Dear colleagues,

In 2017 RUSNANO Group is going to celebrate its first anniversary - 10 years since Russian Corporation of Nanotechnologies was established. During this time we have been carrying out the mission entrusted to us by the state - creation of a new sector in Russia - nanoindustry.

Our work resulted in the launch of 87 plants and R&D centers in 35 regions of Russia in cooperation with our external partners. More than 24,000 high-skilled specialists work in new enterprises and annual turnover of the new industry exceeded 1.3 trillion rubles. New technological clusters were created in Russia, including nanoelectronics and photonics, nanocoating and surface modification, new materials, renewable power generation, nanobiopharmaceutics, nuclear medicine and medical instrument engineering. Due to the efforts in the sphere of import substitution and technology transfer and close interaction with Russian scientific community, the Group managed to commercialize science-intensive developments, that became the drivers of industrial growth and infrastructure development in Russia. Today we can acknowledge - nanoindustry has already succeeded as an economic sector in Russia.

RUSNANO Group strategy 2020 includes further attraction of Russian and foreign private investors into implementation of innovative projects. Advanced technologies in real economy remain the investment priority of the Group.

Anatoly Chubais
Chairman of the Executive Board of RUSNANO Management Company LLC
Chairman of the Executive Board of the Fund for Infrastructure and Educational Programs
RUSNANO —

is a basic development institution in the high-technology sector aimed at diversification of national economy; successor of “Russian Corporation of Nanotechnology” (RCNT), established in 2007 according to Presidential Initiative “Nanoindustry Development Strategy”.

RUSNANO GROUP

- RUSNANO JSC — commercializes the latest nanotechnological developments with the aim to create a competitive business based on them. The company acts as a co-investor of projects with high economic potential; provides financing directly as well as through investment funds.

- RUSNANO MANAGEMENT COMPANY LLC — is in charge of the investment portfolio of RUSNANO JSC, forms private equity funds and investment funds with the participation of third-party investors. Launching production facilities and R&D centers in Russia is the priority of the Company. The share of private investments (Russian and Foreign) in each of the funds is at least 50%.

- THE FUND FOR INFRASTRUCTURE AND EDUCATIONAL PROGRAMS (FIEP) — stimulates innovative development in nanotechnological and associated hi-tech sectors of the Russian economy. The Fund creates and develops innovative infrastructure, particularly networks of nanocenters and engineering companies, system of personnel training and professional education, deals with certification and standardization of nanotechnological products, institutional and informational support of hi-tech developments.
STATE PARTICIPATION IN NANOINDUSTRY CREATION

DIRECT FINANCING FROM THE BUDGET IN 2007–2015

130
bin rubles

RUSNANO JSC 78%

101
bin rubles

THE FUND FOR INFRASTRUCTURE AND EDUCATIONAL PROGRAMS (FIEP) 22%

29
bin rubles

STATE GUARANTEES FOR RUSNANO JSC IN 2010–2015

182
BLN RUBLES

STATE GUARANTEES FOR RUSNANO JSC IN 2016–2018 (PLAN)

70
BLN RUBLES

[1] Production of single-walled carbon nanotubes. OCSIA company, Novosibirsk


[3] Production of armored ceramics. NEVZ-CERAMICS CJSC, Novosibirsk
NANOINDUSTRY INFRASTRUCTURE

THE FUND FOR INFRASTRUCTURE AND EDUCATIONAL PROGRAMS supports innovative development of nanotechnological sector and high tech sectors of Russian economy. It develops the infrastructure of new industry, creates its staff capacity, stimulates demand for nanoproducts, deals with their standardization and certification, contributes to legislation improvement.

The Fund supports and develops the NETWORK OF NANOTECHNOLOGICAL CENTERS. 15 nanocenters were created in 11 regions of Russia. More than 500 startups were launched in nanocenters. Nanocenters partner with private companies, regional authorities, research institutes, universities.

Together with partners the Fund creates TECHNOLOGICAL ENGINEERING COMPANIES (TEC), which develop and implement original technologies for different industries. 9 TECs have already been created. They are specialized in elaboration of composites production technologies, gas-turbine units, gas separation systems, additive technologies and other fields.

EDUCATIONAL PROGRAMS supported by the Fund are aimed at training of highly qualified personnel for nanotechnology. Over 150 educational programs were developed and over 53 thousand people were trained. Online training in nanotechnology and tech-entrepreneurship is provided on eNANO platform. “RUSNANO School League” involves more than 800 schools from 73 regions of Russia. 45 occupational standards have been developed, 3 centers of qualification assessment have been opened with the assistance of the Fund.

In order to expand the scope of innovations, the Fund improves REGULATORY AND TECHNICAL INFRASTRUCTURE. Center of standardization in innovation sphere and regional centers of regulatory and technical support of innovations have been created. More than 100 nanotechnological enterprises received certification documents for free circulation of their products in the market. The Fund developed more than 330 standards for nanoproducts, issued 456 certificates of quality and safety compliance. In order to raise nanotechnology awareness 100 “Russian nanotechnological products” labels that mark nanotechnological products have been assigned.

