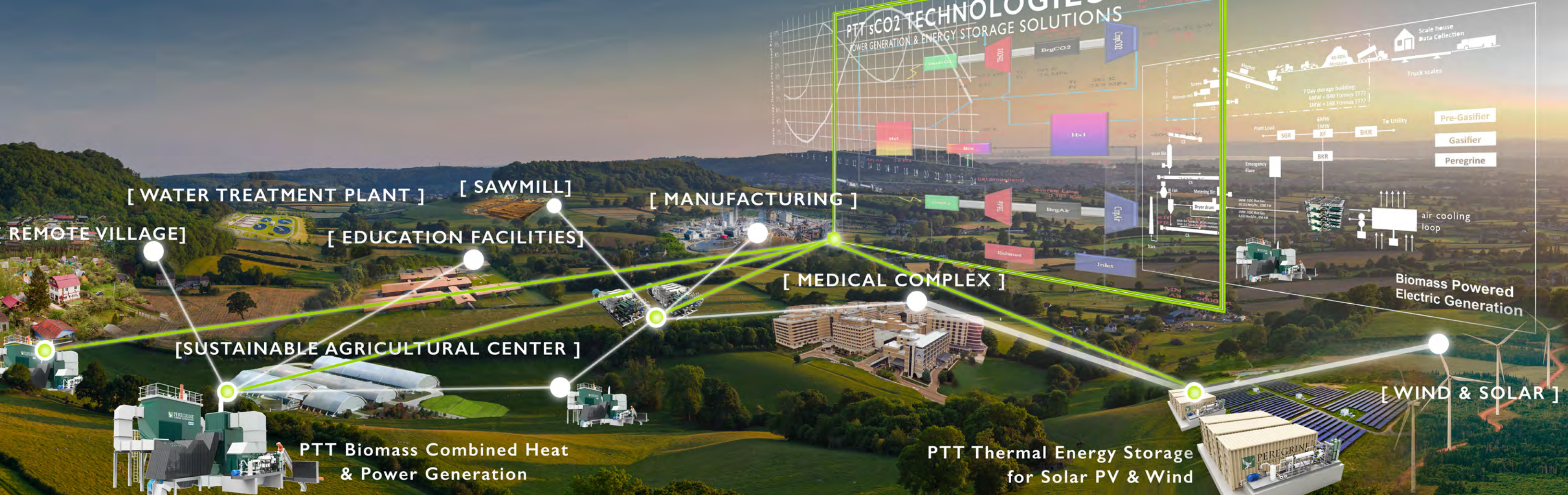




WELCOME TO  
**A NEW DAY IN POWER  
GENERATION & STORAGE**  
PEREGRINE TURBINE TECHNOLOGIES





# Enabling Access to Energy via Solutions Not Possible Before Now.

Our breakthrough technologies are changing the landscape of power generation. We are uniquely positioned to meet the demands of future platforms for advances in clean energy storage and conversion with a total energy management system.

Our novel closed-cycle turbine engine and energy storage technology will demonstrate the world's first economically viable alternative to grid-scale energy storage using Lithium Ion batteries. Our system lasts at least twice as long as batteries and costs about a third of what an equivalent Li-ion system costs.

We are bringing clean, affordable, sustainable energy solutions to the energy disadvantaged and emerging societies, and making a way for net-zero carbon goals to become reality for large scale grids.

# One Modular Design.

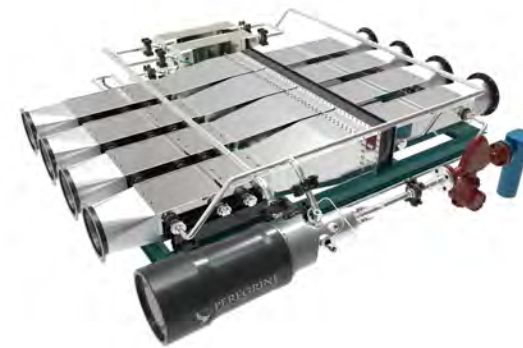
# Many Configurations.

