

---

## **Experience with and strategies for public involvement in offshore wind projects**

---

**Hans Christian Sørensen and  
Lars Kjeld Hansen**

SPOK Consult, Blegdamsvej 4, DK-2200 Copenhagen N, Denmark  
Fax: +45-3537 4537 E-mail: [consult@spok.dk](mailto:consult@spok.dk)

**Karin Hammarlund**

Hammarlund Consulting, Råvetorp 1501, SE-268 90 Svalöv, Sweden  
Fax: +46-418 664066 E-mail: [karin@hammarlundconsulting.com](mailto:karin@hammarlundconsulting.com)

**Jens H. Larsen**

KMEK - Copenhagen Environment and Energy Office,  
Blegdamsvej 4B, DK-2200 Copenhagen N, Denmark  
Fax: +45-3537 3676 E-mail: [jens@kme.dk](mailto:jens@kme.dk)

**Abstract:** The paper describes and analyses different models for public involvement, based on experience from offshore projects in Denmark (especially Middelgrunden) and Sweden (Karlskrona Vindkraft Offshore). The public likely to be concerned by offshore wind energy projects must be informed and consulted as part of the Environmental Impact Assessment (EIA). However, as member states individually define details regarding information and consulting, different approaches are possible. It is concluded that although active public involvement is a time and resource requiring challenge, it is to be recommended as it may lead to mitigation of general protests, blocking or delaying projects and increasing future confidence, acceptance and support in relation to the coming offshore wind farms in Europe.

**Keywords:** Public involvement; offshore projects; Denmark; Sweden; wind.

**Reference** to this paper should be made as follows: Sørensen, H.C., Hansen, L.K., Hammarlund, K. and Larsen, J.H. (2002) 'Experience with and strategies for public involvement in offshore wind projects', *Int. J. Environment and Sustainable Development*, Vol. 1, No. 4, pp.327-336.

**Biographical notes:** Hans Christian Sørensen has a PhD degree in structural engineering and a degree in International Management and Business. He has 30 years of experience as project manager of industrial development and research. Since 1994 he has had his own consultancy, EMU, which recently changed name to SPOK ApS. He was vice project manager during the establishment of the 40 MW Middelgrunden Offshore Wind Farm, responsible for the EIA and the foundation part of the project, and involved as consultant for the 23 MW Samsø offshore wind farm. Dr. Sørensen is a board member of the Danish Association of Wind Turbine Owners.

Lars Kjeld Hansen (MA and Bachelor in Human Health Science) is project manager in the company EMU/SPOK ApS. He was involved in projects regarding social acceptance during the establishment of the Middelgrunden Offshore Wind Farm and served as task manager concerning the subjects of Environmental Impacts, Social Acceptance and Politics in the EU Concerted Action on Offshore Wind Energy in Europe <[www.offshorewindenergy.org](http://www.offshorewindenergy.org)>. He is currently managing projects dealing with social acceptance and public involvement in the EU funded Thematic Network on Wave Energy <[www.wave-energy.net](http://www.wave-energy.net)> and during the construction of the wave energy converter 'Wave Dragon' <[www.wavedragon.net](http://www.wavedragon.net)>.

A PhL in Social Geography, Karin Hammarlund, Hammarlund Consulting, has a unique and long competence from over 13 years working for the large Swedish utilities with coordination of environmental impact assessments and statements, project management and information strategies mainly concerning wind energy projects and other renewables, specialising in case studies on public acceptance. Karin Hammarlund's research on socio-technical aspects of wind power planning has been recognised in both Europe and the USA. Karin has contributed to two Swedish official investigations concerning wind power location: Vindkraft i harmoni 1998 and Vindkraftutredningen SOU 1999:75.

Jens Henrik Møllgaard Larsen graduated in 1989 from the Danish Technical University with a Master of Science in engineering. He was one of the initiators of Middelgrunden Offshore Wind Farm and is now working as administrator of the farm. He has started several wind cooperatives and been actively promoting renewable energy and public involvement since 1985. In 2000 he won the Danish Wind Turbine price and the European Solar price for his work. Other areas of working: Plans for wind energy, Green city, Ecology house, Campaign for solar energy and biomass, Electricity savings, Ecology in buildings, Education, Exhibitions, Publications (books, films) and Policy.

---

## **1 Introduction – legal framework**

Most EU member states have planning requirements that play an important part in the national development of wind power sites. However, the requirements for wind energy proposals vary between the member states. In some countries, legislation has been passed at a national level enabling the authorities to request submission of an Environmental Impact Statement (EIS) of wind power developments.

