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APPLIED SCIENCES



## Action plan to year 2010

# **BERMAP – Business, Educational and Research Cooperation between Institutions of Northern Finland and North-West Russia**

16.10.2007



**EUREGIO KARELIA**  
*naapuruisohjelma | neighbourhood programme*



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## Foreword by the Rectors of the participating universities

The BERMAP project, which has been carried out with the full support of us, the rectors of the participating universities, marks a turning point in the educational and research cooperation between our universities. Never before has such a complete survey been carried out in our universities, where the aim has been to find most potential fields for cooperation between our universities. This document stands as a testimony of that work, which has been carried out in Archangelsk, Murmansk, Oulu and Petrozavodsk in the frame of the project. This search for common scientific disciplines and specific themes has been carried out with determination in the different faculties, departments and even in individual disciplines and laboratories.

These enquires have brought to our knowledge several concrete subjects and fields of interest, where we share a common interest to work together. Some of the topics have already transformed from ideas to concrete projects; and many more will undoubtedly follow. There are many areas, where our interests are similar, and without doubt more and more of these will emerge in the future. The working groups, which have implemented this project in each university, can also give their contribution to this cooperation. The members have gained more knowledge and experience of international project management; and they are now better prepared to assist in the planning and implementation of cooperation projects. Many future projects will undoubtedly gain from their improved skills and know-how, which they are willing to use for the benefit of their universities.

This action plan has been made to guide the cooperation between our universities. It is a blueprint, which will help us to build a common future together, to share our experiences and know how, and to strengthen our universities through international cooperation.

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Archangelsk State Technical University

Rector Alexander Ershov  
Murmansk State Technical University

Rector Lauri Lantto  
Oulu University of Applied Sciences

Rector Anatoly Voronin  
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## 1. INTRODUCTION

The end of the cold war opened the doors for increased educational and research cooperation between the universities and other educational and research institutions of Western and Eastern Europe. This has been apparent also in the Barents Region, where numerous new contacts and new acquaintances have been concluded between the universities. The result of this increased activity has been several cooperation projects, which have been carried out together by Scandinavian and Russian universities. Despite this increased borders crossing activity, the overall extent of cooperation between the universities of Northern Finland and North West Russia has remained on a relatively low level.



European Union and other institutions have allocated more and more funding to international cooperation projects, but the cooperation between Finnish and Russian universities has not really taken off. Only some institutions and individuals have fully seen the possibilities of this cooperation, and in general terms this has been limited to few specific fields of topic, such as environment. In many other areas and scientific disciplines the east is still a widely unknown direction.

The lack of cooperation and contacts is the reason why Oulu University and Oulu University of Applied Sciences started the BERMAP project with the Archangelsk (ASTU) and Murmansk State Technical Universities (MSTU) and Petrozavodsk State University (PetrSU). The aim of the project was to find out those disciplines, topics, departments and individuals, who shared common interests in the field of research and education and were willing to develop these areas in cooperation with their foreign colleagues. As a result of this BERMAP project, the most potential fields of cooperation between the universities were found. One central task of the project was to complete a common action plan, according to which this future cooperation would be carried out. The above-mentioned universities have participated in the writing of this action plan, which has been approved by the rectors of the universities.

However, the cooperation between the universities serves not only the scientific and educational needs of the region, but also those regarding economy and business. The Barents Region faces similar challenges, shrinking population, cold winter climate, long distances, etc., and at the same time there are great changes taking place. The northern gas and oil reservoirs are going to be put into use, whereas on the other hand the environmental problems facing the area are growing and cannot be defeated without international cooperation. As cooperation increases between the universities, this supports also the business cooperation. Information and know-how exchange between the universities will lead to its adoption in the field as well, in companies, in institutions, in administrative level, etc.



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An important way to channel this latest information to these different organisations is through continued education courses and workshops. But since there are no common guidelines, how these Finnish-Russian business workshops can be organised, developing of such model has become very important. In the framework of the BERMAP project such model has been created, which serves as a useful tool, when Finnish-Russian continued education courses will be organised. Information exchange between the universities, but also between universities and businesses or simply between companies, will open potential new markets and provide new business opportunities for northern companies and other organisations.



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## 2. BACKGROUND OF THE COMMON ACTION PLAN

### 2.1. Previous cooperation between the universities

University of Oulu and the North West Russian universities have been doing cooperation for over a decade in some fields, but activities between these institutions have drastically increased since the early 1990's. University of Oulu signed cooperation agreements with the Archangelsk and Murmansk State Technical Universities and Petrozavodsk State University in the 1990's, and a number of successful projects have been carried out. Several of these projects have been in the field of environment, which is one of the key areas of the adjacent areas strategy of the University of Oulu. Project unit NorTech Oulu has had a central role in the implementation of these projects. The overall number of these cooperation projects between the universities has been small, and in many scientific fields there have not been any contacts at all to North West Russian universities.

The Oulu University of Applied Sciences (formerly known as Oulu Polytechnic) has been involved in some cooperation projects with North West Russian universities. For instance the Institute of Technology has participated on projects in the field of environment and construction, where NorTech Oulu has acted as a coordinator. Since the universities of applied sciences were founded only in the course of the 1990's, their contribution to the research and educational cooperation has been smaller than that of the universities. However, the Oulu University of Applied Sciences regards the strengthening of its contacts to North West Russian universities as a vital part of their internationalisation strategy in the adjacent areas of Finland.

There have been bilateral agreements about student exchange between the University of Oulu and the Archangelsk and Murmansk State Technical Universities and Petrozavodsk State University. Despite the fact that student exchange between the universities has become easier through this arrangement, only few students have taken part in the exchange programmes. Only a couple of students from the University of Oulu have studied in Russia annually, whereas Russian students have shown more interest to study in Finland. Similar has been the case regarding Oulu University of Applied Sciences, which has had a similar agreement with the Russian universities for years.

One of the environmental projects carried out by NorTech Oulu was INTERREG financed "*Environmental Cluster: Business together with Russian enterprises and organisations*", which was carried out in 2002–2004. The aim of the project was to increase business cooperation between Finland and North West Russia in order to initialise a considerable growth of business contacts and activities in the future. Several meetings were organised in the course of the project, where also the educational cooperation between the universities of Oulu, Petrozavodsk, Archangelsk and Murmansk was discussed. Many seminars were additionally arranged, such as "*Business co-operation between Oulu area and Republic of Karelia in the field of drinking water and waste water treatment*", Business cooperation workshop "*Modern Environmental Technologies in the field of water, air, waste*" and Barents Waste Management workshop.

The participants of these workshops came to the conclusion that co-operation between Petrozavodsk (PetrSU), Archangelsk and Murmansk State Technical Universities (ASTU, MSTU) and University of



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Oulu should be deepened, especially in the field of environment. There is plenty of know-how about environmental technology in Northern Finland, which could be used in tackling the environmental problems of North West Russia. By increasing cooperation between Northern Finnish and North West Russian institutions – in research, education and in business – there are great gains for both sides. The improved environment in the North West Russia will automatically reflect to that of Northern Scandinavia. Increased co-operation in education and research will sharpen universities possibilities to accomplish their servicing functions also in the neighbouring regions. The increased cooperation in business ensures that Finnish companies can participate in the upcoming great business ventures in the Barents region. As these companies move into the "new" markets, they in part secure vitality and development of Northern Finland in the future.

## 2.2. Aims of the BERMAP-project

The overall aim of the project is to create preconditions for the development and expansion of cooperation between Northern Finland and North West Russia, in the fields of business, education and research. The more detailed project aims are the following ones: 1) to create a common education and research plan, 2) to carry out a market study for the business, 3) to develop a well planned continued education model and to organise business workshops for companies using this model.

One reason for the lack of cooperation both in business and education has been the shortage of information. It has been difficult to find out reliable information about the general conditions of North Western Russia, about the local businesses and economy, as well as about universities from a single source. One aim of the project has therefore been to strengthen the special units of these Russian universities (International Environmental Centres in ASTU and MSTU, Competence Centre in PetrSU) so that they can perform similar tasks to that of NorTech Oulu: work in the borderline of universities and businesses, provide information, participate and lead international projects. By elevating their project management skills to the same level as they are in Finland, these units can better carry out these tasks.

