



PEREGRINE TURBINE TECHNOLOGIES

BREAKTHROUGH ENERGY & STORAGE UPDATE

WISCASSET, ME.

Peregrine Turbine Technologies, LLC today announced the formation of an international collaboration to field a commercial grade, long duration, thermal energy storage (TES) pilot plant. The First-of-Kind system will demonstrate breakthrough energy conversion and storage technologies at an active solar PV field by the end of 2022.

When There is Too Much of a Good Thing at the Wrong Time and Not Enough at the Right Time: Achieving 24-7 carbon-free energy means having clean energy available for every hour of the day on every grid. The intermittent nature of Solar and Wind power generation are causing significant imbalances in the grid. "Decarbonization and 24/7 clean electricity will require a massive increase in the grid's ability to store energy." G. Baker – Principal, GridWorks Consulting.

Advanced Technologies Combine for a Breakthrough Solutions: Both wind and Solar require clean, efficient, cost-effective, environmentally friendly energy storage in order to achieve even modest targets for penetration of renewables. Two proprietary, breakthrough energy technologies have been combined to bring a strong solution to that rapidly growing, global need.

Peregrine's Super-Critical Carbon Dioxide (sCO₂) Energy Conversion system, integrated with MGA Thermal's proprietary thermal storage technology, enables significantly lower annualized cost of storage than current Li-Ion Battery solutions, has more than twice the life, uses low-cost materials, and does not have the end-of-life reprocessing issues.

The breakthrough thermal energy storage system brings step-function improvement in long duration energy storage, defined by the US DoE as "a system that can store energy for more than 10 hours at a time".

A Commercial Level Pilot to demonstrate the Advanced TES System: Peregrine Turbine Technologies, MGA Thermal, and Cianbro Corporation's Power & Energy Group are working together to field a first-of-kind, 1 MWe/16.5 MWhr storage system at an existing Solar PV installation in Pittsfield, Maine by the end of 2022.

Energy Storage Technology Legislation: U.S. Senator Susan M. Collins, who has recently [authored a groundbreaking energy storage law](#), the Better Energy Storage Technology (BEST) Act, commented on this collaborative initiative:

“Energy storage technology holds great promise in the fight against climate change. Strengthening current technology and advancing next-generation energy storage will allow us to integrate more renewables, such as wind and solar, which in turn will help to reduce emissions. That’s why I authored the BEST Act, which seeks to align U.S. research efforts to promote advancements in energy storage technologies. This announcement by Peregrine is a prime example of the types of the exciting breakthroughs in energy storage technology that can be achieved to improve the efficiency of our nation’s electricity grid and bring us closer to a clean energy future.”

-U.S. Senator Susan M. Collins

Last week, the U.S. Department of Energy launched the “[Long Duration Storage Energy Earshot Initiative](#),” which will establish an ambitious goal to reduce the cost of grid-scale energy storage by 90 percent within the decade. The initiative is part of the comprehensive energy storage strategy created by Senator Collins’ BEST ACT.

ABOUT

Peregrine Turbine Technologies, LLC:

Peregrine Turbine Technologies, LLC (PTT) is a privately owned, Maine-based turbine technology company founded in 2012. It has developed the world’s first “High-Performance sCO₂ Turbine Engine”. The advanced turbine is a heat engine that can operate from high quality heat sources or air-combustible fuel, including NG, biomass, small modular nuclear and concentrated solar. PTT’s turbine has:

- 30X the energy density of steam
- Provides a 25% - 60% improvement in fuel burn and emissions over other gas turbine engines.
- Is a modular system with extraordinary demand-response capabilities. It is designed with autonomous integrated layers and results in rapid peak response at 50% lower LCOE than current technology Li-Ion batteries.

When integrated with MGA Thermal’s phase change technology, the system enables thermal energy storage with lower annualized cost/MW than current technology Li-Ion battery storage systems.

“We are delighted to have the participation and strong collaborative involvement of both MGA Thermal and Cianbro’s Energy Group. We are also grateful for the past and on-going support from Senator Susan Collins, Maine Technology Institute, Sandia National Laboratories, the US Air Force Research Laboratory and the US Office of Naval Research.

We believe that Peregrine’s integrated sCO₂ and miscibility gap alloy Thermal Energy Storage (TES) systems are positioned to bring strong, cost effective and environmentally friendly storage solutions to the rapidly growing Solar PV and wind energy markets.”

-David Stapp, CEO/CTO and Co-Founder, Peregrine Turbine Technologies, LLC.

MGA Thermal:

MGA Thermal Pty Ltd (MGA) is a privately owned, thermal energy storage technology company headquartered in Merewether, Australia. The Company has developed proprietary miscibility gap alloy (phase change) thermal energy storage technology that enables safe, efficient, high density, thermal energy storage. Their newly invented, modular system solutions enable rapid thermal charging with nearly 100% conversion of electricity to heat.

In February, MGA and PTT executed a Memorandum of Understanding between the two companies for the collaborative development of a distributed energy storage & electricity generation system capable of accepting renewably generated electricity and re-dispatching it on demand.

Regarding the collaborative development and pilot initiative:

"We are very excited to be working with PTT on this initiative. The system will be a game changer for solar and wind energy generators wanting to control their power dispatch"

- Erich Kisi, CETO, MGA Thermal

The Cianbro Companies:

Headquartered in Pittsfield, Maine, founded in 1949 by the Cianchette Brothers, and with annual revenues in excess of \$1Bn, Cianbro is one of America's largest, employee owned, open shop construction and construction services companies. It is ranked 8th by the Associated Builders & Contractors 2020 and is Ranked #101 Engineering News-Record's 2020 Top 400 Contractors. Cianbro's Company structure includes 11 different groups including its Power & Energy Group.

Cianbro's Power & Energy Group is a leader and active in many clean energy initiatives including a 10 MWe solar PV field near its operations in Pittsfield, Maine. Deploying a PTT-MGA technology TES system with long-duration storage at this location will enable a commercial grade demonstration of this first-of-kind TES and accelerate its time to commercialization.

"Cianbro and its team are excited about the opportunity to support such a technical advancement in renewable energy storage."

- Peter Vigue, Chairman of The Cianbro Companies

For additional product and technology information, as well as investment opportunities, please visit peregrineturbine.com or contact Robert Brooks, Chief Business development Officer at rbrooks@peregrineturbine.com