



The roles of EIA in the decision-making process

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Abstract

Public approval of a project usually is combined with different conditions that the project is required to meet. Environmental impact assessment (EIA) constitutes one important basis for decisions regarding possible conditions to impose. The focus of this paper is to clarify the roles that EIA can have in such decision-making processes. Three common decision-theoretical perspectives are used to illustrate the decision-making process. A total of 45 EIAs of petroleum field development have been studied. Five issues, each representing a potential conflict area between the oil company and public interests, have been classified according to type of content [professional (technical) or political] and form of government (detailed regulation or conflicting/diffuse goals). The empirical research shows that the framework — based on the outlined three types of decision processes and a classification of issues according to the type of content and form of governance — provides a useful tool for understanding the role EIAs can have in decision-making processes. © 2001 Elsevier Science Inc. All rights reserved.

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1. Introduction

Environmental impact assessment (EIA) is generally seen as a tool to help the authorities to make the decisions concerning project approval and which

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conditions must be fulfilled, as appropriate as possible. One method of achieving this is to supply the decision makers with comprehensive information about possible impacts of the project. The aim of this paper is to clarify and discuss the role that EIA can have in different types of decision-making processes. Focus is on the necessity for and the contribution that EIA documents and procedures can make in helping to decide what conditions a project should be required to meet prior to approval.

The explorative point of departure is: *How are the EIA process and the EIA document used in the decision-making process concerning public approval of and imposing conditions on petroleum projects?*

By investigating several empirical decision processes, the answer to this question and to other questions regarding the role of EIA could hopefully be found.

If we find that EIA is of no importance to the decision process — or opposite, of vital importance — how can such findings be explained? Does the explanations lie in the characteristics of the EIA system — or does the explanation lie in the characteristics of the actual decision-making process?

In my view, these are *explanations* of the role of EIA in the decision-making process that are interesting and that can contribute to improve EIA systems. This leads to the question of how decisions can be explained. I have applied three different (but common) theoretical perspectives regarding the decision-making process in order to illuminate the role of EIA from different perspectives.

The public decision-making process concerning the approval of development for a total of 45 petroleum fields and pipelines on the Norwegian continental shelf during the period 1985–1997 (spanning three Parliament election periods) constitutes the empirical basis for this article. The Norwegian Petroleum Act that is introduced below constitutes the formal boundaries of the examined decision processes.

2. Petroleum Act requires impact assessment in two phases

Before opening new areas on the Norwegian continental shelf to exploration activities, the Norwegian Parliament undertakes an overall evaluation of the environmental considerations, fishery interests, the interests of other affected industries, and the benefits of extracting oil and gas. The evaluation is based on impact studies, which have been circulated for comments from public interests. Areas where the drawbacks outweigh the benefits are not open to exploration activities. The Parliament can also impose special restrictions on certain areas in order to limit conflicts of interests between environmental and fishing interests.

Once an area is opened to exploration activities, blocks in the area are made available on offerings organised by the Ministry of Petroleum and Energy (MPE). Production licenses are awarded to the companies that the government, on the basis of an overall evaluation, believes can best realise the estimated assets in the area. After commercially viable finds have been located, the next phase is field

development and operations to realise the natural resource assets. Before the participants taking part in the production license can develop a discovery, the Petroleum Act requires that the authorities approve a plan for development and operation (PDO). As a part of the PDO process, the developer must submit an EIA.

2.1. Procedures concerning public approval of petroleum projects

The public approval of a project is usually combined with different requirements and conditions, which the project is supposed to meet. EIA constitutes one important basis for making such conditional decisions. Approval of an EIA is usually one of the formal (administrative) conditions that has to be met before decisions concerning material conditions are taken. This means that the content of the EIA document has to fulfill requirements as set in the study program, i.e. to give answers to the questions. Usually, the competent authority will determine the study program and decide whether the EIA meets those requirements.

EIAs concerning petroleum development projects cover environmental impacts (emissions to air and discharges to sea including uncontrolled ones, such as blowouts), impacts concerning natural resources (fishery), and social impacts. The average investment in each of the 45 petroleum developments are more than US\$1 billion and are thereby examples of big investment projects in a Norwegian context.

The flow chart below (Fig. 1) illustrates the formal study and decision phases a PDO of a petroleum field should follow.

The flow chart illustrates the formal process of conducting the EIA, the review and consulting process, and the decision-making process concerning both the EIA and the PDO.

The study phase consists of the following elements:

1. The licensee prepares a draft study program (what questions is the EIA going to cover) and submits the program to the MPE. The draft study program is submitted for comment to relevant ministries, regional and local authorities, and the NGO. The final study program is then, on the basis of comments obtained from the consultation bodies and remarks from the MPE, prepared by the licensee.
2. The next step is the preparation of the EIA by the licensee. The EIA is submitted to the MPE who submits the document for a second round of consultations. On the basis of the comments thus obtained, the MPE states whether or not the EIA fulfills the requirements. If not, additional reports must be made by the licensee.

Thereafter comes the decision phase that consists of the following elements:

1. In cooperation with other ministries, the MPE prepares the proposition to Parliament based on comments from all the relevant bodies, the EIA, and

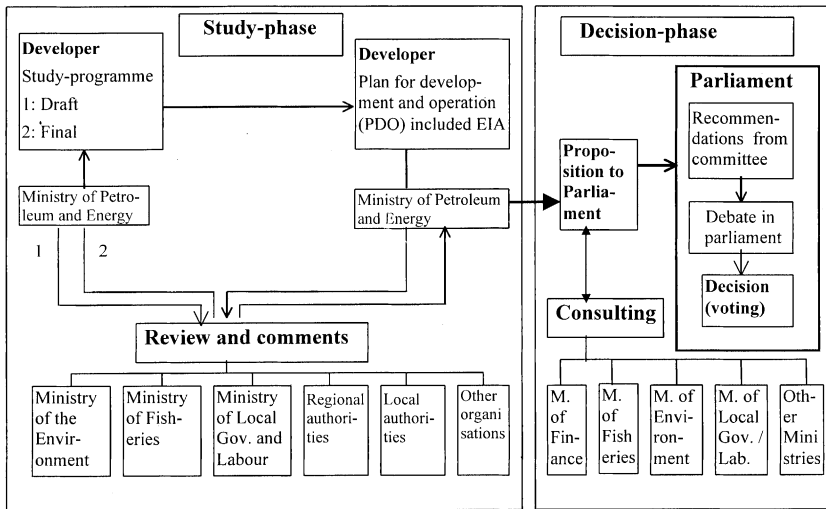


Fig. 1. Formal procedure for EIA, public review, and decision making. The figure is based on guidance documents from MPE March 1987.

the PDO. The Government formally submits the proposition to Parliament. Various questions, regarding the impacts on the environment, natural resources (fisheries), and society that the implementation of the plan and its relevant condition will create, are discussed at this stage.

