

## **Design and optimisation of wind farms built-in to the existing buildings and civil objects**

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Wind energy offers many advantages and it is the fastest-growing renewable energy source in the world. Wind energy is a clean fuel source and does not pollute the air unlike power plants that rely on combustion of fossil fuels. Wind energy is also renewable power source, making it one of the lowest-priced renewable energy technologies available today. More recent developments in this technology have allowed wind turbines to be utilized in building design and in design of other civil objects. Wind turbine efficiency remains a critical component of the overall economic justification for a potential wind farm. There is therefore a requirement for prediction methodologies that are capable of addressing the performance of multiple turbine installations within a specific local environment and operating in a wide range of conditions.

The aim of the project is to predict power output of potential wind farms built-in to the building and other civil objects (bridges, viaducts etc). The project presents an assessment of the expected power output from a wind turbine placed in existing civil objects or buildings, and involves computer analysis from a commercial software package used to model the wind flow through a turbine for a range of resistances of disc representing turbine rotor. Different configurations of the wind farm are assessed based on computer models which use the wind direction and wind speed in the selected area. The project involves collaborators from other higher education institutions and industrial companies.