High-pressure natural gas turbine-generator

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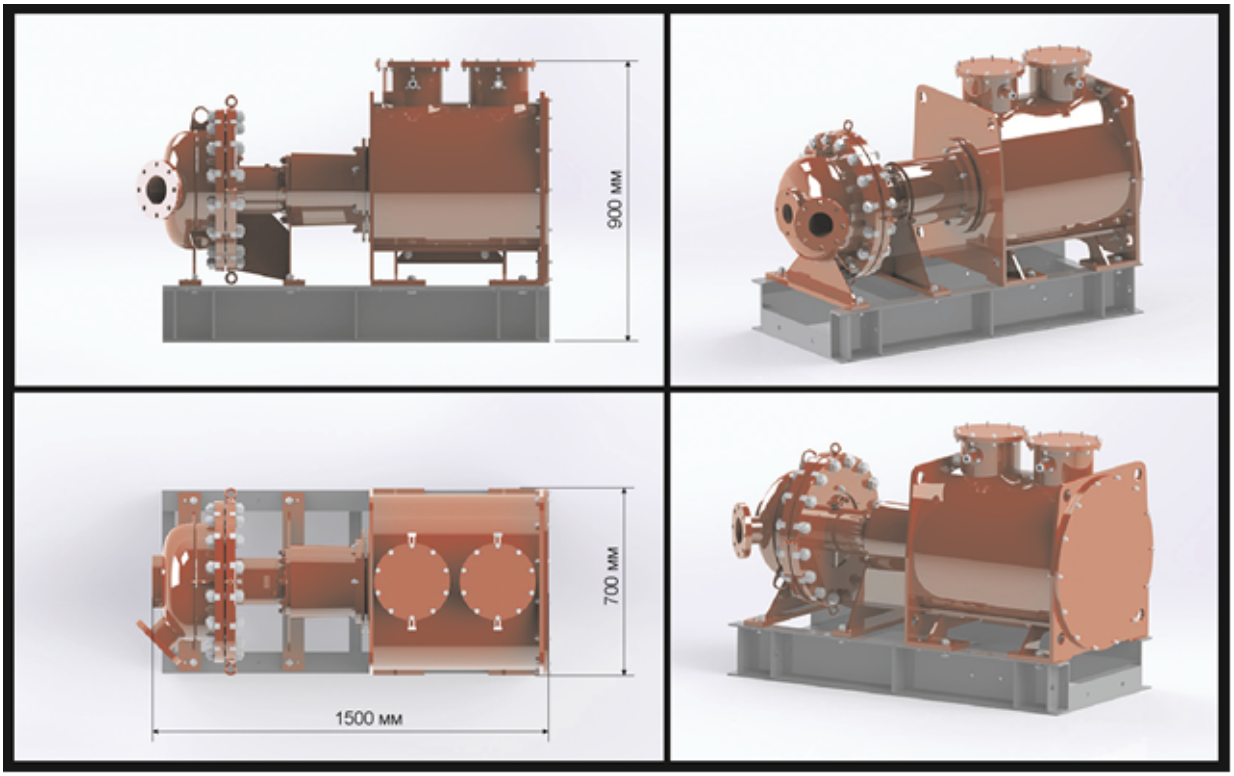

A 3-D model of turbo expander electric generator operating on high-pressure natural gas. Credit: Peter the Great Saint-Petersburg Polytechnic University

Scientists of Peter the Great St. Petersburg Polytechnic University (SPbPU) have developed a turbo expander electric generator operating on high-pressure natural gas. Natural gas, compressed at the power station, releases a large amount of thermal energy into the environment as waste; the use of such derived energy may represent a step toward

sustainable energy.

The focus of the research is an expansion turbine that triggers a significant pressure drop at a low volume flow of natural gas with electrical power of 1 kW. The plastic turbine is manufactured via 3D printing; the turbo expander electric generator converts part of the emitted energy into electrical power, thus reducing thermal pollution of the environment. Additionally, the derived energy that previously would be wasted can be used to generate electricity without any additional fuel.

"The implementation of the turbo expander electric generator can become a no-break power supply of sustainable electricity," says Viktor Rassokhin, of the Institute of Energy and Transport Systems SPbPU.

The fundamentals of the research have been described in an article "A Low Emission Axial-Flow Turbine for the Utilization of Compressible Natural Gas Energy in the Gas Transport System of Russia," published in the *International Journal of Environmental and Science Education*.

The turbo expander electric generator is to be installed in 2017 in one of the suburbs of St. Petersburg.

More information: A Low Emission Axial-Flow Turbine for the Utilization of Compressible Natural Gas Energy in the Gas Transport System of Russia. www.ijese.net/makale/1633

Provided by Peter the Great Saint-Petersburg Polytechnic University