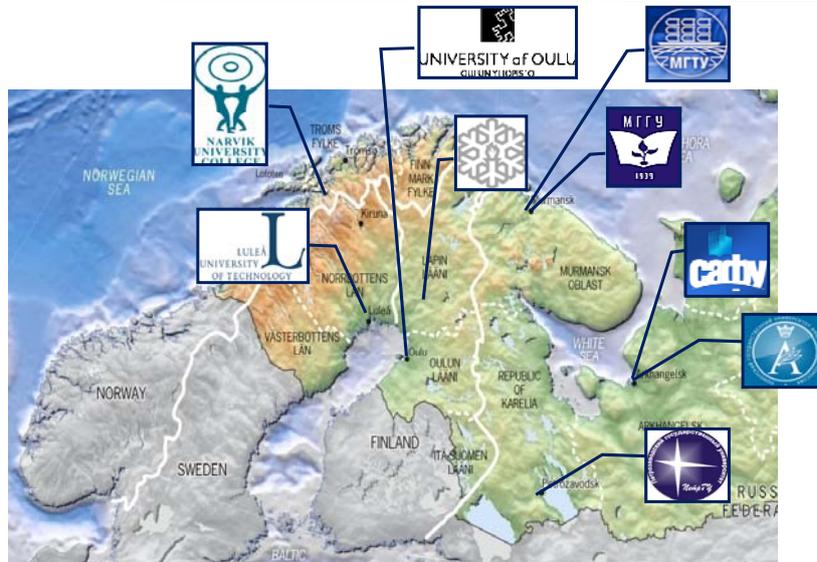


Barents Environmental Engineering



Barents Environmental Engineering (BEE)

- Program leader: University of Oulu
 - Programme at the responsibility of the Faculty of Technology, Department of Process and Environmental Engineering (DPEE)
 - Programme developed together by DPEE and the Thule Institute (BCBU coordination)
- Full BEE partners
 - University of Oulu, Finland
 - Northern (Arctic) Federal University, Russia
 - Murmansk State Technical University, Russia
 - Narvik University College, Norway
 - Not part of the BCBU agreement
 - OU-NUC agreement
- Associate BEE partners
 - University of Lapland, Finland
 - Murmansk State Humanities University, Russia
- Future BEE partners
 - Pomor State University, Archangelsk, Russia
 - Associate partner status to be approved
 - Petrozavodsk State University
 - Partnership (associate or full) to be approved
 - Luleå University of Technology, Sweden
 - Joint programme planning initiated

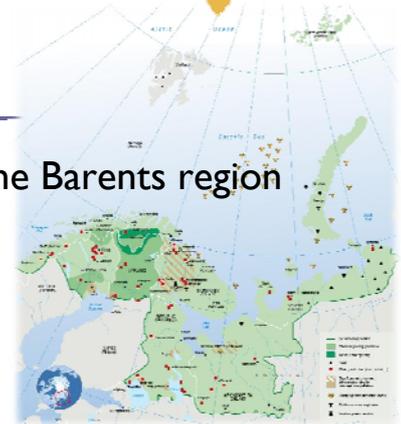


UNIVERSITY of OULU
OULUN YLIOPISTO



LULEÅ
UNIVERSITY
OF TECHNOLOGY

Our interpretation of the BEE Master's Programme



- The rationale behind the programme is the needs of the Barents region
 - Support sustainable production practices
 - Bring growth and progress to the Barents region
 - Maintaining a sustainable use of natural resources
 - Protecting the sensitive Barents environment
- The programme is open for international applicants; however, it is primarily intended to train experts for the Barents regions
- Formally, it is a 2 year, English language master's programme of 120 ECTS, which includes an exchange period of some 10-30 ECTS in at least one of the BEE partner universities
- A special feature of BEE are the jointly organized courses, which are taught by an international teacher team from member universities
- Partner universities can offer their own orientations, however, preferably they all should take advantage of the jointly offered courses

Orientations in BEE

□ University of Oulu (2009):

- *Clean production*
- *Water and environment*

Orientations launched Sept. 7th, 2009, 2nd intake in 2010
- First BEEs to graduate in summer 2011 

□ University of Oulu & Narvik University College (2010)

- *Sustainable energy*
 - *Programme realised jointly by UO and NUC*
 - *Programme is being extended to be offered by UO-NUC- Luleå Techn. Uni.*

