

**“Grid access and administrative procedures”  
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2 – Deliverable No. 8**

### **1. Summary**

This document contains the most up-to-date information about grid access and authorisation procedures for RES-e in Denmark and in specific Greater Copenhagen Region (GCR) in view of the EU directive 2001/77/EC on the promotion of electricity produced from renewable energy in the internal electricity market [1]

The aim is to describe the "real life conditions" of the RES-e implementation.

A part of the document is the analysis of the interviews held with stakeholders in the field of renewable energy who have an involvement with the grid access and administrative procedures.

### **2. Opinion among inhabitants about RES-e – a summary**

Generally there is a high acceptance of renewable energy in Denmark. This is undoubtedly connected to the historical 'bottom-up'-development and a widespread ownership through community shares bought by the general public. Due to the high population density there are not very many large RES-e systems in GCR, neither wind turbines, biogas, nor other technologies, and this fact marks of course the results of surveys on the public position on renewable energy. One example on the public position in GCR is shown in figure 1, which comes from a survey carried out in April 2005. Readers are referred to

[www.solenergi.dk/cph-rese/download/VE\\_el\\_Holdninger\\_HUR\\_2005.pdf](http://www.solenergi.dk/cph-rese/download/VE_el_Holdninger_HUR_2005.pdf)

Though the position on for instance wind turbines is very positive, it requires effort to carry out a project. The Middelgrunds-project, which comprises 20 big off shore wind turbines a few kilometres outside Copenhagen, was met with a lot of objections from citizens with a view to the water Øresund, sailors, and other interest groups. This is to be expected in a densely populated area when trying to establish larger RES-e systems. Wind turbine projects on land are met with objections over expected acoustic and visual nuisances. Biogas projects are met with objections over expected odour nuisances. Solar systems meet no objections,

albeit some people (architects!) often express their dissatisfaction with the aesthetics of retrofit and non-integrated solar systems.

