



IEA WIND TASK 28

SOCIAL ACCEPTANCE OF WIND ENERGY PROJECTS "Winning Hearts and Minds" STATE-OF-THE-ART REPORT Country report of Norway

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Framing the issue

0. Introduction by the Operating Agent of IEA Wind Task 28

In 2009, many governments and organizations set new targets for CO₂ reductions, renewable energies in general, as well as specific targets for wind energy deployment. All these targets require many single projects to be carried out both onshore and offshore that necessitate hundreds of siting decisions and therefore hundreds of communities accepting a wind project nearby.

Research and projects are ongoing in many countries on how acceptance could be fostered, but we need to look beyond national borders to learn from each other and to complement each other's approaches. While Denmark has one of the longest traditions of co-operatively owned wind farms, Japan may bring its expertise in generating additional benefits for the communities hosting the turbines. While Ireland and Canada know about the effects of wind parks on tourism, Norway has conducted actual research on communication between society and science, e.g. concerning bird risks with wind farms.

In the framework of the IEA Wind Implementing Agreement, Task 28 collects and disseminates the current knowledge on how to increase acceptance of wind energy projects with the aim of facilitating implementation of wind energy and climate targets.

Ten countries have officially committed to Task 28 and have provided an input for cross-national comparison and discussion by writing a national report such as the one on hand. The Norwegian report has been incorporated into the international State-of-the-Art Report by IEA Wind Task 28, available also on www.socialacceptance.ch.

a. The issue: Social Acceptance of Wind Energy Projects in Norway

As of 31 December 2008, the total installed capacity of the Norwegian power system (hydro, wind and thermal power stations) was 30807 MW, of which 95.7 percent is hydropower. Although wind power contributes with a relatively small share of the total power production in Norway, there is an increasing annual production from 31 GWh in 2000 to 917 GWh in 2008.¹

However, the overall energy situation is characterized by an increasing power demand in an increasing power market. 2,7 TWh wind power is ready to be realized per september 2009, and resources made available in the planning system makes it possible to accept 13 TWh by the end of 2014.² Of course this potential is dependent on how issues of the social acceptance are handled as well as investments and development of grid capacity.

In Norway today is social acceptance of wind power largely an issue concerning onshore installations. However, there is increased focus on deep sea off-shore development through implementation of R & D programmes and cooperation between large actors in the oil- and petroleum industry and wind technology developers to develop technological concepts and pilot-installations. There are social scientific studies of public acceptance of off-shore installations being developed which is designed to follow the development in the next 3-4 years³.

1. Definitions

a. On-Shore / Off-Shore

The realized commercial wind projects in Norway are all on-shore wind projects.

¹ NVE (2009) Energy In Norway:

"<http://www.nve.no/Global/Energi/Analyser/Energi%20i%20Norge%20folder/Energi%20in%20Norway%202009%20edition.pdf>"

² http://www.nve.no/PageFiles/7983/A1_Agnar_Aas.pdf

³ Alexandra Klimek and Marie Kommisar, both Phd's at Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology will study issues of public acceptance of off-shore wind as a part of their doctorate projects (2009-2012)

Industry Status and Stakeholders

2. National Wind Energy Concepts

The dominating wind energy concept in Norway has until recently been represented by a prioritization of large-scale on-shore wind farms at localisations with most optimal wind resources. There some planned projects off-shore, both near the coastline and at deep sea. Per July 2009 only 1 license has been granted a commercial wind farm, "Havsul 1". In addition are two pilot installations granted licenses with technology developed by industrial actors Sway og Hywind. However, new offshore wind power projects will not be managed by licensing authorities before a new juridical regulation of energy production at sea is implemented.

b. Policies and strategies for wind energy

The realisation of onshore wind projects have been quite modest, not reaching a national policy aim set in 2001 of implementing 3TWh before 2010. One of many reasons was that NVE as the licensing authority lacked resources to manage a considerable sum of proposals entering the planning system. NVE has in 2009 been given resources enabling them to evaluate applications faster. They have also been given responsibility to coordinate and ensure the realisation of "thematic conflict evaluations" of wind farm proposals.

The conflict evaluation is a policy tool that is supposed to help systemize and categorize information on possible conflicts between planned wind farms and what is perceived as different "sectorinterests", and thereby enable a resolution of these through the licencing process. The themes included in the evaluations are 1) Reindeer husbandry 2) Defence 3) Environment and cultural heritage.

