

To
Nordic Folkecenter for Renewable Energy

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WIND ENERGY AS A LEVER FOR LOCAL DEVELOPMENT IN PERIPHERAL REGIONS



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1 INTRODUCTION

Nordic Folkecenter for Renewable Energy has asked Rambøll to develop this memo, which illustrates the potentials of local ownership of wind turbines as a possible lever for local development in remote areas.

The aim of the paper is to raise awareness of the potentials of local ownership models, in order to create a more positive interest in wind projects for both municipalities and the general public.

Local ownership models have two distinct advantages which should have a nationwide policy interest:

1. By ensuring local ownership, local acceptance of wind turbines increases and, instead of protests, active initiative from a broader group of local players will be achieved. That way the government's goal of increased onshore wind power capacity of 1,800 MW on-land can be realised with sufficient support.
2. The regions of Denmark where the wind is stronger are also the ones with the greatest development challenges. This way ensuring that profits from electricity generation support local economy should create a basis to improve development in marginal areas of Denmark.



This memo illustrates through three examples with different ownership models how local ownership can contribute to acceptance and to local development of peripheral regions and finally puts those experiences into perspective regarding the possible actions that can support the proposed development.

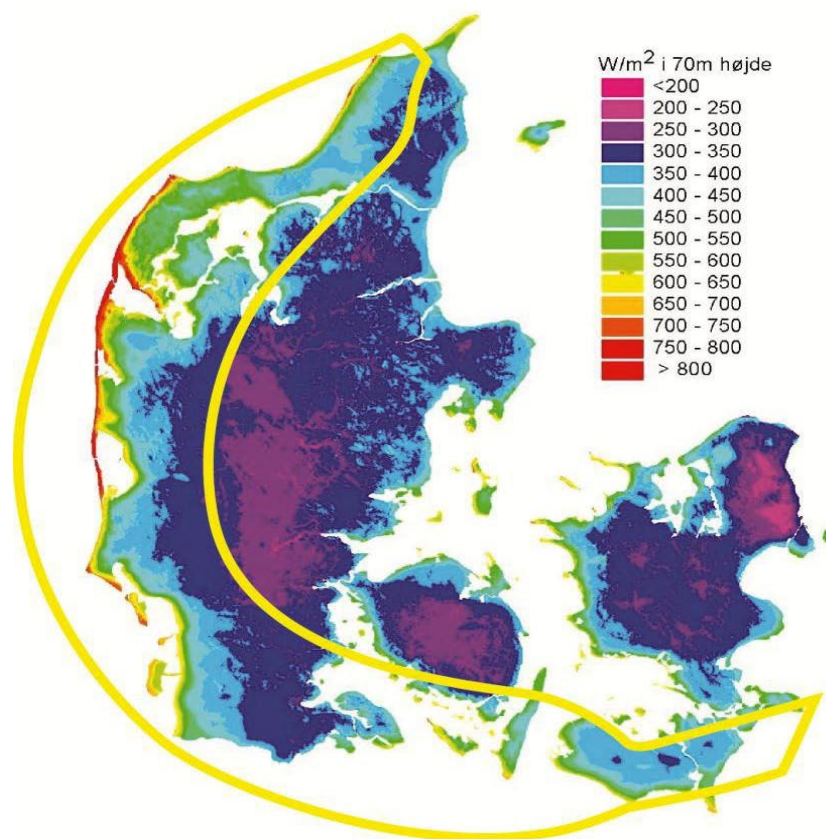
1.1 NATIONAL PLANNING PERSPECTIVES

In the Energy Agreement of March 2012 the government decided that 50% of Danish electricity production must come from wind turbines by 2020. This has raised focus on possible locations for wind turbines and the barriers that may exist for a successful implementation of wind projects.

According to the Energy Agreement, 1,800 MW onshore wind capacity should be installed by 2020, 500 MW near-shore and 1,000 MW offshore. This means that a significant share of wind turbine construction should happen on land.

From a national policy point of view, there is a great potential in linking energy policy, land planning and rural development since there is a significant overlap between the peripheral regions in Denmark, often called "the rotten banana", and the regions with the largest wind resource.

From this emerges the contours of a possible new map of Denmark, where these areas could have a new and stronger role on the basis of their natural potentials. Production of sustainable energy has enormous social value, which should be supported and valued both locally and nationally, since it creates a more solid industrial foundation for local economic development in rural areas, which can help to create greater balance in Denmark.



There is a very interesting correlation between peripheral areas in Denmark with developmental challenges, often called "the rotten banana", and the areas with the greatest wind resources. This underlines the potential for locally owned wind power to become a lever for local development in remote areas.

If the anticipated 1800 MW onshore capacity could not be installed due to local protests, the alternative solution would be to increase offshore capacity more than already planned, which is a much more expensive option. In this way, the higher the capacity installed on land, the lower the electricity price, which benefits both consumers and competitiveness. With the expansion of onshore wind turbines several billions can be saved compared to producing the same amount of electricity offshore, while there are potentially significant local profits from electricity production that could support development in peripheral areas, because this is where the greatest wind resource is.

There will be a significant potential for creating sustainable income in the country's remote areas from 1,800 MW new wind capacity, probably distributed between 600-800 turbines. Even with a conservative estimation expecting also other actors' participation, local ownership could create an annual surplus of not less than 500 million DKK, which could help maintain or create local development in peripheral areas.

