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**Hydrogen energy**

Hydrogen is used as a promising energy carrier for developing a low-carbon economy that minimizes the anthropogenic impact on the climate. Hydrogen energy can serve as the basis for transitioning the world's economies to higher levels of energy efficiency, productivity and environmental friendliness.

The introduction of environmentally neutral hydrogen production technologies and international cooperation in this field will contribute to the diversification of the global energy portfolio, which is an important step towards a carbon-free future.

Russia has adopted a roadmap for the development of hydrogen energy industry until 2030. At the state level, initiatives for hydrogen production and the introduction of proprietary technologies are supported. Having practical competence in handling hydrogen for more than 50 years and a significant science and technology base in the field of high technologies, Rosatom is a leader in fulfilling the goals and objectives for the development of hydrogen energy set at the national level in the Russian Federation.

Rosatom is developing a wide range of process engineering solutions along the entire hydrogen supply chain, both in the area of hydrogen production, for example, electrolysis plants, pyrolysis, and in the area of its storage and transportation to the end consumer, such as composite cylinders.

A remarkable progress has already been made in the field of electrolysis plants. Last year, Rosatom created the first one hundred percent Russian prototypes using unique import-independent Russian technology. At the moment, tests are underway and at the same time a production line is being set up for the mass production of electrolyzers. All issues related to the operation of equipment and product commercialization are being studied simultaneously. Science capacity and broad business diversification give Rosatom great prospects for creating its own competitive solutions.

To address the issue of organizing a large-scale hydrogen production, Rosatom is developing a technology for hydrogen production at an engineering nuclear power station (ENPS) with a high-temperature gas-cooled reactor (HTGR) and a chemical process section. There is a lot of design work, development of certain technologies, and R&D underway. In the transportation sector, Rosatom is responsible for the development of hydrogen refueling complexes and fuel element development.

Rosatom is actively involved in the implementation of pilot hydrogen projects in Russia and the formation of long-term strategic and technological partnerships in this area.

The technologies being developed will be applied in Rosatom pilot projects, including on Sakhalin Island, where an export-oriented hydrogen production plant will be built and hydrogen FE-driven trains will be launched, and the economy in general will be upgraded subject to the objectives of the Green Agenda.