2. The Parliamentary Energy and Environment Committee provides their own recommendations concerning the PDO and conditions for approval.
3. Finally, there is a general parliamentary debate regarding the project and attached conditions that are presented in the proposition and the recommendation from the committee. A final decision is made based on votes for alternative proposals.

There is no way to guarantee that approval of the EIA automatically results in an approval of the field development/pipeline project, but formally, the EIA must be approved prior to the project's acceptance by Parliament.

Parliament completes the procedure with the principal decision as to whether the project (field development or pipeline) should or should not be approved. Inherent to this principal decision are many conditions regarding different aspects of the project development, for instance, approval of estimates of the production rate, technical solutions regarding the type of platform and treatment processes, and how the oil and gas are to be transported to the petroleum refinery.

Also, decisions will be taken about the conditions that the project has to meet in order to avoid or minimise negative or undesirable impacts on either the environment, the fisheries, or society. Such conditions can consist of special technical solutions or procedures that must be met.

The sections above dealt with the formal procedures regarding consultation processes prior to the decision phase and the decision procedure. In Section 4, different theoretical principles on decision making will be discussed. The purpose is to illustrate the variation in how decisions (about conditions that the project has to meet) can be explained. Firstly, however, I will present how data were collected and analysed.

3. Data and method

During 1985–1997 (three Parliament election periods), a total of 45 PDOs of petroleum field/petroleum pipelines on the Norwegian continental shelf were approved. The empirical data basis of the research includes both documents and interviews and comprehends the total sample of development plans. The delimitation of data collection to 1985 is chosen because the requirement of EIA was implemented in the Petroleum Act in 1985. The delimitation to 1997 is connected with the time for completing the underlying thesis. Tables 1 and 2 in Appendix A list the cases (petroleum field developments and pipeline projects) and characteristics attached to each case, such as operator, year of PDO approval, investment volume, and conflict issues.

The following *documentation were* collected and examined for each case:

- Study program and EIA from the licensee (petroleum company alliances);
- Comments from consultation bodies and remarks from the MPE;
- Propositions to Parliament (bills), recommendations from parliamentary committees, and reports from the parliamentary debates.

Interviews have been conducted with representatives from:

- Statoil, Hydro, and Saga (the three Norwegian petroleum companies);
- Two consulting firms;
- MPE, Ministry of the Environment, Ministry of Fisheries, and Ministry of Local Government and Labour;
- The State Pollution Authority, the Directorate of Nature Management, the Norwegian Fishery Directorate, and the Norwegian Petroleum Directorate;
- Various regional authorities along the Norwegian coastline bordering the continental shelf;
- Members of Parliament (Energy and Environment Committee).

The role of EIA in the different decision-making processes have been classified and interpreted according to three theoretical perspectives of decision processes. Three sets of research questions drawn from the theoretical perspectives have been used as a tool to examine and classify the decision-making processes.

4. Theoretical perspectives on decision making

There exist many theories that deal with decision making. I have concentrated the presentation on three such theories that I find useful in explaining and understanding decisions. The three theoretical perspectives are:

- A limited and bounded rational perspective, which assumes that public decisions are based on evaluating the goal achievement of different solutions;
- A new institutional perspective where laws and regulations, standards, established procedures, and norms and values in organisations can explain the decisions; and
- A negotiation perspective where decisions are the result of the participants' resources, interests, antagonism, and alliances.

4.1. Rational perspective

In the rational perspective, it is assumed that public decisions are influenced by a set of objectives, i.e. that the decisions are a result of calculations and evaluations of how development concepts can achieve the highest level of goal fulfillment. In this perspective, both the study program's (the PDO and the EIA) comments and review from different hearing bodies and MPE and the decision process in Parliament can be regarded as part of the rational planning process the state carry out for each development project.

One of the founders, Banfield (1959), of this planning ideal model has described planning according to this ideal as:

Planning is the process by which he selects a course of action (a set of means) for the attainment of his ends. It is "good" planning if these means are likely to attain the ends or maximise the chances of their attainment. It is by the process of rational choice that the best adoption of means to ends is likely to be achieved.

This planning theory is normative, i.e. the theory is based on how planning should ideally be undertaken and not on how planning really takes place. The scientific criticism¹ of this planning (and decision) model is very comprehensive and includes both the fundamental perspectives on society and practical circumstances regarding accomplishing the planning and decision process.

In spite of comprehensive criticism, this planning theory and decision model still constitutes something of a norm for how EIA should be performed. A review of public documents and debates also shows that this normative model of

¹ See, for example, Friedmann (1978), p. 78; Schön (1983), pp. 45–48; Kleven (1995); and Rittel and Webber (1973).

decision-making has survived (Olsen, 1989, p. 22). This is the reason why I will use this perspective as a tool.

4.2. New institutional perspective

Organisations are, in rational planning theory, regarded as instruments to achieve objectives. In the theory of organisational and political science, organisations have a much more vital role to play when it comes to explain decisions. Through the new institutional perspective,² attention is directed upon the organisations that participate in the decision-making process. The decisions and actions of organisations are explained by formal rules, the legal framework, gained experience/established action patterns, and norms and values linked to how one should act in certain situations. This perspective is based upon empirical research of how organisations function and evolve in practice.

