

特 集：ロシアにおける省エネ・省資源技術の現状と関連機関

今号ではロシアの省エネ・省資源技術の現状と技術の開発および導入に携わっている研究所、企業をご紹介します。

全世界的に省エネ・省資源が叫ばれている現在、ロシアにおいても国、地方レベルでの計画・プログラムが実施中であり、企業ならびに研究所等の組織ベースでも様々な措置がとられています。

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1. ロシアの省エネ・省資源技術

1980年代から「燃料とエネルギーの効率的な利用」ということは言われてきたが、ソ連邦崩壊後市場経済に移行してさらにその重要性が指摘されるようになった。

ロシアはエネルギー資源で世界第2位の生産国だが、エネルギー消費の対GDP比は先進国に比べて3～3.5倍であり、1990年に比べても現在は22%増えている。

そこで、ロシアにおいても省エネ・省資源の様々な技術開発に大きな関心が払われるようになった。発電事業においても数量的拡大より、質的な改善、新エネルギー源の活用に目が向けられている。

逆に言えば、ロシアは省エネの大きな潜在力を持っており、エネルギー消費を4割減らすことが可能という試算もある。省エネ技術に投資をした方が、このままの形でエネルギー消費を続けるよりもコストダウンにつながるという認識も広まっている。

国家的な取り組みも始まっている。産業と国民生活の両面で省エネ・省資源への刺激策が取られ、環境への負荷も減らそうとしている。

ここ数年、省エネ・省資源に関する法律の整備も進んだ。

国の調整は次の分野が対象になっている。

- ・ エネルギー資源の採掘、加工、輸送、保管、消費
- ・ 省エネ・省資源技術、診断機器、絶縁材、計器類他の開発

「2002～2005年および2010年までのエネルギー効率化経済特別計画」が実施中で、現在のエネルギー消費の42%に相当する燃料換算4億tの節約が目標となっている。節約の3分の2は燃料エネルギーと工業生産の分野で、4分の1は国民生活の分野で達成することになっている。計画実施に向けた予算支出は2010年までに1,000億ルーブルである。

省エネ・省資源は地方の経済にとってもその競争力を高める上で重要であり、連邦構成行政体ベースでも法律や決定が採択されている。全国では20以上の地域で省エネ・省資源プログラムが実施中である。

また、ガスプロム、統一電力系統、ロシア科学アカデミーといった企業や組織ベースでの省エネ・省資源プログラムも進行している。

省エネ・省資源技術の導入を促進する新たな組織も生まれている。

省エネ・省資源の分野で実際に行なわれている措置には次のものがある。

- ・ 組織のエネルギー消費の診断
- ・ 企業、住宅、社会施設へのメーターの完備
- ・ 電力消費の調整
- ・ 建物の断熱性向上
- ・ 照明設備の近代化
- ・ 既存発電所の改修と近代的発電所の新規建設（年間2,000～2,500万tの燃料節約）

- ・ 効率的な給配電を行なうための送電網整備（燃料換算 700～800 万 t の年間節約）
- ・ 近代的技術をベースとした熱供給システムの推進（年間 1,000 万 t の燃料節約）
- ・ 水力発電と新エネルギーを増やし有機燃料発電の割合を減らす（年間 700～800 万 t の燃料節約）
- ・ 技術用エネルギー消費と熱および電力の輸送ロスの低減（年間 800～900 万 t の燃料節約）
- ・ 既存設備の効率向上（年間 2,000～2,500 万 t の燃料節約）

これらの措置を実施するには最新のテクノロジーが不可欠である。

ロシアでこれらテクノロジーの開発と導入に携わっている組織はいくつかのタイプに分かれる。

- ・ ロシア科学アカデミーの研究所ないしエネルギー分野の研究所
- ・ 省エネ・省資源設備のメーカー、発電設備のメンテナンス企業
- ・ 省エネ・省資源技術を提供する中小企業
- ・ 他の分野の研究所で、一部省エネ・省資源と関連を持つもの

省エネ・省資源に関する展示会、セミナー等の催しも毎年数十件行なわれている。代表的なものは国際見本市「省エネ・省資源・エコロジー展」である。

2 . ロシア科学アカデミー傘下の研究所およびエネルギー分野の研究所

1. Integrated Institute of High Temperatures under RAS Engineering and Research Center of Power-Saving Processes and Facilities

I. Name of the Institute (Organization)

In Russian: Научно-технологический Центр энергосберегающих процессов и установок Объединенного Института Высоких Температур Российской Академии Наук

In Russian abbreviation: НТИЦ ЭПУ ОИВТ РАН

In English: Engineering and Research Center of power-saving processes and facilities of the Integrated Institute of High Temperatures under RAS (Russian Academy of Sciences)

In English Abbreviation: ERC of PSPF

II. Location

Address: Moscow, Izhorskaya St. 13/19

Mail: Moscow, Izhorskaya St. 13/19

Tel.: +7 (095) 485-95-22

Fax: +7 (095) 485-82-63

E-mail: ntc_epu@rambler.ru

III. History

The Experimental Design Office (EDO) of Novel Equipment was founded in 1964, pursuant to the order of the Chairman of the USSR State Committee for Power Engineering and Electrification. In 1971, by decree of the Presidium of the USSR Academy of Sciences, the EDO of Novel Equipment was transformed into the EDO of the Institute of High Temperatures (IHT).

