

TechConnect Innovation Challenge and Defense TechConnect Challenge Submission Form

SAND2019-1952C

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	Note: In addition to the contact information, the following information may be made available to conference attendees if organization is invited to participate in program. Please do not include any confidential or proprietary information in your submissions details.
	Organization Information
Company or Organization:	Sandia National Laboratories
Website URL:	www.sandia.gov
Organization size:	<input type="checkbox"/> 1 - 19 <input type="checkbox"/> 20 - 99 <input type="checkbox"/> 100 - 499 <input type="checkbox"/> 500 - 2499 <input checked="" type="checkbox"/> 2500 or more
	Technology Details
	List as you want printed in the program.
Technology/Solution Name:	Twistact
Brief Description of Technology in layman's terms:	Twistact technology is a fundamentally new type of rotary electrical contact that eliminates the two physical degradation processes – sliding contact and electrical arcing – that limit the performance of traditional rotary electrical contacts. It comprises a pure-rolling-contact device that provides a high-current, ultra-low-resistance (e.g. 1 milliohm) galvanic connection to a rotating object.
	50 words max.
Technology Development Status:	<input checked="" type="checkbox"/> Concept <input checked="" type="checkbox"/> Prototype <input checked="" type="checkbox"/> Proven Manufacturability <input type="checkbox"/> Ready to Market <input type="checkbox"/> Commercial Product
Organization Type:	<input checked="" type="checkbox"/> Academic/Gov Lab <input type="checkbox"/> Early-stage Startup (Seed) <input type="checkbox"/> Mid-stage Startup (A or B) <input type="checkbox"/> Commercial Startup (C+) <input type="checkbox"/> Small to Medium Enterprise <input type="checkbox"/> Corporation
Primary Application Area:	<input type="checkbox"/> Materials, Chemical <input type="checkbox"/> Electronics, Sensors, Communications <input type="checkbox"/> Cyber, AI, Data, Software <input type="checkbox"/> Space, Defense, Mobility <input checked="" type="checkbox"/> Energy, Efficiency, Resilience <input type="checkbox"/> Water, Waste, Environmental <input type="checkbox"/> Medical Devices <input type="checkbox"/> Biotech, Pharma

	<input type="checkbox"/> Manufacturing, Instrumentation <input type="checkbox"/> Materials, Chemical <input type="checkbox"/> Electronics, Sensors, Communications <input type="checkbox"/> Cyber, AI, Data, Software <input checked="" type="checkbox"/> Space, Defense, Mobility <input type="checkbox"/> Energy, Efficiency, Resilience <input type="checkbox"/> Water, Waste, Environmental <input type="checkbox"/> Medical Devices <input type="checkbox"/> Biotech, Pharma <input type="checkbox"/> Manufacturing, Instrumentation <input type="checkbox"/> Other
Other:	
	(if you selected Other above)
Technology Keywords:	slip rings, rotary electrical contacts
	Enter up to 3 technology keywords separated by commas.
Market Keywords:	wind energy, motors, generators
	Enter up to 3 market keywords separated by commas.
Detailed Technology Summary:	<p>Twistact technology comprises a pure-rolling-contact device that transmits electrical current between a stationary and rotating frame (or two rotating assemblies having different speeds and/or direction of rotation) along an ultra-low resistance path (e.g. 1 milliohm). Twistact devices accomplish this pure-rolling-contact galvanic connection using a flexible, electrically conductive belt and a matching set of epicyclic sheaves. Laboratory testing has proven that a single Twistact device will be capable of operating over the full 30-year service life of a multi-megawatt direct-drive wind turbine without maintenance or replacement. A technoeconomic analysis undertaken by NREL on behalf of DOE determined that the substitution of rare-earth magnets with a wire-wound rotor and Twistact module in a 10 MW direct-drive wind turbine eliminates the need for rare earth magnets without incurring any penalties in power generation efficiency or levelized cost of energy (LCOE).</p>
	What is transformational about this technology? How is it different from existing technologies? What is the potential impact on industry, markets and society? 200 words max.
Value Proposition:	<p>Twistact technology, by eliminating the sliding contact and electrical arcing inherent to traditional rotary electrical contacts, has drastically lower wear and correspondingly longer service intervals and avoids the carbon dust particulate generation of graphite brushes. It has a wide variety of potential applications, but was initially motivated by the need to eliminate rare earth magnets in utility-scale direct-drive wind turbines by enabling wire-wound generator architectures with no efficiency or LCOE penalty. Twistact is designed to last the lifetime of a wind turbine, thereby avoiding the maintenance requirements of brushes and slip-rings. Rare earth metals such as neodymium and dysprosium have always been in short supply and demand from competing applications such as electric vehicles is increasing. Moreover, the mining of rare earth metals is notorious for its adverse environmental impact.</p>
	Why should a prospector or funder be interested in this technology? faster/lighter/stronger/cheaper/efficient, etc. 200 words max.
List any Vetted Programs/Awards your tech has been acknowledged	DOE Energy I-Corps (2015)
	i.e., Prize, Challenge, Accelerator, Award Programs. 50 words max.
Any Government Awards/Contracts (list agency, amount, award-date):	
	i.e., SBIR, OTA, Grants, etc. 50 words max.
Any External Funding to Date (non-Gov.):	
	VC, corporate, angel, grants, etc. 50 words max.
Market Strategy, Customers & Partners:	<p>Having completed all of the milestones of its R&D program on Twistact technology, Sandia is now ready to work with generator OEMs to assist with the transfer of Twistact technology into next generation direct-drive wind turbines. Sandia is also open to partnering on the development of high-rpm Twistact</p>

	technology for applications such as electric vehicles or doubly-fed induction generators.
	200 words max.
Please document top 3 executive team members and experience:	<p>Dr. Wayne Staats is a mechanical engineer in the Energy Innovation Department at Sandia National Laboratories. He has led several multidisciplinary teams working on energy-related projects, such as a novel solid-state lighting thermal management platform and Twistact technology. Prior to joining Sandia, he studied at the Massachusetts Institute of Technology, where he developed correlations and design methods for a novel class of compact air-cooled heat sinks with integrated centrifugal fans that enhance air-side convective heat transfer.</p> <p>Dr. Jeff Koplow is a research scientist/engineer in the Energy Innovation Department at Sandia National Laboratories. Dr. Koplow is a serial innovator who specializes in multidisciplinary problem solving in the physical sciences and engineering. Dr. Koplow invented Twistact technology to enable proliferation of low-cost wind power solutions by addressing the reliability and market scalability problems in utility-scale wind turbines. He is also the inventor of the Sandia Cooler, a fundamentally new approach to air-cooled heat exchangers, and led the effort to mature this emerging technology from TRL 1 to TRL 5.</p>
	200 words max.
Would you like your tech to be considered for XXXXXX	<input type="checkbox"/> Yes <input type="checkbox"/> No