In relation to the decision-making processes that EIA is a part of, this perspective does appear particularly relevant since these decision-making processes take place within a regulatory framework of stable procedures and legal rules and with a stable set of participating organisations. In this perspective, the documents (study programs, EIA, PDO, comments, review, propositions to Parliament, and parliamentary committee recommendations) and the process both in the study phase and the decision phase constitute an institution.

4.3. Negotiation perspective

In the third theoretical perspective, the negotiation perspective,³ the organisations are not in focus, but instead, it is assumed that the negotiation process and resources, interests, antagonism, and alliances attached to the individual participants explain the result of the decision-making process. It is also assumed that the participants have different objectives and understandings concerning the issues, so that the participants have the ability to influence the decision(s). The focus in this perspective is the participants, their particular interests, alliances, and antagonism. Who takes part in the negotiations and whether the negotiations can be characterised as “closed negotiations” with a stable limited number of participants or “open negotiations” with many participants will, according to this perspective, influence the final decision.

The main reason for using this perspective is partly because it complements the other two perspectives and partly because there have been conflicts (and negotiations) between the developer and other interests in decision-making processes (connected with public approval of the PDO of petroleum fields and pipelines). In this perspective, the different stages of the EIA process (study

² See, for example, Po Well and DiMaggio (1991), March and Olsen (1989), or Koelble (1995).

³ See, for example, Jensen (1986); Bingham (1986); Coughlan et al. (1993) and Cohen et al. (1972).

Table 1
Comparison of theoretical perspectives

Main characteristics	Theoretical perspective		
	Rational	New institutional	Negotiation
Explanation of decision	Rational analyses of alternatives in relation to established objectives	Organisational values, routines, external conditions	Participants resources, interests, alliances, and antagonism
View on organisations	Instrument	Institution with values and routines	Negotiation part
View on action	Problem solving	Rule compliance routines	Negotiation process
Result	Optimum solution	Rule application	Compromise

program, EIA) and the final decision process (parliamentary bill, recommendations from parliamentary committee, and debate in Parliament) and other linked processes are viewed as a series of connected negotiations taking place with different participants.

4.4. Comparing the theoretical perspectives

The three theoretical perspectives indicate that decisions can be understood and explained in different ways, partly in conflict to each other and partly complementing each other. The perspectives have, in addition, different understandings about what organisations are and how they act. Table 1 displays the main feature of the perspectives.

Explanations of decisions differ between the three perspectives. There can, however, be some accordance between explanations in the rational and the new institutional perspective if management by objectives constitutes a part of an organisation's way of acting (routine). There are obvious differences between the rational perspective and the negotiation perspective. The negotiation perspective assumes that the participants' subjective interests and alliances explain the decisions, while external objectives explain the decision in the rational perspective.

Section 4 dealt with three different theoretical perspectives on the decision-making process (and how decisions can be explained). These theoretical perspectives can be seen as different pictures of the empirical decision-making process. There does not either exist a single precise definition or description of empirical decision-making. In Section 5, I will approach the empirical context by establishing categories of issues that the decision processes are about.

5. Establishing issue categories

My basic assumption is that the role of EIA in decision-making processes will vary according to what kind of issues the decision relates to. In order to examine the

role EIA can have in decision making, four categorical issues are constructed on the basis of two variables, which are (1) the content of the issue and (2) governance of the issue,⁴ respectively. The content of the issues can either be put in the broad category, “professional” or “policy.” Governance (control/management) of the issues can similarly be put in either the category “regulation” or “conflicting/diffuse goals.” These four categories are described in more detail below.

General description of criteria related to content:

- An issue with a “professional” content includes issues that require distinct professional qualifications and insights to solve. Examples can be issues concerning natural science, technical aspects, economic profitability, cultural influence, and industrial development.
- An issue with a “political” content can simply be given a pragmatic description: issues that the politicians are engaged in. Issues concerning distribution/allocation (of impacts) and issues concerning political values usually belong to this category. Political issues will also have a professional dimension.

On many occasions, issues can be categorised as both professional and political or that issues have both political and professional aspects. If conflict and publicity are connected to a professional issue, this can contribute to redefining the issue to be political as well.

General description of criteria related to governance:

- Issues subject to regulations include those issues where specific guidance regarding how to solve the issue exists. Guidance can for instance be in the form of regulations, directives, instructions, rules, standards, or guidelines on how to balance different interests.
- For issues with diffuse or conflicting goals, no such guidance regarding how to solve the issue or how to balance different goals exists. In these issues, goals may not be established, goals can be diffuse or general, or they can be conflicting.

Issues subject to regulation will usually have a strong administrative connection to different public administrations due to staff and the specific professions that are responsible for administering the legal framework. Issues with diffuse or conflicting goals can also have an administrative connection especially to directorates and regional authorities, but these very often have a political

⁴ The categorisation of issues into four typologies is partly based on Christensen’s (1985) 2 × 2 table concerning planning problem conditions. Goal (agreed/not agreed) and technology (unknown/known) constitute the horizontal and the vertical dimensions of the matrix.

		CONTENT DICHOTOMY	
		Professional issues	Political issues
GOVERNANCE DICHOTOMY	Issues subject to regulations	A	B
	Issues with diffuse or conflicting goals	C	D

Fig. 2. 2×2 Matrix dichotomising of content and governance.

anchoring both at state and regional levels and in different organisations. The 2×2 matrix (Fig. 2) sums up the previous discussion.

In Section 5.1, a total of five empirical issues related to EIAs of petroleum field development or pipeline projects will be placed in the different quadrants of the table. There will not however be any issues located in Quadrant B. The logical explanation for this is that ‘issues subject to regulation’ already has a political solution. The political solution is represented by the politically approved regulations that also state how the administrations should handle these issues.

5.1. Localising empirical issues in 2×2 table

The investigation⁵ of a total of 45 EIA and decision-making processes for petroleum field development/pipeline projects (case studies) revealed that several of the issues causing debate and conflict between the participants recurred in many of the projects (cases). Five⁶ of these reoccurring issues have been examined in greater detail in all projects. These issues all represent potential conflicting areas between the petroleum industry and public interests or the public at large. They also reflect the requirements that the fisheries, environ-

⁵ This investigation was part of the doctoral thesis (Leknes, 1999). The investigation included both the document review (study programs, EIAs, comments, propositions to Parliament, and report from parliamentary debates) and interviews with key informants.