In 1992, pursuant to the RAS Presidium decree, EDO of IHT was reorganized into the Engineering and Research Center of power-saving processes and facilities.

IV. Management

Kind of organization: State Scientific Center of the Russian Federation

Responsible Ministry (Organization): Russian Academy of Sciences

V. Executives

Director General: Ruben R. Grigoryants

VI. Major activities

ERC of PSPF is a leading institution in the research, creation and introduction of novel power-saving technologies at enterprises of various sectors of economy. The Center occupies a prominent position among RAS institutions in the development of new trends of power engineering and elaboration of power-saving processes in metallurgy, municipal communal services, etc.

The Center's main purpose is elaboration and introduction of high-efficiency technologies for producing and using electric and heat power, as well as power-saving technologies.

The above purpose shall be achieved by holding researches over the following trends:

- Power saving in the fuel and energy complex (FEC) and other power-consuming sectors;
- Methods and means for creating power- and resource-saving technologies in various sectors of economy ((agricultural industry, materials production and processing, etc);
- Alternative energy generation sources and means;
- Technologies for substituting expensive and scarce fuels;
- Technologies for treating recoverable resources;
- Application of low-temperature plasma in power-consuming manufacturing processes.

ERC of PSPF has gained vast experience in the sphere of its activity and created the required research potential.

Proceeding with the search of new scientific solutions, in the last years the Center mainly focused its attention on the introduction of research developments into practice at enterprises of various sectors and different forms of property.

The Center's structure includes a Group of divisions, named AcademEnergService, which shall enhance efficiency of the RAS institutions in using power resources and ensure reduction of expenses thereon.

Being a multifaceted structure, AcademEnergService does not limit a sphere of its activity by RAS institutions. It also proposes articles, technologies and services to all economic subjects solving engineering and financial tasks from the viewpoint of resource- and power saving.

AcademEnergService successful activity is based on high scientific and creative potential and experience gained by sectoral organizations maintaining contacts with AcademEnergService in the field of power engineering, industrial electronics, automation, and information technologies. AcademEnergService staff includes highly skilled specialists in energy research. Developments of AcademEnergService employees find application both in this country and abroad.

ERC of PSPF participates in the issue of the *Power Saving Problems* journal”.

2. Research Institute of Power Engineering

I. Name of the Institute (Organization)

In Russian: Открытое акционерное общество "Научно-исследовательский институт Электроэнергетики"

In Russian abbreviation: ОАО "ВНИИЭ"

In English: Research Institute of Power Engineering

In English Abbreviation: RIPE

II. Location

Address: Moscow 115201, Kashirskoe Highway 22, bldg. 3

Mail: Moscow 115201, Kashirskoe Highway 22, bldg. 3

Tel.: +7 (095) 113-24-55

Fax: +7 (095) 113-43-88

E-mail: vnii@mail.elektra.ru

III. History

RIPE was established in 1944, first as the Central electrochemical research laboratory.

In 1958, the Laboratory was reorganized into the National Research Institute of Power Engineering

In 1995, RIPE was privatized.

IV. Management

Kind of organization: Joint stock company

V. Executives

Director General: Dmitry S. Savvaitov

VI. Major activities

The Institute is engaged in formation of scientific and technical policy and support of the key trends in power engineering:

- Electric part of all types of power plants;
- Power supply mains and systems; automatic control systems of all levels.

Developments in the field of power saving:

- Power- and resource-saving technologies based on the use of variable frequency power drives of pumps, fans, and compressors;
- Start/stop devices for smooth and knock-free actuation of units with gas and steam turbines for industrial enterprises and communal services;

- Static reactive compensators for reducing mains losses.

RIPE develops and introduces variable frequency power drives (VFPD) for heat power plants. The highest effect is observed in mechanisms with the air blow moment of resistance (e.g., pumps, draft systems), where energy savings can reach 45% and where one can witness enhanced reliability of motor and driving mechanism, which shall finally ensure saving of resources and reduced repair expenses. VFPD of draft systems is made in conformity with the "dual feed machine" scheme with the use of HV non-contact asynchronous motor with two insulated stator windings connected, respectively, to the 6-kW mains and LV frequency converter. A saving control range makes up 40%. Power rating: from 800 to 1600 kW, synchronous rotation frequency: from 500 to 750 min⁻¹. VFPD can be applied in draft fans, exhaust fans, pulverizing fans, circulation pumps. Mass-scale introduction of VFPD in the Moscow Power System (21 VFPD by the end of 2000 of 500-1600 kW unit power) resulted in an annual saving of 17.5 million rubles.