# Many Fuel Sources.



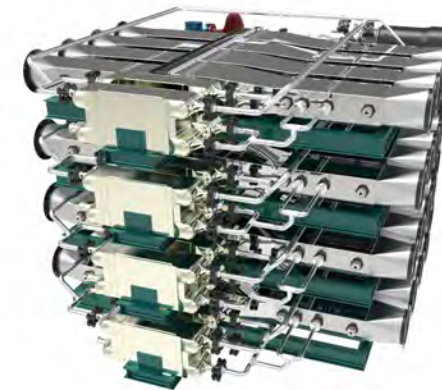
## Peregrine Merlin Series: 1 MW Power Generation System

- Pallet Based, Transportable Adaptable to mobile applications
- High electrical efficiency
- Variable speed operation for optimized off-design efficiency
- Application-specific design



## PEREGRINE FlatPak™ Series: 1 MW Single Core With Multi-MW Stackable Feature (1 layer shown)

- Stackable 1.0 single core layers
- Up to 5 MW integrated magazines
- High electrical efficiency
- Variable speed operation for optimized off-design efficiency
- Application-specific design without engineering development
- Excellent turn-down ratio, load following characteristics



## PEREGRINE FlatPak™ Series: Stackable Single Core and MultiCore™ Feature (4 layers shown)

- FlatPak™ functionality with on-line, MultiCore™ capability
- Almost 1.7 X Power Output with second core activated
- Peaking capacity available for fast dispatch/demand response
- HX's at stable operating temperatures



## PTT-KMW Biomass Systems

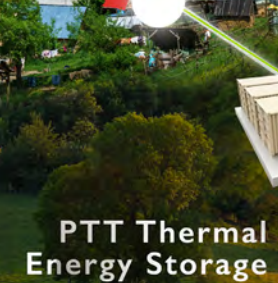
- Direct-fired biomass delivers best-in-class combustion efficiency
- sCO<sub>2</sub> Turbine provides best-in-class electric efficiency
- 2X better than conventional steam turbines
- 3X better than ORC's
- Heat transferred to cycle through a modular HX array

# REACHING THE ENERGY-DISADVANTAGED POPULATION

[ SUSTAINABLE AGRICULTURAL CENTER ]

[ REMOTE VILLAGE ]

[ WIND & SOLAR ]



## THE PROBLEM: ACCESSIBILITY OF AFFORDABLE ENERGY

A major barrier to clean, affordable, reliable energy in remote and emerging societies is most often the cost and lack of an energy infrastructure for the generation, transmission, distribution, and storage of power.

The transmission and distribution cost of delivered energy to the point of use in typical central power distribution circumstances often approaches 50% or more. The greater the distance from the central power generation source the greater the Transmission and distribution costs.

Current technology solutions for producing and storing energy locally are inefficient and at best, only marginally better than many central power generation systems.



## THE SOLUTION: CLEAN ENERGY AT THE POINT OF USE

**STEP Function Distributed Energy Resources (DER).** Over the past two decades, improvements in the generation and storage of clean energy at or near the point of need such as wind and solar, have provided increasing alternatives to large, dirty, expensive central power generation sources.

Peregrine's sCO<sub>2</sub> technology brings much-needed efficiency and safe storage to these clean power generation sources and safely delivers energy with consistency to energy disadvantaged areas.

**This new ability to convert locally produced and stored energy at the point of use is needed to accelerate the paradigm shift to making clean energy accessible, efficient, and affordable.**



# MAKING CLEAN BIOMASS ENERGY ECONOMICAL AND ACCESSIBLE



## THE PROBLEM

All forms of vegetation including plants, grasses, shrubs, bushes trees, and other forms of biomass, are the largest and most efficient form of solar energy storage on the entire planet .... And they are carbon neutral.

Unfortunately, the current best available steam technologies for converting this carbon-neutral stored solar energy to electricity and thermal energy are very inefficient, and subsequently biomass power generation is generally not economically competitive with other sources of energy.

## THE SOLUTION

**The Peregrine Turbine Technologies Biomass System.** Peregrine's sCO<sub>2</sub> turbine conversion systems nearly doubles the efficiency of current best available biomass co-gen technology, thus making it competitive with other mainstream fuel sources and at a small, local scale.

Importantly, it also has broad bio-fuel type conversion capability that covers 70% of available fuel types. It is also capable of operating on refuse derived fuels (RDF) and agricultural waste.



Peregrine's systems are able to operate from any air combustible fuel or high-grade heat source including biomass, biogas, concentrated solar, micro modular nuclear and natural gas. Locations that can operate from sustainable, local fuel sources often realize an additional economic benefit from driving the local supply structure.

The system can produce both electrical power and heat for agricultural, commercial and domestic requirements. It requires low manpower and low skill requirement support, making it ideal for rural and remote applications with limited infrastructure.

# BIOMASS



## LARGE SCALE CLEAN ENERGY OPPORTUNITIES

Peregrine's sCO<sub>2</sub> technology and biomass fueled power generation systems (electrical, heating & cooling) can compete directly with main-stream energy sources without subsidies and also provide other significant performance and application advantages.

