

The Contributions of SEA to Energy Sector Planning

Lisa White^{1*} and Bram Noble²

¹School of Environment and Sustainability, University of Saskatchewan, Saskatoon, SK, Canada

²Department of Geography & Planning, University of Saskatchewan, Saskatoon, SK, Canada

*Corresponding author. Email whitelisa663@gmail.com

Abstract

Strategic environmental assessment (SEA) has been relatively slow to evolve in the energy sector and little is known about the role and contributions of SEA to energy sector planning. Since decisions about energy development have significant implications for sustainability, there is a need to better understand and advance SEA processes and its value added to energy sector planning and decision making. This paper examines the roles and contributions of SEA in six international electricity sector planning case studies. All six cases showed some evidence of ‘best practice’ SEA process, such as participation, consideration of alternatives and impact assessment; however, considerable variability was found in terms of the types of alternatives considered and the approach to impact assessment and monitoring, depending on the timing of SEA application in the PPP process. In terms of the substantive contributions of SEA, it was consistently identified by stakeholders as successfully improving communication during the planning process and informing lower-level decision making, but fared less well in terms of influencing the nature of the particular PPP at hand; only two of the six cases clearly incorporated SEA recommendations into the final PPP. Overall, results show considerable promise and potential for SEA to support PPP assessment and decision making in the electricity sector, but also a considerable need for improvements in understanding of the importance of the timing of SEA in the PPP process and how to integrate the results of SEA in PPP development and implementation.

1.0 Introduction

The energy sector is an “ideal candidate” for SEA (Jay, 2010, p. 3490). Decision-makers need to identify and evaluate alternative energy future scenarios and make informed, measured choices about the longer-term sustainability of PPPs often comprised of competing energy resource investment initiatives. That being said, SEA has been slow to evolve in the energy sector, mainly because the nature of SEA remains unclear to many (Noble, 2009; Vicente and Partidário, 2006); its role in energy sector PPPs is neither well developed nor understood (Fidler and Noble, 2012; Ketilson, 2011; Noble, 2009); and “the relatively fragmented nature of the industry...makes strategic planning itself more difficult” (Jay, 2010, p. 3489). There is some evidence in recent years of SEA and SEA-like processes being used in several countries for a wide range of energy applications (Jay, 2010; Partidario et al., 2010; DECC, 2009; OEER, 2008; PSCW, 2007; OPA, 2007); however, SEA in the energy sector is still considered novel and experimental when compared to other sectors.

This paper synthesizes the results of a recent study focused on the roles and contributions of SEA in energy sector planning, specifically the electricity sector. Six international cases were examined, in terms of SEA process elements and PPP outcomes. In the sections that follow, we provide an overview

of the study results and identify a number of emerging and enduring issues important to advancing the efficacy of SEA in the energy sector.

2.0 Methods

The cases examined were selected based on a review of the literature and by recommendation of several key informants involved in SEA research and practice. The cases capture different SEA contexts, including both formal and informal processes at various PPP levels, spatial scales of application, including also non-spatial policy, regional and sectoral applications, and timing of the SEA application in the PPP development process (Table 1). Each case was examined against typical SEA process criteria, such as alternative consideration, impact evaluation and participation and engagement, as well as SEA outcome criteria, such as knowledge and understanding, decision-making, tiering and communication and learning (Table 2). Cases were examined using a combination of document analysis and semi-structured interviews with 14 key informants.

Table 1. Overview of electricity sector cases

Case Study	Application Scale, Tier & Timing	Assessment purpose	Institutional Requirement
Ontario Power Authority Integrated Power System Plan, Canada	Provincial Plan; During plan development	To prioritize how electricity is developed in the province	Ontario Regulation 424/04
Nova Scotia Tidal Fundy Initiative, Canada	Regional Program; Prior to Program development	To direct the development of TISEC projects & technology in the Bay of Fundy	Federal SEA Cabinet Directive
UK Draft National Policy Statements for Overarching Energy	National Policy; During Policy review & revision	To control how energy infrastructure is developed	Planning Act 2008 Sec. 5(5); EU SEA Directive 2001/42/CE
Finspang Municipal Energy Plan, Sweden	Local Plan; During plan development	To strengthen municipal decision making and evaluate the SEA process	EU SEA Directive 2001/42/CE; National Environmental Objectives
Portugal National Transmission Grid Plan	National Plan; During plan development	To guide the development of the National Transmission Grid	EU SEA Directive 2001/42/CE
Wisconsin Strategic Energy Assessment, US	State Policy; During Policy review & revision	To identify projects & address adequacy & reliability issues	State Statute 196.491(2)

Table 2. SEA review criteria

Criteria	Description
PROCESS CRITERIA	
Alternatives consideration	Comparative evaluation of reasonable alternatives or scenarios
Impact evaluation	Identification of potential impacts or outcomes resulting from each option or scenario under consideration
Participation and engagement	Opportunity for meaningful participation and deliberations
Monitoring program	Procedures to support monitoring and follow-up of process outcomes and decisions for corrective action
OUTCOME and INFLUENCE CRITERIA	
Knowledge and understanding	Identification of key issues and areas of concern for decision makers Identification of additional options or alternatives for consideration in the PPP
Decision-making	Identification and/or adoption of a 'best' option or alternative Influence on the final decision or the decision making process and incorporation of recommendations into the final PPP
Tiering	Adoption of a formal approach to tiering that demonstrates a defined linkage between the current PPP and: i) the goals and objectives set by higher-order PPPs, and ii) the review or approval of any anticipated lower-tier PPPs or initiatives
Communication and learning	Opportunity for institutional learning, improved collaboration and communication Increased transparency in decision-making process and increased public awareness and education

3.0 Results

Consideration of alternatives: Half of the cases reviewed developed or considered alternatives in the assessment process. The types of alternatives considered varied from restrictive 'do nothing' alternatives to much more ambitious alternatives that set out broad government energy policy options.

