

**EUROPEAN UNION-RUSSIAN FEDERATION**

**COOPERATION IN SCIENCE, TECHNOLOGY AND INNOVATION**

**A ROADMAP FOR ACTION**  
**2011-2013**

# TABLE OF CONTENTS

Introduction	Page 2
Summary table of on-going and planned activities	Page 4
Highlight of the main cooperation activities by area	Page 6
Health Research	Page 6
Food, Agriculture and Fisheries, and Biotechnology Research	Page 8
Information and Communication Technologies (ICT) Research	Page 11
Nanosciences, Nanotechnologies, Materials and New Production Technologies	Page 12
(Non Nuclear) Energy	Page 14
Transport (Including Aeronautics) Research	Page 16
Environment (Including Climate Change) Research	Page 19
Space Research	Page 22
Research Infrastructures	Page 23
e Infrastructures	Page 25
International Cooperation Activities	Page 26
Researcher Mobility	Page 29
Fundamental Research	Page 31
Cooperation with the EU Joint Research Centre (JRC)	Page 32
Nuclear Energy Research	Page 36

## Introduction

The EU and Russia have had a strong history of successful and mutually beneficial cooperation in science and technology (S&T), both at the level of the European Union and through bilateral actions between Russia and individual EU Member States.

Indeed, cooperation in S&T forms a central element of EU relations. The EU and Russia have entered into a political commitment to create a 'Common Space in Research & Education, including Cultural Matters' (the 4th Common Space). Cooperation Agreements in S&T, and in nuclear safety and nuclear fusion are being actively implemented and there are several other EU, pan-European and global programmes and initiatives where the EU and Russia cooperate, such as the International Thermonuclear Experimental Reactor (ITER), the International Space Station, Eureka, the European Organisation for Nuclear Research (CERN), the European X-ray Free Electron Laser (XFEL), and the Facility for Antiproton and Ion Research (FAIR).

In both the EU and Russia, the development of effective innovation policies and programmes to develop a knowledge-based economy and increase the effectiveness of investment in research and development is high on the political agenda. This is reflected in the recently developed EU-Russia Partnership for Modernisation and the jointly agreed work plan for implementation.

Under the EU and Euratom Framework Programmes, Russia continues to be the most successful, international cooperation partner country, in terms of the total number of participations in the programme, the total amount of EU financial contribution received and the number of collaborative actions launched. Currently under the 7<sup>th</sup> Framework Programme (FP7), some 391 Russian research organisations are involved in 264 signed FP7 grant agreements, receiving over 45.6million euro of EU funding.

The strength of the EU-Russia relationship in S&T is also demonstrated through international cooperation under the Russian Federal Targeted Programmes (FTPs), where EU countries continue to be the most active international partners. Since 2007, European organisations have taken part in 153 projects funded under the FTP 'Research and Development in Priority Areas of Russia's Scientific and Technological Development in 2007-2013'. This constitutes over 56% of all projects with foreign participation implemented in the framework of this programme. Almost half of these cooperation projects are carried out with research institutions in Germany (44 projects) and France (28 projects). The largest number of projects with the participation of EU countries are in the areas of nanosystems and materials, and living systems.

Under the Activity 1.5 'Grant opportunities for Russian scientists living abroad'<sup>1</sup> of the FTP 'Scientific and Scientific-Pedagogical Human Resources for Innovative Russia in 2009-2013' there has been a high participation rate of researchers coming from EU countries. Out of 235 scientists who have participated in the programme since 2009, 127 (over 54%) came from the EU (mainly from Germany, UK and France). The researchers have been involved in research projects primarily in the areas of nanosystems and materials, living systems and rational use of natural resources.

---

<sup>1</sup> Incoming grants for Russian scientists living abroad to supervise a research project in a Russian R&D organisation.

The creation of permanent joint European Commission-Russia research working groups, under the Science and Technology Cooperation Agreement, in essentially all the thematic priorities of the FP, has been a substantial step towards more common research agendas and increasingly common decision-shaping processes between the EU and Russia.

One of the outcomes of the discussions in many of these thematic groups has been the establishment of a number of 'coordinated calls'. These are parallel research calls published by both the EU and Russia with common research content and a requirement that research teams on both sides that wish to collaborate, establish links and submit separate but complementary proposals to the EU and to the Russian funding agency involved. To date, eight such calls have taken place in key thematic areas, with funding of *ca* 31 million euro from both the EU and Russia. These co-funded activities demonstrate that EU S&T cooperation with Russia is moving towards a partnership between equals based on sharing funds and responsibilities.

In the coming years, these working groups will play a vital role in building a new strategic partnership between the EU and Russia. The groups will work to identify areas of research and innovation policy and programmes which are of mutual interest to the EU and Russia, and in designing and implementing effective cooperation mechanisms, through both the EU and Russian funding programmes to increase the scale and scope of EU-Russian collaboration.

Looking to the post-2013 period, the EU and Russia will develop further their strategic partnership by identifying two to three lead priority areas (over and above regular cooperation) where particular attention and investment could be prioritised to increase the scale of current cooperation

This document provides information on the achievements of ongoing EU-Russian cooperation through both the EU and Russian funding programmes, describes actions which are currently being planned and sets out potential new actions for strengthening cooperation and building a Strategic Partnership between the EU and Russia in research and innovation.

## Summary table of on-going and planned activities as agreed by the EU-Russia Joint S&T Committee

### Health research

Topic	Activity	Who	When / where
EU-Russia Health working group	Meeting of the working group to discuss future cooperation	COM/RF	Late 2011 (location tbd)

### Food, Agriculture and Fisheries, and Biotechnology research

Topic	Activity	Who	When / where
EU-Russia Agri-Bio-Food working group	Meeting of the working group to discuss future cooperation	COM/RF	Late 2011/early 2012 (location tbd)

### Information and Communication Technologies research

Topic	Activity	Who	When / where
Topics to be determined	Coordinated call	COM/RF	FP7 2013 work programme
EU-Russia ICT working group	Video conference and meeting to discuss potential topics for the coordinated call	COM/RF	September/November 2011 (Russia)

### Nanosciences, Nanotechnologies, Materials and New Production Technologies research

Topic	Activity	Who	When / where
Topics to be determined	New mechanisms for coordinated/collaboration	COM/RF	FP7 2012 work programme

### Energy (non-nuclear) research

Topic	Activity	Who	When / where
EU-Russia Energy working group	Meeting of the working group to discuss future cooperation	COM/RF	Autumn 2011 (location tbd)

### Transport (including aeronautics) research

Topic	Activity	Who	When / where
Aeronautics	Coordinated call. Potential topics for the call to be discussed in a future meeting of the working group	COM/RF	Potentially FP7 2013 work programme

### Environment (including climate change) research

<b>Topic</b>	<b>Activity</b>	<b>Who</b>	<b>When / where</b>
EU-Russia Environment working group	Meeting of the working group to discuss future cooperation	COM/RF	Autumn 2011 (Brussels)

### Research Infrastructures

<b>Topic</b>	<b>Activity</b>	<b>Who</b>	<b>When / where</b>
EU-Russia Research Infrastructures working group	Second meeting to continue discussions on future priorities	COM/RF	Late 2011/Early 2012 (Russia)

### eInfrastructures

<b>Topic</b>	<b>Activity</b>	<b>Who</b>	<b>When / where</b>
EU-Russia e-Infrastructures working group	Second meeting to continue discussions on future priorities	COM/RF	Late 2011/Early 2012 (location tbd)

### Researcher Mobility

<b>Topic</b>	<b>Activity</b>	<b>Who</b>	<b>When / where</b>
EU-Russia Researcher Mobility working group	Second meeting to continue discussions on future priorities	COM/RF	2012 (Russia – tbc)

### Cooperation with the EU Joint Research Centre (JRC)

<b>Topic</b>	<b>Activity</b>	<b>Who</b>	<b>When / where</b>
Cooperation with the JRC	Information Event	COM (JRC)	Late 2011, Moscow

## **Highlight of the main cooperation activities by area**

This section provides an overview of achievements, on-going and new activities for each research area. Each section has been divided into two parts that highlight the achievements (e.g. the actions already being implemented) and the planned activities (e.g. new actions mutually identified and agreed upon to be implemented in the coming years).

### **Health Research**

#### **Main achievements of EU-Russian cooperation**

Russia continues to participate strongly in the FP7 Health Theme, with 30 Russian participants involved in 15 current projects, receiving over 6.1 million euro of EU funding.

