). However, while the empirical generalizability of this research might be limited, theoretical generalizations can be made. Theoretical generalization implies that the case studies in this research can be used to test existing theories and hypotheses about SEA effectiveness and the factors that influence its effectiveness. If the case studies will confirm previous theories on SEA, the theories will gain further legitimacy (see Hillebrand, Kok, and Biermand, 2001). Theoretical generalization does not require a large N; one case would already be sufficient (ibid). The most important criterion for theoretical generalization is that the cases that are studied have features in common with the cases for which the theory was developed (Sharp, 1998).

3.3 Research material

The research objects²⁸ that have been studied in order to realize the research objectives are the SEA of the National Waste Management Plan 2002-2012²⁹, SEA of the Third Structure Scheme Electricity Supply 2008-2020, and the SEA of the National Water Plan 2009-2015. Several types of sources of knowledge have been used in order to retrieve information about the research objects and to subsequently fulfill the objectives of this research. A short description of each source of information is provided below.

Literature

In order to develop an assessment framework that could be applied in order to evaluate the effectiveness of the three SEAs and to explain their effectiveness, literature on SEA has been studied. Scientific articles and empirical studies on SEA were selected based on their provision of theoretical insights regarding SEA effectiveness.

Documents

Documents, including the SEAs of the National Waste Management Plan, the Third Structure Scheme Electricity Supply, the National Water Plan, and the draft and final versions of these plans, have been used as a source of information for this research. The advantage of using documents as a source of information is that it is an objective source. An analysis of documents was, among others, useful in order to verify the findings of the interviews (e.g., to assess 'formal conformity').

Interviews

There are different ways in which people can act as a source of information.

First of all, people can act as 'informants' when they "provide data about other people or about situations, objects, or processes" (Verschuren and Doorewaard, 2005: 116). For each SEA that has been assessed one or two informants have been interviewed. Information was gathered from the informants by means of exploratory, semi-structured interviews. Professionals working at the NCEA were the informants for this research. The professionals at the NCEA had reviewed the quality of the three SEAs that are studied in this research and therefore they have ample knowledge regarding the research objects. The informants were inquired about the main developments, issues, and stakeholders pertaining to the cases. In total, four informants have been interviewed.

Secondly, people can act as a source of information in the form of 'experts' and supply knowledge due to their experience in the field of SEA and knowledge about the topic (Verschuren and Doorewaard, 2005). The experts that have been interviewed were selected based on their expertise in SEA and influence and role in the SEA process. While an SEA is a complex procedure in which many people are involved, the interviewees had to have a holistic perspective upon the assessment process and its relation to decision-making ('helicopter view'). This is in line with the objectives of the research that requires an assessment of the entire SEA process and its influence on decision-making. In all, 19 people that fulfilled this criterion, and who were able and willing to participate in the research, were interviewed. The interviewees included five SEA-makers, six respondents from the competent authority (i.e., the respective Ministry that conducted the strategic plan), seven respondents from the NCEA, and one stakeholder³⁰ (see table 3).

²⁸ The research object can be defined as the phenomenon that will be studied by the researcher and about which statements will be made as a result of the research project (Verschuren and Doorewaard, 2005).

²⁹ It must be noted that this is not the most recent National Waste Management Plan (LAP). An SEA has not been conducted for the most recent plan: LAP 2: 2009-2021. The decision-makers of the LAP 2 have used the results of the SEA of the first LAP in order to develop the plan.

³⁰ The selection for stakeholders as interviewees was dependent on their interest in the plan and their reaction (on paper) on the SEA when it was open for public inspection. Of all the stakeholders that fulfilled these criteria and that have been contacted, only one was willing and able to cooperate in an interview. It must be noted that while this stakeholder was able to share his vision on the SEA, the context of the SEA, and environmental benignity of

In appendix A an overview can be found of the interview questions that were asked to the interviewees.

Type of interviewee	Competent Authority	SEA-maker	NCEA	Stakeholder	Informants	Total
Case Study						
a) SEA of the National Waste Management Plan	2	2	2	-	1	7
b) SEA of the Third Structure Scheme Electricity Supply	2	1	3	-	2	8
c) SEA of the National Water Plan	2	2	2	1	1	8
Total	6	5	7	1	4	23

Table 3. The amount of interviews conducted with different types of interviewees

3.4 Research Methodology

Below, the methodology that has been applied in order to attain the research objectives will be described.

3.4.1 Assessment of SEA effectiveness

In order to fulfill the second research objective, the determination of the effectiveness of the three SEAs, it had to be evaluated which SEA effectiveness levels the three SEAs have attained.

In line with the SEA effectiveness assessment framework, three levels of SEA performance have been operationalized: acquaintance, consideration, and consent. In order to conclude whether the first level of performance, 'acquaintance', has been attained it was determined whether decision-makers read and/or consulted information from the SEA during the decision-making process (see Faludi, 2000). The 'consideration' stage is reached when the SEA was used as a reference during the decision-making process to develop, review, and/or discuss the plan or plan alternatives. The final level of performance effectiveness, 'consent', is attained when the actors involved in the decision-making process have acknowledged the content of the SEA and are influenced by it. This can occur either when actors involved in the decision-making process (1) have learned more about the environmental implications of the plan and/or when (2) they have altered their visions regarding the plan as a result of the SEA. The operationalization of each level of performance effectiveness can be found in appendix B-I. All three levels relating to SEA performance effectiveness are determined by means of interviews with experts. The interview questions correspond to the operationalization³¹ of the levels of performance

the final plan, he could not respond to questions regarding the SEA process. Consequently, the outcomes of the interview could not be used to reflect on the influence of the 13 factors on SEA effectiveness.

³¹ Each level of SEA performance effectiveness corresponds to one or two interview questions (see appendix A-I).

effectiveness and regard the manner and extent in which the information provided by the SEA was used and has influenced the decision-making process. Conclusions concerning the attainment of each level of performance effectiveness are based on the level of inter-subjectivity of the responses: the agreement or consensus between the experts about the effectiveness of the SEAs (see Scheff, 2006). Yet, disagreement between experts regarding SEA effectiveness is, when applicable, also noted in the case studies.

As described in chapter two, three different levels of SEA conformance effectiveness can be identified: formal conformity, behavioral conformity, and final conformity. The evaluation of 'behavioral conformity' and 'final conformity' do not fall within the scope of this research.

'Formal conformity' refers to the changes made in the strategic plan as a result of the SEA. Whether or not the SEA effectiveness level 'formal conformity' is attained can be determined by means of a comparison of the draft strategic plan with the final strategic plan. The draft strategic plan can be regarded as the 'business as usual scenario' (BAU) or counterfactual, "an estimate of the circumstances that would have prevailed would the [SEA] not have been introduced" (Cummings, 2006: 7), and the SEA as the 'intervention' that is expected to have had an impact upon the strategic plan. This type of program evaluation has been chosen as it is quite common in policy evaluation studies and because it has been used in previous EA evaluation studies (see Runhaar & Driessen, 2007; Therivel and Minas, 2002; Fischer, 2002). Bias for other intervening factors that could have influenced changes in the final plan have been reduced by means of analysis of the SEA, references to the SEA report, and expert judgment. Evidently, it is possible that the SEA has been carried out as an integral part of the planning process and/or that the information in the draft plan was already in line with the SEA (e.g. the most environmentally friendly alternative is proposed in the draft plan). When these situations occurred it was not clear what the role of the SEA had been and it was "difficult to distinguish the changes made as a result of the appraisal from those made as a result of the normal plan-making process" (Therivel and Minas, 2002:82). Accordingly, in order to determine causal relationships between the SEA and alterations in the plan, references to the SEA in the (draft) plan were looked for, and interviewees were asked to elaborate on, or confirm, the changes in the plan due to the SEA. Once 'formal conformity' was determined, the environmental significance of the changes was established by means of expert judgment. The operationalization of 'formal conformity' can be found in appendix B-I.

The fifth level of the SEA effectiveness evaluation framework is 'behavioral conformity'. Attainment of this SEA effectiveness level implies that the (improved) policy measures that avoid, minimize, or offset adverse environmental effects are implemented accurately. In order to determine 'behavioral conformity' one has to assess how the plan has informed programs and projects and whether the policy proposals described in the plan are indeed implemented. Due to the long time scale, the importance of after-linked decision-making, and the fact that there are many other external factors that can influence the implementation of a plan, it was not feasible to measure the attainment of this SEA effectiveness level during this research.

The three SEAs that are analyzed in this research have also not been assessed on their attainment of 'final conformity': the protection of the environment as a result of the SEA. In order to be able do this it must be determined how the plan, that has become more environmentally friendly due to SEA, has influenced several environmental indicators. Unfortunately, the researcher neither had the resources, time, nor the capacity to evaluate this.

3.4.2 Evaluation of the factors that influence SEA effectiveness

The third research objective regards the identification of factors that have influenced the effectiveness of the three SEAs. Table 2 in chapter two provides an overview of the 13 factors deemed to be important for SEA effectiveness. The table provides the operational definition and indicators for every factor. In addition, the table provides an overview of questions that must be answered in order to determine the presence and/or quality of the factor. The information sources that were consulted in

order to determine the presence/quality of the factors (desk research, document analysis, or interviews) are also described.

To analyze the influence of the different factors on SEA effectiveness a four-level Likert scale has been used (see appendix A). The Likert scale is often used for survey research in favor of measuring respondents' perception concerning a topic. The Likert scale consists of ordered categories meaning that "the data in each category can be compared with data in the other categories as being higher or lower than, more or less than etc., those in the other categories" (Denscombe, 2003: 237). It must be emphasized that with ordinal data one cannot know the causes of the order or tell by how much the data differs from each other; "ranked order is all that can be inferred" (ibid: 238). Furthermore, it must be emphasized that the scores attributed to the factors reflect the opinions of the interviewees and are thus not absolute, but rather subjective, scores.

The respondents were asked to rank the importance of 13 factors for the effectiveness of the SEAs. They were able to rank the importance of the factors as not important (value 1), a bit important (value 2), important (value 3), or very important (value 4) for the effectiveness of the respective SEA. The definition of the different categories that was provided to the interviewees can be found below:

- Not important (value 1): the factor did not contribute to the influence that the SEA had on the decision-making process and/or the final plan (this factor is not important for SEA effectiveness)
- A bit important (value 2): the factor has facilitated or supported the SEA- and/or decision-making process but did not significantly contribute to the influence that the SEA had on the decision-making process and/or the final plan (this factor is a bit important for SEA effectiveness)
- Important (value 3): this factor contributed to influence that the SEA had on the decision-making process and/or the final plan (this factor is important for SEA effectiveness)
- Very important (value 4): the factor contributed significantly to the influence that the SEA had on the decision-making process and/or the final plan (this factor is very important for SEA effectiveness).

All the 13 factors were described on separate cards. After reading all the factors carefully, the interviewees were asked to place the cards upon the score sheet. When the respondent did not have knowledge about a certain factor, (s)he did not have to place to cards upon the score sheet. Furthermore, the cards had two sides: a green and a red side. The red side indicated that the factor was not (sufficiently) present and green implied that the factor was (sufficiently) present during the SEA process or in the SEA report³².

It must be noted that it has explicitly been chosen to use this format in order to rank the various factors instead of a questionnaire. When respondents are able to place the card upon a score sheet they have a holistic overview of their own answers and vision. Twelve experts from the NCEA, to which the methodology was presented, confirmed this assumption³³.

3.4.3 Classification of the SEA implementation context

The SEA implementation context of each SEA has been determined in order to be able to analyze its influence on the potential effectiveness of SEA and the factors important for SEA effectiveness. The SEA implementation context depends on (1) level of scientific certainty about the effects of the plan (2) consent on norms and values regarding the plan, and (3) the characteristics of the decision-making

³² For instance, in case the respondents believed that the factor 'stakeholder participation' was present during the SEA and was also very important for the effectiveness of the SEA they put the card, on which 'stakeholder participation' was stated, on the score sheet under 'very important' with the green side up. On the other hand, when the respondent felt that the factor was not present during the SEA-process but that this could have been very important for the SEA's effectiveness, (s)he will rank 'stakeholder participation' also as 'very important' but will put the red side up on the score sheet.

³³ On 07-03-2011 the research proposal and assessment framework were presented to experts working at the NCEA. The methodology and interview format used were tested among experts and feedback was provided.

process, which regards the "extent to which decision-makers are open to other [environmental] and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6). The SEA implementation context has been determined by means of desk research and interviews. Appendix B-II provides an overview of the operationalization of the SEA implementation context.

3.4.4 Identification of relationships

Several relationships had to be examined in order to answer sub-questions three, four, and five. In order to answer the third sub-question, relations between the thirteen factors and SEA effectiveness had to be appraised. The quantitative evaluations of the various factors and the qualitative answers provided by the interviewees have been used to do this. For each plan, the average score attributed to every factor has been calculated. Furthermore, the standard deviation and variance have been calculated in order to analyze how the data is dispersed. The standard deviation and variance provide an indication of the level of unanimity among the interviewees about the importance of the factor for SEA effectiveness. The qualitative answers provided by the respondents were used to reflect on the manner in which the factor influenced SEA effectiveness.

To answer the fourth sub-question, it had to be assessed whether the factors were equally important for the effectiveness of each SEA. A distinction is made between factors that are unanimous (there is no difference concerning the importance of a certain factor between the plans) and factors that are not unanimous (there is a difference concerning the importance of a certain factor between the plans) with regards their importance for SEA effectiveness. In the latter case, it is argued that the importance of the factor is plan- or context-specific. The distinction between unanimous and non-unanimous factors is based on the qualitative responses from interviewees and their rankings of the factors for SEA effectiveness. First, questions including "are the factors important for each SEA?" and "why was this factor more or less important for this SEA?" were helpful in order to determine whether the importance of a factor would differ per case. Second, in order to underpin the qualitative data retrieved by means of interviews, the differences in the rankings of the factors regarding their contribution to SEA effectiveness were consulted to assess whether a factor was more or less important for a certain SEA.

To be able to answer the fifth sub-question, it had to be assessed to what extent the SEA implementation context influenced the potential effectiveness of the SEAs and the factors important for SEA effectiveness. The establishment of relationships between factors important for SEA effectiveness and the SEA implementation context has been based on the qualitative data derived from the interviews. The answers to questions such as 'which of the factors identified as (not) important are dependent on the implementation context' and 'to what extent did the context of the SEA influence (the importance of) this factor?' were helpful for the researcher in order to identify relationships. Finally, relationships between the SEA implementation context and the potential effectiveness of SEA were established based on the qualitative data derived from the interviewees. After respondents had described and reflected upon the SEA implementation context, they were asked to assess to what extent the context had influenced the potential effectiveness of the SEA.

Chapter Four

Case Study I: The Strategic Environmental Assessment of the National Waste Management Plan

4.1 Introduction

The National Waste Management plan 2002-2012 (*'Landelijk afvalbeheer plan'*; from now on referred to as LAP, the Dutch abbreviation) falls under the responsibility of the Minister of Infrastructure and the Environment³⁴. The LAP replaced the Ten Year Program on Waste (1995-2000) and the Multiple Year Plan for Dangerous Wastes II (1997-2007). The LAP was valid from 2002-2006 and presented an outlook for waste management till 2012.

The LAP is both horizontally and vertically binding for governing bodies. This implies that both the Ministry of Infrastructure and the Environment and governing bodies responsible for the implementation of LAP are bound to its content³⁵. "Provinces, municipalities, and water quality managers have to use the LAP as a reference when they, amongst others, issue permits for waste processing facilities (VROM, 2007). Also, provinces and municipalities have to use the LAP as a reference for their own waste management plans.

The main objective of the LAP is "the prevention and reduction of environmental pressure caused by waste management" (ibid: 17). The LAP consists of three parts. The first part concerns the national objectives and principles for waste management in the Netherlands. This part, amongst others, describes different scenarios, national objectives, international aspects, and principles of waste management. The second part consists of the 'sector plans' for waste streams³⁶. Each sector plan describes the waste type(s) that it encapsulates and the minimum standard for managing these waste types(s). "The approach of setting minimum standards was developed to give the private waste processing market in the Netherlands as much freedom as possible: [...] a waste company can apply any technology it wants, as long as it scores equally or better than the minimum standards [from an environmental perspective]" (MEGJ/MIRI, 2003: 66). The third part of the NWP discusses capacity planning for waste incineration and landfilling.

4.2 The SEA of the National Waste Management Plan

Dutch EIA regulation states that an SEA needs to be conducted for waste management plans that set a concrete frame of reference for one or more of the following aspects: "(a) the method of processing or abating waste, (b) inserting or bringing waste into/onto the ground, or (c) the choice of locations for facilities regarding waste management "(AOO, 2002: 20).

In line with the aforementioned criteria, it is not mandatory to conduct an SEA of the first part of the LAP since it does not set a concrete framework for aspects relating to a, b, or c. It is mandatory to conduct an SEA of the sector plans. The reasons for this are twofold: first, they determine the techniques for waste processing and abatement; second, they set a frame of reference concerning the manner in which waste is inserted into the ground. It has also been decided to conduct an SEA for the capacity planning for waste incineration (ibid). This was required because it regards decisions relating to the bringing of waste into the ground. Furthermore, more information needed to be retrieved

³⁴ When the LAP was developed it fell under the responsibility of the Minister of Housing, Spatial Planning, and the Environment (Dutch abbreviation: VROM). However, in 2010 this Ministry merged with the Ministry of Transport, Public Works, and Water Management (Dutch abbreviation: V&W) and became the Ministry of Infrastructure and the Environment.

³⁵ See article 10.14 of the Dutch Environmental Management Act

³⁶ No sector plans are made for radioactive waste, dredged waste, manure wastes, and wastewater because other plans set a frame of reference regarding the processing techniques required for these wastes.

regarding the capacity needed for the incineration of waste in relation to the opportunities to apply the waste as fuel (ibid).

The SEA was conducted by the Waste Consultation Organ ('*Afval Overleg Orgaan*', Dutch abbreviation: AOO). This was a consultancy that had much experience with waste management and environmental assessments.

The 'Life Cycle Analysis' (henceforth referred to as: LCA) methodology was applied for the assessment. "LCA is an analytical tool specifically designed to assess the environmental impacts relating to the whole production chain of a good" (Tukker, 2000: 436). An LCA thus shows how each production stage, from production to disposal, influences the environment (VROM, 2002). An LCA consists of four main steps.

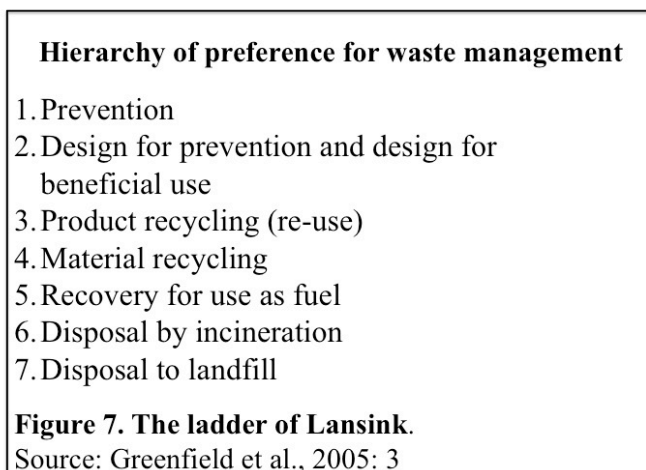
1. First, the goals of the LCA are decided; during this stage it is determined which phases of a production process will be analyzed and what unit of analysis will be upheld during the analysis.
2. The second step concerns the inventarisation of the effects; during this phase the environmental effects of a technique, during each 'production phase', are evaluated.
3. Third, the environmental effects are translated into effects on several environmental LCA themes.
4. The fourth step of the LCA regards the analysis of the results, during which the results are converted into the same unit of analysis and compared.

Several sources of information were used for the assessment including the experiences gained during the implementation of the previous National Waste Management Plans, the quantitative information derived from conducting EIAs, the studies from research programs, and the findings of various monitoring programs (AOO, 2002; MEGJ/MIRI, 2003).

The SEA of the minimum standards for the sector plans

A primary objective of the SEA was to provide information regarding environmental implications of various waste processing techniques in order to facilitate decision-making about minimum standards for the sector plans (AOO, 2002).

The LAP discusses the minimum standards for each waste processing method. The hierarchy of preference discussed in the LAP is in line with the 'ladder of Lansink'³⁷. The ladder of Lansink is a hierarchy of preference pertaining to waste management (see figure 7). It implies that the prevention of wastes and the design for prevention and beneficial use of waste are respectively the best types of waste management. Following, production recycling and material recycling are favored. Incineration with energy recovery that can be used as fuel can also be regarded as a form of re-use. When re-use of waste is not possible, waste should be disposed by means of incineration. Landfilling is the least favorable option for waste management (Greenfield et al., 2005).



³⁷ This ladder is named after the Dutch politician Ad Lansink, who in 1979 initiated this approach towards waste management in the Netherlands.

The LAP appoints the minimum standards for waste processing techniques in four manners: "

- as a step on the ladder of Lansink (e.g. useful application, incineration, or landfilling);
- as a part of the step of the ladder of Lansink (e.g., on the step useful application: product recycling, material recycling, or recovery for use as fuel);
- as an environmental norm that must be respected (e.g., the ratio of the energy retrieved or recycling output); or
- as a specific treatment method" (AOO, 2000: 13).

In order to determine which sector plans needed to be evaluated in the SEA several questions had to be answered. First, a distinction was made between wastes streams for which a minimum standard existed and waste streams for which a minimum standard had not yet been established. When a minimum standard existed for a waste stream, it was only necessary to establish a new standard in case "new scientific insights had been generated concerning techniques for waste management or disposal, new techniques had become operational, and/or problems had arisen during the implementation of the current minimum standard" (AOO, 1999). In case one of the above situations applied an SEA would be conducted. When a waste stream did not have a minimum standard, one of the following criteria had to be fulfilled in order to include it in the SEA: the current treatment method had to be unclear and inconsistent, there were uncertainties or problems regarding the environmental-hygienic implications of the treatment method, and/or no other regulations regarding the treatment of the waste stream existed (AOO, 1999). Based on the above criteria, 27 waste streams were included in the SEA.

The LCA evaluated the techniques on the following effects and respective 'LCA' themes (sub-points):

- "Climate change
 - greenhouse effect, effect on the ozone layer
- Acidification
- Eutrophication
 - water systems and land systems
- Dispersion
 - toxicity for humans, eco-toxicity for water systems, eco-toxicity for land systems, photochemical oxidants
- Use of resources
 - use of biotic and a-biotic resources
- Disruption
 - effects on biodiversity ecosystems, life support ecosystems, and landscape" (AOO, 2002:33).

Afterwards, different weightings were applied to the data in order to interpret the influence of the different techniques from various political perspectives (ibid). In total, five different weighting sets were applied: "(1) all six environmental themes are weighted as equally important; (2) all twelve LCA-themes weight equally important; (3) weighting is based on the relative contribution of an effect to a policy target ('distance-to-target'); (4) only the LCA-themes concerning 'the greenhouse effect' are weighted (due to the policy priority concerning energy reduction); (5) only the environmental theme 'dispersion' is weighted" (ibid: 34).

In addition to environmental effects, it was evaluated what the effects of the waste processing techniques would be on several aspects related to the Dutch economy including the use of space, energy, materials, water, mobility, and the amount of waste to be landfilled.

The SEA of the capacity planning for waste incineration

The Ladder of Lansink indicates that, from an environmental perspective, incineration and landfilling of wastes are least favorable. Yet, "removal is essential as it is necessary to destroy or confine wastes that cannot be re-used or recycled" (VROM, 2002: 19). At the time the LAP was written, the bulk of combustible waste was processed in special waste incineration facilities. These incinerators were suitable to incinerate heterogeneous, low-caloric waste (AOO, 2002).

Due to the increasing supply of combustible waste, there was insufficient capacity to incinerate all the waste and accordingly 40% of it was landfilled (ibid). The Dutch state aspired to stop the landfilling of

combustible wastes that could not be incinerated due to a lack of capacity for waste incineration. For that reason, it was proposed that the capacity for waste incineration in the Netherlands should be increased (MEGJ/MIRI, 2003). However, it was also recognized that when the capacity for waste incineration would be too large there would be no incentive for the prevention and recycling of waste (ibid).

All things considered, there was a need to assess to what extent expansion of the waste incineration capacity was necessary taking into account possibilities to recover fuel from combustible waste (AOO, 2002). In addition, it was important to evaluate how the energy efficiency level generated by waste incineration could be increased. Existing incineration facilities had an energy efficiency level between 22 en 27 percent (ibid). Separation of wastes would make it possible "to create fractions of wastes that have a higher calorific value, which [could] thus be offered to electricity installations that have a high net electric efficiency, such as a coal plants" (ibid: 204). In order to attain more insights regarding the above questions, it was decided to assess the environmental implications of various waste incineration scenarios.

The LCA only evaluated techniques that were at that moment commercially available and waste streams that contributed most to the surplus of combustible wastes (i.e. domestic, private, construction, and demolition wastes) (AOO, 2002). In total, five different scenarios were evaluated in the SEA (see table 4) (ibid). "The scenarios differ in the extent of division into high and low caloric waste streams and the type of waste processing" (ibid: 5). The alternative scenarios can be categorized as system alternatives since they regard rather strategic questions concerning technological options for waste policy in the Netherlands.

Due to the global character of many environmental effects, a simplified LCA was conducted (AOO, 2002). The scenarios were assessed on the following two aspects:

- Use of space for waste that is landfilled
- Process-related contaminations and emissions, i.e. NO_x, CO₂, CO, carbon hydroxides, NH₃, and dioxides.

Also, it was evaluated what the effect of the scenarios would be on the amount of space, mobility, materials, water, landfill sites, and energy demand³⁸.

Scenario	Description
One: <i>Maximum PPF</i>	Domestic and business wastes are separated in refuse-derived fuel (RDF) and organic wet fraction (OWF). Paper and plastic fraction (PPF) is removed from RDF and distilled in coal or cement ovens. The remains of the RDF and fermented/composted OWF are distilled into waste incinerators. Ballistic methods are employed in order to remove the PPF from the other waste streams
Two: <i>Variant of scenario one</i>	Similar to scenario one, only without fermentation or composting the OWF before the distillation in the waste incinerators.
Three: <i>maximal RDF</i>	The methods described in scenario one will be applied for waste streams from other business waste. Domestic waste is processed into RDF and assimilated in specialized (to be build) incinerators for high caloric wastes.
Four: <i>Integrated combustion</i>	The waste is integrally incinerated. The high caloric waste will be incinerated in specialized (to be build) incinerators for high caloric wastes and the low caloric waste will be incinerated into existing incinerators. The incineration capacity of the incinerators will be increased until there will be a balance between supply and capacity.
Five: <i>Status quo</i>	No extension of the incineration capacity. Continuation of the current situation. The excess of combustible wastes is landfilled.

Table 4. Different scenarios for the incineration of combustible waste.

Source: AOO, 2002: 25

³⁸ Amongst others " the reduced demand of primary resources and fuels because of re-use of waste and electricity and heat generation out of waste processing" was calculated (MEGJ/MIRI, 2003: 70).

4.3 Analysis of the SEA

Below the analysis of the SEA of the LAP is provided. As a point of departure, an overview is provided of the SEA implementation context. Subsequently, the effectiveness of the SEA of the LAP is determined. Following, it will be explained how different factors have influenced the effectiveness of the SEA. The analysis will conclude with a reflection on the outcomes of the case study analysis.

4.3.1 The SEA implementation context

The SEA implementation context consists of two aspects: the type of policy problem and the characteristics of the decision-making process.

The type of policy problem

Generally, there was consensus on norms and values relating to the policy issues of the LAP between stakeholders and decision-makers. The main objectives of the LAP were clear and decided: "the objective of the LAP is to determine the policy and management regarding the removal of [various] waste streams" (AOO, 2000:7). The LAP is focused on preventing and diminishing the environmental pressure resulting from waste management and there was not much conflict pertaining to this issue. Also, the approach of setting minimum standards was widely supported since this would give market parties the freedom to choose a waste processing technique. They were allowed to apply each technique that was, from an environmental perspective, in line with or better than the minimum standard.

There was limited scientific uncertainty about the environmental effects of the minimum standards. However, there was ambiguity regarding the feasibility of various minimum standards taking into account existing waste processing facilities and infrastructure. Accordingly, decision-makers required the knowledge and expertise of waste processing companies in order to determine minimum standards that were feasible.

Since the decision-makers were dependent on the stakeholders' knowledge and expertise in order to identify feasible 'means' to solve the problem (i.e. the identification of minimum standards) this policy problem has been categorized as a 'moderately structured, means problem' (see figure 8).

There was not much conflict in norms and values relating to the capacity planning of waste. Generally, there was consensus among decision-makers and stakeholders regarding the fact that landfilling of combustible wastes should be diminished. Uncertainty was inherent to capacity planning. Due to rapid changes in the structure of the European waste market it was difficult to predict what the implications of the scenarios would be. Accordingly, the policy problem pertaining to capacity planning for the incineration of combustible waste has also been categorized as a 'moderately structured, means problem' (see figure 8).

Characteristics of the decision-making process

The characteristics of the decision-making process depend on the "extent to which decision-makers are open to other [environmental] values and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6).

Respondents note that decision-makers were perceptive to environmental values during the decision-making process. Several respondents have emphasized that the LAP is an environmental plan since its objective is the reduction of environmental pressure caused by waste management. Accordingly, the consideration of environmental values is inherent to the LAP.

Furthermore, the decision-makers were willing to share decision-making powers during the development of the plan. The LAP was made during an interactive process in which a diverse array of actors was involved (AOO, 2002). The participation of key stakeholders (especially waste processing companies) was important due to the fact that the implementation of the LAP was dependent on their capacities and conduct.

