



Qnergy Media Kit

About

Qnergy provides a low-maintenance Power Generator that turns methane waste into useful energy. The technology is based on a linear 'Free Piston' Stirling Engine with no rotating parts, meaning no need for lubrication and maintenance. The engine is designed to operate on any fuel including unrefined methane from natural gas fields and biogas. More than a thousand units have already been successfully deployed.

www.qnergy.com

Company Data

100 Customers have Installed about 1,000 Systems

- 80% Energy production companies. The rest are energy transmission and telecom companies
- Americas Focused - 75% in the U.S., 15% Canada and 10% Latin America
- 40% in areas with extreme environmental conditions: freezing temperatures, hurricanes, sand storms, earthquakes and off-shore

Longest running maintenance-free system in the field: 42,500 hours (equivalent to 5 years of continuous operation without any oil change or lubrication)

- The equivalent Internal Combustion Engine requires maintenance every two weeks with continuous operation
- Longest running system in NASA's laboratory: >120,000 hours
- Accumulated hours across all systems: 11,500,000 hours



Superior Climate Performance – each system abates the emissions of about 400 cars

- 22 tons of methane abated per system per year (equivalent to 1,848 tons of carbon dioxide or 400 cars off the road)
- Year to date (September 2022) – abated 200,000 tons of carbon dioxide equivalent (tonCO_{2e}). It is equivalent to 65,000 cars off the road

Operations

- 100 full-Time Employees
- 90,000 square-foot Manufacturing facility in Ogden Utah
- Sales in Texas and Canada; Business Development in Boston

Media Contacts and Executive Bios

Ory Zik, Ph.D., CEO

ory.zik@qnergy.com

<https://www.linkedin.com/in/ory-zik-2813a6b/>

Extensive leadership experience in sustainable energy and climate. Previous roles include co-founder and CEO at Solar Energy company Heliofocus Inc., Founding CEO of Energy Analytics company Energy Points Inc., and Founding CEO of Imaging company QuantomiX Inc. Holds a Ph.D. in Physics from the Weizmann Institute of Science and multiple Worldwide Patents. As an environmentalist, Ory is known for founding and leading the Israeli Branch of Greenpeace.

Kevin Pang, Ph.D., MBA, Vice President of Business Development

kevin.pang@qnergy.com

<https://www.linkedin.com/in/kevin-pang-strategyandinnovation/>



Extensive experience in sustainable energy and innovative technology. Previous roles include VP of Global Consulting at Lux Research Inc., CEO of KYOS Systems Inc., and the VP of Decision Resources Group. Ph.D. in Physiology and Biophysics from Harvard University and his B.S. in Genetics and Molecular Biology from the University of California, Berkeley.

Media Assets

Various logos in SharePoint folder:

<https://appriver3651010582.sharepoint.com/:f:/g/EmlDcWN5Z09Fhomm5VtozfMBRmOie-ZLUXW7AOM3jQ53KQ?e=ledchS>

High-resolution photos:

<https://appriver3651010582.sharepoint.com/:f:/g/EvyrABI2vJBiCbXjOZk-k0Brt0sBtr5JqHp6LcDTvvQ-Q?e=pU4Kov>

Recent Announcements

- Qnergy recognized for its climate technology innovations
- Qnergy is Proud to Offset the Emissions of All the Cars in Ogden, Utah! [LINK](#)
- TotalEnergies and Qnergy remove 98% of vented methane emissions [LINK](#)
- Qnergy Announces the Installation of its first Biogas-Landfill Methane Conversion Generator with Maryland Environmental Service [LINK](#)
- Pioneering engineering firm Qnergy targets new ESG markets as corporations prioritize methane mitigation in the fight against climate emergency [LINK](#)

Digital Presence

Qnergy routinely publishes news in the following locations:

- Company Website: <https://www.qnergy.com/blog/>



- Company LinkedIn: <https://www.linkedin.com/company/1615959/admin/>

Youtube:

<https://www.youtube.com/@Qnergy/videos>

Corporate History and Key Milestones

Qnergy's starting point was an engine that originally developed by engineers commissioned by NASA for high rigor deep space applications ¹.

Qnergy reduced the engine cost and adapted it for terrestrial applications.