Enova SF, as the other governmental institution directly involved in the development of wind energy, was established by the Ministry of Petroleum and Energy for the purpose of promoting the work towards an environmentally friendly restructuring of Norway's energy consumption and energy generation. Enova's overall aim is to contribute to new, environmentally friendly energy generation and energy conservation equivalent to 18 TWh by the end of 2011. Enova SF manages the incentive programme for wind power.

c. Incentive programs for wind energy

Since 2001, Enova has supported 14 wind power projects that are expected to deliver an annual production of about 1,600 GWh. Enova expects to contribute to further developing the Norwegian wind power market at least until the establishment of a "green" electricity certificate market is in place. Enova's financial framework for this announced round is up to NOK 1 billion. This framework has been set on the basis of Enova's overall budget and in accordance with Enova's total objective of 18 TWh by the end of 2011.

Applications will be ranked according to NOK of support per kWh of expected annual production. The investment support from Enova shall be the triggering factor for construction of the facility. The developer must evaluate price assumptions and required rate of return, but the maximum permitted support is calculated on the basis of the following assumptions:

Required rate of return: 8% actual before tax

Lifetime: Construction time + 20 years of production

Power price: Last 6 months' average of 3 years forward observed on Nord Pool as of the application deadline date

Revenues: Power price x expected energy production (P75)⁴

d. Spatial planning

Guidelines for planning and localisation of wind energy (T-1458) were worked out in 2007 to enable a more efficient and long-term approach to how municipalities and counties do assessments of wind energy and spatial planning. A new energy and planning act was also implemented in 2009 that was aimed at making the planning process more efficient. However the amount of new proposals has declined in 2009 and we have little information on the practical changes in the planning processes.

⁴ Enova

The International Energy Agency
Implementing Agreement for Co-operation in the Research,
Development, and Deployment of Wind Energy Systems



Norway is starting to plan for an active off-shore wind development. A method study is made that compares how Denmark and Great Britain work in terms of localising installations.⁵ Factors that are taken into account in this study are technological choices, grid connection concepts, market assessments and wind resources. The report concludes that strategic impact assessments would serve as an important basis for picking localisations. It is also emphasized that good consultation processes that include all important stakeholders from authorities and organisations are important.

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http://www.regjeringen.no/upload/OED/pdf%20filer/Rapporter/Metodestudie_offshore_vindkraft_april09.pdf

3. Stakeholders / target groups

a. Developers / investors

Historically, as analysed in (Bye and Solli 2007), there is special interplay in Norway between wind power and nature which have been influenced by the dominating rationale about cost-efficient energy production. While many countries have implemented relatively favourable incitements and supporting frame works, the norwegian authorities have been reluctant. This has contributed to the fact that the question of profit constantly has been critical to norwegian wind energy development. The wind industry has therefore prioritized large installations on locations perceived as being especially valued in terms of nature conservation. One could argue that the industry eagerly pursuing profitable power production has self contributed to wind power being redefined from being environmentally friendly in the 90 to a potential environmental problem in 00-ies.

In 2009 the developers and investors seem to act cautiously and waiting for more optimal support mechanism that could enable more profitable investments in on-shore projects (Bye and Solli 2007).

b. Financial institutions

In 2009 the developers and investors seem to act cautiously and waiting for more optimal support mechanisms that could enable more profitable investments in on-shore projects

c. National opinion makers, policy makers and general opinion

Solli (2010) has conducted a study of how opinion makers and actors are enrolled and arguments are crafted and mobilised in the resistance to wind farms. The discussion is based on a study of two wind farm projects in Norway, on Smøla and Høg-Jæren. By identifying strategies for making arguments of resistance effective and convincing, the paper explores how these strategies of representation evolve as a process of searching for arguments both adopted to local concerns and to national bodies of environment management. The resistance develops as a process where actor groups construct hybrid collectives by enrolling humans and non-humans. Adjusting the hybrid collectives to fit concerns implies employing nature objects and various concepts of nature that may work in favour or against resistance.

The actors opposing the wind farm projects on Smøla and Høg-Jæren developed responsive narrative and rhetorical strategies in order to influence both local and national audiences. The specific cases in this article indicate that there are several different options for how resistance can be enacted, which I have called strategies of representations. What characterized the creative agency of resistance towards wind farms was that the strategies of representations seem to evolve as a dual process, of searching for the locally adapted arguments, and arguments that are fitted to the concerns of national bodies of environment management.