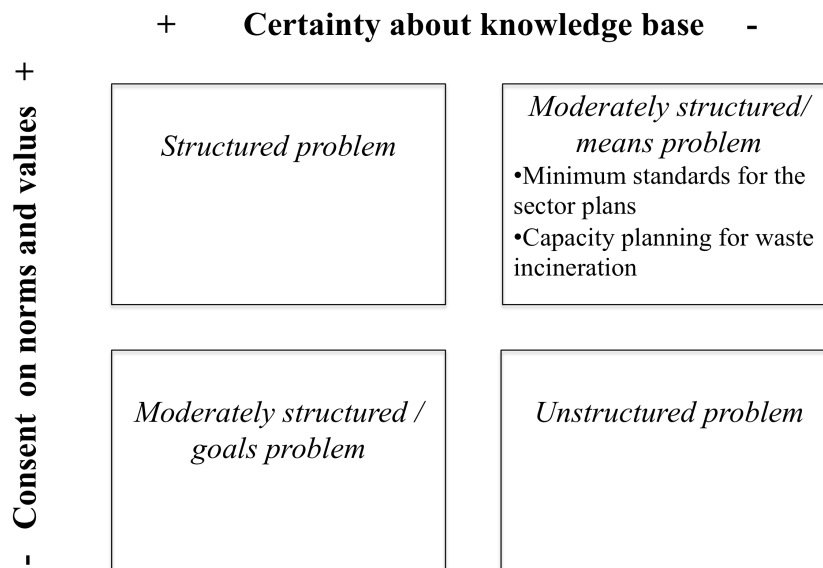


Figure 8. Types of policy problems in the National Waste Management Plan
Adapted from: Hoppe, 2002

4.3.2 The effectiveness of the SEA

In order to establish the effectiveness of the SEA it has been determined how, and to what extent, it has attained the different SEA effectiveness levels.

Acquaintance

To determine whether the first level of performance effectiveness, 'acquaintance', has been attained, it must be established whether the decision-makers have read and/or consulted the SEA during the decision-making process. All interviewees note that both the SEA of the minimum standards of the sector plans and the SEA pertaining to capacity planning have been read and consulted extensively during the planning process.

Consideration

In order to conclude whether the second level of performance effectiveness, 'consideration', has been attained it must be determined whether the SEA was used to develop, review, and/or discuss the plan or plan alternatives during the decision-making process or during subsequent decision-making processes.

The effects of the various waste processing techniques were evaluated parallel to the planning process and accordingly the SEA provided the decision-makers consistently with relevant environmental information needed in order to decide on the minimum standards. All interviewees note that the results of the LCA were used to develop, review, and discuss the different minimum standards. While the consideration of environmental aspects is inherent to waste management, the SEA forced the actors in the planning-process to take environmental aspects explicitly into account (MEGJ/MIRI, 2003). Overall, the SEA played a prominent role during the decision-making process regarding the minimum standards. This reflects itself in the documentation. In the plan, the reasons for the selection of a certain minimum standard are provided and references to the SEA are made (it is described what the outcomes of the SEA were, how they have been taken into account, and whether the final decision is in line with the findings of the SEA).

The SEA of the sector plans was also used during subsequent planning, namely the second National Waste Management Plan 2009-2021 (LAP II). Decision-makers used the SEA of the first LAP to make and justify decisions in the second LAP (ibid). Interviewees deem it plausible that the SEA of the first LAP was also used for the second LAP since LCAs are not dependent on geographical or

temporal aspects and therefore they remain valid and useable.

"The SEA for capacity planning [was] used to formulate policy for the capacity planning for incineration as a form of removal" (AOO, 2002: 3). However, interviewees note that while the SEA provided interesting information, it did not play a prominent role during the decision-making process; other political and economic discussions prevailed. During the decision-making process there were rapid changes in the structure of the European waste market (MEGJ/MIRI, 2003). New European regulations enabled a free market for high caloric waste and this made it difficult to plan and foresee the implications of capacity planning within one country (ibid).

Consent

The third level of performance, 'consent', is attained when the SEA has educated the actors involved in the decision-making process about the environmental implications of the plan and/or they have altered their visions concerning the plan.

With regards to the minimum standards for the sector plans, the interviewees believe that the environmental information often confirmed existing assumptions about the environmental implications of waste processing techniques. The SEA did give rise to new insights regarding the application of minimum standards in general. At the start of the planning process, the competent authority desired to set very detailed minimum standards (i.e. a specific waste processing technique). However, the results of the LCA indicated that many techniques would give rise to approximately similar environmental effects. "It proved hard to conclude which techniques were best from an environmental viewpoint [since] in many cases this depended on the applied weightings" (MEGJ/MIRI, 2003: 74). Due to this insight, the decision-makers decided to, in the majority of cases, determine a minimum standard as a step on the disposal ladder (i.e. useful application, incineration, or landfilling) or as a part of a step of the disposal ladder (e.g. for the step 'useful application: product recycling, material recycling, or re-usage as fuel) instead of selecting a specific treatment method. Thus, the LCA caused the decision-makers to apply a higher level of abstraction for the selection of minimum standards. In addition, the SEA indicated that one should not interpret, or apply, the ladder of Lansink too strictly. Decision-makers learned that recycling is not better than incineration for every waste stream. When energy is generated through waste incineration, and the energy efficiency level is high, incineration can be favorable from an environmental perspective too. Accordingly, while the ladder of Lansink is correct in most cases, there can also be situations in which the environmental implications of recycling and incineration are equal and in which one can thus deviate from the ladder. This insight caused decision-makers to look differently at incineration as a form of product re-use.

The SEA of the capacity planning for waste incineration gave rise to several insights. First, the assessment gave rise to awareness among decision-makers regarding the energy efficiency of various modes of waste separation and incineration. Second, while the Dutch state had decided that landfilling should be diminished, there were still discussions on whether landfilling would not be more profitable compared to waste processing. The LCA indicated that waste processing and re-usage of waste are more beneficial compared to landfilling when one takes into account the global environmental implications and cumulative economic effects.

Formal conformity

An overview of the attainment of 'formal conformity' of both the SEA of the minimum standards for the sector plans and the SEA of capacity planning for waste incineration is provided below.

Formal conformity of the SEA of the minimum standards for the sector plans

For 27 waste streams, the SEA was used to specify which waste processing technique should be favored from an environmental perspective (AOO, 2002). Appendix C-I provides an overview of the evaluation of the waste streams in the SEA and the technique that were selected as the minimum standards in the plan. It must be noted that the decision-makers used the SEA from the beginning to develop the plan and accordingly it is not deemed useful to compare the draft LAP with the final LAP

in order to determine the influence of the SEA. Therefore, the table shows the findings of the SEA and indicates how these are incorporated in the LAP.

The analysis of 'formal conformity' indicates that the majority of the minimum standards are considered best or acceptable from an environmental perspective. For several waste streams the plan does not designate one technique as the minimum standard but rather states that various techniques are allowed that belong to a specific step of the ladder of Lansink. This is due to the fact that the SEA did not indicate that one technique would be most environmentally friendly, which made it difficult to determine which technique ought to be preferred. However, because not one technique has been selected as the minimum standard it is difficult to determine 'formal conformity' in these cases. Nevertheless, in general, interviewees argue that the LAP has become more environmentally friendly due to the SEA (compared to a situation in which no SEA would have been conducted). Furthermore, when a minimum standard was selected that was not the most environmentally friendly waste processing technique, there were legitimate reasons for its selection. Accordingly, when the LAP does not conform to the SEA there is a deliberate departure from it.

Formal conformity of the SEA of the capacity planning for waste incineration

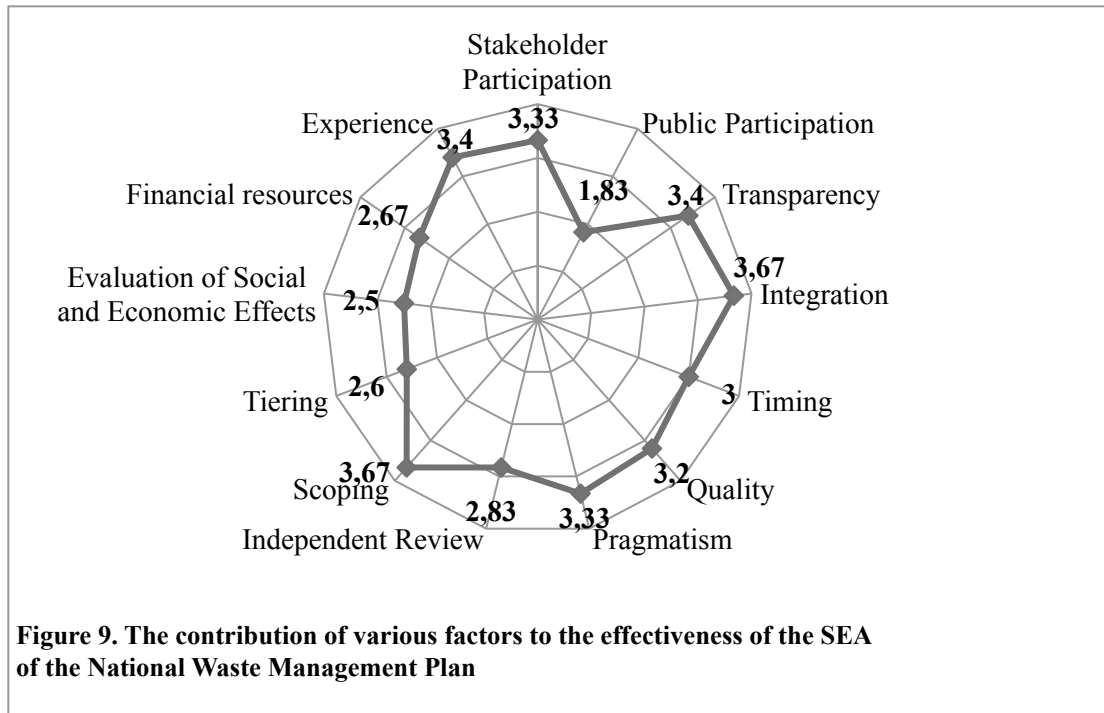
The policy of the LAP is aimed at ending the landfilling of waste that can be incinerated (VROM, 2002). Yet, an important constraint for capacity planning was that existing waste incineration capacity had to be used optimally. The SEA indicated that the separation of high-caloric waste streams into RDF and/or PPF and burning this into installations that have a high energetic efficiency should be preferred over the integral incineration of waste and landfilling (ibid). Thus, "the scenarios that support the separation of wastes [scenario 1,2, and 3] are best from all environmental perspectives" (ibid: 374). Especially scenario three, maximal RDF, scores very high. The SEA indicates that scenario five, the continuation of the status quo, scores worst with regards to effects on the environment. When this scenario is selected, waste cannot be re-used and needs to be landfilled (AOO, 2002).

"Based on the SEA results and consultation with the waste disposal industry the following policy line has been chosen: post-separation of waste, composting / fermentation, (high caloric) thermal processing"(VROM, 2002: 375). The policy is based on the PPF scenario and will ensure that "landfilling of combustible wastes shall be ended within the planning period" (AOO, 2002: 375). The selected policy did not require an extension of the capacity for incineration; capacity for post-separation of waste, integral composting, and fermentation did need to be expanded. Respondents noted that scenario three (the most environmentally friendly alternative) could not be selected because the Ministry of Infrastructure and the Environment wanted to make optimal use of existing incineration facilities (ibid).

4.3.3 Explaining SEA effectiveness

The following section will discuss how different factors have influenced the effectiveness of the SEA. Figure 9 provides an overview of the mean score that the respondents have attributed to various factors based on their contribution to the effectiveness of the SEA (appendix D-I indicates the standard deviation and variance of the responses³⁹). The factors will be discussed in order of importance.

³⁹ The standard deviation and variance indicate the degree of consensus among the respondents regarding the importance of the factors for SEA effectiveness.



Integration

Integration takes place when decision- and SEA-makers communicate with each other about their work and when the two groups co-operate during the planning process. All interviewees note that integration was very important for the effectiveness of the SEA (average score: 3,67). From the beginning until the end of the SEA there was ample interaction and cooperation between the decision- and SEA-makers. During the scoping stage, frequent interaction between the two groups was needed in order to ensure that the SEA-makers understood the decision-makers' needs. When the decision-making process started there was frequent exchange of information between the decision- and SEA-makers and the two groups were constantly updated and consulted about each other's work. Frequent communication was important since the decision-makers were dependent on the information provided by the SEA in order to make the plan. Decision-makers were especially dependent on the environmental data regarding the waste processing techniques. Integration was important for optimal use of the information in order to develop, review, and discuss minimum standards ('consideration'). In consequence, the SEA could influence decision-maker's knowledge base and visions ('consent') and, in turn, be used to develop the minimum standards ('formal conformity'). Respondents do note that while there was much cooperation and communication between plan- and SEA-makers, the two processes were separated from each other. This is considered important in order to ensure that the SEA-makers remain impartial and that the SEA report is objective.

Scoping

At the beginning of the planning process, decision- and SEA-makers collectively determined the likely extent and level of detail of the assessment and the information to be included in the SEA. All interviewees note that scoping has been very important for the effectiveness of the SEA (average score: 3,67). During the scoping stage it was determined which waste streams had to be included and which waste processing techniques would have to be evaluated in the SEA. Furthermore, it was determined that the LCA methodology would be applied for the assessment.

The scoping stage was very important for the efficiency of the SEA because it ensured that the assessment was fine-tuned to the decision-makers' needs. Accordingly, the SEA-makers were able to provide decision-makers with relevant environmental information. This allowed decision-makers to read, consult ('acquaintance'), and use ('consideration') the environmental data during the planning process.

Stakeholder participation

The participation of stakeholders was important for the effectiveness of the SEA (average score 3,33). Stakeholder participation occurred both during the SEA and during the planning process of the LAP.

During the SEA, the SEA-makers consulted several stakeholders (e.g. companies that were specialized in a certain waste processing technique) in order to retrieve specialized information from them concerning certain techniques. Once the SEA was finished, the background document and results were sent to stakeholders so that they could give feedback on the methodology and data. It must be emphasized that stakeholders did not conduct the SEA but they were requested to review the methodology and outcomes of the LCAs.

During the planning process there was participation by key stakeholders (including NGOs and the representatives of interest groups) in pursuance of the development of the minimum standards for the sector plans. They were invited to engage in roundtable meeting in order to discuss waste processing techniques and their implications (MEGJ/MIRI, 2003). During this stage, the stakeholders were invited to interpret and reflect on the outcomes of the SEA. It was discussed what minimum standard would be most appropriate taking into account the outcomes of the SEA, social and economic aspects, and current facilities and infrastructure for waste processing. It could be stated that stakeholder participation thus directly influenced the SEA effectiveness level 'consideration'. Stakeholder participation during the decision-making process was advantageous because it enabled decision-makers to discuss with them the feasibility of the various waste processing techniques and they could take their input into account in the final decision. Finally, stakeholder participation during the decision-making process was felt advantageous by the planners because it enhanced support and acceptance of the plan that was finally adopted.

Transparency

Transparency of the SEA of the LAP was important for its effectiveness (average score: 3,4). Both transparency of the SEA process and report were important. The SEA process was transparent since the roles and responsibilities of all the actors were clearly defined. This enhanced the efficiency of the assessment. Yet, respondents emphasize that especially transparency of the SEA report was important in this case due to the complex methodology applied for the assessment. The LCA method is a complex methodology and it requires the SEA-makers to make multiple choices and assumptions (NCEA, 2002).

Generally respondents consider the SEA report to be transparent because the content, method, and results of the SEA were explicitly described. For each waste stream the SEA provides an overview of the waste stream, the current waste processing technique, and the alternatives methods for processing the waste. The results of the LCA are described qualitatively and illustrated with various graphs and figures. Furthermore, various background documents are attached to the SEA, in which a more detailed (quantitative) analysis of the LCAs is provided. Unfortunately, "the database with the background data is for third parties difficult to access" (NCEA, 2002: 7) and this makes it difficult to test the outcomes of the LCAs.

The outcomes of the LCA of the scenarios for capacity planning are also presented in a clear and transparent manner. The environmental implications of each scenario are discussed and the findings are supported with graphs and figures.

All things considered, interviewees believe that the transparency of the SEA report has enhanced its credibility and consequently the willingness of decision-makers to read, consult, and use the SEA as a reference during the planning process ('acquaintance' and 'consideration'). It is argued by respondents that transparency of the SEA report increases in importance when the discussions and decisions are based on the SEA.

Pragmatism

A pragmatic SEA is deemed important for the effectiveness of the SEA (average score: 3,33). The SEA was pragmatic since the report was understandable for all decision-makers and stakeholders (also those without technical expertise regarding the plan) and adjusted to the decision-makers' needs. With regards to the latter, respondents judge that the SEA was tailored to objectives of the plan: "the procedural relation between the SEA and the LAP and their objectives are clear and transparent" (NCEA, 2002: 6).

With regards to the former aspect of pragmatism, interviewees believe that the SEA report was comprehensible for the actors involved in the decision-making process because it translated technical expert knowledge into information that was relevant for decision-makers. This is relevant because when the quality of the SEA is high but the decision-makers cannot comprehend or interpret the results, the outcomes of the SEA will not be used during planning processes, which will limit the chances that the final decisions will be based on the outcomes of the SEA ('formal conformity').

In sum, due to the fact that the SEA was understandable for decision-makers and adjusted to their needs, decision-makers read, consulted ('acquaintance'), and used the environmental data to develop the plan ('consideration').

Experience

Experience can relate to both the knowledge and practical wisdom of the SEA- and decision-maker regarding SEA in general and to experiences they gained during SEAs of similar plans. Especially the first aspect of experience was important for the effectiveness of this SEA (average score: 3,4). Experiences from SEAs conducted for previous waste management plans have not explicitly been used during the assessment.

Respondents believe that experience of the SEA-maker was important for this SEA because the LCA is a complex method. It was essential that experts with much experience and practical knowledge about this methodology conducted the assessment. At the start of the planning process, an agency started with the assessment that did not have experience in conducting LCAs. During the planning process the AOO, a consultant with much experience in conducting LCAs, continued with the SEA. The AOO's experience in LCA enhanced the quality and efficiency of the assessment. Due to the increased quality of the SEA caused by their experience, this factor indirectly contributed to SEA effectiveness (see the factor 'quality').

Quality

The high quality of the SEA was important for its effectiveness (average score: 3,2). A high quality SEA is based on scientifically valid data and applies a valid methodological approach.

All interviewees note that the LCA methodology was very practical for this SEA. The advantage of the LCA methodology is that it provides a very detailed overview of the whole life cycle of a specific technique and accordingly it allows one to have a comprehensive and holistic impression of the environmental implications of various policy measures. A disadvantage of the LCA methodology is that it is a rather complex method and therefore the results might not always be comprehensible for third parties. Moreover, one respondent argues that a risk of the LCA method is that one focuses too much on the technical discussions (e.g., 'the amount of numbers behind the comma') and disregards the broader perspective and objectives of the SEA.

Respondents note that the SEA has a good quality as it is based on valid data and because it applies a valid methodology. The independent review by the NCEA (2002) notes that while there are a small number of flaws in the SEA pertaining to the numbers and the presentation of the results, the conclusions remain in the majority of cases valid (ibid).

Taken as a whole, the high quality of the SEA directly enhanced decision-makers' ability to use the SEA to develop ('consideration') and decide on minimum standards and policy for capacity planning ('formal conformity'). Also, the high quality of the SEA of the sector plans contributed to decision-makers' ability to use the environmental data during the design of the Second National Waste Management Plan ('consideration').

Timing

The accurate timing of the SEA was important for its effectiveness (average score: 3). All interviewees note that the SEA started early and that the SEA and LAP were prepared simultaneously. Effective timing was important for the effectiveness of the SEA as it ensured that decision-makers had relevant environmental information on time and could use it as a reference during the decision-making process ('consideration'). Nonetheless, the SEA of the minimum standards for the sector plans has delayed the decision-making process slightly. An LCA requires much time and as a result the LCA outcomes of several waste streams was provided to the decision-maker too late. This delayed the decision-making process since the decision-makers were dependent on the outcomes of the LCA to make a decision. Yet, it must be emphasized that the delays during the assessment were caused by unexpected causes that could not have been anticipated.

Overall, it is concluded that an early start of the SEA allowed decision-makers to use the SEA during the decision-making process ('consideration'). Consequently, the environmental data provided by the SEA could influence decision-makers' knowledge, visions ('consent'), and decisions ('formal conformity') regarding the plan.

Independent Review

An independent body, the NCEA, reviewed the quality of the SEA of the LAP. Respondents believe that independent review positively influenced SEA effectiveness (average score: 2,83) since it guaranteed that the quality of the SEA report was sufficient (see factor 'quality').

Financial resources

Financial resources have positively influenced the effectiveness of the SEA of the LAP (average score: 2,67). Much financial resources were needed in order to conduct the SEA of the LAP and to fulfill its objectives. It is emphasized by respondents that a general disadvantage of the LCA methodology regards the fact that it requires much financial resources. Nonetheless, the financial budget of the SEA was sufficient in order to fulfill its objectives.

The majority of the respondents note that financial resources were indirectly important for the effectiveness of the SEA. They reckon that without a sufficient financial budget, the SEA-makers would not have been able to conduct such an extensive, detailed, and high quality LCA (see factor 'quality').

Tiering

Tiering is deemed to be (a bit) important for the effectiveness of the SEA (average score: 2.6). All interviews argue that tiering is very good in the LAP: the information in the SEA is directly linked to lower and more concrete decisions as it identifies clear links between the LAP and concrete projects. When an initiator implements elements of the LAP (e.g., realizes a waste processing facility) and decides on a location and a waste processing technique, the LAP and the SEA are very useful. One interviewee argues that waste-processing companies can consult the LAP in order to see which waste processing techniques are allowed. Also, when they conduct an EIA they can use the evaluation of the respective technique described in the SEA. For the EIA they would only have to add an assessment regarding the environmental effects of the selected location. If they want to apply a new technique, they can look at the SEA to compare the effects of the technique to the effects of the minimum standard. If the new technique gives rise to equal or less environmental effects, the technique will be permitted.

All in all, the direct links in the SEA to project decisions can enhance decision-makers' and waste processing companies' willingness to consult, read ('acquaintance'), and use ('consideration') the SEA at lower-level decision-making and EIA levels.

Evaluation of social and economic effects

Respondents argue that the SEA primarily focused on environmental effects. The SEA did provide a broad overview of how the waste processing techniques and scenarios for capacity planning would affect several criteria related to the Dutch economy. Yet, it is emphasized that the analysis of economic effects was marginal and the SEA of the LAP can therefore not be regarded as an 'integrated

assessment'. While the SEA of the LAP did not (extensively) evaluate social and economic effects, interviewees were inquired about the potential value of this factor. The opinions on this topic diverge (average score: 2,5). Some argue that it is not important to include social and economic effects in an SEA since these aspects are predominantly represented during planning processes. Other respondents maintain that an integrated assessment allows actors involved in the planning process to gain an understanding of the holistic and inter-dependent implications of the plan ('consent').

Public participation

In general, interviewees argue that public participation did not contribute to the effectiveness of the SEA (average score: 1,83). There had been public participation during the planning process and the public was able to react on the plan and SEA in January 2002 when it was made accessible for public inspection. The public was not involved in the SEA itself.

During the planning process several meetings were held in which citizens could participate and express their opinion regarding waste management. The public was presented with information, cases, and questions on which they could react. However, an interviewee notes that the public did not inform the decision-makers with much information that could directly be used for decision-making and accordingly public participation did not influence the planning process.

In addition, not many reactions on the SEA and LAP were received from the public when the two documents were open for public inspection. Consequently, the SEA has not been altered as a result of the comments received from the public. Generally, interviewees argue that public participation was not important for the quality and effectiveness of the SEA since it was a complex, detailed, and technical SEA for which much detailed and expert knowledge was required. Also, it is argued that public participation was less relevant because discussions regarding waste processing techniques and capacity planning are abstract and do not directly affect citizens. It is noted that on a project-scale when, amongst others, a location for a waste processing facility is selected, public participation is important for support.

Although public participation did not influence the effectiveness of the SEA, it is noted that it had an educational value; it taught the public about waste management. Furthermore, respondents note that public participation generally increases the legitimacy of the decision-making process.

4.3.4 Reflection on the effectiveness of the SEA

Performance effectiveness of the SEA of the minimum standards for the sector plans is high: the levels 'acquaintance', 'consideration', and 'consent' have all been attained. The SEA was actively used during the decision-making process in order to define the minimum standard for 27 waste streams ('consideration'). While in most cases the outcomes of the SEA confirmed existing notions regarding the environmental effects of waste processing techniques, it did give rise to several new insights ('consent'). In addition, the SEA indicated that it is often hard to conclude which techniques should be favored from an environmental point of view. Due to this new insight, the decision-makers decided to determine the minimum standard for many waste streams as a step on the disposal ladder, instead of selecting a specific waste processing technique. With regards to 'formal conformity', it is concluded that the SEA has influenced many minimum standards. The majority of the minimum standards are preferred or acceptable from an environmental perspective. In the LAP it is clearly described why a specific minimum standard has been selected and how the information from the SEA has influenced the decision. In case a minimum standard is selected that is not best from an environmental viewpoint, it is clearly explained which, and why, other factors prevailed during decision-making; there is thus a deliberate departure from the SEA. In sum, it is concluded that the SEA of the minimum standards for the sector plans has been effective. All levels of SEA performance effectiveness and 'formal conformity' have been attained.

The SEA of capacity planning for waste incineration had less influence on the planning process and its effectiveness is therefore mediocre. It did provide decision-makers with interesting information and gave rise to several insights ('consent'). The SEA, among others, indicated that waste processing and re-usage of waste is more profitable compared to landfilling. Yet, while the final decision in the LAP is preferable from an environmental perspective, respondents have emphasized that political and economic aspects prevailed when making a final decision regarding capacity planning.

When determining the effectiveness of the SEA of the LAP several aspects must be acknowledged.

First, respondents from the Ministry of Infrastructure and the Environment insist that the LAP is an environmental plan as it has the objective to "prevent and diminish the environmental pressure caused by waste management" (VROM, 2007: 17). Accordingly, an analysis of the environmental implications of the plan is inherent to the planning process of the LAP. One respondent appeared convinced that without the legal requirement to conduct an SEA the environmental effects would still be evaluated since the plan is aimed at reducing environmental pressure caused by waste management. The respondent believes that the plan would have looked exactly the same without the obligation to conduct an SEA. There is no consensus among interviewees regarding this issue. While all recognize that an SEA has less value for a plan in which environmental aspects are sufficiently acknowledged during the planning process, several respondents presume that the SEA would not be as detailed without the obligation to conduct an SEA.

A second aspect that must be acknowledged when determining the effectiveness of the SEA is that the SEA confined itself to only a small part of the LAP, namely technical options for waste management. While the SEA was used to evaluate rather strategic issues that significantly contribute to the impact of waste management on the environment, it is emphasized by several respondents that more strategic issues (e.g., the effects of imports and exports of wastes and a centralized or liberalized waste management approach) should have been evaluated in the SEA. One respondent notes: "the SEA definitely influenced the minimum standards, but the overall influence of the SEA remains limited to a few specific waste processing techniques". SEA-makers note that the SEA was not used to evaluate more strategic aspects (i.e. system alternatives) because of their interpretations of the EA legislation. Since an SEA needed to be conducted for decisions that set a concrete frame of reference for future activities, many aspects of the LAP were not evaluated in the SEA.

To conclude, the SEA of the LAP has been effective. The analysis indicates that the open decision-making process and the political motivation to take environmental values into consideration enhanced the SEA's influence on the planning process and decision. Also, the early start and the integration of the assessment in the planning process contributed to the usage of the SEA as a policy-developing tool, which enhanced its effectiveness.

Chapter Five

Case Study II: The Strategic Environmental Assessment of the Third Structure Scheme Electricity Supply

5.1 Introduction

The Structure Scheme Electricity Supply (Dutch abbreviation: SEV) is the Dutch National plan on the production of electricity, developed by the Ministry of Economic Affairs (Ministry of EZ), that sets the environmental and spatial conditions for electricity supply (see MEGJ/MIRI, 2003).

In 2006 the Ministry of Economic Affairs started the preparation of the Third Structure Scheme Electricity Supply (SEV III). It did this in cooperation with the ministries of Ministry of Housing, Spatial Planning, and the Environment (Ministry of VROM), the Ministry of Transport, Public Works, and Water Management (Ministry of V&W), and the Ministry of Agriculture, Nature, and Food Quality (Ministry of LNV). The SEV III was enforced in 2008 and will be valid till 2020.

The SEV III constitutes an overall revision of the SEV II. The SEV II dates back to 1994 when the state was accountable for the production and transport of electricity (EZ/VROM, 2006). Due to the liberalization of the electricity market in 1998, the SEV III has a different character. The centralized planning of electricity generation has been terminated and it is now the sector's own responsibility to, within the boundaries of the law, ensure the availability of sufficient electricity (EZ/VROM, 2008). For that reason, "the SEV III only steers on headlines regarding energy production" so that other actors (i.e., energy producers, provinces, and municipalities) have the liberty to make, and will be responsible for, their own decisions (ibid: 15).

With the SEV III the Cabinet aims to certify that sufficient space and locations are available for power plants and electricity facilities. The potential locations for power plants and tracks are derived from the SEV II. In order to develop SEV III it had to be evaluated whether it was reasonable to maintain the locations identified in SEV II based on social, economic, and environmental grounds.

In overall, the SEV III addresses three issues:

- Existing and new locations for electric power plants that can revive at least 500 MW
- Global tracks for HVs with a power of at least 220 KV
- Potential landing sites for connections with wind-energy locations at sea.

Energy producers may only establish a power plant, HV track, or landing site for wind-energy on the locations identified in the SEV III. It must be noted that the SEV III does not relate to the implementation and design of concrete projects. In order to realize an electricity facility, subsequent decision-making and EIAs at provincial and local level are required concerning the exact location/track and project design (ibid).

5.2 The SEA of the Third Structure Scheme Electricity Supply

The SEA evaluated what the environmental effects of electricity facilities at various locations would be. Thus, the SEA of the SEV III evaluated site alternatives (see Stoeglehner, 2010). All in all, the SEA of the SEV III consists of three parts:

- The SEA of locations for power plants, HV tracks and landing locations for wind-energy
- The SEA of the warrant policy for nuclear energy
- The appropriate assessment (AA) of the locations for power plants, HV tracks, and landing sites for wind-energy.

Each part of the SEA was conducted by a different consultancy. The consultancy 'Royal Haskoning' conducted the first part, the consultancy 'Witteveen and Bos' carried out the second part, and the consultancy 'Arcadis' performed the third part of the SEA.