1.2 THE ROLE OF MUNICIPALITIES

The planning of onshore wind turbines is a municipal responsibility. Many municipalities have entered the field as active participants in a green transformation of the Danish society, some have even formulated climate policies with the goal of future CO₂ neutrality, and most have also signed an agreement with the Danish Society for Nature Conservation to become a so-called Climate Municipalities. The agreement includes a declaration that municipalities will reduce their CO₂ emissions by 2% per year for a fixed number of years. Wind energy will play a significant role in achieving these municipal ambitions which has also given wind turbine planning a renewed focus.

The Planning Act has also been amended so that it is now possible to incorporate the goal of climate change adaptation and prevention of pollution in the objects clause of the plans. It is possible to prospectively impose requirements for new construction and renovations justified by climatic conditions.

In other words it seems that municipalities will play a much more active role in the transformation into a sustainable energy system where energy demand is reduced through building renovations and stricter requirements for new construction, and energy supply becomes more sustainable due to the development of renewable energy which will mainly come from wind turbines.

Municipalities in peripheral areas in Denmark are challenged by emigration, stagnation and decline. They are generally areas with a low population density, low house prices and a declining economy. However, there is more than twice as much wind as in the rest of the country, therefore these municipalities have some special opportunities for the use of the wind as leverage for local development.

Imagine if there could be a new role for these municipalities with a higher degree of economic independence, entrepreneurial innovation in sustainable energy and energy production for the whole country due to the installation of wind turbines!

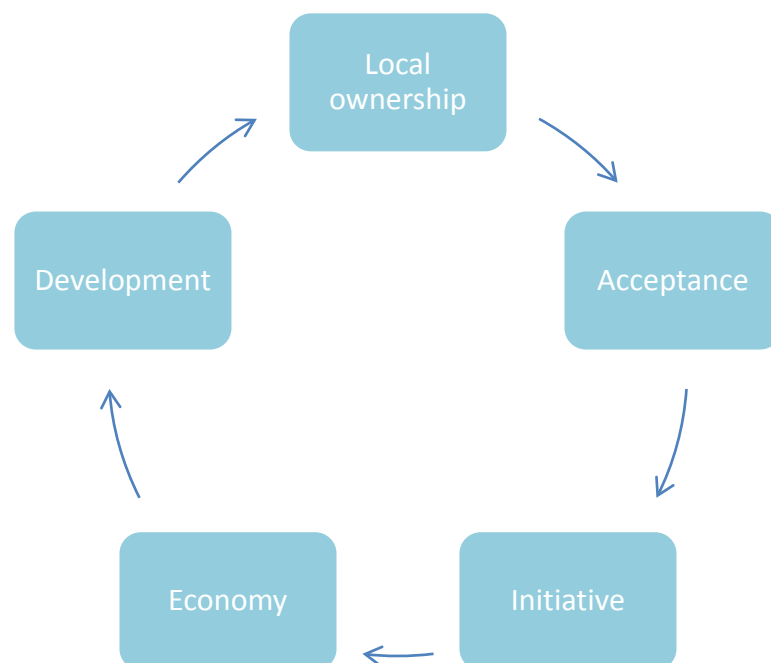
For this to succeed it should be possible to reinvest the profits from electricity generation locally so that they act as a catalyst for green growth and sustainable transition in remote areas. This is why local ownership is essential and local authorities should play a much more active role than has been the case so far.

2 WHY LOCAL OWNERSHIP?

In order to achieve the very ambitious targets of both the state and the municipalities of increasing wind power capacity, there should be a minimum degree of acceptance of wind turbines in the affected part of the local population so that wind projects can actually be implemented. 80% of Danes are generally positive about wind turbines, however a similar proportion is against the establishment of wind turbines in their community. "Not in My Back Yard" seems to be the motto, and the challenge is how to create an ownership of wind turbines with a wide public acceptance; being aware of the necessity of a transition to renewable energy and where a local activation of profits from the turbines would create a greater acceptance and understanding of the nuisances and changes in the visual environment that wind turbines can cause at least to the closest neighbours.

After the residence requirement was repealed in 1998, wind turbine owners / investors may live far from the communities where turbines are erected, generally in tax havens in the Cayman Islands or elsewhere. This means that the value of the wind, which is one of the few resources in remote areas, is effectively drained out of local areas while local citizens have to live with the nuisances that may be associated with turbines. This has created a situation in which almost automatically there is local resistance when considering the installation of wind turbines. There are currently as many as 200 local groups opposed to wind turbines nationwide.

By putting local ownership in the centre a positive and self-reinforcing effect can be created where it becomes clear that wind turbines are for the benefit of local communities or municipalities in a broader sense. This makes it easier to gain acceptance for the subsequent projects since citizens will notice that the initiative is increasingly created locally due to the economic incentive of ownership models that promote local development.



Putting local ownership in the centre can create a positive cycle of development.

The local political dilemma for politicians who want to be re-elected is whether they will support the development of renewable energy by "stepping on local people's toes" by neglecting the often many objections because projects primarily benefit just a handful of people - often developers who do not live in the area.

In Thisted municipality, for example, experience from 2012 shows that there were over 500 pages of objections in connection with the approval towards a number of wind projects. A decision in September 2012 concluded that out of the seven projects with approximately 40 wind turbines only two projects could be approved. Now possibilities of ensuring greater acceptance of wind turbines are being looked into (including ownership models that benefit the community to a greater extent) in order to create a local understanding of the positive impact wind turbines can have on the local communities sustainability profile, economy and development.

