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# Wind power construction from the point of view of health protection

**The Ministry of Social Affairs and Health (Finland) supports the government's policy on increasing the construction of wind power but finds it important to pay attention to the statement in the Government Programme that assessment of the environmental health hazards will be incorporated into all decision-making. It is possible to build a sufficient number of wind power plants in accordance with the government's objectives even if they are not built so close to habitation that hazards are made possible. There have also been well-implemented projects.**

Wind power construction has been on a marked increase in Finland, and there is a strong will to promote it both nationally and internationally. The aim has been to promote wind power construction by both higher feed-in tariffs and law amendments facilitating permit procedures and impact assessments.

In May 2012 the Ministry Employment and the Economy set up a working group tasked to reduce obstacles and restrictions related to wind power construction and to coordinate the objectives of the different administrative branches of the government ministries. In consequence of the working group's report, it was stated that the most

significant challenges for the promotion of wind power construction are linked to noise, land use planning, environmental impact assessment, coordinating and facilitating the permit procedures, and increasing the approval of construction at the local level. If the facilitating of permit procedures proposed by the working group is understood so that impact assessments will be simplified, the consequence would most certainly be that wind power would be the most hated form of energy in the next few years. Then the uncertainty and worry felt by the residents living in the vicinity would increase, and projects would be stopped by complaints and objection. No one wants such a development. It has to be kept in mind why the impact assessment and permit procedures exist, and simultaneously we have to ask if the projects whose preparation they disturb have really been sufficiently well prepared to be carried out.

The administrative branch of the Ministry of Social Affairs and Health has long experience of how people who are worried about their health have to be taken into consideration. We find that wind power construction and its acceptability would best be promoted by a careful environmental impact assessment and careful consideration of where wind power plants should be

built, not by placement of power plants too close to habitation and disparagement of the views of people living in the vicinity. In our view the acceptability of wind power construction would best be promoted by generally acceptable ways of operation related to planning and construction and as reliable impact assessment as possible so as to make the nearby residents convinced that no hazards will occur.

Accelerating the construction of wind power plants and simplifying the impact assessments would probably increase the environmental and health hazards caused by wind power. Therefore, and based on the contacts from municipalities, the Ministry of Social Affairs and Health has become more active in bringing up the issue of harms linked with wind power. This process of becoming more active is linked with the requirements for prevention of environmental health hazards laid down in the Health Protection Act, and by no means to objection to wind power. We have to remember that wind power has plenty of favourable effects on environmental health. At the moment, fine particles in outdoor air are according to international studies the most serious environmental health exposure agent.

By increasing the utilisation of wind power as a form of energy production it is possible to reduce the use of fossil fuels that emit fine particles into the air.

There is not very much knowledge of the health hazards caused by wind power yet. This does not mean, however, that there would not be any hazards, or that there would be no need to take them into consideration in planning and construction. Although there is little knowledge of the direct health effects caused by wind power, people living in the proximity of wind power plants have complained that their noise disturbs their sleep in the night time.

There are guideline values for indoor noise for the assessment of its health hazard. The guideline values have been applied for a long time, and we have long experience of them in hazard assessment. The view on the allowed level of noise hazard is relatively clear. We know about the properties of the noise caused by wind power that this noise is felt to be more disturbing than for instance noise of the same level from road, air or rail traffic.

The purpose of this article is to clarify what the Ministry of Social Affairs and Health considers accountable health protection to involve in connection with the planning and construction of wind power plants. A major objective of health protection is also to prevent health hazards. The cheapest and absolutely best way of implementing health protection is hazard prevention as early as at the planning stage. This should be the goal in wind power construction, too.

## Regional land use plan

The Regional Councils have diligently prepared regional land use plans for wind power indicating the areas that are best suited to wind power construction, and where even large wind parks could be built. As regards regional land use plans it has to be remembered that wind power plants and parks can also be built outside those areas. Therefore there is reason to note that there are planning rules that apply to wind power plants besides those for planning wind power areas also in the general planning rules of the regional land use plan. The general planning rules apply to the entire area of the regional land use plan, and thus they also apply to power plants built outside the wind power plant areas.