Orientation launched Sept. 2010 at UOulu

□ Northern (Arctic) Federal University

- *“Environmental protection” Master’s degree programme*
 - *10 ECTS English module offered*

2 budget places in 2009 for a 90 ECTS programme to Specialist graduates
In 2010 & 2011 intake of 3 specialists and possibly foreign graduates

□ Murmansk State Technical University

- *Multi-purpose Utilization of Water Resources*
 - *7 disciplines are possible to be taught in English*

Started in 2009, totally 6 budget places as of 2010

UOulu: Clean Production & Water and Environment orientations

- 5 students started in Sept 2009, and 5 more follow the programme since Sept 2010
 - All international, none from the partner universities
- Curricula based on existing courses of the industrial environmental engineering and water and geo-environmental engineering orientations of the environmental engineering master's programme, with an additional BEE content:
- Jointly provided courses by an international BEE teacher team
 - *Introduction to the environmental and socio-economic issues of the Barents region (autumn 2009 & 2010)*
 - *Introduction to the environmental legal systems of the Barents region (autumn 2009)*
 - *Environmental issues of the Barents region (spring 2010)*
 - Students of all orientations invited to participate
- New courses implemented based on strong UOulu expertise
 - *Sustainable development (autumn 2009)*
 - *Global change (autumn 2010)*
- Further business and management courses taken from other faculties of UOulu
 - *Principles of environmental economics, Risk management, Business logistics*



Summary of experiences with CP and WE orientations

BEE/CP&WE start successful in UOulu, although not without problems

- Positive issues, but providing new challenges:
 - It was unexpected that BEE attracted applicants from all through the world
 - Of those started in 2009: 3 European, 1 Asian, 1 South-American
 - Of the 5 students in 2010: 1 European, 2 African, 2 Central-American
 - Raised the question: should BEE be only for Barents students?
 - More mature students with higher degrees from other fields or from working life interested in taking BEE as a second (third...) degree
 - Not always with an ideal background, but mature and motivated
 - Student group very heterogeneous
- Issues that need more work
 - No students from BEE partner universities
 - We all need to advertise BEE to our own students
 - Need more input from Russian universities
 - More Russian teachers in joint courses
 - Exchange courses or field study places in Russia



Sustainable Energy orientation

- As of 2010: Jointly organized master's degree orientation of UOulu DPEE & Narvik University College
 - UOulu provides 50 ECTS of course
 - NUC provides 40 ECTS of the courses
 - 30 ECTS diploma work project at home university



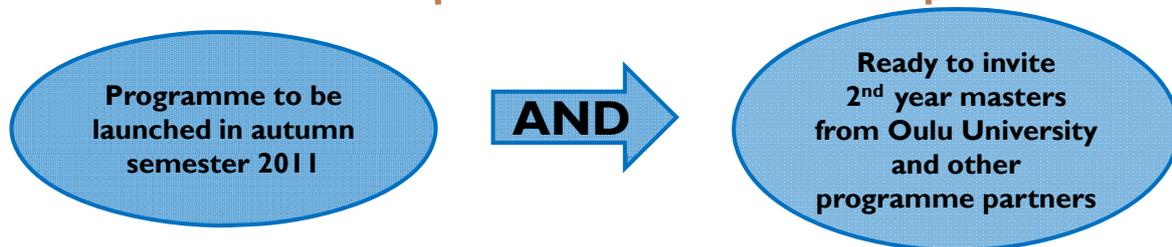
Status as of autumn 2010

- UOulu
 - Six 3rd year BSc students of DPEE plus one BEE student have started the orientation in Sept. 2010
- NUC
 - Accreditation application yet unresolved, no intake in 2010
 - First new course was piloted in May 2010 for BEE'09 students
- LTU
 - Negotiation in progress with Luleå Technical University of to realize the SE orientation as a UO/NUC/LTU joint programme
 - There seems to be sufficient professor/teacher participation and motivation and a good number of English language courses in the 3 universities available for the programme

Northern (Arctic) Federal University



Cooperation and Realization of Master Programme «Environmental protection» with Barents partners



2012 – the first N(A)FU bachelors for 2 years Master Degree Programme (120ECTS)

Courses (total duration - 4 weeks):

- **Monitoring of the environment. Regional aspects (3 ECTS, test)**
- **Ecoanalytics (4 ECTS, exam)**
- **Russian for beginners (3 ECTS, test)**