⁶ The impacts of uncontrolled **blowouts** represent another conflicting issue that have been present in most of the EIA and decision-making processes. This issue has not been examined because it is more complex than the other issues. The issue is attached both in the opening phase and the development phase and affects both questions related to security, environment, and fishery. This complexity makes the examination of cause and effect in the decision process very difficult.

mental and localisation organisations, respectively have proposed to the PDO of petroleum fields and pipelines.

A brief description of each of the five selected issues is provided below. These are categorised according to the aforementioned established 2×2 typology of issues. A more detailed presentation of each issue inside the quadrants are also indicated and accounted for, i.e. detail regulated or only partly regulated, without goal or not agreed goal, and professional/political mixtures.

5.1.1. Restriction zone issues

The fisheries authority requires that there should not be any restriction zone [zones where fishing (trawling) are forbidden] over the subsea installation. The reason for this condition/request is to prevent restriction access to fishing areas. These issues can be characterised as a regulated issue with a professional content. These issues can be placed in the upper left corner of Quadrant A (upper left). The basis of this classification is the established zone regulation that concerns both material conditions (physical size of protected area) and procedures. The decisions are taken administratively by the Ministry of Local Government and Labour, following consultation with the Petroleum Directorate. Decisions on these issues were based on safety criteria. They did not get any political attention.

5.1.2. Discharges to sea — issues

The environmental authorities make claims regarding the type, amount, and concentration of discharges to sea in connection with the development and operation of petroleum fields and pipelines. These issues also relates to what environmental impacts the discharges can have on marine organisms. Discharges to sea — issues can also be characterised as issues subject to regulation with a professional content. These issues can be placed in the middle and right part of Quadrant A (upper left). There is a comprehensive body of rules with detailed regulations concerning both the type and amount of discharges, application procedures, and reporting (monitoring). There are, however, some possibilities of adjusting the requirements made within the regulations. Dedicated staff in the Ministries, the State Pollution Authority, the Institute of Marine Research, and employees working for the petroleum companies have dealt with these issues. Parliament has only to a small degree expressed an interest in these issues/matters. Some other organisations have been interested, and in some occasions, there have been attempts made to induce public discussions (in the newspapers and radio).

5.1.3. Pipelines — issues

The fisheries authorities have demanded that the negative impacts on trawling caused by pipe laying and the presence of pipelines should be minimised. These issues are about technical matters, such as the possibility of trawling over pipelines, trenching, anchor marks, etc. These issues are cha-

racterised as having diffuse/conflicting goals and with a professional content. These issues can be placed in the lower right corner of Quadrant C (lower left). No regulation concerning this issue exists, and the general objectives in the Petroleum Act only expresses that petroleum activities should not, to “an unnecessary or unreasonable degree,” complicate or prevent fishing. These issues were handled administratively by the Fisheries Directorate and the petroleum companies. Some fisheries organisations have focused on this issue, and on some occasions, they have attracted attention both from local authorities and politicians and thereby tried to influence the decision. Apart from this, no political attention has been expressed.

5.1.4. Emissions to air — issues

The environmental authorities require a minimisation of emissions of CO₂, NO_x, and VOC from the operation of petroleum installations. These issues are characterised as having diffuse/conflicting goals and with both a professional and political content. Emissions to air — issues can be placed in the upper part of the lower quadrants. They relate in part to (1) professional matters as equipment and construction methods used to reduce emissions, (2) the question of how much money Norway should be willing to pay for reduced emissions, and (3) how Norway should fulfill/meet the national CO₂ target. National targets concerning emission reductions have been made, but these are not made specific to the petroleum sector. Dedicated staff both in the public administration (Directorate of Nature Management, Ministry of Environment, and State Pollution Authority) and in petroleum companies have been occupied with these issues. Several white papers have been prepared, and comprehensive regulations concerning reporting/monitoring were established. These issues were highly politically sensitive, and both representatives in Parliament and from other public interests were occupied with voicing their concern on these issues.

5.1.5. Localisation — issues

Regional authorities demand that operating organisations and bases should be located in their region. These issues are concerned with the regional distribution of investments and employment in an industry that is based on the national petroleum resources. National targets concerning rural development had to be seen in relation to the project economy. These issues have conflicting goals and a political content and can be placed in the right end of Quadrant D (lower right). Several white papers have been prepared, but no single overriding solution to the different conflicting goals has been established. These issues have drawn great attention both in the regional authorities and in Parliament. (The Parliament can be seen as the assembly of district representatives.) These localisation issues also include professional matters, but these were of minor interest compared with the political considerations.

Below, the five issues are placed in the 2 × 2 table (Fig. 3) according to the characterisation above.

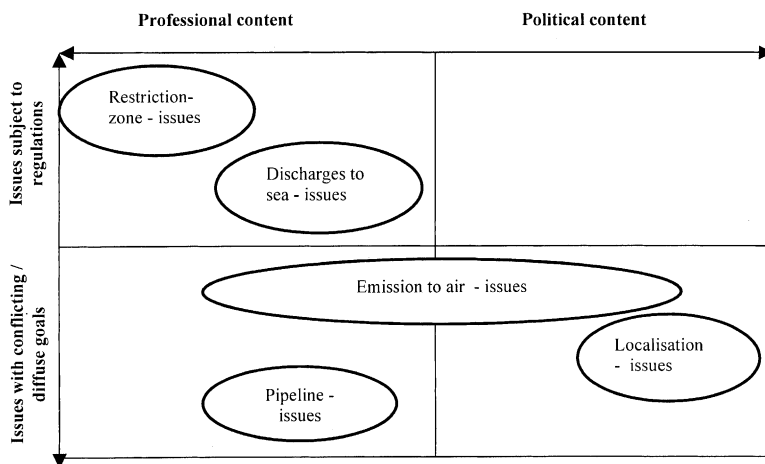


Fig. 3. Characteristics of issues in 2×2 matrix.