The SEA of the locations for electricity facilities

In the SEA, "the various locations constitute different alternatives" (Royal Haskoning, 2006: 128). The status quo (i.e., the situation without the developments) was considered the reference point for the evaluation (ibid). The locations and tracks were evaluated on the following themes and criteria (sub-points):

- "Ground and surface water
 - environmental protection areas, surface water
- Living environment
 - air quality, noise, external safety
- Nature
 - nature protection sites (including Natura 2000 sites), the Ecological Main Structure (EMS), foraging sites for wader birds and geese
- Landscape, cultural-history, and archaeology
 - valuable landscape sites, valuable cultural-historical sites, valuable archaeological sites
- Other aspects
 - possibilities for CO₂ usage and storage, opportunities to use the residual heat, opportunities for transport of waste streams" (Royal Haskoning, 2006: 3)

The interpretation of the effects was determined by means of expert judgment (ibid).

The SEA of the warrant policy for nuclear energy

The Netherlands has a warrant policy with regards to nuclear energy generation, which implies that at the sites designated as warrant locations "no developments may occur that can hinder or halt the construction of the nuclear power plants" (Witteveen and Bos, 2008: 1).

Since the warrant policy sets a frame of reference for future conduct an SEA needed to be conducted. The SEA evaluated what the effects of the warrant locations would be on their surroundings during calamities and during the design, operation, or demolition of the nuclear plant. The warrant locations were assessed on several criteria⁴⁰ relating to its affects on various aspects (Witteveen and Bos, 2008: 17-18):

- Constraints that every location needed to fulfill
 - location is not situated within 5 km of a populous area
 - Feasibility of the execution of disaster prevention measures
- Criteria with regards to safety
 - weather circumstances
 - ground stability
 - cooling water
 - explosion risk
 - hazards from crashes
 - nautical safety
- Criteria concerning effects on the environment.
 - radiation
 - food chain
 - general nuisance
 - destruction or degradation of valuable nature sites
 - destruction of large amounts of (water) organisms
 - ground- and groundwater contamination
 - dissemination of pollution
 - dumping of cooling water on the freshwater reserve

⁴⁰ The SEA evaluated the locations based on the assumption that third or fourth generational nuclear reactors would be build (see Witteveen and Bos, 2008). Also, it is assumed that all stations will conform to the following legislation and standards: the Nuclear Energy Directive, the 'Decision Nuclear Plant, Fuel and Ores', and the 'Decision Radiation Safety' (ibid).

- Opportunities to omit cooling water
- Degradation of archaeological- and cultural history
- Degradation of landscape

For the evaluation a three-point scale was upheld in order to evaluate the warrant locations: the location scores good on the criteria (value 2), the location scores less good on the criteria (value 1), and the location scores poorly on the criteria (value 0) (ibid). When a location would not fulfill the minimum constraints the Ministry would be obliged to delete it as a warrant location (Witteveen and Bos, 2008).

The Appropriate Assessment

The AA determined whether the locations for electricity facilities could significantly affect locations designated by the EU Bird- and Habitat Directive (i.e., Natura 2000 sites). As stated above, the SEA examined the global effects that potential locations electricity facilities could have on the environment. When the SEA indicated that a location could potentially have an influence on Natura 2000 sites, an AA had to be conducted⁴¹.

The locations and HV tracks were assessed on several criteria:

- use of space
- cooling water
- noise
- light
- movements
- barrier effect
- clouding
- drought
- aesthetic value

In the AA report, a distinction is made between effects that would occur during the construction of the facility and effects that would occur during the operation of the facility (Arcadis, 2007).

Whether or not 'significant' effects can occur on a Natura 2000 site is dependent on the site's 'conservation objectives'. These objectives are related to the species and habitats that are preserved in the area and it is thus important that the electricity facilities will not negatively affect the respective species and habitats (ibid). The effects are significant when the objectives cannot be achieved due to the activities managed by the SEV III (ibid).

It must be noted that the exact environmental effects on Natura 2000 sites were difficult to predict because these are dependent on, among others, the exact location of the facility and the fuel mix for electricity generation. Accordingly, the AA functioned as a warning system. For each location and type of electricity generation (coal, gas, and nuclear energy) it was concluded that (1) effects would not occur, (2) effects could not be excluded, or (3) effects would definitely occur (Arcadis, 2007).

5.3 Analysis of the SEA

Below the analysis of the SEA of the SEV III is provided. As a point of departure, the SEA implementation context of SEV III is described. Second, the effectiveness of the SEA is determined. Finally, it will be explained how different factors have influenced the effectiveness of the SEA.

⁴¹ When the SEA indicated that a location would score poorly on one of the following criteria an AA needed to be conducted: "presence of acidification sensitive sites within an area of 10 km, dumping of cooling water within a nature protection zone, occurrence of nature protection sites with light and sound sensitive species within an area of 1 km, fragmentation of the ecological main infrastructure or other protected nature sites, due to an electricity facility on the location" (Arcadis, 2007:55).

5.3.1 The SEA implementation context

The SEA implementation context consists of two aspects: the type of policy problem and the characteristics of the decision-making process.

The type of policy problem

Respondents from the Ministry of Economic Affairs regard the policy problem addressed in the SEV III to be structured. They argue that the objectives of the SEV III were clear and that there was not much debate about the policy issues. Furthermore, there was limited scientific uncertainty about the global environmental effects of electricity generation on the various locations.

While respondents from the Ministry of Economic Affairs deem that the policy problem dealt with in the SEV III was structured, interviewees from the NCEA and several stakeholders argue that the SEV III addressed a 'moderately structured, goal problem'. While there might not have been much conflict in norms and values pertaining to the respective locations for electricity facilities, there was no consent on the underlying values regarding the capacity and type of electricity generation in the Netherlands. Several respondents insist that the policy problems dealt with in the SEV III were framed in such a manner causing there to be limited room for debate. The scope for discussion had significantly been narrowed down since it had yet been determined that no choices regarding the type and capacity of electricity generation were to be made because electricity producers should have the liberty to decide on these aspects.

Several respondents consequently argue that the values underlying the SEV III are one-sided. "The collective values [promoted in the SEV III] appear to be mainly focused on short-term [economic] growth and the long-term implications for the environment play a secondary role" (12 Provinciale Milieufederaties, 2008: 1). The above quote reflects that values and norms regarding energy policy in the Netherlands conflict. Topics that are contested include 'coal-fired power plants', 'nuclear energy', and 'capacity for electricity generation'.

The Dutch government has responded to the above, and similar types of criticism, by stating that the objectives of the SEV III are in line with those determined in the Energy Report of 2008 and that the measures proposed in the SEV III aim to translate these objectives into concrete actions. The Energy Report is a document that the Dutch Government publishes once in four years that describes visions and objectives regarding energy policy and management in the Netherlands. In the Energy Report of 2008 it is acknowledged that many challenges, such as the increasing demand for energy and the need for renewable energy generation, must be solved the following years. The Energy Report does not propose many concrete actions. Rather, it describes the global objectives of the Dutch government regarding energy policy. The Energy Report states that CO₂ emissions must decline with respectively 30 and 50 percent in the years 2020 and 2050. Furthermore, the generation of renewable energy must be 20 percent in 2020 and 40 percent in 2050.

Several respondents are of the opinion that the SEV III constituted a good opportunity to enhance the chance that national objectives regarding renewable energy would be attained. They insist that even in the context of a free energy market, the government can still direct and guide market parties by means of setting guidelines and constraints regarding the type of, and capacity for, electricity production.

To conclude, while there is not much conflict regarding the policy points discussed in the SEV III (i.e. locations for electricity production), there is no consent on norms and values concerning the policy and management perspectives that the SEV III implies. Accordingly, it is concluded that while the policy issues described in the SEV III are structured, the foundation on which the policy issues are based is a 'moderately structured, goal problem'.

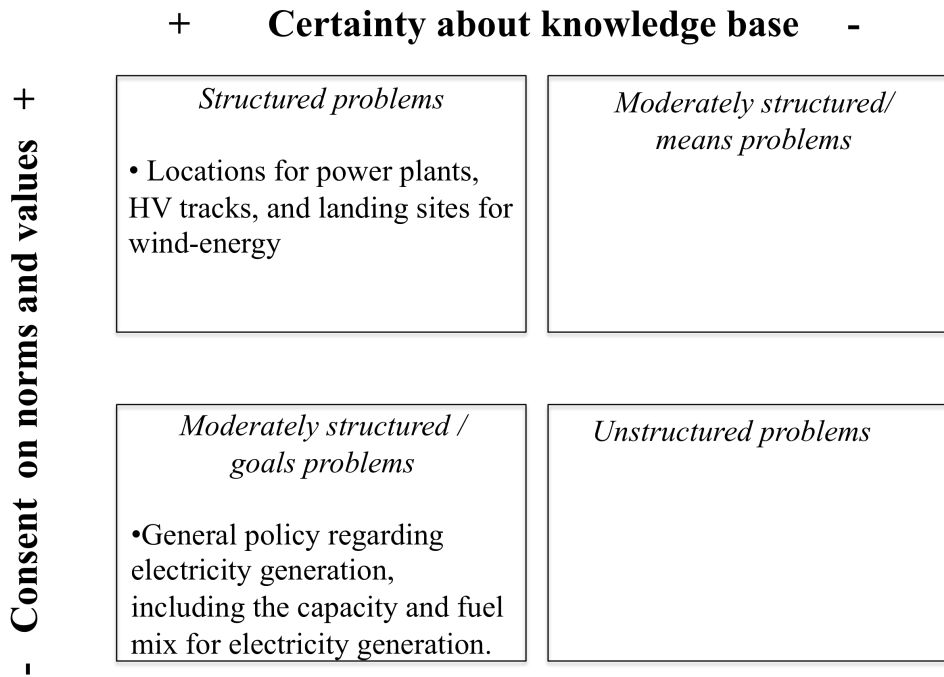


Figure 10. Types of policy problems in the Third Structure Scheme Electricity Supply

Adapted from: Hoppe, 2002

Characteristics of the decision-making process

The characteristics of the decision-making process depend on the "extent to which decision-makers are open to other [environmental] and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6).

It is questioned whether the decision-makers were willing to take environmental values into account during the planning process. "The objective of the SEV III is to guarantee sufficient space for large-scale electricity production and the transport of electricity" (EZ/VROM, 2009: 5). The SEV III does not have environmental objectives. Furthermore, several stakeholders deem that environmental values play a secondary role in the plan (see 12 Provinciale Milieufederaties, 2008).

Based on the interviews and desk analysis it is determined that the decision-making process of the SEV III must be characterized as 'closed'. There was only one formal opportunity for the public and stakeholders to react on the plan. Several respondents believe that the chances for participation were too limited. For instance, the Twelve Provincial Environmental Federations argue that the availability of information regarding the SEV III was not sufficient and that hearings about the plan were limited. "This [...] gives rise to the fact that part of the citizens deflect from politics and believe that decisions are made exclusively by the competent authority" (12 Provinciale Milieufederaties, 2008:1).

Interviewees from the Ministry of Economic Affairs emphasize that a participatory process was not considered necessary because the objectives of the SEV III were known. The main tasks of the SEV III and SEA were to evaluate whether potential locations for electricity facilities fulfilled necessary criteria and respected environmental legislation; this does not require much debate and interaction with stakeholders and the public.

5.3.2 The effectiveness of the SEA

In order to determine the effectiveness of the SEA it is established whether, and how, it has fulfilled the various SEA effectiveness levels.

Acquaintance

In order to establish whether the first level of SEA effectiveness, 'acquaintance', has been attained, it must be determined whether the decision-makers read and/or consulted the SEA during the decision-making process. Interviewees from the Ministry of Economic Affairs have confirmed that this was the case.

Consideration

The second level of SEA effectiveness, 'consideration', is attained when decision-makers used the SEA as a reference during the plan-making process to develop, review, or discuss the plan and plan alternatives.

As said, in order to formulate the SEV III, it had to be established whether the locations for electricity facilities described in the SEV II could be maintained. The SEA of the SEV III was thus conducted when the concept plan was already completed and could thus only be used to evaluate pre-selected locations. The decision-makers used the information provided by the SEA to determine whether the construction and operation of electricity facilities at the locations would not violate environmental- and nature legislation (NCEA, 2009). When the SEA and AA would indicate that Natura 2000 sites would be significantly affected due to an electricity facility nearby (taking into account the possibility to implement mitigation and relapse measures), the location would be omitted from the SEV III. When the assessment indicated that an electricity plant or track would give rise to negative environmental effects, but that these would not necessarily violate environmental- and nature legislation, the decision-makers did not alter the SEV III. When the SEA pointed out that the effects on Natura 2000 areas would depend on the type of project (fuel-mix and capacity for electricity generation), energy producers had to take this information into account during subsequent project-design.

Based on the above analysis, it is concluded that the attainment of the effectiveness level 'consideration' is limited for the SEA of the locations for power plants, HV tracks, and landing sites for wind-energy. The SEA was utilized to validate whether the locations in the SEV III would not violate environmental- and nature legislation, but not used to make a selection of locations that would be favored from an environmental perspective.

The SEA of the warrant policy for nuclear energy has been used more explicitly as a reference during the decision-making process. During the implementation of SEV II more and more discussions arose concerning the suitability of two locations for the generation of nuclear energy. Interviewees from the Ministry of Economic Affairs argue that in the SEV III a definite decision had to be made about the two locations. The information provided by the SEA was used to feed discussions and make a final decision regarding the respective locations.

Consent

The third level of performance, 'consent', is attained when the SEA has educated the actors involved in the decision-making process about the environmental implications of the plan and/or they have altered their visions concerning the plan as a result of the SEA.

Interviewees from the Ministry of Economic Affairs note that the SEA of the locations for electricity facilities has informed decision-makers about the environmental implications of the plan. An important new insight concerns the negative effects of all locations on surface water due to insufficient cooling capacity or opportunities to dump water. Another important insight regards the fact that 20 locations could possibly affect nature protection sites (Royal Haskoning, 2006).

The SEA of the warrant policy has led to new insights and understanding regarding the suitability of the locations 'Westelijke Noordoorspolderdijk' and 'Moerdijk' for the generation of nuclear energy. The SEA indicated that the locations would not fulfill all (necessary) criteria.

Formal conformity

Below an overview is provided of the 'formal conformity' effectiveness of the SEA. The level 'formal conformity' is attained when the plan has changed as a result of the SEA and when the changes make the plan more environmentally benign. 'Formal conformity' has been established for four aspects

discussed in the SEV III: locations for power plants, HV tracks, landing sites for wind-energy, and nuclear power plants. The findings are summarized in appendix C-II.

Locations for power plants

The SEA indicated that at 20 locations the construction and operation of electricity facilities would likely negatively affect nature protection sites. Consequently, an AA was conducted for these locations. The AA evaluated the environmental effects of the locations in more detail and determined whether mitigating measures existed that could reduce potential negative effects.

Based on the results of the SEA and the AA, no locations and tracks for energy production have been removed from the SEV III⁴². Interviewees from the Ministry of Economic Affairs emphasize that the SEA report provides a nuanced overview; exact environmental effects depend on the location and type of project. Furthermore, due to relapse options regarding space reservations, capacity, and fuel it was concluded during the planning process that none of the respective locations would definitely harm Natura 2000 sites and accordingly none of the locations was omitted from the SEV III.

While the SEV III has not been altered due to the SEA, the NCEA argues that a selection could have been made of the locations that should, from an environmental perspective, be prioritized or deleted from the list (see NCEA, 2009).

HV tracks

The SEA and AA indicated that that many tracks would likely negatively affect nature conservation sites, cultural-history and archaeology sites, and landscape (Royal Haskoning, 2006). In the final SEV III only one track, the track Zaltbommel-Arkel, is omitted from plan⁴³ because it passes through an important bird area (see Royal Haskoning, 2006). In order to establish formal conformity a causal link between the SEA and the alteration must be made and the alteration must be significant from an environmental perspective. While the alteration is environmentally significant, a causal relation between the SEA and the alteration cannot be established because the SEV III does not refer to the SEA report. In addition, respondents were also not able to reflect on this change.

The SEV III does not motivate why only one track is omitted from the SEV III. The NCEA notes that based on the results of the SEA, a selection could have been made of the tracks that should be favored or omitted from the SEV III (NCEA, 2008).

Landing sites for wind-energy

The SEA report indicates that all the designated landing locations for wind-energy score poorly on the criteria 'ground' and 'nature'. Almost all locations are situated near nature protection sites or sites that have an important cultural-historical and archaeological value. The report does emphasize that the effects on nature will mainly occur during the construction and will therefore be temporarily. Furthermore, effects can be mitigated and partly prevented by means of careful selection of the exact locations.

The SEV III states that based on the SEA no conclusions can be drawn with regards to the suitability of the locations. "The concrete environmental effects are dependent on the manner in which the landing locations will be used and the mitigating measures that will be implemented" (Royal Haskoning, 2006: 64). The SEV III has therefore not been changed as a result of the SEA.

⁴² With regards to locations for power plants, five locations are omitted from the SEV III (Hunze, Dodewaard, Waalhaven, Merwedehaven, and IJmuiden) and consequently they are no longer a potential location for energy production. The respective five locations are, however, not evaluated in the SEA or the AA and accordingly a causal connection between the SEA and the omissions of the five locations cannot be made. It is argued that the locations are deleted due to their disadvantages compared to other locations.

⁴³ In addition to the track Zaltbommel-Arkel, ten other HV tracks have also been omitted from the SEV III. However, these locations were not evaluated in the SEA and accordingly no causal relationship can be established between this alternation in the SEV III and the SEA. The HV tracks must have been omitted from the SEV III due to other reasons.

Warrant locations for nuclear energy.

The SEA indicated that the warrant location 'Moerdijk' does not fulfill all minimum constraints due to the fact that it is located relatively close to a populous area and because preventive measures for disasters are difficult to execute. The location 'Westelijke Noordoostpolderdijk' scores, compared to the other locations, less good with regards to the criteria: 'food chain', 'nuisance', and 'dumping of cooling water on a freshwater reserve'. The other locations (Borssele, Eems, Maasvlakte) sufficiently fulfill all the minimum constraints and criteria.

As a result of the information provided by the SEA, the competent authority has decided not to maintain the locations 'Moerdijk' and 'Westelijke Noordoostpolderdijk' as warrant locations for nuclear energy. In order to establish 'formal conformity' a causal link between the SEA and the change must be made and the alteration must be significant from an environmental perspective. With regards to the former criterion, it is emphasized by a respondent from the Ministry of Economic Affairs that the modification is the result of the SEA but that there were already a lot of uncertainties and discussions regarding the suitability of these two locations before the SEA was conducted. With regards to the latter criterion, interviewees note that this change is significant from an environmental perspective. In view of this, it can be concluded that there is 'formal conformity' with regards to two warrant locations for nuclear energy.

5.3.3 Explaining SEA effectiveness

The following section will discuss how different factors have influenced the effectiveness of the SEA. Figure 11 provides an overview of the mean scores that respondents have attributed to the importance of various factors for the effectiveness of the SEA of the SEV III (appendix D-II provides an overview of the standard deviation and variance of the responses⁴⁴).

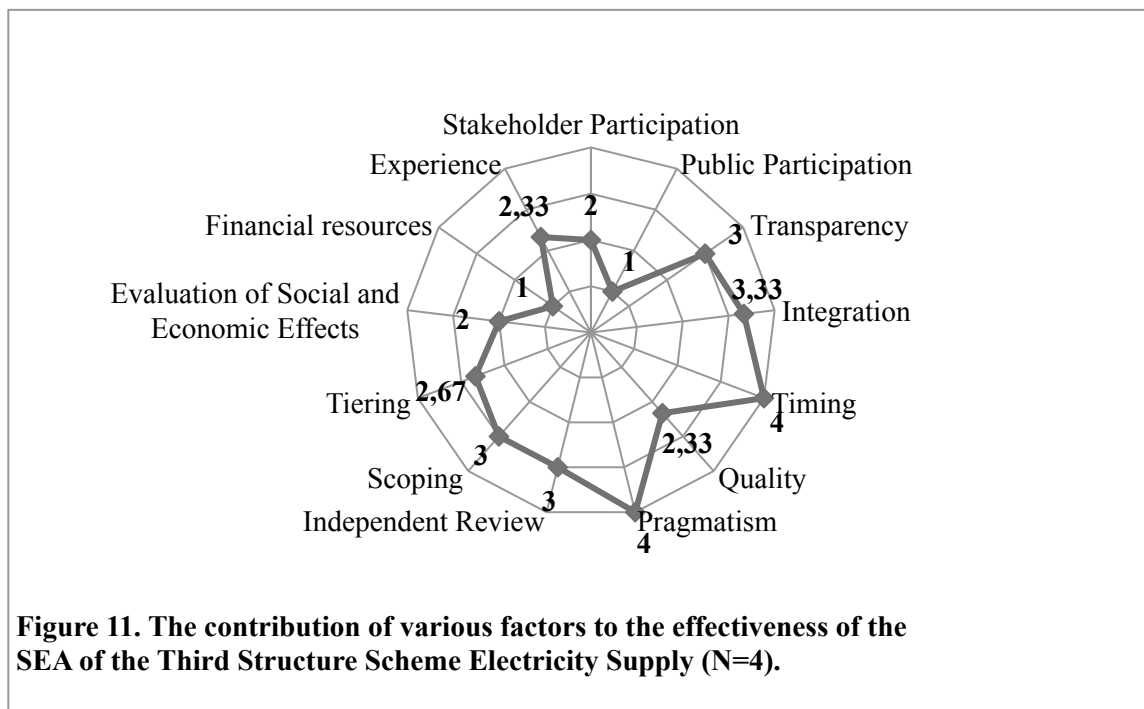


Figure 11. The contribution of various factors to the effectiveness of the SEA of the Third Structure Scheme Electricity Supply (N=4).

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⁴⁴ The standard deviation and variance indicate the degree of consensus among the interviewees regarding the importance of the factors for SEA effectiveness.

⁴⁵ Two of the six interviewees were not able to rank the relevance of the factors for SEA effectiveness.

Timing

All respondents consider timing to be very important for the effectiveness of the SEA (average score: 4). Yet, it is believed that the timing of the SEA in relation to the decision-making process was not optimal. The concept SEV III was finished when the SEA started and consequently the SEA could not be used to guide the decision-making process. An SEA-maker argues that an earlier start would have allowed decision-makers to use the information more explicitly during the decision-making process to develop and discuss policy alternatives ('consideration'). Subsequently the SEA could have influenced more visions ('consent') and decisions regarding the plan ('formal conformity'). However, it must also be recognized that when there is no will to use the SEA to make environmentally friendly decisions, effectiveness is limited regardless of accurate timing.

Pragmatism

Respondents from the competent authority consider the SEA report to be very pragmatic; the SEA provides information that is adapted to the decision-makers' needs and it is understandable for all actors involved in the decision-making process. It is stated that the pragmatism of the SEA report was important for the effectiveness of the SEA (average score: 4).

First, the SEA was pragmatic since it was adjusted to the decision-makers' needs. As said, the SEA evaluated whether locations would violate environmental legislation or not. The decision-makers required the outcomes of the SEA in order to ascertain that the locations would respect environmental legislation.

Second, the SEA is practical and comprehensible. The SEA and AA report discuss each location separately. The SEA provides a clear overview of the environmental effects of each location. It is described in detail how the locations score on various environmental aspects, such as ground and surface water, living environment, nature, landscape, cultural history, and archaeology.

The SEA report's pragmatism influenced decision-makers' willingness and ability to read, consult ('acquaintance'), and use the report to review the locations ('consideration'). In addition, it enhanced (and will enhance) the energy producers' usage of the SEA during subsequent project decision-making and EIAs ('consideration').

Integration

All interviewees believe that 'integration', the communication and cooperation between the SEA- and decision-makers during the planning process, is important for SEA effectiveness (average score: 3.33). Nonetheless, it was not possible to integrate the SEA into the planning process because the SEA started when the concept of the SEV III was almost finished. One interviewee believes that cooperation between the SEA- and decision-makers during the planning process could have triggered and facilitated discussions regarding the environmental implications of the policy outlined in SEV III. Furthermore, the environmental data could have been used as a reference to develop policy ('consideration'), which in consequence could have altered visions ('consent') and decisions ('formal conformity') regarding the plan.

There is no consent among respondents concerning the quality of communication and cooperation between the SEA- and decision-makers during the assessment process. Respondents from the Ministry of Economic Affairs argue that cooperation between the SEA- and plan-makers was good and believe that SEA-makers were always informed about developments that occurred during the decision-making process. An SEA-maker, however, considers that there was insufficient interaction between the SEA- and decision-makers and that the actors were not sufficiently involved in each other's working process. The respondent judges that the SEA had for that reason limited influence on the planning process. Furthermore, the lack of cooperation decreased the cost-efficiency of the assessment process.

Transparency

All respondents argue that both the SEA process and the SEA report were transparent and that this has positively influenced the effectiveness of the SEA (average score: 3).

The SEA process was transparent; all actors knew what to do and expectations regarding the SEA were streamlined. This increased the efficiency of the process.

The SEA report was transparent since the results were presented in a clear and comprehensive manner. Respondents believe that a transparent SEA report was important since this increased the SEA's practicality, legitimacy, and in consequence the decision-makers' willingness and ability to read, consult ('acquaintance'), and use the environmental data to review decisions ('consideration') during the planning process. Finally, it is also speculated that transparency of the SEA has increased (and will increase) decision-makers' and electricity producers' usage of the SEA during subsequent decision-making ('consideration').

Independent review

The NCEA has reviewed the quality of the SEA of the SEV III. All interviewees believe that independent review of the NCEA was important for SEA effectiveness (average score: 3). One respondent argues that, in general, independent review is particularly important for SEAs where there is limited participation because it can increase the chance that all values are acknowledged in the plan. In line with this, another interviewee argues that independent advice is more important when there is limited political will to take environmental considerations into account. The respondent deems that independent advice enhanced the chance that the initiators took the obligation to conduct an SEA seriously. Finally, the interviewees are convinced that independent review increased the legitimacy of the assessment and that this might have enhanced decision-makers' willingness to read and consult the SEA during the planning process ('acquaintance').

Scoping

Scoping, i.e. the determination of the extent and level of detail of the assessment and information to be included in the SEA, was important for the effectiveness of the SEA (average score: 3). Scoping was done by the decision- and SEA-maker together. During this stage the actors clarified for which aspects of the SEV III it was mandatory to conclude an SEA. Furthermore, the evaluation criteria that would be used for the assessment were determined. It is noted by interviewees that scoping has increased the efficiency of the assessment process and the pragmatism of the SEA report. First, it ensured that the decision- and SEA-makers had similar expectations regarding the SEA, which diminished the chance that the SEA-makers would spend time and energy on the evaluation of aspects that were not required. Second, scoping allowed the assessment to be fine-tuned to the decision-makers' wishes, which made the report more pragmatic. This increased, and will increase, decision-makers' willingness to read, consult ('acquaintance'), and use the SEA as a reference during (subsequent) planning process to review locations ('consideration').

Tiering

Respondents argue that tiering positively influenced SEA effectiveness (average score: 2,67). Tiering in the SEA is sufficient; relations between the SEV III and decisions at subsequent decision-making are described. The SEA report indicates which issues are, from an environmental perspective, important for the various locations and how they have to be taken into account during subsequent decision-making and project design (EZ/VROM, 2008). Respondents believe that this makes the SEA more pragmatic and that it increases the likelihood that decision-makers and electricity producers read, consult ('acquaintance'), and use the SEA during subsequent decision-making regarding the exact design of, and locations for, electricity facilities ('consideration').

Quality

Respondents consider that the quality of the SEA has facilitated the SEA's effectiveness (average score: 2,33). The SEA report has a high quality; it is based on valid data and applies a valid methodological approach. The evaluation by the NCEA states that the SEA report provides good information, presented in a comprehensive and systematic manner, suited to the purposes of the SEV III (NCEA, 2008). Furthermore, interviewees argue that the methodological approach applied for the assessment, expert judgment, is valid taking into account the high level of abstraction of the evaluation. The NCEA's only point of criticism on the SEA regards the fact that the assessment of several locations for power plants and HV tracks was not up to date (ibid).

Respondents are convinced that the high quality of the SEA enhanced the legitimacy of the SEA and increased decision-makers' ability to use the information to validate whether it was justifiable to maintain all locations for electricity facilities in the SEV III ('consideration').

Experience

Experience has facilitated the effectiveness of the SEA (average score: 2.33). First, experience can relate to the practical knowledge that the decision- and SEA-makers have gained during SEAs of similar plans. For the SEV II (1992) an SEA was conducted. However, at the time the energy market was not liberalized and accordingly the SEV II and SEA discussed more strategic issues regarding energy policy and management (e.g., the maximum generating capacity for each fuel type) (MEGJ/MIRI, 2003). Due to the different scope of the SEA of the SEV II, SEA-makers did not explicitly use the SEA of the SEV II during the planning process. Second, experience can relate to SEA-makers' experience in SEA in general. Respondents deem that the experience of the SEA-maker has positively influenced the quality of the SEA and therefore indirectly SEA effectiveness (see factor 'quality').

Evaluation of social and economic effects

While social and economic effects were not evaluated in the SEA, respondents were inquired about the potential value of this factor. On the one hand, several respondents argue that while the evaluation of social and economic effects is important in order to have a balanced and comprehensive planning process, this does not need to be done in the SEA (average score: 2). They argue that decision-makers by definition take economic and social aspects into account during planning. In view of this, the evaluation of social and economic effects in SEA will neither add value nor supply new information to the decision-making process. On the other hand, one SEA-maker is convinced that an integrated assessment makes the report more comprehensible. She notes that the global implications and inter-dependencies of the effects will be made more transparent and clear for the actors that use the SEA.

Stakeholder participation

Interviewees note that there was not much stakeholder participation during the SEA of the SEV III. SEA-makers did not require much stakeholder participation in order to fill knowledge gaps. During the decision-making process of the SEV III there was also not much interaction with stakeholders. There is among interviewees no consensus concerning the potential influence that stakeholder involvement could have had on the effectiveness of the SEA (average score: 2).

On the one hand, some believe that stakeholder involvement would have been very important for the effectiveness of the SEA. Stakeholder involvement could have triggered discussions concerning the various locations for electricity facilities and their suitability from an environmental perspective. Also, stakeholders could have generated discussions pertaining to the relation between national objectives concerning the need for renewable energy generation and the policy set out in the SEV III. Stakeholders could have enhanced discussions regarding the scope and content of the plan and SEA ('consideration').