One of the Institute's achievements, especially noticeable in connection with the planned wide-scale application of gas turbines and gas-steam plants in Russia and CIS, is elaboration and introduction of thyristor-based start/stop devices for turbogenerators at 18 power plants.

Methods developed by the Institute specialists regarding optimization of operating modes for power systems and electric mains ensure efficiency of work, reduced losses, and enhanced quality of energy.

VII. Structure

Development of power- and resource-saving technologies at RIPE is entrusted to the Department for machines and fan systems.

The Department incorporates the following sections and laboratories:

- Laboratory of electric drives;
- Laboratory of asynchronous machines;
- Section of electric motors;
- Section of autonomous power systems and non-traditional energy sources;
- Section of control systems for asynchronous machines;
- Section of microprocessor control systems.

VIII. Number of employees

Among the Institute's employees (about 500), there are many high skill specialists in the field of power engineering, including 15 doctors and 84 candidates of engineering sciences.

3. All-Russian Research Institute of Agriculture Electrification

I. Name of the Institute (Organization)

In Russian: Всероссийский Научно-исследовательский Институт
электрификации сельского хозяйства

In Russian abbreviation: ВИЭСХ

In English: All-Russian Research Institute of Agriculture Electrification

In English Abbreviation: RIAE

II. Location

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Mail: Moscow 109456, 1st Veshniakovsky Lane, 2

Tel.: +7 (095) 171-19-20

Fax: +7 (095) 170-51-01

E-mail: [viesh @ dol.ru](mailto:viesh@dol.ru)

III. History

The Institute was founded in March 1930.

IV. Management

Kind of organization: State Research Institute of the Russian Federation

Ownership: Property of the Russian Federation

Responsible Organization: Russian Academy of Agricultural Sciences (RAAS)

V. Executives

Director-General: Dmitry S. Strebkov, Full Member of RAAS, Dr. Sc. (Eng.), professor.

VI. Major activities

Main trends of activity are as follows:

- Scientific grounds, forecast and strategy of electrification and power saving in agriculture; development of ecology friendly resource-saving technologies and machine systems for electrification of agricultural production and cattle breeding;
- High efficiency power technologies and equipment for cattle breeding, plant growing, primary processing and storage of agricultural products; electrophysical means and technologies for pest control and struggle with plant and animal diseases;
- Power-saving technologies in agricultural productions;
- Methods and means of automation of agricultural productions;
- Complex mechanization and automation of dairy farming, cattle breeding, poultry farming, feed processing;
- Methods, technical means and systems for reliable power supply in agriculture, trouble-free operation of power equipment and installations, autonomous supply of energy to rural consumers;

- Systems and technical means of complex electrification and power supply to rural population, farms, and small individual farms;
- Promising technologies and novel technical means relating to the use of recoverable and non-traditional energy sources in agriculture;
- Ecology friendly technologies and technical means for utilization of wastes in cattle breeding and plant growing;
- Systems and technical means aimed at perfection of the energy basis of agriculture, power-saving technologies relating to utilization of fuel resources.

The Institute maintains scientific and technical contacts with foreign partners, participates in joint researches in the field of agricultural electrification and recoverable energy sources with firms and organizations from Poland, Czech Republic, Finland, including international projects (Denmark, USA), and also keeps cooperation in the production sphere with companies from India, Mongolia, and other states

VII. Structure

Departments of the Institute

- Forecasts regarding electrification, structure of the power balance and power saving in the agroindustrial complex;
- Promising machine systems for complex electrification of agricultural productions and cattle breeding;
- Power technologies in agriculture;
- Complex electrification and mechanization of dairy farming;
- Automation of electrified agricultural productions;
- Power supply, operation, and electrical safety;
- Agricultural heat and power engineering, electrification of thermal processes;
- Recoverable energy sources;
- Bioenergetics and environmental protection;
- Complex investigation of systems with non-traditional energy sources in agriculture (Istra, Moscow Region);
- Scientific and technical information, patenting, and marketing;
- Scientific and technical cooperation with foreign countries;
- Research coordination and organization;
- InterSolarCenter under the auspice of UNESCO
- Renewable energy sources and electrification (UNESCO's Chair)

The Institute has set up a joint stock company managed by Yuri D. Arbuzov, Cand. Sc. (Phys.-Math), tel. (095) 74-81-13, which is engaged in research and development of power installations based on novel and recoverable energy sources.

VIII. Number of employees

The Institute staff includes 220 high quality specialists, among them 16 doctors and 75 candidates of sciences.

