

EIA - a Tool for Sustainable Development: A Case Study of Mynyddy Gwair Wind Farm

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Abstract: Environmental impact assessment (EIA) is a tool which aims to make developments better by identifying, avoiding, and mitigating potential negative environmental impacts of projects and other action. In a case study, EIA for Mynydd y Gwair wind farm is analysed to evaluate the importance and effectiveness of EIA within wind farm planning debates, as well as assess to what extent the EIA process has improved the sustainability of the proposal. The analysis shows that although the EIA is important, but the public and stakeholders express concerns about bias and about the inability of EIA to address some development problems and wind farm decommissioning issues adequately. Moreover, the research also analysis key issues which EIA impedes the sustainable development of wind farm project. The paper questions the assumption that EIA is a universally applicable tool, and argues that its effectiveness should be analysed in the context of specific development sectors.

Keywords: Environmental impact assessment; Sustainable development; Social participation; Stakeholder relationship; Environmental mitigation

1. Introduction

Renewable energy technology has obtained strong political support since the 1990s all over the world, not only because of the capacity to help to mitigate climate change, but also it can satisfy growing demands for electricity and improve energy security. Considering the energy industry is the main source of carbon emissions, it is necessary to conduct the energy transition to renewables for low-carbon city development (Bridge et al., 2013). The national goal of UK is that renewable energy will account for 15% of the whole energy use in 2020, where as much as 40% of this is expected to be in the form of renewable electricity generation (UKERC, 2010). The development of renewable energy has received adequate assessment, for it has the potential ability to effect the environment such as the wind farm, to guarantee appropriate protection in the aspect of construction, natural and cultural heritage characteristics and so on (DoE, 2009). While modern technology allows the production of electricity from a variety of renewable sources like solar, wind, geothermal and so on, the policymakers consider the onshore wind energy as the most technically and economically viable technology to achieve the development goals. When compared with other renewable energy sources, onshore wind energy is deemed as an efficient energy, which has the maximum ability to improve production of low cost electricity in the short term (WG, 2005). At present, UK has the world's biggest offshore

wind market with more capacity deployed in the world (DECC,2013). Not only because of the growing electricity demands, but also the policy of UK government for electricity from renewable source, wind farms have gradually become the most rapidly developing technology of renewable energy in the UK (DECC,2011).

Mynydd y Gwair wind farm is a project that conducted by Swansea City and County Council, which including 16 turbines and would be constructed in South Wales. This project is expected to generate 48MW, and able to provide sufficient low cost, low carbon renewable electricity, aims to meet the average annual electricity consumption of 24,700 households, also contribute to improve climate change as well as energy security in Wales (RWE Innogy, 2014). Environmental Impact Assessment (EIA) is a legal requirement in planning application for any large-scale development in EU. Mynydd y Gwair wind farm project has been subjected to EIA process, however, this project presently has a high controversial issue. It is necessary to evaluate the significance and effect in EIA process for wind farm planning debates, as well as assess to what extent the EIA process has improved the sustainability of the proposal.

2. EIA and Sustainability

EIA (Environmental Impact Assessment) as an informative tool that has become accepted as an elemental part of sound decision-making. It is an official process which aims to take environment, society and economy into ac-

count for a comprehensive development, in order to understand the anticipated impacts, address and include those impacts in the decision-making process (IAIA, 1999). EIA systems have been created in different patterns across the world, there are two patterns of the EIA concept: national or local development strategy and resource utilization (i. e. a tool for development planning); and project management (Grogan and Blanchard, 1992). UK conducted the EIA requirement in 1985, and modified it for three times in 1997, 2003, 2009 respectively (EU, 2011). The EIA requirements derived from European Directive as well as the EIA Directive 85/337/EEC (EU, 2011). Since its introduction in the UK, there is a main developing area for planning practice; the number of EIAs has increased from twenty at the beginning stage to hundreds per year, and this is just the tip of the iceberg, the scope of EIA continues to widen and grow (Glasson et al., 2012).

Sustainable development refers to “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). This indicates that it is most important to meet the demands for the poor, and reflects on the limitations set by existing technology and social organization (ibid). Including a balanced approach in the aspect of environment, society, culture and economy. It can be described as a very sophisticated ecosystem in which we are all intertwined into a series of competitive and cooperative survival mechanisms (Jepson, 2001). This requires a balance in the use of natural resources, contextually sensitive built environment, vibrant economy, human capacity, and social cohesion (Roseland & Connelly, 2005). Sustainability is not about the traditional flow of thinking but an incorporation of unconventional thinking aligned to intertwining social, economic and environmental factors to fulfil the demands of the future generation, hence its focus is not only short term but also long term.

