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Social impact assessment in Europe? A study of social impacts in three Danish cases

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Abstract

Social impact assessment (SIA) is applied worldwide to assess social impacts of plans and projects. In Europe, directives on environmental assessment (EA) require attention to social impacts, however, there is a need to investigate the implementation in practice. To this end, we study three Danish cases, which are characterised by debates and conflicts on social issues. Analysis of the EA statements shows inclusion of a broad range of social impacts. However, the EAs do not fully match the concerns of the public, and social impacts are not always analysed in depth, mitigation measures are not suggested or are postponed, and the geographical distribution of impacts assessed is biased towards including negative local impacts. We discuss the scope and handling of social impacts, and possible implications. Based on this, we conclude with the view that EA might do the job of handling social impacts in Europe, if practice is improved.

Keywords

Social Impacts, Environmental Assessment, Public Participation, Conflict, Denmark

1 Introduction

Worldwide, energy and infrastructure projects have at times led to fierce conflicts and civil resistance (see e.g. Faris 2012; Oberti & McPartland 2012; Marowitz 2014). Also in Denmark, projects and planning processes have recently been experienced, which give rise to conflicts between proponents, authorities and the public (See e.g. Ritzau 2011; Ladekarl 2015; Holm 2012). Local opposition has been expressed during public consultation of environmental assessment (EA) processes, both related to expected impacts on the physical environment, but also related to social impacts. As an example social and socio-economic issues have been found to often be the underlying reason for social conflicts related to projects in the extractive sector (Franks et al. 2014).

In the European Union, at the project level, the Directive on environmental impact assessment (EIA) (European Parliament and Council 2014) requires attention to broad concepts on social impacts including “*population and human health...material assets, cultural heritage*”. The same is the case for strategic environmental assessments (SEA) at the level of plans and programs (European Parliament and Council 2001). Thus, EA in the European context is a part of a legal framework developed to assess the socio-economic features, as well as being broad enough to

also potentially encompass human health and wellbeing. However, while EA's are generally recognised as addressing and mitigating impacts on the physical environment, a current debate in the international impact assessment community is questioning, whether current practice and regulation on EAs in Europe adequately assesses and manages social impacts in decision-making processes or if there is a need for mandatory Social Impact Assessment (SIA) in EU. During the annual International Association for Impact Assessment in 2014 four practitioners responsible for integrated assessments in Italy and France stated in a presentation that: "*EU Directives on EIA and national legislation do not provide sufficient guidance on SIA*" (Mezzalama et al 2014). In the spring 2015 a session at the conference titled 'Why does EU not use SIA?' (IAIA 2015) also highlighted a need for further knowledge about the need and quality of assessment of social impacts in Europe in order to understand the potential need for improvement.

While the EU directive does to some extent require assessment of social impacts, the requirement is still not very explicit. An evaluation of eight SEAs concerning health, states that health issues are present in SEAs, but that it could be strengthened by facilitating more consistent consideration of health aspects during the SEA process (Fischer et al. 2009). In the UK there are also examples where social impact are included through a joint process of sustainability appraisal and SEA using an inclusive framework (Therivel and Fischer 2012). Compared to the international use of SIA, and with notable exemptions (see e.g. Langbroek and Vanclay, 2012; van der Voort and Vanclay 2014) still little is known about the actual practice on broad social impacts in EAs undertaken according to the European directives, also about how and to what extent social impacts are addressed in EA practice.

Based on this, we have studied three conflictual cases of energy projects in Denmark, to investigate the assessment of social impacts in EA. We have chosen to look at projects that have caused conflict because we would like to comment on what role social impacts play in these conflicts. We have chosen energy-related projects because we have seen international examples of these being a source of conflict, and further we have focussed on the specific projects because they have been conflictual in the sense that they have caused much public debate in media and formation of public opposition groups. The included Danish cases are: The SEA for a radioactive waste deposit in Risø, the EIA of a wind turbine test centre in Østerild, and the EIA of a natural gas storage facility in Lille Torup.

This paper first describes the methodology behind the study. Then the three cases are introduced, including an overview of the concerns raised by the public related to social impacts. The paper then presents the social impact parameters identified in the three EAs and the level of analysis and the geographical distribution. The paper further presents findings on the management and level of mitigation of social impacts. The findings are followed by a discussion of whether EA does the job, and finally a conclusion and recommendations for further research on the topic.

2 Methodology

The methodology is described in two parts. First the overall analytical approach taken to the study is presented, including an analytical framework. Next the data collection is presented.

2.1 Analytical approach and methods

The analysis presented in this paper was carried out in three steps, as described here:

Step 1: The EA statements for the three cases were screened in order to identify social impacts, and get an overview of how they were addressed. The results were used to develop an analytical framework for the subsequent analysis as described below, based on a discussion of the results of the screening among the researchers in the team, combined with knowledge from literature.

Step 2: After the analytical framework had been established, the research team went through the documents again, making a detailed analysis following the framework which is presented in section 2.1.1.

Step 3: The concerns of the public regarding social impacts were mapped in each case, based on a document study. The accumulated concerns were compared with the results of the previous analysis of the contents of EA statements.