The Fund develops and assists in registration of measurement procedures and standards, essential for nanotechnology, and develops and implements “green” standards in cooperation with the Federal Agency on Technical Regulating and Metrology.

ANNUAL REVENUE OF NANOCENTRES AND THEIR PROJECT COMPANIES, MLN RUBLES

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1,936</td>
</tr>
<tr>
<td>2015</td>
<td>1,609</td>
</tr>
<tr>
<td>2014</td>
<td>1,369</td>
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</tbody>
</table>

NUMBER OF STARTUPS IN NANOCENTERS (ACCRUED TOTAL)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>522</td>
</tr>
<tr>
<td>2015</td>
<td>409</td>
</tr>
<tr>
<td>2014</td>
<td>163</td>
</tr>
</tbody>
</table>
RUSNANO PROJECTS GEOGRAPHY

87 CURRENTLY OPERATING ENTERPRISES AND R&D CENTERS

15 NANOCENTERS

35 REGIONS OF RUSSIA

369 BLN RUBLES ANNUAL VOLUME OF SALES OF NANOPRODUCTS BY PORTFOLIO COMPANIES

- Nanoelectronics and Photonics
- Nanocoating, surface modification and new materials
- Innovative nanopharmaceuticals, nuclear medicine and medical instrument engineering
- Renewable power generation
- Nanocoating, surface modification and new materials
Due to RUSNANO investments, domestic production of semiconductive optical products, LEDs, SIM cards, biometric passports, transport and bank cards, magnetic sensors appeared in Russia. Millions of Russian citizens use products created with RUSNANO participation every day. RUSNANO Group implements the Government’s policy of import substitution in various sectors of Russian economy. Back in 2015, Russia imported 100% of fiber optic cable used for data transmission to Russian Internet users. Today RUSNANO portfolio company “Optic Fiber Systems” supplies optical fiber not only throughout Russia, but also exports it.
Russian scientific and technical developments are widely applied in this cluster. All RUSNANO projects in the field of nanocoating and surface modification are an example of close cooperation of science and business.

Most projects supported by RUSNANO Group in this area are focused on mechanical engineering and industrial production. Metals, ceramics, new materials are used as coating. Application opportunities range from gas-turbine engines and drill pumps to bridges and steel structures. Nanotechnologies fostered creation of Optical light filters that change light transmission factor. This technology is applied in solar panels production, in optics and lighting engineering, organic and flexible electronics, as well as in medicine.
Developments in new materials, one of the key global trends, is one of RUSNANO strategic priorities. RUSNANO Group activities in the market make it possible for Russia to claim leadership in development and production of new materials.

One of successful examples is RUSNANO portfolio company OCSiAl, which was the first to introduce the technology of industrial production of single-walled carbon nanotubes. Microscopic additives of single-walled carbon nanotubes fundamentally change mechanical and electrical properties of basic materials. Technology of industrial production introduced by OCSiAl opens new opportunities for applying the product due to its cost effectiveness and a significantly lower manufacturing cost. OCSiAl share in the global market amounts to more than 90%. Another RUSNANO portfolio company, Monocrystal is an undoubted leader in the global market of synthetic sapphire. This material is used for production of camera lenses, fingerprint sensors and screens of LEDs, smartphones, tablet PCs and “smart” watches. 95% of all Monocrystal products are exported to 25 countries.
Mass production of the most advanced vaccines and pharmaceuticals in the Russian Federation is one of RUSNANO Group’s strategic priorities. The Group Strategy is guided by the targets of “Pharma-2020” governmental program. Thus, RUSNANO stimulates technology transfer, finances the most promising technologies that did not exist in our country previously, such as targeted drug delivery into the affected organs. RUSNANO established cooperation with the World’s leading pharmaceutical groups. Initially RUSNANO was focused on import substitution in the pharmacy sphere, but by now portfolio companies have entered overseas markets.

Geography of operations (including branches)

<table>
<thead>
<tr>
<th>Region</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moscow</td>
<td>4</td>
</tr>
<tr>
<td>Moscow region</td>
<td>1</td>
</tr>
<tr>
<td>St. Petersburg</td>
<td>1</td>
</tr>
<tr>
<td>Kirov region</td>
<td>1</td>
</tr>
<tr>
<td>Yaroslavl region</td>
<td>1</td>
</tr>
<tr>
<td>Kaluga region</td>
<td>1</td>
</tr>
</tbody>
</table>

RUSNANO TECHNOLOGICAL CLUSTERS

INNOVATIVE NANOBIPHARMAEUTICS

ENTERPRISES

[3] Synthetic nanovaccine production. Selecta RUS LLC, Khimki (Moscow region)
New Nuclear Medicine Centers of PET Technology are planned to be opened by the end of 2017. PET Technology, RUSNANO’s portfolio company, created a network of Nuclear Medicine Centers. This increases availability of advanced medical technologies for Russian citizens. As of today, 8 nuclear medicine centers and radiopharmaceuticals production facilities have already been launched.

