

SCIENTIFIC INNOVATION AND KNOWLEDGE SHARING

148.1

BLN RUB – ROSNEFT'S
2013 EXPENSES FOR
INNOVATION ACTIVITIES

In 2013, Rosneft continued working on enhancing its intellectual and technological advantage by funding cutting-edge in-house R&D development, supporting Russia's leading universities and R&D centers, and creating joint R&D centers with leading international companies.

The Company's 2013 innovations budget was RUB 148.1 bln. including Research and Advanced Development expenses in the amount of RUB 23.2 bln. Rosneft filed 52 patent applications for inventions, utility models and software to be protected by intellectual property rights, nearly tripling the number of such applications registered in the previous year.

2013 MAIN ACHIEVEMENTS IN KEY PROJECTS

A technology for tight reservoirs development was implemented in LLC RN-Yuganskneftegaz fields, 32 wells were drilled in 2013 delivering incremental production of 167 kt.

Two unique expeditions – KARA-Winter 2013, KARA-Summer 2013 – were carried out to investigate the ice conditions and conduct metocean studies in support of offshore resource E&A and development projects in the south-western part of the Kara Sea.

During the expedition, a number of ice and metocean measurements on 22 ice stations were done, automatic buoys were installed on 14 ice fields and 16 icebergs in order to record their drift, aerial photography of icebergs and hummock ice ridges was done using a helicopter and a drone, as well as subsea photography of hummock and iceberg keels. Aerial photography of 66 iceberg routes was done from a Ka-32 helicopter. Over 2,500 measurements and tests of ice and iceberg cores were made. A remotely operated vehicle

was used to investigate sea bottom scouring.

The data obtained were used to develop recommendations regarding design solutions to ensure offshore structures reliability and strength and equipment protection from adverse environmental impacts.

In 2013, new oil and gas condensate and gas condensate plays were discovered on the territory of the Irkutsk Region, Mogdinskiy license block. An inflow of up to 425 kcm/day of gas and condensate and 90 cm/day of oil was recorded. This was made possible by using an in-house geological model developed by specialists from the Company's Innovations Block.

As a part of technology development for Turonian low permeability gas reservoir management, drilling of wells with different design was completed, including a well with multistage fracturing by specially developed in RN-UfaNIPIneft design. According to the preliminary test results well yield exceeds 200 thousand cubic meters/day. The Company will receive a technology for Turonian deposits development, an important element of the gas Rosneft's gas strategy.

An innovative 3S-separation gas treatment facility with a throughput of 160 mmcma has been developed and will be installed at the Pravdinskaya Compressor Station, RN-Yuganskneftegaz, to ensure the required amount of gas for RN-Yuganskneftegaz own needs and supplies to Poikovskiy village.

The facility will also produce 11 kcmca of stable condensate from associated gas, which is going to be sold to third party consumers at market prices.



The experimental hydrocatalytic processes modeling unit

Strategic Focus of Rosneft's Innovations

Rosneft's innovative efforts are aimed at creating and implementing cutting-edge technologies to achieve the following goals:

Exploration & Production:

- hydrocarbon reserves replacement at least at the level of 100% of current production;
- ensuring maximum permissible hydrocarbon recovery factors from greenfields, developing systemic measures to enhance oil and gas recovery from the producing fields;
- ensuring maximum efficiency in associated gas utilization – 95%;
- developing technologies for making unconventional hydrocarbon reserves development economic.

Refining:

- improvement of crude oil conversion level;
- implementation of new technologies to refine heavy cuts, as well as new petrochemical technologies.

To achieve these goals, Rosneft is carrying out the Innovative Development Program, compliant with the regulatory and planning documents of the national, regional and corporate levels.

The Program contains the following main blocks:

- Target-focused innovation projects;
- Target-focused modernization and operational efficiency improvement programs;
- Actions aimed at innovative activities improvement.

In 2013, the Company, improved the efficiency of its Innovative Development Program by engaging more actively with the Moscow State University Fund "National Intellectual Development" on developing associated petroleum gas fractionation methods.

36

TARGET-FOCUSED INNOVATION PROJECTS WERE CARRIED OUT IN 2013 WITH PARTICULAR ATTENTION TO IMPLEMENTING THEIR RESULTS AND MAKING THEM PROPRIETARY VIA INTELLECTUAL PROPERTY RIGHTS

SCIENTIFIC INNOVATION AND KNOWLEDGE SHARING

148.1

BLN RUB – ROSNEFT'S
2013 EXPENSES FOR
INNOVATION ACTIVITIES

In 2013, Rosneft continued working on enhancing its intellectual and technological advantage by funding cutting-edge in-house R&D development, supporting Russia's leading universities and R&D centers, and creating joint R&D centers with leading international companies.

