

# Infrasound and health of wind turbines

## Infrasound exposure does not explain the symptom associated with wind power

The project, funded by the Government's Joint Survey and Research (VN TEAS), investigated whether infrasound from wind turbines has adverse effects on human health. The project was implemented in a multidisciplinary collaboration by the Technology Research Center VTT Oy, the National Institute of Occupational Health, the University of Helsinki and the Department of Health and Welfare. The project consisted of three sections: long-term measurements, a survey, and listening experiments.

Long-term measurements showed that in dwellings where residents were known to associate their symptoms with infrasound from wind farms, infrasound levels were significantly higher than in previous measurements in natural areas. The infrasound levels caused by wind turbines in the dwelling were of the same order of magnitude as the infrasound levels in the urban environment.

The survey also targeted areas where residents were known to associate their symptoms with wind farm infrasound. At a distance of less than 2.5 km from the nearest wind farm, 15% of respondents associated their symptoms with wind farm infrasound. In the entire study area, ie at a distance of 20 km from the nearest wind farm, 5% of the respondents combined their symptoms with the infrasound of the wind farms. About a third of those who experienced the symptoms felt that their symptoms were severe, and the spectrum of symptoms was very wide. Many factors, such as the location of the home near wind turbines, chronic illnesses, functional symptoms and disturbances, perceiving wind turbines as disruptive, and considering wind turbines as a health risk, were more common in those who associated their symptoms with wind farm infrasound.

Participants in the listening experiments were shown the sound of wind turbines recorded in long-term measurements, including infrared. They were unable to detect the presence of infrasound in the sound of wind turbines, and infrasound did not affect the annoyance of the sound of wind turbines. An increase in sound pressure level and relevant pulse, in turn, increased the annoyance of the audible sound. There was no difference in the stress-responsive responses of the involuntary or autonomic nervous system as to whether or not the presented sound sample contained infrasound, or whether it was claimed that the sound sample contained infrasound.

Those participants in the listening experiments who reported experiencing symptoms or a feeling of illness from the wind farm's infrasound were not more sensitive to detecting wind farm infrasound than others, and they did not perceive the infrasound as more disturbing than the other participants. Nor did their autonomic nervous system respond more strongly than usual to the infrasound. However, more than half of them experienced adverse symptoms in different sections of the test day, while only a few of those who had not reported symptoms from wind farms reported mild sensations. However, the reported symptom was related to samples that did not involve infrasound (nature videos and sound from wind turbines with infrasound removed).

The level of exposure with no known health effects, the wide range of symptoms, and the fact that the exposure test could not show direct organ effects from wind farm infrasound suggest that the symptom is explained by factors other than wind farm infrasound.

The symptom can be explained by experiencing wind farms as disruptive and considering them a health risk. On the other hand, it is possible that symptoms and diseases that are not related to the infrasound of wind turbines are interpreted as being caused by them. Interpretations are also affected by the ongoing public debate. Similar multifaceted symptoms at very low exposure levels have also been associated with other environmental factors, such as electromagnetic fields, which have no known health effects.



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