Scientific and educational cluster is formed around the industry, allowing PET-Technology company to offer world standard in the field of diagnosis of oncological diseases. More than 34,000 patients have already undergone early diagnosis of oncological diseases.

BEBIG Company is another example of successful application of nuclear medicine technologies. It developed innovative methods for oncological disease treatment using low-dose brachytherapy based on iodine-125. RUSNANO projects facilitate the development of import substitution in the field of hi-tech medical products.

Other successful examples include: HemaCore company, specialized in development of a new method of blood clotting disorder diagnosis, TRACPORE TECHNOLOGY company, which produces unique medical equipment for membrane plasmapheresis.

PET (Positron Emission Tomography)/CT (computer tomography) examinations conducted since the first PET center has been opened (as of May 2017)

34,000

New Nuclear Medicine Centers of PET Technology are planned to be opened by the end of 2017

3
The world’s fastest growing sector of power generation appeared in Russia due to RUSNANO efforts. Hevel LLC, a joint venture of Renova Group and RUSNANO JSC, became the pilot project in this field. Hevel LLC includes solar modules production plant in Novocheloborsk (Chuvash Republic), subdivision for designing and construction of solar power plants and Russia’s only field-specific R&D center of thin-film technologies in power generation affiliated with Ioffe Physical-Technical Institute (St. Petersburg). Due to comprehensive approach to solar energy based on domestic R&D and the most advanced technologies are implemented. Projects in the field of wind energy is the next stage of renewable power generation as an industry. The first industrial wind farm will be opened in Ulyanovsk region by the end of 2017. Wind farm equipment will be produced in Russia.

RUSNANO Group also finances developments in the field of industrial accumulation and storage of energy, as well as the projects associated with the development of city electric transport. In 2017 RUSNANO is launching First Ecological Fund that will focus on the technologies of solid waste disposal and power generation during waste incineration. The Fund will develop the technology of environment-friendly waste burning, which is going to solve the problem of waste disposal in large cities in Russia.
RUSNANO ECOLOGICAL MISSION

The President of the Russian Federation Vladimir Putin declared 2017 the year of environment in Russia. RUSNANO acts as a driver of ecological innovations and considers its ecological mission as the development of projects in renewable power and energy storage sector, production of materials based on waste, environmental-friendly waste recycling. Development of energy-efficient technologies and production of new materials will help reduce consumption of cement, ferrous and non-ferrous metals, traditional plastics. This will reduce incineration of hydrocarbons required for their production, that will result in reduction of CO₂ emissions to the atmosphere. Today RUSNANO portfolio includes dozens of implemented projects, helping to achieve significant ecologization of urban environment and industrial production.

ENVIRONMENTAL EFFECTS:

- **Reduction of emissions of CO₂ due to:**
  - implementation of electric vehicles technologies
  - application of new materials and reduction of usage of basic materials
- **Reduction of consumption of traditional power sources due to:**
  - solar energy development
  - wind energy development
  - waste-to-energy technologies
  - development of energy-efficient technologies, reducing heat losses
- **Eco logically responsible waste recycling:**
  - disposal of glass waste
  - disposal of waste tires
  - environment-friendly burning of non-recyclable waste
  - reduction of amount of industrial wastewaters due to reuse of water after purification

- **Hevel:** creation of solar modules, construction of solar parks
- **Wind Energy Development Fund:** localization of wind turbine components production and wind farm construction
- **Liotech:** creation of Russia’s first production of new generation lithium-ion batteries for power generation sector and electric vehicles
- **First Ecological Fund:** localization of environment-friendly waste burning technology and waste-to-energy technologies
- **ICM Glass:** heat-insulating materials production based on nanotechnological approach to cullet processing
- **New Construction Technologies:** production of roadway covering modifier based on recycled use of waste tires
- **SP Glass:** production of energy-saving glass with nanocoating
- **Galen:** production of composite materials based on basalt fiber for the reduction of heat losses in construction
- **OCSIA:** industrial production of single-walled carbon nanotubes to reduce basic materials and energy consumption
- **RM Nanotech (MEMBRANIUM):** production of nanostructured membranes for water treatment
- **Prepreg-ACM:** production of composite materials based on carbon and mineral fibers for improvement of physical and mechanical properties of materials, extension of life cycle of bearing structures and reduction of basic materials consumption
NANOINDUSTRY
IN RUSSIA
2007–2017
NANOELECTRONICS
AND PHOTONICS
RENEWABLE POWER GENERATION
NEW MATERIALS
NANOCOATING
AND SURFACE MODIFICATION
INNOVATIVE
NANOBIOPHARMACEUTICS
NUCLEAR MEDICINE AND MEDICAL
INSTRUMENT ENGINEERING
NANOINDUSTRY INFRASTRUCTURE

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