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The influence of vision on noise annoyance evaluation of wind farms

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Abstract

The noise impact assessment of new infrastructures is strongly correlated with the environmental context where they are built in. The observers are influenced mainly by two types of stimuli: audio and visual. These stimuli are perceived simultaneously and both contribute to the noise impact annoyance. Different studies have found out that the visual stimuli, such as colour and movement, can influence the auditory perception (e.g. loudness).

Although for wind farms the noise impact evaluation could be not so significant if it is observed only from the acoustic point of view, the vision of the wind farms can modify the global judgement.

The aim of this study is to determine the contribution of some visual factors on wind farm noise perception and annoyance. In a laboratory test four types of visual factors (quantity of turbines, colour difference of rotor blades, rotor speed and wind turbine form) graded at different levels and the wind turbine noise were used as stimuli. They were presented to a sample of people who were then asked to assess the quality of noise through self-report questionnaires. The results of the influence of the visual factors on noise assessment are presented and discussed.

Introduction

In the last decades, concerns about climate change have oriented the worldwide energetic policies toward the installation of a large number of renewable energy power plants. However the construction of wind farms has raised up some environmental impact problems. For wind farms, environmental impact problems are caused, mainly, by the combination of physical (visual and audio) aspects such as the noise, the blinking effect, the movement of shadows and the change of landscape, but also from wildlife preservation aspects.

Regarding environmental noise impact of wind turbine, studies report that wind turbine noise could be more annoying than other types of noise, with equal sound