When it comes to the role of EIA in the process to achieve sustainability and sustainable development, there are still some pros and cons like effectiveness as well as limitations. There are many ways to define ‘EIA system effectiveness’, the mostly commonly adopted definition is the one adopted by Barry Sadler, which says that effectiveness is about how well an EIA system performs. The purpose of effective study is Evaluating Practice to Improve Performance (Sadler, 1996). So it is surprising to find that soon after the introduction of the EIA system, numerous researchers with enthusiasm embarking on effectiveness studies in an attempt to improve the practice, and the most important one is the quality of decision making.

Additionally, the EIA process has many benefits for decision makers, it will assist in building a more systematic framework for preparing conditions and legal agreements

to have a better management for future operation of projects, to enhance the accuracy of the information; to improve participation and resolution of stakeholder concerns; and increased rigour in the evaluation of environmental information. EIA is considered and used as a systematic and integrated process, which can take potential effects into consideration before the decision making process, regardless of whether a proposal should be approved to continue (Wood, 1995). In order to incorporate the environmental considerations into a decision making process, EIA is developed into a process to understand the possible consequences of a proposed action. EIA is powerful in affecting results of stakeholder, forming deliberation and guaranteeing transparency and accountability for decision makers (Cashmore et al., 2004).

Although EIA is regarded as a useful tool to identify potential impacts of new development, however, when it comes to the quality and scope of solving the impacts on environment, EIA has been criticized for its inadequacies (Glasson, 1999). Some elements of environment and society should be taken into consideration to determine the location or scale of wind farm projects, including the landscape and visual assessment, transport, land use, and cultural heritages and so on, which are the most important factors in the planning process (DoE, 2009). But it can be found that the main drawback in EIA process is the failure to sufficiently deal with significant impacts, as well as lacking of adequate consideration for alternatives and poor assessment of cumulative effects (Westion, 2000).

Furthermore, EIA is considered as not rigorous enough, and can not provide sufficient details on mitigation measures for the impacts (Glasson, 1999). Sometimes, the process and outcomes of EIA are not objective and the effects which will be mitigated through right methods are too often eliminated (Barker and Wood, 1999). Jay et al. (2007) held the idea that the lack of transparency usually due to the the subjectivity of EIA judgements in the information generation process. These problems demonstrate that it is essential to examine whether the key environmental elements are addressed in EIA process, which are important for informing decision makers.

At present, EIA process within the wind farm project is a controversial subject, the planning decision for wind farms which under 50MW is conducted by local authority and following the procedure set in the Town and Country Planning Act (Smith, 2014). In terms of regulation, the local planning authority is concerned about the consequences of rejecting wind farm applications, because when developers are not satisfied with the decisions which from the Secretary of State, they can appeal against the decisions. Renewable UK conducted the study for the onshore wind farm projects, it illustrated that 42% of those projects were rejected planning per-

mission in 2010/11 at local authority level, but 51% of the onshore wind farm projects obtained approval after appeal (IEMA, 2011).

3. EIA Influences the Sustainability of Wind Farm Project

A major objective of planning is to assess the positive and negative effects in society, environment and economy of individual development, it also has the potential to provide a reflexive place that people can have public discussions of different opinions such as spatial governance, environmental justice. As an essential part in the planning process, EIA can influence the sustainability of a project in many aspects including social participation, stakeholder relationship and environmental mitigation and so on.

3.1. Social participation

Scoping is considered as having crucial significance in the EIA process (Snell and Cowell, 2006), which emphasizes the fields of concern owing to perception of inconsistent decision making (IEMA, 2011). Scoping process demands the decision would be made what compromises possible important effects, there are some complicated questions due to lacking of perspicuity with respect to the objective of EIA, as well as the existing intrinsic subjectivity of some environmental impacts (Ross et al., 2006). In 2004, the Scoping Report and a formal request for a Scoping Opinion was submitted to the City and County of Swansea (RWE Innogy, 2014). Scoping stage aims to guarantee that EIA research can solve many aspects of the potential concerns of LPA (Local Planning Authority) and its consultees, but also offer important information to make the application to be decided. The scope of coverage of EIA contains the scoping meeting and pre-application meeting, which are necessary for guiding the environmental assessments. The suggestions and feedback obtained from the scoping meeting were important for prioritizing the most necessary elements that EIA solved. It can be found that scoping could play a vital role in the EIA process, which can improve the sustainability of this wind farm project. Besides scoping stage, having the correct baseline in place is regarded as a key factor to notice decision makers during the pre and post stages of development of wind farms.