The analytical framework developed based on step 1 and used in step 2 is presented in the following section.

2.1.1 Analytical framework

Based on a combination of knowledge from literature and the initial screening of the EA statements, we chose to focus the analysis on three themes:

1. As stated by Esteves, Franks and Vanclay (2012), one of the problems with social impact assessment is that it can be too superficial. At the same time, according to Vanclay (2015) social impacts should be analysed, monitored and managed. Based on this and the initial screening, we choose to look closer into the quality of the inclusion of social impacts, beyond whether they are mentioned or not which was the focus of the initial screening. In order to achieve this, we analyse the scope and level of social impacts included in EAs: What kind of social impacts are included? We analyse how the social impacts identified were handled, meaning whether they are identified, analysed, assessed and mitigated.
2. According to Esteves, Franks and Vanclay (2012), one of the weak points of the current practice of SIA is that there is often no analysis of the distribution of impacts e.g. in terms of geography or stakeholders. Further, one of the issues raised in the guideline for assessment of social impacts is that of equality or inequality in distribution of impacts (Vanclay 2015). Based on this

and the initial screening, we analyse the geographical distribution of the social impacts: At what geographical scale are the social impacts analysed: International, national or local? The initial screening indicated differences in the scale of the positive social impacts and the negative social impacts. This is important because it is an expression of equality in which actor's interests are being taken into consideration.

3. A main point in the guideline on assessment of social impacts is the fact that social impacts should be managed (Vanclay 2015). Based on this and the initial screening, we analyse the mitigation of the social impacts: Are they mitigated? What is the timing of dealing with the social impacts? Are they dealt with in the impact assessment, or postponed until later in the process? This is because the initial screening showed differences in this regard, and because it goes back to the question of whether these impacts, and thus the concerns of the public, are actually handled within the impact assessments.

In order to analyse at what level the analysis of social impacts takes place (bullet 1 in the list above), it was assessed for each of the categories of social impacts included in the EA statements, whether the social impacts are identified, analysed, assessed or mitigated. In each instance a score was attached in order to be able to visualise the results: Identified impacts = score 1, analysed impacts = score 2, assessed impacts = score 3, mitigated impacts = score 4. The scores are visualised in spiderwebs in section 4.2. It is important to state that it may not always be desirable to get a higher score in this analysis. The way social impacts should be handled is also dependent on an assessment of how significant they are. Despite this, we believe that the analysis is useful to be able to show differences in emphasis on the social impacts.

In order to add further detail to the analysis of how social impacts are mitigated, we compared the mitigation measures related to social impacts, with the mitigation hierarchy as presented by amongst others Weems and Canter (1995) and recently in Jesus (2013). The mitigation measures, in order of priority, includes:

- *Avoidance* of actions causing negative impacts
- *Minimisation* characterised by reducing the impacts by limiting the size or adjusting the type of the development
- *Rectification* is featuring repair and rehabilitation of an impacted site, and
- *Reduction* involving decreasing potential impact through for example preservation and maintenance techniques during a project life cycle.
- *Compensation* where it is sought to compensate for impacts after they occur, if they cannot otherwise be managed

This hierarchy is used as an analytical frame for the analysis of the collected data.

2.2 Data collection

The study is based on text analysis of key documents. The document analysis

comprised three EA statements, and three documents listing the comments from the public. In total, more than 800 pages have been analysed in the autumn of 2014.

The analysis of the EA statements is based on an inductive and exploratory approach. The coding of the social impacts in the documents therefore was an iterative process of bracketing and labelling words and sentences, which by the researchers were determined to be within categories of social impacts. This coding was inspired by guidance and literature on SIA such as Vanclay (2015). The coding was made in pairs of researchers, which allowed for a thorough dialogue about techniques and content and a fine-tuning of the quality of the work.

The overview of the public concerns involving social issues in the three cases is also based on analysis of documents, namely reviews of public hearings statements prepared by the authority in charge of the EA. The input in the reviews are from municipalities, national authorities, local residents, local and national businesses, farmers, local politicians, museums, local and national NGOs, and universities. From these documents the social impacts articulated in the hearings were drawn. The results are presented for each case in sections 3 and 4 of this paper. We thus use the public comments gathered in the official documents for the three EA statements as a proxy for the public's concerns about social impacts, and used these comments for comparison with the content of the EA statements. These formal comments are likely a biased representation of public concerns, in the sense that the formality of the process may have an influence on the types of concerns mentioned, and in the sense that authors may be tactical in their comments and not necessarily describe things as they are. Further, we based our analysis on summaries made by the responsible authorities, who may also display a bias in the way they represent the public comments. By making this choice, we thus submitted our analysis to some bias, but on the other hand this bias should make our summary of the concerns of the public a conservative one, which means that any discrepancies found between the EA statements and the public concerns should be the more valid.

3 Overview of the cases and public concerns

As stated in the introduction, the investigation is based on a study of three cases related to energy production in Denmark. The cases are chosen because they a) are cases of energy infrastructure b) have been subject to a SEA or EIA process c) have been controversial. The cases are described in the following. First general information is presented and then an account of the concerns of the public regarding social issues.

