

# 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.

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.

## REACHING THE ENERGY-DISADVANTAGED POPULATION

[ SUSTAINABLE AGRICULTURAL CENTER ] [ REMOTE VILLAGE ]

PTT Biomass Heat & Power Generation

#### THE PROBLEM

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. PTT Thermal Energy Storage

### THE SOLUTION

**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.

WIND & SOLAR ]

Peregrine's sCO2 technology brings muchneeded 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



PEREGRINE

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 sCO2 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.



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.

# CLOSING THE 24/7 CLEAN ENERGY GAP

FG

#### 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 Lilon batteries which are expensive, have short life spans, and are toxic to the environment.

### THE SOLUTION

Peregrine's sCO2 Enabled Thermal Energy Storage System enables true 24/7 carbon-free energy by storing wind and solar energy using breakthrough, patented sCO2 technology combined with miscibility gap alloy thermal storage technologies.

This solution is economically competitive, providing an alternative to costly, largescale 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 systems 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 CO2 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 employs 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 sCO2 turbine systems are a safer, more efficient means of converting nuclear energy into electrical power. Its' high energy density sCO2 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.



A sustainable, more accessible clean energy future is underway. peregrineturbine.com