4. G. Krzhizhanovsky Energy Institute

I. Name of the Institute (Organization)

In Russian: Открытое акционерное общество "Энергетический институт им. Г.М.Кржижановского"

In Russian abbreviation: ОАО "ЭНИИ"

In English: G. Krzhizhanovsky Energy Institute

In English Abbreviation: KEI

II. Location

Address: Moscow 119991, GSP-1, Leninsky Prospect, 19

Mail: Moscow 119991, GSP-1, Leninsky Prospect, 19

Tel.: +7 (095) 954-37-32, 954-62-47

Fax: +7 (095) 954-42-50

E-mail: ao_enin@iristel.ru, enin@csi.ru

III. History

The Institute was founded (1930) and headed for more than 25 years by Gleb Krzhizhanovsky, the outstanding scientist and public figure. G. Krzhizhanovsky supervised elaboration of Russia's first state electrification plan – GOELRO (Russian abbreviation). Scientists that participated in the GOELRO plan development formed the Institute's scientific nucleus.

Results of research in the field of heat exchange, thermodynamics, gas dynamics, and physicochemical processes in power equipment have become an important part of normative and guiding documents and reference books, and are used during design and operation of equipment for thermal and nuclear power plants.

IV. Management

Kind of organization: Joint stock company

V. Executives

Director General: Edward P. Volkov, Corresponding Member of RAS

VI. Major activities

The Krzhizhanovsky Institute is a leading organization in complex investigation over promising trends of power engineering development.

Developments in the field of resource- and power saving

Fuel application technologies and environmental aspects of power engineering

Environmental aspects of power engineering:

- Analysis of environmental impact of power plants on environment

Use of low-grade fuels in power engineering:

- Shale processing plant;

Wastes utilization:

- Technology and equipment for ecology-friendly local utilization of wastes;
- Production of active coals for purification of waste water;
- Production of carbon sorbents for water purification;
- Plasma treatment of coal with the obtainment of coal sorbents;
- Purification of effluent gases from nitrogen and sulfur oxides
- Purification of furnace gases from SO_2 и NO_x with the aid of an electron beam;
- Reprocessing of ash and slag wastes of thermal power plants;
- Gas fuel catalytic heaters;
- Heaters for fireplaces.

Power saving and non-traditional energy sources:

- High efficiency turbines for utilization of low-potential heat;
- Modular power installation;
- Combined cold- and heat-supply installation;
- Low-potential power installation;
- Combined solar power plant;
- Single-circuit photothermal solar power plant;
- Double-circuit photothermal solar power plant;
- Solar collector;
- Power-saving film;
- Multi-screen and porous foamy insulation: modern computation methods;
- Geothermal power plants;
- Utilization of worn-out tyres;
- Utilization of reinforced concrete structures.

5. Research Institute of Power Structures

I. Name of the Institute (Organization)

In Russian: Открытое акционерное общество "Научно-исследовательский институт энергетических сооружений"

In Russian abbreviation: ОАО "НИИЭС"

In English: Research Institute of Power Structures

In English Abbreviation: RIPS

II. Location

Address: Moscow 123362, Stroitelny Lane, 7a

Mail: Moscow 123362, Stroitelny Lane, 7a

Tel.: +7 (095) 493-51-32, 497-56-01

Fax: +7 (095) 493-64-29

E-mail: niiesoao@mtu-net.ru, info@niies.elektra.ru

III. History

The RIPS history goes back to 1949, when a new research section was established at the Hydroproject Research and Design Institute.

In 1991, the above section was reorganized into the Research Institute of Power Structures. Since then, it acts as an independent research organization.

In 1994, the Institute was privatized.

The Institute is a subsidiary of the United Power System (RAO "EES of Russia" – Russian abbreviation).

IV. Management

Kind of organization: Joint stock company

Responsible Ministry (Organization): RAO "EES of Russia"

V. Executives

Director General: Sergey O. Britvin, Cand. Sc. (Eng.)

VI. Major activities

RIPS is a leading organization in providing scientifically based grounds for construction and reconstruction of civil and industrial facilities in power engineering and water management with the analysis of their impact on environment, as well as in ensuring safe and trouble-free operation of power constructions.

Basic trends of the Institute's activity are as follows:

- Hydraulic investigations;
- R&D work in the field of construction materials, development of novel technologies for repair of concrete and reinforced concrete buildings and facilities;
- Monitoring and assurance of safe operation of power constructions, preparation of safety instructions;
- Field tests and development of methods of means of power equipment diagnostics for optimization of its operation;
- Investigations of building structures and facilities, developments in the said area;
- R&D work in the field of small and non-traditional energetics;
- R&D work in the field of environmental safety of power installations and facilities.

Developments regarding resource- and power savings

The Institute is engaged in R&D work in micro and small hydraulic power engineering, tidal and wind power engineering, boiler houses and small capacity diesel generators. Besides, RIPS specialists determine prospects and solve problems regarding the use of small rivers and spillway systems as energy sources.

The following hydraulic power units are elaborated for small and non-traditional energetics:

- With orthogonal turbines for 1-5 m heads;
- With propeller-type turbines for 5-20 m heads;
- With turbines for 20-150 m heads.

Hydraulic units under development are rated for 1-1000 kW, maximal flow varying from 0.1 to 100 m³/s. Those units are intended for producing electric power for supply mains. They can be as well complemented with electrical equipment for autonomous operation.