Regarding dissemination, there is a great need to clarify which economic, legal and organizational options exist where not only the 20% defined in the Renewable Energy Act but 100% of the revenue from wind projects can be maintained in local areas in order to create a concrete financial incentive to assist in finding suitable sites for wind turbines. This memo can be seen as the beginning of such a process regarding the clarification of the potential which lies in local development through a more proactive wind energy policy where all local stakeholders can participate in different ways.

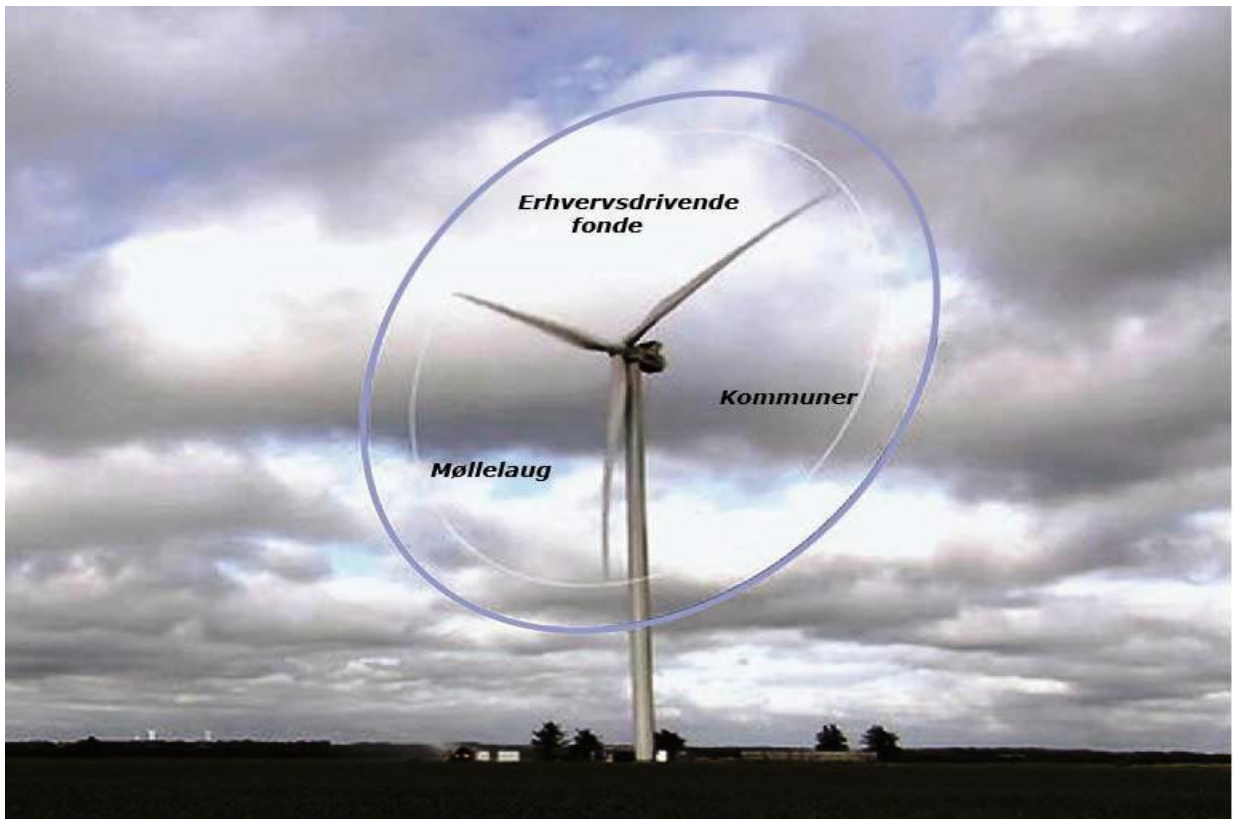
3 EXAMPLES OF LOCAL OWNERSHIP MODELS

There are already local ownership models around the country, as there is both a general desire in the municipalities and the population to promote the development of renewable energy. At the same time there is often quite attractive overall economy in the erection of wind turbines on land where the rule of thumb says that: under the current arrangements, each MW of capacity installed onshore could generate an annual surplus of around 1 million DKK (130,000 €) depending on the local wind conditions.

The conditions are in place and below three different ownership models that can help strengthen a local development both economically, culturally and in terms of employment are introduced:

1. **Industrial foundations.** The profits from electricity production are statutorily earmarked to related local purposes that can support local employment, culture and infrastructure. Denmark is quite unique in its variety of many different associations for different purposes; sports clubs, theatre groups, civic associations, trade unions, tourism associations, business associations, agricultural associations, etc.. These could have an interest in participating in a industrial foundation owned wind turbine project if the purpose and use of the profits of the industrial foundation would be formulated so that they coincides with the interests of the associations. As associations are a key part of the Danish culture, especially in peripheral areas, the participation of local associations in wind projects could contribute to the development of culture, sports and business while ensuring local acceptance of wind projects. Local utilities can also be included in the industrial foundations.

2. **Municipal ownership.** The surplus may be used for other initiatives within the energy sector and investments in new energy projects that reduce operating costs, create new jobs and reduce local CO₂-emissions.
3. **Vindmøllelaug** (wind turbine guilds) are a well-established way to offer shares in wind turbines to local residents and there is a legal requirement that at least 20% of the shares must be offered locally within 4.5 km from the turbines. The main point in this context is that it should be a broad group of local residents / landowners, not just an outside investor, who will benefit from the proceeds of the wind turbines with the objective to achieve the desired local acceptance and development.



Possible ownership models that can be part of local ownership of wind turbines

These ownership models can be combined depending on local circumstances, needs and objectives.