5.2. Variation in EIA and decision-making performance

There are considerable variations between the five different issues both regarding performances in EIA-related documents and regarding attention in the decision-making process. The main findings with respect to these variations are listed below.

- *Restriction zone issues* have been treated the same way in all cases in the 12-year period. The issues were listed in study programs, impacts (loss of fishery area/potential catch) were estimated in the EIA, and the fishery organisations made their ritual requirements. Usually, the decisions (based on the zone regulations) went in favour of the fisheries' interests. Minor development regarding impact assessment have been reached and also limited political attention in the decision-making process.
- *Discharges to sea — issues* has gained considerably attention both in the study program phase and in the EIA phase. Hearing bodies have required more and more advanced analyses of impacts, and the petroleum companies have gradually managed to fulfill these requirements. Lack of detailed specification of discharges at this stage of project development has been an obstacle to treat this issue thorough enough in the EIA. In the decision phase, these issues got minor attention, and they were transferred to the later application phase.
- *Pipeline — issues* and the questions about impacts on trawling have been a “hot” issue in all pipelines projects. Repeated quarrel about whether impacts will occur or not have enforced the petroleum companies to carry out trawling experiments to enhance knowledge. These issues attained

considerable space in the pipelines — EIA. Decisions were based on the conclusions in the EIA but were taken by negotiation between Ministry of Fisheries and MPE.

- *Emission to air — issues* was mainly not an issue in the EIA before the latest Parliament election period (1993–1997). Until then, both MPE and the Committee oversaw requirements about considering impacts on climate or acidification. The new elected Energy and Environment Committee focused on the climate question and forced both the petroleum companies and MPE to devote more attention to these questions both in project development (how to minimise emissions) and in the EIA. In several of the cases in this period, these issues gained most attention of all issues in the decision-making process.
- *Localisation — issues* affects the question about distribution of spin-off effects from the petroleum activity on different regions of Norway. In every project where localisation has been a question, various impacts attached to localisation alternatives have been thoroughly analysed. In most cases, the competing regions have come up with their own reports and thereby tried to convince both the petroleum companies and the Parliament members. Localisation — issues gained a lot of attention both during the study phase and the decision phase.

6. Explanations of decisions by theoretical perspectives

The decision processes in each of the five issues (and in every case) were characterised according to three sets of research questions. The connection between research questions and theoretical perspectives are displayed in Table 2.

6.1. Theory-based descriptions and explanations

The examinations of decision-making processes according to each of the theoretical perspectives indicated differences between (1) how suitable the theory-based description of the decision process was and (2) how well the theoretical perspectives could explain the specific decision. Table 3 below provides an overview of the variation of the theoretical perspectives' suitability to the five examined issues.

The decisions in the restriction zone issues and the discharge to sea issues are both in correspondence to the objectives of these issues, and the rational perspective can therefore explain the decisions. The decision-making processes in these issues do not, however, fit the rational perspective, because information concerning impacts is missing and comparing of project alternatives only takes place to some extent in the discharges to sea issue. In the localisation issue, the decision-making process is close to the rational ideal,

Table 2
Research questions drawn from theoretical perspectives

Theoretical perspective	Research questions
Rational perspective	What objectives concerning the issue exist? What kind of information exists about issue-relevant impacts the project can cause? How are project alternatives compared? Does the approved project correspond to the objectives?
New institutional perspective	What laws, regulations, procedures relevant to the issue exist? What values, attitudes do the different actors inhibit in relation to the issue? In what way is this type of issue usually handled, and have there been any changes during the 12-year period? Are any of the external conditions changed, for example, judicial or political conditions?
Negotiation perspective	In what way does the negotiation process take place? Who is participating? What kinds of resources do different participants have? What kind of antagonism and alliances exist between different parts?

but in most of the cases, the coherence between decision and objective is difficult to establish.

The new institutional perspective can explain both the decisions relating to “restriction zone” — issues and “discharges to sea” — issues. Rule compliance can be a short characterisation of the decision-making process in these issues. The absence of negotiations (the permission authority are arbitrary) makes the negotiation perspective less relevant, and the absence of analytical processes makes the rational perspective also less relevant in explaining the decisions in these types of issue.

Decisions regarding “emission to air” — issues can be explained both by the negotiation perspective and the new institutional perspective. The latter one provides the best the in-depth explanation to a change in decisions that occurred in connection with election of new representatives to Parliament from a shift in the

Table 3
What decision-theoretical perspective can describe the decision process and explain the specific decisions in different issues?

Decision making process concerning the following issues	Rational perspective can		New institutional perspective can		Negotiation perspective can	
	describe process?	explain decision?	describe process?	explain decision?	describe process?	explain decision?
Restriction zone	No	Yes	Yes	Yes	No	No
Pipelines trawling	No	No	Yes	No	Yes	Yes
Discharge to sea	Partly	Yes	Yes	Yes	No	No
Emission to air	Partly	Partly	Yes	Yes	Yes	Yes
Localisation	Yes	Partly	No	No	Yes	Yes

responsibility of that specific parliamentary committee. The decision-making processes in the emission to air issues are in the cases in the last parliamentary period (1993–1997; see Appendix A) close to the rational ideal. The absence of connection (preference function) between the specific decision and the analyses makes this perspective less suited to explain the particular decisions made in this period.

The negotiation perspective can explain both the decisions in pipelines — issues and localisation — issues. The absence of goals in pipeline — issues makes the rational perspective lacking in explaining the decisions here. The absence of a stable pattern (routine) in relation to balancing different aspects of localisation — issues makes the institutional perspective less suitable to explain the decisions. Although the decision-making *process* in pipeline issues can be understood through the new institutional perspective, this perspective cannot substantially explain the change in decisions.