As regards developments in tidal hydropower engineering and shelf construction, the Institute performs as follows:

- Feasibility studies regarding to tidal power plants of various capacity (up to 19,000 MW) created by cutting off bays by biologically permeable dams from floating units;
- Environmental investigation of seacoasts, marine building materials, reinforced concrete structures and foundations created underwater.

For holding investigations, the Institute makes use of its marine scientific base at the Kislogubskaya tidal power plant (near the city of Murmansk).

The Institute specialists have a 30-year experience in creating tidal power plants and industrial construction in the Extreme North region.

RIPS has elaborated methods and facilities for electrolysis protection used for preventing total biological overgrowing of concrete surfaces and equipment of turbine water conduits during the whole service life. Protection is ensured by means of a seawater electrolysis unit.

The RIPS specialists carry out regular investigations of wind power plants with a vertical rotation axis. As a result, they have made up numerical models allowing design of those plants of any power in a free flow. The efficiency factor of pilot samples with up to 10 kW power has reached 35%.

RIPS-designed wind power units can find application in regions with the average wind velocity exceeding 5 m/s. Wind units can be produced both for individual consumers (farms, gardens, country houses) and for supply mains.

The Institute is running the **Center for power saving of RAO "EES of Russia"**.

The given Center is a leading structure of RAO "EES of Russia" in elaboration and realization of projects in the field of power saving and environmental problems.

The Center's principal tasks are as follows:

- Improvement of technologies and instruments of control over power saving processes in power engineering;
- Improvement of the mechanism for financing development and introduction of power-saving technologies and equipment;
- Analysis of the normative and legal basis and its perfection in conformity with the principal aims and purposes of power saving in the given sector;
- Coordination of the Program for power saving in electric power engineering for the period of up to 2010 with the respective federal and regional programs in the given field;
- Arrangement of energy audit at the sectoral enterprises;
- Information support of power saving as part of the sectoral information system;
- Arrangement of educational, information, and demonstration activity on the power saving problems.

VII. Number of employees

46 candidates and 5 doctors of sciences work at the Institute. The RIPS specialists have obtained 500 inventor's certificates, of which 220 were use during construction of power objects.

6. Order of the Red Banner of Labor Research Institute of Heat Engineering

I. Name of the Institute (Organization)

In Russian: Акционерное общество открытого типа "Всероссийский дважды ордена Трудового Красного Знамени теплотехнический научно-исследовательский институт"

In Russian abbreviation: АО "ВТИ"

In English: Research Institute of Heat Engineering

In English Abbreviation: RIHE

II. Location

Address: Moscow 109280, Avtozavodskaya St., 14/23

Mail: Moscow 109280, Avtozavodskaya St., 14/23

Tel.: +7 (095) 275-34-83, 275-50-77

Fax: +7 (095) 279-59-24, 275-11-22

E-mail: sozaev@ia.ru

III. Management

Kind of organization: Joint stock company

Responsible Ministry (Organization): RAO "EES of Russia"

IV. Executives

Director-General – Gurgен G. Olkhovsky, Dr. Sc. (Eng.), professor

V. Major activities

The aim of RIHE (est. 1921) is R&D work in the field of heat engineering for solving current and future tasks and provision of:

- Conditions for trouble-free and efficient operation of heat engineering equipment for thermal power plants;
- Maximal service period for the above equipment;
- Minimal environmental impact;
- Scientific and technological progress in the given field.

Main trends of activity are as follows:

- Perfection of the acting main and auxiliary heating and mechanical, water preparation, fuel-delivery equipment for increasing its service life, enhancing reliability and efficiency, as well as improving environmental conditions;
- Improvement of system and technical means of automatic control over manufacturing processes at thermal power plants (TPP), improvement of means of equipment diagnosis during its operation;

- Development of manufacturing processes and equipment for environmental protection;
- Research concerning: hydrodynamics, heat- and mass-exchange processes in boilers and heat-exchange apparatuses; processes of traditional and non-traditional burning of solid fuels in various furnaces; water chemical processes; strength and service properties of metals; physicochemical properties of solid fuel, ash and slag formed in the course of those fuels burn-up;
- Scientific and technical maintenance of heat and power plants, startup and adjustment operations, assembly and repair work

Main trends of activity in the field of power saving:

- Enhancement of TPP efficiency. The Institute has worked out proposals on improvement of flowsheets and equipment of large power units (from 300 to 500 MW) with the view of enhancing their efficiency by 6-8%, as well as proposals concerning creation of coal power units rated for supercritical steam parameters (pressure of up to 300 atm, superheating temperature being within 600-610 °C), enabling to increase the efficiency factor to 44-46%;
- Elaboration of schemes for production of heat and electric energy with the use of gas-steam and gas-turbine units at combined heat and power plants (CHPP). The Institute has developed various schemes for the above units rated for 10-250 MW;
- Development of technologies and equipment for utilization of solid municipal wastes and burning of biomass fuel.