The initiative may come from many different local stakeholders thus it can be both the Municipality, a utility company, an association or local residents who take the initiative for the establishment of wind turbines in a locality.

The Renewable Energy Act ensures that local people should be offered a minimum of 20% ownership of a wind turbine project. In the 3 cases that are reviewed in the following pages, also the remaining 80% is locally owned, what means that they have 100% local ownership.

3.1 INDUSTRIAL FOUNDATION (Trust Fund): HVIDE SANDE



The 3 wind turbines in Hvide Sande

Background:

Hvide Sande in Ringkøbing-Skjern municipality is a predominantly fishing community on Holmsland dune with approximately 4,000 inhabitants and where tourism is also important economically.

For several years, private project developers had been working to erect wind turbines in this area, but because of local protests they could not realise their project.

Ownership construction:

In 2010 the Holmsland Dunes Tourism Association created a industrial foundation with the aim to install three wind turbines of 3 MW in an area that is owned by Hvide Sande harbour in order to support the development of the harbour and the tourism in Hvide Sande through the production of renewable energy.

The local 20% of the wind project is owned by Hvide Sande Nordhavn Møllelaug I / S with approximately 400 shareholders from Hvide Sande and the surrounding area.

Overall economics / finance:

The investment in the three wind turbines was 91 million DKK (12.2 million €), which was borrowed from two local banks with the wind turbines as collateral.

The harbour owns the land where the wind turbines are installed. Therefore an annual rent of 4.8 million DKK (640,000 €) is paid by the industrial foundation, creating an annual operating surplus to support the development of the port.

The turbines came into operation in January 2012 and each is expected to produce 15 million kWh per year corresponding to a capacity factor of 0.50. This is in line with offshore wind turbines where the investment per MW can be more than double.

The "Hvide Sande Industrial Foundation" expects to be able to repay bank loans in approximately 5 years due to the very attractive location.

Legal aspects:

Industrial foundations are independent institutions where the founders do not hold the ownership and thus have no special rights regarding the revenues of the industrial foundation.

Industrial foundations are a well-known form of ownership which is regulated in the Industrial foundation Act. The rules will not be discussed further here since it should only be emphasized that the Industrial foundation Act contains no restrictions on who can be co-founder of a foundation.

The interesting thing therefore is not that wind turbines can be owned and operated by a industrial foundation and that anyone may in principle be co-founders of such foundation but how the objectives and the conditions for use of surplus of the foundation are formulated and who will receive dividends from the foundation i.e. profits from the operation of wind turbines.

The formulation of objectives of the fund and how a surplus is to be distributed however will be very much determined by who the co-founders of the industrial foundation are. So, in relation to the promotion of local development in a local area, the composition of the industrial foundation should reflect the specific local challenges and potentials.

If local associations are co-founders, it would be natural that a portion of the proceeds will go to fulfil the same purpose as these associations such as sports purposes, local energy research - and development, business development purposes, etc. When utilities are co-founders, the profits can go to the support of renewable energy, sustainable energy supply or similar.

Involvement of stakeholders:

During the public consultations of the project by the Hvide Sande Industrial Foundation, only a few complaints entered. However, none of the complaints were upheld fully or partially.

Preliminary experience:

An earlier project for wind turbines in Hvide Sande proposed by private developers had been stalled by local protests, so from this perspective the objective of the industrial foundation and the positive impact on the local community in Hvide Sande has been crucial for local acceptance.

3.2 CONSUMER OWNED: NØRRE NISSUM BAY, LEMVIG



Visualisation of 14 190-meter-high wind turbines at North Nisum Bay.

Background:

A project with coastal wind turbines for installation in the western part of Nisum Bay off Thyborøn Tange was presented in 2008. The capacity will be 42 to 98 MW depending on the final solution. The initiators of the project have previous experience from four coastal cooperative owned 2 MW wind turbines installed nearby Rønland.

Ownership Construction:

The ownership of the new wind farm project in the western part of Nisum Bay is planned to be divided roughly equally between the local energy supply company called Nordvestjysk Elforsyning A.m.b.a (NOE) and Nørre Nisum Vindmøllelaug I / S, whose members have to be residents of the municipality of Lemvig. Participating companies involved in Nørre Nisum Vindmøllelaug I / S must also be local to the municipality of Lemvig so that the taxation of profits will stay in the municipality where the wind turbines are installed.

The objective of the wind cooperative is formulated as follows: "The purpose of the partnership is the production and sale of electricity through the construction and operation of wind turbines. The overall objective of the partnership is to contribute to a sustainable energy supply in Denmark."

Legal aspects:

Renewable Energy Act § 14, which provides local citizens with the option to purchase at least 20% of a wind farm project, ensures a certain local private ownership in all onshore wind turbine projects, but the proportion can be higher and in some cases it is actually 100%.

This local private ownership is typically organized in a partnership known as a wind turbine cooperative, where the profits from the operation of wind turbines are distributed according to the ownership share of the individual in the partnership.

The partnership is governed by a set of rules, which may include rules regarding the transfer of shares such as a ban on the transfer of shares to physical and legal persons outside the local area.

In cases where a *vindmøllelaug* (wind cooperative) owns more than 20% of a wind turbine project, the project is typically initiated by a group of local citizens and not by a single investor. Such local wind cooperatives or other local groups of citizens can seek a commitment from Energinet.dk on guaranteed loans contracted to finance feasibility studies, including site studies, technical and economic assessments and the preparation of applications to the authorities to establish one or more wind turbines.