On the other hand, several respondents from the Ministry of Economic Affairs believe that stakeholder involvement was not necessary since many decisions were already determined. As mentioned, decision-makers had determined the scope and content of the SEV III and regarded the policy problems in the plan to be structured. A participative decision-making process and discussions about the SEV III would be futile and might even have increased the risk for policy paralysis (see Holland, 2002 in O'Faircheallaigh, 2010).

Public participation

None of the respondents considers that public participation could have contributed to the effectiveness of the SEA (average score: 1). During the SEA of the SEV III the public had one formal opportunity for consultation regarding the plan and SEA. Interviewees argue that public participation did not influence the quality of the SEA and decision-making process. In addition, respondents argue that the potential value of public participation was limited because the content of the SEV III is too abstract and does not directly affect citizens. It is stated that for EIA, when the location, scope, and direct

effects of a electricity facility will be known, public participation is important in order to increase support for the decision.

Financial resources

Respondents state that the financial budget available for the SEA has not influenced its effectiveness (average score: 1). The interviewees could not elaborate on the financial budget available. Yet, is stated that the financial budget was sufficient in order to attain the objectives of the SEA.

5.3.4 Reflection on the effectiveness of the SEA of the SEV III

Based on the analysis of the effectiveness of the SEA of the SEV III, it is concluded that the levels 'acquaintance', 'consideration', 'consent', and 'formal conformity' have strictly speaking all been attained. However, performance effectiveness is low for the SEA of the power plants, HV tracks, and landing sites for wind-energy. The SEA was mainly used to determine whether the locations or tracks would not violate environmental legislation (NCEA, 2008). The environmental data was not used as a reference to discuss and select locations. Thus, instead of being used as a tool to develop policy, the SEA was used to review and validate pre-defined locations. Also, while the SEA was informative it did not influence the final decision much: only one HV track has been omitted due to the information provided by the SEA. Accordingly, 'formal conformity' pertaining to the locations for power plants, HV tracks, and landing locations for wind-energy is negligible.

The performance effectiveness of the SEA of the warrant locations for nuclear energy is relatively high. The SEA has influenced the visions regarding the suitability of each location for the production of nuclear energy. Furthermore, two warrant locations for nuclear energy generation have been omitted from the SEV III due to the SEA. Interviewees note that the removal of two warrant locations for nuclear energy generation is significant from an environmental perspective. Yet, it must also be acknowledged that the SEA and the SEV III did not address the question regarding the need for nuclear energy itself.

Taken as a whole, it is concluded that the effectiveness of the SEA of the SEV III is mediocre. It was used to review the plan, but not to develop and discuss policy options. Yet, regardless of the limited effectiveness of the SEA, it still has value. The SEA reviewed the environmental performance of each location and ensured that the locations included in the SEV III would respect environmental- and nature legislation. Furthermore, "the SEA reports provides insights into the most important environmental aspects and problems that must be taken into account during the design of projects in order to prevent or diminish negative environmental effects (EZ/VROM, 2008). Electricity producers and grid operators can take note of the environmental data provided by the SEA when designing concrete projects (ibid).

While the effectiveness of the SEV III has been mediocre, the analysis indicates that the content and process of the SEA were rather good. Factors including 'scoping', 'transparency', and 'pragmatism' contributed to a high quality of the SEA report and an efficient SEA and decision-making process. Limited effectiveness of the SEA is mainly the result of the implementation-context and (consequently) the lack of integration and ineffective timing. It is believed that the potential of the SEA in giving rise to an environmentally friendly plan was significantly restricted due to the context of the SEV III. There was no political will to decide on the amount and type of energy generation because this was regarded to be inconsistent with the free market approach promoted for electricity policy in the Netherlands. The Dutch government wants to give electricity producers freedom to choose the locations and fuel-mixes for electricity facilities. Accordingly, decision-makers did not use the information provided by the SEA to pro-actively select locations that would score best from an environmental perspective.

Several respondents regret that the SEA has not played a more significant role during the planning process. They maintain that the SEA had a high potential in making the strategic plan more environmentally friendly. Respondents from the NCEA and several stakeholders insist that the Ministry of Economic Affairs could have set guidelines regarding the capacity and type of electricity

production, and still have acted in line with the principles of the free market approach. Not all locations of the SEV III are required for electricity facilities and decision-makers could have used the information from the SEA in order to make a selection of locations or tracks that ought to be prioritized or deleted from an environmental perspective⁴⁶. Furthermore, the capacity and fuel mix permitted for each location could have been determined by the SEV III. Thus, regardless of the liberalization of the electricity market, the government could have set more guidelines concerning energy production. Market parties would be free to select a location for an electricity facility and the type of power plant; but they would have to take into account the minimum constraints for each location.

Several respondents regret that the SEV III and the SEA did not address more strategic (system) alternatives regarding electricity production. They argue that the public and stakeholders have many questions regarding energy policy and management that are not addressed by the SEV III. Discussions about strategic questions such as the capacity for electricity production, the desirability of coal-fired power plants, nuclear energy, and renewable energy could have been discussed and answered during the planning process of the SEV III. Because the SEV III and the SEA do not concentrate on these questions, there remains ambiguity regarding these issues at project level. Consequently, the public and stakeholders raise these strategic questions at project level where these questions cannot be answered. Interviewees from the NCEA note that during each project and EIA, stakeholders and the public ask questions about energy policy in the Netherlands. It could be argued that it would have been more efficient if the SEV III had responded to these issues in order to avoid discussing them at project-level.

Furthermore, respondents believe that it would have been plausible if the SEV III and SEA had focused on more strategic issues relating to electricity policy in order to achieve national environmental objectives. Taking into account the national policy objectives of the Dutch government regarding renewable energy, it would have been reasonable if the SEV III had provided more guidelines regarding the type and capacity for electricity generation. Several respondents believe that the SEV III would have been a perfect vehicle for attaining these objectives.

In fact, several stakeholders and interviewees argue that the policy set out in the SEV III will hinder the attainment of national objectives concerning renewable energy. Sevenster et al. (2009), for instance, illustrate that in the near future there will be an overcapacity of electricity on the Dutch electricity market. This is mainly due to the construction of many coal- and gas- plants. One respondent argued that as a result of this overcapacity, and the limited capacity to export the electricity, it will not be profitable to invest in renewable energy. When the SEV III would have determined the maximum capacity per fuel type, the chance for overcapacity of grey energy to occur would have been reduced and energy producers would have been induced to invest in renewable energy.

⁴⁶ A respondent from the NCEA argues that, for instance, the 'Eemshaven' could have been omitted from the SEV III as a potential location for a power plant since it is located next to the Wadden Sea, a sea that has an important ecological function.

Chapter Six

Case Study III: The Strategic Environmental Assessment of the National Water Plan

6.1 Introduction

The National Water Plan 2009-2015 (from now on referred to as NWP) is the successor of the fourth National Policy Document on Water Management (1998-2006). The NWP falls under the responsibility of the Ministry of Infrastructure and the Environment⁴⁷.

The objective of the first NWP is to ensure water safety in the Netherlands, now and in the future, in order to ensure that future generations can enjoy the Netherlands as a safe and wealthy water land (ibid). Accordingly, the NWP⁴⁸ presents various initiatives and strategies that must be taken in order to ensure water safety and security in the Netherlands (V&W, 2009⁴⁹). With regards to the spatial aspects concerning water management, the NWP functions as a structural vision, as set out in the Spatial Planning Act (NCEA, 2009). The NWP is therefore indicative and only legally binding for the Dutch state itself; not for governments or municipalities at lower governmental levels. The Cabinet does explicitly request other governments or municipalities to convert policies described in the NWP into their own plans and programs (V&W, 2009).

6.2 The SEA of the National Water plan

In line with Dutch EIA regulation, it is mandatory to conduct an SEA for several policy proposals of the NWP since they set a concrete frame of reference for future decisions or activities that can negatively affect the environment. Furthermore, when the preparation of the plan was initiated, it could not be guaranteed that Natura 2000 sites would be preserved when the policy measures of the NWP would be implemented.

The NWP and the SEA make a distinction between short-term decisions that will be made before 2015 and long-term decisions that will be made after 2015. With regards to long-term decisions, the SEA and AA reports have an exploratory nature.

In total, eight short-term decisions and seven long-term decisions were evaluated in the SEA (see V&W, 2009):

- Conservation of the coastline by means of sand replenishment and natural processes (short- and long-term)
- Rise in the water level in the IJsselmeer area (short- and long-term)
- Spatial choices regarding the IJsselmeer area
 - Placement of wind turbines alongside, or next to, the IJsselmeer (short-term)
 - Spatial reservations and developments in the outer dike area (long-term)
- Natural estuarine processes in the South-west Delta
 - Salinization of the Volkerak-Zoommeer (short-term)
 - Recovery of the estuarine dynamics (long-term)
- Spatial choices regarding the North Sea
 - Choice of location for sand extraction in the North Sea (short- and long-term)

⁴⁷ The NWP was made by the Ministry of Traffic, Public Works, and Water Management; Ministers from the Ministry of Housing, Spatial Planning, and the Environment and the Ministry of Agriculture, Nature and Food Quality. However, since 14-10-2010 the Ministry of Traffic, Public Works, and Water Management and Ministry of Housing, Spatial Planning, and the Environment have been merged into the 'Ministry of Infrastructure and the Environment'.

⁴⁸ Attached to the National Water Plan are also four river basin management plans.

⁴⁹ See www.rijksoverheid.nl (access 09-01-2010)

- Partial realization (around 50%) of the to be realized in 2020 6000 MW of wind energy generation at the North SEA (short-term)
- Carbon sequestration in the North Sea (short- and long-term)
- Construction of an energy island in the North Sea (long-term)
- Additional peak discharge for the rivers the Maas and the Rijn (short-term)

The list above reflects that the SEA has evaluated several long-term policy issues that concern rather strategic, technological issues regarding water management. However, it must be noted that the need and reason for the selected policy measures had already been determined during earlier planning process. Accordingly, while the SEA evaluated rather strategic alternatives regarding options for water management, the assessment was not used to assess aspects relating to the global objectives and visions of the plan.

Royal Haskoning, an independent international consultancy, started the assessment at the end of the year 2008. The SEA is conducted by means of expert judgment. The effects of the alternative development options are compared to the reference situation: "the concrete situation within the respective area, including its most important values" (Royal Haskoning, 2009: 19). The alternatives are evaluated on the following themes and criteria (sub-points):

- Sustainability
 - natural processes, flexibility, climate
- Water
 - water quality
- Nature
 - nature conservation sites, flora and fauna, biodiversity
- Landscape
 - cultural-history, archaeology
- Living Environment
 - living experience, recreation, public health, build environment
- Use functions
 - agriculture, fresh water availability, energy production, commercial shipping, commercial fishing, mineral extraction.

For the evaluation a five-point scale was applied: "++ very positive compared to the reference situation; + positive compared to the reference situation; 0 (almost) no effects compared to the reference situation; - negative effects compared to the reference situation; -- very negative effects compared to the reference situation" (Royal Haskoning, 2009:24).

6.3 Analysis of the SEA

Below the analysis of the SEA of the NWP is provided. As a point of departure, an overview is given of the implementation context of the SEA. Subsequently, the effectiveness of the SEA of the NWP will be determined. Following, it will be explained how different factors have influenced the effectiveness of the SEA. The analysis will conclude with a reflection on the main outcomes.

6.3.1 The SEA implementation context

The SEA implementation context consists of two aspects: the type of policy problem and the characteristics of the decision-making process.

The type of policy problem

All interviewees emphasize that each chapter of the NWP concerns a different type of policy problem. On the one hand, some policy topics such as 'additional peak discharge for the rivers the Maas and the Rijn' were structured; there was neither much scientific uncertainty nor discussion about the policy proposals. On the other hand, there were also policies that were rather complicated. A description of the policy issues that were most complex is provided below.

All interviewees emphasize that especially the policy relating to activities at the North Sea was complicated. First of all, this was a difficult policy problem because there was limited knowledge about the effects that various economic activities at the North Sea would have on the ecological climate.⁵⁰ It is mentioned by an interviewee from the Ministry of Infrastructure and the Environment that much more research needs to be conducted in order to be able to evaluate the cumulative environmental effects of the different economic functions at the North Sea. The fact that there was no clear reference situation with regards to, amongst others, the occurrence of species and their exact movement patterns also made it difficult to estimate the environmental effects that different activities on the North Sea would cause.

In addition, the North Sea chapter was complex because there was no consensus on norms and values in relation to the activities at the North Sea. The NWP is the only structure vision that sets out policies for the North Sea and accordingly it needs to set a strict frame of reference for various economic activities. There are many stakeholders to this policy and all have different needs and ideas about developments at the North Sea. There was especially much conflict between the wind-energy sector, oil and gas companies, and the maritime navigation sector. All in all, interviewees are unanimous in concluding that there was no consent on norms and values and that the scientific certainty was limited. In view of that, the policy pertaining to the North Sea is classified as an 'unstructured policy problem'. Nevertheless, it must also be acknowledged that the categorization of the policy depends on the perspective or level of analysis one takes. An interviewee from the Ministry of Infrastructure and the Environment argues that when one would uphold a narrow perspective one would see the different interests regarding economic activities at the North Sea. However, when one would endorse an abstract level of analysis, (s)he would see that all stakeholders agreed with the ecosystem approach, implying that the economic activities should be in balance with other societal objectives and occur within ecologically meaningful boundaries (Garcia et al., 2003). Furthermore, all stakeholders understood and accepted that certain activities had to be prioritized over other activities due to their urgent nature⁵¹.

There was also a lot of discussion about the potential rise in water level of the IJsselmeer. The stakeholders who are dependent on fresh water were in favor of the proposal. Municipalities and nature conservation organizations objected to the plan because they feared that an increase of the water level would jeopardize their municipalities and degrade surrounding nature areas. The level of certainty regarding scientific knowledge was rather high and accordingly this policy problem can be regarded as a 'moderately structured, goal problem'.

In view of the above, it can be stated that each different chapter of the NWP regards a different type of policy problem (see figure 11). Nevertheless, taken as a whole, respondents deem the NWP to be a complex plan because it consists of many different policy problems and affects many actors. In addition, it might not be possible to combine all the policy visions proposed in the NWP: "there are dilemmas for which choices have to be made about locations and financial resources" (PBL, 2009: 46). Also, the synergies between, amongst others, nature, recreation, and economic activities, promoted in the NWP are intense and it must be questioned whether they are feasible (ibid).

⁵⁰ For instance, it was not known what the effects of the sound of wind turbines would be on seals or porpoises. Also there was uncertainty regarding the possible occurrence of the barrier effect on birds due to the wind turbines. The wind turbines could potentially prevent or hinder the movement, mingling, or interbreeding of individuals or populations of a species (Merriam-Webster Online Dictionary, 2011).

⁵¹ For example, sand replenishment should be given priority over other activities at the North Sea because it is vital to protect the Dutch coast from sea floods.

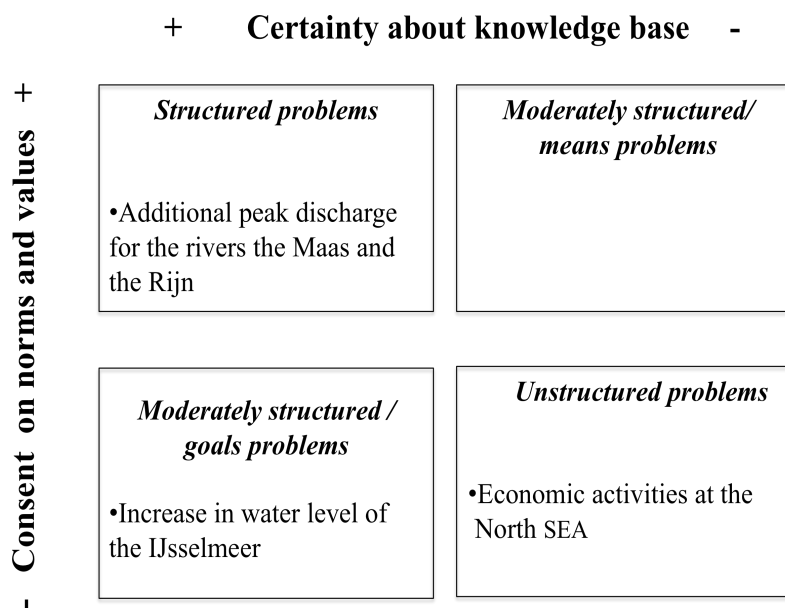


Figure 12. Types of policy problems in the National Water Plan.
Adapted from: Hoppe, 2002

Characteristics of the decision-making process

The characteristics of the decision-making process depend on the "extent to which decision-makers are open to other [environmental] and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6). Many interviewees believe that the decision-makers were perceptive towards environmental values. The NWP aims to contribute to sustainable water management⁵² and accordingly, in order to achieve the plan's objective, it was important to discuss aspects related to the environment and sustainability during the planning process.

Furthermore, decision-makers were willing to share decision-making powers. This could be explained by the fact that the decision-makers were dependent on stakeholders for support and information. Stakeholders possess much practical knowledge that was needed during the planning process in order to develop policy alternatives. A review on the development of the NWP by de Graaff, Jansen, and Joosten (2010) notes that "stakeholders are reasonably satisfied about the communication and degree of participation" (ibid: 9). However, it is noted that stakeholder participation mainly took place during the plan-making process itself and not during the pre-phase during which policy problems were identified and defined (ibid). As a result, the stakeholders were not involved in the delineation of the objectives of the plan (ibid). Nevertheless, respondents categorize the decision-making culture of the NWP as 'open'.

6.3.2 The effectiveness of the SEA of the National Water Plan

In order to determine the effectiveness of the SEA it has been established how, and to what extent, it has fulfilled the various SEA effectiveness levels.

⁵² The rationale for sustainable water management is "moving along with natural processes where it is possible, building resistance when necessary, and utilizing opportunities for prosperity and welfare" (Royal Haskoning, 2009: 5).

Acquaintance

In order to determine whether the first level of performance effectiveness, 'acquaintance', has been attained, it must be established whether the decision-makers read and/or consulted the SEA during the decision-making process. All respondents are convinced that the SEA started too late. The concept of the NWP was finished when the SEA started. Consequently, the SEA itself could not be consulted when the concept NWP was prepared. However, when the concept NWP was reviewed internally at the Ministries, decision-makers concurrently consulted the SEA. An SEA-maker deems that the decision-makers read and consulted the SEA seriously during this phase since he received a lot of feedback from them.

Consideration

In order to determine whether the second level of performance effectiveness, 'consideration', has been attained, it must be assessed whether the information provided by the SEA was used to develop, review, or discuss the plan or plan alternatives during the decision-making process. As mentioned above, the preparation of the SEA started when the concept NWP had already been concluded and policy alternatives had already been developed. Consequently, the opportunity to use the SEA as a policy development instrument was lost and the information generated by the SEA could not be used to identify problems and develop alternative plan options. As a result, the SEA of the NWP was predominantly utilized to validate pre-defined policy measures. Before and during the preparation of the draft NWP many studies had been conducted in order to assess, amongst others, the environmental implications of the policy proposals within the NWP. The SEA could substantiate the finding of these studies and hence allowed the decision-makers to validate their decisions.

The SEA has also been used during subsequent decision-making processes. When the NWP was finished, an SEA was conducted for a structure vision regarding wind-energy parks at the North Sea. The SEA of this structure vision used the information provided by the SEA of the NWP.

Consent

The third level of performance effectiveness, 'consent', is attained when the SEA has educated the actors involved in the decision-making process about the environmental implications of the plan and/or they have altered their visions regarding the plan. It is acknowledged by all interviewees that the SEA did not provide much new information on the environmental effects of the various policy proposals. This is mainly caused by the fact that many studies had already been conducted in order to assess the environmental implications of the NWP. Yet, respondents from the Ministry of Infrastructure and the Environment acknowledge that the SEA was informative and that it has provided new insights regarding two topics: 'increase in water level of the IJsselmeer area' and 'placement of wind turbines in the North Sea'. With regards to the former, the SEA indicated that a small increase of the water level in the IJsselmeer area would negatively affect its ecological climate. This insight triggered discussions concerning the desirability of the policy proposal and caused the decision-makers to alter their vision about this decision. With regards to locations for wind energy parks at the North Sea, the SEA and the AA provided decision-makers with additional information on the ecological effects that would occur when the long-term vision, the generation of 6.000 MW by wind turbines, would be realized. Decision-makers learned that significant effects on certain bird species (e.g., the lesser black-backed gulls) and marine mammals would likely occur⁵³. The insights have explicitly been taken into account during the SEA for the structure vision 'Wind Energy Parks at the North Sea'.

Formal conformity

In the following section it is examined whether the information provided by the SEA has been used to alter decisions in the final NWP. The analysis will indicate that the attainment of the SEA effectiveness level 'formal conformity' is limited: only two policy proposals have been altered

⁵³ The SEA indicated that by wind-turbine parks of approximately 2.000 MW that are situated relatively close to breeding colonies near the coast (minimal 50 km) will likely have negative effects on the lesser black-backed gulls due to possible collisions.

marginally as a result of the environmental information. The other policy issues that were included in the SEA have not been altered. There are various reasons for this: the SEA indicated that the policy proposal was in line with the findings of the SEA, the SEA indicated that the policy did not significantly affect the environment, or there was no alternative that scored best from an environmental perspective. In addition, the NWP is often not changed due to the SEA because the plan has an exploratory and abstract nature and not a lot of explicit choices are made in it (see PBL, 2009; NCEA, 2009). Below, it will be discussed whether the policy proposals evaluated by the SEA conform to the outcomes of the assessment. Appendix C-III provides a summary of the evaluation.

Conservation of the coastline by means of sand replenishment and natural processes (short- and long-term)

Due to climate change and the prospect of sea level rise, the Dutch government aims to protect the Netherlands from sea floods. The SEA evaluates different alternatives that can be implemented in order to obtain this objective. The first alternative implies that the coastline will be shifted towards the land in order to protect the coast. The second alternative focuses on extending the coast towards the sea by means of artificial supplementation of sand on the foreshore, beach, and dunes. The third and fourth alternatives are in line with natural processes of sand replenishment. The third alternative promotes the extension of the coastline through supplementation of sand before the coastline, which will accordingly give rise to natural sand replenishment and the strengthening of the coastline. Finally, the fourth alternative (the preferred alternative) aims to maintain the coastline by means of sand replenishment. This measure is flexible as the amount of sand that will be supplemented can be adjusted to the sea level.

The Dutch state prefers to protect the coast by means of natural sand replenishment processes and alternative three or four are thus to be favored (Royal Haskoning, 2009). Yet, the SEA indicated that alternative one would score best with regards to effects on water and nature. Furthermore, the third and fourth alternative could give rise to negative environmental effects on species and habitats. However, the AA indicated that both the third and fourth alternative would not negatively affect Natura 2000 species or habitats during the plan-period. In the SEA report it is stated that in the future the volumes of sand that will be supplemented might increase significantly and it can therefore not be guaranteed that Natura 2000 sites will not be negatively affected when the future vision is attained.

The decision regarding sand supplementation in the NWP has not been altered due to the SEA. While alternative one is slightly preferred from an environmental perspective, the preferred alternative (alternative four) is deemed appropriate when taking into account the government's objective to implement policy measures that are flexible and in line with natural processes.

Limited and season-tied water level increase in the IJsselmeer area (short-term)

"The IJsselmeer is the largest freshwater reserve in the Netherlands: more than 30% of our country is dependent on the water from this area" (Royal Haskoning, 2009: 4). In order to guarantee that the IJsselmeer will continue providing the Netherlands with sufficient freshwater it is relevant that challenges regarding climate change are taken into account and, if necessary, are adapted to accordingly. The SEA states that only one realistic option is available in order to solve this problem. This (preferred) alternative focuses on a rise in the water level with maximum 30 cm above the summer water level. This measure would ensure that sufficient freshwater will be available for future generations and economic activities. This short-term measure is considered an immediate step towards the attainment of the long-term vision (see below). The results of the SEA and AA indicate, however, that a 30 cm rise of the water level would negatively affect Natura 2000 sites. The AA, however, concluded that there exist no realistic alternatives that could solve the problem. Additionally, the report states that water availability is an issue that is of immense importance in order to ensure that the Dutch population and agricultural businesses will have sufficient water.

While the draft NWP states that in 2012 a final decision regarding this issue will be made; the final NWP states that more research will be conducted before a decision can be made (NCEA, 2009). It must be examined which measures can be implemented in order to diminish or compensate for the environmental damage. In order to establish whether 'formal conformity' has been attained a causal relationship between the SEA and this change in the NWP must be established and the changes must

make the plan more environmentally friendly. Interviewees have confirmed that the SEA caused this change in the NWP. In addition, interviewees are of the opinion that the change is significant from an environmental perspective. Yet, it is emphasized that the policy proposal has not been cancelled; the final NWP merely states that more research must be conducted before a final decision can be made.

Safety and freshwater availability in the IJsselmeer area (long-term)

The draft NWP announces that in the future the IJsselmeer will become more important as a freshwater reserve (Royal Haskoning, 2009). In addition, it is argued that due to sea level rise, the water level of the IJsselmeer must be raised in order to protect the IJsselmeer area against sea floods. Therefore, the draft NWP argues that the water level of the IJsselmeer will be raised and that in 2015 a decision will be made regarding the degree and pace of the increase of the water level rise.

The SEA evaluated several alternative policy options to solve the above problem. Alternative one focuses on maintaining the water level in the IJsselmeer area. Water will be pumped from the IJsselmeer to the Wadden Sea in order to protect the IJsselmeer area from floods (Royal Haskoning, 2009). This alternative does not support the creation of a freshwater reserve. Alternative two does ensure that the IJsselmeer becomes a freshwater reserve in the future. It focuses on raising the water level of the entire IJsselmeer area with one meter maximum. Water can flow from the IJsselmeer to the Wadden Sea by means of ventilation. The third, and preferred, alternative regards a combination of the first and second alternative (pumping and ventilation). The water from the IJsselmeer is ventilated to the Wadden Sea and the water level must be raised with 1.5 meters maximum in 2100 in order to ensure the availability of sufficient water. Additionally, the Markermeer-IJmeer and the Veluwrandmeren will be disconnected from the IJsselmeer and a flexible water level will be upheld for these lakes.

The SEA report states that alternative two and three will negatively affect the environment since foraging districts of several bird species alongside the IJsselmeer will be lost and reedlands will be affected (ibid). The AA, however, indicated that no other realistic alternatives do exist and that safety against floods and water availability are two issues of vital importance for the Netherlands.

The draft NWP states that in 2015 a decision will be made regarding the degree and pace of the water level increase in the IJsselmeer area. It is thus insinuated that the water level will be raised. In the final NWP, however, it is stated that only in 2015 an actual decision shall be made regarding the *desirability* and *feasibility* of an increase of the water level of the IJsselmeer. In order to determine 'formal conformity' a causal relationship between the SEA and this change must be established and the alteration must be significant from an environmental perspective. Interviewees have confirmed that this change is the result of the information provided by the SEA. In addition, respondents believe that the change is significant from an environmental perspective. However, it must be emphasized that the policy proposal has not been cancelled; it is merely acknowledged that more research must be conducted before a final decision can be made.

Natural estuarine processes in the South-West Delta (short- and long-term)

During the plan-period (2009-2015) a decision will be made regarding the water-quality of the South-West Delta. In order to ensure water safety and water quality, the Dutch government aims to recover natural estuarine processes. Accordingly, the Volkerak-Zoommeer will be connected with surrounding waters and salinized (alternative I) (Royal Haskoning, 2009). The SEA report states that salinization will not lead to negative environmental effects. The NWP states that after the plan-period other isolated water basins will also be connected with each other in order to ensure that salt and freshwater will flow (alternative II). This will increase the flexibility of the water system and lead to partial recovery of the salt-fresh water transition, which will improve the water quality (ibid). Alternative III, the long-term preferred vision of the Dutch government, aims to abate the strict division between fresh and saltwater leading to a more natural process (ibid).

The SEA report indicates that the long-term preferred policy option (alternative III) scores best with regards to its effects on the environment, water, and sustainability. From an environmental perspective, alternative one scores worst. Yet, for the plan-period this alternative is selected. It could be stated that alternative one and two will be immediate steps towards the implementation and attainment of the long-term vision: alternative three. The AA concluded that Natura 2000 sites would

not be negatively affected due to salinization of the Volkerak-Zoommeer⁵⁴. Natura 2000 sites can be negatively affected when alternative III (the long-term vision) is implemented because some species can either not survive in freshwater or they are not acclimate to tidal movements.

Both the short- and long-term visions described in the NWP regarding the 'Southwest Delta' have not been altered as a result of the information provided by the SEA. While alternative one scores less good compared to alternative three, it must be acknowledged that alternative one and two will be immediate steps towards the implementation and attainment of the long-term vision (alternative three).

Spatial developments in the IJsselmeer area: placement of wind turbines alongside, or next to, the IJsselmeer (short-term)

The draft NWP states that wind turbines will be placed in the IJsselmeer area. The SEA report discusses several alternatives. The first policy option regards the placement of wind turbines alongside the old coast of the IJsselmeer (Noord-Holland and Friesland). The second alternative focuses on the placement of wind turbines in the IJsselmeer. The third, and preferred, policy option implies that wind turbines will be placed alongside the new coastline of the IJsselmeer. The SEA has indicated that with regards to all three alternatives there is a limited chance that natural areas will be negatively affected. The wind turbines might potentially be disruptive for certain bird species. The SEA report provides an overview of measures that could compensate these effects (see Royal Haskoning, 2009).

Based on the outcomes of the SEA it is difficult to identify one specific alternative as being preferred above the rest from an environmental perspective. Accordingly, there was no need to alter the NWP as a result of the SEA. The NWP states that the Cabinet will make a decision regarding the placement of wind turbines before 2015. A more detailed AA will be conducted for subsequent, project-level decisions when the environmental effects can be predicted more accurately.

Outer dike developments in the IJsselmeer area (long-term)

The SEA evaluated the environmental effects of different areas that could be reserved for outer dike developments in the IJsselmeer area. A requirement for all alternatives is that they may not negatively affect, or degrade, the qualities and characteristics of the landscape (Royal Haskoning, 2009). Four different alternatives are assessed: (I) near Amsterdam in the IJmeer, (II) near Almere in the Markermeer, (III) near Lelystad in the Markermeer, and (IV) a combination of all the locations. The fourth alternative is the preferred alternative in the NWP. The SEA indicates that all locations give rise to similar environmental effects and that Natura 2000 sites will likely be affected when the developments occur.