The term 'Best Practice Guidelines' has been adopted in many member states in order to describe the best and most appropriate approach for development, operation and decommissioning of wind energy projects.

These Best Practice Guidelines may very well assist any assessment procedure in addressing, not only the technical, commercial and environmental aspects of projects, but also the social impacts.

### *1.1 EIA*

Private and public projects that are likely to have significant effects on the environment must be subject to an Environmental Impact Assessment (EIA) before they can be

allowed to proceed. All offshore wind projects are therefore expected to be subjects of an EIA.

The main purpose of the EIA is to examine, in detail, the impacts of the project and this also includes a requirement for public participation [1].

The public that is likely to be concerned about a project must be informed and consulted, but each member state defines individually the details of these arrangements, resulting in numerous potential approaches.

Although national relevant authorities have the responsibility of safeguarding that these consultations are carried out in an appropriate and sufficient way, often the process of information and consultation is carried out by the developer without any involvement from the responsible authority.

In the EIA also the true potential of the project lies hidden. Hence, the relevant issues of an EIA will prove to be relevant also to the decisions made during the planning phase of a project. If the scope of an EIA also covers social impacts of a development, this will prove to be an important foundation for a dialogue with the concerned population. Even better, there will be an understanding of what the population might be concerned about when it comes to offshore wind power locations. It should be known who to address, when to address and how to address. If there is no understanding of the local social contexts and important issues for the concerned population, this cannot be known.

An EIA might prove to be the foundation needed for the appropriate adjustment of the project to the prevailing circumstances. Hence, it is not only supposed to be a document (EIS) presented to the authorities, but a dynamic process, a framework and tool for project development. An EIA involves a flexible procedure where amendments to the original proposal are constantly weighed against all different aspects of the project. Mitigation is discussed in order to arrive at the most acceptable form of development. It is impossible to understand which mitigation measures are relevant, if there is no open dialogue between different concerned parties.

## *1.2 Public participation*

There are different forms of public participation, but basically the public can be involved in a project in three major ways, [2–4]:

- through information about ongoing development (information)
- through involvement in the decision making process (planning participation)
- through financial involvement in the project (financial participation)

The most common approach is quite passively to inform people and carry out the minimum requirements regarding consultation. People are almost never offered a direct influence on the decision making.

This is due to imagined disadvantages and misconceptions, mainly such as [3]:

- public participation may worsen the situation
- public participation might be inefficient
- it is impossible to satisfy all interests so you might as well not try
- public participation may expand the scope of the conflict

However, if the channels for a dialogue are kept open and looked after, potential threats can be mitigated before a more general protest is formed. There will be a sense of control over the development of the project and the dialogue with the concerned public will not be handed over to misinformation by media. If a sense of control is created through an open and dynamic dialogue, the confidence of the public can be achieved. This is a very efficient way to navigate towards not only a successful outcome of a project but also future confidence in wind energy developments and, perhaps even more important, in wind power developers.

The advantages of public participation may include:

- an essential improvement of planning decisions and balancing of different aspects
- increased awareness of public concerns
- an increased understanding of possible cooperation between opposing parties
- elimination of misinformation and believed threats
- future confidence and acceptance

### 1.3 Conclusion

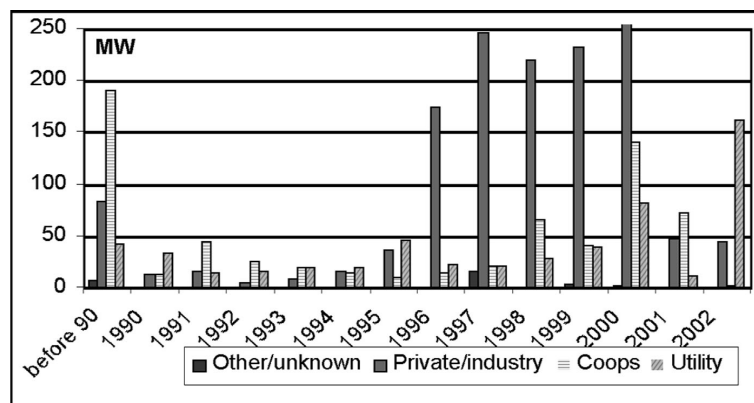
If multiple parties are involved in the decision making, the social and environmental impacts can be properly addressed and the conflicts reduced. Conflicting interests are illuminated in a pedagogic way early in the process. This improves the possibilities to compare facts such as the pros and cons of wind energy in relation to the effects of other energy sources. People who tend to accept the process also tend to accept its outcome [5].