Impact Assessment: All cases assessed potential impacts of the PPP, but the focus and practice was variable. In five cases, impacts were assessed based on social, economic and environmental factors; one case focused only on environmental impacts. All but one case was largely qualitative in assessment design.

Participation and engagement: All cases included some form of participation and engagement, albeit at varying levels. Engagement typically included simple information dissemination, but others were much more ambitious and included roundtable discussions, workshops and public panels.

Increased knowledge and understanding: Interview participants reported that SEA resulted in improved knowledge and understanding. In all but one case, the SEA was reported to have resulted in the identification of new issues or concerns, including electricity supply reliability issues and additional alternatives for consideration.

Improved communication and institutional learning: Improved communication and collaboration was reported in all six cases. In three cases, institutional learning on behalf of the planners involved in the SEA was reported as having emerged from the interactions between government departments and stakeholders. In these same three cases, improved transparency was identified as a result of collaboration with stakeholders during the SEA process.

Influenced PPP decision making: In five of the cases, SEA was said to have influenced PPP decision-making. Some cases reported that a ‘best’ option was identified and subsequently adopted in the PPP; others reported improved decision-making due to the incorporation of recommendations from the SEA. SEA was particularly influential when it was “built in” to the plan decision-making process itself, which reportedly resulted in more robust strategies or actions being included and subsequently adopted.

Promoted tiering: In all six cases, SEA was seen as tiering toward lower level processes, including pre-screening projects and setting a context for future projects; however, there was demonstrable evidence of influence of the SEA on lower-level decision making in only two cases. In four cases the PPP was legislated as part of a lower tiered initiative, including mandatory assessments for proposed projects that must adhere to requirements set out in the SEA. The same four cases were also influenced by higher tiered regulations, including renewable generation requirements, criteria for siting projects and security of supply requirements.

4.0 Discussion

In the six cases reviewed, regardless of whether they were formal SEA or SEA-like process, all demonstrated some evidence of ‘good’ SEA process and influence on either the PPP at hand or on subsequent assessment and decision making processes. This suggests that there are immediate benefits to be derived from SEA or SEA methodology, regardless of whether the SEA is formally labeled or recognized as such. Consistent with Noble (2009), some of the better SEA applications in the energy sector may be occurring outside the umbrella of formal SEA requirements and, as such, go unrecognized in the mainstream SEA literature. That being said, there are several common issues that emerged from the set of cases that need to be addressed in order to further advance benefits of SEA in the energy sector.

Generation and consideration of alternatives: Alternatives are considered to be a fundamental part of ‘good practice’ SEA. Only half of the cases considered alternatives, but it in those cases the generation and consideration of alternatives had a significant positive impact on PPP development. There is a clear need for the promotion of alternatives consideration in SEA applications in the electricity sector; currently the process is rather restrictive (see Jay, 2010).

Impact assessment methodology: There appears to be a dominance of qualitative impact assessment methodologies used in practice. While appropriate for use in some cases, qualitative methods may prove problematic in ensuring good SEA follow-up programs, where the focus is on monitoring actual impacts of the PPP. Consistent with Noble et al. (2012), there may be a lack of awareness about available quantitative methods for use in SEA and guidance on how to choose them appropriately. Structured guidance on how to choose a suitable methodological approach, as well as a set of supporting methods, is needed to advance SEA in the energy sector.

Timing: The timing of SEA application is key to its influence. Several cases adopted SEA early on in the PPP development stage and in those cases the SEAs had a significant influence on decision-making. In other cases, SEA was applied late in the PPP development and it was less influential on the decisions taken. Early application of SEA is needed in order to influence and add value to energy sector PPP development.

Participation and learning: In all of the cases, improved collaboration and communication was deemed a major outcome resulting from the participation in the SEA process. There is merit to participation in SEA, and evidence to support its value added to strategic level decision making, including: educating the public and decision-makers, as well as making the PPP process more transparent, thereby instilling confidence and bringing accountability to decisions that are made.

Tiering: Tiering is sometimes labeled as ‘idealistic’ in the SEA literature (Fischer 2010; Nitz and Brown, 2001), or not reflecting how the PPP process actually works. Our cases suggest that tiering is alive and well in SEA. The cases demonstrate the ability of SEA to influence actual outcomes through a tiered process at three levels:: 1) tiering down, informally, to lower level decisions; 2) tiering up, to higher level PPPs being legislated into subsequent lower level actions; and 3) the SEA itself occurring within the context of a higher tiered PPP initiative.

5.0 Conclusion

In a period of rapidly increasing global energy demand and increasing concerns over the impacts of energy development, there is a significant need and opportunity to advance the application of SEA to energy futures and energy sector planning; however, SEA in the energy sector is still considered novel and experimental when compared to other sectors. Based on a review of SEA cases in the international electricity sector, our results indicate considerable promise and potential for SEA in the energy sector. We also found strong evidence from practice of the added value of SEA or SEA-like processes to electricity sector planning. Early adoption of SEA processes in PPP development, along with structured SEA methodologies, were found to be important factors in ensuring both the immediate and tiered influence of SEA. We suggest that, in order to continue to advance SEA in energy sector planning, there is a need to improve the understanding and importance of the timing of SEA application and shift toward more structured SEA guidance to ensure consistent and effective application.

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