One goal of the project has been to increase the activity of Finnish companies in the North Western Russia. Several business workshops have been carried out in cooperation with the special units, which have been planned according to the wishes of Finnish and Russian companies. Finns have had a possibility to market their products, new contacts have been made and Russian companies have received know-how. A consortium has been founded for the Northern Finnish companies, which are working with environmental technology, and partners have been searched from Russia by the special units.

The most important part of the project, however, especially from the point of view of the universities, has been the research and education surveys. The universities have been examined faculty by faculty, in most cases also in the departmental and laboratory level, and all the possible topics for borders crossing cooperation have been collected. Then potential partners have been sought from the other side of the border, which share the interest towards the proposed ideas and are willing to start to cooperate. Some topics and proposals have naturally had to be dropped out as this work has



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proceeded, not all of them have generated enough interest, and for some topics there just have not been natural partners to be found. In the course of this processing work the most potential project proposals have emerged, which will form a common action plan. This action plan, which has been accepted by the rectors of the universities, will form the basis for the future cooperation between the universities.



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### 3. PRESENTATION OF THE UNIVERSITIES

#### 3.1. Archangelsk State Technical University

Archangelsk State Technical University (ASTU) was founded as Archangelsk Forest Engineering Institute (AFEI) in 1929 to provide training of engineers for Forest Economy and Timber Industry. In 1994 it acquired the status of a technical university. The Rector of the Archangelsk State Technical University is Alexander L. Nevzorov, doctor of technical sciences, professor of the department of engineering geology, basis and foundation.



The University offers training at 8 faculties and 4 Institutes: Faculties of Forestry, Natural Resources, Mechanical Engineering, Mechanical Technology of Wood, Chemical Technology, Industrial Power Engineering, Building Engineering, Correspondence, Institute of Economics, Finance and Business, Institute of Oil and Gas, Institute of Informational Technologies, Institute of Law and Entrepreneurships. Training is also provided in three colleges (information technologies and telecommunication, law and business).

A total of 14 000 students study at the faculties, institutes, colleges and branches both full time and by correspondence. Every year about 3000 new students begin their studies at the University. Two-level system of education provides basic two-year training for students to receive an incomplete higher education. The second level – training of specialists with qualification of "engineer" – is given in 49 degree programmes.

The teaching staff consists of 550 people, among them 30 academicians and corresponding members of academies, 68 professors and doctors of science, 285 candidates and associate professors. A doctoral degree can be obtained, including defending of the dissertation, in the following specialties: Wood Science, Technology and Woodworking Equipment; Technology and Machines of Forest-harvesting and Forestry, Technology and Equipment of Chemical Processing of Wood Biomass, Chemistry of Wood. The degree of candidate can be obtained in the following specialties: agricultural sciences - Forest Cultures. Selection. Seed Science; Forest Organization, Inventory; Forest Science and Silviculture, Forest Fires and Forest Protection; in pedagogical sciences - General Pedagogy, History of Pedagogy and Education. The candidate degree includes defending of a candidate thesis.

The university offers PhD studies in 18 programmes: forest organization and forest inventory; physical chemistry; industrial power engineering; technologies and machines in forestry and forest-harvesting; wood science, technology and equipment of wood-processing production; basement, foundations and underground structures; forest cultures, selection and seed science; economy and management of the national economy; silvics and silviculture, forest fires and forest protection; technology and equipment of processing of wood biomass, chemistry of wood; mathematical logic, algebra and theory of numbers; astrometry and sky mechanics; designing and building roads,



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underground railroads, bridges and transport tunnels; geo-ecology; general pedagogy, history of pedagogy and education; German languages; Roman languages; constitutional Law, municipal law.

University has several scientific subdivisions, such as Scientific-research Institute of Chemistry and Chemical Technology of Wood and Scientific-Research Sector. These comprise of 9 scientific-research laboratories, 8 engineering centers, including the accredited Analytical Centre, Technological Park, Knowledge and Technology Transfer Center.

Scientific research is carried out in 11 directions, the majority of them referring to the priority areas of science and technology development of the Russian Federation and funded from the federal and regional scientific-research programmes. The number of projects realized by the scientists of the university for the industrial companies grows steadily.

The University collaborates with 29 partner-universities, companies and organizations of Germany, Sweden, Finland, Norway, Germany, Great Britain, USA, Poland and China. ASTU participates in international projects, funded by the European Community (TEMPUS/TACIS programs). One important direction of the international cooperation is the participation in different international projects.

PROJECT NAME	PARTNERS	IMPLEMENTATION PERIOD
Executive Master of Business Administration (US Aid with Eurasia Foundation & Barents Secretariat)	Bodø Graduate School of Business, Bodø Regional University, Norway, ASTU, Baltic State Technical University, St.-Petersburg	2001–2006
Development of an Environmental Platform for the Northern Calotte and Northwest Russia (Interreg IIIA Kolarctic)	Luleå University of Technology, Sweden, University of Oulu and Rovaniemi Polytechnic, Finland, ASTU, MSTU, Kola Science Center of the Russian Academy of Science	2002–2005
Development and Improvement of Vocational Teachers Training System for Environmental Forestry in High Education Institutions in Northwest Russia (IB_JEP_23107-2002 Tempus)	Tampere Polytechnic (Finland), Ecole Nationale de Formation Agronomique (France), Saint-Petersburg Forest Technical Academy, ASTU, Syktyvkar Forest University, Petrozavodsk State University	2003–2006
Decay Resistant Timber – Siberian Larch Compared to Scots pine in Forestry and Products (INTERREG IIIB Northern Periphery)	Jämtland county council institute of rural development (Sweden), Helgeland Forest Society (Norway), Iceland Forest Service, METLA (Finland), Institute of Biology (Komi Republic), Northern Scientific-research Institute of Forestry (Arkhangelsk), ASTU	2004–2007
Energy Economical Wooden House (INTERREG IIIA/KO-LARC-TIC)	Narvik University College, AT Consult AS, Hålogaland Element As (Norway), ASTU; Arhstroy Project; Otdelstroy	2004–2007
Labor Market Development for Economic Growth in Arkhangelsk Oblast (SIDA)	Folkuniversitetet, Uppsala KY-myndigheten, CFL, Stockholm University, Tourism department at Kalrskrona University (Sweden), Committee for International Affairs and Tourism Development, Committee for Labor of Arkhangelsk Regional Administration, ASTU	2004–2007
Barents Educational Geographic Information Network (JEP-2421-2003)	Luleå University of Technology, University of Gävle (Sweden), University of Münster (Germany), ASTU,	2004–2007



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	MSTU, Syktyvkar Forest Institute, Committee for Land Resources and Land Surveying of Murmansk, Arkhangelsk, Petrozavodsk, Komi Republic.	
Business, Educational and Research Cooperation between the Institutions of Northern Finland and Northwest Russia (BERMAP)	University of Oulu, Oulu Polytechnic, ASTU, MSTU, Petrozavodsk State University	2005–2007
Development of International Marketing Network to Promote Barents Region Higher Education (ERASMUS-MUNDUS)	University of Lapland, Rovaniemi Polytechnic, Kemi-Tornio Polytechnic, Umeå University, Luleå University of Technology, Bodø Regional University, Tromsø University College, ASTU, Pomor State University, Northern State Medical University, MSTU, Murmansk State Pedagogical Institute, Murmansk Humanitarian Institute	2004–2007

### 3.2. Murmansk State Technical University

Murmansk State Technical University, which was founded in 1950 as a Marine Academy, is today a multi disciplinary university with 8500 students and 2000 members of staff. MSTU was given the university status in 1996, and today there are 11 faculties in the university.