The information provided by the SEA has not influenced the NWP. The Ministries do not make a decision regarding the location for the outer dike developments in the NWP. It is stated that the results of the SEA will be used for the subsequent decision-making processes related to the 'Decision Amsterdam-Almere-Markermeer'.

Partial realization of 6000 MW of wind-energy generation at the North SEA in 2020 (short-term)

Four different sites (alternatives) at which wind turbines can be build have been evaluated. The alternatives concern coastal areas (outside the 12 miles zone) near: (I) Borssele, (II) North and South Holland, (III) the north of the Wadden Sea, or (IV) IJmuiden. The preferred alternative constitutes a combination of the first, third, and fourth alternative. The assessment pointed out that the environmental effects of all alternatives are relatively similar. Negative environmental effects on the environment and biodiversity will mainly occur during the construction of the wind turbines. The AA indicated that negative environmental effects can be (partially) mitigated by means of, amongst others, placement of the wind turbines within certain distance from breeding colonies and spawning grounds and consciously stopping the wind turbines during bird migration periods (Royal Haskoning, 2009). In

⁵⁴ It is noted that whether or not significant negative environmental effects upon Natura 2000 sites will occur depends upon the conservation objectives of the Natura 2000 site (salt or fresh water variant). Also, it is stated that the conservation objectives will be determined based upon the decision to salinize the Volkerak-Zoommeer. Taking this into account, it can be concluded that when salinization of the Volkerak-Zoommeer will occur, the salt variant will be selected and no negative environmental effects will occur on salt-water species.

the NWP it is emphasized that, at the moment, there are no reasonable alternatives that can be implemented in order to attain the national goals relating to renewable energy production (i.e., 20% renewable energy production in 2020). Climate change and the decreasing amount of fossil fuels cause the attainment of this objective to be of uttermost importance.

All things considered, the NWP has not been altered due to the SEA. It is acknowledged in the final plan that further research will be conducted in order to assess the exact environmental effects of the wind turbines and to examine mitigation measures that can be implemented in order to diminish environmental harm.

Carbon sequestration in the North Sea (short- and long-term)

Since it is predicted that oil- and gas activities in the North Sea will diminish in the future, the Dutch government wants to reserve former gas fields for carbon sequestration. During the planning-period pilots shall be conducted in pursuance of experimentations with carbon sequestration. For the pilot experimentations, two locations before the coast of Zeeland are identified (alternative I). The SEA report notes that no other reasonable alternatives exist. For carbon sequestration in the future (alternative II) two areas are identified, one area Northeast of Den Helder and one close to Texel.

The SEA indicates that both alternatives (short- and long-term) do not give rise to negative environmental effects. Consequently, the NWP has not been altered as a result of the SEA.

Energy island in the North Sea (long-term)

The Dutch government aspires to construct an 'energy island' in the North Sea where energy can be generated and stocked. At the moment there are two reasonable locations for this energy island: (I) far from the coast, on the northern part of the Dutch continental shelf and (II) before the Coast of Zeeland (preferred alternative). The SEA report indicates that the preferred alternative scores less well on criteria related to natural processes, nature areas, and species and fauna. However, as the policy measure shall not be made or implemented during the plan-period, an AA has not yet been conducted.

The NWP has not been altered as a result of this finding. The final NWP states that the energy island will be situated before the coast of Borssele (Zeeland). While the other location is preferable from an environmental perspective, this location is preferred due to its relative short distance from the shore.

Choice of location for sand extraction in the North Sea (short- and long-term)

The NWP, amongst others, defines the locations for sand extraction in the North Sea. In the draft NWP it is proposed to extract sand in deep waters (6 meters under the seabed) in the area of the 20 meters isobaths within the 12 miles zone (alternative I). The SEA assessed two additional alternatives: sand extraction within the same area but two more meters deeper (alternative II) and sand extraction within and outside the 12-mile zone (alternative III). The SEA indicates that the environmental effects of alternative one would be 'neutral' and that it scores best compared to the other two alternatives. The AA report states that no negative effects on Natura 2000 sites are expected.

The decision in the final NWP is in line with the findings of the SEA. However, the draft plan already supported this 'most environmentally friendly alternative' and therefore it cannot be concluded that the plan has become more environmentally friendly as a result of the SEA.

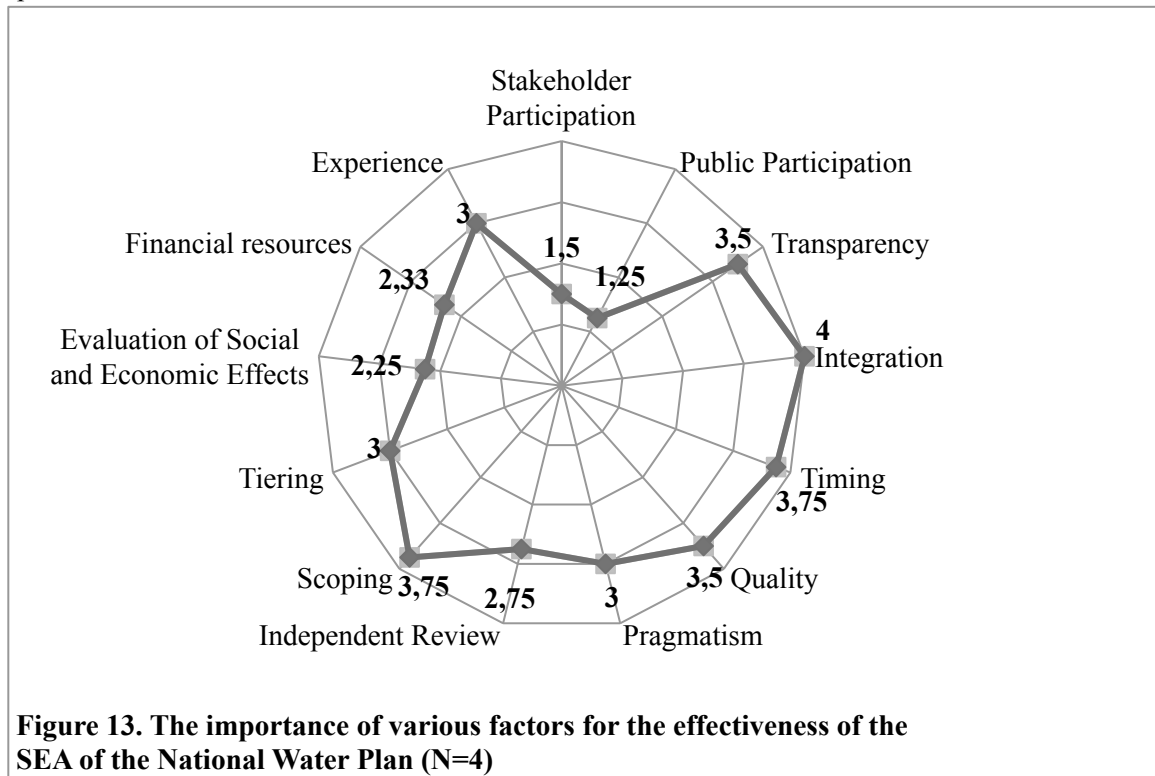
Peak discharge for rivers Maas and Rijn (short-term)

"Due to climate change it is expected that the rivers in the Netherlands will have a higher peak discharge" (Royal Haskoning, 2009: 3). In line with this prospect, two 'river broadening programs' are implemented at the moment: 'Room for the River' (*Ruimte voor de Rivier*) for the Rijn and 'Maas work' (*Maaswerken*) for the Maas. It was assessed how the rivers could be given more space by means of enlargement of the catchment area and increasing the capacity inside the dike in order to absorb the excess of water. For the Rijn the preferred alternative is 'peak discharge via the Waal and the IJssel' and the implementation of inside-dike arrangements. With regards to the Maas, the provision of more space inside the dike is considered the preferred alternative. There are no reasonable alternatives available for both rivers. The SEA has indicated that both alternatives will positively

influence the water quality and nature sites. The AA indicated that during the plan-period no significant effects on Natura 2000 sites are expected. Accordingly, the text of the NWP has not been altered due to the information provided by the SEA.

6.3.3 Explaining SEA effectiveness

The following section will discuss how different factors have influenced the effectiveness of the SEA. Figure 13 provides an overview of the mean score that respondents have attributed the factors' contribution to the effectiveness of the SEA of the NWP (in appendix D-III a table can be found with the standard deviation and variance of the responses⁵⁵). Below, each factor shall be discussed in order of importance.



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Integration

Integration occurs when decision- and SEA-makers communicate about their work and cooperate during the planning process. Logically, due to the late start of the SEA there was no integration during the planning process itself and this has significantly limited the effectiveness of the SEA (average score: 4). The environmental data could not be taken into account during the preparation of the concept NWP. This has directly diminished the decision-makers' usage of the SEA to develop, review, and discuss policy options during the planning process ('consideration'). Consequently, the chance that the environmental data would influence visions ('consent') and policy decisions ('formal conformity') was significantly diminished.

While the integration of the SEA into the planning process did not take place, there was cooperation and exchange of information between decision- and SEA-makers during the preparation of the SEA in order to ensure that time and energy was spend on the evaluation of aspects required. Yet, the decision- and SEA-makers did not actively take part in each other's work processes. During internal consultation at the Ministries, the concept NWP was sometimes modified. SEA-makers deem that it

⁵⁵ The standard deviation and variance indicate the degree of consensus among the respondents regarding the importance of the factors for SEA effectiveness.

⁵⁶ Three of the seven interviewees were not able to rank the importance of the factors for SEA effectiveness.

was not always evident when, and why, policy alternatives had been obliterated and argue that this has diminished the efficiency of the SEA process.

Timing

All interviewees believe that accurate timing of the SEA in relation to the planning process would have significantly increased the instrument's effectiveness (average score: 3.75). As mentioned previously, the SEA was conducted when the draft NWP was almost concluded. Halfway the planning process it was realized that it was compulsory to conduct an SEA for several aspects of the NWP⁵⁷. In consequence, "the preparation of the SEA started when the concept of the NWP was finished and ready for internal consultation at the Ministries" (interviewee from the Ministry of Infrastructure and the Environment). "Due to this late start and late tender there was limited time to adjust the NWP based on the outcomes of the SEA" (de Graaff et al., 2010: 8). A respondent from the NCEA argues that had the SEA been started earlier, the results of the assessment could have been used to develop and discuss plan alternatives ('consideration') during the planning process. As a result, the environmental data of the SEA could have influenced more policy visions ('consent') and policy measures of the NWP ('formal conformity'). It is even speculated by one respondent that more innovative policy alternatives would have been developed if the SEA had an explicit role during the planning process.

It must be concluded that the late start of the SEA has hampered the tool's influence on the planning process. Furthermore, respondents emphasize that if the SEA had indicated that short-term policy measures would have significantly affected the environment, the planning process would have been impeded since there was not much room or time for altering the content of NWP.

Scoping

All interviewees consider that the determination of the extent and level of detail of the assessment and the information to be included in the SEA was very important for its effectiveness (average score: 3.75). However, there is no consensus amongst the interviewees with regards to quality of the scoping phase. On the one hand, the concept NWP was concluded and hence the content of the policy issues were clear. On the other hand, the scope of the SEA was ambiguous since it was difficult to determine which policy issues of the NWP had to be evaluated in the SEA. The NWP covers many policy proposals but not all are concrete enough and can potentially give rise to negative environmental effects. However, while this caused SEA-makers to spend much time on scoping, it did not negatively affect SEA effectiveness; it mainly delayed the assessment.

Generally, all interviewees note that the energy put into the scoping phase was important since it allowed the SEA to be more efficient, pragmatic, and fine-tuned to the planning process. Furthermore, due to scoping it became clear for decision-makers which information the SEA would provide them with. Accordingly they read, consulted ('acquaintance'), and used the environmental data to review ('consideration') the policy measures of the concept NWP.

Quality

All interviewees note that the data and methodological approach of the SEA were scientifically valid and that this has positively influenced the effectiveness of the SEA (average score: 3.5). The NCEA believes "that the SEA provides sufficient information on the environmental effects of the policy proposals that will be made within the plan period" (NCEA, 2009: 3). The SEA provides information that is scientifically valid, up-to-date, and fine-tuned to the objectives of the plan. The NCEA also considers the methodological approach of the assessment to be good. The environmental effects are determined by means of expert-judgment and this is deemed appropriate given the high level of abstraction of the plan. However, the NCEA does note that a number of aspects are evaluated rather subjectively: "about several outcomes of the assessment one could have a discussion and it is possible that different conclusions are drawn based on the same scores" (NCEA, 2009: 4).

In spite of the subjective evaluation of a few cases, overall the SEA report maintains a good quality, allowing decision-makers to use the environmental data as a reference to review and verify their policy

⁵⁷ The interviewees did not know the exact start date of the SEA. However, all respondents state that it started at the end of the planning process when the concept of the NWP was almost finalized.

proposals ('consideration'). In addition, the high quality of the environmental data enabled decision-makers to alter their ideas and decisions regarding the policy measures relating to the IJsselmeer and the North SEA ('consent' and 'formal conformity').

Transparency

A transparent SEA process and report are important for SEA effectiveness (average score: 3.5). All respondents consider the SEA report to be comprehensible and argue that the results are made explicit and clear. It is deemed that this has enhanced the credibility, and consequently political confidence in the assessment. It is argued that this has increased decision-makers willingness to read and consult the SEA during the planning process ('acquaintance').

The SEA process was also transparent: within the SEA team, roles and responsibilities were clearly defined, causing the process to be efficient.

Experience

Experience can relate to two different aspects. First of all, the SEA-and decision-makers can have experience in conducting SEAs for similar plans. Second, experience can refer to the SEA-maker's practical knowledge about SEA in general. Respondents believe that both aspects of experience have influenced the effectiveness of the SEA (average score: 3). With regards to the former, the NWP was the first plan regarding water management at such a large scale. Previous plans regarding water management in the Netherlands for which an SEA was conducted differed with regards to their scope and content. Due to lack of experience in SEAs of similar type of plans the competent authority was not aware of the obligation to conduct an SEA. This has negatively influenced the effectiveness of the tool since it caused the SEA to start too late. Furthermore, both the decision-and SEA-makers did not know what the SEA of the NWP should encapsulate and this negatively influenced the efficiency of the SEA process. It was a challenge to determine which aspects of the NWP had to be evaluated in the SEA (see factor 'scoping') and to establish how the cumulative effects of the various policy measures had to be evaluated. This has delayed the assessment process.

With regards to the latter aspect of experience, respondents argue that due to lack of experience in similar SEAs, the experience of the SEA-makers was particularly important since they could use their practical knowledge to determine how the SEA had to be conducted and which aspects needed to be evaluated. Experience in SEA enabled the SEA-maker to conduct a high quality SEA within a short period of time. The experience of the SEA-makers thus indirectly influenced the effectiveness of the SEA (see factor 'quality').

Pragmatism

All interviewees believe that the SEA was pragmatic since it was adapted to the needs of the decision-makers and comprehensible for all actors involved in the planning process. The pragmatism of the SEA report was important for the effectiveness of the SEA (average score: 3). For each subject that the SEA has assessed, the report provides a table in which the main findings of the SEA can be found. A five-point scale (very positive, positive, neutral, negative, or very negative) is applied in order to show how the policy measures will affect the various evaluation criteria. The pragmatism of the SEA report has enhanced decision-makers' willingness to read and consult the SEA during planning ('acquaintance'). Finally, the pragmatic SEA report allowed decision-makers to use the environmental information to review the policy proposals ('consideration').

One respondent argues that the SEA was too pragmatic since it only assessed the environmental effects of policy proposals for which it was mandatory to conduct an SEA. In consequence, the SEA was not used to assist with the development of policy proposals that were relevant from an environmental perspective but which did not require an SEA because they were not concrete enough.

Tiering

Tiering is considered important for the effectiveness of SEA (average score: 3). Tiering was sufficient in the SEA of the NWP; it identifies relations between the plan and the issues that should be addressed in subsequent decisions and EAs. This makes the SEA pragmatic and useful for subsequent decision-making. The SEA, for instance, states that attention must be paid to several environmental aspects

when further designing, or implementing, a certain policy. This has made, and will make, following decision-making and implementation more focused. For instance, during the decision-making process and SEA concerning wind-energy parks in the North SEA, the information and recommendations provided by the SEA were explicitly used to develop, review, and discuss alternatives ('consideration').

In its totality, tiering positively influenced SEA effectiveness as it enhanced, and will enhance, the usage of the SEA during subsequent decision-making.

Independent review

The NCEA reviewed the quality of the SEA. Respondents acknowledge that the advice of the NCEA positively influenced the planning process and SEA (average score: 2.75). First, respondents argue that, in general, if it is known that the NCEA will review the assessment, it will increase decision-makers' awareness of the SEA and this increases the likelihood that they will read and consult the environmental data during the planning process ('acquaintance'). Second, independent advice was important since it ensured that the quality of the SEA was sufficient (see factor 'quality'). Third, the advice of the NCEA improved subsequent decision-making. The SEA- and decision-makers consulted the NCEA several times before and during the assessment in order to enquire, amongst others, about the suitability of the methodological approach chosen. This reassured the SEA-makers of their methodological approach and increased the legitimacy of the assessment. Finally, the NCEA advised decision-makers to make an assessment framework for the economic activities at the North Sea. The NCEA argued that the NWP and the SEA do not provide sufficient guidelines and references with regards to the priority of, and conflicts between, certain economic activities at the North Sea. The SEA lacks a clear overview of the cohesion of the different activities and the cumulative effects thereof. Thanks to this point of advice a subsequent SEA has been made regarding the locations for wind-energy parks in which this point is addressed.

Evaluation of social and economic effects

In addition to environmental effects, the SEA also evaluated several social and economic effects of the policy measures. Among the interviewees there is no consensus concerning the influence of this factor on the effectiveness of the SEA (average score: 2,25). On the one hand, some find that an integrated assessment allowed decision-makers to have a comprehensive overview of all effects of the NWP, which made the SEA more pragmatic. Furthermore, one respondent deems that (while this was not the case during the planning process of the NWP due to the late start and lack of integration) the assessment of social and economic effects can potentially facilitate participation during the planning process. During participative processes, decision-makers will often be enquired about the social and economic implications of the plan; the direct effects on humans and their livelihoods. When the SEA addresses all three aspects, the assessment can explicitly be used as a reference during discussions with stakeholders and the public regarding the plan ('consideration').

One respondent is convinced that having a balanced decision-making process in which social, economic, and environmental aspects are represented is most important. Whether social and economic effects are assessed in the SEA or in the planning process is irrelevant. Yet, others insist that the evaluation of social and economic aspects in the SEA might shift the balance of the decision-making process against the environment when these aspects are already sufficiently represented.

Financial resources

All interviewees consider that financial resources facilitated the effectiveness of the SEA (average score: 2.33). Financial resources were sufficient in order to attain the objectives of the SEA. None of the interviewees was able to provide extensive information regarding the financial resources needed for the assessment and the factor's influence on SEA effectiveness.

Stakeholder participation

There was no stakeholder involvement during the SEA but respondents judge that this has not negatively influenced the instrument's effectiveness (average score: 1.5). First of all, stakeholders were actively involved during the planning process itself and the development of alternatives. Since stakeholders were able to discuss and develop policy alternatives during the planning process,

stakeholder involvement during the SEA was consequently less important. The main discussions had already been held and alternatives had been selected (the alternatives discussed during the planning process were the same that were assessed in the SEA). During the planning process, (expert) knowledge of the stakeholders was thus used to develop means to solve the policy problems. Second, stakeholder involvement was not required during the assessment process in order to fill knowledge gaps. Finally, it is one respondent's opinion that stakeholder involvement during the SEA would have had limited value since the SEA was not used to make explicit policy choices. With regards to many policy issues, the decision-makers did not want to make concrete decisions yet and accordingly there were not a lot of issues that stakeholders could react on.

To reiterate, while all interviewees note that the participation of stakeholders can be important during SEA, it was not very important during the SEA of the NWP due to the fact that stakeholders had already been extensively involved in discussions during the planning process, the SEA-makers did not require much stakeholder knowledge in order to conduct the assessment, and not much explicit policy choices were made.

Public participation

Except for the compulsory public consultation when the draft NWP and SEA were open for public inspection⁵⁸, the public did not participate in the SEA. Respondents argue that lack in public participation did not negatively influence the effectiveness of the SEA (average score: 1.25). All argue that the policy choices inherent to the NWP are too abstract and technical for public participation. The questions addressed in the SEA mainly focus on the technical design and locations for policy measures. In addition, it is deemed that public participation was not necessary since decision-makers did not want to make many concrete decisions that could directly affect citizens. The NWP has an exploratory nature and it is often stated that more research needs to be conducted before a decision can be made.

The interviewees assume that potentially public participation can be important when one wants to make concrete decisions about complex and strategic choices concerning water management that directly concern the public. Furthermore, some argue that public participation might be beneficial when decision-makers want to know more about the visions and priorities of the public in order to be able to make trade-offs between social, economic, and environmental values. In these situations, the SEA can be used as a direct reference during deliberations with the public and stakeholders about the policy problem, visions, and policy measures ('consideration').

6.3.4 Reflection on the effectiveness of the SEA

The analysis of the effectiveness of the SEA of the NWP indicates that the levels: 'acquaintance', 'consideration', 'consent', and 'formal conformity' have strictly speaking all been attained. However, attainment of the level 'consideration' has been marginal; the SEA has not been used to develop or discuss policy measures during the decision-making process. Instead, the SEA was used to review and validate pre-defined policy proposals and it had to ascertain that the NWP did not encapsulate any policy measures that would harm Natura 2000 sites. 'Consent' has been attained; the SEA gave rise to new insights regarding the environmental effects of an increase of water level in the IJsselmeer and the placement of wind turbines in the North Sea. With regards to 'formal conformity', all the interviewees note that the SEA has had only limited influence on the substantial content of the NWP. Of the fifteen policy options that have been included in the SEA, only two have been altered marginally due to the SEA. While the changes are significant from an environmental perspective, it is essential to note that the decisions have not been ruled out, but rather that decision-makers now acknowledge that more information must be retrieved before a decision can be made. Based on the analysis, it is argued that the effectiveness of the SEA is mediocre. It contributed to few new insights, but did not give rise to many substantive changes in the plan.

⁵⁸ The NWP and SEA report were open for public inspection from 11-05-2009 to 22-06-2009. There was one public gathering on 26-06-2009 during which the public was consulted and heard about the NWP and the SEA.

When making conclusions about the effectiveness of the SEA, several aspects must be taken into account.

First of all, it must be acknowledged that before and during the planning process, many studies had been conducted in order to attain insights into the environmental implications of the NWP. In fact, a respondent from the NCEA judges that the consideration of environmental values is inherent to the NWP since the plan has the objective to contribute to sustainable water management. As a result of previous studies, the SEA did not give rise to many new insights that caused the competent authority to change the content of the NWP.

Second, when evaluating 'formal conformity' of the SEA, it must be noted that the NWP has an exploratory and abstract nature and not a lot of explicit choices are made (see PBL, 2009; NCEA, 2009). A review of the NWP by the Netherlands Environmental Assessment Agency indicated that while the long-term policy visions of the NWP can give rise to sustainable water management in the future, there exists a large discrepancy between the long-term visions and the policy measures to be implemented during the planning period till 2015. "Realization thereof ['the long-term visions'] is not possible with the starting points [i.e., 'the short-term policy measures'] described in the NWP" (ibid: 46). In all, due to the fact that the NWP is not decisive regarding many issues, defining 'formal conformity' has limited value.

While it is argued by the majority of the respondents that the SEA did not significantly influence the decision-making process and content of the NWP, it is emphasized that one can therefore not conclude that the SEA has not been cost-effective. The first advantage of SEA is that it enhances support for the NWP. The SEA has validated findings of previous studies. Accordingly, the SEA increased the legitimacy of the plan, and the studies on which the plan is based, and this consequently increased public support in the NWP. A second benefit of the SEA regards the formal opportunity that the public and stakeholders had for participation. Both groups had the opportunity to react on the SEA before the final NWP was adapted. An interviewee from the Ministry of Infrastructure and the Environment notes that the participatory aspect of SEA had procedural advantages since afterwards the plan-maker could conclude the SEA process. Since everyone had the opportunity to react on the plan, it was legitimate to cease the SEA and planning process. Finally, by means of conducting an SEA the competent authority can demonstrate that it is responsible and has carefully taken environmental interests into account during the decision-making process. The competent authority can expose that the likely effects of the plan are fully understood and given careful consideration during the planning process.

All in all, while the substantial effectiveness of the SEA of the NWP might be limited, respondents from the Ministry of Infrastructure and the Environment reckon that the SEA has, and will, have judicial and procedural benefits for the competent authority. Yet, it must be emphasized that these benefits do not relate to the objectives of SEA and therefore they do not indicate SEA effectiveness.

While the effectiveness of the SEA of the NWP has been mediocre, the analysis indicates that the content and process of the SEA were rather good. Factors including 'scoping', 'experience of the SEA-maker', and 'pragmatism' caused the SEA process and report to have a high quality.

Given the high quality of the SEA, many interviewees believe that the effectiveness of the SEA could have been much higher. The SEA could have been used to develop policy alternatives and could have provided a platform for discussion among stakeholders and decision-makers. The most important reasons for the limited effectiveness of the SEA are the late start of the SEA and lack of integration. It must be noted that the limited effectiveness is not the result of a lack of political will to use the instrument, but rather caused by a lack of knowledge on (how to use the) SEA. First of all, when the preparation of the plans started it was not known that an SEA had to be conducted. Second, due to the fact that this was the first NWP, there was ambiguity about how to make and use an SEA for this type of plan. The majority of the interviewees argue that conducting the SEA of the NWP must be regarded as a learning process. Respondents from the Ministry of Infrastructure and the Environment argue that for subsequent decision-making processes the SEA shall start earlier in pursuance of using the instrument to develop, review, and discuss the plan. It is suggested that the SEA-makers will from the outset be involved in the planning process so that alternatives can be developed collectively, during an interactive planning process (see de Graaff et al., 2010).

Chapter Seven

Results

7.1 Introduction

In this chapter the results of the case studies will be compared to each other and to SEA literature. The outcomes of the case studies will be used to answer the central question of this research:

What is the effectiveness of the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan and which factors contributed to their effectiveness?

A comprehensive answer to this central question will be given by means of addressing, one by one, sub-questions one through five. The chapter will start with a reflection on the SEA effectiveness assessment framework designed for this research (section 7.2). Subsequently, an overview is given of the effectiveness of each SEA (section 7.3). Afterwards, it will be examined to what extent the SEA implementation context has influenced the three cases (section 7.4). Following, an overview is given of the similarities and differences between the three cases as regards the factors important for SEA effectiveness (section 7.5). The chapter will conclude with a short reflection on the data (section 7.6).

7.2 Reflection on the SEA effectiveness assessment framework

The following section reflects on sub-question one:

What is SEA effectiveness and which methodological approach can be developed in order to evaluate it?

In chapter one, an SEA effectiveness assessment framework has been developed in order to respond to this question. The framework was based on objectives of SEA derived from SEA literature and regulation. The assessment framework proved to be helpful in order to describe and assess the influence of the SEAs on the decision-making process and final decision. Based on the case study analyses, several conclusions regarding the SEA effectiveness assessment framework have been made.

First, it is found that higher levels of SEA effectiveness can only be achieved when lower-ranking SEA effectiveness levels have been attained. 'Formal conformity' can only be attained when 'consent' has been reached, 'consent' can only be achieved when the criteria for 'consideration' have been fulfilled, etc. Yet, it is found that exclusively an account of the attainment of SEA effectiveness levels does not sufficiently reflect the tool's impact. In order to have an accurate impression of an SEA's effectiveness and to be able to compare it to other cases, it is important to depict, in detail, how the steps have been attained. For instance, in this research all cases have, strictly speaking, attained the level 'consideration': the SEAs were used to develop, review, or discuss the plan. Yet, only one SEA (SEA of the LAP) was also used to develop and discuss the plan and plan alternatives. The other two SEAs were only used to review pre-defined policy proposals. The extent to which 'consideration' has been attained thus reflects whether SEA was used as a policy-developing tool, that could significantly influence the planning process, or whether it was merely used to evaluate the environmental benignity of pre-defined policy proposals. Taken together, the extent to which the cases have attained 'consideration' varies significantly. It is argued that this is caused by the fact that the definitions and operationalization of the different effectiveness levels are rather broad in scope. It is proposed that this problem could, amongst others, be solved by means of further operationalizing each SEA effectiveness

level and/or accrediting points to every SEA based on the extent to which it has attained each effectiveness level (see chapter eight).

Second, the analysis indicates that the degree of 'consideration' positively influences the environmental significance of 'formal conformity'. The content of a plan can potentially become more environmentally friendly when environmental concerns are already acknowledged during the earliest stages of decision-making. When an SEA is only used to assess pre-defined policy proposals it "might lead to mere 'end-of-pipe' adaptation of planning measures or the introduction of compensation measures for negative impacts, but not to a substantive change in values or [policy] objectives"(Stoeglegner et al., 2009: 117). The SEAs of the NWP and the SEV III illustrate that when the SEA is used to evaluate pre-defined policy proposals, it gives rise to a small number of modifications in the plan but not to a substantive change in the content of policy proposals. The SEA of the LAP, on the other hand, was from the beginning used to formulate the minimum standards. Respondents argue that the plan has become more environmentally friendly due to the explicit use of the SEA to determine the minimum standards. In all, it is argued that conformance effectiveness of SEA is more significant if decision-makers explicitly use it as a policy-developing tool.

Third, the case study analyses indicate that the significance of the attainment of the levels 'consent' and 'formal conformity' (and in consequence also 'behavioral conformity' and 'final conformity') greatly depend on the scope and content of the SEA. It is in the author's opinion that 'consent' and 'formal conformity' will be more meaningful if the SEA would evaluate strategic, system alternatives. SEA's potential in contributing to the design of plans that avoid, minimize, or offset adverse environmental effects and enhancing environmental protection will be greater when the environmental information gives rise to new visions and changes in the plan relating to system alternatives (see Stoeglegner, 2010).