VI. Number of employees

Among the Institute's employees (over 700) there are 15 doctors and 88 candidates of sciences.

The Institute's experimental basis enables research and pre-industrial perfection of engineering solutions, including those concerning high-power units operating under supercritical steam parameters.

3 . 省エネ・省資源設備メーカーおよび発電設備メンテナンス企業

1. Firm engaged in operation and maintenance of power plants and supply mains

In Russian: Открытое акционерное общество “Фирма по наладке, совершенствованию технологии и эксплуатации электростанций и сетей”

In Russian abbreviation: АО “Фирма ОРГРЭС”

In English: Firm engaged in operation and maintenance of power plants and supply mains

In English Abbreviation: OMPPSM

Address: Moscow 107023, Semenovskiy Lane, 15

Tel.: +7 (095) 360-13-35

Fax: +7 (095) 360-86-40

E-mail: orgres@orgres-f.ru

Director General – Vadim V. Kumin

Main trends of activity:

The OMPPSM Firm is well known in Russia, CIS, and abroad as a specialized engineering organization working in the field of power engineering.

One of the basic kinds of the Firm activity is execution of jobs ensuring trouble-free and efficient functioning of power and electrification objects at requests of enterprises and organizations of the power complex.

At present, OMPPSM is a subsidiary of RAO "EES of Russia". The number of employees is 580 persons, engineers and technicians for the most part.

The Firm renders all kinds of industrial and intermediate services in introduction of novel equipment and power-saving technologies, and improvement of operation of power enterprises, both acting and those being under design, reconstruction or modernization.

2. TURBOCON Scientific and Production Company

In Russian: Закрытое Акционерное Общество Научно производственное внедренческое предприятие "Турбокон":

In Russian abbreviation: ЗАО НИИВП “Турбокон”

In English: Turbocon Scientific and Production Company

In English Abbreviation: Turbocon SPC

Address: Kaluga 248010, Komsomolskaya Roshcha St., 43, P.O.B. 7715

Tel.: +7 (0842) 16-71-93, 55-04-74

Fax: +7 (0842) 55-17-51

E-mail: turbocon@kaluga.ru

Director: V.A. Fedorov, Dr. Sc. (Eng), laureate of the I.Polzunov RAS Prize

Main trends of activity:

- R&D work aimed at creating gas-turbine units (thermal physics, hydro- and gas dynamics, vibration acoustics, strength, control);
- Leasing activity associated with development and introduction of power-saving and ecology-friendly fuel-free technologies for producing heat and energy (0.25 to 25 MW capacity units based on national power equipment).

TURBOCON SPC participates in federal scientific and technical programs, such as *Fuel and Energy, Ecology-Friendly Energetics, Power Saving in Russia, Long-Term Program of Power-Saving in Moscow*, as well as in R&D work over priority trends of science and technology development for civil purposes.

The Company's developments in the field of power-saving technologies are supported by the Greenpeace international organization.

Two RAS Academicians, 15 doctors and 30 candidates of sciences from Kaluga, Moscow, St. Petersburg, and Novosibirsk work at the Company's projects.

3. FISONIC Innovation Company

In Russian: ИННОВАЦИОННАЯ КОМПАНИЯ ФИСОНИК

In English: FISONIC Innovation Company

Address: Moscow 115035, Sadovnicheskaya St., 71

Tel.: +7 (095) 953 4716, 953 6374

Fax: +7 (095) (095) 953 6376

E-mail: mail@fisonic.ru

Director-General: S.V. Tishkin

Main trends of activity:

The FISONIC company was established with the view of extending R&D activity and development of FISONIC technologies for the needs of power engineering and other sectors, as well as for promoting the said technology to the world market.

The FISONIC apparatus is a heat machine using the energy of steam for heating and pumping of liquid without application of additional energy sources. The principle of operation of all FISONIC machines is based on the two-phase flow theory. The FISONIC machines can find application in any place where it is necessary to heat or pump liquid by means of steam.

The FISONIC Company possesses exclusive patents for the principle of operation and application of the FISONIC technologies in Russia, the USA, and some European and Asian countries.

Batch production of the FISONIC equipment is arranged at some Russian plants authorized by the Company. The FISONIC machines successfully operate at more than 500 industrial enterprises and civil objects in Russia and abroad.