The Company's 2013 innovations budget was RUB 148.1 bln. including Research and Advanced Development expenses in the amount of RUB 23.2 bln. Rosneft filed 52 patent applications for inventions, utility models and software to be protected by intellectual property rights, nearly tripling the number of such applications registered in the previous year.

2013 MAIN ACHIEVEMENTS IN KEY PROJECTS

A technology for tight reservoirs development was implemented in LLC RN-Yuganskneftegaz fields, 32 wells were drilled in 2013 delivering incremental production of 167 kt.

Two unique expeditions – KARA-Winter 2013, KARA-Summer 2013 – were carried out to investigate the ice conditions and conduct metocean studies in support of offshore resource E&A and development projects in the south-western part of the Kara Sea.

During the expedition, a number of ice and metocean measurements on 22 ice stations were done, automatic buoys were installed on 14 ice fields and 16 icebergs in order to record their drift, aerial photography of icebergs and hummock ice ridges was done using a helicopter and a drone, as well as subsea photography of hummock and iceberg keels. Aerial photography of 66 iceberg routes was done from a Ka-32 helicopter. Over 2,500 measurements and tests of ice and iceberg cores were made. A remotely operated vehicle

was used to investigate sea bottom scouring.

The data obtained were used to develop recommendations regarding design solutions to ensure offshore structures reliability and strength and equipment protection from adverse environmental impacts.

In 2013, new oil and gas condensate and gas condensate plays were discovered on the territory of the Irkutsk Region, Mogdinskiy license block. An inflow of up to 425 kcm/day of gas and condensate and 90 cm/day of oil was recorded. This was made possible by using an in-house geological model developed by specialists from the Company's Innovations Block.

As a part of technology development for Turonian low permeability gas reservoir management, drilling of wells with different design was completed, including a well with multistage fracturing by specially developed in RN-UfaNIPIneft design. According to the preliminary test results well yield exceeds 200 thousand cubic meters/day. The Company will receive a technology for Turonian deposits development, an important element of the gas Rosneft's gas strategy.

An innovative 3S-separation gas treatment facility with a throughput of 160 mmcma has been developed and will be installed at the Pravdinskaya Compressor Station, RN-Yuganskneftegaz, to ensure the required amount of gas for RN-Yuganskneftegaz own needs and supplies to Poikovskiy village.

The facility will also produce 11 kcmca of stable condensate from associated gas, which is going to be sold to third party consumers at market prices.



The experimental hydrocatalytic processes modeling unit

Strategic Focus of Rosneft's Innovations

Rosneft's innovative efforts are aimed at creating and implementing cutting-edge technologies to achieve the following goals:

Exploration & Production:

- hydrocarbon reserves replacement at least at the level of 100% of current production;
- ensuring maximum permissible hydrocarbon recovery factors from greenfields, developing systemic measures to enhance oil and gas recovery from the producing fields;
- ensuring maximum efficiency in associated gas utilization – 95%;
- developing technologies for making unconventional hydrocarbon reserves development economic.

Refining:

- improvement of crude oil conversion level;
- implementation of new technologies to refine heavy cuts, as well as new petrochemical technologies.

To achieve these goals, Rosneft is carrying out the Innovative Development Program, compliant with the regulatory and planning documents of the national, regional and corporate levels.

The Program contains the following main blocks:

- Target-focused innovation projects;
- Target-focused modernization and operational efficiency improvement programs;
- Actions aimed at innovative activities improvement.

In 2013, the Company, improved the efficiency of its Innovative Development Program by engaging more actively with the Moscow State University Fund "National Intellectual Development" on developing associated petroleum gas fractionation methods.

36

TARGET-FOCUSED INNOVATION PROJECTS WERE CARRIED OUT IN 2013 WITH PARTICULAR ATTENTION TO IMPLEMENTING THEIR RESULTS AND MAKING THEM PROPRIETARY VIA INTELLECTUAL PROPERTY RIGHTS

ROSNEFT R&D CENTER IS ONE OF THE KEY RESIDENTS IN THE SKOLKOVO INNOVATIONS CENTER WITH ANNUAL FUNDING OF RUB 350 MLN

The uniqueness of the facility comes from using an associated petroleum treatment technology (3S-separation) based on a low-temperature ultrasonic gas separator that uses state-of-the-art aerodynamic technology.