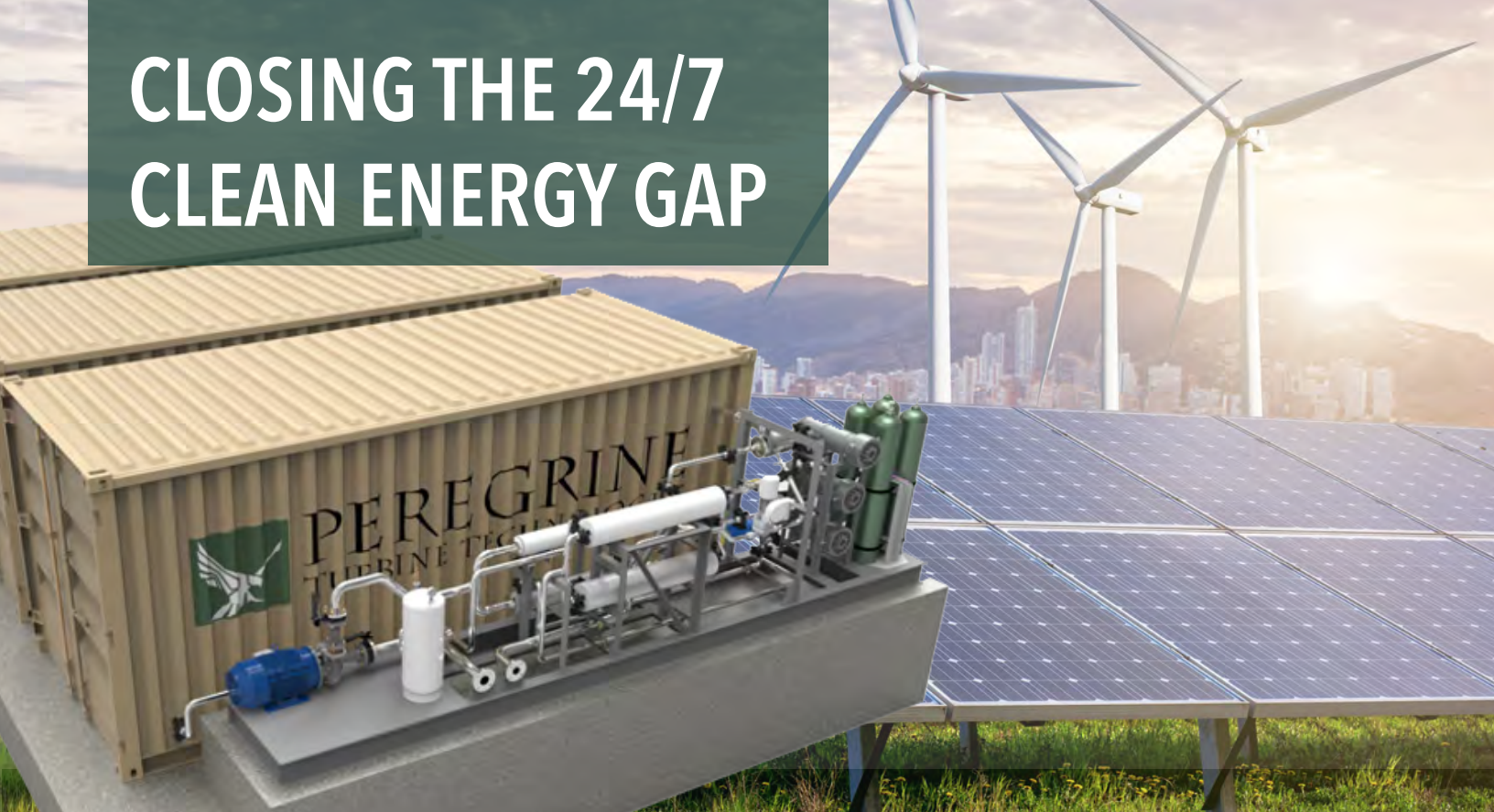
Peregrine's biomass conversion efficiencies will be transformational in global clean energy markets

It can be produced at or near the point of use, configured to specific application requirements, saving infrastructure, nonvalue added capital costs resulting in lower Levelized Cost Of Electricity (LCOE) and is "dispatchable".