4. Power Saving Center and TOVUS Company

Address: Moscow 111116, Aviamotornaya St., 4

Tel.: +7 (095)362-01-59

Fax: +7 (095)362-01-11

Main trends of activity:

- Introduction of power-saving lamps and lights
- Introduction of variable frequency LV and HV drives
- Introduction of the technology for non-fire repair of defects of pipelines for petroleum products, gas, water, and defects of reservoirs for explosive media without their emptying
- Introduction of finished units based on gas-turbine power plants of 15 MW capacity

5. VETROTOK Scientific and Production Company

Address: Yekaterinburg 620151, P.O.B. No. 54

Tel.: +7 (3432)39-98-19

Fax: +7 (3432)53-14-60

Main trends of activity:

- Wind power unit VEU-16 for power generation in any natural and climatic zone with normal and increased wind activity
- Wind power unit VEU--5-4
- Solar water heat units
- Electric water-heating boilers, 3 to 15 kW power
- Heat accumulators, 1 to 3 kW power, for heating of premises

6. CASPYI Scientific and Production Company

Address: Astrakhan 414056, Tatishchev St., 16

Tel.: +7 (85122)25-74-63

Main trends of activity:

Wind power unit VTES-32 intended for production of energy with the aid of both wind power and fuel (black oil, gas, etc) combustion products. When the wind velocity is from 8 to 12 m/s, VTES operates as a wind power plant, when the wind is weak, VTES starts to operate as a thermal heat power plant with the temperature of combustion products at the turbine entrance not exceeding 220-240 °C.

7. QUARK Firm

Address: Moscow 113545, Varshavskoe Highway, 127-V, bldg. 2

Tel.: +7 (095)315-67-91

Fax: +7 (095)315-67-91

Main trends of activity:

Heat-exchange and deaeration equipment of the new generation, kinetic ejector pumps, devices for heating viscous media, which can find application in all productions.

The Firm is engaged in R&D work regarding novel power-saving technologies for heating, deaeration, pumping of gas and liquids.

8. KRIOKOR Company

Address: Moscow 105043, 3rd Parkovaya St., 8/19

Tel.: +7 (095) 367 6909

Fax: +7 (095) 367 6918

Main trends of activity:

Development and turn-key construction of power-saving units using surplus pressure of natural gas at gas distribution plants. At present, the KRIOKOR Company has elaborated and started lot production of the DGA-5000 gas-expansion machine of 5- MW power intended for operation at gas-distribution points of big gas consumers, such as combined heat and power plants and regional hydroelectric power plants within Russia's Unified Power System.

9. Moscow Plant of Heat Automatics

Address: Moscow 105058, Mironovskaya St., 33

Tel.: +7 (095)369-70-03

Fax: +7 (095)166-32-98

Main trends of activity:

Development and production of automation means for generation, distribution and saving of heat energy. The Plant produces regulating devices for boiler units and heat supply of the RS-2 series, instruments for control of flame and lighting. For power saving purposes, the Plant manufactures the TEPLAR regulators and new devices of the MINITERM-300 and MINITERM-400 series. RUNT devices are successfully operated at present.

10. Research Center

Address: Москва 103460, Zelenograd

Tel.: +7 (095)531-24-72

Main trends of activity:

The Center has developed a family of luminescent compact lamps governed by electronic start control devices (ESCD), and such ESCD for industrial and domestic lighting fixtures of 7 to 132 W power with up to four lamps in a fixture. Power consumption for lighting of living accommodations, premises, and office rooms with the use of compact lamps and ESCD may be decreased four- of fivefold as compared with filament lamps and throttle start control devices.

11. Podolsk Machine-Building Plant

Address: Podolsk 142103, Moscow Region, Zheleznodorozhnaya St., 2

Tel.: +7 (095) 137 97 63

Fax: +7 (095) 202 29 62

Main trends of activity:

The Podolsk Machine-Building Plant is one of the leading national manufacturers of high-capacity boilers for thermal power plants, and equipment for petroleum processing industries and atomic energetics. One of the Plant's priorities is creation of recovery boilers of various throughput for gas-steam units of 16-500 MW power. Those boilers shall be have pipes with spiral ribbing developed and produced at the Podolsk Plant.

The Plant produces a good deal of various devices for power units, namely: low- and high-pressure heaters, firm valves for dust and air ducts, steam and water calorifers with spirally ribbed pipes, heating surfaces, unified sections of tubular air heaters, etc.

The Plant specialists do not spare efforts for enhancing efficiency of boilers and complete power units.

During modernization of acting boiler equipment, the Plant specialists work out and apply engineering solutions for enhancing service period, achieving power saving, improving environmental conditions.

12. Geared Machinery Scientific and Technical Center

Address: Moscow 105094, Semenovskaya Embankment, 3/1, bldg. 3

Tel.: +7 (095)360-01-34

Fax: +7 (095)360-01-34

Main trends of activity:

The Geared Machinery Center, engaged in solving commercial, technical and production tasks relating to asynchronous gear systems, offers asynchronous geared motors of home, foreign, and joint make. The Center is an official distributor of frequency converters of the MITSUBISHI ELECTRIC Company.

13. Rybinsk Instrument-Making Plant

Address: Rybinsk 152907, Yaroslavl Region, Serov Lane, 89

Tel.: +7 (0855)55-87-00

Fax: +7 (0855)55-45-24

Main trends of activity:

- Promising power-saving equipment with the use of automatic energy account and control systems, and electronic energy counters (ESE-2, ESE-3, TsE6807, TsE6803);
- Wind power units;
- Automated heat pump plants ATNU-12R. A pilot plant is operated in the Luibimsky district of the Yaroslavl Region;
- Plants for complex water purification and disinfection, domestic filters.

