

# Solutions to reduce the effect of wind power on digital communications

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The Shepherds Flat Wind Farm is an 845 MW wind farm in the U.S. state of Oregon. Credit: Steve Wilson / Wikipedia.

Using methods developed by VTT Technical Research Centre of Finland, wind farms can now be designed to minimize their effects on television broadcasting and mobile communications.

Methods and tools developed in a research project conducted by VTT

Technical Research Centre of Finland Ltd allow an optimal location to be identified for [wind turbines](#), where interference on television broadcasting and mobile connections is minimized.

"The placement of wind turbines can have a major impact on the quality of digital connections across a wide area," points out VTT's Principal Scientist Seppo Horsmanheimo.

A wind turbine's effects on digital communications are dramatically different from those of a large building. The rotation of the [wind turbine blades](#) generates a dynamic force which depends on the direction and speed of the wind. Until recently, few tools have been available to assess this impact. A standard building produces a static impact.

A wind turbine can also generate a greater static impact than an ordinary building, because turbine towers tend to be considerably taller than other buildings, and multiple wind turbines are usually located in the same area.

In addition to energy companies, the solutions VTT has developed can be used by operators building mobile communication or television networks in the vicinity of existing wind turbines. The new technology allows prior assessment of the need to adjust base station antennas or install additional base stations and television gapfiller transmitters.

Given the highly dissimilar views prevailing on the nature and scope of the impacts of wind turbines, reliable measuring techniques are a valuable asset. Citizens in areas where [wind farms](#) have been built have filed complaints with the Finnish Communications Regulatory Authority, mobile operators and Digita Oy, the company that owns the television broadcasting network.

"With our methods, it is possible to verify the impacts and investigate

their actual causes, and thereby identify the source of problems and mitigate the impacts," explains VTT's Principal Scientist Markku Sipilä.

The new solutions will bring some relief to consumers, operators and the authorities, as they provide efficient tools for the prevention of digital interference at the wind turbine and communications network planning stage. This provides significant savings potential, as it is usually more expensive to make changes afterwards than to factor in different variables at the planning stage. A reduction in interference will also reduce the costs of customer services.

## **New methods a driver for renewable energy**

The research findings support Finland's national objective of increasing the use of wind power and other renewable energy. With tools now available for minimising the potential negative impacts of [wind](#) power at the planning stage, power plant projects are likely to meet with less resistance and to progress more smoothly.

The current research project is part of a more extensive study of electrical and data communications networks, the objective of which is to secure the operability of critical infrastructure in all circumstances. In today's digital society, electrical and data communications networks are increasingly interdependent. With the growing popularity of network automation, reliable mobile services are crucial to the proper functioning of power networks.

The methods, tools and analysis process developed by VTT can provide new service export opportunities for VTT and for the designers and builders of power plants and mobile networks.

The effects of [wind power](#) on digital radio communications were analysed with a [research project](#) carried out by VTT and commissioned

by the Finnish Communications Regulatory Authority in the winter 2014  
- 2015.

Provided by VTT Technical Research Centre of Finland

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