In addition to the direct involvement of Russian research organisations in FP7 projects, the last three work programmes for the Health Theme have included specific topics for EU-Russian collaboration. The 2009 work programme included a coordinated call with the Russian Ministry of Education and Science, with two topics in the areas of human genetics and cardiology. Two grants were selected for funding each receiving *ca* 3 million euro of European funding. Similarly, two grants were identified by the Russian authorities to fund these projects, with funding of *ca* 2 million euro per project. The 2010 and 2011 work programmes included topics for Programme Level Cooperation with Russia. The 2010 work programme included a topic on 'mathematical modelling for systems biology' where on the EU side one project was selected for funding (for *ca* 3 million euro). Finally, in the recently finished 2011 call of FP7 Health a topic dedicated to proteomics was opened and resulted in the selection of a grant which is currently under negotiation.

The projects resulting from the coordinated call and from the Programme Level Cooperation activities have clearly demonstrated the added value of EU-Russian collaboration. In particular, the project on human genetics ('Genomic Variations Underlying Common Neuropsychiatric Diseases and Disease Related Cognitive Traits in Different Human Populations') and the cardiology project ('Studies Investigating Co-Morbidities Aggravating Heart Failure'), which are now well into their second year of operation, have produced excellent results which were only possible due to the collaboration between the Russian and EU partners. The cooperation between the Commission and the Russian Ministry has been very smooth. No major obstacles have been encountered and minor obstacles have been addressed and corrected where needed. Some problems have been encountered in the projects themselves related to material transfers in and out of Russia, which is being addressed by the Russian side.

Russia has nominated an NCP for Health and is integrated into the network of Health NCPs, which gives access to information and exchanges between the partners. The European Commission Health Directorate has participated in a number of dedicated workshops with Russia, in St. Petersburg, Moscow and Tomsk in the past years. Some of these workshops were instrumental in selecting priority topics for cooperation at programme level.

## **Planned activities**

The 2011 FP7 Health call included a topic on proteomics, which had been shaped at a workshop in Tomsk, Siberia in 2009. The resulting EU grant is currently under negotiation and is expected to start operation in late 2011 or early 2012. Close collaboration is needed for linking this grant with a future Russian grant, or grants on the same topic.

Russia is invited to explore the possibility of participation in the current and planned multilateral (multinational) programme level cooperation activities, such as the activity on rare diseases which is planned for the 2012 call, and population research on Type 2 diabetes, which will start in early 2012.

No activities for bilateral cooperation are foreseen in the upcoming 2012 call of FP7 Health. However, it has been suggested to hold an EU-Russia workshop in late 2011 or early 2012 for the preparation of a possible topic for cooperation in the 2013 FP7 call, which will be the last call under FP7. Neurology has been suggested as a theme for the workshop, but further discussion is needed.

The health working group has not met in its current, new configuration. A meeting could be convened to prepare the above workshop.

## Food, Agriculture and Fisheries and Biotechnologies Research

### Main achievements of EU-Russian cooperation

EU-Russian cooperation in FP7 projects in the area of the Knowledge-Based Bio-Economy (KBBE) continues to be fruitful with 36 Russian partners involved in 20 projects during the period from 2007 to 2010, with a success rate of 19%. The research projects with Russia in 2010 include key strategic projects: from a large project on arctic research, to a series of collaborative projects on marine biotechnology, algae, microbial meta-genomics and fisheries in the Black Sea area.

New types of actions for co-ordinating R&D programmes from Russia and the EU have been introduced. These include: 1) the first EU-RU Partnership Initiative, on microbes and plants biodiversity; 2) the first Global Initiative, on animal health; 3) an ERA-Net, on phyto-sanitary research, with active Russian involvement.

Among the successful cooperation at the project level, there is a focus on:

- **Mission-oriented research towards life sciences, biotechnology and biochemistry for sustainable non-food products and processes.** A good example is a project on animal by-products (the PROSPARE project), which is offering solutions for using non-marketable animal by-products through providing processes leading to valuable new products; thus contributing to reducing waste and pollution. A second example is the IRENE project which aims to accelerate the sustainable innovation of the chemical industry through overcoming existing bottlenecks for a broader diffusion of bio-catalysis. It will allow the design of industrial enzymes through molecular modelling. For example, cooperation aims at developing novel methods, e.g. of treatment of animal by-products for the production of substances with biologically valuable functional properties. In this context, valuable recommendations for new legislation and standards will be one of the impacts.
- **Diseases which are particularly relevant to both the EU and Russia.** Important cooperation is on going in the domain of Plant Production of Vaccines including for Avian Influenza Virus (AIV), Blue Tongue Virus (BTV) Porcine Respiratory and Reproductive Syndrome Virus (PRRSV). Advances in the technologies for expressing proteins and extracting them from plants have allowed several plant-made products to be assessed for safety and efficacy. The participation of Russia in the Global Animal Health Initiative is also very important for identifying emerging animal diseases given the key geographical position of Russia. This initiative addresses emerging infectious disease threats, improves the cost-effectiveness and added value to network partners of current research programmes and develops durable procedures for a better co-ordinated, rapid response to urgent research needs.
- **Gaining new knowledge and new technology for improved production from agriculture and forestry.** EU - Russia cooperation in the BRIO project, which started in May 2011. The objective of BRIO is to organise cooperation between specialised collections (material from West-European and East-biotopes) used as bio-pesticides, bio-fertilisers, and in bio-remediation, constituting a common pool of micro-biodiversity. The creation of the Pan-European Rhizosphere Resource Network (PERN) under this project

will facilitate access and further exploitation of these resources from scientists and industry.

In April 2010, the EU-Russia working group for Agri-Bio-Food extended the governmental dialogue to other Russian Federation Ministerial counterparts playing a role in the research area, notably the Russian Ministry of Agriculture and the Russian Agencies for Forestry and Fisheries.

One of the many achievements of the EU-Russia cooperation is the agreement by the working group on the implementation of new models of strategic cooperation among programmes to achieve more scope and scale, through strategic projects and programme level cooperation allowing the systematic linking of projects in a given field on both sides, including, on the EU side, projects of the Member States.

Efforts have been made to set up a KBBE policy dialogue/ partnership for EurAsia – to create alliances in a multilateral configuration, notably EU-Russia-China-India.

The VIth EU-Russia Symposium on Biotechnology, Agriculture, Forestry, Fisheries and Food Research in Moscow, April 2010 allowed a new dimension to the EU-RU co-operation, putting emphasis on innovation, in line with both the EU2020 Strategy and the EU-Russia Partnership for Modernisation.

In April 2010, the EU sent a delegation, led by Maive Rute, Director for Biotechnologies, Agriculture and Food in DG Research and Innovation, to EurasiaBIO 2010: the global event for Biotechnology and Renewable Energy in Russia and CIS countries. A Russian delegation led by Vladimir Popov, the Director of the Russian A.N. Bakh Institute of Biochemistry, attended the international policy session of a KBBE information day in Brussels in September 2010, contributing to the panel on 'biotechnologies: tools for greening industry'.

### **Planned activities**

The EU-Russia Working Group in Agri-Bio-Food will continue to foster EU-Russia co-operation in Food, Agriculture, Fisheries and Biotechnologies, putting emphasis on innovation, in line with both the EU2020 Strategy and the 'EU-Russia Partnership for Modernisation'. The working group will also make efforts to strengthen the KBBE policy dialogue and partnership in the Euro-Asia context and extend alliances in a multilateral configuration, particularly EU-Russia-China-India. The next meeting of the working group is foreseen for the second half of 2011 or early 2012; date to be agreed.

Cooperation between the EU and Russian Technology Platforms will be encouraged, principally via the EU-Russia Symposia on Biotechnology, but also through events organised by the Technology Platforms.

With respect to animal health, Russia's involvement in the recently launched global alliance for the coordination of research on the major infectious diseases of animals (STAR-IDAZ) is expected to reinforce mutually beneficial cooperation in the sector.

In the domain of bio-mass research, another important contribution can be expected through Russian participation in the project exploiting perennial grasses on marginal lands for biomass production.

Information and dissemination activities will be continued to be carried out regularly via the Russian Bio-NCP, with the support of the BIOCIRCLE project, (network of third countries Bio-NCPs).

The 2012 FP7 work programme has special emphasis on innovation, with many topics calling for proof-of-concept and demonstration activities, requiring or encouraging knowledge transfer and dissemination activities, and supporting standardisation activities. The strong involvement of SMEs is being continued by requiring their participation in about half of the topics. This strong focus of innovations should be in line with the new approach EU and Russia have decided to pursue.