Students are taught in 45 different fields and professions. Issues related to seafaring are studied in the Maritime Academy, which includes two separate faculties. The main direction of the Navigation Faculty is “Navigation and Operation of Ship’s Power Plants”. Students and teachers of the Marine Engineering Faculty concentrate on the “Operation of Ship’s Electrical Equipment and Automation”.



Polytechnical Faculty has 4 main fields of study, which differ greatly from each other. “Computer Software and Automated Systems”, “Automobiles and automobile management”, “Automation of Technological Process and Production” and “Energy supply of enterprises” are the major fields of this faculty.

Faculty of Technology, on the other hand, prepares engineers solely for one direction: the foodstuffs and fishing industries. The main two directions are “Technology of Fish and Fish Products” and “Technology of Food Products”.

Faculty of Natural Sciences concentrates its efforts on training specialists, who are dealing with many fields related to the use of natural resources. The main branches of study of this faculty are “Industrial Power Engineering”, “Underground Mining of Minerals”, “Opencast Mining of Deposits” and “Water-Supply and Water Use”.



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Despite the fact that MSTU is a technical university, one of the biggest faculties of the MSTU is Faculty of Economics. There are several chairs in various fields of economics, such as in “Finance and Credit”, “Accounting and Auditing”, “Management”, “Marketing”, “Information Systems in Economics”, “Advertisements” and in “Commerce”.

There are also other faculties, which don't educate engineers or operate in the field of technology. Faculty of Biology has two main directions - Biology and Bioecology, whereas there is also Faculty of Humanities in MSTU, which focuses mainly on social work. MSTU also offers education in the science of law. The main field of study in the Faculty of Law is naturally the Russian law.

The Murmansk Region is an adjacent area of Northern Scandinavia, and the closeness to the Nordic countries creates good conditions for co-operation with educational institutions of Norway, Sweden and Finland. MSTU has agreements of co-operation with several educational institutions and universities. Exchange programmes are realised with Finnish, Swedish and Norwegian partner universities and educational institutions.

Education of specialists is an important task of MSTU, but so is research. The main research directions of MSTU are the following:

1. Computer and information technologies in technical systems, economics, science and education
2. Techniques and technologies of conversion of hydrobionts and raw materials produced by agriculture
3. Fishery and technical operation of the Fleet
4. Ecology, environment and safety of life's activity
5. Problems of reliability and efficiency improvement of technical systems and technological equipment
6. Resources and energy saving technologies
7. Problems of education
8. History, philosophy and sociology
9. Fundamental problems of geology of the Kola Peninsula and the Arctic sea shelf
10. Researches of geophysical process in Arctic
11. Regional problems of economics, forecasting and management.

The university has participated in more than 30 international projects. Currently, MSTU is taking part in about ten different projects. The university is also involved in direct co-operation with Norwegian company “*Norsk Hydro*”. The co-operation has such forms as personal scholarships (for teachers and students), support of scientific researchers, laboratory equipment and also retraining of teachers. The possibilities of doing cooperation with company “*Statoil*” are being examined at the moment.



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### 3.3. Oulu University of Applied Sciences

Oulu University of Applied Sciences (OUAS, known until 2006 as the Oulu Polytechnic) is one of the biggest universities of applied sciences in Finland, which were earlier known as polytechnics. The universities of applied sciences are more practically oriented than “regular” universities; they educate professionals for expert and development tasks. They lay special emphasis on expertise in working life and its development, but they also carry out research and development activities relevant to their teaching as well as industry and commerce. Universities of applied sciences educate Bachelors, whose studies comprise of 210–270 ECTS credits, depending on the field of study. Completing the degree takes 3.5 to 4.5 years of full-time studies. In all fields, the curriculum comprises basic and professional studies, free choice studies, a practical training and a Bachelor’s thesis.



Oulu University of Applied Sciences was founded to provide higher professional expertise for the needs of the economy and industries of Northern Finland. Annually, almost 1,000 students, in six educational units, complete a Bachelor’s Degree in Business and Administration, Culture, Health Care and Social Services, Natural Resources or Technology and Communications. Multidisciplinary School of Vocational Teacher Education is responsible for the pedagogical education of teachers for vocational institutes and polytechnics. Altogether, there are over 6,500 students at Oulu Polytechnic.

Oulu University of Applied Sciences began to offer higher vocational education in 1992. It responds to the business and employment needs of Northern Finland by arranging and developing training at the higher vocational education level. Oulu University of Applied Sciences has branches besides Oulu also in Oulainen and Raahе (Oulainen is situated 100 km and Raahе 75 km south of Oulu). Presently there are approximately 7700 students at Oulu University of Applied Sciences. In 2005 the intake in the education leading to a degree is 1470 students. The objective of the polytechnic studies is to provide the students with a higher education qualification and skills that are needed in the working life. Students work as trainees and prepare their Bachelor's theses in the partner enterprises and organisations of the polytechnic.

Oulu University of Applied Sciences offers degree programmes in the following fields of study: Culture and Music, Natural Resources, Natural Sciences, Health Care and Social Sciences, Business and Administration, Technology and Communication and Vocational Teacher Education. In the academic year 2004–2005, there were 30-degree programmes in the curriculum of the university, which lead to a higher professional qualification (B.Sc. hons). Three of the degree programmes are instructed entirely in English whereas in the other degree programmes the language of instruction is Finnish. From autumn 2002 on the institute has offered two polytechnic postgraduate programmes, one in the study fields of Health Care and Social Services and one in



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Technology and Communications. They lead to a new Finnish postgraduate polytechnic degree: a master level degree which comprises 60–90 ECTS credits depending on the field of study in which the first degree is taken.

### 3.4. Petrozavodsk State University

The Petrozavodsk State University (PetrSU) was founded in 1940 as the Karelian-Finnish University, which was renamed in 1956. During this half a century long history, the university has trained more than 35000 highly qualified specialists. Among its graduates are academicians, ministers and world-famous specialists in culture and science, heads of enterprises and employees of various branches of industry of the Northwest and Northern regions of Russia.



The University provides training at 16 faculties: Faculty of History, Faculty of Forest Engineering, Faculty of Mathematics, Faculty of Medicine, Faculty of Baltic and Finnish Philology and Culture, Faculty of Industrial and Civil Engineering, Faculty of Agriculture, Faculty of Physical Engineering, Faculty of Philology, Faculty of Ecology and Biology, Faculty of Economics, Faculty of Law, Faculty of Political and Social Sciences.

The university has four branches: Kola (Murmansk Region), Priladovski (Sortavala), Belomorsk (Belomorsk) and Kostamuksha (Kostamuksha) and two educational centers in Segezha and Kondopogha. The teaching staff of the 76 departments of PetrSU consists of 800 people, among them 20 academicians and member-correspondents, 83 professors and doctors of science, 368 candidates and associate professors.

Annually, the university participates in over 30 international projects, which receive financing from the following sources:

- European Bank for Reconstruction and Development (EBRD)
- Global Ecological Foundation
- Northern Ecological Financing Corporation
- USAID
- Tacis-EuregioKarelia Programme
- The Norwegian Barents Secretariat
- Nordic Council of Ministers
- Swedish Institute
- CIMO – Centre for International Mobility of Finland
- Foundation for Northern Initiative



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Additionally, exchange programmes are developed. About 400 foreign professors, specialists and students visit PetrSU annually, whereas over 350 teachers, doctoral students and other students teach or study in foreign universities every year.

### 3.5. University of Oulu

The University of Oulu (OU) is an international science community, with a reputation for producing high quality research and professional experts for different national and international projects. Founded in 1958, the university is among the largest in Finland and has exceptionally wide scientific base. Promoting education as well mental and material well being, especially in Northern Finland, the university has managed to distinguish itself in the national and European scientific innovation and education system.

The multidisciplinary university has six faculties, which are in the order of magnitude: technology, natural sciences, humanities, education, medicine and economics and business. The main focus areas of the university are information technology, biotechnology and northern issues and environment. These strong point areas of the university don't recognise borders between faculties, departments and laboratories, not even borders between scientific disciplines. The concentrated research and education policies of the university have ensured the university has become a key research and educational institute in these issues, also internationally.