3.1 Case 1: Radioactive waste deposit, Risø (2014)

The origin of the case dates back to 1958, where the Danish Government established the nuclear energy research center Risø. The research center was run for 43 years until 2001, and the need to deal with the considerable amounts of low radioactive waste, which had been produced at Risø and elsewhere in Denmark became pressing. The process of finding a suitable location for a final repository was

commenced in 2003, with a decision in Danish Parliament to decommission Risø, and produce a basis for their decision on a solution regarding the waste. In 2011, preliminary studies identified 22 geologically suited locations within the Danish borders, of which six were recommended. An SEA assessing these six sites was commenced in April 2014. The plan under assessment encompasses a final repository for all the radioactive waste, with three alternatives: 1) A repository on the surface, 2) a repository on the surface combined with a drilled hole for the long-lived waste, and 3) a medium-deep repository (30-100m below the surface). (Danish Ministry of Health 2014) After the preliminary studies, the immediate response of the five municipalities, which cover the six locations, was to refuse to host the repository. Furthermore, the conclusions spawned the formation of citizen groups in each of the five municipalities. (See e.g. Morads n.d.) In spring 2015 the discussions took a new turn, as the Danish Parliament decided to consider the possibility of establishing an intermediate storage facility, and set aside the plans for a final repository (Boye 2015).

Overall, many of the hearing statements state, that they are concerned, that social and socioeconomic issues are not dealt with properly in the SEA. Specifically, effects on business are mentioned, notably effects on agriculture, fisheries, food industry and tourism, e.g. camping sites and amusements parks. There are concerns about how the plan might affect jobs in the local areas including jobs at the facility. A related issue pointed out is the effects on development in emigration and immigration, and what the plan will mean for property prices. There are also concerns about health issues, notably related to groundwater and thus security of supply of drinking water. Generally there are concerns about health and security regarding risks of contamination from the radioactive waste: Radiation, heavy metals etc. Finally both museums and other actors raise concerns about ancient monuments, protected artifacts and cultural environments in the local areas. (Danish Ministry of Health 2015)

3.2 Case 2: Wind-turbine test centre, Østerild (2009)

The Danish government has a goal to keep a leading position in the development of wind turbine technology for the production of renewable energy. Therefore, in 2009 it was decided to establish a national test centre for wind turbines. (Danish Nature Agency n.d.) The test centre should give the Danish industry the possibility of testing different prototypes of large wind turbines meant for use offshore. This should help Denmark stay attractive for wind turbine companies, and thus help draw expertise and jobs to the country. For the purpose of the test centre, an area was needed that could provide space for a row of ten up to 250 m tall wind turbines and the related technical facilities. Fourteen different areas were part of a screening, but only two sites fulfilled the technical demands for a test centre. One of the sites was a part of a bird protection area under the EU directive on conservation of wild birds, and also a training area for the Danish army. Hence, the second site, the forest plantation

Østerild in North Jutland, was chosen instead, as the only possible area for the establishment of a test centre, and an EIA¹ was carried out for this site only. The establishment of a test centre at Østerild plantage demanded the removal of approximately 400 ha of the plantation, and consequences for some of the closest neighbours to the test centre were expected. The EIA statement was published in December 2009 and available for public hearing until March 2010. (Danish Ministry of the Environment 2009) Opposition led to considerable parliament debates and additional environmental analysis (Lyhne, 2011). However, the national parliament approved the test centre by law in June 2010, with some amendments, mainly that the test centre is now only for seven wind turbines. Construction work started in summer 2011, and the test centre was dedicated in October 2012.

During the process, the public raised concerns about different health aspects of the project. Partly this was related to the wind turbines themselves, where the concerns were about noise as well as light, shadow and reflections from the turbines, and what effect this might have on health of locals. There were also concerns raised regarding the groundwater, and whether there were risks of contaminating or depleting this, risking also the security of supply of drinking water. Another issue concerning security of supply is a concern that the EIA has not assessed the effects of the project on populations of game, particularly red deer and subsequently the local hunting possibilities. This can also be seen as a recreational issue, which is supplemented by concerns of the effects of the project on the nearby National Park Thy. Further in this theme, there is a concern that the forest that will be planted as compensation for lost forest will not be open to the local population for recreational use. Last but not least there are concerns about different issues of settlement and property. This includes the effects of restrictions on use of land, for examples restrictions on which crops can be grown where, where windbreakers can be planted, and whether there is access to the land. This in turn is a concern about the commercial possibilities for agriculture in the area. There are also concerns about expropriations, how many will be necessary and how the price will be settled. (Danish Ministry of Environment 2010a)

3.3 Case 3: Natural gas storage facility, Lille Torup (2010)

In 2010, the Danish Ministry for the Environment published an EIA for the expansion of an existing natural gas storage facility in Lille Torup. The project site is located in North Jutland, in the vicinity of the fjord Limfjorden. The proponent was the Danish national transmission system operator for electricity and gas, Energinet.dk. The project includes 1) flushing three salt domes to supplement the 7 domes already used as storage, 2) maintenance on 6 of the domes currently in use as storage, and

¹ The test centre was approved by law, and under the EU Directive such projects are exempted from the EIA regulations. Never the less, the Danish state carried out an approximated EIA procedure.

