

Sound waves turn natural gas into liquid

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Worldwide, 100 billion cubic meters of natural gas is wasted every year. Now, the Denver-based company Swift LNG aims to turn that gas into a usable liquid fuel with a thermoacoustic natural gas liquefaction technology just licensed from Los Alamos National Laboratory.

The thermoacoustic natural gas liquefier converts heat into sound waves and then converts the hot sound wave energy to cold refrigeration using highly pressurized helium contained in a network of welded steel pipes. First, the system combusts a small fraction of the natural gas to heat one end of the steel pipe network. Then, the resulting acoustic energy refrigerates the opposite end of the network, which cools the rest of the natural gas. At minus 160 degrees Celsius the natural gas liquefies - rendered dense enough for economical transport. This technology requires no moving parts, contributing to its economy of operation.

According to a study done by the United States Government Accountability Office, every year about 3.3 trillion cubic feet of natural gas is flared or vented - burned wastefully or released into the atmosphere - across the globe, enough to meet the natural gas needs of France and Germany for a year. In addition, some 5,000 trillion cubic feet of undeveloped and unused natural gas deposits exist around the world in well fields that are too expensive to develop due to their size or location.

"Using this wasted or dormant clean energy resource will address environmental concerns and help solve the world's energy problems," said Greg Swift, one of the Los Alamos inventors of thermoacoustic

technology. While Swift LNG bears his name, Swift remains a Laboratory scientist who owns no interest in the company.

"Today, capturing natural gas requires costly ultracold natural-gas liquefiers the size of oil refineries," said Swift. "But our thermoacoustic liquefier should be economical at a smaller size, useful for remote corners of the world where smaller gas fields are available. I'm especially eager to capture the associated gas that often comes out of the ground as a byproduct of oil production."

Swift LNG plans to have the commercial thermoacoustic liquefaction system ready for use by 2010.

Source: Los Alamos National Laboratory

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