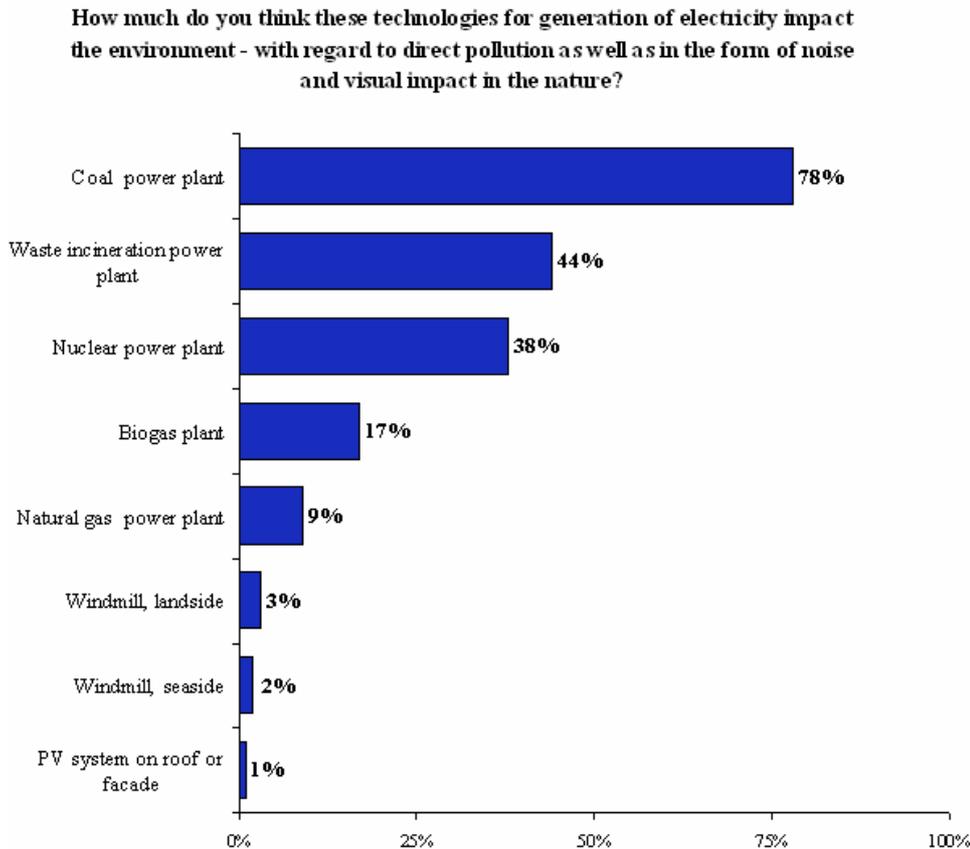


Figure 1. From survey in GCR, April 2005.

### 3. Planning and Permission

The general conditions for planning and obtaining permission to construct power production plants is described. Specific conditions for land-based wind turbines, offshore wind turbines, and biogas plants are given. Other RES-e technologies are not subject to specific rules or are not relevant in GCR.

Conditions regarding the grid connection are described in a later paragraph.

#### General conditions

The following is based on the “Report on the evaluation of various issues relating to the use of RES electricity” [2].

Pursuant to the Electricity Supply Act [9], only undertakings which have electricity production plants with a total capacity in excess of 25 MW require a licence. Permission is also required for the establishment of new electricity production plants and significant alterations to existing plants. Unlike licences, permission is granted in respect of an individual production unit. Permission is required only for RES production plants with a capacity in excess of 10 MW.

Plants with a capacity of between 200 kW and 10 MW must be notified to the Energy Authority, although wind turbines are exempt from the notification requirement.

Under these rules, only a small number of RES electricity production plants require licences or permission. Those that do are wind farms and individual central CHP plants which partly use straw and waste as their energy source. Moreover, RES electricity production plants with a capacity in excess of 25 MW are owned by big electricity-producing undertakings which already hold a licence. There has thus been no need to issue licences specifically for RES electricity production.

Conditions and procedures relating to the issue of permits for land-based electricity production plants are laid down in Order No 493 of 12 June 2003 concerning conditions and procedures for the granting of permission for the establishment of new electricity production plants and significant alterations to existing plants [10].

### Offshore Wind turbines

Special rules apply to RES electricity production plants in Danish territorial waters etc.; in practice, these are offshore wind turbines, including all offshore wind farms. Pursuant to the Electricity Supply Act [9], permission is required for preliminary surveys and utilisation of energy sources in Danish territorial waters etc. Permission is also required for the establishment of offshore wind turbines. An EIA must be carried out before permission can be granted for the establishment of offshore wind turbines which are considered likely to have a significant impact on the environment.

The Energy Authority issues licences and grants permission, issues invitations to tender and carries out environmental impact assessments in respect of offshore wind turbines. Ministerial orders have been issued concerning the performance of a number of these tasks. Rules concerning the assessment of the impact of offshore wind turbines on the environment are specified in “Order No 815 of 28 August 2000 concerning the assessment of the impact on the environment (EIA) of offshore electricity production plants” [11].

### Land based Wind turbines

Land-based wind turbines affect the environment significantly, and over the years comprehensive national basic rules for planning and construction permission have been elaborated. With these rules well-defined and uniform criteria are made, that take into consideration a number of different interests, like for instance vulnerable landscapes, relics of the past, and neighbours to the wind turbines.

Danish Wind Turbine Owners’ Association ([www.dkvind.dk](http://www.dkvind.dk)) which comprises owners of wind turbines and other people interested in wind energy has issued a number of leaflets with facts about wind energy. Leaflet P2: “Planning of Wind turbines” describes in detail the roles of the different authorities, the most relevant legislation, and the procedures to follow when establishing a wind energy plant.

For details regarding conditions for the establishment of land-based wind turbines the reader is referred to the relevant legislation (environmental protection, land-use planning [5], and building legislation). The following is a summarized review of the roles and procedures.