3) expansion of the above-ground facilities, including new compressors and facilities for gas drying. The argument from the proponent was, that the project was needed, in order to secure a stable future gas supply network in Denmark. (Danish Ministry for the Environment 2010b) In 2011 the project was reduced to a renovation of the existing salt domes through re-flushing them. Arguments were made that this was among other things due to the opposition and debates at local and national level. (Kjær 2012)

Some of the social impacts raised by the public are closely related to environmental impacts. Thus issues of groundwater pollution, noise and air pollution from increased traffic are all concerns, in terms of what the effects may be for the health of local residents. Further there are concerns about the risk of accidents related to the increased traffic, as well as incidents of instability in the surface above the storage compartment and the risk that the ground may collapse. There are also concerns raised about economic impacts on the local fisheries and businesses dependent on fishing and selling clams, if the populations of these are affected. Finally, the public raises issues of recreational values and impacts on angling, bathing and in turn the tourism trade and the related businesses. (Danish Nature Agency 2011)

4 Results: Social Impacts in the EA statements

In this section, the results of the analysis are presented. This takes point of departure in the analytical framework described in section 1, and thus the scope of social impacts included, the level of assessment, the geographical distribution of the social impacts and the mitigation of social impacts.

4.1 Scope of social impacts addressed in the EA statements

The analysis shows, that a wide variety of social impacts can be found in the three EA statements. They can be divided into eight overall categories: Settlement and property, commercial development, health, cultural heritage, recreational values, security of supply, brand and identity, and sense of security. Table 1 shows which social impacts are included in the EA statements, and which concern the public in each of the three cases. The concerns of the public are based on the review in section 3.

Category	Impact	Radioactive waste deposit		Wind turbine test centre		Natural gas storage facility	
		SEA statement	Public	EIA statement	Public	EIA statement	Public
Settlement and property	Emigration	X	X				
	Immigration	X	X				
	Property prices	X	X			X	
	Expropriation			X	X		
	Restrictions on land			X	X		

	use						
Commercial development	Agriculture	X	X	X	X	X	
	Tourism	X	X				X
	Sales and export of food	X	X				X
	Amusements	X	X				
	Summer cottages	X				X	
	Food production		X				X
	Jobs at the facility		X	X		X	
	Fishery		X			X	X
	Forestry					X	
	Extraction of raw materials			X			
	Subsidies			X			
Health	Radiation	X	X				
	Psychological well-being	X					
	Pollution of groundwater	X	X		X		X
	Noise			X	X	X	X
	Air pollution					X	X
	Light, shadow and reflections			X	X		
Cultural heritage	Ancient monuments	X	X	X		X	
	Cultural environments	X	X				
	Protected artifacts		X				
	Archaeological findings					X	
	Protected structures			X			
Recreational values	Recreational values	X					
	Camp sites	X	X			X	
	National park	X			X		
	Game and hunting			X	X		
	New landscape and forest			X	X		
	Shooting range			X			
	Bathing					X	X
	Angling					X	X
	Sailing					X	
Security of supply	Drinking water		X		X		X
	Game			X	X		
	Natural gas					X	
Brand and identity	Green image	X	X	X			
	Sales and export of food	X	X				

Sense of security	Risk of accidents at facility	X				X	
	Risk of traffic accidents						X
	Risk of surface caving in						X

Table 1 Overview of which social impacts are included in the EA statements for each case and which social impacts concern the public for each case, based on section 3.

It is clear that the scope of social impacts in the EA and the concerns of the public overlap in many cases, but do not coincide completely. There are some social issues included in the EA statements, which are seemingly not of great concern to the public, for example the impact on property prices for the natural gas storage facility, or jobs created at the wind turbine test centre. On the other hand, also quite a few social issues of concern to the public both in the case of the radioactive waste deposit and the wind turbine test centre, are not included in the EA statements, such as pollution of groundwater and subsequently security of supply of drinking water.

In this first analysis however, it is merely registered whether each category is in any way represented in the statements, even if they are just mentioned. This means the depth and quality of analysis of each impact, cannot be seen from Table 1 including whether it is identified, analysed, assessed, or if any action will be taken and when. The next sections cover the deeper analysis and discussion of the description of social impacts in the EA statements.

4.2 Level of social impacts addressed in the EA statements

In the following figure 1, the results of the analysis of the levels of assessment are illustrated for each of the three cases.

