of between 1 and 5 percent may be small compared to the total energy used in pipeline pumping, the total national energy savings can be substantial. Many other compressor applications are envisioned. This technology was the basis for a new business that has grown to be a multimillion-dollar firm; its president was named 1986 Innovator of the Year by the Small Business Administration. A product line suitable for smaller compressors has already been developed.

High-Efficiency Water Heater

In 1977, an inventor was awarded a DOE grant to install his direct-contact, gas-fired hot water heater in a new 210-unit apartment building and measure the system characteristics, efficiency and reliability. The high-efficiency water heater is designed for commercial and industrial use and employs a unique design which blows a natural gas flame directly into a "rain of water." Because the temperature of exhaust gases is equal to ambient temperatures, there are no stack losses and a hot stack is not required, reducing installation costs. The efficiency of the unit exceeds 98 percent. After the performance claims had been established, the inventor was able to license his technology, and multimillion-dollar sales were achieved in 1987. A stack economizer spin-off technology is also being marketed with increasing sales.