In addition, consultations with statutory consultees such as Country Side Council for Wales and Natural Resources Wales, and non-statutory consultees like RSPB, local ecologists were key factors in this project. They are considered to be able to influence the scope of EIA, provide support for the establishment of wind farm projects, as well as put forward feedback and recommendations for decision makers, which is beneficial to influence information of EIA. Moreover, they helped to guide decisions and construction of development of the wind farm

project. If the recommendations which comes from the consultations were deemed effective, they would be adopted by LPA.

However, when public and LPA are involved in consultations process such as scoping meetings, there are some existing problems especially for local residents, they perhaps hold divergent interests to what EIA implementers maybe consider essential to evaluate (Harding, 1998). Stakeholders think that it is important for the the identity of individuals that participated in EIA process, mainly owing to people concern that there is a bias in favour of the development of the Environment Statements (ESs), because the developers write the ESs, or maybe they have excessive influence for EIA consultations process. Planning authority and developer prefer to own the specific importance of independence, this is probably owing to the partiality, and the contents of information in the planning application, is a material planning consideration (Warren CR et al., 2014). It is also probably because the developer is often eager to argue claims that this method towards EIA is not adequate.

It can be said that the individual that involved in writing ESs have an indirect impact on wind farm planning outcomes, due to the partiality is an important element that affects the public response to the development proposal, not only the action which comes from the professional stakeholders (ibid). However, it indicates that perception bias can still become a significant determining element of the essence of wind farm project debates. Furthermore, based on the literature review, it is found that sometimes the scoping process of EIA tends to lack proper focus (IEMA, 2011). Additionally, according the relevant document analysis, it should be noted that consultations process in EIA can not give appropriate attention to address some problems owing to the constraints like time limitations and resources shortage (UNDP, 2011).

3.2. Environmental mitigation

The purpose of EIA process is to amend and enhance the planning of environment; guarantee resource can be used in an efficient and adequate way; determine main influence and suitable mitigation measures; prevent irreversible environmental damage. EIA is reasonable and effective, which can ensure that the potential environmental impacts would be alleviated and the appropriate monitoring would be implemented.

For Mynydd y Gwair scheme, in 2008, a planning application about a 19 turbines program was submitted to the City and County of Swansea Council. RWE NRL afterwards appealed to the Planning Inspectorate Wales for non-determination of this application but dismissed by the Secretary of State in 2011 (RWE Innogy, 2014). Then the planning inspector took the attitude that the Secretary of State could concentrate on the problem that several turbines might have a bad effect on the environ-

ment especially for the peat resource. Therefore, RWE re-designed the Mynydd y Gwair program by decreasing the number of the turbines, the scoping response about this program was obtained from Countryside Council for Wales and Environment Agency Wales. It indicates that appropriate mitigation measures would contribute to the environment development, and this is also a result of multi cooperation in the EIA process.

On the other hand, EIA as an informative tool cannot ensure that the final decision would be made. For the 19 wind turbines scheme, permit was firstly refused because of the damage on the environment especially for the deep resource, but it was approved through re-design the scheme by decreasing the number of the wind turbines. However, because the objection has not been addressed in the early stage, then the decisions have been subjected to a judicial review. Developer and consultees are comparatively not concern about the capacity of EIAs to effect suitable mitigation measures, while the capacity to carry out mitigation measures that mentioned in ESs. Though planning condition is regarded as a vital factor of the effectiveness of the EIA process in decreasing the damage on environment (Warren CR et al., 2014).

3.3. Stakeholder relationships

The informative essence of EIA helps corresponding stakeholders have a comprehensive understanding for the possible effects of development, so that they can make reasonable decision. EIA practitioners work at the interface among LPA, community, developer and the environment, and therefore the EIA process should keep the balance between these interest groups to improve the development (IEMA, 2011). EIA process builds the support for the different stakeholders to hold balanced ideas to form the planning decision, it also has a framework for negotiation to deal with controversial problems of wind farm projects development (Sadler, 1996).

During the early stage of EIA, the consultations between the developers and local strategic partnership usually foster the acceptance of the wind farm projects, contributed to have a better understanding of problems for local community and LPA that assisted in reducing conflicts (Office of the Deputy Prime Minister, 2004). In the context of Mynydd y Gwair, different ideas could be received from the public through the consultations with statutory and non-statutory consultees. In addition, access to information especially the ESs of wind farm project, guaranteeing adequate implementation in the EIA process, recommendation and feedback are useful for informing decision was made (ibid).

