

# Notre Dame licenses wind technology

By Kevin Allen South Bend Tribune | Posted: Friday, April 15, 2016 6:00 am

A device developed at the University of Notre Dame could help wind turbines around the world produce more power.

Earlier this week, a Rhode Island company named Aquanis LLC licensed a "plasma actuator" patent portfolio through Notre Dame's Office of Technology Transfer. Plasma actuators are thin, flat semiconductor devices that can be attached to objects to control air flow.

Aquanis plans to use actuators on wind turbines to affect the flow of wind around the turbine blades, reduce turbulent air and maximize aerodynamic performance. The goal is to generate more electricity and minimize damage to turbines during high wind speeds.

Thomas Corke, the director of the Notre Dame Hessert Laboratory for Aerospace Research and the Notre Dame Center for Flow Physics and Control, has worked with plasma actuators for 25 years. He's spent the past six years applying the technology to wind. The two wind turbines visible from Douglas Road on the north side of Notre Dame's campus are there for research purposes.

Corke explained that plasma actuators, which have electrodes in them, "ionize the air to make it conductive, and then the conductive air is subjected to an electric field, and the electric field makes the ambient air move. It's designed to produce a jet of air."

The product can boost the amount of energy a turbine generates by 5 to 10 percent, according to the university.

Neal Fine, the founder and CEO of Aquanis, said wind energy currently accounts for 4 percent of the nation's electricity demand, but the U.S. Department of Energy would like to see that reach 20 percent by 2030. He said the actuator could lower the cost of wind energy.

"This is probably the best technology available to do that, because it doesn't require any wholesale



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From left, Neal Fine, founder and CEO of Aquanis LLC, and Thomas Corke, a professor in the Department of Aerospace and Mechanical Engineering at the University of Notre Dame, stand in front of wind turbines on the north side of Notre Dame's campus on Tuesday. Photo provided

changes to the blade design," Fine said. "It's simple and has no moving parts. It's inexpensive."

There are more than 48,000 utility-scale wind turbines in operation nationwide, and more than 1,000 of those turbines are in Indiana, according to the university.

Corke said there are real opportunities in wind energy because it hasn't been optimized. "There's a standard understanding that you could take the best, most efficient wind turbine, put it at the most efficient site, and it still would extract only 30 percent of the available energy in the wind," he said.

Corke said plasma actuators have been used in other fields, too. He's worked with companies that have used the devices on helicopters, jet engines and trucks.

One of their advantages, Corke said, is that they don't require a lot of space. "You can get them in strategic areas where other types of flow-control devices don't fit," he said.

The university held a signing ceremony with Corke, Fine and other research partners on Tuesday evening before the 1st Source Bank Commercialization Award Dinner at the Hilton Garden Inn next to Saint Mary's College.

**kallen@sbtinfo.com**

**574-235-6244**

**@KevinAllenSBT**