ATREVIDA SCIENCE

Bold Blades To Power Our Future

Code Red: Our world is on fire! Per the U.N. IPCC 2021 Report, combating GHG emissions requires bold, transformative climate innovations like Atrevida Science's Active Morphing Blade™ for wind turbines. Active Morphing Blades™ dynamically adjust the shape of their profile to match current wind conditions using actuated segments and real-time machine learning software. Our AMB™ harnesses as much as 14% more wind energy than today's rigid blades, driving down the Levelized Cost of Energy (LCOE*) and delivering greater profitability.

Bigger is Better, Until It's Not: Over the past 40 years, wind turbines have increased the amount of electricity generated by growing the length of the turbine blades. This decades-long trend has seen the growth of a commercial wind turbine blade from 7 m to 125 m and the output from 500 KW to 15 MW. However, designs for longer, rigid blades are now reaching sizes that create challenging physics such as difficult logistics and installations, greater loading stresses requiring beefier super structures, and shortened lifecycle time for blades and key drive train components.

QUICK FACTS
Q4 2021

NYS Startup spun out (incorporated 2018) of University at Buffalo Business & Entrepreneur Partnerships (UB BEP)

Award winning participant in Venture For ClimateTech, Clean Tech Open, VentureWell ASPIRE, NSF I-Corps

$335 K Pre-seed, Non-Dilutive Grants to date, $1.6 M pending award

Patented technology will reduces 18.3 M MtC02e annually (NYSP2I).

Supported by UB, NECEC, NYSERDA, NextCorps, Second Muse, LaunchNY

Inclusive Team, Female Minority Founder & CTO

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The Next Generation in Turbine Blades: For decades, commercial turbine blades were fixed permanently in one position. Twenty years ago, pitch control was developed to allow the blades to rotate at the hub. This mitigated some of the deleterious impact of excess wind conditions and reduced the LCOE. However, the blades are still a single, static piece. The AMB™ blade dynamically transforms the twist angle distribution (TAD) along the full length of the blade, alleviating fatigue loads and improving wind capture. The design consists of a standard rigid spar surrounded by flexible blade sections. These sections are actuated at each end to deform the TAD. Using real-time feedback, the machine-learning adjusts the sections to create the optimal blade profile for current wind conditions.

The Time is NOW: The global offshore blade market is $1.7 Bn with a CAGR of over 10%. Currently the U.S. has almost no presence in the market. In March 2021, the U.S. announced a national effort to install 30 GW of offshore wind energy production along the N.E. coastline. Current plans call for 30+ wind farms with over 3,000 wind turbines. This is a huge opportunity as the market share for a single OEM's installed systems using AMB™ on the northeast coast of the U.S. is $43 M (licensing).

Beyond Efficiency: Improving efficiency has a positive impact on LCOE, but beyond improved generation, there are critical needs that AMB™ blades address. The dynamic blades also reduce blade loading by as much as 70%, which in high winds can mean reduced wear and tear on critical parts of the blade and drive train. Also, today's large blades are cast in a single shape as long as five tractor trailers. Maneuvering these engineering marvels in fabrication factories or transporting them to site has become a serious and expensive challenge. Atrevida's AMB™ blade features a sectional design that makes transportation and installation much less difficult.

*LCOE is a standardized method for comparing power generation facilities, especially of different types. It's the cost of building and operating any type of power generation plant over an assumed financial life and activity level. Key inputs include capital costs, fuel costs, fixed and variable operations and maintenance (O&M) costs, financing costs, and an assumed utilization rate. For wind turbines, the longer the