- Best available biomass generator technology is steam turbines with a net efficiency of only 28% - 30% vs. PTT Integrated, Direct Fired system at 43% and PTT Pyrolytic systems at 41%.
- PTT generator system reduces feedstock input by approx. 50%\* and eliminates post combustor fuel cleanup.
- LCOE of PTT Direct Fired systems is 22% lower than best available Steam (Incumbent) Technology.
- PTT's standardized, modular package reduces capital, NRE, and on-site commissioning time.

\* Feedstock Input Reduction: A 6MW PTT Biomass Plant utilizes the biomass generation equipment to an equivalent of a 3.2MW steam turbine plant

# CLOSING THE 24/7 CLEAN ENERGY GAP



## THE PROBLEM

The intermittent nature of Solar and Wind do not align well with typical demand requirements, and over production is causing huge imbalances in the grid.

Reliable power 24/7 Clean Energy can't happen without a cost-effective long duration energy storage (LDES).

Existing energy storage relies on Li-Ion batteries which are expensive, have short life spans, and are toxic to the environment.

## THE SOLUTION

Peregrine's sCO<sub>2</sub> Enabled Thermal Energy Storage System enables true 24/7 carbon-free energy by storing wind and solar energy using breakthrough, patented sCO<sub>2</sub> technology combined with miscibility gap alloy thermal storage technologies.

This solution is economically competitive, providing an alternative to costly, large-scale chemical batteries and eliminating the need for fossil fuel back-up power.

The TES is 1/3 the cost of current battery storage solutions, has more than 2X the life and no toxic end of life reprocessing / disposal issues.



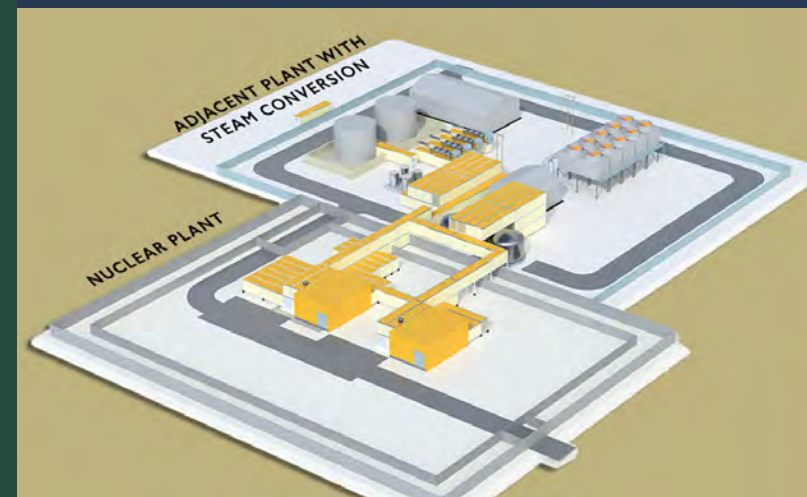
Long Duration Energy Storage (LDES) is essential to enable cost-effective solar and Wind generation in energy disadvantaged and emerging areas as well as large grids. Peregrine's TES integrates with stand-alone distributed energy applications as well as distributed grid applications.

# SMALL MODULAR REACTORS: THE NEW [SAFE + CLEAN] GAME IN TOWN.

## THE TECHNOLOGY

Small Modular Nuclear Reactors (SMR's) are a clean, new technology system not capable of meltdown should a worst-case malfunction occur. Fuel source sufficient for 10 - 60 years operation, displacing more than 1 millions tons of CO<sub>2</sub> and other emissions over its life time.

The new generation of microreactors are designed specifically for remote applications that are difficult to support with conventional baseload or renewable power. They are designed to meet their energy needs by providing safe, reliable and clean power to small populations dispersed across vast distances, despite harsh climate, geography, and other environmental conditions.



## THE PROBLEM

The current Adjacent Plant providing heat to power generation employ complex and inefficient steam turbines requiring significant water sources and licensed operator support. Additionally, the infrastructure and maintenance for steam technologies is extensive and not cost efficient.

## THE SOLUTION

Peregrine's sCO<sub>2</sub> turbine systems are a safer, more efficient means of converting nuclear energy into electrical power. Its' high energy density sCO<sub>2</sub> systems are 30X smaller, are 30% - 50% more efficient, are air cooled (no water cooling), do not require high level licensed operators, have significantly fewer wear parts, and are specifically designed for ease of field maintainability.

# OUR BREAKTHROUGH TECHNOLOGIES ARE CHANGING THE LANDSCAPE OF POWER GENERATION.

The Peregrine Turbine is uniquely positioned to meet the demands of future platforms for advances in integrated propulsion, power and thermal management; a total energy management system. We provide capabilities currently not possible with conventional and even advanced adaptive cycle engine technologies.