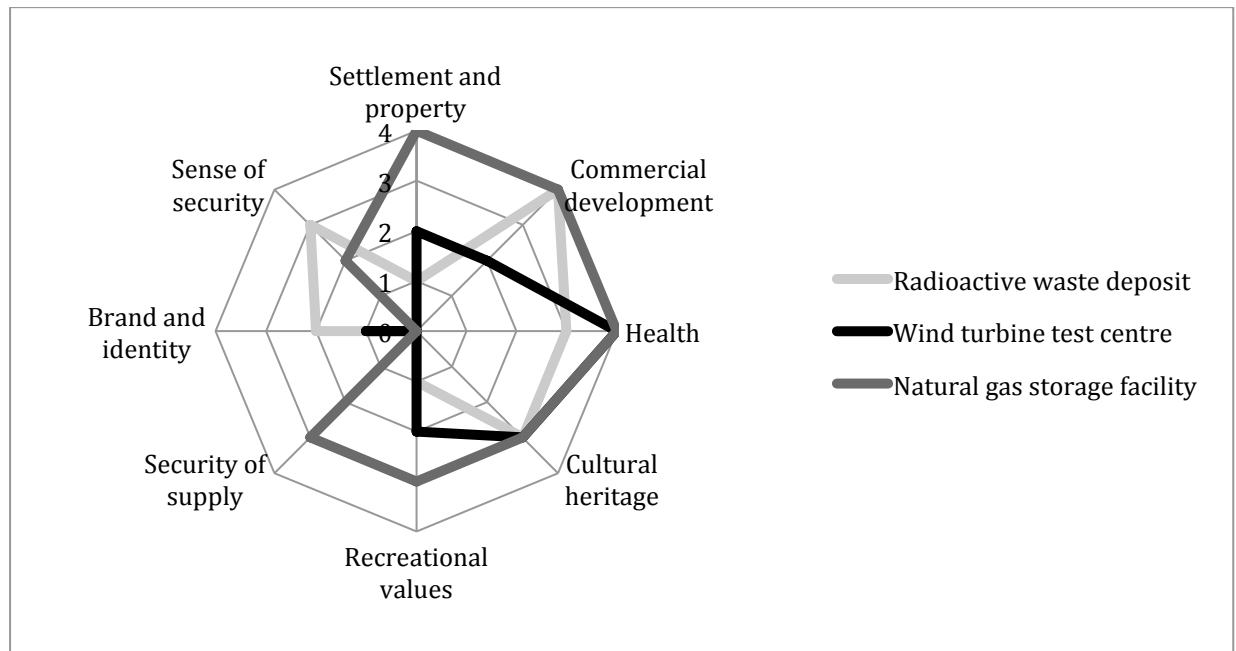


Figure 1 Level of analysis for each category of social impacts in the three cases. Level 0 = not included in the EA statement, level 1 = identified in the EA statement, level 2 = analysed in the EA statement, level 3 = assessed in the EA statement, and level 4 = mitigated in the EA statement.

It should be noted that the score attached to each category is the highest that is achieved, thus there may be differences in the level of analysis for the specific impacts within each category, which the analysis does not uncover. For example within commercial development in the case of the radioactive waste deposit, there may be mitigation measures put in place for summer cottages while the impacts on local production of food is only described. In this case the score for commercial development is 4. Also if mitigation measures are discussed, but elaboration and action on them are explicitly postponed to later in the process, the score is set at 3 for the assessment (see also section 4.4).

Comparing the results of figure 1 for the radioactive waste deposit, with the concerns of the public, it is evident that some of the issues that concern the public are merely identified or analysed but not assessed or mitigated. This includes settlement and property, recreational values, security of supply, and brand and identity. This reveals a discrepancy between what concerns the public and what is dealt with in depth in the EA statement. The rest of the social parameters are dealt with at a relatively high level where they are assessed and one of them results in mitigation.

Comparing the results in figure 1 for the wind turbine test centre, with the concerns of the public, it is clear that security of supply which concerns the public is not included in the EA statement, as also shown in section 4.1. Further, it becomes clear that two of the issues that concern the public, namely settlement and property and recreational values, are merely identified and analysed, but not assessed or mitigated. On the other hand, the issue of health, which is of concern to the public is

both assessed and mitigated. Cultural heritage, which is not something that concerns the public, reaches a relatively high level, as it is assessed.

Comparing the results in figure 1 for the natural gas storage facility, with the public concerns, notably, most of the issues that concern the public are handled at a relatively high level of assessment or mitigation. On the other hand, another concern of the public, the sense of security, is only analysed in the EA statement. Interestingly, also here cultural heritage is assessed, while it is not a great concern of the public. This might reflect the planning system and rules for protection of shared cultural heritage, as well as the influence of local museums, which safeguards the joint national interests in this, rather than local concerns.

Overall, the results show a more varied picture of the inclusion of social impacts in the EA statements than that achieved in section 4.1. Especially for the two first cases, it is clear that some of the social impacts, which are included as relevant, are not analysed in much depth and not assessed or mitigated. There could be a tendency that some social impacts are generally better handled than others. This is for example cultural heritage, which is assessed in all three cases, or health, which is assessed in all three cases and mitigated in the cases of the wind turbine test centre and the natural gas storage facility. In the other end of the spectrum are social impacts such as brand and identity, which is merely analysed in one case and identified in another.

4.3 Geographical distribution of social impacts addressed in the EA statements

The following table 2 shows the results of the analysis of the geographical distribution in the assessment of social impacts in the three cases. The results are based on whether the social impacts are assessed as positive, negative or neutral in the EA statements, and thus not on how the public or the authors of this paper assess them.