Yet the strategy of biodiversity seems especially in the case of Smøla to have been enacted in the context of national debate, with little awareness of local concerns. This is based on an understanding that (inter-) national species protection was more tractable, which also suggests that national debates are perceived as more crucial than local debates

d. National, regional and local administration

From our studies of the politics of planning and localisations of wind energy we see that local administration often tend to support the development of wind power projects. Neither national bodies of energy nor the environment management plays active roles to contribute in the development of wind energy in Norway. The national bodies of environment management have together with nature conservation organisations been rather sceptical towards many of the planned wind power projects in Norway (Bye and Solli 2007, Solli 2010).

e. Local population

There are several studies of how local population relates to both planned and existing wind farms. A recent survey of attitudes towards wind power concludes that people in affected municipalities are very positive towards wind power and that people in municipalities with existing wind farms perceived more positive than negative effects. Another result from this survey is that people living so near the installations that they can see the wind turbines are the most positive.⁶

⁶ http://www.nve.no/PageFiles/7983/B1_Daniel_Rees.pdf

f. Visitors / tourists

Western Norway Research Institute has conducted a study of the relationships between tourists, tourist industry and Wind power in Norway. Their study consisted of three parts, 1) a thorough review of the relevant Norwegian and international literature concerning the relationship between tourism and wind power production, 2) An opinion poll among tourists on vacation along the Norwegian coast and 3) Case studies in three Norwegian municipalities. The study concludes that there are “not many or large conflicts between existing wind power plants and existing tourism. However, the survey on tourist attitudes indicates a potential for larger conflicts in the future, as a result of more and larger plants located in areas of great interest for the tourism industry.” The study emphasizes the “great potential for conflicts between large scale construction of a wind power plant and tourism’s present branding of Norway as holiday nation”.

The part of the study discussing the environmental impacts of tourism business vs. wind power points to how the wind power and tourism businesses are differentiating in several ways in regards to environmental questions: “Tourism have both a global and local negative environmental impact: reduction of the environmental effect, especially related to green gas emission from transportation, which is very much dependant on over national control. Wind power has a predominantly positive global environmental impact, despite the negative local environmental impact. “ The study argue that this can be regulated by local governance and finds that “tourists are as much concerned with tourism’s impact on untouched nature as wind power’s impact on untouched nature.”

Further, in the work with reduction of conflicts between wind power and tourism, the authors “regard it as important to distinguish between ideal, potential and material conflicts, and between project- and strategically levels. This is because different actions are relevant to different categories of conflicts and on different geographical levels. Our main conclusion is that the question regarding the summarized effects is not managed well enough at the time being. Consequently, we suggest that further work should be carried out on this issue related to tourism.” (Western Norway Research Institute 2009)

Variables Influencing Social Acceptance

4. Well-being

a. Valuation of ecosystems

The international literature on resistance to wind projects emphasizes landscape rather than biodiversity to be the key conflict issue, that should be focused as a design criteria. However in Norway biodiversity has been very important in the way resistance has been represented. Especially birds has been an issue, i. e the sea eagle (see section "National opinion makers, policy makers and general opinion").

The localisations that are most valuable in terms of nature quality (endangered species and recreation areas) have the best wind resources, so developers should pick their 'second best' projects.

The knowledge basis of the biological data used in planning process should be strengthened and more opened up for dialogue. These suggestions have partly been handled through research projects directed at developing new knowledge on collision risk (see section "

Scientific results and practical application").

5. Distributional justice

A study of how low benefits and environmental cost argument are played out in norwegian wind energy Municipalities (forthcoming Western Norway Research Institute).

a. Distributional justice

A study of how arguments are crafted and adapted in order to be efficient point to the way distributional justice were the most central initial concern for local actors that voiced their scepticism against the plans for building the largest wind farm in Norway (Solli 2010). However, after experiencing that these arguments did not prove that efficient they changed to the potential negative effect on the sea eagles as their main strategy.

