VTT studied the health effects of infrasound in wind turbine noise in a multidisciplinary cooperation study

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The study targeted to adverse health effects of wind turbine infrasound and was funded by the Finnish Government's Analysis, Assessment and Research Activities (VN TEAS). It was found that symptoms intuitively associated with wind turbine infrasound were relatively common, but the symptoms were not caused by exposure to infrasound. The findings increase scientists' understanding of the nature of infrasound in wind turbine noise. The work was commissioned by the Finnish Government's Analysis, Assessment and Research Activities. The participants in this study were VTT (lead of the project), the Finnish Institute for Health and Welfare, the Finnish Institute of Occupational Health, and University of Helsinki.

The project consisted of three subprojects: a long-term measurement campaign, a questionnaire study and listening tests. The study was focused on areas where local residents had reported symptoms that they associated with infrasound from a nearby wind farm.

VTT led this research study on the potential health effects of infrasound emitted by wind turbines. In addition, VTT was also responsible for a infrasound measurement campaign. The aim of the campaign was to find out the infrasound levels and their variations inside dwellings near wind farms. VTT also contributed to the planning and implementation of the listening tests.

The questionnaire study was conducted by the Finnish Institute for Health and Welfare. Based on the answers, symptoms intuitively associated with wind turbine infrasound were relatively common (15%) among people who live close to (≤ 2.5 km) wind farms where local residents had reported symptoms associated with infrasound and less common (5%) across the whole of the area (≤ 20 km).

According to the measurements, the soundscape within a radius of approximately 1.5 km from wind turbines became more urban in terms of sound pressure. The sound inside dwellings was dominated by very low frequencies, less than 2 Hz. Measurements were continued for 308 days in two areas where the nominal capacities of the wind turbines were between 3 and 3.3 MW. The equivalent continuous sound pressure level inside houses varied between 67 and 75 dB, and the highest value for a 10-minute equivalent level was 102 dB. The infrasound samples representing the worst-case scenarios were picked out from the measurement data and used in the listening tests.

The participants in the listening tests were divided into two groups based on how they reported wind turbine infrasound related symptoms: people who suffered from those and people who never had symptoms. The participants were unable to make out infrasonic frequencies in wind turbine noise, and the presence of infrasound made no difference to how annoying the participants perceived the noise, and their autonomous nervous system did not respond to it. There were no differences between the results of the two groups.

No evidence of health effects of wind turbine infrasound was found. The findings increase scientists' understanding of the nature of wind turbine noise inside dwellings in different times of the year, especially in respect of infrasound. Unique and rare sound data covering a frequency range from 0.05 to 20 000 Hz, over a long and continuous period, inside uninhabited dwellings, was captured.

The work was commissioned by the Finnish Government's Analysis, Assessment and Research Activities. The participants in this study were VTT (lead of the project), the Finnish Institute for Health and Welfare, the Finnish Institute of Occupational Health, and University of Helsinki. A summary of the means and main results, Policy Brief, was published. The project was started on 16 August 2018 and will officially end when the final report is published by June of 2020.

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