	Local	National/ international
Negative	Settlement and property (RWD, WTTC, NGSF) Commercial development (RWD, WTTC, NGSF) Cultural heritage (RWD) Recreational values (RWD, WTTC) Brand and identity (RWD, WTTC) Sense of security (RWD)	
Neutral		Health (RWD, NGSF) Cultural heritage (WTTC, NGSF) Sense of security (RWD)

Positive	Commercial development (WTTC, NGSF) Recreational values (WTTC, NGSF) Brand and identity (WTTC)	Commercial development (WTTC) Security of supply (NGSF) Health (WTTC)
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Table 2 Overview of the geographical distribution in the assessment of the social impacts in the three cases, and whether they are assessed as predominately negative, neutral or positive. RWD = radioactive waste disposal, WTTC = wind turbine test centre and NGSF = natural gas storage facility.

All three cases are characterised by a gap between the geographical scale of the positive and negative social impacts included in the EA statements. Typically, the motivation for a project is based on expected positive consequences on a national or international level, while at the local level mainly negative impacts are assessed. In the case of the radioactive waste deposit, the national interest in handling the waste problem is the motivation and the point of departure, although not assessed as such, while the impacts on the local level is assessed as mainly negative. In the case of the wind turbine test centre, the positive impacts expected on an international and national scale stem from development of renewable energy and the promotion of economic competition. In opposition to this, are the possible negative social impacts assessed on a local scale. Also in the case of the natural gas storage facility, the motivation for expanding the already existing natural gas storage facility is the need for sufficient national storage capacities. This is based on an assessment of a positive national impact opposite to a less positive assessment of local impacts. Interestingly, in the hearing documents for the natural gas storage facility, members of the public question the necessity of the facility, based on the political desire to stop using fossil fuels.

If the information in table 2 is compared to the concerns of the public in table 1, it can be seen that a negative impact is expected at the local level for many of the issues that concern the public. The question is whether the public is satisfied with the impacts they are most concerned about being assessed as negative, or whether this spurs conflict. In this regard it is also worth considering whether the reason for the public concern is the fact that the impacts are assessed as negative – whether this naturally makes them uneasy. Thus there might be a chicken and egg situation; the impacts that most concern the public may be assessed as negative, or the public are most concerned about the impacts that are assessed as negative.

4.4 Mitigation of social impacts in the EA statements

In the following, the issue of whether and when social impacts are mitigated is analysed. The analysis is focused on the negative impacts, as the positive impacts typically do not require mitigating measures.

The table below is an illustration of the range of negative social impacts, for which either mitigating measures have been suggested or mitigation is explicitly postponed

to a later point in the planning process. For the sake of simplicity, social impacts, for which neither of these have been found, are not included in the table.

		Radioactive waste deposit	Wind turbine test center	Natural gas storage facility
<i>Category</i>	<i>Impact</i>	<i>Mitigation</i>	<i>Mitigation</i>	<i>Mitigation</i>
Settlement and property	Property prices	-	-	Compensation
	Emigration/Immigration	Postponed	-	-
Commercial development	Fishery		-	Reduction
	Agriculture	Postponed	-	Compensation
	Forestry		-	Compensation
	Summer cottages	Reduction		
	Tourism	Postponed	-	-
Health	Pollution of groundwater	Postponed	-	-
	Air pollution		-	Postponed
	Noise		Reduction	Compensation
Cultural heritage	Ancient monuments	Postponed	-	Postponed
	Archaeological findings	-	-	Postponed
	Protected structures		Postponed	
Recreational values	Angling	-	-	Postponed
Brand and identity	-	-	-	-
Sense of security	Risk of accidents at the facility	Postponed		

Table 3 Overview of social impacts for which mitigation measures are suggested or explicitly postponed. Blank spaces indicate issues that are not relevant for the case.

The results in table 3 show that fairly few of the social impacts are actually mitigated in the EA statements. Further, none of the three environmental assessments identifies mitigation measures, which can be defined as avoidance of actions, minimisation or rectification of the impacts. This could of course mean that none of these types of mitigation measures are proposed, however, it could also be the case that such mitigation measures are discussed and put in place during the process before the EA statement, and thus are not documented. There may be one measure identified, which can be characterised as *Rectification* – this is information of the public, which is highlighted several times in the SEA for the radioactive waste deposit but as a broad suggestion not connected to specific impacts.

Some of the proposed mitigation measures presented in the EA statements can be classified as *Reduction*, for example using noise-reducing materials. Only the case of the wind turbine test centre includes mitigation in the form of *Compensation*, for example it includes an offer of compensation in form of money for land to residents in the impacted area. When looking further into the argumentation, this is however not

with the main goal of reducing the negative impacts on local residents, but rather of securing sufficient room for the installations.

It is also evident from table 3 that there is a considerable amount of postponed descriptions of mitigating measures, especially in the radioactive waste deposit case. In the EA statement, for every alternative location assessed, a description is made of the local community's concerns in regards to social impacts. These issues are all assessed as probable negative impacts, but very few of them are handled in the EA, and there are no mitigating measures described. Instead the EA states: "*Questions regarding the establishment of the facility and the practical problems that may occur in that connection are not addressed in this impact assessment due to the level of detail in the plan. The project specific issues that are called in question will be handled in a later phase.*" (Danish Ministry of Health 2014) Consequently, neither the social impacts nor the mitigating measures to alleviate them are handled at this point in the planning process or weighed against each other. Only after the location is chosen and a specific type of deposit picked, the social impacts will be handled in a subsequent project EA.