Topics for international cooperation in the 2012 work programme could include multi-lateral cooperation with major trading partners (e.g. standardisation for bio-based products), or to tackle global challenges (e.g. global food safety). Subjects of mutual interest for the EU and Russia could be in the domain of animal health (where good collaboration is already established), in particular fighting African Swine fever which is currently also spreading in Russia and the Caucasian region, and in forestry research for multi-purpose trees and non-wood forest products for an innovative forestry in rural areas.

## **ICT Research**

### **Main achievements of EU-Russian cooperation**

EU-Russian cooperation in the FP7 ICT Theme continues to be strong, with 36 Russian partners involved in 28 projects during the period from 2007 to 2010.

A first coordinated call in the area of ICT was organised in the 2011 FP7 work programme with the Russian Ministry of Education and Science, focusing on the following areas:

- Programming Models and Runtime Support
- Performance Analysis Tools for High-Performance Computing
- Optimisation, Scalability and Porting of Codes

As a result of this Call, two EU-Russian projects have started in early 2011. In both cases, the projects involve separate EU and Russian projects, linked through a coordination agreement. The projects are:

- HOPSA (HOListic Performance System Analysis); duration 24 months; funding: 1.4 million euro from the EU side and 20 million roubles from the Russian side.
- APOS (Application Performance Optimisation and Scalability); duration 24 months; funding: 1.2 million euro from the EU side and 19 million roubles from the Russian side.

### **Planned activities**

The two projects funded from the coordinated call will organise a common event in 2012; the details for the event are still to be finalised. The Commission will organise ICT info-day(s) in Russia in 2012.

A meeting of the EU Russia Research Working Group on ICT took place on 24 June 2011. There was common interest in continuing the collaboration through new coordinated calls and the Russian participants underlined their interest in holding information days in Russia.

The discussion included, amongst other things, (i) practical and legal issues in relation to tender procedures and calls for proposals, and (ii) possible topics of future common interest in ICT which could possibly be addressed in a coordinated call to be launched in 2012 with projects starting in 2013.

As to (i): the timetables of the current legal framework for FP7 and in Russia are not compatible, but there are discussions ongoing in Russia for an extension of the current Federal programme, or the development of a new programme, which would allow for a better match. As to (ii): it is intended that, following an initial exchange of views by video conference in early September, the topics will be further elaborated in early November in Russia by a group of experts from both sides in the fields concerned. A meeting of the working group and an FP7 ICT info-day would be organised on the same occasion.

# **Nanosciences, Nanotechnologies, Materials and New Production Technologies (NMP)**

## **Main achievements of EU-Russian cooperation**

The EU-Russia Working Group on Nanotechnology (WG Nano) was established in 2007, between the European Commission and the Russian Ministry of Education and Science to reinforce cooperation, in line with the agreed approach to create an EU-Russia common space of research and education. It was agreed to work towards establishing common research activities in the area of nano-sensors, nano-membranes, computational nano-materials science, nano-photonics and spintronics.

In December 2008, WG Nano agreed to launch a coordinated call on nano-sensors, together with a mapping of Russian nano-technology and infrastructure. This was implemented under the 2009 FP7 NMP work programme, resulting in three coordinated research projects and a study.

A second coordinated call on 'modelling' was launched under the 2011 FP7 NMP work programme. It is expected that a further three coordinated projects will be funded as a result of this call (see below). Both calls followed the same model and benefited from a global budget of *ca* 9 million euro equally funded by the European Commission and the Russian Ministry of Education and Science.

Annual meetings of the WG Nano have taken place since 2007. The last meeting was held during the ENF2011 conference in Budapest on 30 May – 1 June 2011, where Deputy Minister Ivanets was present and handed over the co-chairmanship of the WG Nano to his successor Igor Protsenko, Director for External Integration in the Russian Ministry of Education and Science.

A preparatory meeting was held in Brussels on 12 May 2011 with a special focus on possibilities for further coordinated calls or similar activities under FP7. The Russian colleagues made clear that, due to their requirements of their funding programmes, which require funded projects to finish within the duration of the programme (end 2013), it was not possible to foresee a coordinated call as part of the FP7 2013 work programme. Options are being considered with the Ministry of Education and Science for the optimal collaboration methods for involving Russian research organisations in the topics under the FP7 2012 work programme, notably for the topics of mutual interest, such as those in the areas of biomaterials and materials for extreme conditions.

At project level, Russia is a strong partner in NMP through 30 participations of 25 different organisations, in 19 FP7 projects under FP7. Both calls followed the same model and benefited from a global budget of ~9 million euro equally funded by the EU and the Russian Ministry of Education and Science.

## **Planned activities**

The mapping exercise of nanotechnology and nano-structured materials research infrastructures in Russia, performed by the FP7 funded support action 'NANORUCER', will finish its work in October 2011, including recommendations for future calls.

The 2011 EU-Russian coordinated call on 'multiscale modelling as a tool for virtual nanotechnology experimentation' is being completed and is expected to result in three new projects, starting in autumn 2011, addressing the theoretical analysis, design and functional virtual testing of:

- of hetero or hybrid nano-structured elements for use in smart systems, integrated systems, OLEDs, photovoltaics or energy saving applications;
- organic matrix nano-composites for industrial applications (including optical, electrical and mechanical properties); and
- behavioural features (e.g. biocompatibility and mechanical properties) of biocompatible, metallic nano-materials.

As set out above, options are being considered for coordinated and/or collaborative mechanisms for EU-Russian actions through the 2012 and 2013 FP7 work programmes, which allow for the budgetary constraints caused in the final phases of the implementation of the Russian Federal Targeted Programme.

Future joint activities could be based on the recommendations to come from the work of the FP7 NANORUCER support action 'mapping of nanotechnology and nanostructured materials research infrastructures in Russia', as set out above.

Russia showed interest for cooperation in the field of bio-materials for regenerative medicine and in materials for application at high temperatures. Some research networking could be explored. Further to this it may be possible to identify topics of joint interest from recommendations from advisory groups, and cluster or networking activities, including the 'nanosafety cluster', operated by the European Commission. Further discussion is needed on the method and instruments for implementing joint and/or coordinated activities, building on the experience from the first two coordinated calls.

## **(Non-Nuclear) Energy Research**

### **Main achievements of EU-Russian cooperation**

Russian participation in FP7 projects in the Energy Theme continues to be strong: to date there is Russian participation in 12 projects, with the Russian partners receiving just over 2 million euro of FP7 funding

This includes two joint projects which result from the coordinated call which was published in the 2008 work programme. The EU partners in these projects receive *ca* 4 million euro of FP7 funding, with a similar level of funding provided to the Russian partners by the Russian Ministry of Education and Science. These two projects which focus on electricity networks management (ICOEUR) and combined heat and power generation from bioliquids (BIOLIQUIDS CHP) have successfully established strong research links between European and Russian participants. Both projects are due to come to an end later in 2011.

Within the context of the International Partnership on Hydrogen Economy (IPHE), the European Commission has participated in and co-chaired the Russian organised Second International Conference on Hydrogen Storage Technologies.

The EU and Russia also participate in the work of the International Energy Agency (IEA) International Low-Carbon Energy Technology Platform and in several IEA Technology Agreements (implementing agreements).

The EU and Russian stakeholders in the EU-Russian Energy Dialogue have been informed on the actions in international S&T cooperation, the EU Strategic Energy Technologies Plan (SET Plan), including on-going Commission-funded projects in the energy sector.

There has been an exchange of reviewers, as well as Russian evaluators assessing European proposals, and vice-versa for the coordinated call.

### **Planned activities**

The new FP7 Energy Calls corresponding to the 2012 work programme will be published in July 2011 (with a budget of *ca* 325 million euro). The topics of these calls are largely designed to support the implementation of the main action lines of the Strategic Energy Technology Plan (SET Plan) and in particular the European Industrial Initiatives. The following areas will be open:

- Renewable Energy (photovoltaics, Concentrated Solar Power, wind, biofuels, ocean energy, heating & cooling);
- Clean Coal/ carbon capture and storage (CCS);
- Smart Energy networks;
- Energy Efficiency; and
- Future Emerging Technologies.

In the framework of the EU – Russia Energy Dialogue, the Russian side has expressed its interest in technology cooperation with the EU with involvement of energy research institutes and innovative industry, particularly in the following areas:

- Nuclear research;
- Clean coal technologies (coal bed methane) and alternative uses of gas;
- Power sector (interconnection, maintenance and management of power grids);
- Energy efficiency (solutions for industry and residential sector, construction materials etc.);
- Renewable energy (RES for heating and for power production in isolated areas).

Given this, the topics in the forthcoming FP7 Energy calls on Grids, clean coal/CCS, biofuels and future emerging technologies may be of particular interest for Russian participation.

