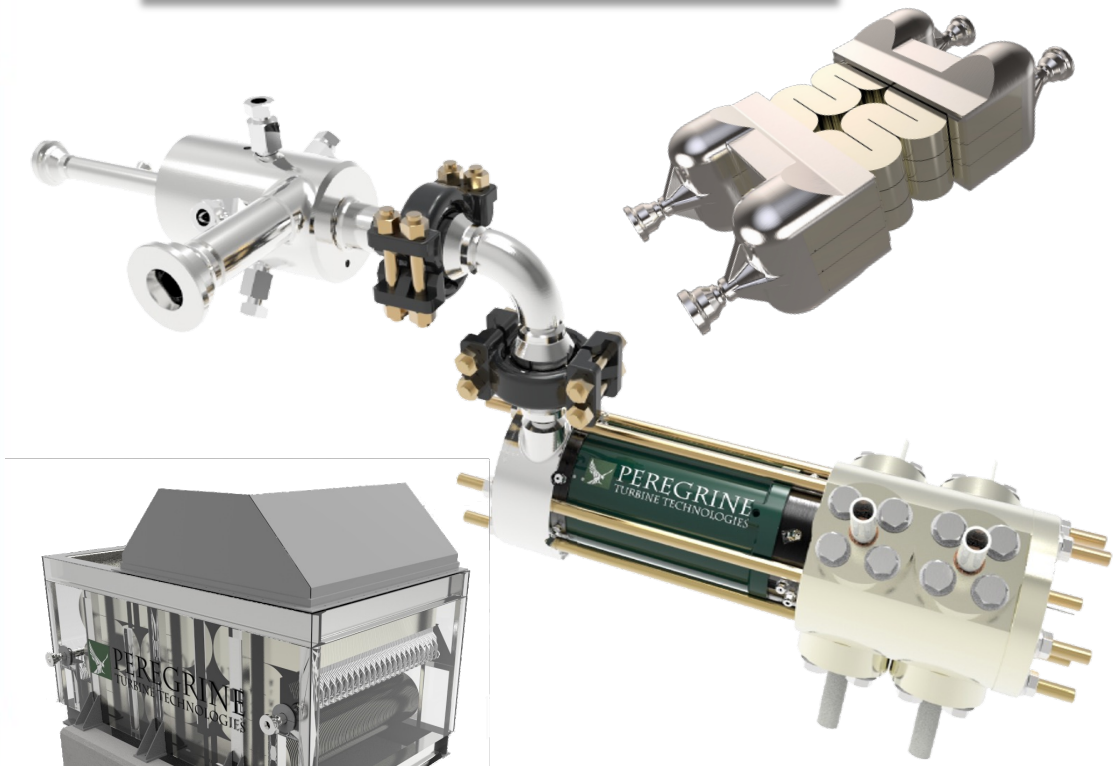
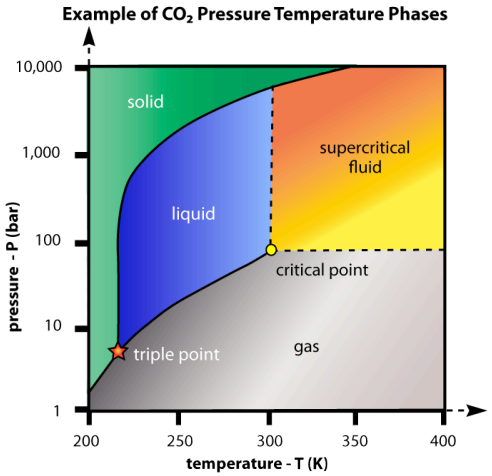
TRANSFORMATIONAL POWER CONVERSION TECHNOLOGY (Enabled By)

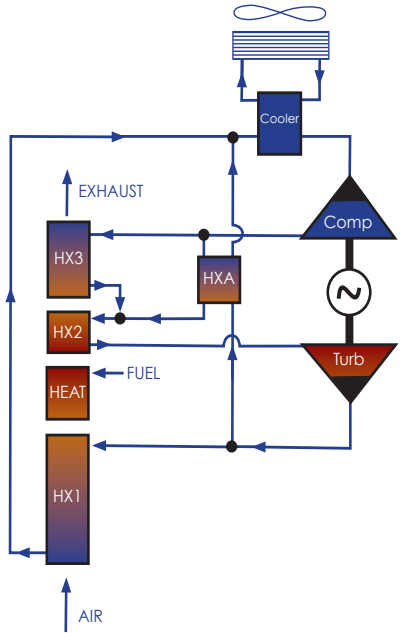
PTT's Proprietary sCO2 Turbomachinery & HX Design



