

 SBIR/STTR SUCCESS



PRECISION COMBUSTION, INC.

How can one technology change the world? That is one way to look at Precision Combustion, Inc.'s (PCI) strategy for its catalytic reactor technologies. PCI is a clean energy technology company developing and manufacturing advanced performance catalytic reactors and systems for energy and environmental applications. With multiple applications for its technology, PCI has established a strategy that helps the company to remain sustainable while taking technical risks.

PHASE III SUCCESS

Phase III follow-on commercial and DoD funding for the Microlith® reformers is in excess of \$20 million to date.

AGENCIES

DOE, DoD, NASA, EPA, NSF, USDA

SNAPSHOT

PCI is helping move the U.S. to a hydrogen economy, one catalytic reactor at a time.

PRECISION COMBUSTION, INC.

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Founded upon two SBIR awards, PCI has grown to become a world leader in innovative catalytic system technology, with 35 employees, 80 U.S. patents, multiple licensees and a wide customer base comprising both large and small businesses, universities and other research institutions across the globe as well as the U.S. government. Innovation, effective collaboration and system solutions providing high value and quality are key success factors, as is a strategy of focus and leveraging technical synergy, a necessity for a small business. Applications include enhanced stability catalytic combustors, high performance Microlith® fuel reformers, regenerable air filters, and catalytic steam generators.

“We start with a market push, not a market pull strategy,” said PCI President Kevin Burns, “We take what we know, catalytic reactors, and say ‘how can we use them to solve problems?’” In addition to identifying new application areas for the technologies, these brainstorming strategy sessions consider other factors as well including whether there is an established path for the technology and whether there is enough potentially-added value. PCI focuses on developing new, novel solutions for previously unmet needs, avoiding “me too technologies,” as Mr. Burns explained. By combining technology synergy with a portfolio strategy the company is able to take greater technical risk and pursue multiple innovations simultaneously. PCI’s portfolio of developing technologies thus contains common technical elements and initiatives across a range of market applications directed to the company’s vision of clean energy solutions for the 21st Century.

A notable success has been PCI’s innovative suite of catalytic fuel reforming technologies, which enable ultra-compact components, unique performance and high efficiency. Applications include fuel cell systems, internal combustion engines, burners, and hydrogen generation. For example, PCI’s Microlith® Compact Logistics Fuel Processor® reformer systems, initially developed with Army and Navy SBIRs, combine novel, short contact time catalytic elements with unique process-intensified reactor design and balance of plant. These allow military and commercial fuel cells to use conventional liquid fuels, including

military logistics fuels containing sulfur such as JP-8. This enables practical military use of emerging efficient, quiet and high reliability fuel cells. Commercial applications are driven by interest in using conventional liquid fuels and natural gas instead of hydrogen. Spinoffs have included PCI's technically-related fuel conditioning technology allowing improved burner performance and internal combustion engine operation, and system level innovations improving in energy efficiency, logistics, and environmental impact.

"SBIR is a great program for funding basic and initial research and development for new technologies, developing skills, and bringing innovations to market. With SBIR the awards are truly merit focused, and this requires being capable and innovative," said Burns.



Precision Combustion's clean energy technologies are finding uses in a variety of industries.

PCI has used SBIR support for early stage breakthroughs and development, and leveraged that work toward advanced development and prototype purchase from the Federal government and from private industry. Phase III follow-on commercial and DoD funding for the Microlith® reformers is in excess of \$20 million to date.

PCI also attributes its success to its location - Connecticut. Burns notes that the state is full of highly skilled people and contains many high capability suppliers. In addition to cultivating a highly skilled, team oriented, and flexible employee base, PCI works to grow the company and secure its market position through its intellectual property and portfolio strategy. By cultivating and maintaining components used in a variety of industries and on a variety of product lines the company helps to insulate itself from macroeconomic forces – each product has its own unique strategy, but they all play into the company's goal of advancing a synergistic set of technologies to the market.

"PCI's reputation as an innovative and dependable partner has helped cultivate its partnerships and opportunities within industry," said Burns. "We don't over-promise and have built up levels of trust and experience over time with our customers and partners." PCI's clean energy technology has advanced American energy efficiency and energy independence while improving environmental impacts. The solutions benefit both customers and the company's active supply chain of other high tech companies and regional manufacturers making subcomponents to PCI specifications. The company has also championed STEM through relationships with universities and public schools, and has actively supported the development of other high growth potential technology businesses. PCI has been the subject of nine agency SBIR success stories, three Tibbetts awards, two Army SBIR Achievement Awards (2008 and 2010), and multiple other recognitions.