The new Energy calls for proposals will also include a topic on the impact of the quality of CO<sub>2</sub> on transport and storage, which is targeted to members of the Carbon Sequestration Leadership Forum – CSLF – which includes Russia.

The EU-Russia energy research dialogue will be re-invigorated through the energy working group established under the S&T Cooperation Agreement. Close links will also be established with the EU - Russia Energy dialogue between the Commission (DG Energy) and the Russian Ministry of Energy, which has also expressed an interest to cooperate in energy technologies.

As the last meeting of the working group was held back-to-back with a meeting of the ICOEUR project, it is suggested that the next working group meeting could be held in autumn 2011, back-to-back with the closing conference of the BIOLOIQUIDS CHP project.

The Commission and the Russian Federation will continue their close cooperation through multi-lateral fora such as the IPHE and CSLF.

## **Transport (including Aeronautics) Research**

### **Main achievements of EU-Russian cooperation**

#### **Aeronautics:**

There is strong EU-Russian cooperation in aeronautics research, both quantitatively and qualitatively, with a long history of major Russian research institutions participating in large important FP6/FP7 integrated projects (30-50 million euro EU contribution) as well as in smaller scope (1 million euro EU contribution) projects. Major Russian institutions, notably the Russian Central Aerodynamics Institute (TsAGI), the Baranov Central Institute of Aviation Motors Development (CIAM) and the State Scientific Research Institute of Aviation Systems (GosNIAS) receive a large share of the EU funding awarded to Russian partners, but Russian participation also includes many other Russian research institutions and universities. EU-Russian collaboration spans all areas of the programme, aero-structures, engines, avionics, etc., with high success rates for Russian applicants in FP7, both in number of applications (31%) and funding (26%).

An EU-Russian working group on aeronautics research was established in 2007 following two successful high level workshops (Brussels, spring 2006 and Moscow spring 2007) on cooperation in aeronautics research, with the aim to create favourable conditions to enable the deepening of EU-Russia cooperation in aeronautics research. The working group is very active: eight formal (and two informal) meetings have been held to date, which led to a coordinated call with the Ministry of Industry and Trade (MIT) of the Russian Federation, which was issued under the 2010 FP7 work programme. The coordinated call included five topics jointly defined with the MIT, with an EU budget of 4 million euro earmarked for the non-Russian participants, with a maximum funding of 1.5 million euro per project. An analogous budget was allocated by the MIT for Russian participants. Three projects, from the 34 applications to the call were selected for funding by the European Commission. The selection was verified and confirmed by the MIT through a call for tender. The projects selected were:

- SVELTANA - a three year project on safety and maintenance improvement through automated flight data analysis, which started in December 2010;
- ALaSCA – a 3.5 year project on advanced lattice structures for composite airframes, which started in August 2010; and
- ORINOCO – a 26 month project on advanced noise control based on plasma actuators, which also started in August 2010.

There has also been successful twinning of EU and Russian projects. There has been light twinning of two large projects on avionics – SCARLETT (FP7) and IMA (Russia) – based on a Memorandum of Understanding between Thales and GosNIAS signed in 2007. Avionics is an area where Europe excels and Russia has a great potential and demonstrates high motivation in having aircraft equipped with avionics systems best fitted to new worldwide air market needs of today. SCARLETT, one of the largest FP7 projects has a total budget of about 40 million euro and deals with Integrated Modular Avionics (IMA) which has been very successful in Europe, with a 1<sup>st</sup> generation of products now integrated in the A380. IMA is a Russian project funded by the Federal Agency for Industry of the Russian Federation (Rosprom) and coordinated by GosNIAS, which focuses on the development of a new

generation of IMA products. Participants of both projects met during a joint workshop in September 2009 attended by around 150 participants.

Three EU-Russian workshops in aeronautics organised in April 2006 in Brussels and in March 2007 and October 2009 in Moscow proved very useful in contributing to the quality, scale and scope of EU-Russian collaboration as well as to the successful participation of Russian research organisations in FP6 and FP7.

It should be noted that non-signature by the Russian Federation of the agreement on Siberian over-flight limits EU-Russian cooperation on Air Traffic Management research. No specific cooperation should be foreseen in this area.

### **Surface transport (road, rail and waterborne transport):**

There is active EU-Russian cooperation in surface transport, mainly in rail and maritime research, with 438,000 euro EU funding in FP7 to date. However, whilst there was good participation in the first two FP7 calls, Russian participation dropped in the 2011 call, but has increased again in the most recent call.

Rail research was identified as an area for strengthening EU-RU cooperation. A Joint Statement and Action Plan on Rail Research signed in 2006 with the Russian Railway Research Institute (VNIIZHT) and several workshops for rail research were organised in Russia through FP7 support actions in Russia. A Russian National Contact Point for rail research was nominated and participated in different NCP support activities, it is anticipated that these efforts may lead to a further increase in Russian participation in future calls.

Road infrastructure, urban transport and Intelligent Transport Systems (ITS) have also been identified as potential areas for cooperation and several workshops on road transport have been organised in Russia in the framework of FP7-funded SIMBA II Coordination Action. The two main areas of potential cooperation are ITS and road infrastructures. Bilateral meetings were organised between the Commission and ITS Russia as well as between FEHRL and their Russian counterpart. However, limited cooperation in the area of infrastructure is expected as actors are quite focused on ITS.

### **Planned activities**

Russia is not specifically targeted in the 2012 FP7 work programme, however all topics remain open to Russian participation.

Discussions on topics of common interest were initiated during the 8<sup>th</sup> meeting of the EU-Russia working group on civil aeronautics research, which was held on 23 June 2011. If further discussions are successful in identifying topics of common interest, they could be co-funded through a second coordinated call, similar in principle to the 2010 call, which could be included in the 2013 work programme.

The 2011 European Conference on Aerospace Sciences (EUCASS 2011) took place on 4-8 July in St. Petersburg and attracted a large audience from Russian aerospace academic institutes.

In surface transport, Russian participation in the last FP7 call (WP2011) increased to previous levels after an important drop in the third call.

A topic encouraging cooperation between rail research centres along Asia-European corridors (including EU neighbouring countries, Russia and China) is included in the 2012 FP7 Transport work programme. Russian interest in this area was confirmed during a meeting with the European Commission, and representatives from the European Rail Research Advisory Council (ERRAC), the International Union of Railways (UIC) representatives and Russian Rail officials. A topic on safety of ships in Arctic conditions is also included in the 2012 FP7 work programme, where Russian (as well as Canadian and US) participation is encouraged.

In the area of Intelligent Transport Systems (ITS), a Specific International Cooperation Action on ITS for large events, which could cover the Sochi winter Olympic Games is planned for the 2013 work programme. Action is possible in rail related research, in the areas of greening, inter-operability, infrastructure, safety and security, standardisation and harmonisation of requirements for rolling stock and infrastructure.

Longer-term cooperation may offer possibilities for larger, co-funded, projects on topics of mutual interest. Agreement on such topics would be necessary and the form of such larger-scale cooperation activities has to be further explored; potential implementation is not foreseen until after 2013 in the next 'Horizon 2020' Framework Programme.

## Environment (including climate change) Research

### Main achievements of EU-Russia cooperation

Throughout FP6, Russia has a significant level of participation in environment research activities. The main cooperation areas included climate change, the marine environment with an emphasis on the Black Sea, water resources, and biodiversity. **In the FP7** calls to date (2007-2011) there are 36 Russian participants (including one project coordinator) in 20 successful projects in a wide range of environment research areas, including climate change, Arctic research, management of marine environments, water technologies, coastal technologies, Earth Observation, and sustainability assessment.

Some examples of successful EU-Russia cooperation at project level include:

- The **CASPINFO project** (which includes seven Russian partners) – the Caspian environmental and industrial data and information service. The project has strengthened the environmental data management infrastructure around the Caspian Sea by fostering cooperation and data sharing between marine scientists, the oil and gas industry and government institutions in the Caspian Sea region.
- The **SUST-RUS project** (which is coordinated by a Russian organisation and includes four other Russian partners), which is developing and implementing an integrated spatial-economic-ecological modelling approach for Russia, which represents the state-of-the-art in different areas of economic, transport, resource-use and environmental modelling. The SUST-RUS modelling approach will provide the Russian and international community with a sound scientific support for formulating sustainability policies. The use of the SUST-RUS approach will assist in the implementation of the EU strategy for sustainable development in Russia as well as an efficient incorporation of the sustainability goals into the existing Russian policy tools on regional and federal levels.
- The **E-URAL project** (which includes four Russian partners) – the European Union and Russia Link for S&T cooperation in the area of the environment. The project aims to identify potential cooperation opportunities, areas of scientific excellence and the major research infrastructure in Russia in all areas of the FP7 Environment Theme. In the context of this project, a number of EU and Russian expert workshops have taken place in the areas of coastal zone management, biodiversity and forestry, climate change, and environmental technologies. The workshops have identified potential topics of mutual interest, as well as discussed appropriate instruments for cooperation, including twinning and networking activities between EU and Russian research communities.
- The **PAGE21 project** (involving two Russian partners) – which addresses the changing permafrost in the Arctic and its global effects in the 21st century. The project is currently under negotiation.
- The **PROMITHEAS-4** (including one Russian partner) – Knowledge transfer and research needs for preparing mitigation/adaptation policy portfolios. The major aim of this project is the development and evaluation of climate change adaptation/mitigation policy portfolios and the prioritisation of related research needs for 12 Eastern European countries including Russia.