Unique Properties of sCO2



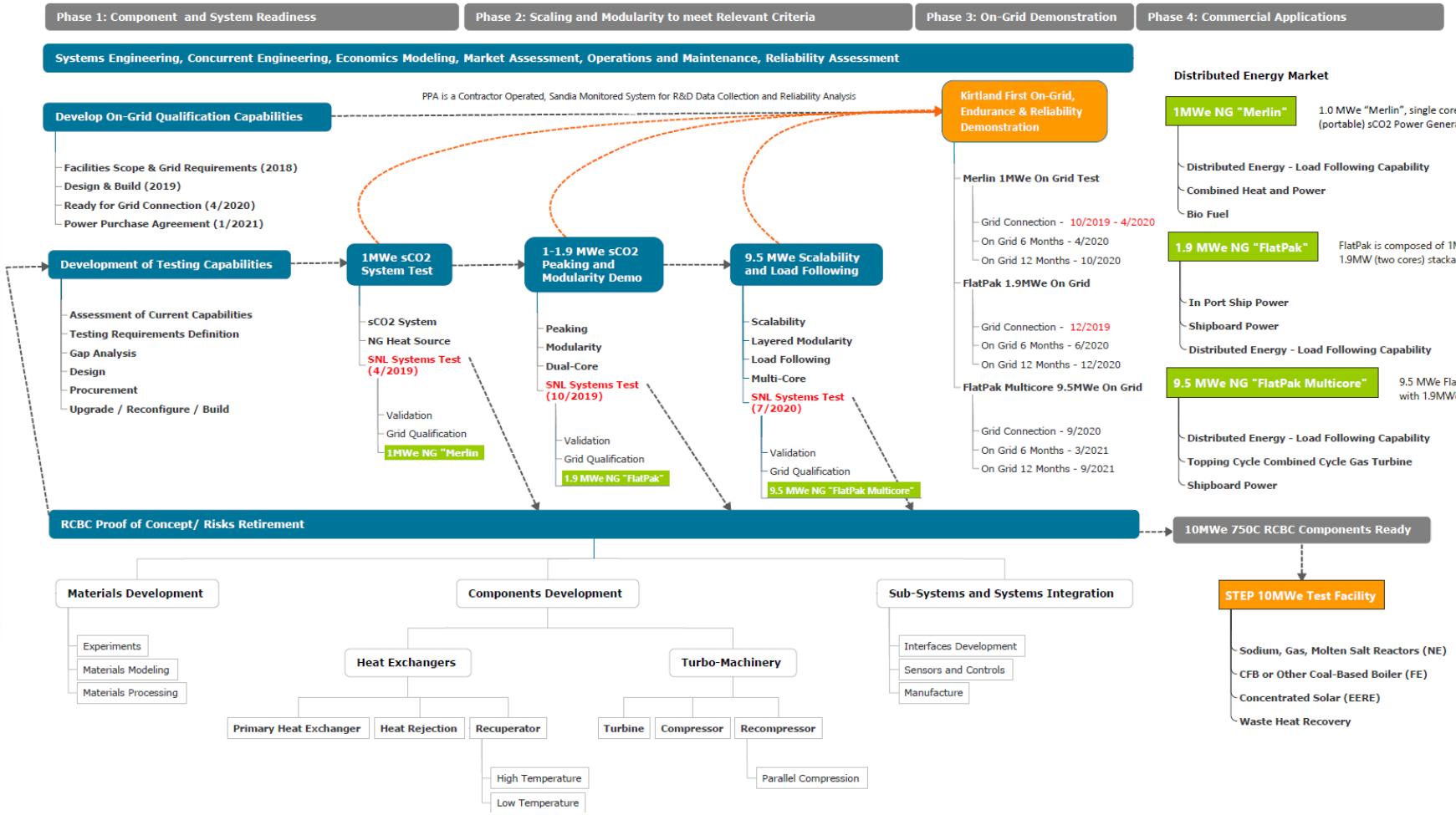
PTT's Proprietary Thermal Cycle



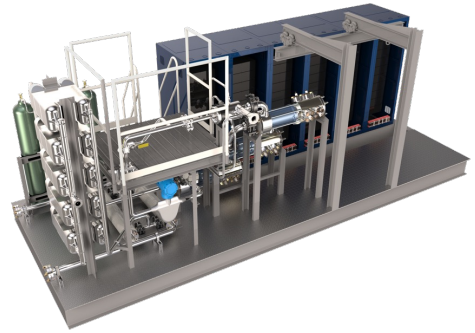
The Peregrine sCO2 Turbine has Market-Disruptive Potential