However, under the Renewable Energy Act paragraph 21 part 2, there is a condition that the wind cooperative or initiative group has at least ten members, the majority of wind cooperative or initiative group members live in the municipality where the turbines are planned to be erected or at a distance of maximum 4.5 km from the site, that participants have a controlling interest in the guild or initiative group and the implementation of the wind turbine project as proposed by the cooperative or initiative group is considered realistic.

Such guarantee may not exceed 500,000 DKK (67,000 €) per project and the budget available to Energinet.dk is only 10 million DKK (1.34 million €), which is distributed at the request of wind cooperatives or initiative groups. The cost of the feasibility studies are typically well above 500,000 DKK which means that such locally initiated wind projects often require members who are willing to invest a greater amount in these preliminary studies without certainty that the project can be realized. Therefore utilities, in this case NOE, or site owners are often invited to become part owners of a bigger share of the wind project.

Overall economics / finance:

Pre-subscription to share in the wind cooperative could, in this project, be done by contacting a local bank on a first-served basis. Interest in buying shares in windmills created queues in front of the bank, which needed two days to register subscription of wind turbine shares. By that time, 2,000 local residents had pre-subscribed for shares with a value of a maximum of 175,000 DKK (23,000 €) / person. In addition, there are 800 interested in wind turbine shares on the waiting list.

Involvement of stakeholders:

Many of the members know each other from an existing project in the area, and the additional public meeting organized for interested people was attended by about 400 attendees. In connection with the preparation of the environmental impact assessment for the project, there have been very few objections and no objections from local residents.

Preliminary experience:

There was very strong demand for shares in the wind turbines, and it would have been possible to reach an even larger share of private members. This example shows that it is possible to raise large amounts for a local wind project even in a low-income community. The next steps in the project depend on a number of technical studies and the development of a more accurate budget based on settlement prices for onshore wind energy.

3.3 MUNICIPAL OWNERSHIP: SAMSØ MUNICIPALITY



Paludans Flak south of Samsø consists of 10 wind turbines, 5 of which are municipally owned

Background:

In 1997 Samsø was selected by the Danish Energy Agency to become Denmark's Renewable Energy Island. Samsø won the title by writing a 10-year action plan (RE-island plan) for energy development based on an assessment of local energy resources. As a result, Samsø Municipality had to develop a vision on energy development and to contribute to the execution of the plan and the treatment of local plans and technical processing.

Ownership Construction:

In 2002, 10 offshore wind turbines were installed south of Samsø. From the start the Municipality was part of the steering committee for the project and decided to purchase 5 of the 10 wind turbines through a municipally owned Aps. Citizens on the island own the rest of the project.

The whole development of the wind project was carried out by Samsø Energy Company with a board consisting of Samsø Island Municipality, Samsø Agricultural Association, Samsø Business Forum and Samsø Energy and Environment Office. The goal of the organisation was to implement the Renewable Energy Island Plan and work for the partners involved.

Overall economics / finance:

The total investment was 240 million DKK (32 million €), of which Samsø Municipality accounted for 120 million DKK. The commitment of the Municipality was approved by the Århus County Supervisory Board and construction was completed within the contract price.

In eight years, various project funds, government agencies, citizens, economic operators, the EU and the Municipality have invested nearly 500 million DKK in renewable energy on the island.

Legal issues:

Under the Electricity Supply Act paragraph 4, a Municipality can participate in limited liability companies, with activities in the production, transport, trade or supply of electricity, or in other activities closely linked to such an undertaking.

If municipalities participate in a wind farm project under the Electricity Supply Act, it is important to keep in mind that, in this case, it is the municipal company that lends to the installation and not the Municipality. This means that the profits from the company can only be used for similar or other associated activities, see the Notice on Municipalities participating in other activities which are closely linked to their main activities under the Electricity Supply Act.

In addition, the Energy Regulatory Authority may authorise a Municipality to participate in some form of subsidiary if the related activity has a sufficient connection with the production of electricity and the activity has a much smaller extent than the production plant itself.

Following the rules of the Electricity Supply Act paragraphs 37 and 37a, if a Municipality receives a dividend from an electricity production company the Municipality directly or indirectly owns, the municipal block grant will be reduced by 40 or 60% unless the activity is an activity that can be considered as a related activity.

Municipalities should therefore present the planned related activity to the Energy Authority for its opinion before it is implemented in order to ensure that it will cause no unexpected offset in the municipal block grant. Municipalities can of course also choose to collect profits against a partial offset in the block grant.

In the mentioned project in Samsø, the Municipality decided that all the profits from the five turbines should be spent on future energy projects not to have an offset in the block grant. This way a municipal company was created and its profits have been used to co-finance EU projects, to start new projects, to perform energy savings in municipal buildings and to establish Samsø Energy Academy.

Involvement of stakeholders:

The offshore wind farm project is the result of a joint effort on the island and the relatively easy process clearly shows that there was agreement on the fact that the project was a good and useful idea for the island, there was consensus on the final location and there were no protests against the wind turbines.

Preliminary experience:

The decision for the municipal involvement has proven to be a good idea. The turbines are functioning satisfactorily and production is higher than budgeted. The initial political scepticism has been replaced by a positive backing and it is politically decided to profit from the turbines beyond the budgeted will also be used for municipal investments in new energy projects.

It is the municipal council intention that the planning and installation of additional wind turbines continue backed by a broad public engagement. With a common process, the plan is to double the electricity production from wind turbines on Samsø.

The status of Samsø as a renewable energy island is an essential part of the island's business card. Concretely, the island is now 100% energy self-sufficient through the introduction of locally owned solutions in the form of onshore and offshore wind turbines and district heating plants.