6.2. *Correspondences between different perspectives*

The examination of the decision-making processes demonstrated that several perspectives could describe the process or explain the decision in each issue. This indicates that the same empirical phenomena are given alternative descriptions and explanations in the different theoretical perspectives. Identified conceptual correspondences are:

- Calculations and goal achievement analysis in the rational perspective correspond to the participants' arguments and reports in the negotiation perspective.
- Objective-based decisions in the rational perspective correspond to established practice in the new institutional perspective.
- Values in the new institutional perspective correspond to the participants' interests and basis for argumentation and alliances in the negotiation perspective.

Identified explanatory correspondences are:

- Acts, regulations, and guidelines (in the new institutional perspective) are interpreted as goals in the rational perspective.
- Goal achievement analysis and comparison in the rational perspective equals reports and argumentation in the negotiation perspective.
- Values and standards (new institutional perspective) can be perceived as argumentation in the negotiation perspective and goals in a rational perspective.

The review above indicates that the different theoretical perspectives use the same empirical phenomena to describe and explain decision-making processes.

All the analyses show that the type of issue is significant with respect to which degree each of the three perspectives can explain decisions. My expectation is

also that the type of issue is significant with respect to the role EIA can have in the decision-making process.

7. The role of EIA in decision-making processes

The aim of this paper (as referred to Section 1) is to clarify and discuss the role that EIA can have in decision-making processes. Variations between the roles of EIA, which different types of issues result in, are an important part of the findings of this paper.

Many aspects can be used to describe the role of EIA in decision-making processes. The focus of this paper is not on the overall function and role of EIA as a decision-preparation mechanism but the specific role of EIA in decision-making processes in relation to different types of issues. I have chosen the following common questions as the basis for a description and discussion of the roles EIA can have.

- Who is participating in the decision-making process, and how can the process/relationship between the various participants be described?
- What importance/relevance do the comments from different consultative bodies (both to the study program and to the EIA document) have in relation to the decisions?
- How is the EIA document used in the final decision-making process?
- What degree of influence does EIA exert on the final content of the decision? (What would the situation be if there were no EIA?)

First, I will try to answer these questions according to each of the three main types of issue, thereafter I will discuss the variations between the types with respect to these questions.

EIA in the petroleum sector in Norway constitutes the basis for the generalisation of the role EIA plays in decision-making processes. This ‘empiricism’ will also be used as an example to illustrate the more general findings concerning the role of EIA in different types of issues.

7.1. Regulated and technical/professional issues

The issues relating to (a) restriction zones and (b) discharges to sea (from the empirical context of EIA in petroleum field development) are examples of this kind of issue. Below are given the answers to four common questions regarding the role of EIA:

1. The participants in the decision process were typically the developer (applicant), the authority responsible for regulation, and quite often, a few governmental bodies with special interests relating to the particular issue.

The final decision-making process was actually the management of the application by⁷ the relevant authority.

2. Comments from consultation bodies to the study program and the EIA dealt in part with what kind of information and analysis the EIA should include and also which requirements were likely be placed upon the project. The same comments were repeated for other similar types of projects (this format was consistent for all types of project). For developers that had been through the EIA process before, the comments were usually well known and as expected.
3. Specific information and data attached to the application formed the basis for the evaluation of the project with regards to providing consent or refusal by the determining authority. EIA could be seen as an early test of this formal application. EIA clarified, at an early stage of the planning process, if any obstacles relating to specific issues existed that the developer should be aware of (and subsequently enable changes to be made to the project in order to avoid such obstacles).
4. To be formally correct, EIA had only minor influence on the content of the decision in regulatory detailed and professional/technical issues (matters). In such cases, it was the application with attached specific data and the judicial regulation that constituted the most important causes (element) of decision.

7.1.1. Summing up

EIA, both the process (procedure) and the document, formed a part of the decision-process routines or institutional arrangements that were applied in regulated and professional/technical issues. EIA played a minor role in the final decision-making processes, which were dominated by the relevant authorities and their interpretation of the application in relation to legal regulations. The EIA process did in some cases, however, provide an early indication of the likely restrictions and/or requirements that would be placed on the project by the authorities.

7.1.2. Generalisation of findings

In issues related to technical/professional questions and at the same time subject to regulation by laws and guidelines, decisions will usually be based on previous experience and existing routines and procedures by the relevant administrative bodies. After some time, the management and decision-making processes relating to this type of issues will become *institutionalised*, so that the participating organisations follow the same courses of action in each new

⁷ Examples: application of permission to discharge polluted water to sea and application of permission to establish restriction zones.

case. These are the core elements in the new institutional perspective. Our two issues (restriction zones and discharges to sea) fit with this perspective of the decision process.

7.2. Professional/technical issues with conflicting or diffuse objectives

Matters relating to (c) pipelines and in part (d) emissions to air in EIA for petroleum field developments are examples of these kinds of issues. Some of the answers to the four common questions regarding the role of EIA are given below:

1. The developer, the ministry responsible of the EIA process, affected organisations, and ministries representing affected organisations participated at the beginning of the negotiation process where (and when) the study program and EIA were discussed. When the negotiations proceeded to the point where the EIA was approved and specific conflict issues in the project had to be resolved, participating members were narrowed down to the developer and the ministry representing the affected organisations. Then followed a traditional negotiation process where a consensus between the participants had to be reached, and if this was not the case, higher level (political) authorities would become involved.
2. The comments received both to the study program and the EIA were important, as they indicated the requirements from one of the negotiation participants regarding the kind of information relating to impacts that the developer had to make available to the public. These requirements could be seen as the beginning of the final negotiation. If the requirements were not met by the EIA, participants could maintain that there was insufficient information to continue negotiations, and the decision-making process could be delayed.
3. The scientific documentation in the EIA (and lack of it) relating to the impacts of developing the project and the comments received from the consultative bodies often formed the basis of the same arguments that the professional experts put forward in the negotiation process. There was in fact a kind of professional scientific competition with regard to the most valid argumentation in relation to the impacts of the project. The EIA document and the comments from the hearing bodies constituted both a necessary and vital part of the decision-making process in these instances.
4. Decisions in these issues were to a high degree based on the documentation obtained during the EIA process. Since the results of the negotiation process were based on consensus between the negotiating participants, comments and requirements from the hearing bodies concerning the scientific quality of the EIA were of major importance.