The university is a working place for almost 17 000 students and 3000 members of staff. The annual intake of new students is about 2200. About 1300 bachelor's and master's degrees are completed every year as well as some 150 doctoral dissertations. Out of the 900 teachers of the faculty about 240 are professors.

The university has also several branches: Kajaani University Consortium (Kajaani), Meri-Lappi Institute (Kemi), Oulu Southern Institute (Nivala, Ylivieska and Haapavesi), Raahe Unit (Raahe) and Sodankylä Geophysical Observatory (Sodankylä). The two first mentioned units are run in cooperation with other universities. The university has also two research stations, Oulanka and Hailuoto stations.



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## 4. RESULTS FROM THE UNIVERSITIES

### 4.1. Environmental technology

The universities have been active in carrying out cooperation in the field of environmental technology, so it was no surprise that several proposals were received from this sector. Due to the previous projects and contacts, these proposals were also the ones, which raised most interest on both sides of the borders. Environmental issues have been given a high priority in the research programmes of the universities, and these topics seem to be the ones, where both sides can make great gains, so talks have been very intensive and thorough.



Concrete projects have not been planned yet, but the potential cooperation areas have been found out from those numerous proposals that have been put forth by the universities. Short descriptions of those research topics and areas of interests are given below, which both sides have found most interesting ones. Educational cooperation will be included in the upcoming Master Programme of Environmental Engineering, which will be implemented in the frames of the Barents Cross Border University.

#### 4.1.1. Proposals from the Department of Theoretical and Practical Chemistry (ASTU)

Main Russian partner: Archangelsk State Technical University, Faculty of Chemical Technology, Department of Theoretical and Applied Chemistry, Prof. Konstantin Bogolitsyn ([bogolitsyn@agtu.ru](mailto:bogolitsyn@agtu.ru) +7 8182 653 849)

Main Finnish partners: University of Oulu, Faculty of Technology, Department of Process and Environmental Engineering

Mass and heat transfer processing lab., Prof. Riitta Keiski ([riitta.keiski@oulu.fi](mailto:riitta.keiski@oulu.fi) +358 8 553 2348)

Water and environmental technology lab., Prof. Björn Klöve ([bjorn.klove@oulu.fi](mailto:bjorn.klove@oulu.fi) +358 8 553 4510)

The department of Theoretical and Applied Chemistry of ASTU had proposed six topics as potential cooperation topics for Finnish partners. Two departments of Process and Environmental Engineering of OU were interested about the topics. The Mass and Heat Transfer Laboratory was interested to carry out further talks about proposals 1 and 3, and the Water and Environmental Laboratory about proposals 4, 5 and 6. Discussions about concrete projects have been carried out in November 2007.



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### 1) Researching properties and developing physical-chemical models of interaction of biopolymers in water-organic medium, including ionic liquids

*Accents:*

- researching lignin's hydrodynamic properties in the solvents of different nature;
- defining molecular and mass characteristics;
- studying conformation of macromolecules;
- researching lignin's and solvent's interaction, using calorimetric method.

### 2) Synthesizing and using selective catalysts of oxidative and reductive transformation of aromatic biopolymers

*Accents:*

- synthesizing and researching properties of polyoxometalates with the purpose of using them as redox-catalysts.

*Background:*

Liquid-phase catalysts of oxidative and reductive transformation of aromatic biopolymers are developed on the basis of Mn (II). The scheme and kinetic model of the catalytic oxidation of phenol-comprising compounds are offered.

### 3) Supercritical fluid extraction of biological active substances

*Background:*

Processes of supercritical fluid extraction of softwood (by CO<sub>2</sub>) with the purpose of evolving complex of coloring agents, carotenoids, volatile oils, that are used in pharmaceutical and perfume industries are studied.

Action of biomass of sea algae in the supercritical CO<sub>2</sub> medium is investigated. The possibility of obtaining complex of biological active substances and algae cellulose, that are characterized by increased sorption activity according to heavy metals is displayed (efficient entero-sorbent).

### 4) Researching sorption and chemical properties of soils. Finding out the nature and ways of chemical interacting

*Accents:*

- studying agrochemical indices of the soil's quality;
- defining the sorption ability of soils according to different pollutants (mainly heavy metals);
- researching complexation processes of the soil organic matter and heavy metals;
- mathematical modeling pollutant's migration within the soil layers (including migration with ground water).

The emphasis is on the peat soils.

### 5) Comparing priority indices of environmental objects' state and 6). Unifying methods of



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## analytical control

### Accents:

- working out common principles of ecological monitoring and analytical control;
- researching the state of the environmental objects, using most sensitive and selective methods of analysis;
- researching and choosing most representative and descriptive indices for the means of analytical control, including developing methods of analysis;
- developing the principles and methods of analytical control under certain climatic, hydrological and geological conditions

### 4.1.2. Proposals from the Department of Biotechnology (ASTU)

Main Russian partner: Archangelsk State Technical University, Faculty of Chemical Technology, Department of Biotechnology, Prof. Evgeny Navozhilov ([biotech@agtu.ru](mailto:biotech@agtu.ru) +7 8182 216 145)

Main Finnish Partner: University of Oulu, Faculty of Technology, Department of Process and Environmental Engineering, Mass and Heat Transfer Processing Laboratory, Prof. Riitta Keiski ([riitta.keiski@oulu.fi](mailto:riitta.keiski@oulu.fi) +358 8 553 23 48)

Department of Biotechnology of ASTU had proposed 4 topics as potential cooperation topics for Finnish partners. The department of Process and Environmental Engineering of OU announced that it was interested to carry out further discussions about proposal 1. Discussions about concrete projects have not started yet.



#### 1. The technology of alcoholic berries juice production

#### 2. Enzymatic treatment in pulp and paper industry

1. reduction of consumption of chlorine and other agents used for bleaching
2. improvement of pulp quality
3. reduction of waste water pollutants

#### 3. Treatment of biological sludge with mineral, organic and bioactive substances

Reaction of the sludge with mineral components such as sand and ash. One of the main water treatment directions is intensification and efficiency improvement of sludge dewatering process.

Enzymes and biodegradable products addition provides:

- increasing of dewatering rate;
- increasing of final dryness of the mass;
- deodorizing process.



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#### **4. Automatic method of microbial suspension monitoring, automatic control of microorganisms content using microscope equipment**

To detect concentration and sizes of microorganisms in biological sludge (waste water sludge) and in microbial suspensions (yeast suspension).

##### **4.1.3. Proposals from the Department of Ecology and Environmental Protection (MSTU)**

Main Russian Partner: Murmansk State Technical University, Chair of Ecology and Environmental management, Prof. Sergey Zavalko ([szavalko@mail.ru](mailto:szavalko@mail.ru) +7 8152 476 614)

Main Finnish Partner: University of Oulu, Faculty of Technology, Department of Process and Environmental Engineering, Water and Environmental Technology Laboratory, Prof. Björn Klöve ([bjorn.klove@oulu.fi](mailto:bjorn.klove@oulu.fi) +358 8 553 4510)

Department of Ecology and Environment Protection proposed the 2 topics as potential cooperation topics for Finnish partners. The laboratory of Water and Environmental Technology Laboratory of OU announced that it was interested to work as partner in these projects, if MSTU would be leader in the project. Discussions about concrete project plans have not started yet.

##### ***1. Elaboration of a low-turbid coloured waters purification technology***

###### **1. Overview**

Drinking water treatment technology, used now in the purification plants of the Murmansk oblast, foresees the use of aluminium sulphate as a coagulant. Aluminium sulphate used by low-turbid coloured water purification has both its positive and its negative sides. Rather low coagulation efficiency at low temperatures, as well as purified water corrosivity increase should be considered as negative characteristics of this process.

###### **2. Aims**

The aim of the project is to optimise the reagent natural water treatment technology in the city of Murmansk and in the Murmansk oblast.

###### **3. Expected results**

Proposed drinking water treatment technology shall provide:

- treated water color decrease
- treated water corrosivity decrease

###### **4. Timetable and financing**

Implementation period is 2008/2009, approximate budget is 30 000€.