In addition to strong participation of Russian researchers in the FP7 Environment theme calls, a number of other noteworthy collaboration activities have taken place. These include an ex-post twinning of an FP7 project with a complementary Russian project, and a conference on climate change held in Moscow on 10-11 November 2009.

**Twinning:** The Russian project MEGAPOLIS was funded by the Russian Federal Agency for Science and Innovation (FASI) specifically for the purpose of this twinning exercise. MEGAPOLIS was linked with an existing FP7 project, MEGAPOLI (Megacities: emissions, urban, regional and global atmospheric pollution and climate effects, and integrated tools for assessment and mitigation). As a result, a good working relationship has been established between the two projects, including exchange of information and participation in joint events.

**EU-Russia conference on climate change:** as the result of discussions within the EU-Russia Environment Research Working Group, the conference 'Global Climate Change and Mechanisms of Adaptation to it' was held in Moscow on 10-11 November 2009. The conference was organised by the (former) Federal Agency for Science and Innovation of the Russian Federation with collaboration and support of the European Commission and the Ministry of Education and Science of the Russian Federation and the Federal Service on Hydrometeorology and Environmental Monitoring (Rosgidromet of Russia). The agenda included a number of presentations made by EU project representatives. This was the first such EU-Russia event on climate change and adaptation research. The conference increased the level of exchange of scientific information on climate change issues and promoted a science based approach to the solution of climate change problems and mechanisms of climate change adaptation. In the final discussions and conclusions of the meeting, the Russian organisers expressed their strong interest to have this conference established as a regular annual or bi-annual event. .

### **Planned activities**

In February, 2009, the **EU-Russia Working Group on Environmental Research** was formally established and extensive discussions were held regarding common cooperation priorities, optimal modalities of cooperation, and concrete cooperation activities. The first results of the group included the MEGAPOLI twinning and the organisation of the conference on climate change in Moscow in November 2009 (see above).

Following the decision of the Russian Government during the winter of 2010, to restructure the Russian Federal Agency for Science and Innovation (FASI), and to merge the agency with the Russian Ministry of Education and Science, the working group was put on hold. In view of re-vitalising the EU-Russia Environment Research working group, working level contacts will be re-established in the nearest future, with an aim of holding the renewed working group meeting in the autumn of 2011, preferably in conjunction with the final conference of the E-URAL project (venue: Brussels; exact timing yet to be confirmed).

In the meantime, further cooperation activities are being carried out through Environment Theme projects. For example, the E-URAL project will hold a brokerage event aimed at initiating new partnerships with Russian research institutions for the upcoming 2012 FP7 Environment Theme calls. The brokerage event was organised on 17 June 2011, in the margins of the Environment Info Day.

Based on the discussions during the November 2009 climate change conference in Moscow, as well as the outcomes of the E-URAL experts workshop on climate change impacts (Barnaul Russia, November 2010), climate change adaptation and mitigation may be an area where further more targeted cooperation with Russia could be envisaged in the last phase of FP7. The exact nature and modalities of such cooperation activities would need to be further discussed with the Russian side.

Other areas for potential further cooperation could include: forestry, biodiversity, earth observation, and marine science.

## Space Research

### Main achievements of EU-Russian cooperation

The cooperation between EU and Russia is coordinated by the EU-ESA-Roscosmos Space Dialogue. Through seven working groups under the dialogue, which cover all fields of space activities, several projects have been launched, mainly through Russian participation in FP7 and relevant EU co-funding of joint projects, such as – as a most prominent example - an EU contribution to the installation of a Soyuz launch pad at the European Space Port in Kourou / French Guyana. The first launch is foreseen for the 3rd quarter 2011 to transport two Galileo satellites into orbit.

Two Specific International Cooperation Actions (SICAs) with Russia were included in the 2010 work programme. The participation from Russia exceeded expectations: there were 71 Russian partners in evaluated proposals, 36 of them are in the successful projects and receive 2.8 million euro of EU funding.

Under the 2011 work programme, two interesting projects were selected for funding, the first connects EU, US and Russian major research establishments to explore actions and technologies to mitigate potential impacts from a collision of our planet with asteroids, and the second focuses on the launch and operation of 50 cube satellites produced by students and post-docs of universities from 35 countries and four continents (with a Russian launcher).

In the first FP7 space conference, which took place in Budapest in May 2011, Russian space institutions participated with a large expert delegation, lead by Roscosmos, discussing with European counterparts potential projects for the remaining calls under FP7, i.e. a potential cooperation in the field of future propulsion technologies for inter-planetary missions.

### Planned activities

The next annual **meeting of the Steering Board** within the Space Dialogue (involving the Directors General of the European Commission Directorate-General for Enterprise and Industry, together with the co-chairs of the seven working groups), took place on 30 June 2011 in the ESA research centre (ESTEC) in the Netherlands to set out a working plan for 2012-13.

A high-level expert group from Russia (the Russian Federal Space Agency Central Research Institute of Machine Building (TsNIIMash) and the Keldysh Research Centre) participated in a recent consultation event on potential topics in the space field for the forthcoming Horizon 2020 Framework Programme for Research and Innovation. Several areas for long-term cooperation were suggested, including:

- Space transportation, future propulsion technologies;
- Space habitats;
- Life support for planetary missions;
- Robotic exploration;
- Critical components development; and
- Space security and debris removal

## **Research Infrastructures**

### **Main achievements of EU-Russian cooperation**

Through the Seventh Framework programme, Russian organisations participate in the whole range of EU support schemes for existing and new infrastructures, including:

Projects from the European Strategy Forum on Research Infrastructures (ESFRI) roadmap:

- ERICON-AB – Icebreaker
- FAIR – Hadron physics
- HIPER – Lasers
- PRE-XFEL – European XFEL
- SIOS-PP – Svalbard arctic stations

Design studies:

- Mondilex – Slavic languages
- LAGUNA LBNO – Astroparticle physics

Policy actions:

- EURORIS-NET – NCP network

Integrated Infrastructure Initiatives (I3's):

- EUCARD - accelerators
- EUROPLANET RI - planetology
- NMI3 – neutron sources
- UP-GRADE BS-SCENE - environmental and socio-economic research
- INTERACT - Terrestrial Research and Monitoring in the Arctic

To date, Russian participants in the FP7 Research Infrastructures programme receive over 1.4 million euro of EU funding.

Beyond the framework programme, Russian users constitute one of the largest groups of non-EU users in European Research Infrastructures, as part of User Groups led by EU partners, applying directly for access at the many European RI that are open to international users. Russian scientists are active in a large number of collaborations on research infrastructures, including CERN.

EU Member States and Russia are also partners in a growing number of international research infrastructures. Russia has recently committed significant resources in order to participate in two ESFRI projects: XFEL (European X-Ray Laser project) in Hamburg (250 million euro) and FAIR (Facility for Antiproton and Ion Research in Europe) in Darmstadt (178 million euro). For many decades already, European organisations have been involved in the international Joint Institute for Nuclear Research (JINR) institute in Dubna, Russia. Additionally, Russia has recently signed a Memorandum of Understanding with the European Synchrotron Radiation Facility (ESRF) that paves the way to full membership in the next few years.

Following the 2010 Joint S&T Committee meeting under the EU-Russia S&T Cooperation Agreement, an EU-Russia working group on Research Infrastructures has been established

between the European Commission and the Russian Ministry of Education and Science to analyse EU-Russian Federation cooperation in this field. The first meeting of the working group took place in Brussels on 28 June 2011, during which information was shared on the EU and Russian processes for establishing and supporting research infrastructures. The discussion also focused on how to facilitate the implementation of projects of mutual interest, including global research infrastructures.