The vast majority of the land-based wind turbines are established in the rural zone, where the county (region) has the competence to approve the location of construction [7]. The county also issues the environmental approval (noise). The municipality works out a local area development plan against which the county

like anybody else has the right to object. The municipality issues the permission of construction (formalities regarding correct dimensioning of the foundation etc.). If in a project there are more than 3 wind turbines or the total height of a wind turbine is more than 80m, which is almost always the case by modern turbines, the county has to make an Environmental Impact Assessment (EIA). The legislation differentiates between large wind turbines and smaller 'household' turbines, which are limited to a total height of 25m and a rotor diameter of 13m. Household turbines don't need a EIA or a new local area development plan to be worked out. Furthermore the household turbines are paid a higher feed-in tariff.

In GCR it is decided to limit the total height of wind turbines to 70m [4].

#### Biogas plant

A biogas project must go through a very time consuming process of planning and approvals: approval of location, approval of construction, approval as an environmentally critical plant, EIA, and approval from the food and veterinary authorities. For details the reader is referred to the homepage of the Danish Biogas Association [www.biogasbranchen.dk](http://www.biogasbranchen.dk). The homepage presents a lot of information including planning guidelines in English.

#### **4. Grid connection**

The Electricity Supply Act contains provisions on connecting RES-e production plants, other than wind turbines, to the grid. Plant owners are to bear the cost of connecting to the grid at a specified level. The grid or transmission undertaking concerned must implement the connection and bear other costs associated with connection and the reinforcement and expansion of the electricity supply grid.

In the case of wind turbines, the Wind Turbines Order [12] contains rules requiring the network or transmission undertaking to implement the connection and concerning the sharing of the costs of connecting to the grid and costs arising by virtue of a wind turbine being connected to the grid.

Pursuant to the Electricity Supply Act [9], RES electricity has priority access to the electricity supply grid in the event of there being insufficient grid capacity. This form of electricity production is thus subject to downward adjustment only when other possibilities for such adjustment have been exhausted. Priorities are set by the undertakings which are responsible for the system.

#### **5. Streamlining of procedures for grid connection**

The European Commission requires member states to streamline procedures for grid connection of distributed generation.

For wind turbines the Act of Planning lays down simplified requirements and streamlined procedures in the regional and local planning context. Building legislation contains special, less stringent rules on wind turbines, as the construction of a wind turbine does not require a building permit but needs only to be notified to the municipal authority responsible for building. Finally a type-approval scheme has been adopted on objective non-discriminatory principles. Type-approval entails simplification of the processing of cases under the above-mentioned rules.

There is practical cooperation between the county and municipal authorities involved in the processing of applications for permission etc., and there is an administrative appeals procedure for decisions taken pursuant to the laws referred to above.

The Order of Wind Turbines lays down clear rules for the split of costs related to the grid connection of a wind turbine between the owner and the utility.

#### Private PV-systems smaller than 6 kWp.

Since 1998 the tax authority has permitted the use of net energy metering (grid connection on the customer side of the meter) and of energy tax exemption of the amount of surplus electricity from the generator that on a sunny day is fed into the grid and taken back during the night or in winter, as long as there is no export to the grid on an annual basis.

Without these permissions the value of the electricity would be much lesser and besides the metering arrangement in most cases does not need any modifications. The utilities are entitled to demand a payment for making the grid available for temporary 'storage' of electricity from the PV generators on the low voltage network. The utilities therefore bear a very crucial influence on the profitability of a PV system. In practice they all act unbureaucratic to the benefit of the owners of the PV systems.

### **6. Guarantee of origin of RES electricity**

Guarantees of origin make it possible for the producers of RES electricity to prove that the electricity they sell is originating from renewable energy sources.

The guarantees of origin are issued in compliance with the EU directive for RES-e and the Danish Order of Guarantees of Origin [3]. They are considered as an important mean to promote RES electricity and to increase the share of renewable energy sources to the electricity production in EU.