The SEA of the LAP has evaluated system alternatives concerning technical options and capacity planning for waste management in the Netherlands. Nevertheless, the SEA confined itself to a small part of the LAP. It is noted by respondents that the SEA could have evaluated more strategic issues and that accordingly the SEA could potentially have had more influence on the LAP.

The SEA of the SEV III only assessed site alternatives. System alternatives were not evaluated in the SEA due to the political context of the plan. The SEA's potential in contributing to the design of plans that avoid, minimize, or offset adverse environmental effects was limited because the SEA of the SEV III was bound to a higher, system level, strategic framework in which environmental values were not considered.

The SEA of the NWP did assess several strategic choices regarding water management. However, it is also noted by respondents that questions concerning the need and demand for the policy measures had already been answered during preceding planning phases and the SEA was thus not used to substantiate and underpin policy visions and objectives. Especially the short-term policy measures relate to technical options and locations that were available for the implementation of pre-defined policy proposals.

The above findings link to the observation by Stoeglehner (2010) in his review of SEAs conducted for spatial planning in Austria. "In the SEA normally no system alternatives are introduced, the demand question is not asked, and only site and technical alternatives are assessed in the environmental report" (Stoeglehner, 2010:227). Accordingly, the author concluded, "only mitigation of negative impacts, but not the overall improvement of the PP [plan or program], can be the assessment objective" (ibid: 227).

7.3 Reflection on the effectiveness of the three SEAs

In the case studies the effectiveness of each SEA has been discussed in detail. A brief answer to the second research question will be provided below:

What is the effectiveness of the SEA of for the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan?

The SEA of the LAP has been effective. The case study analysis indicates that performance effectiveness of the SEA of the sector plans is high. The SEA was used as a reference during the decision-making process in order to develop, review, and discuss the plan. The SEA of the sector plans was actively used during the decision-making process in order to define the minimum standard for 27 waste streams and has influenced many minimum standards. The majority of the minimum standards are preferable or acceptable from an environmental point of view. When a minimum standard does not conform to the SEA, it is described how the results of the SEA have been considered and why the selected alternative is chosen; there is thus a deliberate departure from the SEA. In all, interviewees note that the minimum standards have become more environmentally benign due to the SEA. The SEA of capacity planning for waste incineration has influenced visions and knowledge about waste management. Yet, while the scenario selected in the LAP is broadly in line with the most environmentally friendly alternative, the SEA only played a marginal role during decision-making; other social and economic aspects prevailed.

The effectiveness of the SEA of the SEV III is mediocre. The information provided by the SEA of the SEV III regarding the locations for power plants, HV tracks, and landing sites for wind-energy was mainly used to validate pre-selected locations and to determine whether the locations or tracks would not violate environmental- or nature- legislation. While based on the results of the SEA a selection could have been made of the locations that would be favorable or unfavorable from an environmental perspective (see NCEA, 2008:4), the political context caused the decision-makers not to do this (see section 7.4). The SEA of the warrant locations has been used more explicitly by decision-makers during the planning process and has also influenced the content of the final SEV III: two warranty locations for nuclear energy have been deleted. While this modification of the plan is important, it must be acknowledged that the SEA did not address the need for nuclear energy itself.

The effectiveness of the SEA of the NWP is mediocre. Due to the late start, the SEA was mainly used to justify pre-defined policy proposals and to ascertain whether they would not violate environmental legislation. The SEA has not been used to develop and discuss policy measures. The most important contributions of the SEA include the insights that it has provided about the environmental effects caused by the placement of wind turbines at the North Sea and an increase in water level of the IJsselmeer. The SEA indicated that the proposed policy proposals would give rise to more environmental damage than was initially expected. With regards to the policy proposal concerning the IJsselmeer, decision-maker decided that more research would have to be conducted before a final decision could be made. The environmental significance of the alteration of the NWP with regards to these policy issues is high, but it must be emphasized that the decisions have not been cancelled; they have just been postponed until more research regarding the effects of the policy proposals has been conducted.

In sum, the three SEAs have attained all levels of performance effectiveness. Yet, as discussed above, there is much difference with regards to the extent to which the level 'consideration' has been attained. While strictly speaking the level 'consideration' has been attained in all cases, only the SEA of the LAP has been used to develop, review, and discuss the plan and plan alternatives. In addition, all SEAs have attained the level 'formal conformity'. However, it is difficult to compare the three cases with regards to this level since each relates to different policy issues.

7.4 The implementation contexts of the three SEAs

As a point of departure, the implementation context of each SEA must be determined in order to assess its influence on the potential effectiveness of the instrument and the factors important for SEA effectiveness. Accordingly, the following section provides an overview of the SEA implementation

context of each SEA, consisting of the type of policy problem dealt with in the plan and the characteristics of the decision-making process.

Type of policy problem

Different chapters of the NWP are categorized as different policy problems. For instance, the policy problem regarding economic activities at the North Sea is unstructured; the policy problem concerning the increase in the water level of the IJsselmeer is a 'moderately structured, goal problem'; and other chapters, including the additional peak discharge for the Maas and Rijn, have been categorized as structured problems. With regards to the LAP, both the establishment of minimum standards for the various sector plans and the capacity planning for waste incineration are 'moderately structured, means problems'. With respect to the SEV III, respondents disagree about the types of policy problems discussed in the plan. While respondents from the Ministry of Economic Affairs consider the policy problems dealt with in the SEV III to be structured, actors from the NCEA and several stakeholders insist that the SEV III addresses 'moderately structured, goal problems'. They assert that the policy problem in the SEV III was framed as 'structured', about which not much debate was required. Yet, the underlying values and visions regarding electricity policy that the SEV III implies are conflicting.

Characteristics of the decision-making process

The decision-making processes of the LAP and the NWP have been categorized as 'open' and the decision-making process of the SEV III as 'closed'. Stakeholders were actively involved during the planning processes of the LAP and the NWP and cooperated with decision-makers in the design and selection of policy alternatives.

The closed decision-making culture of the SEV III relates to the observation that the policy problems in the SEV III were classified as structured by the competent authority: objectives were determined and there was not a lot of scientific uncertainty. Since the competent authority desired to give electricity producers the freedom to make choices regarding the selection of locations for electricity facilities, there was no need for a participative process in which policy problems and objectives could be discussed and environmental values could be confronted with social and economic interests. Furthermore, participation of external actors was not required in order to gain access to specialized knowledge. As a result, several stakeholders to the SEV III judge that the chances for participation were too limited and that environmental values were insufficiently represented during the planning process.

In addition, in order to assess whether decision-makers were perceptive to environmental values, it has also been examined whether the three plans have environmental objectives. Both the NWP and the LAP have objectives related to environmental protection or sustainability (respectively, the reduction of environmental pressure caused by waste management and sustainable water management). Accordingly, it was important for the decision-makers to take environmental effects into account during planning. The SEV III does not have explicit environmental objectives. For that reason, decision-makers of the SEV III were less inclined towards the consideration of environmental values during the decision-making process.

Reflection on the influence of the SEA implementation context

Based on the outcomes of the case studies, (the second part of) sub-question five can be answered:

To what extent did the SEA implementation context influence the potential effectiveness of the SEAs?

It is argued that "the extent to which decision-makers are open to other [environmental] values and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6) has a discriminatory function with regards to the potential effectiveness of the SEA. First of all, it is important that decision-makers are willing to involve other actors in formal decision-making processes so that, amongst others, environmental values can be represented during the planning process. Second, it is vital that decision-makers are perceptive to environmental values. Political will to take environmental values into account during decision-making determines whether the SEA is seen as a mandatory survey exercise, that must be conducted in order to obey environmental legislation, or as an opportunity to engage in an informed negotiation process (Stoeglehner, 2009). Both the LAP and the

NWP had direct objectives related to environmental protection and sustainability and the potential effectiveness of the SEA was therefore high. The SEV III did not have direct environmental objectives and decision-makers were less inclined to take environmental values into account during decision-making. Since the information of the SEA of the SEV III was not explicitly used to make (environmentally friendly) policy decisions or attain environmental objectives, the potential effectiveness of the SEA was lower.

In sum, based on the outcomes of the case studies it is concluded that political determination to respect environmental values is of extreme importance for SEA effectiveness.

The cases cannot be used to validate the assumption that the type of policy problem influences the potential effectiveness of SEA. The cases vary with regards to the level of scientific certainty and consent on norms and values. Yet, in none of the three cases these issues appear to have influenced the potential effectiveness of the SEAs. However, it is speculated that 'formal conformity' will increase when there is scientific certainty. The SEA of the NWP reflects that when scientific uncertainty is inherent to policy measures, decision-makers will be less inclined to make explicit decisions, which by definition limits 'formal conformity'.

7.5 Explaining SEA effectiveness

Each case study has discussed how various factors have contributed to the effectiveness of the SEA and the three case studies have thus jointly answered sub-question three:

Which factors influenced the effectiveness of the SEA of the National Waste Management Plan, the SEA of the Third Structure Scheme Electricity Supply, and the SEA of the National Water Plan?

The second column of table 5 (see below) depicts the average value attributed to the importance of the 13 factors for the three cases together. In the following section each factor's contribution to SEA effectiveness will be discussed. Furthermore, it will be judged whether the factors are equally important for each SEA in order to answer sub-question four:

Based on the outcome of sub-question three, is there a difference with regards to the factors that are important for the effectiveness of the three SEAs and, if so, how can this be explained?

Table 5 provides an overview of the mean score of all factors for all plans collectively and the average score of each factor for every case. Based on the evaluation of the factors and the qualitative data derived from the interviews a distinction has been made between factors that are unanimous and not unanimous in their influence on SEA effectiveness. When a factor is unanimous it is equally important for every SEA. Factors that are not unanimous differ in their contribution to SEA effectiveness per SEA. Explanations for their varied influence on SEA effectiveness must be looked for in the implementation-context or in the plan itself. The analysis indicates that 11 factors were equally important for the effectiveness of each SEA. The importance of the factors 'experience' and 'stakeholder participation' varied per case.

Finally, in the analysis of the factors below, it will be noted to what extent the importance of the respective factors have been influenced by the SEA implementation context. This will allow answering the first part of sub-question five:

To what extent did the SEA implementation context influence the factors important for SEA effectiveness?

Factor	All SEAs together	SEA of the LAP		SEA of the SEV III		SEA of the NWP	of the
Integration	3,69	3,67	+	3,33	-	4	-
Timing	3,5	3	+	4	-	3,75	-
Scoping	3,54	3,67	+	3	+	3,75	+
Pragmatism	3,36	3,33	+	4	+	3	+
Transparency	3,33	3,4	+	3	+	3,5	+
Quality	3	3,2	+	2,33	+	3,5	+
Experience	3	3,4	+/-	2,33	+	3	+/-
Independent review	2,85	2,83	+	3	+	2,75	+
Tiering	2,73	2,6	+	2,67	+	3	+
Stakeholder participation	2,43	3,33	+	2	-	1,5	+/-
Evaluation of social and economic effects	2,31	2,5	-	2	-	2,25	+
Financial resources	2,27	2,67	+	1	+	2,33	+
Public participation	1,46	1,83	+/-	1	+/-	1,25	+/-

Table 5. The average scores assigned to the importance of the factors for SEA effectiveness.

The columns on the right side of the columns where the average values are listed, indicate whether the factor was present (+), not sufficiently present (+/-), or not present (-).

7.5.1 Unanimous factors: factors that are important for every SEA

Below the factors that were equally important for each SEA ('unanimous factors') will be discussed in order of relevance.

Timing and Integration

The analysis indicates that integration and timing are interlinked and both very important for SEA effectiveness. Accurate timing of the SEA in relation to the planning process allows SEA- and decision-makers to communicate and cooperate during the planning process.

For the SEA of the LAP, an early start of the SEA and good cooperation between SEA- and decision-makers enabled decision-makers to use the information provided by the SEA as a reference to develop the plan. Vice versa, a lack of integration and effective timing are considered to be the major causes of the limited effectiveness of the SEA of the NWP and the SEA of the SEV III. In the case of the SEA of the NWP there was political will to use the information. However, due to the late start of the SEA, key decisions had already been made causing opportunities for effective cooperation and discussions between SEA- and decision-makers regarding policy proposals and their environmental effects to be lost. When the SEA would have been integrated into the planning process, the environmental data could have been used to feed the discussions during the decision-making process. The concept of the SEV III was also already finished when the SEA started, making it impossible to use the environmental data to develop the plan. However, taking into account the context of the SEV III, it must be questioned whether accurate timing and integration would have increased the influence of the SEA on decision-making.

The outcomes of the research are in line with the rationalization of the factors described in the theoretical background. "If the environmental assessment is initiated after key decisions on the plan or program have already been made, it is almost impossible to influence the plan or program, even if it has not yet been formally adopted" (Hilden et al., 2004:528).

In the theoretical background it was speculated that an early start might not be cost- and time-efficient when the plan has not been crystallized yet. The outcomes of the case studies indicate that, while an early start might require more time and financial resources, the factor is crucial as it determines whether an SEA will be able to have an influence on planning. The factors 'timing' and 'integration'

directly influence the effectiveness level 'consideration' and increase the chance that the environmental data will alter visions, knowledge ('consent'), and decisions ('formal conformity') regarding the plan. The relevance of the two factors for SEA effectiveness is not dependent on the type of policy problem. Yet, the factors will have more influence on SEA effectiveness (and will more likely occur) in an open decision-making context.

Scoping

Scoping, the determination of the extent and level of detail of the assessment and the information to be included in the SEA, was very important for the effectiveness of all three cases. For each SEA it was important that the decision- and SEA-makers collectively determined what issues had to be included in the SEA in order to ensure that their expectations of the SEA were streamlined. While the cases show that scoping can take much time and effort (see NWP), it is emphasized that this stage is important since it will ultimately enhance the efficiency and focus of the SEA. The outcomes of the case studies thus correspond to SEA literature; scoping ensures an efficient assessment (see Sommers, 2005). Furthermore, scoping can directly influence SEA performance effectiveness. The research indicates that when the SEA is fine-tuned to the wishes and needs of decision-makers, they will more likely consult and use it during planning ('acquaintance' and 'consideration'). Based on the case studies, no relationship has been found between the SEA implementation context and the relevance of this factor.

Pragmatism

A pragmatic SEA report that is adapted to the decision-makers' needs and understandable for all actors involved in the decision-making process contributed to the effectiveness of each SEA. It enhanced decision-makers willingness and ability to read, consult ('acquaintance'), and use the SEA to develop, review, or discuss the plan and plan alternatives ('consideration'). In line with SEA evaluation studies it is found that a pragmatic SEA report is important for decision-makers to understand the complex and technical data inherent to an EA (see MEGJ/MIRI, 2003). The analysis indicates that relating the outcomes of the SEA to various political themes or objectives can be rendered useful (see LAP) since it will make the implications of the findings of the SEA more logical for actors involved. Furthermore, when the SEA report is fine-tuned to the decision-makers' needs and fills information gaps, decision-makers will more likely consult and use the environmental data ('acquaintance' and 'consideration').

The analysis does not indicate a relation between this factor and the SEA implementation context.

Transparency

Transparency of both the SEA process and report are important. The cases indicate that transparency of the process (i.e., clearly defining the responsibilities and roles of all actors involved in the SEA and planning process) mainly enhances the efficiency of the assessment. However, transparency of the SEA report, implying that the content is made explicit and clear, directly influences decision-makers' usage of the SEA during decision-making ('acquaintance' and 'consideration'). A transparent SEA report is important because the methodology applied for the assessment will contain many assumptions and preconditions (see LAP). In line with SEA literature, the research suggests that transparency influences the legitimacy of the results and confidence in the assessment. Accordingly, decision-makers will be less inclined to use a non-transparent SEA as the foundation for a decision since it might lead to criticism and rejection of the decision (see Arbter, 2003).

The case studies cannot be used to underpin a relationship between the SEA implementation context and the relevance of transparency, but it has been speculated by interviewees that the factor's significance increases as the complexity of the SEA becomes higher and if the findings of the SEA are used to make a decision regarding a conflicting, unstructured policy problem.

Independent review

The independent review of the quality of the SEA by an independent body positively influenced the effectiveness of each SEA. In line with SEA literature (see Sheate et al., 2009), the research shows that independent advice is especially important for quality control of the SEA; it can warrant that decision-makers will take the obligation to conduct an SEA seriously and conduct a high quality SEA. In

addition, the advice can potentially enhance the quality of the SEA. In all, the quality and legitimacy of the SEA as a result of independent review can enhance the likelihood that the SEA will be read and consulted ('acquaintance') during planning (see factor 'quality').

One respondent insists that the review by an independent body is especially important in an implementation context where decision-makers are not perceptive to environmental values. When the decision-makers know that an independent body will review the report they will likely put effort in conducting a high quality SEA. Yet, others have emphasized that while independent advice guarantees quality of the assessment, it does not directly influence decision-makers' usage of the SEA during the planning process since this is dependent on the political will to use the SEA.

Respondents have not identified a relation between this factor and the type of policy problem.

Tiering

Contrary to several studies (e.g. Hilden et al., 2004), the case studies do not indicate that the identification of relations in the SEA between the plan and subsequent decisions is essential, but rather indicate that it is a facilitating or important factor for SEA effectiveness. Hilden et al. (2004) argue, "it is crucial to consider how the environmental assessment of policy, plan or program is linked to the project level" (Hilden et al, 2004: 527) for the implementation and realization of the plan. Respondents also believe that tiering is relevant since it makes the implications for, and relations with, lower tiers of decision-making more transparent. This increases the decision-makers' (and stakeholders') ability to read, consult ('acquaintance'), and use the information as a reference during *subsequent* decision-making processes ('consideration'). The factor might not have been classified as 'crucial' because the respondents themselves are not involved in subsequent planning and EAs, causing them not to experience the direct benefits of tiering.

Respondents have not identified a relation between the relevance of this factor and the SEA implementation context.

Financial resources

It is difficult to draw conclusions regarding the influence of the factor 'financial resources' because not many respondents were able and willing to elaborate on the influence of this factor on the SEAs. Nevertheless, it has been argued that the financial resources of all SEAs were sufficient to attain predefined objectives of the assessment. Furthermore, respondents deem that financial resources must always be sufficient, regardless of the implementation context or the characteristics of the plan. When the financial budget is not sufficient the assessment cannot be conducted properly, which in consequence limits the SEA's quality and, in turn, reduces the decision-makers' ability to use the environmental data during decision-making. This corresponds to the rationalization of the factor in chapter two, indicating that while financial resources cannot guarantee SEA effectiveness, lack of financial resources can negatively influence the SEA's quality.

Quality

The quality of the SEA, implying that the data and methodological approach of the SEA were valid, has contributed to the effectiveness of all three SEAs. While this factor was ranked as relatively less important for the effectiveness of the SEA of the SEV III, compared to the SEAs of the LAP and NWP, it is found that this factor is neither plan- nor context-specific. Respondents argue that this factor equally influences all SEAs, regardless of the context or type of plan, because it can improve the quality and legitimacy of the decision-making process and the decisions. When the quality of the SEA is high it will more likely be consulted ('acquaintance') and used to develop, review, and discuss ('consideration') policy alternatives. Furthermore, it is argued that when the quality of the SEA is low, the environmental information will less likely inform decision-makers, give rise to new visions ('consent'), and influence decisions ('formal conformity').

This finding underpins the notion that good quality information can influence actors and the decisions they make (see Fischer, 2007; Barlett and Kurian, 1999). Yet, several respondents emphasize that while the quality of the SEA should be high, the aspiration for high quality data should not delay the decision-making process.

Evaluation of social and economic effects

Only the SEA of the NWP evaluated several social and economic impacts. The case study of the NWP indicates that this factor did not significantly contribute to the effectiveness of the SEA of the NWP. While the SEAs of the LAP and SEV III did not assess social and economic effects, all respondents were inquired about the potential benefits of this factor. The results of the case studies reflect that there is no consensus among respondents pertaining to this issue.

Some respondents believe that the evaluation of social and economic effects can be useful since it allows decision-makers to gain a holistic and comprehensive understanding of the implications of the plan and the inter-connections of social, economic, and environmental effects ('consent'). Furthermore, when the SEA addresses all three aspects, the assessment can explicitly be used as a reference during discussions with stakeholders and the public regarding the plan ('consideration'). Others maintain that the evaluation of social and economic aspects in an SEA does not increase its effectiveness. They believe that SEA aims to counter the perpetual imbalance between social and economic values on the one hand and environmental aspects on the other, that often prevails during planning. The inclusion of social and economic aspects in SEA can weaken this resumed balance, causing environmental values to receive again less weight compared to economic and social aspects. This remark is in line with a viewpoint provided by Morrison-Saunders and Fischer (2006): when social and economic effects are evaluated in the SEA, "socio-economic factors are presented or considered more than once during the [decision-making] process (i.e., a kind of 'double-dipping') but the same does not apply for environmental elements" (ibid: 25).

The differences in opinions regarding this issue among SEA practitioners links to the inconsistency of views on this factor in SEA literature. Based on the outcomes of this study it is difficult to make robust conclusions regarding the influence of this factor on SEA effectiveness (N.B. only one out of the three SEAs evaluated social and economic effects). Furthermore, the outcomes of the case studies cannot be used to identify relations between the SEA implementation context and the relevance of the evaluation of social and economic effects. Yet, it is deemed reasonable by the author that the contribution of this factor depends on the plan and decision-making process. It is important to have a balanced decision-making process, in which social, economic, and environmental effects are represented. Including all effects in the SEA might be beneficial if social and economic effects are not sufficiently represented during planning.

Public participation

The analyses indicate that in none of the cases the public, "the broader, relatively undifferentiated collectivity of unorganized individuals who may have some interest or be affected relatively indirectly by a decision"(Dietz and Stern, 2008:61), actively participated in the SEA itself. In all three cases the public could react on the SEA when it was open for public inspection, but was not involved in the selection of alternatives and did not inform SEA-makers with specialized (local) knowledge. Only during the planning process of the LAP could the public actively participate. Yet, while public participation might have positively influenced aspects related to environmental education and democracy, it did not contribute to the quality of the SEA and plan.

Generally, respondents judge that the public could not add much value to a SEA because the issues were too technical (LAP), too abstract (NWP), or not directly relevant for the public (SEV III). Nevertheless, while public participation did not influence the effectiveness of the SEA, it did enhance the legitimacy of the plan and SEA.

Based on the outcomes of the cases studies, the contribution of public participation to SEA effectiveness is called into question. Yet, it must be acknowledged that public participation in the three cases mainly involved consultation of the public regarding the plan and SEA. In consequence, the outcomes of this research cannot be used to determine the influence of an interactive, participative process on the effectiveness of SEA. Several interviewees believe that public participation can potentially be useful in the case of unstructured or moderately structured, goal problems in pursuance of the identification of the wishes and priorities of the public. Nonetheless, respondents believe that this potential communicative function of SEA is hardly employed in Dutch SEA practice (see chapter eight).

7.5.2 Non-unanimous factors: factors that are not equally important for each SEA

The contribution of two factors differed between the three plans: experience and stakeholder participation.

Experience

The factor 'experience', the knowledge or practical wisdom that SEA- and decision-makers have gained during previous SEAs, was more important for the SEAs of the NWP and the LAP compared to the SEA of the SEV III. It is important to assess why the contribution of this factor differed per case and whether the SEA implementation context or characteristics of the plan or SEA can explain this difference.

There are two reasons for the importance of the factor 'experience' for the SEA of the NWP.

First, the lack of experience in SEAs for similar plans has influenced the SEA. The NWP was the first plan regarding water management at such a large scale and accordingly the Ministry of Infrastructure and the Environment did not have experience with conducting an SEA for this type of plan. When the decision-making process started it was not known that it was obligatory to conduct an SEA of the plan. When the SEA had finally started, it was a challenge to determine which aspects of the NWP had to be assessed in the SEA and how the cumulative effects of the various policy measures had to be evaluated. Respondents from the Ministry of Infrastructure and the Environment have noted that the experiences obtained during this SEA have been, and will be, used during subsequent decision-making. Due to this experience they have learned that the SEA must start earlier and be integrated into the decision-making process in order to allow for an iterative decision-making process during which information from the SEA can be used to develop, review, and discuss the plan and plan alternatives.

Second, experience of the SEA-maker was important for effectiveness for the SEA of the NWP. It is argued that the experience of the SEA-maker was especially important due to the lack in experience in previous SEAs of water management plans and because of time constraints. The SEA-maker could use experiences gained from other, unrelated SEAs in order to determine which policy proposals had to be included in the SEA and how the evaluation had to be conducted. This caused the SEA process to have a high quality and to be efficient. Within a short time period an extensive and high-quality SEA had been conducted.

SEA-makers' experience in the LCA methodology was important for the effectiveness of the SEA of the LAP. An LCA is a complex method and experts that have much experience and practical knowledge regarding the LCA methodology should conduct the assessment in order to increase the quality and efficiency of the SEA. The first consultancy that was hired to conduct the SEA did not have experience in conducting LCAs. This has delayed the process and eventually caused the initiator to employ another consultant that did have experience in this specific methodology.

Experience was less important for the SEA of the SEV III. SEA-makers note that the experience obtained by means of conducting an SEA for the SEV II has not explicitly been used during the assessment. Experience by the SEA-maker has contributed to the quality of the SEA process and report but did not directly influence the SEA.

Based on the analysis, a relationship between the relevance of the factor 'experience' and the SEA implementation context does not appear to exist. However, experience does seem to be more important for SEA effectiveness in three situations. First, it is concluded that experience of SEA-makers is more important when the objective of the SEA is demanding. If the SEA requires a methodology that is complex, it is important that experts who have much practical knowledge regarding the respective method will conduct the assessment. This will enhance the quality and efficiency of the SEA. Second, the experience of SEA-makers has more value when an SEA needs to be conducted for a plan for which no previous SEA has been conducted. The experience of the SEA-maker can be used to determine the scope and approach of the assessment, which can increase the quality and efficiency of the SEA process. Third, experience becomes more important when there are time constraints. If the SEA needs to be carried out within a relatively short period of time, the experience of the SEA-maker will increase the efficiency of the process.

Stakeholder participation

The participation of stakeholders, the representatives of organizations, communities, or interest groups that have a direct stake in the plan, was more important for the effectiveness of the SEA of the LAP, compared to the SEA of the SEV III and SEA of the NWP.

Stakeholder participation was important for the SEA of the LAP in order to have access to specialized stakeholder knowledge and to discuss which techniques had to be included in the SEA. Stakeholders' knowledge and expertise regarding the feasibility of various waste processing techniques was required in order to create the minimum standards. During the planning process decision-makers had discussions with key stakeholders pertaining to the feasibility of the selection of different waste processing techniques as the minimum standard based on the information from the SEA ('consideration'). The inclusion of stakeholders during this process was considered important because the implementation of the LAP depended on the support, capacities, and knowledge of the stakeholders. The above findings link to the proposition by Runhaar and Driessen (2007), who argue that "in the case of moderately structured, 'means', problems, stakeholder involvement is not required for recognition of the problem at issue, but mainly for the selection of the means by which the goal is to be reached" (ibid:6).

There was no stakeholder participation during the SEA of the NWP. It was not required to involve stakeholders in order to fill knowledge gaps or to identify alternatives. However, stakeholder participation did take place during the decision-making process of the NWP. It is argued that all different perspectives regarding policy problems were considered during the planning process and that the stakeholders were involved in the development of policy alternatives. Furthermore, some believe that stakeholder participation was less relevant for some policy issues because they have an exploratory nature (See PBL, 2009; NCEA, 2009). The NWP often proposes to conduct more research regarding a certain policy issue before a final decision can be adopted. Accordingly, explicit policy choices are not made for each policy issue. Respondents note that stakeholder involvement is less important if one does not want to use their input to make explicit decisions because stakeholders might become frustrated and judge that their input has been futile. While the potential value of stakeholder participation was thus limited, it is stated that the provision of environmental data by the SEA could have added value to the interactive planning process of the NWP. The SEA could have been used to indicate how various stakeholder preferences relate to environmental interests.

There was limited stakeholder participation during the SEA and planning process of the SEV III. It is noted that stakeholder involvement was neither important for access to information nor for support. This corresponds to the observation that decision-makers perceived the policy problem as structured. Stakeholders could not influence decision-making since there was no room and need for discussion; the objectives of the SEV III were determined. The SEA fulfilled mainly an informative function. The environmental data was not used to make explicit policy choices since the Dutch government wanted to give electricity producers the freedom to select the sites, capacities, and fuel-mixes for electricity facilities. The case study of the SEV III supports the proposition by Runhaar and Driessen (2007), stating that when decision-makers perceive the problem as structured, they decide to solve it in a traditional manner without much involvement of external actors. It is interesting to note that all respondents who maintain that the SEV III addresses a 'moderately structured, goal problem' are convinced that stakeholder involvement would have been very important. They insist that stakeholder participation could have been used to identify and discuss stakeholders' visions and objectives regarding energy policy in the Netherlands. This corresponds to the hypothesis by Runhaar and Driessen (2007) who argue that when an SEA addresses a 'moderately structured, goal problem', stakeholder participation can be used to identify and streamline the wishes of stakeholders (ibid). However, taking into account the fact that the decision-making process of the SEV III was closed and decision-makers had already determined the objectives of the plan, stakeholder involvement might have been futile and could have increased the chance for policy paralysis to occur.

It is difficult to draw robust conclusions regarding the contribution of stakeholder participation to SEA effectiveness (i.e., stakeholders were only extensively involved in one SEA). Based on the above

analysis, it is possible to speculate about the relevance of stakeholder involvement in various situations. First, stakeholder involvement, and the manner in which they are involved, is dependent on the type of policy problem. When decision-makers consider the policy problem to be structured they will not involve stakeholders because they do not need them for the provision of information or identification of objectives of the plan. Stakeholders should be involved in the SEA and decision-making process of 'semi-structured, means problems', when decision-makers rely on their specialized knowledge and expertise in order to develop the plan.

In addition to the type of policy problem, the analysis indicates that the characteristics of the plan or decision-making process can also influence the relevance of stakeholder participation. The case studies indicate that stakeholder involvement is important when the implementation of the plan is dependent on their support and conduct, and explicit policy decisions will be made.

