

CAITIN

DYNAMICALLY ADJUSTABLE WIND TURBINE BLADES

PROJECT TITLE:	Adaptive Turbine Blades: Blown Wing Technology for Low-Cost Wind Power		
ORGANIZATION:	Caitin, Inc.	LOCATION:	Petaluma, CA
PROGRAM:	FOA1	ARPA-E AWARD:	\$3,000,000
TECH TOPIC:	Renewable Power Generation	PROJECT TERM:	2/1/10 – 6/30/12
WEBSITE:	www.paxscientific.com		

CRITICAL NEED

Wind power represents one of the most rapidly growing contributions to the U.S. electric energy generation fleet. While the cost of wind power has decreased as a result of building at large scales, challenges continue to hinder further deployment, including excessive noise, expensive operations and maintenance, difficulty manufacturing large blades, and low efficiency at small scales. Advances in wind turbine technology are still needed to make wind power a cost-effective alternative for electricity generation throughout the country.

PROJECT INNOVATION + ADVANTAGES

Caitin is developing wind turbines with a control system that delivers compressed air from special slots located in the surface of its blades. The compressed air dynamically adjusts the aerodynamic performance of the blades, and can essentially be used to control lift, drag, and ultimately power. This control system has been shown to exhibit high levels of control in combination with an exceptionally fast response rate. The deployment of such a control system in modern wind turbines would lead to better management of the load on the system during peak usage, allowing larger blades to be deployed with a resulting increase in energy production.



IMPACT

If successful, Caitin's project would increase the power generation capacity of wind turbines, reducing the cost of energy and enabling widespread adoption of wind power.

- **SECURITY:** Advances in wind power would diversify electricity generation, alleviating reliability and security concerns associated with the electric grid.
- **ENVIRONMENT:** Electricity generation accounts for over 40% of U.S. carbon dioxide (CO₂) emissions. Enabling large-scale contributions of wind and solar power for our electricity generation would result in a substantial decrease in CO₂ emissions.
- **ECONOMY:** Caitin's advanced turbine blades would make wind power a more cost-effective alternative for consumers and businesses.
- **JOBS:** Widespread use of wind power would create jobs in the U.S. manufacturing, construction, and engineering sectors.

CONTACTS

ARPA-E Program Director:
Dr. Mark Johnson,
mark.a.johnson@hq.doe.gov

Project Contact:
Paul Lees,
paul.lees@caitin.com