4 POTENTIAL FOR CREATING JOBS IN PERIPHERAL AREAS THROUGH WIND TURBINES

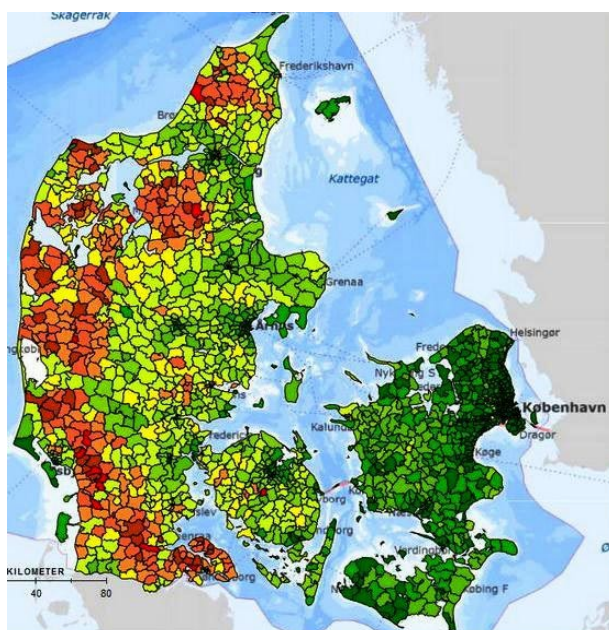
Access to jobs is crucial for local development and, due to the structural changes and the efficiency improvements in agriculture and industry, there is a need to develop new types of jobs in rural areas.

Production of renewable energy from wind turbines has in itself the potential for creating new jobs, both in the preconstruction, the construction and the subsequent operation and maintenance of wind turbines. In addition, the surplus from wind turbines will laid the basis to support development and innovation in a number of other types of professions and activities adjusted to the needs of specific local areas.

In order to promote employment in peripheral areas as much as possible, it is important that the profits from electricity production from renewable energy contribute to the innovation and development of other sectors where remote municipalities enjoy particularly good conditions. With a strategic focus on utilising the profits from electricity production for local development, it will be possible to create new jobs within e.g. agriculture, tourism, maritime industries, the construction sector or commercial activities, depending on local potentials and needs.

Below the examples are described in general, although there can be many other opportunities for local business development in peripheral areas as described in Realdanias future scenario "2050 - der er et yndigt land" (2050 - there is a lovely country), which also deals with how "peripheral" can turn into "forefront".

Agriculture has a potential for research, innovation, demonstration and commercialisation within e.g. biogas and biofuels since, in addition to a high wind resource, particularly western Jutland also has a high livestock pressure. This development could be facilitated, for example if agricultural associations entered into ownership of wind turbines through industrial foundations. This way the range of renewable energy production in peripheral areas will become wider and it will probably become easier to find suitable site options since agriculture is the owner of most of the land where wind turbines can be established.



Livestock pressure reflects the quantity of animal production in agriculture and at the same time it largely coincides with municipalities facing development challenges. Production of biogas and

biofuels and other forms of renewable energy could supplement wind energy in these areas.

Adventure tourism could be supported through the development of new facilities, nature restoration and nature development projects, etc. that can support the great natural experiences, linked to sea, beaches and the landscapes at the coast. In Hvide Sande, part of the profits from the industrial foundation will in that way be used to develop facilities for surfers, so that tourism in the area can be strengthened.



The wind is also a prerequisite for Windsurfing, that has become a great success in parts of the North Sea coast, and there are great attractions in the mudflat and dune landscapes along the coast.

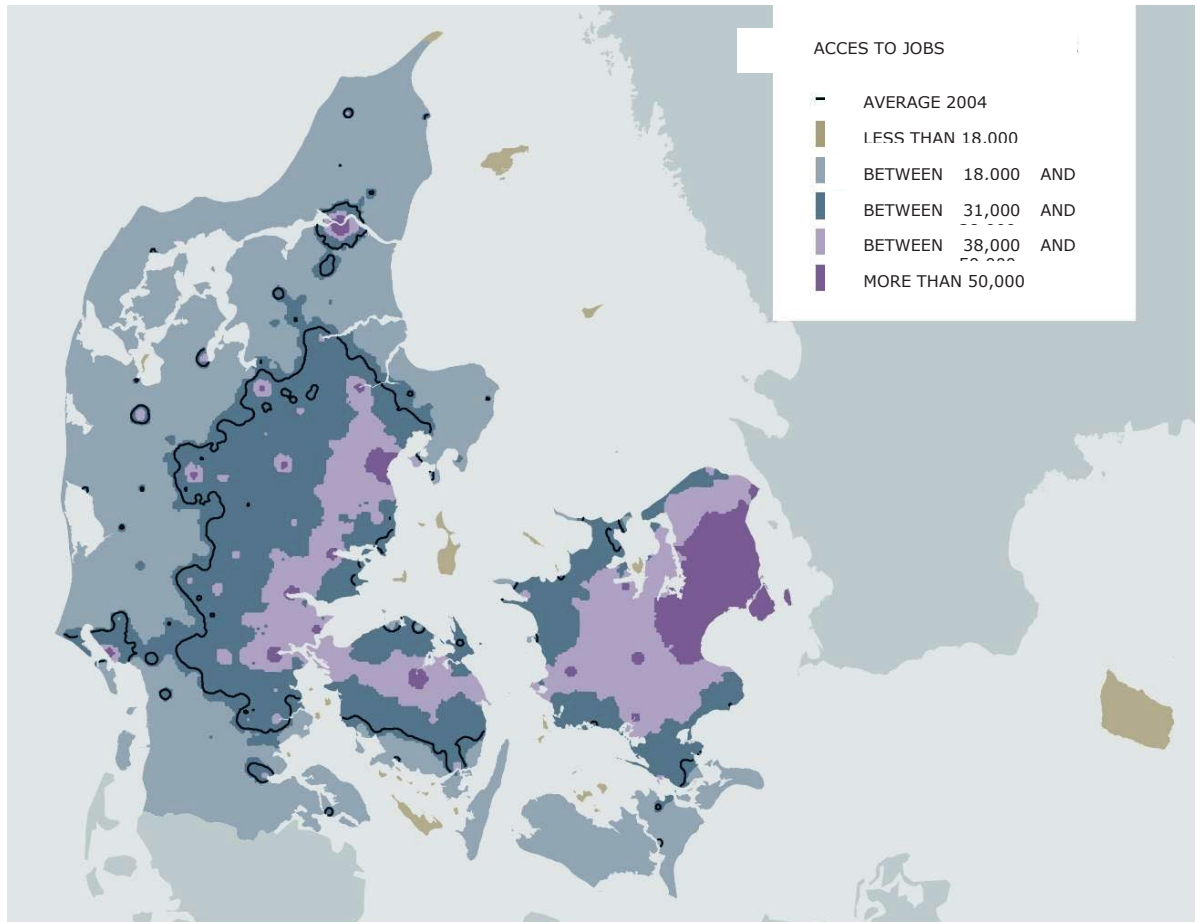
Maritime industries, including port operations and fisheries might also be supported through industrial foundations, as has been the case in Hvide Sande.