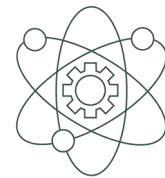
## ACCESSIBLE & SUSTAINABLE CLEAN ENERGY

Peregrine Power Generation & Storage Systems are designed to be transportable in standard ISO containers and with minimum field setup. The unique design and modular nature reduce the requirement for licensed operators and highly skilled service personnel, especially ideal for remote and off-grid communities and operations.



## MODULAR & CONFIGURABLE PRODUCT ARCHITECTURES

Peregrine's engine and storage products are scalable and configurable to specific applications, enable safe failover, as well as the ability to execute maintenance while operating at part power.



## BREAKTHROUGH TECHNOLOGIES

Peregrine's sCO<sub>2</sub> Engine Technology integrated with MGA Thermal's proprietary miscibility gap alloy thermal storage technology enable 24/7 wind and solar power supply. Additionally, it advantages biomass and nuclear energy production by efficiently and economically storing and converting heat to electricity.



## POSITIONED FOR GLOBAL MARKETS

The highest value, lowest risk for Peregrine's sCO<sub>2</sub> Technology is in the Global Distributed Energy Markets, and 70%-80% of the near term market value is in the 1MW- 20MW system size. Peregrine's modular product designs have significant advantage over the "one size fits all" of conventional offerings.



### DAVID STAPP

Co-Founder / Chief Executive Officer / Chief Technology Officer

President and founder of Peregrine Consulting, Inc. (PCI), Peregrine Turbine Technologies, LLC, and inventor of the Peregrine Engine:

David is a thirty-five (35) year veteran of aerospace engineering with expertise in Turbo-machinery design and analysis (military and commercial, aero and power-gen), UAV aircraft design (both rotary and fixed wing), structural design and analysis, as well as high-end computer server design and integration. He holds a BSME from the University of Colorado.

David began his career with GE Aircraft Engines in 1985 working on such projects as T700 production, GE36 design, CFE738 design, F412 design, and GE90 design, and CF34-8C design working on all rotating engine structures (high and low pressure compressors, high and low pressure turbines). David also conducted the life re-certification analysis for the CT7-5 LPT and similar work for the CT7-9 LPT.

In 2003 David's company won a Phase I and later a Phase II SBIR with the US Air Force Research Lab/ Materials Lab to develop a new methodology for determining the life consumed of highly-stressed rotating parts as a function of varied mission usage. More recently David teamed with Brayton Energy, LLC to develop a biomass and natural gas burning recuperated land-based power turbine in the 1.2MW class as well as structures design for a large scale solar energy farm in Arizona, and turbine design for an intercooled-recuperated turbo-shaft engine for an eighteen wheel application. He has also been a consultant to Samsung Techwin of Korea to assist in development of various frame and rotating components for the Korean Helicopter Program jointly developed with GE Aircraft Engines.



### ROBERT BROOKS

Co-Founder / Chief Development Officer

Bob is co-founder of Peregrine Turbine Technologies, LLC (PTT) and is serving as the Chief Business Development Officer and COO for the Company.

Previously, Bob has particular expertise in analyzing, developing, and implementing strategies and actions that optimize the value streams within a company and the markets served. He has a strong track record of bringing high impact solutions to mid and small market operating companies and Boards of Directors looking for step function improvements in EBITDA and Cash optimization. His value creation and commercialization expertise brings solid strategy and market development expertise to the commercialization the breakthrough sCO<sub>2</sub> products that the Company is developing.

Prior to co-founding PTT, Bob was a Principal for American Capital Ltd. (Nasdaq: ACAS), a private equity company with in excess of 220 portfolio companies and \$18 billion in capital resources under management. Bob's primary responsibilities at ACAS were to work with its portfolio companies, with and on their BODs, to identify and execute strategies and tactics that deliver profitable growth and increased value for their shareholders, customers, and employees. Bob has dealt with a wide range of Small to Middle Market companies.

Prior to joining ACAS, Bob was a Corporate Officer, Group Executive and Corporate Vice President of Strategy and Business development. He was responsible for operational due diligence and integration of the corporation's \$1 Bn "bolt on" acquisition program as well as for corporate-wide productivity and continuous improvement.

In addition to various earlier operational roles with Union Carbide and other diversified Industrial products companies, he served six (6) years with the US Army Corps of Engineers.

Bob is a Maine native and received his BS degrees from the University of Maine.



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