The first meeting of the Group of Senior Officials (GSO) on global research infrastructures met in Brussels on 24 March 2011. The Group is composed of appointed representatives from the G8+O5 countries. In the coming months, the GSO will work on various aspects of global research infrastructures as identified in the last meeting of the Carnegie Group of Science Advisors, to which it will report its findings at the end of 2012.

A specific EU-Russian Federation working group on e-Infrastructures has been established between the European Commission and the Russian Ministry of Communications and Mass Media (see the next section of the road-map).

### **Planned activities**

As established in the Terms of Reference for the working group, the second meeting of the EU-Russia working group on research infrastructures should take place in Russia six months after the first meeting. The final composition of the group on the Russian side will be confirmed at this meeting.

A final call for research infrastructure projects in FP7 was launched in July 2012, which will provide further opportunities for Russian partners to participate in EU-supported consortia.

The work of the Group of Senior Officials also continues; the second meeting of the GSO will take place in Cape Town in November 2011.

Research Infrastructures present a wide area for intensifying cooperation with Russia, both within EU-supported projects and beyond. Options and opportunities will be identified and discussed in the frame of the EU-Russia working groups on Research Infrastructures and eInfrastructures

## **e-Infrastructures**

### **Achievements of EU-Russian cooperation**

The integration and interconnection of the Russian research and education network community – headed by e-ARENA – into GÉANT has progressed well: Russia is now linked via two different 10 Gb/s connections to GÉANT; the GÉANT Point-of-Presence in Moscow has finally been established and is fully operational now; Russia participates in the trans-Siberian EU-China link project ORIENTplus.

In the area of Grids and scientific resource sharing there is excellent cooperation between EGI (the European Grid Infrastructure) and the Russian partners (resource infrastructure providers).

In the area of high-performance computing there is interest between the European and Russian actors to explore software efforts for exa-scale systems.

### **Planned activities**

An EU-Russia working group on e-Infrastructures has been established. The Russian co-chair of this working group has now been nominated: Igor Khimchenko, Acting Director of the Creation and Development of Information Society of the Ministry of Telecom and Mass Communications of the Russian Federation. The working group is co-chaired by Mario Campolargo, Director for Emerging Technologies and Infrastructures in the European Commission Directorate-General for Information Society and Media on the EU side. A first meeting of the working group took place via video conference on 28 June. It was agreed to identify three priority topics for cooperation. These topics are currently under discussion: they address networking, data and computing.

In the context of PRACE (Partnership for Advanced Computing in Europe) a meeting with Russian actors took place in Helsinki in April 2011. In the context of the International Supercomputing Conference (ISC) in Hamburg a further meeting was held.

In the area of open access to scientific data and scientific data repositories closer interactions with the Russian community could be envisaged.

Once the trans-Siberian ORIENTplus link is upgraded to 10 Gb/s one can jointly investigate an intensified exploitation of this unique resource (currently it is completely utilised) and an associated regional event could be foreseen. An extension of the trans-Siberian linking to Japan and Central Asia on the one side and via St. Petersburg to Helsinki on the other side could be explored.

## International Cooperation Activities

### Main achievements of EU-Russian cooperation

The FP7 Capacities 'Activities of International Cooperation' programme is designed to support and stimulate the participation of third countries in FP7 as well as to provide access opportunities in research programmes managed by third countries.

The activities supported by the programme have three major objectives:

- To strengthen bi-regional and bilateral dialogues in scientific cooperation and assist in joint identification of topics for collaboration under the FP7 thematic programmes;
- To network different stakeholders (such as universities, industry, government, civil society and donors) in order to strengthen research capacity;
- To facilitate the development and implementation of a coherent European-level approach towards international S&T cooperation.

S&T cooperation with Russia is considered as a long-term priority under the programme, given the fact that Russia is a neighbouring country with significant S&T capacities. In order to enhance further EU-Russia S&T cooperation through FP7, the programme currently supports four projects involving or specifically targeting Russia: FP7 IncoNet EECA, BILAT-RUS, ERA.Net RUS and ACCESSRU.

Launched in January 2008, the **FP7 IncoNet EECA** project aims to strengthen the bi-regional policy dialogue between stakeholders from the EU and the countries of Eastern Europe and Central Asian (EECA), among them Russia, on S&T cooperation. Two Policy Stakeholder Conferences within the frame of the IncoNet EECA were organised in 2009 (Athens) and in 2010 (Moscow), gathering policy makers and scientists from both the EU and the EECA regions. The focus of the conference was on best practices for S&T policy governance, analytical methods of policy advice and benchmarking of S&T policy measures and research institutions processes. They resulted in an exchange of experiences and views on the current state of the EU-EECA S&T cooperation, on present challenges and on concrete recommendations.

A workshop on barriers for the incoming and outgoing mobility from/to EECA was held in October 2009 in Moscow. Participants proposed recommendations to boost knowledge exchange and the mobility of researchers. The FP7 IncoNet EECA also delivered several studies of particular interest to EU-Russia S&T cooperation, on S&T indicators, cooperation patterns and key research institutions. An assessment of the FP7 Contact Points in Russia was implemented and the results were disseminated. A series of thematic workshops has been organised and resulted in the identification of research areas of common interest for the EU and Russia that could be suitable as FP7 SICAs or other targeted actions.

**The BILAT-RUS project** ('Enhancing the Bilateral S&T Partnership with the Russian Federation') started in September 2008 aiming to enhance bilateral EU-Russia S&T cooperation. The project contributes to the optimisation of the framework for collaboration, to identify fields for cooperation in research domains of common priority, and to use information and knowledge more effectively. . The project also offers to provide assistance and knowledge to the joint EU-Russian working groups established under the S&T Cooperation Agreement. A key project deliverable is the web portal [www.st-gaterus.eu](http://www.st-gaterus.eu)

offering information about the Russian S&T landscape and funding opportunities from the EU and Russian sides for the implementation of joint scientific activities. A database of over 550 S&T research institutes is available at this portal, together with a partner search tool. Project experts delivered an inventory of existing instruments for EU-Russia S&T cooperation and examples of good cooperation practices. The project also set up an advisory network between Russian and EU FP7 Contact Points, facilitating the exchange of best practice.

Launched in February 2009, the **FP7 ERA.Net RUS** project ('Linking Russia to the ERA: Coordination of Member States' and Associated Countries' Programmes Towards and with Russia') aims to strengthen S&T cooperation between Russia and EU through the coordination of EU Member States' research programmes towards and with Russia. It has developed a concept for coordinating activities of S&T programme owners in EU and Russia and is currently implementing two pilot joint calls for research and innovation projects. A call for collaborative S&T projects, covering various scientific fields including materials and cutting-edge technological processes, environmental research and climate change, health and contemporary socio-economic studies, was launched with an overall budget of *ca* 6 million euro plus additional budget from the INTAS association. The participating countries were: Estonia, Finland, France, Germany, Greece, Norway, Poland, Russia, Spain and Switzerland. A second call for 'innovation projects', has been designed to deliver innovative products, services or processes of significant economic and/or societal value to both the EU and Russia. This call has a budget of *ca* 3 million euro and involves Germany, Greece, Israel, Russia, Switzerland and Turkey. These joint calls may be seen as the first experience of EU-Russia multilateral coordinated programmes for research and innovation.

The **FP7 ACCESSRU** project ('Strengthening EU-Russia S&T Cooperation and Access to Russian National Funding Programmes') aims to help EU researchers and research organisations to accede to the scientific and innovation programmes established within Russia. It has produced an overview of Russian research and innovation programmes and an analysis of access opportunities. Analyses have been based on comprehensive information and explanations on the legal framework of Russian federal funding of research and innovation in Russia and a brief comparison of the research funding systems in Russia and most EU Member States. Project findings and options for recommendations were extensively discussed at two round-table events held on 15 October 2010 and 31 May 2011 in Moscow. Among the variety of Russian research and innovation programmes open for foreign organisations, the bilateral MS-Russia schemes or initiatives, the programmes addressed to the development of Russian universities and the recently established programme to attract leading scientists to Russian universities have been identified as the most suitable for European researchers. In parallel, the project has started implementing dissemination and awareness campaigns about specific calls and other opportunities of EU access to Russian research and innovation programmes.

### **Planned activities**

In line with the EU and Russian agenda and priorities given to innovation policy, the **FP7 BILAT-RUS** forthcoming activities will focus on the EU-Russia cooperation in this field, in particular through implementing support actions to the EU and Russian Technology Platforms and by carrying out an analysis of Russian innovation clusters. In close cooperation with the recently established EU-Russia Working Group on mobility, the project partners should organise an international workshop to discuss a proposal for a joint EU-Russian agenda on

researchers' mobility. They should also strengthen the advisory network of EU and Russian FP7 Contact Points by developing twinning activities based on a new concept.