The construction sector can be strengthened through energy renovations and sustainable new municipal buildings. This could have a significant impact; if it is clearly defined that sustainable renovation and development of the municipal building stock can be considered "affiliated undertaking" in municipal ownership, such that there is no offset in the block grant.

The trade sector will be able to benefit from a generally stronger local purchasing power and more tourists, as it is expectable that trade as well as tourism and other associations will participate in the commercial industrial foundations.

The way in which the surplus is used for the development of local areas is different depending on the ownership structure chosen for new wind turbines. The municipal treasury will generally benefit from having more people at work and profits being taxed locally, while a municipal ownership allows to use the surplus in energy-related activities. A foundation ownership may as illustrated help develop tourism and port operations as well as local associations, sports and culture in the broad sense. Private revenues from wind turbine cooperatives could indirectly increase employment in trade and crafts since people would have a greater purchasing power.

The positive local economic effects of local ownership of wind turbines will obviously not on its own change the situation in remote areas, but they offer some opportunities for local development to be grasped by local stakeholders. In collaboration with a number of other local political priorities and initiatives, revenues from wind turbines will be an important tool for maintaining and developing viable cities and communities in remote areas.



Map of employment potential (from National Planning Report 2005) illustrating the correlation between the availability of jobs and the development challenges that exist in remote areas.

The creation or conservation of local jobs in peripheral areas and a municipal surplus of electricity production will benefit the local population, but the improved local economy with reduced social spending and higher employment will also mean a reduction in the block grant from the municipal compensation. More affluent municipalities will also have the advantages of local ownership of wind turbines in remote areas, and the contours of a possible new and more balanced Denmark map, where these areas could have a new and stronger role on the basis of their natural potentials, are gradually appearing.

5 A NEW MINDSET AND LOCATIONS WITH SPECIAL POTENTIAL

Denmark's environmental and energy policy is now one of the world's most ambitious and we can actually be a little proud of it.

Both we and the tourists who visit our small country should therefore be able to see and notice where the energy comes from as a natural part of the way we have organised ourselves, in the same way as we for example have visible rainwater solutions as part of urban recreational areas and parks.

In 10-20 years, it will be usual to ride electric trains and drive electric vehicles on the highways and then it will be a nice experience to drive through the wind farms that produce the electricity we use.

Even with local ownership, concrete placement will often be a limited stock therefore some placement options that may have some special potentials given wind power's new social role are given below:

In ports as there are good wind conditions, especially in the western oriented ports without coastal protection. Ports are often municipally owned, which simplifies planning significantly.

Near industrial installations, such as district heating plants and other plants with similar scale since the visual impact will not be as significant in its interaction with the existing facilities.

Along highways as the visibility is great and there is overlap with existing noise zones and the possibility for simple servicing and maintenance.

Near railways as noise and vibration zones coincide with wind turbines and there is great visibility from the trains, where it can be a nice experience to drive through a wind farm.

Particular iconic locations where a wind farm may help to underscore Denmark's leading position in sustainable development. For example visible from the ramp to the Fehmarn Belt tunnel.

It is obviously vital that wind farms are not built in very valuable landscapes, but it may also be important for wind farms to be designed so that they can be seen as a kind of land art that can enrich the experience of the landscape through a conscious design.



Just as Lightning Fields in California helps to establish a scale of the landscape deliberately designed wind farms would contribute to the aesthetic dimension of naturally weak landscapes in Denmark.

6 RECOMMENDATIONS TO PROMOTE LOCAL OWNERSHIP OF WIND TURBINES

Dissemination of existing possibilities is obviously important as Municipalities, utilities, associations, communities and citizens are often not aware of the great economic potential in setting up wind turbines in areas with high wind resources. The State should therefore ensure easy access for all relevant stakeholders to all necessary information about potential to install wind turbines and about all or some of the existing ownership models for new wind farms.