## 2 Experience from Denmark

### 2.1 Introduction

In Denmark many people are involved in wind energy projects, approximately 150,000 families, due to environmental concerns and/or the possibility of receiving some financial benefits.

**Figure 1** Development in ownership of wind farms in Denmark MW installed power each year



Source: Nielsen [6]

The cooperatives, where mostly local people share expenses and income from a wind turbine, have played an important role, especially providing acceptance at a local level, where the possibility of resistance is otherwise high due to visual or noise impacts.

In general there is broad acceptance to wind energy in Denmark – opinion surveys result in at least 70% being in favour of it, whereas about 5% are against.

Regarding offshore, the farms established so far at Vindby and Tunoe Knob are utility owned, whereas the Middelgrunden is owned 50% by the local utility and 50% by a cooperative.

The involvement of the public regarding Vindby and Tunoe was basically founded on the information approach, whereas a much more active information and participation strategy was used and needed at Middelgrunden, as described below.

## 2.2 The Middelgrunden project

The project consists of 20 2 MW Bonus turbines, half of them owned by the Middelgrunden Wind Turbine Cooperative. Eight thousand five hundred people, primarily in the local area, have joined the cooperative, which makes it the world's largest wind turbine cooperative, typically investing 2,850 EUR, corresponding to production of 5,000 kWh/year.

The farm was constructed in 2000 (see Table 1) and from March 2001-October 2002 the production has been app. 147,500 MWh [7]. In [8,9] details regarding technical and financial aspects are presented concerning the construction of the farm.

**Table 1** Process before establishment of Middelgrunden offshore wind farm [8–10]

Application on principal approval	September 1996
First public hearing, 27 turbines	Jun – Sep 1997
Second public hearing, 20 turbines	Jun – Sep 1998
Principal approval	May 1999
Third public hearing (Environmental Impact Assessment Report)	Jul – Oct 1999
Final permit from Danish Energy Agency	December 1999
Contracts signed	December 1999
Construction initiated	March 2000
Turbines start power production	March 2001

### 2.2.1 History and importance of the cooperative

In 1996, the Copenhagen Environment and Energy Office (CEEEO) took the initiative to organise the project, after the location of Middelgrunden, three km from Copenhagen harbour, had been identified as a potential site in the Danish Action Plan for Offshore Wind [11]. Together with CEEEO a group of local people formed the Middelgrunden Wind Turbine Cooperative and cooperation with Copenhagen Energy CE was established. As the Municipality of Copenhagen owns CE, a close link to politicians was thereby also established. The locally based commitment, along with cooperation between

the cooperative, the local utilities and the municipality of Copenhagen, constituted a significant precondition for the development of the project.

The project was the subject of a long and intensive hearing phase, as can be seen from Table 1.

The original project dating back to 1997 consisted of 27 turbines placed in three rows. After the public hearing in 1997, where this layout was criticised, the farm layout was changed to a slightly curved line and the number of turbines had to be decreased to 20 [12,13].

The authorities raised a number of questions that were answered during the publicly funded pre-investigations. During the hearing in 1997, 24 positive and eight critical answers were received.

Behind these figures, comprehensive information work is hidden, both in relation to relevant authorities and NGOs and in relation to the many future shareholders in the cooperative.

For instance, locals were worried about potential noise impact from the farm, but after a demonstration tour of a modern onshore wind turbine, the locals were convinced that there would be no noise impact from the Middelgrunden turbines.

Information to the potential shareholders was, in the beginning, primarily carried out with the purpose of securing a sufficient number of pre-subscriptions. This turned out to be a success and the interest of more than 10,000 local people was proof of strong local support, which could be useful in the approval phase.

Some of the shareholders got involved in the democratic hearing process, which was intended to create the foundation for authorities' approvals.

As an example, the Danish Society for the Conservation of Nature at first decided to reject the proposed location, but through the involvement of and information directed at the local committees of the society, this decision was later changed.

At the final hearing a large number of local groups and committees, not to mention the several thousand shareholders, recommended and supported the project – only a relatively small group of yachtsmen, fishermen, individuals and politicians remained in opposition.

**Figure 2** The Middelgrunden 'the curved line' and 'the three rows' from the beach at Kastrup



Source: Moeller & Groenborg AS [13]

During and after construction there has been surprisingly little resistance to the project, considering the visual impact from the large turbines, located just 3 km away from, for instance, a very popular recreational area – a beach – near Copenhagen. The reason for this lack of protest is believed to be the strong public involvement, both financially and in the planning phase.