Learning from the implementation and results of the two pilot joint calls, the **FP7 ERA.Net RUS** will carry out a foresight exercise for a sustainable research and innovation cooperation between EU Member States and Russia. Structural and thematic scenarios will be designed for a 2020 time perspective. Foresight results shall provide a basis for a joint research and innovation funding programme and will be fed into the policy making process on S&T cooperation between EU Member States and Russia.

On the basis of project findings and exchange with stakeholders, including Russian research and innovation funding organisations, the **FP7 ACCESSRU** partners will prepare a set of recommendations aiming at facilitating the access of European researchers to Russian research domestic and cooperation programmes.

## **Researcher Mobility**

### **Main achievements of EU-Russian cooperation**

The FP7 Marie Curie Actions (MCA) play an important role in reinforcing and/or establishing EU-Russian collaborations by supporting the mobility of top quality researchers and by strengthening collaborations of European and Russian research institutes.

The Marie Curie Actions offer various possibilities of mobility to and outside Europe. International Outgoing Fellowships aim particularly at encouraging European researchers to undertake a mobility period outside Europe, e.g. in Russia. Under International Incoming Fellowships, Russian researchers may benefit from a research period in the EU and a subsequent return period to Russia, thus promoting transfer of knowledge and facilitating 'brain circulation'. The FP7 International Research Staff Exchange Scheme (IRSES) promotes mutual exchanges between research organisations. Whilst Outgoing fellowships have not resulted in a significant mobility from the EU to Russia, IRSES has been specifically set up in FP7 as a balanced programme in terms of mobility to and from Europe. Russian participation has been very successful in IRSES, with 42 organisations participating. This represents more than 1100 researcher months from Russia coming to Europe.

The Russian research organisations can cooperate with European ones in the FP7 Initial Training Network, which target the doctoral training of young researchers, and the Industry-Academia Partnerships and Pathways, which focus on academia-business collaborations. It is to underline that Russian organisations receive the same level of funding in the programme as the EU research institutions.

According to FP7 statistics, 62 Russian institutions have been selected in the Marie Curie Actions since 2007, receiving EU funding of 4.1 million euro. In addition, 134 researchers with Russian nationality have been funded so far in FP7 Marie Curie projects. This represents a general positive increase in the participation of Russian researchers and research organisations compared to the 6<sup>th</sup> Framework Programme. It is expected that the interest and success of RU researchers and organisations will continue to grow.

It should be noted that Russian research organisations were particularly successful within the IRSES scheme however more efforts should be made in order to increase the awareness on the possibilities offered by the PEOPLE programme particularly in terms of IIF, IOF schemes, host driven actions and COFUND.

As an example of funded MCA projects, the FP6 project 'Astro-Propeller' was granted to a Russian researcher who, after a period at the Institute of Astronomy of the University of Cambridge was re-integrated to the Laboratory of Stellar Physics of the Astrophysical Department, in Saint Petersburg. The researcher's activity during the project has led to a formation of an informal research group focusing on studies of long-period X-ray pulsars and Cataclysmic variables.

### **Planned activities**

Following the agreement at the last Joint S&T Committee meeting in July 2010 and in order to discuss further coordination of EU-Russian mobility programmes, a working group on Researcher Mobility has been established in the framework of the EU-Russian S&T

Cooperation Agreement. The tasks of the working group will include: an exchange of information on existing policy and programmes for the mobility of researchers, academic staff and students in Russia and the EU; enhancing participation in researcher mobility programmes; elaboration of strategic directions and concrete activities for new cooperation in the field of mobility of researchers, academic staff and students; and enhancing existing actions. The first meeting of the working group took place on 28 June 2011 in Brussels, to discuss and agree short- and long-term objectives.

In the context of the working group, the following activities have been proposed:

- Monitoring and analysis of mobility trends and flows between the EU and Russia;
- Exchange of good practices in mobility;
- Possible link of Russian mobility portal(s) to EURAXESS;
- Considering of the potential for Russian matching funding for IRSES projects;
- Regular updates on developments in mobility programmes; and
- Joint experts' workshops and symposia in the field of mobility.

## Fundamental Research

### Main achievements of EU-Russian cooperation

The European Research Council (ERC), which is funded through the FP7 Ideas Programme, operates on a bottom-up basis; therefore there are no current or planned activities involving Russia *per se*. However researchers from around the world can apply for ERC grants provided the research they undertake will be carried out in the EU Member States or in the countries associated to FP7. To date, the ERC has run eight calls for proposals of which six have been completed. In total 26,000 proposals have been received and around 1,600 grant agreements signed. The participation from Russian nationals so far has been:

	Applications from Russian nationals	Grants to Russian nationals
Starting Grant 2007	108	2
Starting Grant 2009	30	1
Starting Grant 2010	40	4
Starting Grant 2011	60	Evaluation in progress
Advanced Grant 2008	23	0
Advanced Grant 2009	13	0
Advanced Grant 2010	10	2
Advanced Grant 2011	21	Evaluation in progress
TOTALS	305	9

In the large majority of cases applicants with Russian nationality were already resident in the EU Member States or in a country associated to FP7 at the time of application. Four of the successful grantees are women; five are men. Three are carrying out their research in the UK, three in Germany and one in France, Switzerland and Norway. Six of the grantees work in the area of physical sciences, two in social sciences and one in life sciences. It should be noted that one of the nine Russian grantees, Konstantin Novoselov (ERC Starting Grant 2007) has subsequently won the 2010 Nobel Prize for Physics.

The ERC Scientific Council has set out two major goals for the future: to increase the number of women scientists among its awardees; and to increase substantially the number of excellent researchers from outside Europe who wish to work within the EU (be they of European origin or not). Working towards the second goal implies devising a medium- to long-term internationalisation strategy with clear priorities and an overall strengthening of efforts. The Scientific Council plans to intensify current 'outreach' measures and to make sure that this goal will also be reached in the years ahead.

## Cooperation with the EU Joint Research Centre (JRC)

The Russian Federation is one of the main international partner countries of the EU Joint Research Centre (JRC). The cooperation between the JRC and Russia is established mainly through competitive activities and is particularly strong in the nuclear area. It concerns both nuclear safety and security aspects

In the past five years, more than 300 Russian experts were trained in JRC advanced workshops and training courses (under the JRC Enlargement and Integration Action) mostly in the field of nuclear safety and security, but also in the areas of energy, security and crisis management, health and consumer protection and sustainable management of natural resources.

### Main achievements of EU-Russian cooperation

Between January 2010 and April 2011 the JRC has completed 14 partnerships with 10 Russian partners

Twelve of the activities concerned Framework Programme competitive projects (in which JRC is also a partner), including:

- SESAME (November 2006-April 2011), which assessed and predicted changes in the Mediterranean and Black Sea ecosystems (Partner: Russian Academy of Sciences);
- NitroEurope (NEU) (February 2006 – April 2011) investigated the effect of reactive nitrogen on net greenhouse gas budgets for Europe (Partner: Russian Academy of Sciences);
- SEADATANET, (April 2006 – March 2011) which aimed to develop a Pan-European Marine Data Management Infrastructure for large data sets (Partner: Russian Research Institute of Hydrometeorological Information);
- SECURE, which concerned Sustainable European Community Biofuel Industries and Systems and ran from 1 January 2008 to 31 December 2011 (Partner: Russian Academy of Sciences);
- ECOOP (February 2007 – April 2010), which consolidated existing European seas operational observation and forecasting systems into a pan-European system for detecting and predicting environmental and climate changes (Partner: Russian State Hydrometeorological University);
- FCTESQA (May 2006 – April 2010), on development of harmonised test procedures for fuel cells (Partners: Russian Research Centre, Kurchatov Institute and The Institute of Physics and Power Engineering);
- GABRIEL (March 2006 to Feb 2010), which provided an integrated multidisciplinary program of post-genome research by applying epidemiology, genetics, '-omics', statistics, ecology and immunology into the causes of asthma (Partner: Siberian State Medical University of The Federal Agency on Health Care And Social Development); and
- FCANODE (December 2006 – January 2010), which aimed at finding alternatives to platinum-based catalysts for fuel cells, (Partner: Boreskov Institute of Catalysis of the Siberian Branch of the Russian Academy of Sciences).

