

# HYDROGEN ENERGY AND FUEL CELLS

## AREA OF INTERESTS:

- Investigations and development activities in the field of fuel cell technology.
- Investigations and development activities in the field of hydrogen generation from hydrocarbon fuel.
- Development of hydrogen storage systems for marine and terrestrial stationary objects.
- Development activities of fuel cell based power plant for marine and territorial stationary objects, on-board electric power supply (standby electrical power) and heating objects for different applications.

## POWER PLANTS BASED ON PEM FUEL CELLS, TECHNOLOGIES OF HYDROCARBON FUEL



Cogeneration power plant based on PEM fuel cells working on natural gas. The electrical power is 10 kW



Combined power plant with electrical power of 60 kW. The high efficiency is attained as a result of including of gas-turbine generator in the power plant with electrochemical generator based on PEM fuel cells. Diesel oil is initial fuel



## APPLICATION OF NEW TECHNOLOGIES IN PRODUCTION OF POWER PLANTS BASED ON PEM FUEL CELLS



PEM fuel cell battery working on synthesis gas and air. The electrical power is 6,5 kW



Jet device for hydrogen (synthesis gas) recirculation in fuel cell battery without electric power consumption



Fuel processor (natural gas) for PEM fuel cell power plant



Test of PEM fuel cell battery prototype working on purified synthesis gas and air, area of fuel cell active surface is 1225 sq.cm

## INTERMETALLIC HYDROGEN STORAGE SYSTEM



Intermetallic accumulator of hydrogen based on the alloy  $\text{LaNi}_5$  is the safest and most compact ( $800 \text{ nl H}_2/\text{dm}^3$ ) system of hydrogen storage