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## ***2. Optimization of biological waste water after purification by use of wetland complex with higher vegetation in arctic circumstances***

### **1. Overview**

A serious problem in the wastewater treatment systems is the nitrogen and phosphorous mineral forms formation as the result of the microbiological organic oxidation in the treated wastewater. One of the most effective, cost-efficient and, what is the most important thing, ecological methods of biogenic elements mineral forms surpluses extraction from the sewage is the usage of higher aquatics as an absorbing element. Purification effect is reached due to the plants capability to absorb actively nitrogen and phosphorus mineral forms in the course of biomass growing. Nitrogen and phosphorus extraction is conducted while periodical mowing the grown plant biomass. Further utilization of the gathered plant mass harvest makes for ecological orientation of this purification problem solving. Higher vegetation usage for wastewater purification is a prevalent practise, but there is hardly a precedent of using this technology in the Arctic circumstances.

### **2. Aims**

The aim of the project is to optimise the realization of this wastewater afterpurification technology for northern conditions.

### **3. Actions**

Project duration is two years. The works will be conducted on the base of the purification plant wetlands in the settlement of Shounguy.

Activities:

- Testing area organizations.
- Conducting of a number of experiments in order to determine an optimal vegetable subject, which maximum indexes as a «biological pump»: mass grow rate and nitrogen and phosphorus concentration in tissues.

### **4. Timetable and financing**

Implementation period is 2008/2009, approximate budget is 30 000€.

#### **4.1.4. Cooperation in waste management issues**

Development of waste management has been one of the most important fields in the environmental technology, where the universities have relentlessly engaged themselves in cooperation. NorTech Oulu/University of Oulu and ASTU were major actors in the already mentioned ArcWaste project, dealing with the waste management system of the City of Archangelsk.



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Cooperation in this field has been planned further in the framework of this project. Individual experts from OU, OUAS and ASTU have discussed about concrete, potential cooperation topics in this field, new contacts have been made and opinions and views exchanged. NorTech Oulu and the Department of Theoretical and Applied Chemistry of ASTU have also planned continuation for the ArcWaste project, and some other waste management projects have emerged likewise.



## 4.2. Construction techniques and building sector

Building sector is the second field, where there has been cooperation between the Finnish universities and especially PetrSU for several years. One concrete project is starting in this field, which has been planned for some time already, but has been finalised in the framework of the BERMAP-project.

### 4.2.1. Double degree programme in the field of building construction

*Main Finnish participant:* Oulu University of Applied Sciences, School of Engineering, Department of Building Construction, Principal Lecturer Raimo Tikka ([raimo.tikka@oamk.fi](mailto:raimo.tikka@oamk.fi) +358 8 312 6665)

*Main Russian participant:* Petrozavodsk State University, Faculty of Industrial and Civil Engineering, Chair of Construction Management, ass. prof. Alexei Vikhorev ([vikhorev@psu.karelia.ru](mailto:vikhorev@psu.karelia.ru) +7 814 271 1039)

### 1. Overview

The Russian students graduating from the field of building construction have little knowledge about the western building standards. However, many western companies have recently increased their activities in Russia and are looking for skilled experts, who have also experience and know-how of the western practices and methods.

### 2. Aims

The aim of this cooperation is to increase the information exchange regarding building construction through a double degree programme. Students of the Faculty of Industrial and Civil Engineering of PetrSU become familiar with the western methods and standards of building construction, and at the same time the teachers of the Oulu University of Applied Sciences are able to broaden their expertise as well.





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### 3. Actions

- 1) Selected students from the Faculty of Industrial and Civil Engineering, Chair of Construction Management, spend a year in exchange at the Oulu University of Applied Sciences. During this time they will study in one of the study programmes offered by the Oulu University of Applied Sciences: Structural Engineering or Municipal and environmental engineering. Teaching is going to be given in Finnish. The student's are required to complete 60 ECTS credits during their exchange year in Oulu.
- 2) Oulu University of Applied Sciences and PetrSU will accept the studies done in the other university. The diploma thesis, which has been made for the specialist degree in PetrSU, will be accepted in Oulu University of Applied Sciences as a student's Bachelor thesis.
- 3) PetrSU will issue the students a specialist's degree and Oulu University of Applied Sciences will issue the students a Bachelor's degree in engineering.

### 4. Expected results

The students have studied the western methods, standards and practices of building construction, and they possess also the information regarding the Russian side. They have two degrees, a Russian and a Finnish one, so their employment possibilities have increased significantly. They can work in Russian companies or in foreign companies operating in Russia. Working in Finland is not either out of question.

### 5. Timetable

The first two students arrived to Oulu in autumn 2007.

#### 4.2.2. Other proposals dealing with construction techniques and building sector

There were several other proposals as well, which raised some interest cross the border. A building seminar was held in Oulu in March 2007, during which potential cooperation fields were discussed between the experts of PetrSU, ASTU and OUAS. One concrete idea, which was raised, was the possibility to organise student exchange/trainee between the Faculty of Building of ASTU and the institute of Technology of the OUAS. Some other potential research areas were also mentioned, but further steps have not been decided.



There were also some other proposals, received earlier from PetrSU, which have not proceeded further. Below is a list of these proposals and the reasons why they did not proceed further.





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Discipline	Proposal	Contact person	Reason for not continuing
Chair of architecture	Research of the traditional architecture in the Säämäjärvi area and creation of a GIS map and database of the region	Head of the chair Vyacheslav P. Orfinsky	Representatives of the Chair of Architecture were invited to Oulu for discussions with their Finnish colleagues (Dept. of Architecture), but the trip was cancelled
Chair of architecture	Introducing traditional building techniques to the local population	Head of the chair Vyacheslav P. Orfinsky	As above. The institute of Technology of the Oulu University of Applied Sciences was interested of this topic as well
Chair of architecture	Historical and architectural research of the Kolatselga foundry and restoration of the buildings	Irina Voroneskaya	Neither the Department of Architecture nor the Institute of Technology were interested of this topic
Chair of CAD	Use of computer aids in design and building	Ass. Prof. Pavel Medveded	Talks with the Institute of Technology of OUAS have not led to concrete plans
Building construction and geotechnics	Research of building structures, including wooden trusses with nail plate joints, etc.	Ass. Prof. Ljubov Selutina	Talks with the Institute of Technology of OUAS have not led to concrete plans

### 4.3. Agriculture and related areas

There have not been many borders crossing cooperation projects in the field of agriculture, where the universities and other research institutions of the Oulu region have been active. However, one cooperation topic in this field, which was proposed by PetrSU, evolved into a concrete project during the implementation period of the BERMAP-project.

#### 4.3.1. Development of Potato Technology in the Republic of Karelia

*Main Finnish participant:*

MTT Ruukki (the Biotechnology and Foodstuffs Research Unit)

Senior Researcher Elina Virtanen

([elina.virtanen@mtt.fi](mailto:elina.virtanen@mtt.fi) +358 2708 4500)

*Main Russian participant:*

Petrozavodsk State University,  
Department of Mechanisation of Agriculture

Lecturer Evgeny Tihonov

([tihonov@psu.karelia.ru](mailto:tihonov@psu.karelia.ru) +7 8142 71 10 46)



### 1. Overview

The location of Finland next to Karelia, similar climatic and soil conditions and co-operation networks between different bodies will create good preconditions for joint development projects. In Karelia, the potato occupies about 5.5% of the 700 000 hectares of cultivated land.



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The yields of potato cultivation are relatively low in Karelia (usually less than 10,000 kg/ha) compared with yields in Finland (30–60,000 kg/ha) and the quality is poor. Development measures in the Republic of Karelia must focus on maintaining the reliable supply of potatoes and seed potatoes in the Republic of Karelia (BASIC SEED BANK), recognition and control of plant diseases interfering with the production (DIAGNOSTICS AND PREVENTION MEASURES) and the use of organic fertilisers from the viewpoints of quality and the environment, in addition to that of yield (OPTIMISING FERTILISATION). Co-operation allows the Finnish operators in the potato industry to develop their business activity, widen their knowledge of potato production and pesticides/plant diseases in the border area and to improve co-operation with plant inspection authorities and advisory organisations.