- High value-add features:
  - *20% - 60% fuel burn and emissions improvement*
  - *Fuel agnostic*
    - *Air combustible fuels including biomass/biogas*
    - *Small Modular Nuclear and CSP*
  - *CHP & thermal management capable*
  - *Superior Load following; Rapid Peaking*
  - *High Availability with N+1 Redundancy*
  - *30% lower LCOE compared to Li-ion batteries*
  - *Application-specific configurability*

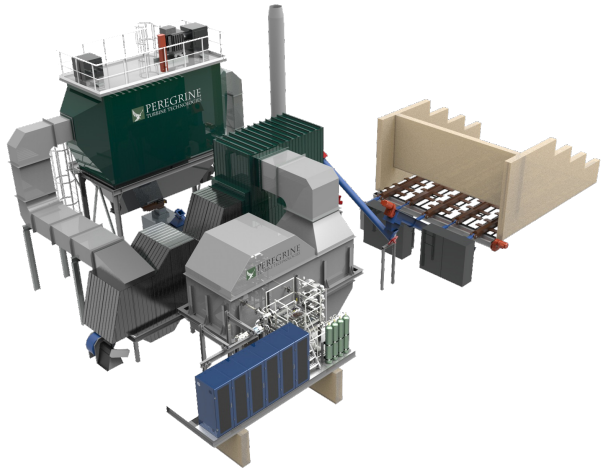
Peregrine's Product & Technology Development DNA is rooted in SNL's "Roadmap to sCO2 Power Cycles" Nuclear Energy Application Plan



PTT sCO2 Power Conversion Systems



PTT Biomass Systems



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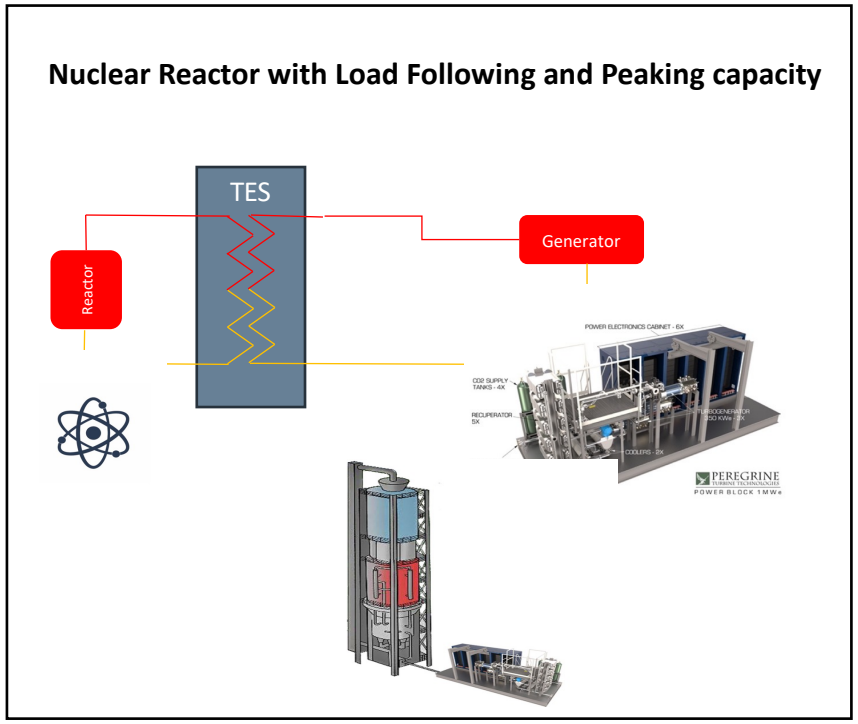
Advanced Nuclear Integration with sCO2 enabled LDTES and Conversion



- Cycle can be optimized for reactor and Primary Loop temperature range
- No major development to turbomachinery because of Closed Loop
- sCO2 channels and construction no change to existing process
- Integrated Thermal Storage provides enhanced Nuclear Power functionality
  - Load Following reactor with primary loop at steady state conditions
  - Peaking capacity through additional energy from storage

Architectural Study Take-Aways for PTT's sCO2 Systems Integration with Micro Reactors

Conversion Efficiency and Application-Specific Configurability Provides Opportunity For Reactor Optimization:

PTT's sCO2 Conversion performance and capabilities provide reactor developers with new choices for the optimization of their reactor designs beyond what is possible with current steam and air Brayton conversion technologies.