In the other two cases, the gas storage facility and the wind turbine test center, the reasons for postponing assessment and mitigation of the social impacts are different. In these cases, the locations are known, but due to uncertainty about either the design of the project or lack of knowledge, assessment and mitigating measures are postponed. For example in the case of the wind turbine test center, the design of the test center is already known, and it is possible to describe the impacts in detail. However, the size of the wind field remained unknown at the time of the EA. The project entails that a large area of plantation is to be cut down, in order to secure sufficient wind for the turbines. The EA postpones the decision on how much of the plantation will have to be cut down, and where a statutory substitute forest is to be established (Danish Ministry of the Environment 2009). This omission in turn affects the description of mitigating measures for other negative impacts e.g. on property value, settlement patterns and the general use of the area surrounding the project, because it is unknown how many landowners will be affected by the restrictions in the wind field. This illustrates that the postponement of important assessments and mitigation measures can lead to uncertainty in relation to other issues of concern to the public.

5 Discussion: Does EA do the job?

In this section we discuss the results of the analysis, with an emphasis on the scope of the social impacts in the EA statements, the way the social impacts are handled in the EA statements and finally the possible implications of this.

5.1 A broad scope of social impacts included

The results show that the EA statements include many different social impacts - more than anticipated by the research team. According to Vanclays guideline for social impact assessment (2015, p. 2), social impacts are basically any impact that is

valued by an affected local community, and “*SIA therefore should address everything that is relevant to people and how they live*”. As a guideline, social impacts can encompass impacts on people’s way of life, culture, the community, political systems, the environment, health and well-being, personal and property rights, and people’s fears and aspirations (Vanclay 2015). With this definition and examples in mind, there seems to be a focus in the analysed cases on fairly well defined impacts closely related to the development in the physical environment. For example in relation to cultural heritage there is more focus on monuments than local community identity, and overall less attention is paid to for example issues of brand and sense of security than health risks from groundwater and air pollution. Also, if looking at the debates there seems to be input that cannot be rediscovered in the EA process. This perhaps corresponds to a European study of EIAs made by the Commission of the European Communities (2003), which showed assessment of health impacts primarily concerns physical impacts that can be measured quantitatively. Other research has argued that practice tends to focus on impact categories in which threshold limits and monitoring methods already exist (Hilding-Rydevik et.al. 2005). Consequently, most of the issues concerning physical impacts such as noise, emission into groundwater plus nearness to ancient monuments and protection lines are assessed fully in the EIA’s and corresponding mitigating measures are described. There might also be connected to what competences are present among the professionals involved in the EA, what background and experiences they have. Perhaps if the EA team is traditionally composed of professionals with a predominately natural science background, this makes it more difficult to perform the task of assessing some of the social impacts. Here it might be expedient to look to the SIA community and professionals to enhance the competences in assessing social impacts.

5.2 Superficial handling of social impacts

The results show that far from all of the social impacts are assessed, fewer are mitigated and also the handling of impacts is often postponed. This echoes results from reviews of practice of SIA practice, where some of the issues that have come up in recent reviews are a lack of analysis of the spatial, temporal and stakeholder distribution of impacts, and that analysis can be superficial (Esteves, Franks and Vanclay 2012). If this is the case also for SIA this tool may not be the solution for handling social impacts in Europe. The result that mitigation rarely goes beyond reducing impacts prompts us to ask whether some of the discussion of minimising and avoiding social impacts take place outside the scope of the EA and are not documented.

Thus the discussion of the need for SIA in Europe is not only a matter of how social impacts are handled in EA statements and by EA practitioners, but also a matter of how social impacts are handled in planning practice. A range of countries in Europe have strong traditions within schools of planning that favours community benefits and community acceptance (e.g. collaborative planning (Healey 1997)). These traditions and the related institutional setups serve in many ways to enhance local benefits. As an example of the institutional role, local social impacts from wind turbines are in

Denmark sought compensated economically, and wind turbine development is institutionally made somewhat attractive for local residents, by forcing proponents to offer local residents opportunities of ownership in the coming wind farms. This strong tradition and institutional support to local residents might explain why European countries are lagging behind an international development of increasingly widespread adoption of SIA approaches. It does not mean that SIA is not relevant though: The increasing amount of conflicts related to infrastructures mentioned in the introduction may be an expression for a flawed planning practice or a need for a development of planning practice as a consequence of the development in society, where e.g. social media provide new platforms for social organisations and communications. SIA is most likely not the solution to the conflicts and planning challenges, but the structured approach and knowledge within the SIA community may be assist authorities, developers and the public in fostering a practice that in an acceptable way identify, assess, mitigate and/or enhance the relevant social impacts.