2005..... Stirling Energy Technology (STC) changed its name to Infinia. Raised approximately \$300 million to further the technology

2009..... Ricor Solar founded as a subsidiary of Ricor to leverage Ricor's Stirling expertise in the energy market

2013..... Ricor Solar acquires Infinia's assets and founds Qnergy

2017..... Power Gen 5650 beta testing 'try and buy'. 100% success: All beta customers bought their trial units

2018..... PG5650 launched for commercial sales

2019..... 200% growth; first multimillion dollar order from Tier 1 customer; launch of Qnergy's methane abatement program

2020..... Continuous growth despite the COVID-19 slowdown

¹ NASA announced in March 2020 that a free-piston Stirling power convertor developed by Qnergy's engineers at STC (acquired by Qnergy) accomplished about 14 years of maintenance-free operation in the Stirling Research Laboratory at NASA's Glenn Research Center <https://www.nasa.gov/feature/glenn/2020/stirling-convertor-sets-14-year-continuous-operation-milestone>



2021..... Qnergy customers had full power through state-wide outage caused by Texas hurricane. TotalEnergies publishes an order of 100 methane abatement units from Qnergy

2022..... Expansion of the Ogden manufacturing facility to meet the growing demand

Technology

Qnergy uses a technology called a 'Free Piston Stirling Engine'. The Free Piston Stirling Engine is a linear engine with no rotating parts, no lubricants, and the ability to run for years with zero engine maintenance, even in extreme environments. The Stirling Engine is also called an 'external combustion' engine since the fuel is always external to the engine. This external combustion property allows the engine to work on 'dirty' unrefined fuels and maintain its extremely high reliability.

The original Stirling engine was invented by Robert Stirling in 1816. It is also called external combustion engine because heat energy is applied to the outside of the device. In the early 1960s, William T. Beale of Ohio University invented the Free Piston Stirling Engine to overcome the difficulty of lubricating the crank mechanism common to Stirling systems up till that time.

Like any heat engine, a Stirling engine converts heat energy to mechanical energy (work) by repeating a series of basic operations, known as its cycle. Stirling engines use pistons but the engine itself is sealed to the atmosphere.

The heat is transferred to the engine's working gas through the walls of the primary heater. The engine is a completely closed system. The working gas (helium) forces the pistons in the engine to move, compressing and expanding the working fluid, thus producing mechanical energy that can be used to drive a generator and produce electricity.



The motion in the Free Piston Stirling Engine is linear and the piston is suspended on flexures, giving rise to the name Free Piston Stirling Engine. The engine is contactless (i.e. no contact between moving parts, fully sealed and requires no lubrication or oil change). Since the Free Piston Stirling Engine has no manual linkages, both the reliability and life expectancy of the engine are increased as there is nearly no wear in the system.

Products

PowerGen

Qnergy's lead product is the "PowerGen". It is a power generator based on the Free Piston Engine technology. Our typical size is 5.5 kilowatts of electric output delivering uninterrupted, 24/7 sustainable power. Our generators can be bundled together to create larger generation solutions.

Methane Abatement Solutions

CAP3- Methane Abatement Package

Allows operators to replace methane emission in pneumatic devices in gas fields with clean instrument air. Air is compressed using our PowerGen, which combusts the normally vented methane, while providing reliable electric power and dry, clean instrument air.

"Powered by Qnergy" Developer Program

Is designed to leverage external innovation by allowing other organizations to develop new applications for our engine. A public example is the [MARVEL](#) small nuclear program led by Idaho National Laboratory (INL).



Dashboard

All our PowerGen units are connected to our central cloud based, IoT platform that connects the system through an amplified cell signal and satellite access. This capability allows Qnergy to perform real-time analytics as well as provide our customers with 24/7 live support and early failure alerts.

Competition

Although many companies, including multinationals like Sanyo, Toshiba, Philips, and Mitsubishi have tried to develop a commercial Stirling Generator, Qnergy is the only company that today offers a commercial Stirling-based power generator.

Qnergy's success is rooted in coupling modern power electronics (firmware and hardware – the same technology that is used in solar inverters) with precision manufacturing (laser welding, robotics, and more) and advancements in material science to build the most reliable Power Generators in the market.

The Qnergy Future

Turning Wasted Methane into Useful Energy

Qnergy already delivers the energy platform that productively utilizes methane at its source and can be connected into a wide range of devices requiring power and/or heat, from pneumatic devices in distant gas fields to emitted methane from legacy landfills to digesters on farms, kitchens, and residences.

In the future the company will grow into converting all distributed methane prior to release into the atmosphere is one of the biggest opportunities for reversing impact to the environment. Rather than seeing methane merely as a GHG to be



mitigated, we need to also see it as a useful fuel to be harnessed. We need to evolve a new way of thinking and technologically addressing the distributed nature of methane throughout its many production streams. A truly global solution therefore needs to be fundamentally distributed in nature instead of our traditional reliance on highly centralized, costly, large transport and infrastructure approaches, which to date have been inefficient in capturing and converting methane.