Significant potential impact on:

- Reactor size
- Reactor output
- Fuel Life

Reactor-Specific Use Cases, Performance/Capabilities Choices, and Techno-Economic Analysis guide early design decisions and ROI effectiveness.

*Internal PTT Study based on test results and computer modeling

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PTT's sCO2 system is:

- 1.5X the conversion efficiency of steam with MANY other "mission critical" advantages i.e. no H2O, black start, size, maintenance.
- 3X+ the conversion efficiency of modified Air Brayton Cycle gas turbine technologies
- **PTT is 5 to 7 years ahead of nearest sCO2 conversion competitor**

PTT sCO2 conversion system has its DNA roots in Sandia National Laboratories' sCO2 conversion development program as "the conversion technology" for the coming Advanced Nuclear Reactor deployment

PTT sCO2 Conversion vs Steam & Air Brayton in Nuclear Energy Markets

(Commercial & Military)

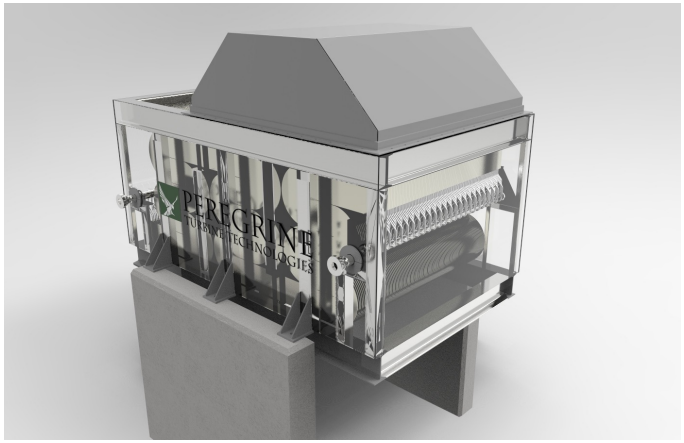
	NUCLEAR POWERED CONVERSION CYCLE		
Parameter	**PTT sCO2**	**Conventional Steam**	**Air Brayton Cycle (Air/NG)**
Specific Power: Design achieves high specific power	✓	⊖	⊖
Efficiency: High efficiency at low TIT	✓	⊖	⊖
Dry Cooling: Closed cycle system	✓	✗	✓
Packaging: Small footprint	✓	✗	✓
Number of Parts: Small and simple in construction	✓	✗	✗
Maintainability: Modular- packaged as field replaceable cartridge	✓	✗	✗
Reliability: High reliability & fewer parts	✓	⊖	✗
Maturity: TRL	⊖	✓	✓

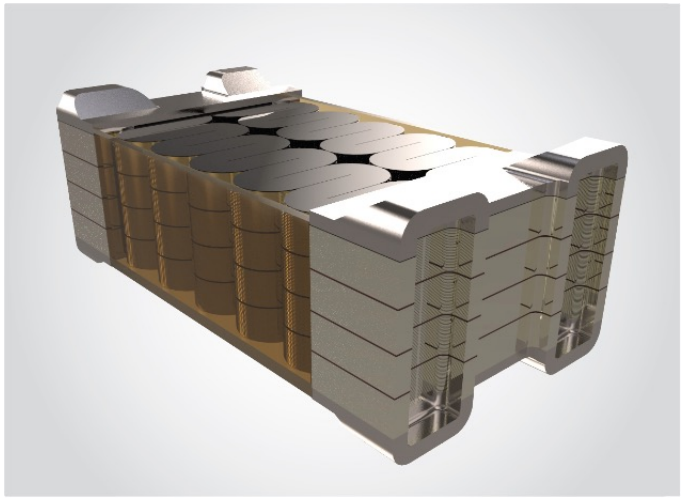
Assumptions:
Reactor Collant He • Intermediate HX to transfer heat to the conversion cycle • Gas turbine inlet is near ambient pressure

PROPRIETARY

PTT HEAT EXCHANGERS

PCHE DEVELOPED WITH AERO TECHNOLOGY





- Proven proprietary strain-tolerant HX architecture with trade-secret manufacturing processes developed and proven over years
- Counterflow arrangement with high thermal effectiveness in compact package
- High temperature high pressure capabilities
- Demonstrated robust design tested at Sandia National laboratories and in PTT test laboratory.