### *2.3 Lessons learned*

During the approval process, authorities raised a number of questions, which were answered through the carefully planned pre-investigations.

Through dialogues with many kinds of interest groups, CEEO and the Middelgrunden Windturbine cooperation, with its 8,500 members, generated a widespread understanding for and social acceptance of the chosen location and layout of the farm.

Locally based commitment and cooperation between the cooperative, the local utility CE and the municipality of Copenhagen have been a significant precondition for the development of the project.

This cooperation has provided credibility to the project in relation to politicians, press, public etc. The municipality's role in the project has mostly been political, through the local parliament's commitment to the project and through the preparation of the terms of collaboration between the utility, CE and the cooperative.

### *2.4 Future offshore wind projects in Denmark*

Currently two private projects are planned, along with five 150 MW demonstration projects [11].

Of the two private projects, the one at Grenaa is owned by a private developer and has been delayed due to much local resistance.

The other private project, the 23 MW project at Samsø (10 turbines), is owned by shareholders, consisting of local people and neighbouring municipalities. The project is under construction, Autumn 2002, and probably because of the direct public involvement in the preplanning phase and the public financial participation, the project has to date not been the focus of any major protests.

Of the two 150 MW demonstration projects currently under construction, the Horns Rev Offshore Wind Farm is utility-owned and the Nysted/Rødsand farm is owned by utilities and investors; in both cases without direct public involvement.

The coming three 150 MW offshore demonstration farms were intended to be utility-owned, but as the utilities have seen the advantages of public involvement, they have agreed upon a plan drawn up by the Danish Association of Turbine Owners, including public financial participation. This agreement, however, has not been politically approved yet, and the establishment of the three farms has been postponed.

### 3 Experience from Sweden

#### 3.1 Introduction

In Sweden the first offshore turbine was erected in 1989 in Nordersund. It was owned by the local utility and ever since this time most offshore wind farms in Sweden have either been owned by a utility or by a private developer.

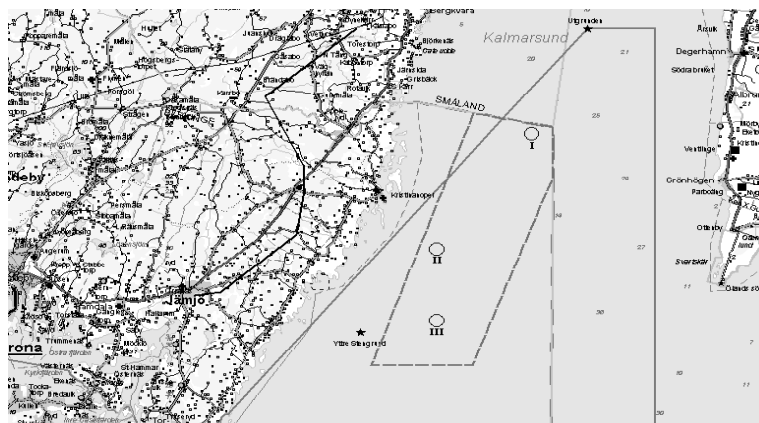
#### 3.2 Karlskrona Vindkraft offshore

A broad-based participation in the implementation and decision process is used in a Swedish offshore project in Kalmarsund conducted by Vattenfall, the largest utility in Sweden. This is a form of conflict management which extends the group of actors involved in the decision process, increases transparency and promotes negotiations and discussions.

The special focus for this project is to investigate which parties should be involved in the decision process and how these different parties can participate and represent their interests in the planning process.

The result of this approach is so far that the project has conducted a dissent management strategy instead of putting trust in fictitious consent. The importance of this type of conflict management seems to correlate with the amount of realised and planned projects in a demarcated and clearly defined geographical area suitable for offshore wind power.

**Figure 3** Three different sites at Karlskrona offshore [14]



Through this experience it can be concluded that the strategy suggesting that local public opposition can be overcome by rational decisions made by experts and that people will eventually get used to change, may prove fatal. The strategy of the Karlskrona offshore project has instead been to involve the local public directly early in the planning phase and incorporate the recommendations into the project planning and decision making. The purpose of this strategy is to give the local population a motivation to accept changes by, for example, giving them a say in the planning of the project. Another lesson learned is that the presentation of a wind power plan requires a sense of timing. In some cases,



depending on the size of the project, it might be worthwhile to allow a certain period of adjustment. A large wind farm can be developed sequentially which makes adjustments easier if people express misgivings. Such adjustments manifest the flexibility and reversible quality of wind power developments. Just because a wind farm can be erected quickly, does not mean it should be.