The Ministry of Social Affairs and Health has suggested in its opinions on the regional land use plans that the general planning rules for wind power construction should read as follows: "It must be ensured in the detailed planning of wind power construction that the habitation will not be caused unreasonable burden or health hazard from noise or flutter." In this way it could be ensured that the detailed planning would take into account both health hazards and unreasonable burden in both the wind power areas designated in the plan and outside of them. It should clearly appear from the rule that it is question, in particular, of a health hazard that is supervised by the municipal health protection authorities or of an unreasonable burden as referred to in the Act on Neighbourhood Relations, the observance of which is supervised by the municipal environmental protection authorities. Then the detailed planning should take into account also health hazards better than today, besides environmental hazards, and the process should include not only environmental protection authorities but also health protection authorities.

In its opinions on the regional land use plans the Ministry of Social Affairs and Health has also taken a stand on the

buffer zones between wind power plants and habitation. The Ministry has stated that a buffer zone of 500 meters between habitation and a wind power plant is all too short and that the distance should be clearly greater. The Ministry has suggested as the rule of thumb that the distance should be roughly 10 times the polar altitude of the power plant. The real sites of the power plants or the type and size of the power plants are not yet known in the context of the land use plan. Therefore the Ministry proposed 2 km as the buffer zone. In this way the hazards of power plants could with great probability be avoided. Now a buffer zone of 2 km is referred to in discussions as the absolute minimum distance, which was not the purpose in the Ministry's opinions. Wind power plants can be built closer than that but then the impact assessment should be careful and assertive and be based on reliable given values. Power plants should not be built within a distance shorter than 2 km without a comprehensive health impact assessment.

## Wind power (local) master plan

From the point of view of health protection the detailed planning of wind power plants should be carried out as a plan in compliance with the Land Use and Building Act, not as a planning requirement decision. The purpose of the master plan is the overall guidance of the community structure and land use of a municipality or its part as well as coordination of the operations. According to a wind power master plan, wind power construction can be realised in areas with no valid land use plan. Wind power plants are mainly built in such areas.

An impact assessment in connection with wind power master plans should be made in the real locations of power plants and with such plant types that would be built in the place concerned and with the same given values that would be observed there. This improves the reliability of impact assessment.

From the perspective of health protection the wind power master plan procedure is absolutely a better procedure than the planning requirement decision presented below. In the context of a master plan the

hearing is a more extensive process than in the context of a planning requirement decision. The planning requirement decision should indeed only be used when a wind power plant is being planned for an area where there is no need for coordinating operations, and where landowners have not any other interests in regard to land use. It is true that wind power plants will limit land use within their area of influence, and for instance housing, holiday housing or other operations sensitive to noise cannot in practice be built in the noise area. This can be taken into account in the plan by means of restrictions on building.

## Planning requirement decision and building permit

A planning requirement decision is an extended building permit consideration in accordance with the Land Use and Building Act, where an impact assessment is carried out before the building permit consideration. In the context of the planning requirement decision, an impact assessment of environmental and health hazards corresponding to that made in the context of a master plan procedure or an environmental impact assessment (EIA) should be made. The studies made in

the context of a planning requirement decision will be assessed by the building supervision authority, which is not the best municipal expert in environmental and health impacts. As regards impact assessments it is necessary for the building supervision, health protection and environmental protection authorities to cooperate and unite their expertise. After the impact assessment made in the context of a planning requirement decision the project will either be rejected or approved. If the project is approved it can thereafter be granted a building permit, but any specific permit conditions for the activity cannot be issued. It is possible to tackle hazards only afterwards, on account of complaints, in virtue of the Health Protection Act or the Act on Neighbourhood Relations. This may cause problematic situations in elimination of hazards. The elimination of hazards may at its worst lead to limitation or even prohibition of the use of the power plants concerned.