It is the intention that certificates are issued to the owners of RES-e systems for the purpose of trade. The scheme will give the consumers more options to choose the source of energy and the producers more possibilities to utilize new market perspectives on RES electricity production across the borders. In Denmark there is no longer an obligation to buy RES electricity and the players decide individually if they want to join the scheme. The consumers are not obliged to buy certified electricity at premium prices.

The undertaking responsible for the electricity system, a recently established national company by name Energinet.dk has been conferred the responsibility of issuing the guarantees of origin in Denmark. A guarantee of origin is issued to electricity producer for the last full completed month or for the most recent completed 3, 6 or 12 months. The undertaking responsible for the electricity system maintains a register over the issued guarantees.

Legislation, organisation, and administration concerning guarantees of origin is in place in Denmark, and thus one of the important prerequisites for the establishment of a market for guarantees of origin is fulfilled. The market is developing rather slowly, and as a compensation for the missing income possibility from the market – mainly a problem for the wind turbines – the Danish parliament has passed a resolution to give a (time limited) premium settlement for the electricity.

## **7. Relative change in ease of connection compared with before transposition**

It is very difficult to give an objective answer whether the transposition of the EU RES-e directive has relieved the access to the grid. Long time before the adoption of the directive many barriers were removed as a result of a broad political wish to increase the wind power capacity significantly. Generally the electrical grid is strong, and compared to the enormous development of the wind power capacity during the last 10 years there has been little need to reinforce the transmission lines and distribution networks. However, recently there has been some short periods with very different spot prices on electricity in east and west Denmark caused by an unequal distribution of the wind power capacity and the lack of an electrical connection between east and west. These incidences have made the politicians decide for the establishment of a transmission line between east and west.

Several barriers not related to the grid access have been removed some time ago through legislation, formalized cooperation between associations and authorities, and independent boards of appeal.

Yet, there is no doubt that the EU RESe directive contributes to make Denmark stay on the track towards more RESe capacity, not least in changing political climates

## **8. Concentrate of comments from main players on barriers**

### Wind turbines

Advocates of wind energy seem to agree that the essential questions regarding grid access and connection have been solved, technical matters as well as issues on the cost split between the wind turbine owner and the electric utility. However, it is still seen that a few utilities continue an old praxis and invoice too much money for the permission to use the grid.

Recently disagreements with the aviation authorities have also been solved. Wind turbines with the wing tips in top position over 100m must be marked with warning light spots. These light spots can be seen from far away and have caused some public opposition to wind turbines. But now the aviation authorities have accepted to reduce the power significantly and to assess the need of light power from case to case.

The major problem is the very long time it takes for the authorities to approve the location of construction. In 2004 the counties were ordered to revise the regional plans regarding suitable locations for wind turbines in compliance with new national rules. The order was interfering with ongoing work to reform the complete regional development plans, and some of the counties were receiving the order with a rather negative attitude.

The advocates complain that the developer himself typically has to work out the EIA and the local area development plan, because the county and the municipality know that the developer is in a hurry. This is a simple way for the local and regional administrations to save money. It is political decisions whether the authority wants to 'control' the process or just come to a decision as to what developers have worked out.

Another major barrier is, of course, the formerly high feed-in tariffs that have been cut substantially. The tariffs have been reduced so much now that no private persons erect wind turbines anymore, neither big ones nor household-size.

The wind turbine line of business, owners as well as consultants and industry, miss a long-term and comprehensive national action plan laying down clear criteria for pointing out locations suitable for wind energy plants and mapping out annual targets for the development of the wind power capacity. In recent years the development has moved in bulky steps, which have been difficult to handle by the local planning authorities, utilities, and industry.

The brand new national energy strategy “Energistrategi 2025” suggests that the market to a large extent shall decide the development, but most people in the wind energy business object to this with the argument that the market usually works on a much shorter perspective than is needed when dealing with the development of a national energy infrastructure.

Specifically for GCR wind energy advocates complain about the limit of the total height of the wind turbines of 70m. This corresponds to a power less than 1 MW, which is much lower than the typical modern and much more profitable sizes >2 MW.