7.2.1. *Summing up*

The EIA regulation formed a procedural framework for negotiations with regards to conflicting issues by securing the preparation of scientific and relevant information concerning the impacts of the project. In these kinds of conflicting issues or issues with diffuse objectives and a professional/technical content, EIA and the comments from the consultative bodies had a central role in the decision-making process.

It should be observed that on several occasions in recent years, the undertaking of an EIA has resulted in continuous scientific competition between the negotiation participants. On these occasions, EIA fulfills its role by continually promoting increased awareness and understanding of the “cause and affect” relationship.

7.2.2. *Generalisation of findings*

The decision-making process (and the actual decision) in professional/technical issues where there are conflicting or diffuse objectives will usually be based on negotiations involving administrative staff.⁸ Negotiations in these instances can be characterised as “closed,” whereby a limited number of participants form a stable group in which “members” have known interests, antagonism, alliances, and resources. The main types of resources in this type of negotiations are professional arguments. The participants and their resources are core elements in the negotiation perspective and can usually explain the result of the decision. Our two issues (pipe laying and, in part, emissions to air) fit in with this perspective of the decision-making process.

7.3. *Conflicting issues/issues with diffuse objectives and a political content*

The issues relating to (e) *localisation* and in part (d) *emissions to air* in EIA of petroleum field development are examples of this kind of issue. Below follow answers to the four common questions regarding the role of EIA.

1. The developer, the ministry responsible for the EIA process, affected organisations, ministries representing affected organisations, and politicians all participated in an open negotiation process where the study program and the EIA were discussed. Two parallel and connected processes existed in tandem: one was a formal and closed negotiation process that followed the regulatory procedures with only a limited number of participants, and the other was an open “discussion” process in the press, media, and at public

⁸ In some sectors, the decision process will be based on a kind of goal achievement function or cost-benefit analysis. Usually, these kind of administrative and rational decision are reconsidered by politicians.

meetings. This open process influenced the formal process. The final decision-making process was based upon formal negotiations between the elected representatives, where arguments partly based on the EIA, were presented prior to the final vote.

2. The comment from the different consultative bodies highlighted different aspects of the project. These comments also revealed what points of view different organisations and ministries had taken in connection to the issue at stake. In both these ways, the comments provided necessary (important) information to the decision makers.
3. The EIA document was used as professional information base concerning the potential impacts of development, but if the decision maker did not agree with the developer, this information could be overlooked, argued against, or paid little attention to in the final decision-making process.
4. The kind of professional analysis and formal process EIA represented influenced the final decision in these types of political issues by making them more rational, i.e. making decisions based on a higher degree of certainty supported by professional knowledge, which would not be available if these analysis did not exist. However, the kind of rational analysis EIA represented did not have the potential to guide the decision maker in matters where the questions relate to political values (e.g. distribution of goods between regions, environmental conditions, etc.).

7.3.1. Summing up

In political matters where there were conflicting/diffuse objectives, the main role of EIA was to supply the decision process/negotiation with “scientific”/professional arguments. However, in many issues where questions relate to political values or distribution, etc., the role of the politician was more important, and influence of EIA in the final decision-making process was diminished.

7.3.2. Generalisation of findings

The decision-making process with regard to conflicting issues/issues with diffuse objectives and a political content must also involve negotiations, although the character of these negotiations changes in relation to the previous set of issues. Since politicians have entered the negotiation arena, the political power play (number of votes) has become an important resource at the negotiation table. Decisions are no longer based on consensus but on majority voting outcomes. This implies that inputs beyond scientific arguments can now be employed in the negotiation process. However, the participants and their resources remain as core elements in the negotiation perspective and in explaining how and why the final outcome is reached.

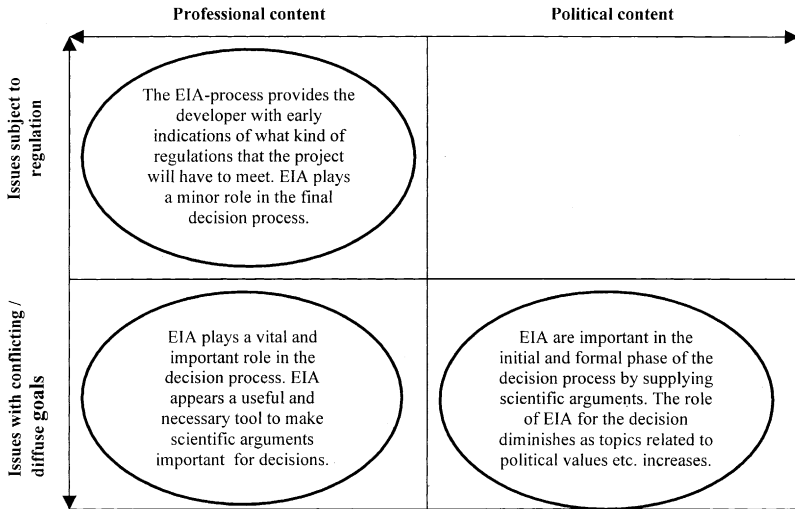


Fig. 4. The role of EIA in relation to type of issues.

The issues relating to (e) *localisation* and in part (d) *emission to air* in EIA of petroleum field development are suitable examples that fits into this perspective of decision-making process.

8. Conclusion: issue-dependent and dynamic role of EIA

In Section 7, the role of EIA is described based on a generalisation of findings in the investigation of decision-making processes in five types of standard issues⁹ in a total of 45 projects. The roles of EIA in relation to the three different typologies of issues are summarised in Fig. 4.

The role of EIA in decision making does also corresponds to the relevance of the three decision-theoretical perspectives in each of the three types of issue (see Section 7).

Decisions in issues subject to regulation with a professional content are based on *institutionalised routines* (earlier experience and existing regulations) and EIA function as a superior procedure that places the decision within the relevant context. The actual decision making takes place through a dedicated administrative routine process separated (both in time and space) from the EIA process.

⁹ Type of issues that occur in every project.