In the context of a planning requirement decision the hearing procedure is more limited (border neighbours) than for instance in the context of a wind power master plan or EIA procedure (those in the area of influence). In projects realised in the form of planning requirement decisions, all hazards or

land use conflicts that will arise in the area of influence of the wind power plants will not necessarily be found out. Therefore a planning requirement decision should only be applied in exceptional cases, in very clear cases and non-conflict projects.

#### Environmental impact assessment (EIA)

An environmental impact assessment is applied in wind power construction when there are a minimum of ten power plants or the total output of the power plants is at least 30 MW. If the power plant projects remain just below the EIA limit or two separate projects to be implemented in the same area constitute a project that together exceeds the EIA limit, the EIA procedure should also be applied to these projects. With a view to environmental impacts it does not matter much whether the plants have been built within one or several projects or if there are nine or ten power plants.

The EIA procedure is a good tool in the assessment of environmental and health impacts. In this procedure, impacts are assessed from a number of perspectives and the related hearing is realised on a wide range. The interaction with e.g. residents living in the vicinity must take place on a large scale. It is also

important to remember in an EIA that noise hazards caused by wind power should be expressly assessed by those types of power plants that would be realised within the project and the initial information on them. In this way the assessment would be as reliable as possible.

The Ministry of the Environment has published four sets of instructions relating to the planning of wind power construction, verifying the noise emission by measuring, modelling of the noise and measuring the noise level in the object subject to exposure. These instructions can and also must be applied when planning wind power plants. A further starting point for planning must be that the indoor noise levels in housing do not exceed the guideline values.

The noise impact areas of the biggest wind power plants extend farther than those of small ones, and their noise is in general also of a lower frequency. Guideline values for low-frequency noise have been set for indoor noise, and in order to avoid health hazards it would thus be necessary to also take into consideration low-frequency noise, besides the equivalent continuous sound levels. The most annoying aspect

of low-frequency noise is that the house structures do not dampen it very well. At frequencies of below 100 Hz the walls dampen noise only by a few decibels. In addition, there is much temporal variety in wind power noise, which must be taken into account as an uncertainty factor in impact assessment.

The health protection authorities should already take part in the EIA process at its initial stages, not only when they are asked for comments. In this way it could be ensured that the health protection perspective is taken into consideration adequately and at an early stage.

## Environmental permits

The environmental permit procedure has been applied to wind power construction to a very limited extent. The objective of actors is to place the power plants so that the risk referred to in the Act on Neighbourhood Relations of an unreasonable burden does not arise and there is no need for carrying out an environmental permit procedure.

From the point of view of health protection it would however be useful that wind power plants of an industrial

scale would be required to apply for an environmental permit. An environmental permit would facilitate imposing such conditions on the permits that environmental and health effects could be avoided. The noise hazard caused by wind power plants is considerably influenced by the size and distance of the power plant and also by how and by what kind of controls the power plant is operated. For instance, the use of power plants could be limited in such wind conditions where it will constitute a hazard to the nearby housing. This is not possible in projects implemented exclusively by means of planning requirement decisions and building permits.

Since it is particularly important for the production of wind power plants that they can be used as efficiently as possible, restrictions included in environmental permits are not beneficial from the point of view wind power production. Therefore it is in the interests of the wind power plant actors, too, that the power plants are located as far away from habitation as possible so that their operation does not need to be restricted.

## In conclusion

It has been annoying to follow the discussion that aims at promotion of additional construction of wind power in Finland and where views of worried citizens have not been taken into consideration. The actors promoting wind power construction should understand that no economic or political objectives should be placed above the requirements for individuals' health and wellbeing, and that people's worries cannot be removed by justifying wind power construction by climate policy or economic objectives – rather the opposite. The worries can only be removed by well-done impact assessments and well implemented projects in connection with which the nearby residents have been genuinely heard and their worries have been taken into consideration. The next few years will show if there is desire to understand this matter and how wind power construction will succeed or not.