### *3.3 Public dialogue – use of ICT*

In the Karlskrona offshore project different ways of promoting a dynamic dialogue have been developed. In this context ICT plays an important part. The use of a website for communication on project updates has been the main tool. An important task has been to make sure that this site is updated regularly and maintains a high standard in order to promote confidence in the developer. Regular information has also been sent out to complement and draw attention to the website. Phone calls and e-mails have also been important tools for a direct personal response to concerned people. It has been high priority in the project to answer all questions as expediently as possible. It has also been of high priority to direct questions directly to the project management. This communication strategy has emanated in a thorough report on information, communication and reactions from the public in the EIS. On top of this the Karlskrona offshore project has instigated two inquiries along the coast in order to identify in which geographical area the public feel concerned and what they are concerned about. The replies to these enquiries have been very useful for guidance concerning what topics are of central importance to emphasise in the EIA and how to mitigate them in order to arrive at an acceptable EIS. Also, these enquiries have made it possible to prepare and address the issues of central importance to the public at public meetings. This has been a very effective way to create confidence in the project and the developer, Vattenfall.

## **4 Conclusions**

An open public dialogue right from the very beginning of a planning phase is crucial for achieving social acceptance – and social acceptance may also influence political decisions.

Direct public involvement, e.g. the cooperative ownership model, is an important means for social and political acceptance, but may influence strongly decisions taken during the planning phase, which must be accounted for in the pre-planning phase as even minor deviations in the work at sea have a disproportionately large effect on the time schedule.

There is today no clear overview of the results of different strategies for public involvement and conflict management. This is a subject that deserves to be studied in more detail, through a monitoring program focusing on public acceptance before and after the installation of an offshore wind farm in relation to the degree of public involvement and active conflict management. The Karlskrona Offshore project in Sweden has contributed to the information of such a study.

### Acknowledgement

This paper is based on the contribution of the EWEA Special Topic Conference on Offshore Wind Energy, Brussels, December 2001.

### References

- 1 (1997) *Council Directive 85/337/EEC*, amended by Council Directive 97/11/EC.
- 2 Hammarlund, K. (1999) 'Planning for acceptance – windpower in a social landscape', (Hammarlund, Mårtensson), appendix 14 i EWEC'99, Nice 1999 Reserapport och sammanställning av VKK-föredrag FFA TN 1999-50 (1999). Landskap, vyer och vindkraft, s 5-21 i Rapporter och Notiser 156. Inst. För Kulturgeografi och ekonomisk geografi, Lunds Universitet (1999). All summarised in: Hammarlund, K. (2002) *Wind Power in View: Energy Landscapes in a Crowded World*, University Press, USA.
- 3 van Erp, F. (1996) 'Siting processes for wind energy, project in Germany: public participation and the response of the local population', *Arbeiten zur Risiko Kommunikation*, Forschung Zentrum Jülich KFA.
- 4 Walker, G. (1995) 'Renewable energy and the public', *Land Use Policy* 1995, Vol. 12, No. 1, pp.49–59.
- 5 Luhmann, N. (1969) *Legitimation durch Verfahren*. 2. Auflage. Opladen: Westdeutscher Verlag.
- 6 Nielsen, P. (2002) *Personal Communication*, Energi- & Miljø Data.
- 7 [www.middelgrund.dk](http://www.middelgrund.dk)
- 8 Soerensen, H.C. et al. (2000) *Havmoeller paa Middel-grunden*, Forundersoegelser, fase 2 og 3, KMEK.
- 9 Soerensen, H.C. et al. (2001) *Experience From The Establishment of Middelgrunden 40 MW Offshore Wind Farm*, EWEA 2001Copenhagen.
- 10 Soerensen, H.C. et al. (2000) 'Middelgrunden 40 MW off-shore wind farm, a prestudy for the Danish offshore 750 MW wind program', *Proceedings ISOPE 2000 Conference*, Seattle pp.584–592.
- 11 (1997) *Action Plan for the Offshore Wind Farms in Danish Waters*, The offshore Wind-Farm Working Group of the Danish Electricity Companies and the Danish Energy Agency – Haslev.
- 12 Jessien, S. and Larsen, J.H. (1999) 'Offshore wind farm at the bank Middelgrunden near Copenhagen Harbour', *EWEC*, Nice.
- 13 Moeller & Groenborg AS (1998) *Vindmoellepark paa Middel-grunden II – Aestetisk vurdering og visualisering (Wind Park at Middelgrunden II – Aesthetic Estimation and Visualization)*, Aarhus (In Danish).
- 14 [www.havsvind.nu](http://www.havsvind.nu)