

RFNC-VNIIEF activities in the field of hydrogen energy in the interests of Restricted Liability Company Gazprom

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The issues being solved by hydrogen energy embrace many fields of human activity. We will make an accent on just comparatively narrow, but still highly demanded and pragmatic tasks associated with the economy of fuel resources.

One of these tasks is the creation of economical 5 kW power plant (PP) under the contract concluded with Restricted Liability Company Gazprom. This PP is designed to power the stations of cathode protection of the pipelines, communication systems and telemetry. The solid polymer FC — based PP being developed will have the efficiency of 25–30% and is designed to replace imported turbogenerators of "Ormat" type and thermoelectric generators with the efficiency not exceeding 7%.

Development of a single-stage membrane fuel processor generating high pure (99,99%) hydrogen is being implemented for various applications. This may be both a universal fuel processor for the solid polymer FC — based PP up to 10kW and an autonomous module for hydrogen filling stations. The technology being developed is directed to the application of a hyperfine palladium film with the thickness up to 10 μm and a new efficient catalyst.

The compact syngas generator we are developing now is designed to produce a hydrogen-rich gas via partial oxidation of natural gas and its further application as an initiating additive in internal combustion engines. The rig tests have demonstrated a 20% improvement of engine efficiency and the decrease of emissions. We have developed experimental samples for automotive internal combustion engines and autonomous PP on their base.