It is not widely known either that the lending market for wind turbines is quite efficient. The payback is relatively short and insurances on minimum production can be taken which turn wind turbines into a very safe investment and loans can often only be recorded with the wind turbines as collateral. This allows many types of ownership and that even quite small groups of citizens can get loans for good locations.

Besides communicative action, there is a need for a comprehensive discussion of the necessity of wind turbines in terms of achieving the national ambition to become independent of fossil fuels by 2050, where a first step is taken with the objective of 50% of all electricity to come from wind by 2020.

If it is ensured that the profits from the turbines are anchored locally, the compensation arrangements for neighbours might be modified, and a closer look might be taken at the possibility of treating wind turbines the same way as other necessary common constructions, such as high tension lines, regarding compensation for landowners.

The residence obligation, which was repealed in 1998, could be another aspect. The reintroduction of one model or another could be considered in terms of promoting local ownership. Speculation has come up in the rather attractive schemes to the point where just the concession for the plot to build a wind turbine on can represent a value of up to 5 million DKK (670,000 €), when the private wind energy developers are bidding against each other. With locally initiated and owned wind projects more dialogue will be possible with various farmers on where wind turbines can be placed and at what cost considering local fairness and avoiding similar speculation in a process whereby external investors are driving up the price for concessions for construction.

Finally, there is a need for clarification and principal positions on a number of issues as several of the aforementioned ownership models are so new that the possibilities and limits of their multiplication are not clearly defined in legislation. Below there are some of the points that should be clarified and further developed in relation to the individual ownership models.

Industrial foundations

The possibility of industrial foundations is not very well known in connection with the establishment and ownership of wind turbines, so it is possible to go a long way with a solid communication effort towards utilities, associations, etc. about their potential.

Rambøll does not know any examples where a Municipality has participated in the establishment of an industrial foundation whose purpose is to establish and operate wind turbines, but it is obvious that there would be greater freedom in relation to the use of profits to local causes.

According to the current legislation, if a Municipality wishes to participate in or provide local warranty for such a fund, it is essential that the purpose and use of the surplus can be aligned with the municipal authorities' rules, i.e. it is used for a municipal purpose.

Municipal ownership

Many municipalities are interested, but there are only a few examples of municipalities pursuing an active policy in initiating new wind projects. Municipalities could thus play a much more active role also as a promoter and co-owner example through an A/S or Aps. If the Municipality wants to be co-founder of an industrial foundation this must fit municipal authorities' framework and objectives of the industrial foundation should therefore be in a general municipal interest.

In this context, it should be considered if individual municipalities should be allowed to decide that they, for example, only want to establish new wind projects where there is local ownership, given that this is essentially a political decision. One could also imagine to identify specific wind municipalities with the coincidence between the major development challenges and large wind resources, where targeted local special arrangements could be made.

Professor Bent Ole Gram Mortensen has recently written a position paper for Energy Cluster Centre Zealand (Energiklyngecentret Sjælland) on the possibility for municipalities to own wind turbines and the main conclusion is that they can, whatever the purpose and even beyond their own municipal boundary. The position paper describes the relevant legal issues with municipal ownership and should be read by municipalities who are considering becoming owners of wind turbines.

Even if this paper also mentions the case of the 5 wind turbines owned by Samsø Municipality, it is doubtful whether other Municipalities would be allowed to erect wind turbines on the same terms as Samsø based on the principle of equal treatment since the decision of the Board of Supervisors was based on the fact that Samsø had been appointed as an energy island. This issue should be clarified because the case of Samsø demonstrates precisely the high potential offered by municipal ownership of wind turbines.

As previously stated, there will be an offset in the block grant of 40 to 60% if a Municipality obtains a surplus through the production of electricity except for the part used for "related activities". Clarification / extension of what may be considered related activities would facilitate municipal ownership significantly.

The possibility of municipal guarantees is another issue that should be clarified, as it will simplify and cheapen borrowing.

Vindmøllelaug (wind guilds, cooperatives)

Often it can be a barrier to the local initiative that the whole prior process of environmental impact assessment, local planning, legal structure, stakeholder involvement etc. are quite costly both in terms of finances and time.

The guarantee mentioned in the Nørre Nisum case helps to get local initiatives on their way, but is not sufficient.

In Austria, for example, there has been worked a model where a local project has been allocated an amount of up to 1.5 million DKK (200,000 €) for the necessary feasibility studies and process to organise local people. If and when local people can agree on where to install wind turbines, the environmental impact assessment process can be started and if everything falls into place, the surplus will go to the local population. This way the overall planning considerations meet the local initiative in a more flexible way than is the case in Denmark today.

Utilities, as shown in the Nørre Nisum case, can become equal owners with a local wind cooperative, but they can also hold the maximum 80% alone or be part of a industrial foundation.

7 THE WAY FORWARD

As can be seen, there are already good examples of how industrial foundations, municipal ownership and wind turbine cooperatives can work together in different ownership models that can promote local ownership, acceptance and development in the remote areas of the country. The peripheral areas include the vast majority of the potential for onshore wind energy in Denmark, what means that, by valuing wind resources as a local resource that can be activated as a possible lever for local development, a greater degree of balance between the Danish municipalities can be created. It is our hope that this memo may trigger a number of ideas that could be further developed into a process forward towards establishing an overall legal model for local ownership of wind turbines. The state and municipalities should get together around the clarification of the framework, and it is our assessment that the municipalities will be both willing and the most obvious as coordinator, promoter and facilitator in the subsequent realisation.