14. TBN Energoservice Company

Address: Moscow 103055, 2nd Vysheslavtsev Lane, 17, bldg. 2

Tel.: +7 (095)973-00-19

Fax: +7 095)978-00-84

Main trends of activity:

Researchers of the Company's scientific and industrial laboratory are engaged in development of TS-2000 universal metering devices of the new generation with considerably improved technical characteristics for energy account and control in various power systems. At present, TVU-6 universal multi-channel electromagnetic energy counter, and KM-5 electromagnetic energy counter have been developed and shall be soon certified.

15. Sectoral Center of Plasma Power Technologies of RAO "EES of Russia" at the Gusinozersk regional hydroelectric power plant (RHPP)

Address: Gusinozersk 671280, Gusinozersk RHPP

Tel.: +7 (30145)91-523

Fax: +7 (30145)92-685

Main trends of activity:

The Center has developed and started lot production of a plasma system for kindling of boilers with the use of electric arc plasmatrone. This technology makes it possible to exclude application of black oil, reduce underburning, and also provides wide opportunities for automation of a kindling process, stabilization of the coal dust flame, and reduction of discharges into environment.

16. Urals Electrotechnical Company

Address: Yekaterinburg 620017, Starykh Bolshevikov St., 22

Tel.: +7 (3432)43-86-79

Fax: +7 (3432)34-98-91

Main trends of activity:

The Urals Electrotechnical Company produces up-to-date plate-type and shell-and-tube heat exchangers for construction, municipal communal services, power engineering, shipbuilding, and other sectors.

Field of activity and equipment produced: heat exchangers – plate-type; demountable (fully or partly); welded heat exchangers for heating, hot water supply, conditioning and ventilation, as well as for media heating and cooling in various manufacturing processes; unit-type heat points; assembly units for account and control instruments; mounting of heat- and hot water supply systems; cleaning of pipelines and boilers, etc.

17. Tsentrpribor Company

Address: Moscow 150058, Mironovskaya St., 33

Tel.: +7 (095)369-64-16

Main trends of activity:

The Company is engaged in development and production of reliable and high-accuracy ultrasonic instruments and devices for commercial account of heat, cold and hot water consumption (UFM-001 and UFM-005 flow meters, UTC-1, UFEC-001 and UFEC-005 heat counters).

18. Electrotechnical Company

Address: Moscow 117942, Vavilov St., 38, bldg. 3

Tel.: +7 (095)132-81-49

Fax: +7 (095)132-83-55

Main trends of activity:

The Company produces "Master" and Transformer" microprocessor devices used for automatic control of equipment of heat points, boilers, air heating and conditioning systems, etc.

At present, over 3,000 such devices are functioning at various objects.

19. ENELEKO Firm

Address: Moscow 109145, Privolnaya St., 25

Tel.: +7 (095)705-87-36

Fax: +7 (095)132-83-55

Main trends of activity:

The Firm offers an integral system for power consumption control with emergency signaling and radio channel, which provides as follows:

- Integration of all individual systems for account and control of end users' consumption of power, heat, gas, cold and hot water;
- Control over conditions of power-, water-, heat-, and gas supply systems, as well as sewerage systems.

20. EnergoProgress Association of the Tatarstan Power Mains, Engineering Center

Address: Kazan 420044, Republic of Tatarstan, Bondarenko St., P.O.B No. 113

Tel.: +7 (8432)387-124, 373-015

Main trends of activity:

- Design of power consumption accounting devices
- Delivery of equipment for accounting power and cold water consumption (computing devices, flow meters, gages);
- Servicing of consumption accounting equipment.

21. Energotekhnika Scientific and Production Enterprise

Address: Penza 440026, Lermontov St., 3

Tel.: +7 (8412)55-31-29

Fax: +7 (8412)52-13-76

Main trends of activity:

The Energotekhnika enterprise was established in 1993 as a result of conversion of some Penza plant. The main trends of the enterprise activity are development and production of systems for automatic control and accounting of power consumption.

By the present day, the enterprise has designed and started lot production of the *Resource* system for accounting consumption of power, cold and hot water, steam, natural and other gases. The enterprise also carries out design, assembly, startup/adjustment operations.

22. ERA Scientific and Production Enterprise

Address: Voronezh 394000, F. Engels St.

Tel.: +7 (0732) 52-05-86

Fax: +7 (0732) 53-12-62

Main trends of activity:

The ERA enterprise activity includes R&D work, manufacture and supply of asynchronous motors control devices.

The enterprise has arranged lot production of the following items: BPR, BPR-RM, BPR-250 start control devices, KED motor controllers. Of promising developments worth mentioning is a variable frequency electric drive rated for 10 kW (prototype tests conducted, lot production expected in the nearest future).