Flexible architecture lends itself to limitless repackaging for:

sCO2 to sCO2
supercritical fluids on hot and cold streams

sCO2 to He
supercritical fluid to moderate pressure stream, such as nuclear He reactor cooling

sCO2 to Air
supercritical fluid to atmospheric pressure stream, such as air cooling or flue gas heating

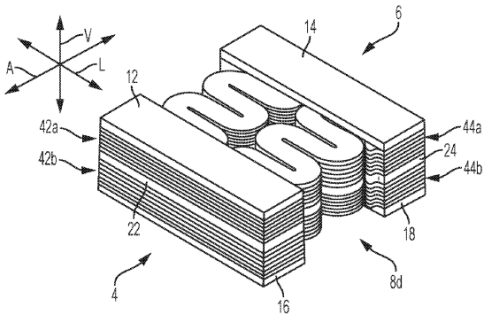
Notice of Allowance

Application No. 14/832,984

Heat Exchanger for a Power Generation System

"The application above has been examined and is allowed for issuance as a patent." Dated September 17, 2018.

Abstract: The present disclosure relates to heat exchanger for a power generation system and related methods that use supercritical fluids, and in particular to a heat exchanger configured to minimize axial forces during operation.



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PTT Proprietary Heat Exchangers

- Compact Heat Exchanger Technology (PCHE)
- High-Integrity Diffusion Bonding
- Durable Header Design
- Proprietary Design with Patented Features
- Thermomechanical Fatigue (TMF) Resistant
- Impervious to blockage
- Tailorable to various gas heat sources
- Modular Design Can Be Sized to the Application
- Minimal Weight

