

Getting to the bottom of wind turbine noise

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University of Adelaide researchers are developing a sophisticated wind turbine experiment to investigate exactly how wind turbines produce noise.

The findings should enable the construction of better designed [wind farms](#), improved public policy and new [noise](#) control technologies.

Chief Investigator Associate Professor Con Doolan says that despite the attention paid to wind farm noise in recent years, there remain large question marks over the sources of noise, particularly in the low-frequency range which seems to be most significant.

"We have a fair amount of knowledge around the noise generation mechanisms but, particularly in the low-frequency ranges, we don't know a lot about how they combine together," says Associate Professor Doolan.

"This project is aimed at getting to the bottom of what is creating the noise that can cause disturbance. When we know what is contributing most to that noise – exactly what's causing it – then we can stop it."

The researchers, from the University's Flow and Noise Group in the School of Mechanical Engineering, will build a small-scale wind turbine in the University's [wind tunnel](#). Around the wind turbine they will also build an anechoic chamber (a specialist acoustic test room).

"This will be the most sophisticated wind turbine noise experiment in the

world," says Associate Professor Doolan. "We'll be recreating the environment of a wind farm in the laboratory, with all the different noise sources, and then use advanced measuring techniques – laser diagnostics to measure the [aerodynamics](#) and microphone arrays for the acoustics – to find out what the strongest [noise source](#) is and how we might control it.

"We'll measure the aerodynamics (air flow and surface pressure) and acoustics at the same time so we can pin point exactly what is causing each type of noise generated.

"If we can understand what's creating these sounds, then we can advise governments about wind farm regulation and policy, and make recommendations about the design of wind farms or the turbine blades to industry."

The three-year project, 'Resolving the mechanics of wind turbine noise production', is funded under the Australian Research Council's Discovery Project scheme.

Provided by University of Adelaide

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