6. Procedural design

a. Communication strategies, public consultation

How should community engagement in the policy process for sustainability be conceptualized and promoted? A study analysing the practices of three norwegian municipalities in the planning and localisation of wind power suggests how the initial plans are presented and opened up to public is of vital importance (Øverås 2009). The forms of opening up the wind farm projects is made differently in the municipalities and thereby creating engaged publics influencing the local acceptance in different ways. The study of public involvement consisted of one case that may be viewed as a success story and one case with many conflicts and a rather bad process. In the success story, all the involved parts, or stakeholders, seem to be more or less delighted about the quality of the process. The developer took care to have a close dialogue with the local administration, with the landowners, and also with the rest of the local community from a very early moment and throughout the process. The developer took care to run what the interviewees unanimously label a *good process*. This process took about three years, and the interviewees are surprised that the issue didn't get more controversial, because in a neighbouring municipality the waves have been going high around similar wind power plans. The developer suggests that this absence of controversy might be due to that they had such **good dialogue** with the ones that might have protested more vigorously otherwise. Another possible explanation suggested by the interviewees is that although the developer wasn't a local stakeholder, the public felt that it was a **local process**. A third explanation that is suggested is that the plans were **carefully** opened up. The mayor puts it this way: The only challenges we had in the process were to cooperate [with the other involved actors] and render harmless [the possible objections], I mean, to put the facts on the table in a way that avoids exaggerations." Another interviewee adds: "All the possible negative effects were explained in a decent way... Wind power plants have their advantages as well as their disadvantages... We have to know more than those that try to present negative information" (Øverås 2009).

Presenting case stories like this of course has its limits because of local contingencies, but the vital point made here is that ways the plans are opened up and communicated influence the project being good or less good. To inform this point further and to develop a sound basis for lessons learned one therefore needs to explore the successful as well as the unsuccessful processes.

b. Cultural relationship, local context

In exploring how different birds and other objects mattered in the resistance towards wind power projects at two locations in Norway, Solli (2010) found how the cultural valuations of sea eagles and the Dunlin were different and the cultural power of these objects was used differently by local actors and national bodies of environment management. These strategies of representation evolve as a process of searching for arguments both adopted to local concerns and to national bodies of environment management, as well as to the events in procedural processes.

7. Implementation Strategies

a. Scientific results and practical application

One of the lessons drawn from a study on the politics of planning and localization of wind turbines in Norway is that biodiversity should be addressed in an early phase and should be dealt with in the developers' implementation strategies. However, biologists and experts doing evaluation of proposals have repeatedly demanded that more knowledge on i.e. collision risks should be enabled. Now, such research projects have been funded and production of new knowledge is being developed that stakeholders in environmental agencies expect could serve as support for future decisions on the implementing wind farms. Further, this has led to the question of how biologists and ornithologists do produce knowledge of birds and wind turbines, which is addressed in a social acceptance study. This study by Øverås (2009) is based on interviews with the biologists at the Nature Research Institute (NINA). The study describes how the researchers supervise the birds and the wind turbines through a multitude of methods, and then use this assemblage of methods to solve the problem of sea eagles collisions, a kind of problem solving that may be compared to CSI (Crime Scene Investigations). However, technology and methods are not only being developed for the biologists to be even better "detectives" in the future, but also to help them find preventive measures. To make relevant knowledge for policy and implementation strategies the biologists generated in a context of application rather than the commonly supposed linear process where a detached science produces pieces of knowledge which then defines the endpoint of the researchers' involvement with this knowledge. Rather, the knowledge production process described is the total environment in which scientific problems arise, methodologies are developed, outcomes are disseminated, and uses are defined. A central point here is that society now 'speaks back' to science and that this reverse communication transforms science. The bird scientists' long-desired new knowledge is made in the context of application. They believe and hope that it will be socially robust, and that they will be heard. To reach their goal they are more than willing to engage in what Nowotny et al. (2001) labels 'strongly contextualized' knowledge production.

So, NINA wants to develop statistical models for estimating the number of bird-turbine collisions at onshore wind farms, and develop theoretical population models for assessing the impact from turbine-related mortality on avian population dynamics. They aim to develop a model which will tell us how much human-induced mortality the sea eagle population can bear. Through such calculations they will be able to say something about the development of the population, and about how the construction of wind power affects sea eagles locally, regionally and nationally. Finally, they intend to settle which measures can help the birds "stay out of trouble".

Summary and Conclusions

8. Conclusions

a. What we know already

The wind energy concept in Norway has been represented by a prioritization of large-scale on-shore wind farms at localisations with most optimal wind resources. Lessons to stakeholders is since localisations that are most valuable in terms of nature quality (endangered species and recreation areas) have the best wind resources, so developers should pick their 'second best' projects, taking biodiversity as a design criteria and develop solutions of compromise. On the other hand should bodies of environment management contribute more actively to the work of seeking out "green" areas and to moderate conception of nature as something untouched and something that be put on pedestal, thus also seeking good compromises with developers and local authorities often welcoming wind energy projects

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