## 2. Aims

General objective is to improve and to guaranty the self-sufficiency of food both in Republic of Karelia and in Finland. At the same time the objective is to get bigger harvest (amount) and better quality. General objective is consisted about sub objectives, which are the better quality seed potatoes, identification of sicknesses and rejection of them, optimising the fertilizing and use of better technologies in the future in the potato sector.

## 3. Actions

3.1. A basic seed bank of the purified seed stock material will be formatted. Field tests in will be carried out in the Republic of Karelia with two Finnish potato varieties.

3.2. The most common plant diseases in the tubers and yield in potato production in the Republic of Karelia will be found out. The ability of Karelia and Finland to prevent the possible spreading of a potato plant disease as an epidemic will be improved.

3.3. Soil samples will be taken in the pilot farm and analysed. Recommendations about the use of fertilisation will be given based on these results. Comparisons will be made with the use of industrial fertilisers.

## 4. Expected results

4.1. A basic seed bank has been created, which insures better availability of potato.

4.2. Better yields are achieved with better seed potatoes. More information has been acquired about the potato diseases in the Republic of Karelia and diseases can be stopped before they grow into epidemics.

4.3. Fertilisation recommendations are in use and produce better yields.

## 5. Timetable and financing



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Implementation period is 2007–2009. Financing: Interreg 67 700 euros (including 6000 private financing and 14700 other public funding) and TACIS 145 900 euros (including 18900 other public funding).

#### 4.3.2. Other proposals from the field of agriculture and related areas

Several other proposals were received from the Faculty of Agriculture of PetrSU, but these failed to proceed further. Main reason for this was the fact that there is not a Faculty of Agriculture and Forestry in the University of Oulu, and the Department of Biology focuses on other aspects than those which were proposed. Also, the Renewable Resources Institute of the Oulu University of Applied Sciences focuses on some other fields of this sector, than those that were proposed.

### 4.4. Economics

Several concrete proposals dealing with economics were received from PetrSU, ASTU and MSTU. The teachers at the School of Business and Information Management of OUAS found one of the proposals from PetrSU interesting, and the experts decided to continue working on this topic, which is shown below.

#### 4.4.1. Strategic Leadership

*Main Finnish participant:* Oulu University of Applied Sciences, School of Business and Information Management, Senior Lecturer Tiina Gällén ([tiina.gallen@oamk.fi](mailto:tiina.gallen@oamk.fi) +358 312 6856)

*Main Russian participant:* Petrozavodsk State University, Faculty of Economics, ass. prof. Boris Adajev (+7 8142 57 64 71)

### 1. Overview

Lack of knowledge regarding strategic leadership holds back Finnish-Karelian business cooperation, and also the development of individual companies. This can be changed through a joint Finnish-Karelian project, which targets this knowledge gap.

### 2. Aims

General objective is to support the development of business and networking between Finnish and Russian companies. One central aspect of this is to improve the knowledge regarding strategic leadership among the teachers, directors and students.

### 3. Actions

1. A benchmarking seminar about strategic leadership will be organised for the teachers.
2. Students will study how companies implement strategic leadership in their operations.





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3. Based on these results, a seminar will be organised for the leadership of the companies, where the different strategies will be analysed and the best ones will be selected.
4. Students produce analyses and information for the companies, which support their strategy work.
5. Seminars will be organised for the students both in Finland and in Karelia, during which the students can compare their findings and get to know to the companies.
6. Other seminars about strategic leadership, its methods and tools can be organised for the leadership of the companies in the course of the project.

#### 4. Expected results

The tools and methods of strategic leadership are better known, and the companies have made new contacts, which open up new cooperation opportunities in business life. The students of Oulu University of Applied Sciences have gathered know how about the Russian business life, which they can put into use in their work life. The project strengthens the skills of the students and teachers of PetrSU. The participating companies get more information about strategic leadership in general and specifically about how to use it in their own companies. Numerous articles, thesis and other publications will be made.

#### 5. Timetable and financing

The planning of the project will start in 2007 and continues in the following year, when financing for the project will be applied. The project could start already in 2008, but most of the activities will take place in 2009 and 2010.

One source of financing can be the participating companies, but other financing sources have to be also found.

##### 4.4.2. Other proposals in the field of economics

Couple other concrete project proposals were made also in the field of economics. Short summary of these proposals, which did not proceed further, is given below.

Discipline	Proposal	Contact person	Reason for not continuing
Accounting and Audit, MSTU	Monograph about the stable development of the timber industry in Finland and Russia	Professor Andrej Kibitkin	Similar research has been done in the Faculty of Economy of OU, but not anymore
Economic information processing, ASTU	Comparing the performance efficiency of circular and band saws, creating a software program based on these results	Ass. prof. Sergey V. Ershov	Some similar research has been done in the Faculty of Technology of OU, but no interest
Faculty of Economics, PetrSU	Several research topics, e.g. "Business culture in ROK", "Logistics", "Investment and innovation policies", etc.	Teacher Ludmila Levkina	No interested parties found from OU or OUAS





## 4.5. Medicine

Two of the universities, University of Oulu and PetrSU, educate students also in medicine and carry out research on this field. Several proposals were received from medical faculties of University of Oulu and PetrSU, but unfortunately they failed meet interest from their Russian and Finnish colleagues. The complete list of these proposals is given below.

Discipline	Proposal	Contact person	Reason for not continuing
Chair of hospital therapy, PetrSU	Researching the quality of life of patients with rheumatoid arthritis, osteoporosis and gout	Docent Natalia Vezikova	No interested parties were found from the University of Oulu
Chair of hospital therapy, PetrSU	Researching the quality of life of patients with chronic kidney insufficiency	Docent Natalia Vezikova	As above
Pediatrics, obstetrics and gynecology, hospital therapy, PetrSU	Epidemiology and improvement of preventive actions against iodine sicknesses	Senior endocrinologist T.I. Kulagina	As above
Pediatrics, obstetrics and gynecology, hospital therapy, PetrSU	Research on the commonness of osteoporosis and osteopeny among kids	Docent Natalia Vezikova	As above
Chair of physical pulmonology, PetrSU	To improve the diagnosis of MDR-TB-cases and to prevent expansion of it	Head of the chair Juri Markelov	As above
Chair of physical pulmonology, PetrSU	To improve the abilities of the staff at the health care centers to act against smoking	Head of the chair Juri Markelov	As above
Chair of hospital therapy, PetrSU	Development of monitoring processes for the elderly suffering from hypertension	Head of the chair T. Kuznetsova	As above
Chair of obstetrics and gynecology, PetrSU	Different aspects of the epidemiological and of papillooma virus infection found among different age groups of Karelian women	Head of the chair Jelena Gumenjuk	As above
Chair of obstetrics and gynecology, PetrSU	Prevention of premature births and early diagnosis	Head of the chair Jelena Gumenjuk	As above
Chair of Nursing science and health policy, OU	Open for proposals dealing with this field	Head of the dept. Arja Isola	No proposals dealing with this topic was received from PetrSU
Chair of Pediatrics, OU	Open for proposals dealing with children's mental health, other related issues	Professor Irma Moilanen	As above
Chair of Obstetrics and gynecology, OU	Research about the treatment of infertility, medical treatment of drug-moms and abnormalities of embryos	Special doctor Marko Niemimaa	No interested parties were found from the Russian universities





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The main reason, why these proposals did not lead to discussions or projects seems to have been the fact that the interests of the parties were too far apart. Even if there are similar interest areas in the research programmes of the two medical faculties, there was no common ground for cooperation. It seems that the departments and clinics of the Medical Faculty of OU thought, that cooperation in the proposed topics would not have produced increased scientific knowledge. This is one of the decisive elements, which each department has to take into account, as they decide whether to participate in a project or not. This time, the proposals from PetrSU did not promise enough challenges and benefits for the Finnish side.