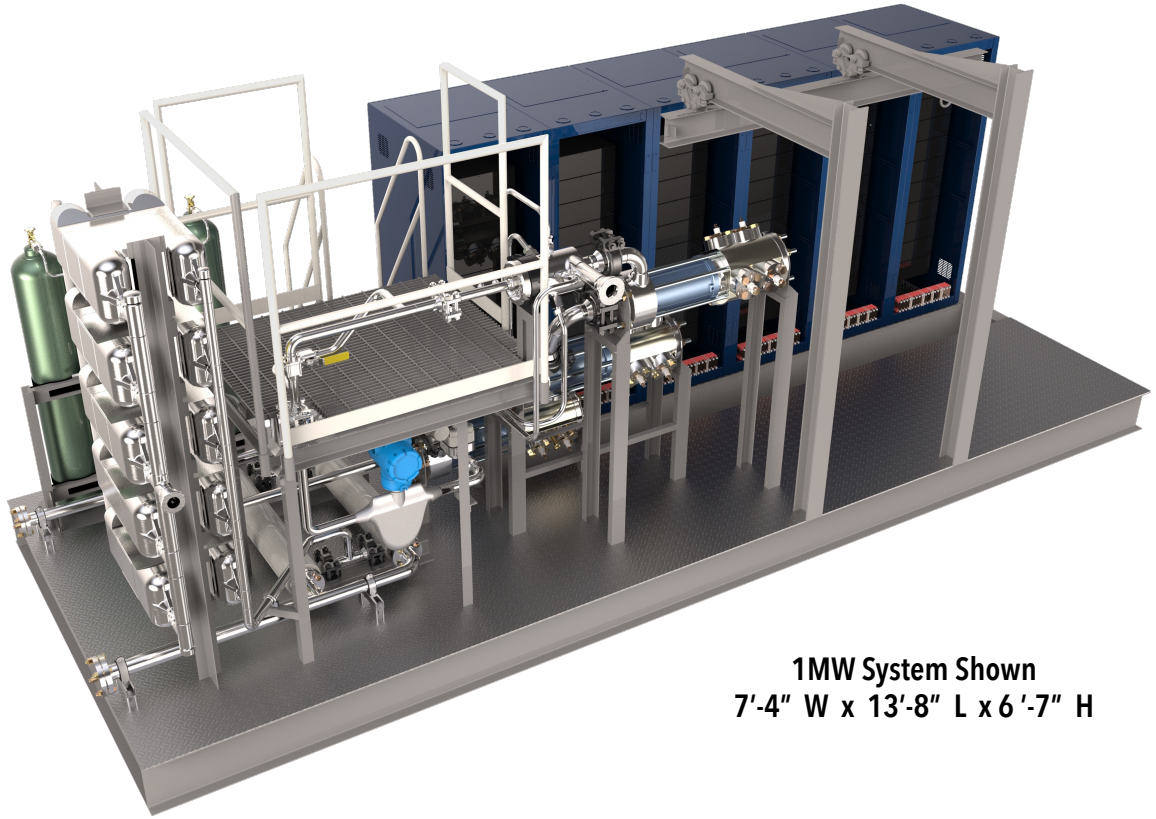
PTT Nuclear Energy Systems

Configurable sCO2 MMR Power Conversion Systems For Advanced Reactor Optimization

COMMERCIAL CONFIGURATION

Merlin™ Series

350 Kw • 700 Kw • 1.0 MW



1MW System Shown
7'-4" W x 13'-8" L x 6'-7" H

Peregrine's sCO2 Conversion System vs. Conventional Steam

- Higher Efficiency – 35% - 48% for Peregrine vs. 32% for conventional steam
- Lower cost/MW
- No water required; No phase change (dry cooling)
- Oil-free
- Black start capability
- Modular construction at component and system levels
- Significantly fewer moving parts/wear parts (increased reliability/availability)
- Enhanced field supportability with cartridge-style, field replaceable turbomachinery
- Operates at higher temperature (750C) allowing optimization of reactor (smaller size or greater output than with steam conversion)
- Smaller physical footprint (30X greater power density)
- Lower skilled in-field service support and short service to run times
- Benign Failure Heat Exchangers
- Increased load following capabilities
- Lower first costs
- Minimized in field construction requirements and time
- Strong fit for DOD/DOE base energy surety, remote communities, and industrial applications with limited support of infrastructure.

New Nuclear Energy Markets

(Commercial & Military - SPACE and Terrestrial)

PTT NUCLEAR ENERGY SYSTEMS

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DEMONSTRATION SITES & STATUS

TARGETED DEMONSTRATION:

- PTT is in multiple initial stage "architectural" discussions with leading micro reactor development companies in the US, Canada, and France.
- Peregrine has executed a Memorandum of Understanding (MOU) with the leading advanced micro-reactor developer outlining our collective intent to test PTT's sCO2 conversion system with their advanced reactor at Idaho National laboratory's DOME facility.
- The Company is also pursuing different sCO2 to NU test programs at certain US based universities and Canadian test installations.

New Generation Nuclear Energy Markets

(Commercial & Military)

Mission Critical Hurdles

PTT NUCLEAR ENERGY SYSTEMS

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MMR and SMR developers must clear two hurdles to be long term commercially viable:

- The first is to develop and gain approvals for their reactor designs including establishing demonstrator units at Idaho National Lab (IDNL) asap.
  - The leading companies have been acknowledged, funded, and are rapidly moving down this track.

- **The second is for their reactors to become financially and physically viable and competitive.**
  - **The single largest STEP function opportunity to optimize their reactor designs and performance is, by an order of magnitude, the "conversion of heat to electricity".**

New Nuclear Energy Markets

(Commercial & Military)

PTT NUCLEAR ENERGY SYSTEMS

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ADVANCED NUCLEAR DEVELOPMENT:

- The new family of rapidly evolving, safe, highly efficient reactors is now a very high priority for:
  - US DoD "energy surety"
  - Decarbonization in energy intense industrial applications such as data centers and steel, cement, glass, and other industrial processes
- The interest level in PTT's sCO2 conversion system from Nano, Micro, Micro Modular, and Small Modular nuclear reactor developers is very strong and increasing domestically and internationally.
- PTT formed PTT NES to "position" the Company to respond to the growing market pull.
- PTT is in active discussions multiple MMR and VSMR companies in US, Canada, UK and France for ground and space applications
- PTT is in multiple initial stage "architectural" discussions with leading MMR company and expect additional interests from others.