A patent was issued for a utility model, "A Device for Casing Repair or Selective Reservoir Isolation". The technology will enable reactivation of over 400 idle wells with the total post-reactivation flow rate of over 2,000 t/day.

The first stage of pilot testing of equipment for dual production and injection was done by OJSC Udmurtneft and OJSC Samarateftegaz, candidate wells were selected for each BHA, and test equipment was run in 3 wells, which achieved a steady-state flow. Four patents for 3 dual production assemblies and 1 dual injection assembly were issued. The Company can potentially implement these technologies in 50 wells per annum with incremental oil production of ca. 250 ktpa.

In 2013 new algorithms and software were developed in 15 subsidiaries and 8 corporate R&D and Design Institutes, making it possible to address unique flow modeling and reservoir management issues, including:

- ensuring monitoring and real-time adjustment of horizontal well drilling trajectories based on logging while drilling data;
- application in tight reservoir development (Priobskoye and Prirazlomnoye fields) whose recoverable reserves, are 150 mm t.;
- ensuring optimum well pad designing and field development planning based on the reservoir long-term proxy model.

Jointly with the Catalysis Institute, Siberian Branch of the Russia Academy of Sciences, a technology for pilot fluidized-bed reforming catalyst production was developed. Commercialization of the technology will provide for a 1–2% increase in the reformate yield (high-octane component of motor and jet fuels) vs. known foreign analogues.

As part of looking into alternative energy, the Company, jointly with the Biochemical Physics Institute, Russia Academy of Sciences, and the

Moscow state University, is conducting fundamental and technology-focused research developing and improving 3-rd generation thin-film solar cells based on metal-oxide solar cells (MO SC). Applications for 2 invention patents have been filed, "Bilateral Solar Photo Converter" and "Solar Photo Converter". A test facility was designed and installed on the roof of the Biochemical Physics Institute building, which consists of 5 different types of solar panels.

The ultimate project goal is development of a technology for manufacturing a new type of solar cells and solar panels which could be 2–3 times less expensive than existing analogues

ROSNEFT CONSOLIDATED R&D CENTER – ADVANCED OIL REFINING AND PETROCHEMICAL TECHNOLOGIES

The Company's Innovations Block organization includes the Consolidated Research and Development Center (RN-R&D Center, LLC). The Center has Gas-to-liquids (GTL) technologies and is now completing mini-GTL technology development. It can also offer unique technologies for catalyst production fit for this process.

The corporate RN-R&D Center has developed cutting-edge oil refining and petrochemical technologies:

- a technology for producing a broad variety of synthetic base oils with the 130–170 viscosity index and -50 °C...-60 °C pour point for different applications. This innovative technology can reduce feed and power costs by 10–15 %.
- a new technology, unrivaled in the Russian Federation, has been developed enabling the creation of own feed base to manufacture high-value polymer materials which could replace imported materials.
- new polymer composite materials (glass- and carbon-fiber) have been developed, which on a number of parameters are superior to the best known commercial examples. In addition, their cost is significantly lower due to availability and low price of the feed material, dicyclopentadiene, a product currently not by petrochemical plants.

Knowledge rollout

Setting up a system of continuous summarization and rollout of knowledge and best practices is the vital element of Rosneft Innovative Development Program.

In 2013, our activity in this area included the following:

- quarterly production of our corporate Nauchno-tehnichesky vestnik OAO NK Rosneft ("Rosneft Science Monitor");
- regular publication of articles authored by Company specialists, in leading Russian academic and technical editions;
- participation of Rosneft specialists in national and international conferences.

Our Company is implementing a Knowledge Management System (KMS, the iKnow information system).

KMS is a necessary condition for the implementation of innovations and new technologies, enhancement of professional competences, allowing Company employees to share best practices, successful projects, lessons learnt, technical expertise, and laying grounds for professional enhancement and career growth via participation in Professional Communities.

Based on 2013 results, the Knowledge Management System is:

- 14 professional communities (67 experts, over 370 participants);
- 700+ documents uploaded to the iKnow Library;
- about 180 proposals and projects with lessons learnt;
- 1000+ unique users;
- 2000+ search queries.

Cash flow by new technology system projects portfolio, by year