When it comes to whether the interactions among different stakeholders in EIA have an effect on the outcomes of wind farm project, some stakeholders hold the view that EIA can enable people have a better understanding for the decision making process (Warren CR et al, 2014).

It can be found that developer strongly suggested EIA to enhance transparency in planning, if EIA aims to put additional information into the planning process, afterwards it perhaps would help in making reasonable decisions (Thissen et al., 2000). It should be noted that the political elements also play an essential part in the decision making process, such as perceptions of bias apart from some reasonable purposes in the planning system. As for the effectiveness of EIA, transparency is considered a vital determining factor in the aspect of making an audit trail (Arts et al., 2012), but this is not adequate to eliminate the concerns from public with regard to EIA.

Community participation could enhance transparency for making decisions in the EIA process, however, it found that because of they don't have a good understanding of it contradicts claims, community group is separated from the planning system of EIA (Weston, 2000). Lacking participation among EIA community stakeholders is one of the factor which leads to foster the perceptions of bias, because if the local residents take the attitude that they detached from the EIA process, this will result in the suspicion which comes from the public. EIA should improve the social participation to encourage local residents to engage in the planning process for the local development. In addition, if there is an engagement between the developers and communities, this is not only considered to be able to enhance the quality of planning application, but also to assist in resolving local conflicts. Therefore, in the planning system of EIA, it is possible that the engagement between different stakeholders could have an impact on the wind farm debates, as well as plays an important part in forming wind farm planning outcomes.

In addition, the interaction between stakeholders is considered an essential part in the EIA process, and this can also influence effectiveness of EIA. Although EIA as an informative tool aims to inform decision makers, the environment conditions could also have an impact on the experience of stakeholders in the planning process (Briggs and Hudson, 2013), such as through improving the connection between developer and consultee in the early stage. On the contrary, sometimes EIA can also have a negative impact on the experience of stakeholders, this would lead to the controversy of wind farm project.

4. Conclusion

Although EIA has intrinsic constraints in some aspects, however, it can also strongly improve the sustainable development for the wind farm project in a variety of ways (Cashmore et al., 2004). EIA is a useful informative tool which can support the local authority to make rational decision, provide information for decision makers, identify mitigation measures of environment, and allow plan modifications to ensure the sustainable development of the wind farm project.

EIAs conducted on wind farms are considered as an essential tool to uncover possible consequences of wind farm on the natural environment. It is necessary to introduce more focused scoping method so as to focus on basic problems which play a vital role in the whole decision making process. It could not only help to reduce the volume of environmental statements and making them more concise for planner, but also better for competent authorities to make reasonable judgement. It was obvious that there is a demand for improved integration of EIA in the process of project planning, in order to have a better development including environment and economy aspects of this project (Ogunba, 2004). EIA within wind farm project should take some other factors into account like technological as well as infrastructure aspects, and have a comprehensive coverage of possible effects in environment and society (DoE, 2009).

In addition, it should be noted that if only depend on EIA cannot guarantee the decision to be made on wind farm, some policies and rules like LDPs, NPPF, TAN8 also constituted the foundation for approving or rejecting this project. So as to enhance the quality of information which generated in EIA process, it is important to engage corresponding stakeholders in the early stage of scoping and consultations meeting. Conducting a consultation with residents, professionals as well as other stakeholders is regarded as an important resource of information to make decisions on wind farm project. The risk can be decreased during the early stages, for the individuals who are not experts, to minimize unnecessary cost would be also quite important for the environmental consequences of the wind farm project (UNDP, 2011). In decision making process of the Mynydd y Gwair wind farm project, it can be found that the LPA adopted suggestions from statutory and non-statutory consultations.

In fact, the effect of EIA in the aspect in the planning process of wind farm project, it has not obtained sufficient attention up to now, although this is a resource intensive process. Planning research has concentrated on the strategic planning for wind farms in some aspects (Power and Cowell, 2012). However, technology development has the ability to improve the management process of wind farm planning, this is an area that remains to be explored (Arts et al., 2012). Due to the technological progresses for EIA, the capacity of LPA and consultant engaging EIA has also improved in recent years. For some particular EIA topics, there are more materials which could be used to improve the accuracy of information. If EIA has received more attention, maybe there is a better understanding of its practice, EIA as an informative tool can make a great contribution for the process of decision making. In conclusion, EIA can act as a significant tool to ensure that that adjustment and mitigation measures would be implemented, and to guide

decision makers to more sustainable decisions in the wind farm project.

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