The results also show that often the projects analysed were based on positive national or international impacts, traded off with negative social impacts on the local level. This may not be surprising, however in this study it is specified how this is replicated in the EA statements. Looking at these results, the conflicts, which characterise the three analysed projects, may be more understandable. One could come to the simplified conclusion that these disgruntled local communities are displaying the NIMBY or “Not In My Back Yard” effect and reject complaints from citizens because of this. Nonetheless labeling citizens and local communities as ignorant with a NIMBY-label are reducing social issues and ignoring the diversity of underlying social dilemmas and motivations (Wolsink 2000). The use of NIMBY is in turn known to increase conflicts and misunderstandings in the local community (Bunningham, Barnett and Thrush 2006). When the public is retained in the role as unilateral opponents, it is difficult to include underlying nuances and motives that arise, when planning interact with a social reality. In SIA there is a strong focus on “managing” social impacts, meaning enhancing and providing positive social impacts for the local communities (Vanclay 2015). Perhaps here EA can learn from SIA practice, which have the capability to go beyond NIMBYism and exploring what Bunningham, Barnett and Thrush (2006) refers to as wide social circumstances including reasons for both supportive and opposing civic views.

It is important to emphasise in relation to the discussion of scope and handling of social impacts that, in this study we have mapped the content of the EA statements and compared to what concerns the public. This means that we have not analysed whether the assessments made in the EAs are sound, whether the scoping is justified and that is why some social issues are not included even if the public is concerned about it or whether postponement of mitigating the social issues is the most reasonable process. This of course hinges on a discussion of how much weight the concerns of the public should have compared to the assessments of the EA professionals and politicians, however, for now this lies outside the scope of this paper.

5.4 Possible implications of neglecting social impacts

The tendency of public uproar against new developments internationally and in Denmark (see section 1) may be related to the flawed integration of social issues. Research has shown that social issues are among the parameters that affect the comprehensiveness of opposition against new developments (Devine-Wright 2009). If the governance system is not providing a forum and basis for discussing social issues, a latent conflict might boost. Social and economic issues have been found to often be the underlying reason for social conflicts related to projects in the extractive sector (Franks et al. 2014). Interestingly, in the extractive sector, a lack of addressing perceived risks, including social impacts, is a cause of conflict (Franks et al. 2014), and thus one of the benefits of SIA is proposed to be a reduction of social and environmental conflicts such as these (Esteves, Franks and Vanclay 2012; Franks et al. 2012) Research shows that conflicts cost the proponents considerable resources due to loss of production and use of time and money for conflict and stakeholder management etc. Thus a quantification of these costs have motivated proponents to handle social issues and conflict more proactively, for example adjusting the project design and engaging in more communication with communities. (Franks 2014)

A possible implication of the approach to social issues is that people base their arguments on expressions of concern for the environment, when they protest against projects and plans, even if their resistance and anxiety in reality are about the social impacts such as impacts on peoples welfare and way of living. A Danish example dates from 2011, when a bridge was being planned, across the Limfjord in Northern Jutland, passing a small Island, Egholm. The residents of the island were against the project, as they feared it would destroy the 'island' atmosphere, thus their slogan is "*Preserve Egholm as an island*" (Egholms Venner 2014). However when they during the EIA process discovered that a certain endangered newt was living on the island, this became the dominant argument in the formal responses to the EIA that they sent during the public consultation period (Danish Road Directorate 2012). At this point we do not know the extent to which this phenomenon exists, we only have indications as the example above. However, if there is an environmentification of arguments taking place, it might indicate that the public finds that impacts on the natural environment are (considered) more legitimate arguments for opposition than social impacts, and they are forced to use the language of natural science and environmental regulation.

6. Conclusion

Our study of the three cases indicates that the current EA statements in Denmark include a considerable range of social impacts. Decision-makers might therefore be confident that the basis for decision is adequately taking the relevant impacts into account. However, our results unambiguously show that beyond this superficial view, the current practice is flawed in terms of social impacts. Especially there is a lack of focus on qualitative, non-physical impacts and problems with adequate assessment and acting on the impacts. We argue that inappropriate assessment of social issues may lead to frustration and opposition in the public, and to costs and delays for the

developer, which in turn is problematic for decision-makers. Thus, all actors have an interest in improving the assessment of social impacts.

Although our study only comprises a microscopic percentage of EAs being undertaken in Denmark, it does provide an understanding of existing knowledge gaps that can serve as directions for future research on the integration of social impacts in EA in Europe including a broader investigation of EA practice and the need for SIA or lessons learned from SIA through more cases than the three presented here. Also an investigation of the tendencies regarding the scope of social impacts and the reasons behind this, e.g. based on mapping of competences among practitioners, perceived need for support from thresholds, and the connection to physical environment could inform the on going debate. Another relevant investigation is an exploration of the link to planning and decision-making processes beyond the EA to find whether social impacts are more adequately handled elsewhere. Finally the study presented point to the need for an analysis of the use and considerations by decision-makers to find what role the social impacts actually plays in decision-making.

Based on the results and discussions in this paper, it is our perception that SIA may not be necessary in Europe, since EA clearly can incorporate social issues in one integrated assessment and document. The study also shows that quality of assessment and handling of social impacts in the practice of EA is poor, which could point back at implementation of SIA. However, our conviction thus far is that we rather need an improvement of quality in the EAs already carried out in Denmark. SIA takes a different approach to the process and aims to function as a more active part. Thus lessons could be learned from the SIA practice and community to improve EA practice.

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