Finally, it must be emphasized that, regardless of the type of policy problem and plan, stakeholder involvement requires an open decision-making culture. Stakeholder involvement is fruitless when decision-makers are not willing or able to respond to the input provided (see SEV III). When this is the case, stakeholders might become "frustrated when they find out that their input is not used in formal decision-making" (Runhaar and Driessen, 2007: 6)

7.6 Reflection on the data

This chapter has provided an overview of the main results of this research. As argued previously, the small number of case studies and the soft data retrieved by means of interviews make it difficult to extrapolate the outcomes of this research to SEA in general. Moreover, due to the fact that various factors were constant in all case studies (e.g., presence of factors and aspects regarding the SEA implementation context) it is difficult to draw exact conclusions regarding relationships between factors and SEA effectiveness. In view of the above, it is difficult to make robust statements regarding the significance and context-specificity of factors in relation to SEA effectiveness.

Nevertheless, while empirical generalization might not be feasible, SEA experts to whom the outcomes were presented have confirmed the outcomes of this research⁵⁹. In addition, it was argued that the conclusions with respect to the influence of the factors and context on SEA effectiveness are also observed in practice.

Furthermore, as stated in chapter three, theoretical generalization of the outcomes of this research is legitimate. As indicated in this chapter, the majority of the outcomes related to the explanations for SEA effectiveness correspond to the outcomes of previous evaluation studies. As a result, the respective theories regarding explanations for SEA effectiveness will gain further legitimacy. Nevertheless, it is vital that more research will be conducted in order to be able to make more robust statements and learn more about SEA effectiveness.

⁵⁹ On 17-10-2011, the conclusions of the research were presented to SEA experts working at the NCEA. In addition, the research was sent to, and reviewed by, the informants who were interviewed at the beginning of the research project.

Chapter 8

Discussion & Recommendations

8.1 Introduction

The previous chapter provided an overview of the main results of the three case studies. This chapter will reflect on the interesting implications of these findings for SEA theory and practice. First, it will be discussed to what extent SEA meets expectations pertaining to its ability to support an informed decision-making process, designing environmentally friendly plans, and enabling environmental protection (section 8.2). The second point of discussion regards the alternatives that SEA evaluates (section 8.3). It is argued that in many cases SEA is not strategic enough and that accordingly the tool's ability to enable environmental protection is diminished. Third, SEA's potential in facilitating a deliberative planning process is examined (section 8.4). The final section of this chapter will provide recommendations for SEA practice and future research (section 8.5).

8.2 Discussion point one: does SEA achieve its objectives?

In chapter two, the main objectives of SEA were identified: supporting informed decision-making, contributing to the design of plans that avoid, minimize, or offset adverse environmental effects, and protecting the environment. As a point of departure, a critical reflection on SEA's success in fulfilling these objectives is provided.

SEA's capacity to support informed decision-making

This research has indicated that SEA supports informed decision-making. SEA provides decision-makers with relevant information that can be used during decision-making. The case studies and opinions of the interviewees reveal, however, that SEA is mainly used to inform decision-makers about the environmental effects of a pre-defined plan. Attainment of 'consideration' often confines itself to usage of the environmental data provided by SEA to review the plan, rather than to develop plan options. While SEA informs the decision-makers regarding the environmental implications of the plan, it is often not explicitly used as a policy-developing tool. This is distressing since limited use of the SEA to develop and discuss the plan (i.e. 'consideration') diminishes the attainment of the effectiveness level 'formal conformity', and in consequence the design of plans that avoid, minimize, or offset adverse environmental effects.

The cases studies reflect that 'timing' and 'integration' are essential for a high level of 'consideration' and accordingly the decision-maker's use of SEA as a policy-developing tool. In line with literature on SEA, it is concluded that "in order to allow for a strategic and pro-active assessment timing is important: the assessment process needs to start soon enough to allow for an integration of environmental considerations in decisions so that the environmental assessment results are available early enough to influence the decision-making process"(Stoeglehner, 2010: 224).

To improve the tool's influence on planning it is relevant to understand why SEA is often started too late, not integrated in the planning process, and why it is, consequently, not used to assist decision-makers with the development of plans.

First, it may be caused by a lack of knowledge on SEA as a planning tool. When asked about this issue, several interviewees noted that there is still some ambiguity and uncertainty present regarding the usage and value of the tool. SEA is often perceived as a bureaucratic procedure that must be conducted when the draft plan is finished in order to obey environmental legislation; its potential to facilitate an informed planning process that can be used to develop (and not just review) the plan is not always recognized. Stoeglehner et al. (2009) therefore note that planners and decision-makers need to

embrace the components of SEA practice and methodology. It is important that decision-makers recognize the techniques, processes, and time frames for SEA and that they perceive that SEA can add value to their decision-making process (ibid). Decision-makers must become more aware of possibilities to integrate SEA in planning processes and during the scoping phase attention should be paid to the question how SEA can be adapted and integrated into the planning process. "SEA proponents will need to understand the stages of planning and policy-making and [should be] able to identify the issues that will be addressed at each stage" (Stoeglegner et al., 2009: 118). They should know when decisions are made during the planning process and be aware of the information that should be available at these decision points in order to enable an informed decision-making process (ibid).

Second, the lack of usage of SEA as a policy-developing tool might be caused by a limited need or will to take environmental aspects into consideration during planning. The outcomes of the case studies reflect that the context factor 'characteristics of the decision-making process', namely the 'openness of decision-makers to environmental values' has a discriminatory function as to the potential effectiveness of SEA. The cases reflect that political will and need to respect environmental interests during the planning process are enhanced when the plan has direct environmental objectives. Accordingly, it is the author's opinion that it is vital that plan-makers are aware of how their plan is related to (national) environmental objectives and assess how it can contribute to the attainment of these respective goals. It is speculated that having clear environmental objectives can increase decision-makers' willingness to use SEA and enhance the assessment's focus. Environmental goals related to the plan should be identified and formulated during the scoping phase.

Third, inaccurate timing, lack of integration, and accordingly the diminished potential to use SEA as a tool to develop policy, might be the result of (the strict interpretation of) SEA legislation. Respondents note that in order to determine which aspects need to be included in the SEA, SEA-makers must have a clear idea of what the plan encapsulates. It is emphasized that at the beginning of a planning process it is often difficult to predict which policy measures a plan will entail and what the environmental implications of the plan will be. At the beginning of a planning process it is hence difficult to predict if, and for which aspects of the plan, an SEA needs to be conducted. As a result, the SEA is often not used to develop policy from the outset of the planning phase. This finding links to the conclusion made by Stoeglehner (2010): "according to the SEA Directive a PP [plan or program] has to have significant environmental effects to qualify for an SEA. To be able to make this judgment, the main contents of the PP, in other words a preliminary draft of the PP, must exist" (ibid: 224). In consequence, the SEA process is likely to be always one step behind the planning process (ibid).

An obvious solution to this problem would be to apply SEA proactively instead of reactively. While SEA regulation does not compel decision-makers to start with SEA from the beginning of the planning process, it does not hamper their ability to apply SEA proactively before the content of the plan is explicit and it is determined that it is mandatory to conduct an SEA. The assessment of environmental effects should start from the beginning of the planning process, regardless of the fact whether it is mandatory to conduct an SEA or not. Environmental interests should be represented and incorporated when the general content and objectives of the plan are determined. It is therefore advised that environmental agencies are from the outset permanently represented at planning meetings. Thus, when it is concluded during the planning process that it is mandatory to conduct an SEA, the majority of the work will already have been conducted, which will consequently make the assessment process more efficient. On the other hand, when the plan does not entail elements that are concrete enough to give rise to environmental effects, the plan-makers have nevertheless designed a balanced plan that recognizes social, economic, and environmental interests.

SEA's ability to contribute to the design of environmentally friendly plans & protection of the environment

As shown in chapter two, international documents and legislation on SEA reflect that the tool has a 'substantive objective': it must contribute to the design of plans that avoid, minimize, or offset adverse environmental effects and enhance environmental protection. Yet while documents on SEA might be

clear as to SEA's substantive objectives, there are practitioners that question whether these are indeed direct objectives of the tool.

This research indicates that 'formal conformity' is often limited and confines itself to minor modifications and fine-tuning of the plan. Often SEA does not lead to significant changes regarding, for instance, revised plan objectives or new plan alternatives (Therival and Walsh, 2006). Why is 'formal conformity' relatively limited?

When inquired about this issue, almost all respondents argued that the most important function of SEA is the provision of environmental information in order to allow for an informed decision-making process. The majority of respondents believe that the design of environmentally friendly plans ('formal conformity') and the enhancement of environmental protection ('final conformity') are not direct objectives of SEA. This links to the argument by Bina (2007) who argues that "SEA tends to be implemented as an *informational technique*), the findings of which need no more than a review by the relevant agency" (emphasis added) (ibid: 592).

Jesse (2008) argues that the perception of SEA as an 'information tool', instead of an environmental protection tool, is partly the result of inexplicit SEA formulation, both in Europe and in the Netherlands. Article 8 of the EU SEA Directive states that "the environmental report prepared [...] shall be taken into account during the preparation of the plan or program and before its adoption or submission to the legislative procedure". The term 'take into account' can be qualified as an open norm; it is not explicitly stated what it encapsulates (Jesse, 2008). Jesse (2008) notes that one has to take the tool's substantive objective (see the preamble and article 1 of the EU SEA Directive) into account when interpreting this term and that accordingly the decision-makers must use the information provided by the SEA to make a decision that will be (more) environmentally friendly. While article 8 of the SEA Directive is an open norm, the remaining text allows one to recognize the environmental protection function of the tool. While Dutch legislation on SEA is supposed to transpose the EU SEA Directive, Jesse (2008) notes that it is even more ambiguous with respect to the objective of SEA. In fact, Jesse (2008) finds that, in contradiction to the EU SEA Directive, Dutch SEA legislation and jurisprudence do not imply a substantive objective of SEA. First, Dutch SEA regulation does not explicitly state that the objective of SEA is protection of the environment. Second, when The Dutch Council of State Administrative Law section explicitly mentioned the objective of EA it did not indicate the substantive objective of the tool: "EA serves to support the administrative decision-making and does not supplement it. Conducting an EA neither implies that during subsequent decision-making only environmental effects can play a role, nor that the MEA ['most environmentally friendly alternative'] needs to be chosen⁶⁰" (Council of State Administrative Law as cited in Jesse, 2008).

Legislation on SEA (especially Dutch legislation) permits subjective interpretation regarding the tool's objective. It is the author's opinion that recognition of the substantive objective of SEA, both in Europe and in the Netherlands, is crucial for the strength of the tool and its capacity to enable environmental protection. After all, the preamble of the EU SEA Directive states "the different environmental assessment systems operating within Member States should contain a set of common procedural requirements necessary to contribute to a high level of protection of the environment" (SEA directive, 2001).

How can SEA practitioners become more aware of the substantive objective of the tool? Several authors (see Polonen et al., 2011; Jesse, 2008) have suggested that legislation should be formulated more explicitly. At the EU level it should therefore be defined what 'take into account' encapsulates (see Polonen et al., 2011). If SEA legislation would have a compelling nature, decision-makers might be more inclined to take the results of the assessment seriously into account during the planning process. For instance, with regards to EIA, "the [European EIA] Directive could contain the following kind of requirement: "No authority is empowered to grant a permit for the implementation of a project if the assessment indicates that the project will have a significant adverse impact on the environment" (Polonen et al., 2011: 124). Likewise, Jesse (2008) proposes that in Dutch SEA practice, unless there

⁶⁰ Jurisprudence Nr. 59 ABRV 19 april 2006 (m.nt.KJ). Doel m.e.r. ('The objective of EA'). *Milieu en Recht*, Vol. 33, issue 6, p. 381

are critical social or economic interests, decision-makers should be obliged to choose the most environmentally friendly alternative that is evaluated in the SEA.

Another solution that could boost SEA's capacity for environmental protection is the application of the 'no net loss' principle. The principle implies that no environmental deterioration may result from a plan (Sadler and Verheem, 1996). "All resource losses and environmental deterioration occurring as a result of development must be matched by an equivalent (like-for-like) package of ecological gains and benefit"(ibid: 159). Conformance effectiveness is likely to increase and to become more environmentally significant if it would be mandatory to apply this principle. It would take SEA "beyond its conventional role of simply identifying and mitigating adverse impacts, towards being a vehicle for ensuring environmental enhancement on a scale that fully offsets negative impacts" (Jay et al., 2007: 297).

To conclude, it is argued that stronger regulatory backing of SEA's objective concerning environmental protection would increase the effectiveness of the tool. Such an obligation would especially contribute to the environmental benignity of decision-making in cases where political will to respect environmental values is absent.

8.3 Discussion point two: is SEA strategic enough?

As mentioned in chapter two, one of the reasons to implement SEA was the need to identify and assess the environmental implications of decisions during the earliest stages of decision-making. Chapter two identified three types of alternatives: system, site, and technical alternatives. System alternatives encapsulate choices concerning the decision's objectives, visions, and technological options; site alternatives refer to sites for the implementation of projects; and technical alternatives regard the design of concrete projects on selected sites (Stoeglehner, 2010). The framework set at system level determines site and technical alternatives. The potential of site and technical alternatives in contributing to environmental protection is significantly limited when environmental values are not considered at system level. Accordingly, at system level a lot can be gained from an environmental perspective: it can significantly prevent negative environmental impacts and proactively enhance environmental protection and sustainable development (Fischer, 2007).

The case studies indicate that each plan and SEA differ in terms of their strategicness. This reflects the notion that SEA can be applied in a range of situations and that the content depends on the type and characteristics of the plan. Yet, for each case there are respondents who believe that the SEA could have focused on more strategic issues. It is in the author's opinion that the 'strategicness' of the topics included in the SEAs have influenced the potential and actual attainment of the effectiveness levels 'consent' and 'formal conformity'. It is argued that the higher the level of strategicness of the SEA, the more significant 'consent' and 'formal conformity' will be. The two SEA effectiveness levels will be more significant from an environmental perspective if the SEA gives rise to new system alternatives, compared to site or technical alternatives (see Stoeglegner, 2010).

Based on the analysis, it must be questioned why SEA in the Netherlands is not (sufficiently) used to evaluate strategic, system alternatives. Based on a discussion with the interviewees regarding this topic, it is proposed that this phenomenon is partly the result of EA legislation in the Netherlands. As depicted in chapter one, once it is established that an SEA needs to be conducted for a plan (screening) it is determined what aspects of the plan need to be included in the SEA (scoping). Only aspects that set a concrete frame of reference for future projects (for which also an EIA might have to be conducted) need to be evaluated in the SEA. Yet, while the term 'a concrete frame of reference' is not explicitly defined it is noted that the plan must be concrete enough in order to determine whether, and how, it will affect the environment (VROM, 2006). However, as stated previously, genuine strategic choices are often ambiguous and it is not always clear if, and how, the environment will be affected. Several respondents deem that as a result of the strict interpretation of EA legislation, the most interesting strategic choices regarding the plans were not included in the assessment.

A possible solution to this problem would be to broaden the phrase 'set a concrete frame of reference for'. "Any planning task can be optimized from an environmental perspective independent of the scale so the question about significance [i.e. does the decision give rise to significant environmental effects] might become absolute" (Stoeglehner, 2010: 229).

Another solution, which does not require adaptation of SEA legislation, links to the solution proposed for a late start and lack of integration of SEA (see discussion point one). At the start of a planning process decision-makers should examine how their plan is likely to affect the environment and how the content of the plan can become more environmentally benign. It is advised that decision-makers are less concerned with determining for what aspects it is mandatory to conduct an SEA, but instead examine which topics are most relevant from an environmental perspective, regardless of their level of concreteness. At the start of the planning phase, decision-makers should address questions including 'which strategies does this plan imply?', 'what strategies can be followed in order to attain the objectives of the plan?', 'how does the plan relate to broader environmental protection and sustainable development objectives?' and 'how can SEA contribute to the formulation of strategies?' (see Cherp et al., 2007). Answering these questions enables decision-makers to discuss and recognize how SEA can aid with the development of policy that respects environmental interests.

Finally, when SEA is used to evaluate strategic planning elements it could be helpful to make more explicit use of sustainability concepts in the assessment (Jay et al., 2007). Rather than trying to identify the effects of policy proposals on the direct, biophysical environment, it is recommendable to identify the global implications for the environment and sustainable development (e.g. effect on environmental resources, resilience of ecosystems, biodiversity, and ecosystem services) (see Jay et al., 2007). This will allow all actors involved in the assessment to understand the global, cumulative, and indirect implications of various strategic development paths. In addition, this might trigger deliberation and public debate during the SEA process (see below).

8.4 Discussion point three: does SEA facilitate sufficient stakeholder and public deliberation?

In chapter two it was discussed that an interactive, communicative approach towards SEA is increasingly promoted. It was argued that the choice for a rational or communicative approach, and consequently the importance of the factors 'stakeholder involvement' and 'public participation', depends on the implementation context of the SEA. In line with the position by Runhaar and Driessen (2007), it was speculated that the two factors are more valuable for SEA effectiveness in an open decision-making context, when scientific uncertainty about the plan is low and/or when interests regarding the content of the plan diverge.

This research underpins the notion that, with regards to many policy issues, decision-makers can no longer afford to make decisions in a hierarchical, closed fashion (see Runhaar, 2009). The cases reflect that stakeholder participation is important when the design and implementation of a plan are dependent on the expertise and support from stakeholders.

Respondents have emphasized that stakeholder involvement in planning becomes, in general, increasingly important. Many respondents consider it valuable when the information provided by the SEA is used to inform stakeholder discussions during the planning process. This allows decision-makers to understand how various interests relate to environmental values. It enhances discussions about the implications of policy proposals and allows for an iterative decision-making process in which policy measures are developed that are environmentally benign and supported by the stakeholders. The SEA of the LAP is a successful example of how the SEA can be used to inform discussions among decision-makers and stakeholders. However, respondents note that in practice the SEA often starts too late, when discussions with stakeholders have ended, and that 'the deliberative potential' of SEA is hence diminished.

Many studies emphasize the relevance of public participation for SEA effectiveness⁶¹. Yet, the outcomes of this research and the experiences of the interviewees indicate that public participation often confines itself to the 'formal consultation' of the public and this does not influence SEA effectiveness. Several respondents do argue that public participation can potentially be used to identify and make trade-offs between social, economic, and environmental values. This is in line with the justification for public participation by Dietz and Stern (2008): it "may help to find a fair balance or a

⁶¹ Except for the study by Therivel and Minas (2002), that did not find a significant correlation between public consultation during the SEA and changes to the plan.

mutually acceptable trade-off between the extremes of too much and too little caution in environmental protection" (ibid: 56). This is especially important in situations where there is insufficient scientific certainty regarding the effects of policy measures (ibid). However, some respondents argue that in these situations it is also valid to allow, for instance, NGOs to represent public interests.

While SEA literature and SEA practitioners recognize the potential value of a deliberative assessment and decision-making process it is not put into practice. Why is public participation in SEA marginal? First, limited public participation can be the result of the participative procedures in SEA practice. Formal consultation and placing the plan and SEA open for public inspection mainly serves to inform the public about the plan. It must be questioned whether this enhances critical reflection and discussion among the public regarding the plan and its relation to sustainable development. Second, many respondents deem that public participation is limited because the general public is less inclined to participate in, or react on, an SEA because the policy issues are too abstract or technical. It is in the author's opinion that this links to the observation that the alternatives discussed in the SEAs often do not pertain to strategic issues. Indeed, the public might not be inclined to participate in discussions regarding the potential locations for electricity facilities. Yet, debates about the type of, and capacity for, electricity generation will likely attract many citizens. Accordingly, public participation might add value to SEA and decision-making processes during which system alternatives are considered that are directly relevant for the public.

Based on the above findings, it is deemed that SEA has not fulfilled its deliberate potential yet. Furthermore, it must be questioned whether SEA is successful in enhancing societal debate regarding environmental values. This is distressing since many regard a deliberative societal debate as crucial in order for environmentally conscious patterns of development to commence (see Fischer, 2009). In order to increase the tool's success, it is important that more practitioners recognize the value that SEA can add to a decision-making process. When SEA will be used to inform debates among decision-makers and stakeholders it will contribute to the 'greening' of political decision-making structures (ibid).

8.5 Recommendations

In order to ensure a sustainable future it is vital that strategic decisions do not give rise to adverse effects on the environment. SEA is generally regarded as one of the key tools that can 'green' decision-making since it allows decision-makers to assess the environmental effects of proposed decisions and to take these into account in the final plan. It is aspired that this will enhance the chance that environmentally friendly plans are designed, which will lead to the protection of the environment.

Yet, this research has illuminated that the contribution and influence of SEA towards decision-making could be increased. It appears that the knowledge and understanding regarding the usage of the instrument during decision-making is still not sufficient. Also, SEA is an innovative aspect of public policy formulation and accordingly "confronted with bureaucratic and political incomprehension and resentment" (Caldwell, 2000).

Given the adversities that SEA is confronted with, what can be said about the future of this tool? Is the strength of SEA sufficient in order to constitute a vehicle towards a more environmentally sustainable society? Is it strong enough to counter the forces that benefit from the continuation of the *status quo* and the dominance of economic interests over social and environmental values?

As a point of departure, it must be emphasized that the potential value of SEA is high. SEA enhances the integration of environmental concerns into decision-making and ensures that plans will not give rise to significant adverse effects on the environment (e.g., on Natura 2000 sites). In addition, the cooperation between decision- and SEA-makers allows for the design of innovative synergies that respond to social, economic, and environmental needs. Furthermore, SEA can improve the environmental benignity of strategic decisions and can thus contribute to environmental protection. Finally, it must be recognized that on a long-term scale, SEA can introduce environmental values and ecological rationality into political decision-making structures.

Given the above advantages that SEA can bring to decision-making, it is argued that it is worthwhile to continue with the application of the tool. Yet, several criteria must be fulfilled in order to increase the value of SEA and to ensure that it will be used optimally. This research has indicated that political will and understanding regarding the usage of SEA as a policy-developing tool significantly influence the potential effectiveness of the instrument. The factors ensure that the timing of the assessment procedure is accurate, that the SEA is integrated into the planning process, and that the tool is thus applied proactively instead of reactively. When these respective factors are not present the effectiveness of SEA is reduced, regardless of the quality of the report and/or process.

Based on the notion that SEA is a valuable tool and the awareness of factors that limit its effectiveness, an overview will be given of recommendations that can ensure a successful future for the instrument (some have already been mentioned previously). A distinction is made between recommendations regarding SEA in general (system level) and recommendations that must be taken into account when conducting SEAs (case level). In addition, a short outline is given of ideas for future research on SEA effectiveness.

General recommendations

- Improvement of the reputation and perception of SEA.
 - The potential function of SEA is still undervalued. Among SEA practitioners there is still ignorance regarding the value that the tool can add to decision-making. In addition to the incorrect perception, there is also still insufficient knowledge regarding the instrument among decision-makers. It is not always known that an SEA needs to be conducted at the start of the planning process and how it can aid with the development of policy alternatives. In all, in order to change the reputation and perception of the tool, it is vital to increase capacity building and education concerning the tool among decision-makers. This can, amongst other, be done by means:
 - Providing workshops for decision-makers on SEA. SEA-experts should teach them about the contributions that the instrument can make to decision-making. In addition, decision-makers should learn how they can use SEA during planning processes.
 - More SEAs should be evaluated based on their quality, process, and contribution to decision-making. The outcomes and recommendations should be shared and discussed among decision-makers.
- Boost the environmental protection function of SEA
 - SEA is often perceived as a tool that can be used to facilitate informed decision-making. The fact that SEA ought also to contribute to the design of environmentally friendly decisions and environmental protection is less apparent. Yet, if SEA is to be an 'environmental protection' tool, it is vital that its substantive objective is acknowledged. This can be achieved by means of altering SEA regulation and the perception of the tool.
 - SEA regulation should be formulated more explicitly. At the EU level it should be defined what the following obligation encapsulates: "the environmental report [...] should be taken into account during the preparation of the plan or program and before its adoption or submission to the legislative procedure" (article 17 of the EU SEA Directive). It is advised that the Directive will become more compelling with regards to the relation between the assessment and the decision-making process. The further refinement of the SEA Directive in relation to the influence of the SEA on the decision must also be transposed into Dutch SEA regulation.
 - Mandatory application of the 'no net loss' principle. Application of this principle would ensure that no environmental deterioration would result from any plan or program (Sadler and Verheem, 1996).
 - Increase decision-makers' will to use SEA to design environmentally friendly plans and programs. The actors should become more aware of environmental

problems and learn how the design of plans or programs that avoid, minimize, or offset adverse environmental effects can contribute to the achievement of (national) objectives regarding the protection of the environment and sustainable development.

- Apply SEA to strategic issues
 - SEA should be applied for decisions that have much influence on the environment and that set a framework for a cascade of program and project decisions. Currently, questions pertaining to the objectives and vision statements of a plan are rarely assessed in the SEA. This is mainly due to the formulation of SEA regulation. An SEA must be conducted when it 'sets a concrete frame of reference' for future activities that can negatively affect the environment. There are several solutions to this problem:
 - Use SEA to evaluate 'system alternatives', which regard the need and demand, vision statements, goals, and technological options relating to the plan. Decision-makers should from the outset of the planning process determine which policy aspects have environmental implications and ponder how SEA can be used to enhance the environmental quality of these decisions, regardless of whether there exists an obligation to conduct an SEA.
 - Broaden or clarify the term 'set a concrete frame of reference for' in the EU SEA Directive and national SEA regulation. While it might be difficult to identify the immediate environmental effects of strategic choices, they do set a frame of reference for future activities and can have a profound impact on the environment.
 - Evaluate the alternatives on their global implications for the environment and sustainable development (e.g., biodiversity, ecosystem services, resilience of ecosystems), in addition to their effects on the direct, biophysical environment. This will allow for a comprehensive understanding concerning the global, environmental implications of alternative strategies.

Recommendations for SEA practice

- Start with SEA proactively instead of reactively. Do not wait with the assessment until it has, during the screening and scoping stages, been established whether or not it is mandatory to conduct an SEA. Environmental considerations should from the beginning of the planning process be represented and taken into account, even if it is not known whether there exists an obligation to conduct an SEA. This will allow the SEA to start early, when environmentally friendly policy proposals can still be developed. The value of SEA is diminished when fundamental decisions have already been made; it cannot be used to develop plan alternatives, but can merely fine-tune the plan or add mitigation measures.
- Integrate the assessment into the planning process. Ensure that the SEA and the planning process jointly form an iterative decision-making process. SEA- and decision-makers should cooperate closely and environmental values should from the beginning be represented at planning meetings. The environmental data provided by the SEA must feed the planning process in order to develop, review, and discuss the plan and plan alternatives.
- Define and identify environmental objectives related to the plan. Decision-makers should be aware of how their plan is related to (national) environmental objectives and assess how their plan can contribute to the attainment of these objectives. Decision-makers might consider the SEA to be more relevant when they have identified environmental objectives that are related to the plan. Additionally, clear environmental objectives can increase the focus of the assessment.
- Scoping, pragmatism, transparency, stakeholder participation, and tiering positively influence the likelihood that decision-makers read, consult, and use the SEA to develop, review, and discuss the plan.
- Independent review, experience, and financial resources positively influence the quality of the SEA report.

- Stakeholder participation in the SEA is required when the SEA-makers require their specialized knowledge for the assessment. Stakeholder participation in the planning process is dependent on the policy problem and the openness of the decision-making process. The participation of stakeholders is relevant when decision-makers are dependent on their knowledge, support, and implementation of the plan. When there is uncertainty about the knowledge base and the means in which the policy problem can be solved, stakeholders can identify appropriate measures (see Runhaar and Driessen, 2007). When there is no agreement on the objectives and vision statements of the plan, decision-makers can use stakeholder participation to identify and streamline preferences (ibid). Yet, regardless of the type of policy problem, stakeholder participation is only valuable in an open decision-making culture, where decision-makers take their input into consideration and use it to make explicit policy decisions (ibid).
- Outsource the SEA to a consultant that has much experience in the methodology required for the assessment and when there are time constraints.

Recommendations for future research

- Further development of the SEA effectiveness assessment framework. As argued in chapter six, it is difficult to compare cases solely on their attainment of the various SEA effectiveness levels. It is therefore considered plausible to assign points to an SEA corresponding to the degree to which each SEA effectiveness level has been attained. Of course, in order to be able to do this, each level of the effectiveness framework would have to be further operationalized and the points that could be appointed to each level would have to correspond to the indicators.
- Evaluation of 'behavioral conformity' and 'final conformity'. When plans become more environmentally friendly due to SEA, it is also important to assess whether they are implemented accurately ('behavioral conformity'). Future studies must look at subsequent decision-making in order to determine whether the recommendations and proposals of the plan are endorsed and implemented accurately. Furthermore, more research must be conducted regarding the 'final conformity' of SEAs. Relationships between policy measures in a plan and environmental indicators should be studied in order to establish whether the environmental effects of the plan were predicted accurately in the SEA. Also, the evaluation of 'final conformity' is important in order to conclude whether SEA fulfills its ultimate objective: environmental protection.
- More evaluation studies on SEA effectiveness should be conducted. The SEA effectiveness assessment framework designed for this research and the analytical framework, comprising the 13 factors relating to the SEA content and process and the implementation context, can be used for this purpose. It is relevant that in future evaluation studies there is more variance among the variables in order to be able to draw robust conclusions regarding explanations for SEA effectiveness.

8.6 Conclusion

The list of recommendations provided above is diverse. The list reflects that broadly speaking two main paths can be followed in order to increase the success of the tool. First, SEA can become more effective and become a more forceful environmental protection tool if its legal basis becomes more compelling. This approach implies that political will and need to use SEA can be fostered when there are stricter requirements regarding the relationship between the instrument and decision-making. A second approach that can be upheld in order to improve the effectiveness of SEA focuses on capacity building and the improvement of the perception and understanding of the tool. This line of policy thus entails that knowledge and understanding of the tool will foster decision-makers' will and ability to use SEA effectively.

While the paths that can be followed in order to increase the effectiveness of SEA differ, all recommendations aim to ensure that SEA becomes a more sophisticated and powerful environmental protection tool. Given the environment related challenges that we are facing today, it is vital that

environmental values are pro-actively represented and acknowledged during strategic political decision-making processes. When taken into account, the provided recommendations could increase the importance of SEA as an instrument for sustainable development.

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Appendices

Appendix A - Interview Questions

The effectiveness of the SEA

I. The objective of SEA

1.a What is/are, in your opinion, the objective(s) of SEA?

