

# ENGINEERING

Main objectives for the development of the 'Engineering in the Russian Federation' segment within the context of the Inter RAO Group's strategic priorities:

- establish a full-cycle engineering complex that is capable of providing services from the design to the commissioning of various types of power facilities
- ensure the implementation of new construction projects and the reconstruction and modernization of generating facilities within the prescribed periods without exceeding the design and estimated cost in accordance with quality requirements
- develop the production of turbine equipment with features corresponding to the best world analogues

## Key assets

LLC Inter RAO – Engineering is an engineering company that specializes in the management of energy construction projects in Russia and abroad. The company provides a wide range of services for the implementation of energy construction projects, including project management on EPC/EPCM terms, the design of power facilities, and the supply of main and auxiliary equipment.

At present, LLC Inter RAO – Engineering has references from implementing construction projects and modernizing power facilities with total capacity of 7.5 GW. The company has successfully implemented 22 projects. Its current order book consists of three projects with total capacity of approximately 860 MW.

LLC Inter RAO – Engineering manages the core assets of the Inter RAO Group and participates in a joint venture with General Electric (GE) and the Rostec State Corporation while facilitating the introduction of the most modern and efficient technological solutions for the development of energy infrastructure.

LLC Russian Gas Turbines represents the interests of the Inter RAO Group in a joint venture with General Electric (GE) and JSC United Engine Corporation (UEC) for the production and maintenance of 6F.03 gas turbine units in Russia.

## International certification

In late 2018, a surveillance audit was conducted at LLC Inter RAO – Engineering for compliance with the requirements of international standards ISO 9001:2015, ISO 14001:2015, and OHSAS 18001:2007 by the certification body TÜV NORD GmbH (Germany), with which the company has cooperated since 2013. During the audit,

Priority areas for the development of engineering companies include:

- developing expertise in:
  - > general contracting
  - > project activities
  - > commissioning
- turnkey delivery of equipment
- establishing consortiums with international engineering companies
- organizing the production of modern energy equipment in the Russian Federation

TÜV NORD GmbH verified all the mandatory requirements of the standards, drawing on the example of the implementation of a project at the Primorskaya TPP in the executive office and the Svetlovsk branch as well as design at the company's Ivanovo branch. No discrepancies were found, and recommendations were made for improvements to the integrated management system of LLC Inter RAO – Engineering. Based on the results of the four-day surveillance audit, TÜV NORD GmbH confirmed the successful completion of the audit and recommended continuing the registration of the management systems for the next three years.

## Trends

The government of the Russian Federation has approved a program to upgrade the generating capacities of thermal power plants in Russia to 41 GW from 2022 to 2031 on a competitive basis. The modernization program guarantees generating companies an up to 14% return on investment per year in rubles. In connection with the legislative enshrinement of mechanisms for the return on investment in upgrading generating capacity, generating companies are planning new investment programs, which could expand the market for engineering and design services, increase the volume of construction and installation work in the electric power segment in the Russian Federation, and result in new orders. Promising areas in the electric power industry of the Russian Federation include renewable energy projects, the design and construction of thermal waste incineration plants, and the development of distributed generation, which means industrial companies will be interested in building their own power plants.

At present, LLC Inter RAO – Engineering is one of the leading companies on the engineering services market in the electric power industry of Russia and is on par with such players as JSC ASE United Engineering Company and JSC TEK Mosenergo. Substantial investments in the construction of power plants and networks to meet the growing demand for energy consumption in the developing nations of Asia, Africa, and Latin America by 2035 will create a potential opportunity to increase the presence of the Group’s engineering companies on foreign markets.

## Construction

LLC Inter RAO – Engineering manages energy construction projects in Russia and abroad. In March 2018, the company managed the commissioning of two power plants in the Kaliningrad Region: the Mayakovskaya TPP in Gusev and the Talakhovskaya TPP in Sovetsk with capacity of 156 MW each, which were built in record time at just over a year and a half. The plants were built based on the same design and are projected to cover peak loads in the network. The main plant equipment is 100% Russian-made. Both TPPs include two gas turbine units with capacity of 78 MW each. LLC Russian Gas Turbines (Rybinsk, Yaroslavl Region) manufactured the units. The generators were manufactured at the Elsib Research and Production Association (Novosibirsk). The new energy capacities have strengthened the energy security of the Kaliningrad Region and also significantly increased the maneuverability and controllability of the energy system in the westernmost region of the country.