*Consensus-orientated and closed*¹⁰ negotiations based on scientific/professional reports (EIA) constitute the decisions in issues with conflicting or diffuse goals with a professional content. It is both the “knowledge generating” and the participation aspects in the EIA concept that provides for the success of EIA in decision making when related to these types of issues. Dynamic elements attached to decision making in this type of issue are

- without new professional reports related to the issue, the issue will change character, and decision making will become routine, but the role of EIA will be upheld as long as no legal regulation is established;
- without consensus between the professional (administrative) negotiation participants, the issue will become politicised, and so there must be a political solution (and the role of EIA would be reduced).

In political issues with conflicting or diffuse goals, *strategic and open*¹¹ negotiations constitute the decision-making process. Scientific/professional reports (EIA) are used in the negotiations, but the negotiation participants in political issues will focus on all kind of arguments that can strengthen their position in order for them to achieve the desired outcome. In that type of negotiation, arguments based on EIA will only be used if they serve the participants’ aim. Political solutions of a principal character can change a political issue to a professional issue and thereby also change the role of EIA.

The main conclusion in this paper is that the character of an issue, if it is a professional/technical issue or a political issue and if the issue is regulated or with diffuse/conflicting objectives, determines the role EIA may play in the decision-making process.

These conclusions are relevant to the decision-making processes in the petroleum sector in Norway and may be to other decision-making processes with similar characteristics. The conclusions are however dependent on the characteristics (qualities and constraints) of the EIA system. In my view, there is a potential to improve the EIA system in a way that EIA can gain more significance in the decision process, also in political issues and in regulated technical issues. One approach can be to introduce requirements regarding ex post documentation of how the EIA is applied in the decision phase. Another approach can be to combine the separate application procedures in technical matters with the EIA procedure. These ways of improving EIA systems can however be an issue to study and discuss in future research.

¹⁰ The same sample of participants attend the negotiations every time.

¹¹ A negotiation that in part take place in the press and with many participants.

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Appendix A. Characteristics of cases

A.1. Table 1

Petroleum field developments on the Norwegian continental shelf in the period 1985–1997.

Name of field development	Operator	Investment 1997 (US\$)	PDO approval	Conflict issue attached to the development			
				Restric- tion zone	Dis- charge to sea	Emis- sion to air	Locali- sation
Tommeliten	Statoil	0.5 billion	June 1986	X	X		
Sleipner Øst	Statoil	10.0 billion	Dec. 1986		X		X
Troll I	Shell	75.0 billion	Dec. 1986		X		X
Gyda	BP	5.5 billion	June 1987		X		
Veslefrikk	Statoil	9.0 billion	June 1987	X	X		
Snorre	Saga	25.5 billion	May 1988	X	X		X
Hod	Amoco	1.5 billion	June 1988		X		
Draugen	Shell	14.5 billion	Dec. 1988	X	X		X
Brage	Hydro	8.0 billion	Mar. 1990		X		
Statfjord Øst	Statoil	5.5 billion	Dec. 1990	X	X		
Statfjord Nord	Statoil	6.5 billion	Dec. 1990	X	X		
Heidrun	Conoco	24.0 billion	May 1991	X	X	X	X
Tordis	Saga	4.5 billion	May 1991	X	X		
Loke	Statoil	1.0 billion	May 1991		X		
Lille Frigg	Elf	0.5 billion	Sept. 1991		X		
Heimdal Jura	Elf	0.5 billion	June 1992		X		
Mime	Hydro	0.5 billion	June 1992		X		
Troll II	Hydro	37.0 billion	May 1992	X	X	X	X
Frøy	Elf	1.0 billion	May 1992		X	X	
Sleipner Vest	Statoil	24.0 billion	Dec. 1992		X	X	
Vigdis	Saga	4.5 billion	Dec. 1994	X	X	X	
Yme	Statoil	1.5 billion	Jan. 1995		X		
Norne	Statoil	10.0 billion	Mar. 1995	X	X	X	X
Njord	Hydro	4.5 billion	June 1995		X	X	X
Balder	Esso	4.0 billion	Feb. 1996	X	X		
Visund	Hydro	14.5 billion	Mar. 1996	X	X	X	
Gullfaks Sør	Statoil	12.5 billion	Mar. 1996	X	X		
Rimfaks	Statoil	3.5 billion	Mar. 1996	X	X		
Gullveig	Statoil	0.5 billion	Mar. 1996	X	X		
Varg	Saga	1.0 billion	May 1996		X	X	

(continued on next page)

Appendix 1 (continued)

Name of field development	Operator	Investment 1997 (US\$)	PDO approval	Conflict issue attached to the development			
				Restriction zone	Dis-charge to sea	Emis-sion to air	Locali-sation
Åsgård	Statoil	50.5 billion	June 1996	X	X	X	X
Oseberg Øst	Hydro	3.5 billion	Oct. 1996		X	X	
Jotun	Esso	4.5 billion	June 1997		X	X	
Oseberg Sør	Hydro	12.5 billion	June 1997		X	X	

A.2. Table 2

Petroleum pipelines on the Norwegian continental shelf in the period 1985–1997.

Name of pipeline	Operator	Investment 1997 (US\$)	PDO approval	Conflict issue attached to the pipeline	
				Impact on fish trawling	Localisation
Zeepipe I	Statoil	2.7 billion	Dec. 1988	X	X
Sleipner ØKT	Statoil	0.7 billion	Dec. 1989	X	X
Europipe I	Statoil	2.0 billion	May 1991	X	
Zeepipe II A	Statoil	0.6 billion	May 1992	X	
Frostpipe	Elf	0.1 billion	April 1992	X	
Haltenpipe	Statoil	0.3 billion	Feb. 1992	X	X
Troll Oljerør	Statoil	0.1 billion	Dec. 1993	X	
Zeepipe II B	Statoil	0.3 billion	Jan. 1995	X	
Norfra	Statoil	1.2 billion	1995	X	
Europipe II	Statoil	1.0 billion	Nov. 1996	X	
Åsgard Transp.	Statoil	1.0 billion	June 1996	X	X

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