Two of the partnerships concerned collaboration agreements on jointly resolving scientific issues in the field of soil science including building a soil database and soil protection. The

agreements ran from mid-2007 to mid-2010 with the Russian Federation and Moscow State University

Key outcomes: Of the recently completed events, one highlight is the publishing by the JRC of a Soil Atlas of the Northern Circumpolar Region in 2010. The EU Commissioner for Research, Innovation and Science Máire Geoghegan-Quinn launched it at a JRC event in the European Parliament on 4 May 2010. The atlas gives a detailed overview of circumpolar soil resources relevant also to agriculture, forest management, water management, land use planning, infrastructure and housing and energy transport networks. This was a collaborative project with partners from northern EU countries, Norway, Iceland, Greenland, Canada, the USA and Russia, developed in close cooperation with the Russian Academy of Sciences Institute of Geography; Institute of Geocryology, Yakutia; Institute of Biological Resources of the North-Polar Ural; Dokuchaev Soil Science Institute of the Russian Academy of Agricultural Sciences and other Russian research organisations.

Likewise, the outcome of the NEU study resulted in, for the first time, attaching an economic value to the threats posed by nitrogen pollution, including contributions to climate change and biodiversity loss. To put that into perspective, this cost is more than double the value that nitrogen fertilizers are estimated to add to European farm income.

Key events: The JRC held a meeting in October 2010 with Professor Ugrumov, from the Russian Academy of Sciences (RAS), Counsellor of the Presidium of RAS on Foreign Affairs, and member of the S&T Council of the Russian Parliament on scientific collaboration.

The JRC has 20 ongoing activities with 16 Russian partners

Eleven concern competitive activities

- Net RUS (February 2009 – January 2013), aims to raise knowledge on bilateral and national S&T programmes with or towards Russia (Russian Partner: State University Higher School Of Economics);
- GMOS (November 2010 – October 2015), aims to develop a global observation system to provide temporal and spatial distributions of mercury concentrations in ambient air and precipitation over land and over surface waters (Russian partners: Saint Petersburg State University and Meteorological Synthesising Centre);
- MYOCEAN (January 2009 – March 2012), aims to raise marine core services, operational oceanography, space, global, regional, climate change, oil-spill management, marine safety, marine resources and ecosystems, coastal management, polar operation (Russian partner: Foundation Nansen-Centre);
- IRIS (October 2008 – March 2012), aims to raise industrial safety, online risk assessment, safety concept, monitoring systems, decision support system (Russian partner: Vibroseism Ckti Ltd.);
- RECOSEY (April 2008 – March 2012), aims to raise the analysis of redox reactions, radionuclide transport, safety case (Russian partner: Faculty of Physics Moscow State University);
- REALISEGRID (September 2008 – May 2011) is a generic project (Russian partner: R&D Centre for Power Engineering); and
- FISHPOPTRACE (March 2008 – May 2011) aims to bring together expertise in fish traceability projects, fish population structure, illegal, un-reported and un-regulated

fishing, enforcement, conservation (Russian partner: Russian Federal Research Institute of Fisheries and Oceanography).

Seven of the ongoing activities are in institutional networks:

- REM – EURDEP (running since January 1994) is both a data-format for radiological data and a network for the exchange of automatic monitoring data;
- ITWG aims at fostering the fight against illicit trafficking of nuclear material, at the analysis of seized material and developing technical and organisational measures for detection, prevention, handling and post-processing of cases of seizures of nuclear or radioactive material (Russian partner: Ministry of Atomic Energy).
- C&I (running since September 2001) is the Combustion and Industry Expert Panel working under the auspices of the UN-ECE Task Force on Emission Inventories and Projections, which deals with combustion and industrial activities (Russian partners: Research Institute of Atmospheric Air Protection, Russian Academy of Sciences and Meteorological Synthesising Centre);
- GBA 2000 (running since January 2000) aims to perform an inventory of the area burnt for the main vegetation cover types, during one year, over the entire globe, (Russian partner: Russian Academy of Sciences).
- EUROMET (running since January 2002) aims to advance the state of the art of measurement sciences, providing the endpoints for traceability of measurements thus forming the backbone of the Système International (SI) in the EU (Russian partner: Mendeleev Institute for Metrology).

Two of the ongoing activities are via collaboration agreements:

- EURDEP, which is a network for radiological data and for exchange of automatic monitoring data;
- In addition, an agreement has been signed on nuclear safety. (Agreement for cooperation between the European Atomic Energy Community and the Government of the Russian Federation in the field of nuclear safety).

### **Planned activities**

Given the already well-established collaborations in the nuclear area, future collaborations will focus more on the non-nuclear area. Pilot actions in the field of climate change, energy incl. efficiency, food security, environment (e.g. boreal soils and forests), research policy analysis and monitoring, maritime surveillance, and raw materials could be considered.

Specifically the JRC is considering:

- a cooperation agreement on Global Satellite Navigation Systems.
- will follow-up on activities related to the recently signed agreement on nuclear safety.

Negotiations on the following competitive projects are ongoing but not yet decided:

- ÉCLAIRE would investigate the ways in which climate change alters the threat of air pollution on European land ecosystems including soils;
- SeaDataNet II would aim to upgrade the SeaDataNet infrastructure into a Pan-European infrastructure for access to marine metadata, and would involve three Russian partners;

- MARINA would investigate how life cycle analysis, exposure, hazard, and risk assessment for traditional chemicals, would need to be modified to address the novel properties of nanomaterials.

**Events:** As a follow-up to the meeting in October 2010 with Professor Ugrumov (see above), a JRC Information Exchange Event in Moscow will take place in 2011, aiming to inform the Russian scientific community about the JRC and its activities.

# **Nuclear Energy Research**

## **Fission Research**

### **Main achievements of Euratom-Russian cooperation**

Nuclear expertise in Euratom and Russia is complementary; collaboration therefore results in a win-win situation for both sides. Russian partners have participated in Euratom fission and radiation protection projects under Euratom FP7. These have been predominantly radiation protection projects, including the CTB (Chernobyl Tissue Bank) and SOLO/ SOUL (on the Southern Urals) projects which relate to post-accident radiation protection.

The working group Euratom (RTD)-Rosatom on nuclear fission energy research was established in 2008, under the Agreement for cooperation between the European Atomic Energy Community and the Government of Russia in the field of nuclear safety, which has been in force since 2002.

The discussions within the working group led to the launch of a part of the 2009 FP7 fission call being specifically targeted at Russia. This call led to six parallel projects, linked by coordination agreements, where both the Euratom and Russian sides provide funding for their own projects. This approach of coordinated, parallel projects has been highly appreciated by both sides, as it sets the basis for a partnership on an equal-footing. The respective coordination agreements are currently being completed.

The six projects are:

- **ENEN-RU** (cooperation in nuclear education, training and knowledge management);
- **ERCOSAM** (containment thermal hydraulics of current and future LWRs for severe accident management);
- **EVOL** (Molten Salt Reactors (MSR));
- **STYLE** (ageing and lifetime management of Reactor Coolant System (RCS));
- **LONGLIFE** (Reactor Pressure Vessel integrity assessment for long-term operation); and
- **LEADER** (Lead-Cooled Fast Reactors (LFR)).

Since the 1990s the projects funded under the ISTC have also been a building block in Euratom-Russian collaboration in fission research: <http://www.istc.ru/>

### **Planned activities**

Bilateral interactions could also take place in the context of the multilateral Generation IV International Forum (GIF). Euratom is a fully-fledged member of GIF and has acceded to all six systems. Russia has signed the GIF Framework Agreement, and in July 2010 has acceded to the SFR (Sodium-cooled Fast Reactors) System Arrangement. Russia is also considering joining LFR (Lead-cooled Fast Reactors)

## **Fusion Research**

### **Main achievements of Euratom-Russian cooperation**

Russia is the founder of the tokamak design principle – on which both JET and ITER are based – and has played a prominent role in fusion research. Cooperation and synergy between Euratom and Russia in fusion research has been strengthened through ITER, and has served to advance fusion science globally.

The bilateral Euratom-Russian cooperation Agreement in the field of controlled nuclear fusion has been in force since 2002. The Sixth Coordinating Committee (CC-6) meeting under this Agreement was held in October 2010. The inventory of bilateral cooperation between Euratom and Russian research entities showed more than 40 on-going collaborative activities. Also possible cooperation on JET and Broader Approach activities was discussed.

ISTC has been a significant pillar for maintaining nuclear research relationships with Russia. Since 2007 there have been six ISTC fusion projects with EU partners.

### **Planned activities**

Bilateral interactions will continue at multilateral platforms, such as through the ITER International Organisation, in which Russia is a major partner, and through cooperation in ITPA (International Tokamak Physics Activities) and the four OECD-IEA Implementing Agreements, where Russia has the status of a regular observer.