2G Cenergy Produces First Dedicated Hydrogen Internal Combustion Engine Powered CHP

2G's hydrogen CHP cogeneration systems reduce CO_2 emissions to near zero

St. Augustine, FL, June 4, 2013 – 2G CENERGY announced that the 2G Group began production of dedicated hydrogen fueled CHP (combined heat and power) cogeneration systems with 6- and 12-cylinder engines, making it the first CHP manufacturer in the world to do so.

"These engines represent a significant milestone in 2G's research and engine development efforts in hydrogen technology," said Christian Grotholt, President & CEO of 2G Energy AG. *"We have learned a great deal about hydrogen powered internal combustion engines during the development phase of this engine family."*

2G's hydrogen internal combustion engine family is much more than just an advanced production engine. These CHP systems are specially prepared to burn hydrogen as a fuel, but are based on the same modular engine series that powers many 2G CHP products fueled by natural gas, biogas, or other specialty gases. Significant efforts were made to optimize this engine for hydrogen fuel to achieve maximum efficiency and robust durability. Prior to production, 2G dedicated years to development and performed thousands of tests on the factories' engine test cells to ensure optimum durability and performance. The engine development process replicated the same stringent durability standards applied to all other 2G CHP engines.

2G's IL6 and V12 hydrogen-fueled engines are powering 2G's *agenitor*® 306 and 312 CHP systems, which have many advantages when utilized for CHP such as high efficiency (up to 41%), and near zero emissions of regulated pollutants and greenhouse gases (CO_2). NOx emissions are also reduced by more than 75%.

The first units have been installed at the new Berlin Brandenburg Willy Brandt Airport energy station, and are now operated by the multinational oil & gas consortium TOTAL, renewable energy company ENERTRAG, and the LINDE Group. Additional hydrogen fueled cogeneration systems will be delivered to customers later this year. Hydrogen internal combustion engine technology represents an important step toward enabling hydrogen to become a more broadly available CHP fuel.

The fluctuating hydrogen fuel produced by electrolysis is captured by a unique patented technology for storing hydrogen in solid form (metal hydrides) at low pressure, dramatically improving security related to hydrogen storage. This storage enables the permanent supply of hydrogen fuel for the 2G CHP system. Dual fuel technology also allows the cogeneration system to operate with natural gas.

While the hydrogen internal combustion engine cogeneration systems will provide valuable real-world experience, 2G is also conducting research into next-generation hydrogen internal combustion engines, including additional advanced features to enhance power and fuel economy even further. *"We have only scratched the surface in terms of what can be achieved with hydrogen internal combustion engine technology and are serious about maintaining our leading edge in this field,"* said Michael Turwitt, President & CEO of 2G CENERGY. *"Hydrogen is a potentially emissions-free alternative fuel that can be produced from diverse domestic energy sources. This fuel is high in energy, yet an engine that burns hydrogen produces almost no pollution. The real beauty is that no fuel cells are required, and we figured out how to convert hydrogen into electrical and thermal energy using our well-proven engine technology."* he adds.

Specialized components include mixture formation technology and a special intake manifold with port injection. This design utilizes the turbo to compress combustion air only, and this assures that hydrogen is deconcentrated to increase operational safety. The geometrical injection is based on CFD (computational fluid dynamics) resulting in extreme high homogenization of the gaseous fuel mix. Not only is the engine compression ratio optimized for hydrogen operations, but the valves and valve sets also utilize specially developed 2G *agenitor*® technology to compensate for hydrogen reduced lubrication properties. Also, the pistons, connecting rods and piston rings are designed to accommodate the higher combustion pressure of hydrogen fuel.

2G has built its strategy for alternative fuels around multiple technologies, including hydrogen internal combustion engines. This flexible approach allows the company to meet goals for customer needs, environmental impact and shareholder interests. The strategy does not focus on one catch-all solution, but offers a flexible array of configurations and options, including biogas, LFG, natural gas, and a variety of specialty gaseous fuels.

With a strong focus on research and development (2G has its own R&D company -- 2G Drives GmbH) the 2G Group maintains its position as the technology leader in the CHP cogeneration market segment.

About 2G CENERGY Power Systems Technologies Inc.

Headquartered in St. Augustine, FL, 2G CENERGY Power Systems Technologies Inc. is a 2G Energy AG group company providing environmentally-friendly and highly efficient CHP cogeneration systems to the North and South American market. 2G's concept of modular combined heat and power plants for decentralized energy production is leading the way. 2G Energy AG is a long-established manufacturing company publically traded at the Frankfurt Stock Exchange. Today 2G is the largest independent manufacturers of combined heat and power (CHP) systems, with manufacturing plants in the USA (2G Manufacturing Inc.) and in Germany. More than 3,000 cogeneration plants are installed and operating. The company's CHP power plants guarantee extreme high energy efficiency, generated from natural gas, biogas, landfill gas, sewage gas, coal mine gas, syngas, hydrogen, and other specialty gaseous fuels. 2G CENERGY provides technologically advanced and clean systems to generate electricity and heat, while reducing CO2 emissions and greenhouse gases. All plants are designed and manufactured "plug & play, connection-ready".

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