Also, the fields in which the Finnish side expressed their willingness to do cooperation were not those ones, which are priority areas in PetrSU. University of Oulu has done earlier cooperation with some Russian universities, for instance with the Northern State Medical University (NSMU) from Archangelsk, in the field of circumpolar health. This research topic has been on a high place in the agendas of these two universities and both sides have benefited greatly from this cooperation. This prospect, the mutual benefit, was maybe not so strongly present in these proposals, which were offered by OU and PetrSU.

#### 4.6. Humanities

Some proposals dealing with the field of humanities were received from the Department of Art Studies and Anthropology (TAIDA) of University of Oulu. Also, some proposals were received from the Arts and Crafts Museum of the Republic of Karelia. All of these are in the table below.

Discipline	Proposal	Contact person	Reason for not continuing
Cultural anthropology, OU	The impact of changing environment to the economy and culture of reindeer herders	Head of the chair Jukka Pennanen	No interested parties were found from the Russian universities
General archaeology, OU	Multidisciplinary approach to waste archaeology	Head of the chair Eero Jarva	As above
Arts and Crafts Museum of the Republic of Karelia	Improving museum workers skills	Aljona Kantysheva	Department of Arts Studies and Anthropology offers teaching in museology in the OU, but cannot spare its resources for cooperation
Arts and Crafts Museum of the Republic of Karelia	Archaeological research, several topics	Mark Shahnovich	Mark Shahnovich and Jari Okkonen from TAIDA met during a conference, but cooperation projects have not been planned

Common for all of these proposals was that not a single one of them proceeded further. This is partly due to the fact that two out of the three Russian universities involved in this project were technical universities with only few chairs on these disciplines. On the other hand, there are only some financing instruments, which support projects in the field of humanities, and the existing human



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resources in the humanities are quite small. The topic of the cooperation project must therefore be wholeheartedly supported and embraced by the applicant. There is always the risk, that the money applying process will not produce the desired result. Therefore, time and money can usually be only spared to the planning of those projects, which are most important ones. It can be said, that these risks are greater in the field of humanities than in some other sectors.



#### 4.7. Natural sciences, tourism, technology, etc.

Several other proposals were received from various departments and disciplines from the participating universities. Unfortunately, all of these failed to proceed further for various reasons. A list of the proposals is below.

Discipline	Proposal	Contact person	Reason for not continuing
Information measuring systems and physical electronics, PetrSU	Nano- and micro sensors, X-ray diffraction as a means of measurement in wood research	Ass. Prof. Alexei Moschevikin	Interest at Measurement and sensor, and Microelectronics and materials physics laboratories OU, meeting planned but cancelled
Energetics and transport, MSTU	Industrial power, energy efficiency, etc.	Head of the dept Vladimir Malyshev	Discussions about co-operation in this field will be continued in the Oulu-Murmansk work groups
Department of Biology, MSTU	Bioresources, estimation of environmental conditions, ecology	PhD student Irina Panteleva	Some interest at different departments of OU, no concrete plan in Oulu on how to proceed
Fac. of world economy and intern. relations, MSTU	Environmental impacts of gas and oil industry	Head of the faculty Maya Cheucherina	Some interest at different departments of OU, no concrete plan in Oulu on how to proceed
Fac. of world economy and intern. relations, MSTU	Development of tourism and marketing studies, etc.	Head of the faculty Maya Cheucherina	No interest at OUAS or OU
Department of industrial transportation, ASTU	Development of automated control and positioning programmes for logging	PhD student Aleksey Karjakin	No interest at Measurement and sensor laboratory of OU
Karelian Forest Research Institute	Utilisation of sewage sludge in forestry	Researcher Elena Robonen	No partners were found from the Oulu or rest of the country
Metso Automation, PetrSU	Information technology	Ass. Director Anton Skapajev	Information has been given to PetrSU, contacts are being made
Fac. of automation and computer science, MSTU	Simulators of automatic control in technological processes, virtual laboratory	Ass. Prof. Andrey Viskov	No interest at the mechatronics and machine diagnostics of OU
Technical mechanics MSTU	Virtual modelling	Head of the dept Alexander Prygunov	Interest at the lab. of mechatronics and machine diagnostics of OU, but no resources at the moment





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## 5. Conclusions

The results of the survey confirmed many assumptions about the extent of the Finnish-Russian cooperation between the participating universities: It is clear, that only some individuals and departments have real experience about it. Many departments have had contacts with their fellow colleagues, and perhaps some meetings have been arranged, but these have rarely led into concrete, common educational or research projects. These first contacts might have been made several years ago, and even if there would have been a common interest to do cooperation, the circumstances have not always been most favourable for such efforts.

However, in some fields the common interests have been stronger, and the other obstacles have been bypassed as well. Among these areas are building sector and environmental technology, which have seen cooperation over the years, and as this survey confirms, will continue to do so in the future. Most likely there would have been some kind of mutual projects in these fields even without this project, but the BERMAP-project has opened numerous new doors for this. The existing links between the departments have grown stronger, new acquaintances have been made and new fields of interests have been found. The common challenges in the environmental and in the building sector attract interest on both sides of the border. These areas are definitely the mainstays of cooperation between our universities also in the coming years. On the other hand, some of these traditional Finnish-Russian cooperation areas, such as Finnish language and medicine, failed to provide concrete project ideas, which would have gathered interest on both sides.

However, the greatest challenge, to find new areas of interests, where there has not been Finnish-Russian cooperation between the universities before, did not produce hoped results. There were only few new openings, which hit the right point on both sides of the border. First and foremost, the “Development of the Potato Technology in the Republic of Karelia” -project must be mentioned, which is a joint venture of PetrSU, NorTech Oulu and MTT Ruukki (Finnish Agrifood Research). Additionally, there seems to be common interest between OUAS and PetrSU to develop common educational projects in the field of economics. These fields will undoubtedly strengthen the cooperation between our universities in the future.

But many questions are left unanswered at the end of the BERMAP-project. Five multi disciplinary universities have been studied from bottom to top, but only few concrete proposals will evolve into common projects. What are the underlying reasons, which have prevented the emergence of more concrete cooperation projects between our universities? First and foremost reason has been the lack of mutual interest. Many of the topics and proposals, which have been put forth, have not simply attracted interest on both sides. All the universities do not have same disciplines in their selection, and even the focuses of the similar departments have not been compatible. If there have been similar topics on the agenda of these departments, the benefits of such cooperation have not always been deemed as worth the effort. The cooperation would not have increased the scientific expertise of the participating unit, or there have not simply been any resources available for such attempts. Also, in many cases the decisive factor has been the economics. Building of common cooperation projects, which might include applying of money from external sources, is always labour and time consuming.



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If the topic is truly close to the heart of the department's scientific directions, then the risk has only been worth taking.

Another issue, which prevented further processing of some cooperation proposals, seems to have been the lack of interest of the proposal makers. In many cases there was interest on the other side for further discussions, or more detailed enquires were made, but the initiator of the proposal was not interested to carry on. Many potential proposals were therefore not completely explored; the work had to be quitted. On some cases there was definitely interest on both sides, but the timing was not the best for further discussions. This document will undoubtedly shed some light on those areas as well, which are common for both sides, and which could be taken up later again.

One central issue became clear in the course of the project. Despite the fact that the formal cooperation agreements between our universities were signed many years ago, we still don't know enough about each other. Increased knowledge about each other's strengths and main scientific directions will help us to find common ground for cooperation between our universities. This document will undoubtedly bring more light into this issue. It is also obvious, that the rectors should encourage the faculties, departments and laboratories to search actively for international projects, to make new contacts – to boldly go to west/east. True cooperation between our universities happens on the grass root level, between individual departments and laboratories.

This document should promote further contacts and eventually concrete cooperation ventures also in those fields, which did not fare so well in this survey. As the international educational and research programmes gain greater importance, and more financing instruments become available, more and more Finnish-Russian cooperation projects will emerge between our universities.