} **10 ECTS**



BEE in MSTU

Multi-purpose Utilization of Water Resources

Direction of training: 280200.68 “Environmental protection”

Started: September 2009

Accepted students: 6

Disciplines possible to be offered in English

- Perspectives and Problems of the Arctic Water Resources Developing
- Characteristics of the Kola North Water Ecosystem.
- Mechanisms of the Water Ecosystem Anthropogenic Damage
- Physicochemical Processes of the Water Treatment Technologies
- Technologies of the Water Purification and Conditioning in Murmansk Region
- Technical Facilities of the Enterprises Water Consumption
- Hydro-Botanical Technologies of Waste and Natural Waters Treatment in Northern Conditions
- to be extended...



Petrozavodsk State University

➤ Courses in English available at

- Chair of Architecture, Building Units and Geotechnics
- Chair of Construction Management
- Chair of Water-Supply, Hydraulics and Water Drain
 - Courses on Water and wastewater treatment and Environmental and Socio-economical Issues of the Republic of Karelia
 - Working group ready to contribute in the project, teach the mentioned topics or prepare new ones
- **5 lecturers started to translate their courses into English**
- **Took part in English language courses (academic writing)**



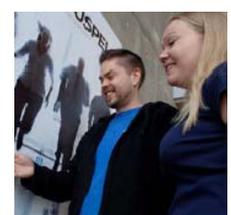
Environmental Issues in the Barents Region – BEE joint course

- First real joint course during May 24–28, 2010 in Oulanka Research Station
- Participants from 4 universities:
 - UOulu: 7 students, 3 teachers
 - MSTU: 3 students, 1 teacher
 - PetrSU: 3 students, 3 teachers
 - NUC: 1 teacher
- Teachers' presentations on specific environmental problems of:
 - Murmansk oblast and Karelia
 - North-Norway and North-Finland
- Included issues:
 - Diversity of the northern environment
 - Land-use impacts and changes
 - Sustainable use of northern resources
 - Barents sea resources and protection
 - Industrial pollution remediation
 - Water use
- 20h contact lectures + 5h field work + exercises, discussions, group works & fun



Marketing the BEE programme

- Has not been one of the success stories
 - No applicants from partner universities in 2009
 - One in 2010, however, with background insufficient for engineering studies
 - Most applicants probably found BEE in “University Admissions Finland” web-portal
 - Only 1-2/year is specifically applying for BEE, most are interested in environmental engineering
- BEE www page (<http://bee.oulu.fi>)
 - Informative, serves also present and future students of UOulu
 - Need to further develop to include all orientations equally
 - BEE needs to be more present also on the pages of partner universities
- Strong need to improve marketing strategy
 - We need especially to perfect marketing in the Barents region



Issues discussed at the BEE WG

- The future of BEE, prognosis of having joint programmes with Russia
 - Are the administrative and financial frameworks supportive?
- The heterogeneous nature of the BEE programme, BEE is more a brand name describing the partnership, rather than one MSc programme
 - All 5 orientations are master's programmes on their own, rather than orientations of the same programme
 - The only common feature seems to be the joint courses
- How can Russian full partner universities fully utilize this partnership to offer international level master's programmes?
- Role and benefits of associate partners
 - The only common interest is the joint courses to which all universities could send teachers and students
- Financial resources for implementing joint courses/exchange?
- Is BEE 'in the Barents for the Barents', or 'in the North for the World'?
 - Is BEE a programme for our own national students or an international recruitment channel?

Questions from the BEE WG

- Opportunities for double/joint degrees?
 - No financial interest in Russia for sending students abroad for a year
 - Students away for a longer term (semester or year) would mean minus for the Russian teachers' performance evaluation
- Providing motivation for the teachers to participate in BCBU – to develop/translate courses
 - Will it be counted as part of the 840 hours/yr teaching requirement?
 - Teachers need financial motivation to develop/teach courses in English
- Are the Russian universities ready to allocate international funds to support their students exchange periods e.g. in Finland?
 - (alternatively) When sending Russian students to study the full programme in Finland, is there any help to find sources of income (e.g. jobs) in Finland
- If Russian students would study the full programme in UOulu, will the the BEE master's degree from be accepted in Russia?
 - We will have to work on the comparability of Russian and Finnish curricula