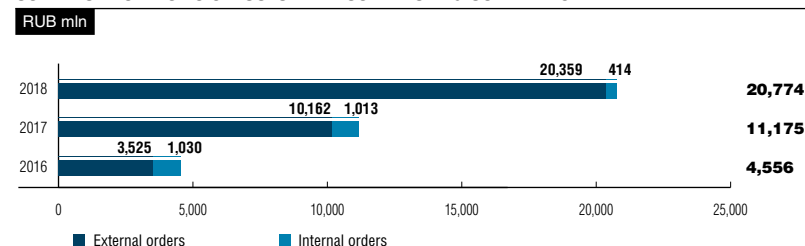
As part of this project to ensure the energy security of the Kaliningrad Region, which is being implemented based on instructions from Russian President Vladimir Putin and in accordance with a directive of the Russian government, construction is continuing on two more power plants: the Pregolskaya TPP in Kaliningrad with capacity of 455 MW and the Primorskaya TPP in the Svetlovsk urban district village of Vzmoreye with capacity of 195 MW. In late 2018, the Agency for Architecture, Town Planning, and Long-Term Development of the Government of the Kaliningrad Region granted permission for the commissioning of three of the four power units at the Pregolskaya TPP.

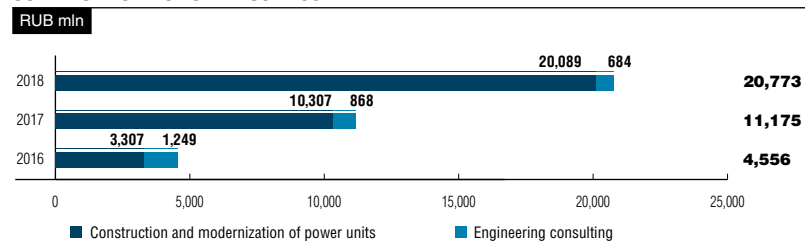
In addition, the Zatonetskaya CHPP was commissioned in Ufa in March 2018. The new power plant consists of two power units with total electric power capacity of 440 MW and thermal power capacity of 290 Gcal/h. Modern Russian-made high-efficiency steam and gas equipment has been installed at the CHPP. The new combined heat and power plant will reduce the shortage of electric power in the Ufa power generation system, create additional opportunities for connecting new energy-intensive consumers, and enhance the reliability of energy supply to consumers.

## Development of the equipment market

In 2018, LLC Russian Gas Turbines installed and carried out adjustment supervision of eight 6F.03 gas turbine units manufactured by LLC Russian Gas Turbines at its plant in the Yaroslavl Region city of Rybinsk under a contract for projects in the Kaliningrad Region. The Company continues to work on further developing and increasing the degree of localization and production of gas turbine equipment with features that correspond to the best world analogues.

**CONTRACT PORTFOLIO STRUCTURE BY CONTRACTING COMPANIES**



**CONTRACT PORTFOLIO BY BUSINESS****Foreign projects**

LLC Inter RAO – Export implements engineering projects abroad. The company's strategic goal is to expand its presence on target foreign markets as well as promote Russian practices and energy solutions on foreign markets.

Countries of Latin America, Southeast Asia, and Africa are the key markets where the company is implementing and developing its projects. LLC Inter RAO – Export promotes the main and auxiliary equipment for power generation facilities on foreign markets.

**Promising areas for development**

Strategic areas for the development of LLC Inter RAO – Engineering and other engineering companies of the Group include:

- improving the quality of services taking into account best international practices in quality management, environmental safety, and occupational safety
- increasing the supply of products (equipment, work, and services) for the construction of energy facilities, including innovative/energy efficient products made by the Group's enterprises

The main objective of LLC Inter RAO – Engineering in 2019–2020 is to ensure the implementation of all the Group's new construction and modernization projects as well as projects being implemented with the Group's involvement (the construction of generating facilities in the Kaliningrad Region). The company has the potential opportunity to enhance the competitiveness of the engineering business and expand its presence on the Russian and foreign markets in the medium term due to several key EPC players leaving the Russian market, the availability of sustainable financial resources, the prospects of the generating capacity modernization program

**GEOGRAPHY OF CONTRACT PORTFOLIO, RUB MLN**

Region	2016	2017	2018	Change vs. 2017, %
Siberian Federal District	2.7	20.6	7	–66.0
Volga Federal District	765.1	158.3	171	8.0
Urals Federal District	176.0	747.1	48	–93.6
Central Federal District	465.8	289.98	157	–45.9
North Caucasus Federal District	790.0	8,848.1	0	
Southern Federal District	3.2	0	0	
Northwestern Federal District	0	0	20,014	
Other	2,352.6	1,110.9	376	–66.2
Total	4,555.5	11,174.9	20,774	85.9

in Russia, its own offerings on the gas turbine market, and its extensive experience in the design and construction of turnkey power facilities.

LLC Russian Gas Turbines aims to further develop and increase the degree of localization of the manufacturing of gas turbine equipment with features that correspond to the best world analogues.

The strategic goal of LLC Inter RAO – Export is to expand its presence on target foreign markets as well as promote Russian energy practices and solutions on foreign markets. Countries of Latin America, Southeast Asia, and Africa are the key markets where the company is implementing and developing its projects.

The primary strategic goal of LLC Quartz Group for the period until 2020 is to increase the company's share in the energy and general industrial segments of the market while sustaining profit margins by increasing the commercial appeal and competitiveness of the services it provides.