#### Photovoltaic systems

From talks with professional players (utilities, developers, consultants, and others) in the PV business line the following can be extracted.

Sikkerhedsstyrelsen, which is the highest Danish authority on safety in electrical installations and equipment, requires that a PV system connected to the grid has a separate RCD and over-current safety switch, no matter the power of the system. Only authorized people may connect the PV system to the grid. A consequence is that the costs for very small PV systems (< 0,5 kW) get prohibitively high. Some stakeholders object to this rather restrictive requirement by referring to the Netherlands, which has a more liberal safety code allowing unauthorized people to make the connection in the existing installation under certain conditions.

The present very modest development of the PV capacity brings few new technical problems into daylight. However, stakeholders complain that the profitability in a system is very uncertain. The tax exemption for the part of electricity that is temporarily ‘stored’ in the grid (day to night, summer to winter) is expiring by the end of 2006. The politicians have not yet made up their minds whether this scheme will continue. If not or if an investment subsidy is not introduced as a replacement the development of the grid connected PV capacity will stop completely. Another economical uncertainty is what will happen, when the utilities start changing hundreds of thousands of meters from the old Ferraris-type to modern electronic (one-way) types. And if the utilities continue to accept no payment for making the grid available for the transfer of power from the PV systems.

Without comparison the largest barrier to the development of PV capacity is the high investment cost. There are no investment subsidy schemes or attractive feed-in tariffs like in Germany.

Finally some stakeholders complain that the recently launched national energy supply strategy is without visions and ambitions and does not stimulate or encourage the development of grid connected PV systems at all.

## Biogas

There are no specific requirements to the grid connection of biogas plants.

Stakeholders complain especially about the difficulty getting an approval of a location for the plant. The authorities take extremely long time to consider a case, the time to be counted in years.

Furthermore stakeholders complain that the recently passed Order on Electricity Supply Act requires that biogas plants be established before year 2008, if they want to receive a price supplement on the electricity market price in a guaranteed period of 20 years. This is a problem when taking the long consideration time of the authorities into consideration. They also complain that the price ceiling of the market price plus supplement is stated in non-indexed amounts, thus making the profitability of the investment uncertain.

## Referencer

- [1] Europa-Parlamentets og Rådets direktiv nr. 2001/77/EF af 27. september 2001 om fremme af elektricitet produceret fra vedvarende energikilder inden for det indre marked for elektricitet
- [2] Rapport om vurdering af forskellige spørgsmål vedrørende udnyttelse af VE-elektricitet, Energistyrelsen, 31-10-2003
- [3] BEK nr 1 af 06-01-2004: ”Bekendtgørelse om oprindelsesgaranti for VE-elektricitet”
- [4] HUR Regionplan 2001
- [5] LBK nr 883 af 18-08-2004: ”Lov om planlægning” (Planloven)
- [6] BEK nr 428 af 02-06-1999: ”Bekendtgørelse om supplerende regler i medfør af lov om planlægning”, (Samlebekendtgørelsen)
- [7] CIR nr 100 af 10-06-1999: ”Cirkulære om planlægning for og landzonetilladelse til opstilling af vindmøller” (Vindmøllecirkulæret)
- [8] BEK nr 304 af 14-05-1991: ”Bekendtgørelse om støj fra vindmøller”
- [9] LBK nr 286 af 20-04-2005: ”Bekendtgørelse af lov om elforsyning”
- [10] BEK nr 493 af 12/06/2003: ”Bekendtgørelse om betingelser og procedurer for meddelelse af tilladelse til etablering af nye elproduktionsanlæg samt væsentlige ændringer i bestående anlæg”
- [11] BEK nr 815 af 28/08/2000: ”Bekendtgørelse om vurdering af virkninger på miljøet (VVM) af elproduktionsanlæg på havet”
- [12] BEK nr 1365 af 15/12/2004: ”Bekendtgørelse om nettilslutning af vindmøller og pristillæg for vindmølleproduceret elektricitet m.m.” (Vindmøllebekendtgørelsen)