II. The effectiveness of the SEA: performance

2.a Did decision-makers read and/or consult (seek information from) the SEA during the planning process?

2.b To what extent, and how, did the SEA function as a reference during the decision-making process? Was it used to develop, review and/or discuss the plan and plan alternatives?

2.c Did the SEA influence subsequent decision-making, EIAs or SEAs? If yes, how?

2.d Did the SEA educate actors involved in the decision-making process about the environmental implications of the plan and/or did they alter their vision of the plan due to the SEA?

2.e What was the most important contribution of the SEA to the decision-making process?

III. The effectiveness of the SEA: formal conformity

3.a Did the SEA have an influence on the final plan? If yes, did the content of the plan alter due to the SEA? If yes, how has the plan changed and can you guarantee a causal relationship between the SEA and the alteration in the plan?

3.b When you have indicated that the plan has been altered because of the SEA, how significant is this alteration from an environmental perspective?

The SEA implementation context

IV Description of the SEA implementation context and its influence on the SEA

4.a Where there conflicts in norms and values between decision-makers and stakeholders regarding the plan?

4.b Was there, and to what extent, scientific certainty regarding the knowledge base of the plan?

4.c How would you describe the political context and the decision-making culture of the planning process?

4.d Did decision-makers involve stakeholders during the formal planning procedures? If yes, how?

4.e Where decision-makers perceptive towards environmental values?

4.f How, and to what extent, did the context influence the potential effectiveness of the SEA?

Explaining the effectiveness of the SEA

V Factors that influenced the effectiveness of the SEA

The interviewees were given 13 cards on which 13 different factors were described. The interviewees were asked to rank all factors on a scale from one to four.

How important was this factor for the effectiveness of the SEA?

A horizontal scale with four points marked by vertical dashed lines. Below the scale, the numbers 1, 2, 3, and 4 are centered under each tick mark. Underneath these numbers are the labels: 'not important' under 1, 'a bit important' under 2, 'important' under 3, and 'very important' under 4.

During the assignment the respondents were inquired about the factors (see table 2) and were asked why the factor was (not) important. Furthermore, the respondents were asked the following questions:

5.1 Are there additional factors, not written on the cards, which were also important for the effectiveness of the SEA?

5.2 Are there additional factors, not written on the cards, which have hampered the effectiveness of the SEA?

5.3 Which of the 13 factors are most important for the effectiveness of SEA? Why?

5.4 Which of the 13 factors are least important for the effectiveness of SEA? Why?

5.5 Are there factors of which their relevance for SEA effectiveness differs per plan or SEA? If yes, why were they more or less important for this SEA?

5.6 Are there factors of which the relevance for SEA effectiveness is dependent on:

-(the lack of) conflicts on norms and values regarding the plan?

-the scientific (un)certainty regarding the knowledge base of the plan?

-the characteristics of the decision-making culture (i.e., open/closed; openness to other (environmental) values?

Appendix B - Operationalization

B-I Operationalization of the four different levels of effectiveness that are evaluated in this research

Effectiveness level	Indicators	Operationalization	Source
Acquaintance	The decision-makers read and/or consult the SEA	Did the decision-makers read and/or consult the SEA during the decision-making process?	Interviews
Consideration	<p>-The SEA is used as a reference during the decision-making process: the information provided by the SEA is used to develop, review, and/or discuss the plan or plan alternatives.</p> <p>-The SEA is used as a reference during subsequent decision-making processes: the information provided in the SEA is used to develop, review, and/or discuss policy options.</p>	<p>-Has the SEA been used to develop, review, and/or discuss the plan or plan alternatives?</p> <p>-Has the SEA been used to develop, review, and/or discuss policy options?</p>	Interviews
Consent	The actors involved in the decision-making process are influenced by the SEA and change their knowledge base and/or visions accordingly.	<p>-Did the SEA educate the actors involved in the decision-making process about the environmental implications of the plan?</p> <p>-Have actors involved in the decision-making process altered their visions regarding the plan due to the SEA?</p>	Interviews
Formal conformity	The plan becomes more environmentally friendly due to the SEA: it avoids, minimizes, or offsets adverse environmental effects.	<p>-Has the plan been altered due to the SEA?</p> <ul style="list-style-type: none"> • References to the SEA in the plan • A causal link between the SEA and the change is identified by the interviewees <p>-Does the change make the plan more</p>	Document analysis; interviews

		environmentally benign: does it avoid, minimize, or offset adverse environmental effects?	
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B-II Operationalization of the SEA implementation context

Context Factor	Indicator	Operationalization	Source
Certainty of the knowledge base	Degree of scientific certainty about the (environmental) effects of the plan	How much scientific certainty is there about the (environmental) effects of the plan?	Document analysis of the SEA; interviews
Consent on norms and values	Degree to which norms and values regarding the objectives and content of the plan coincide among stakeholders and decision-makers	Is there among stakeholders and decision-makers consent on norms and values regarding the plan?	Desk research; interviews
Characteristics of the decision-making process	"The extent to which decision-makers are open to other [environmental] values and willing to share decision-making powers" (Runhaar and Driessen, 2007: 6)	<p>-Are the decision-makers perceptive to environmental values?</p> <ul style="list-style-type: none"> • Does the plan have environmental objectives? <p>-Are the decision-makers willing to involve other actors during formal decision-making processes (i.e., open or closed decision-making process)?</p>	Interviews

Appendix C- Formal Conformity

Table C-I Formal conformity of the SEA of National Waste Management Plan.

Sources: AOO (2002); Ministry of VROM (2007)

Type of waste	SEA	Plan
Asbestos	Within the SEA four different techniques are compared: (1) pyrolysis/melting; (2) dissolving in standard soda solution; (3) sintering; (4) land-filling. The SEA indicates that landfilling of waste is in most cases the best method with the lowest environmental pressure. Only when the Distance-to-target (Dtt) weighting is applied, landfilling is least preferred.	The minimum standard for asbestos is landfilling. In all, the minimum standards are in line with the findings of the SEA (VROM, 2007). Also, the minimum standard is in line with current practice and is therefore feasible (ibid).
Batteries	<p>The SEA evaluated four different techniques: (1) electro-melting furnace; (2) pyrolysis /melting; (3) pyrometallurgical processing; (4) hydrometallurgical processing.</p> <p>The SEA indicated that the electro-melting furnace scores least good from an environmental perspective. The SEA indicates that for the other techniques the most environmentally friendly alternative depends on the applied weighting.</p>	<p>The minimum standard for batteries is 'useful application of the metals', and all techniques are therefore allowed.</p> <p>Based upon the findings of the SEA, it is difficult to determine one alternative that ought to be preferred from an environmental perspective (VROM, 2007). "The most important similarity between the alternatives is the useful application of the metal fraction (iron, manganese, sink)" (ibid: 223). Within the LAP it is argued that the minimum standard is environmentally friendly because it focuses upon re-use and the prevention of dispersion of the metals.</p>
Talus and sieve sand	The SEA did not assess different techniques for processing talus and sieve sand but evaluated different forms of useful application of the sands after processing. There are two scenarios for their useful application: (1) substitute gravel and replace concrete and mason sand and (2) replace foundation material and fill sand. The SEA indicates that not one scenario is preferred from an environmental perspective. Both scenarios have different advantages and disadvantages (AOO, 2007)	<p>The minimum standard is useful application in the form of material re-usage.</p> <p>While the SEA discusses different applications of sand the LAP states that given the results of the SEA, there is no need to further specify the minimum standard (VROM, 2007).</p>

Photographic waste (bleach fixer)	<p>The SEA evaluated seven alternatives: (1) electrolysis, sulfideprecipitation / ultra-filtration membrane pre-evaporation, physical / chemical / biological purification and evaporation, incineration / land-filling; (2) electrolysis, sulfideprecipitation/ ultra-filtration membrane before evaporation, physical / chemical / biological purification and evaporation, verification; (3) electrolysis, pre-evaporation, physical / chemical / biological purification and evaporation, incineration / land-filling; (4) hysico-chemical purification, pyrolysis, vitrification; (5) electrolysis, for evaporation, physical / chemical / biological purification and evaporation, vitrification (6) Electrolysis, reverse osmosis and evaporation, vitrification; (7) re-usage.</p> <p>The SEA indicated that alternative 7, re-usage, is preferred from an environmental perspective.</p>	<p>"The minimum standard for this waste, with a silver content greater than 100 mg/l is reclamation of metals" (VROM, 2007:264). After the evaporation the purified residual liquid and the evaporation that is released are processed in a grate incinerator (ibid).</p> <p>"The minimum standard for this waste with a silver content less than 100 mg/l is evaporation followed by purification, after which it is burned in an grate incinerator" (ibid: 264).</p> <p>"With regards the recoveries of metals from liquid waste streams, all techniques that lead to separation are permitted" (ibid: 262). All in all, "the minimum standard is consistent with the outcomes of the SEA" (ibid: 262).</p>
Vegetable-, fruit-and garden waste	<p>The SEA evaluated five alternative: (1) separate collection and composting (2) separate collection and fermentation, (3) separate collection and gasification / co-incineration; (4) integral collection and incineration in an AVI, (5) integral collection, fermentation, burning.</p> <p>Alternative three is the most environmentally friendly alternative. Alternative one is least preferred from an environmental perspective.</p>	<p>The minimum standard is set at composting or fermentation aimed at the re-usage of the materials (alternative 1).</p> <p>The minimum standard is not in line with the outcomes of the SEA. It is stated that the techniques that are at the moment operational equally affect the environment and accordingly other aspects such as costs and the available infrastructure for waste treatment prevailed when deciding on the minimum standard (VROM, 2007).</p>
Green waste	<p>The SEA evaluated three techniques that can be used to process the wood fraction of green waste: (1) composting; (2) gasification/ co-firing in a power plan; (3) fluidized bed combustion. All techniques score well on the various criteria. Gasification scores best.</p>	<p>The minimum standard is recycling in the form of material re-use or fuel. No standard for a technique is provided. All three alternative techniques are thus allowed.</p>
Sludge	<p>The SEA evaluated nine different techniques: (1) incineration; (2) co-firing in an AVI; (3) biological drying and co-firing of dried sludge in a power plant; (4) biological drying and co-firing of dried sludge in a cement oven; (5) thermal drying and co-firing in a power plant; (6) thermal</p>	<p>The minimum standard is thermal processing. This means that all alternatives, except for seven and nine, are allowed. "The minimum standard is in line with the SEA and is preferred from an environmental perspective"</p>

	drying and co-firing of dried sludge in a cement oven; (7) wet oxidation; (8) gasification and co-firing of synthesis gas in an power plant; (9) pyrolysis/melting	(VROM, 2007: 38).
Category III used oil (with halogen)	The SEA evaluated four techniques. Using the oil in cement ovens scores best, followed by processing in power plants and distillation. Usage of a rotary kiln scores least well from an environmental perspective.	The minimum standard is 'beneficial re-use' as fuel. Re-use in cement ovens or power plants are permitted. Distillation by means of dehalogenation is permitted if certain specifications and standards are met. Usage of a rotary kiln is not permitted. The minimum standard is in line with the outcomes of the SEA and is most desirable from an environmental perspective (VROM, 2007).
Oil, water and mud mixtures	Oil fraction: the SEA indicated that usage of the oil in a power plant, cement oven, or distillation facility all score positive with regards to effects on the environment. The usage of a cement oven scores highest. The rotary kiln technique give rise to the most negative effects on the environment. Mud fraction: the cement oven scores best, followed by the AVI. The thermal soil installation gives rise to net negative effects on the environment. The rotary kiln technique gives rise to the most negative effects on the environment.	The minimum standard implies that the mixtures must be separated into an oil-, mud- and water-fraction. The oil is used as fuel; the mud is purified by means of a thermal soil installation, AVI, or cement oven. The water is discharged. The minimum standard is preferable from an environmental perspective since the wastes are re-used.
Cutting and absorption oil	The SEA indicated that the techniques: cement oven, incineration in a power plant, and usage as a reducing agent do not have negative effects on the environment. The cement oven and power plant score best. The usage of a rotary kiln scores least well from an environmental perspective	The minimum standard is usage as a reducing agent. Usage in cement ovens or power plants is also permitted. The LAP states that "the minimum standard conforms to the SEA [...] since it does not designate one most environmentally friendly alternative" (VROM, 2007: 187).
Solvents	The SEA assessed the following techniques: rotary kiln, cement oven, power plants, and distillation. It indicates that except for the rotary kiln all techniques score positive on the criteria. The order of preference for the techniques, from an environmental perspective, is: cement oven, power plants, distillation in a cement oven and distillation in a rotary kiln.	The minimum standard is distillation. The alternative is not best from an environmental perspective but it is in line with the infrastructure for waste management in the Netherlands.
Gas discharge tube	The SEA evaluated four different alternatives: (1) shredder; (b) end-cut/air-push; (c) end-cut/air-push with selection unit (4) melting in a plasma oven. The SEA indicates that all alternatives give rise to approximately similar environmental	The minimum standard is separation of mercury and processing of the mercury causing dispersion to be prevented. The glass and met caps must be re-used. The

	effects.	breakdown product can be landfilled. The SEA did not identify one processing technique that is preferred from an environmental aspect. A necessary criterion for all techniques is that they must separate mercury. This is necessary in order to minimize dispersion of mercury (VROM, 2007). Since the minimum standard focuses on the separation of mercury and the prevention of dispersion of mercury, it is in line with the findings of the SEA.
Used chemical packaging	The SEA assessed four different waste processing alternatives: (1) cryogen treatment; (2) shredder and hydraulic sluicing; (3) incineration in a DTO; (4) pyrolysis/melting. The SEA indicated that cryogen treatment gives rise to the least environmental pressure (AOO, 2002).	The minimum standard is cryogen treatment, followed by useful application (VROM, 2007). The minimum standard is in line with the findings of the SEA that indicate that cryogen treatment ought to be favored from an environmental perspective (ibid).
Wastes with mercury	The SEA evaluated two different waste processing techniques: (1) pyrolysis/melting; (3) vacuum distillation. The SEA indicated that pyrolysis/melting should be preferred from an environmental perspective. Nevertheless, it is also noted that the difference between the two effects is not significant.	"The minimum standard for wastes with mercury is separation and concentration of the mercury causing dispersion of mercury in the environment to be prevented" (VROM, 2007: 244). None of the two techniques is thus selected as the minimum standard. This is in line with the findings of the SEA since it does not identify one alternative that is most favorable from an environmental perspective. Also, it must be noted that the technique pyrolysis/melting is not operational yet in the Netherlands (ibid).
Mud of detoxified neutralized drain	The SEA evaluated three alternatives: (1) landfilling as C2-waste; (2) cold immobilization and landfilling; (3) pyrolysis/melting. The SEA indicates that landfilling causes the lowest environmental pressure (AOO, 2002).	"The minimum standard is landfilling of the C2 wastes and the landfilling of the C3 wastes after cold immobilization. The minimum standard is in line with the outcomes of the SEA.
Wet flue gas clearing	The SEA evaluated six different processing techniques: (1) landfilling in big-bags (pure); (2) landfilling in big-bags (as mixture); (3) landfilling after cold immobilization; (4) land filling after cold immobilization with pulverized fuel ash; (5)	The minimum standard is landfilling. Since the SEA indicates that all different landfilling techniques generally score equally from an environmental perspective it is

	Versatzbau; (6) pyrolysis/melting Landfilling in big-bags is in most cases, to be preferred from an environmental perspective.	concluded that the minimum standard is in line with the findings of the SEA.
Dry flue gas clearing	The SEA assessed four different processing techniques: (1) land filling in big-bags (pure); (2) land filling in big-bags (as mixture); (3) Versatzbau; (4) pyrolysis/ melting. The SEA indicated that "land-filling in big bags, mixed or not mixed with other wastes, causes the lowest environmental pressure" (AOO, 2002: 162).	The minimum standard is land-filling in big bags (pure or mixed). "Other techniques that ensure complete useful application of the flue gas residue are also allowed" (VROM, 2007: 264). The minimum standard is in line with the findings of the SEA.
Shredder waste	The SEA assessed four alternatives: (1) land-filling; (2) incineration in an AVI; (3) pyrolysis/ melting; (4) gasification with post-incineration. The SEA indicates that incineration in an AVI, pyrolysis/melting, and gasification with post-incineration score equally well and should be preferred from an environmental perspective due to the fact that energy will be retrieved from the waste.	The minimum standard is thermal processing. This is in line with the outcome of the SEA. However, landfilling is also allowed since techniques for thermal processing of shredder waste are not operational yet.
Grit	The SEA evaluated two different techniques: (1) land-filling; (2) pyrolysis/ melting. "The SEA indicated that generally landfilling gives rise to the lowest environmental pressure" (AOO, 2002: 173).	The minimum criterion is landfilling. "This is in line with the outcomes of the SEA and is acceptable from an environmental perspective" (VROM, 2007: 264).
Tar mastic	The SEA evaluated five different techniques: (1) land-filling; (2) incineration in an AVI; (3) incineration in an DTO; (4) incineration in a cement oven; (5) incineration in a fluidized bed furnace. The SEA indicates that processing in a cement oven is preferred from an environmental perspective. Incineration in a DTO gives rise to most environmental pressure. The SEA indicated that thermal processing should be preferred from an environmental perspective.	The minimum standard is thermal processing. This is in line with the findings of the SEA. It is noted that in case of insufficient capacity, landfilling is also permitted.
AVI-fly ash	The SEA evaluated eight different techniques are evaluated: (1) land-filling in big-bags; (2) land-filling after cold immobilization; (3) land-filling after cold immobilization with sludge; (4) hydrostab (mix with surpluses and watergas); (5) filler in asphalt; (6) versatzbau; (7) dammbau; (8) pyrolysis/ melting. Processing as filling in asphalt and pyrolysis/ melting give rise to most environmental pressure.	The minimum standard is landfilling after cold immobilization (with or without mixture with other wastes) (VROM, 2007). This alternative is not preferred from an environmental perspective. It is, however, chosen because it corresponds to current practice.

	Hydrostab is preferred from an environmental perspective.	
DTO-fly ash	<p>The SEA evaluated four different alternatives: (1) cold immobilization and land-filling; (2) cold immobilization and land-filling with sludge (3) land-filling in big bags; (4) filling in asphalt; (5) versatzbau; (6) dammbau; (7) pyrolysis/melting;</p> <p>The SEA indicated that the alternatives focussed on landfilling score mediocre; pyrolysis/melting scores worst, and that dammbau is favorable from an environmental perspective.</p>	<p>The minimum standard is landfilling after cold immobilization. Other techniques that enable useful application of the fly ash are also allowed (VROM, 2007).</p> <p>"Taking into account the results of the SEA, the minimum standard is acceptable" (ibid).</p>
Waste incineration scenarios	"The SEA indicated that the PPF and RDF scenario are preferred from an environmental perspective" (AOO, 2002: 218).	<p>"Based on the results of the SEA and consultation with the waste disposal industry the following policy line has been chosen: post-separation of waste, composting / fermentation (high caloric) thermal processing"(VROM, 2007: 375). This is based on the PPF scenario. Yet, it is emphasized that the existing capacity for incineration does not need to be extended. "The PPF scenario will thus be executed with existing AVIs. Expansion or replacement of the (expensive) D10 capacity is not necessary" (VROM, 2002). Capacity regarding post-separation of waste, integral composting or fermentation does need to be expanded. Yet, these costs are considerably lower compared to an extension of the D10 capacity (ibid).</p>

C-II Formal conformity of the SEA of the Third Structure Scheme Electricity Supply

Sources: Royal Haskoning (2006), Witteveen and Bos (2008), Aracadis (2007), Ministry of Economic Affairs/ Ministry of Housing, Spatial Planning and the Environment (2009).

Topic	SEA	Final Plan
Locations for power plants	The SEA indicated that 20 locations can possible negatively affect the environment and Natura 2000 sites. The AA indicated that the suitability of these locations for electricity generation is dependent on the space reservations, capacity, and energy mix of power plants.	No locations are deleted from the SEV III
HV tracks	10 locations score negative, due to their cumulative effects on criteria related to nature, landscape, and culture-history and archaeology. The AA indicated that 17 HV tracks could negatively affect Natura 2000 sites.	One HV track is omitted from the SEV III.
Landing-sites for wind-energy	The SEA indicated that all the designated landing sites for wind-energy could have negative effects on aspect related to the criteria 'ground' and 'nature'. The effects on nature will only be temporarily.	No locations are deleted from the SEV III
Warrant locations for nuclear energy	The SEA indicated that the warrant location Moerdijk does not fulfill the minimum constraints. The location Westelijke Noordoostpolderdijk scores less well with regards to the criteria: food chain, nuisance, and dumping of cooling water on a freshwater reserve. The other locations (Borssele, Eems, Maasvlakte) do not score negative on one of the minimum constraints or criteria.	The locations Moerdijk and Westelijke Noordoostpolderdijk are deleted from the SEV III.

C-III Formal conformity of the SEA of the National Water Plan

Sources: Royal Haskoning (2009), Ministry of Transport, Public Works, and Water Management (2009)

Topic	SEA	Final Plan
Conservation of the coastline by means of sand replenishment and natural processes	The SEA shows that alternative one would score best (i.e. neutral) with regards to effects upon water and nature. The SEA has found that when the third or preferred alternative (IV) would be selected, negative environmental effects upon species and habitats cannot be excluded.	The decision has not been altered as a result of the SEA. While alternative one is slightly preferred from an environmental perspective the preferred alternative (alternative four) is deemed appropriate when taking into account the government's objective to implement measures that are in line with natural processes and that are flexible.
Limited and season-tied water level increase in the IJsselmeer area	The SEA states that only one realistic option is available in order to solve this problem. This (preferred) alternative focuses upon a rise of the water level with maximum 30 cm above the summer water level. The results of the SEA and AA indicate, however, that a rise of the water level of approximately 30 cm would already give rise to negative effects on protected species and habitats residing in Natura 2000 areas.	The NWP has been altered as a consequence of the SEA. While the draft NWP states that in 2012 a final decision regarding this topic will be made; in the final NWP it is stated that research will be conducted and more elements regarding the issue shall be examined before a decision can be made (NCEA, 2009).
Safety and freshwater availability in the IJsselmeer area	The environmental assessment indicates that alternative two, raising the water level in the IJsselmeerarea with one meter maximum, will negatively affect the environment as foraging districts of several birds alongside the IJsselmeer will be lost and reedlands will be affected, which will negatively affect spawning areas of fish (Royal Haskoning, 2009).	The draft NWP states that in 2015 a decision will be made regarding the degree and pace of the increase in the water level of the IJsselmeer. It could be stated that it is thus insinuated the water level will be raised. The final NWP, however, argues that in 2015 a decision shall be made regarding the desirability and feasibility of an increase of the water level of the IJsselmeer.
Improvement of the water-quality by means of connecting Volkerak-Zoommeer with surrounding waters	Within the plan-period, the Volkerak-Zoommeer is connected with surrounding waters and salinized (alternative I). The SEA indicated that salinization will not lead to negative environmental effects. The NWP states that after the plan-period, other isolated water basins shall also be connected with each other (alternative II). Alternative III, the long-term preferred vision of the Dutch government, aims to abate the strict division between fresh and saltwater leading to a more natural process (Royal Haskoning,	Both the short- and long-term vision described in the NWP regarding the 'Southwest Delta' have not been altered as a result of the information provided by the SEA.

	<p>2009).</p> <p>The SEA indicated that the long-term preferred policy option (alternative III) scores best with regards to its effects on the environment, water, and sustainability. Alternative I (the decision for the plan period) scores, compared to the other two alternatives, lowest with regards to sustainability, water, nature, and environment. However, it could be stated that alternative one and two will be immediate steps towards the implementation and attainment of the long-term vision: alternative III.</p>	
<p>Spatial developments in the IJsselmeer area: placement of wind turbines alongside, or next to, the IJsselmeer</p>	<p>In the SEA report several alternative locations for wind-turbines are discussed. The preferred policy option implies that the wind turbines shall be placed alongside the new coastline of the IJsselmeer. Based on the information provided by the SEA, there cannot be identified one location that is preferred from an environmental perspective.</p>	<p>The NWP has not been altered as a result of the information provided by the SEA.</p>
<p>Outer dike developments in the IJsselmeer area</p>	<p>Four different alternatives (i.e. locations) are assessed: (I) near Amsterdam in the IJmeer, (II) near Almere in the Markermeer, (III) near Lelystad in the Markermeer, and (IV) a combination of all three locations. The fourth alternative is presented as the preferred alternative in the NWP. The SEA indicates that all locations give rise to similar effects on the environment.</p>	<p>The NWP does not make a decision regarding the location that will be chosen for outer dike developments. It is stated that the results of the SEA can be used for the subsequent decision-making process regarding the Decision 'Amsterdam-Almere-Markermeer'.</p>
<p>Partial realization (around 50%) of the to be realized 6000 MW of wind energy generation at the North SEA</p>	<p>Five different areas have been evaluated (alternatives) within the SEA. The respective location alternatives are coastal areas (outside the 12 miles zone) near: (I) Borssele, (II) North and South Holland, (III) the north of the Wadden Sea, and (IV) IJmuiden. The preferred alternative (V) combines locations from the first, third, and fourth alternative. The SEA indicates that all alternatives give rise to approximately similar environmental effects.</p>	<p>The NWP has not been altered as a result of the SEA.</p>
<p>Carbon sequestration in the North Sea</p>	<p>Two locations before the Zeeuwse Coast are identified as sites for pilot experimentations with carbon sequestration (short-term vision). The long-term preferred policy vision identifies an area Northeast of Den Helder and Texel. The SEA indicates that both alternatives (short- and long-term vision) do not give rise to negative environmental effects.</p>	<p>The NWP has not been altered as a result of the SEA.</p>
<p>Energy island in the North Sea</p>	<p>At the moment, two potential locations for the energy island exist: (I) far from the coast, on the northern part of the Dutch continental shelf and (II) before the Coast of Zeeland (preferred alternative). The SEA indicates that alternative two, in contradiction to the preferred alternative, scores positive with regards to effects on natural processes,</p>	<p>The plan has not been changed as a result of the SEA. While the SEA indicates that the other location would be preferable from an environmental perspective, the location near</p>

	nature areas, and species and fauna.	the coast of Zeeland is preferred due to its relative short distance from the shore.
Choice of location for sand extraction at the North Sea	In the de draft NWP it is proposed (alternative I) to extract sand in deep waters (6 meters under the sea bed) within the 12 miles zone. In the SEA report two additional alternatives are evaluated: (II) sand extraction within the same area but only two meters deep and (III) sand extraction within and outside the 12-mile zone. The SEA indicates that alternative I scores best compared to the other two alternatives.	The preferred alternative is favored from an environmental point of view. The text of the NWP has not been altered as a result of the SEA.
Peak discharge for the rivers the Maas and Rijn	The SEA assessed how the rivers the Maas and the Rijn can be given more space by means of enlarging the catchment area and enlarging the capacity inside the dike. For the Rijn the preferred alternative is peak discharge via the Waal and the IJssel and the implementation of arrangements inside the dikes. With regards to the Maas, the provision of more room inside the dike is considered the preferred alternative. For both rivers there are no other reasonable alternatives available. The SEA has indicated that both alternatives will positively influence the water quality and nature areas.	The text of the NWP has not been altered because of the SEA.

Appendix D - Data regarding the evaluation of the factors

D-I. The influence of factors on the effectiveness of the SEA of the LAP

The table shows the number of responses and the mean, standard deviation and variance of each factor

	Number of responses	Mean	St. deviation	Variance
Public participation	6	1,83	0,75	0,57
Financial resources	6	2,67	0,82	0,67
Tiering	5	2,6	1,14	1,3
Evaluation of social and economic effects	6	2,5	1,38	1,9
Stakeholder participation	6	3,33	0,82	0,67
Experience	5	3,4	0,84	0,7
Quality	5	3,2	0,84	0,7
Independent review	6	2,83	0,75	0,57
Pragmatism	6	3,33	0,52	0,27
Transparency	5	3,4	0,89	0,8
Scoping	6	3,67	0,52	0,27
Integration	6	3,67	0,52	0,27
Timing	5	3	0,71	0,5

D-II The influence of factors on the effectiveness of the SEA of the SEV III

The table shows the number of responses and the mean, standard deviation and variance of each factor

	Number of responses	Mean	Standard deviation	Variance
Public participation	3	1	0	0
Financial resources	2	1	0	0
Tiering	3	2,67	0,58	0,33
Evaluation of social and economic effects	3	2	0	0
Stakeholder participation	4	2	1,42	2
Experience	3	2,33	0,58	0,33
Quality	3	2,33	0,58	0,33
Independent review	3	3	0	0
Pragmatism	2	4	0	0
Transparency	3	3	0	0
Scoping	3	3	0	0
Integration	3	3,33	0,58	0,33
Timing	3	4	0	0

D-III The influence of factors on the effectiveness of the SEA of the NWP

The table shows the number of responses and the mean, standard deviation and variance of each factor.

	Number of responses	Mean	Standard deviation	Variance
Public participation	4	1,25	0,5	0,25
Financial resources	3	2,33	0,56	0,33
Tiering	3	3	1	1
Evaluation of social and economic effects	4	2,25	1,26	1,59
Stakeholder participation	4	1,5	0,58	0,33
Experience	4	3	0	0
Quality	2	3,5	0,71	0,5
Independent review	4	2,75	1,26	1,58
Pragmatism	2	3	1	1
Transparency	4	3,5	0,58	0,33
Scoping	4	3,75	0,5	0,25
Integration	4	4	0	0
Timing	4	3,75	0,5	0,25

D-IV Average value of the factors for the three cases together

	Number of responses	Mean	Standard deviation	Variance
Integration	13	3,69	0,48	0,23
Scoping	13	3,54	0,52	0,27
Timing	12	3,5	0,67	0,46
Pragmatism	11	3,36	0,67	0,46
Transparency	12	3,33	0,65	0,42
Quality	10	3	0,82	0,67
Experience	12	3	0,60	0,36
Independent review	13	2,85	0,8	0,64
Tiering	11	2,73	0,9	0,82
Stakeholder participation	14	2,43	1,22	1,5
Evaluation of social and economic effects	13	2,31	1,11	1,23
Financial resources	11	2,27	0,9	0,86
Public participation	13	1,46	0,66	0,44