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## Appendix: Guidelines for organising continued education courses for companies

### Background of the guidelines

Numerous Finnish-Russian continued education courses have been organised since the early 1990's, which have addressed a wide array of different themes. Both Finnish and Russian organisations have been the initiators of these events, and naturally different institutions have emphasised different areas of interest. The agendas of these courses have varied greatly, all the way from nuclear hazard issues to the promotion of citizen society or youth work. These courses or workshops, what ever we want to call them, have all shared a common basic aim: to provide information and training for a specially selected target groups.

Organising of these Finnish-Russian courses has in many cases proved to be very laborious and the results have been smaller than anticipated. The basic aim has not been achieved; both sides may have left the venue with unfilled expectations – information has not transferred. Cultural differences present a major obstacle in the organising and implementation of educational events, when the two sides don't share same cultural background. The differences tend to be even bigger between Western Europeans and Russians, but the problems can't be explained only by cultural dissimilarities. The differences of the educational systems contribute also to this fact, as well as the differences in the working culture. Therefore the lecturer's job is much more demanding, when the audience does not consists of his/hers fellow citizens. This also means that the audience have to struggle harder to follow and to understand the presentation of the foreign lecturer. There are several more or less invisible borders, which separate the specialists from each other. In worst case scenario the two sides fail to make contact at all. The lecturers may spend hours on talking about their topic, but audience leaves the lecture hall without learning anything new or valuable to them.

These above mentioned issues present noteworthy problems, especially for lecturers. This means that other, mainly organisational problems have to be minimised, so that the set goals of workshops can be met. Extra emphasis has to be put on the planning phase of the Finnish-Russian workshops, but a lack of a common guideline has not made this task any easier. As the cooperation between Finnish and Russian organisations is bound to increase, it is obvious that this obstacle has to be removed. One central goal of the BERMAP project was to develop a continued education model, which would be tested in practice and refined in the process. Now this work has been completed.

### Business Workshops of the BERMAP project

Four Business Workshops were organised in the framework of the BERMAP project: two in Petrozavodsk (November 2005 and October 2007), one in Archangelsk (May 2007) and one in Murmansk (November 2007). The topics of the workshops dealt with various aspects of environmental technology, in particular waste and drinking water issues. But the important thing is not what the topics themselves were, but how the workshops were organised and what were the results and experiences of these events.



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The first workshop was a test ball, which formed a basis for the development of the continued education course model. A two day long workshop was organised in Petrozavodsk, in cooperation with PetrSU. The aim was that the Finnish project partners - Kemira Oyj, Pöyry Group and Pipelife Finland Oy - would lecture on a selected topic for a Russian target group.

The main topic of the workshop was water and drinking water issues, as the Finnish companies involved in the project were experts of this field. The workshop was tailored according to the needs of the target group, Karelian organisations and companies working on the water sector. PetrSU project group had systematically collected proposals from these companies, which gave a clear picture about their educational needs and interests. A few of the proposals were selected as the main topics of the workshop, and lecturers were chosen accordingly from the Finnish companies.

Those Karelian companies, which had expressed their interest to participate in the workshop, were sent a draft of the programme together with the invitation. The target group was well represented in the workshop, about 40 specialists from the Petrozavodsk water works, local planning offices, cities and municipalities took part in the seminar. Despite the high numbers, it can be said that quantity did not supersede quality in this case either. Several of the participants did not stay for the whole workshop; some left already in the middle of the first day, whereas others did not bother to show up on the second day. In addition, the presentations did not stimulate discussions, and only some questions were asked.

It was clear that the workshop did not go as planned, even though the programme was built according to the wishes of the target group. The major problem seems to have been that the target group had been too big. Many different topics were chosen and in this way too many wishes were taken into account. This was a **weakness**, as everybody did not find all the topics equally interesting. When some had heard “their” presentations, they decided to leave. People did not have enough interest and commitment to stay through the whole workshop. If a participation fee would have been collected, perhaps people would have stayed to the end of the workshop in order to get value for their money. But on the other hand, the participation fee might have deterred potential participants also away, if they saw that the event would not provide enough for the money.

Charging of a participation fee is one way to get more committed participants, but a better way is to select the lecture topics and the target group more **precisely**. This is exactly what was done with the second workshop, which was organised in cooperation with ASTU in Archangelsk in May 2007. This time the theme was narrowed down on the “waste water issues of pulp and paper industry”, which was proposed by the project group of the ASTU. Local companies and other organisations were asked for more detailed topic ideas, and based on these Finnish lectures were chosen.

The target group was smaller and the **participants were more carefully selected**. About 20 persons from paper companies, municipal and regional administration and different laboratories took part in the seminar, and most of them were operational specialists, dealing with these issues daily. Interesting point was that majority of them were women. The lecture hall suitable for 70 persons was selected as the event venue, which proved to be a right decision. In PetrSU the workshop was organised in the biggest lecture hall of the university, but in ASTU the small room was ideal for this small scale event.





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The communication between lecturers and listeners worked better, as the physical distance between the lecturers and listeners was not too big. The lecturers were bombarded with numerous questions, and a relaxed, open atmosphere lasted throughout the event. It seemed really that the people were there to learn new things, and not just seeking free coffees and lunches. The goal had been reached.

### **Outline of the further education course -model**

Two more seminars were organised, one in Petrozavodsk and one in Murmansk, in which the winning formula of the Archangelsk workshop was tested and developed further. Below are some points, which have proved to be the most important ones in the planning and implementation of Finnish-Russian workshops. These points form the basis for further education courses.

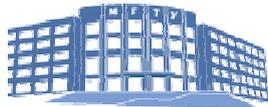
#### 1. Topic and presentations

1. When to start to plan a workshop? The planning work should start at least three months before the intended date of the event. This due to the fact that the calendars of the Finnish specialists tend to fill up several months in advance.
  2. Choosing the general theme and selecting the potential target group. What will the workshop be about, who will be the potential target groups?
  3. Define the interests of the target group. Get to know as soon as possible what the target group wants. Find out what is on demand, what kind of information is needed.
  4. Selection of lecturers. Present the proposals to the experts and select those lecturers, who can supply the know-how that the listeners want to get.
  5. Combine the two viewpoints. What kind of presentations are expected – scientific or more practical oriented? General or more detailed? The organisers have to combine the interests of the listeners and the lecturers, they must be compatible.
- ⇒ If the workshop is build on the needs of the target group, then the commitment and interest of the listeners is ensured. There are fewer absences and running aways, and the lunch tourists can be eliminated, because the programme has been done according to the target group's wishes.
- ⇒ The right lecturers are selected, who posses the know-how which is on demand. They know to whom they address their presentation, how detailed or how general the presentations must be.

#### 2. Organisational issues

1. Target group. The target group should not be more than 20 people. The interaction between the lecturers and audience is easier; listeners won't be intimidated to ask questions in a small company.





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2. Location of the workshop. The workshop should be held on a neutral ground, preferably not on the working place of some of the participants. This would ensure that the listeners can concentrate on the workshop, and will not drift away to their working place or be bothered by their colleagues.
3. Collecting of entrance fee. Collecting an entrance fee is one way to ensure listeners' commitment to the workshop, but it is not mandatory as the Archangelsk case proves. If the topics and the target groups have been selected properly, the people won't try to find excuses to leave the workshop.
4. Duration of the workshop. The ideal duration for a short workshop is 2 days at maximum. Besides lectures there should be also time reserved for discussions and free interaction between the participants. Coffee breaks and lunches offer a good venue for this, but this should also be taken into account in the programme, which should not consist just of lectures.
5. Introduction by the chairman. Chairman or somebody else from the behalf of the organisers should give a short introduction of the workshop in the beginning of the event. The background and the underlying reasons, which have led to the organising of the workshop, should be presented to the audience, as well as the set aims of the workshop. In this way the participants will get a better idea, why the event is being organised and what is being expected from them – why they are there in the first place.
6. Learning from the workshops. Collect feedback and analyse it. If you take into consideration these issues, you will be able to make next seminar better and prepare yourself for unexpected problems and other situations.



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