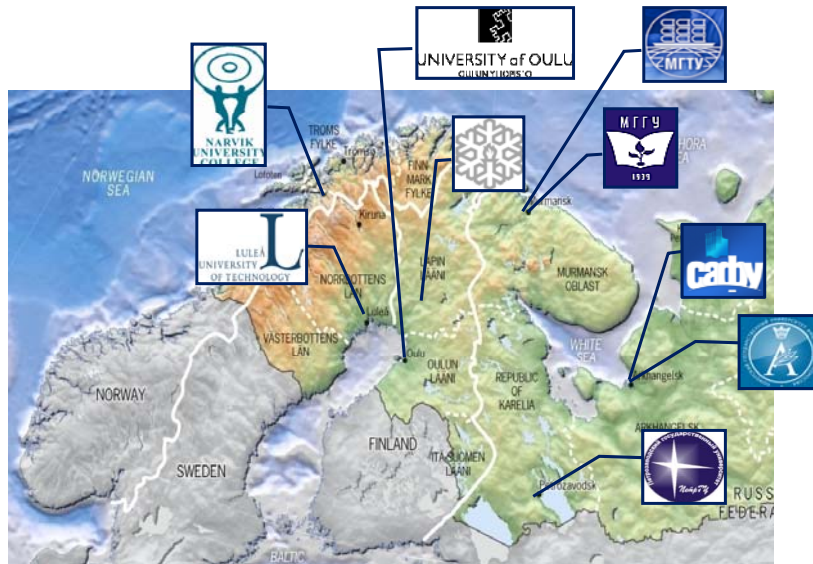
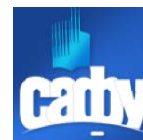


# Barents Environmental Engineering



## Barents Environmental Engineering (BEE)

- Programme 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
  - Petrozavodsk State University
    - **Associate partnership accepted by BEE WG**
  - Pomor State University, Archangelsk, Russia
    - **To be united with NArFU (reorganisation in progress)**
  - Luleå University of Technology, Sweden
    - **Joint programme planning initiated for BEE SE orientation**



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# Status of orientations in BEE

## University of Oulu (2009-):

- Clean production (CP)
- Water and environment (WE)
- Sustainable energy (SE)
  - Programme realised jointly by UO and NUC
  - Programme is being extended to be offered by UO-NUC-Luleå Technical University

**Orientations launched** Sept. 7<sup>th</sup>, 2009, 3<sup>rd</sup> intake in 2011  
 - Eligible applicants 36 (12 female applicants) in 2011 (selection of ~10 students will be done in March)  
 - First students will graduate in summer 2011

**SE orientation launched** Sept. 2010 at UOulu

## Northern (Arctic) Federal University

- "Environmental protection" Master's degree programme
  - 10 ECTS module is offered in English

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

## Murmansk State Technical University

- Multi-purpose Utilization of Water Resources
  - 7 disciplines are possible to be taught in English (~16 ECTS)

Started in 2009, totally 6 budget places as of 2010

## Petrozavodsk State University

- Water-Supply, Hydraulics and Wastewater Management
  - 5 courses are possible to be taught in English

Courses in English are ready and will be offered on request

# UOulu: Clean Production & Water and Environment orientations

- 5 students started in Sept 2009, and 5 more follow the programme since Sept 2010
  - All international (1 Asian, 4 European, 3 American, 2 African), none from the partner universities
- Curricula based on existing courses of the DPEE with Barents specialised courses.
- Courses jointly provided by an international BEE teacher team, e.g.:
  - Introduction to the environmental and socio-economic issues of the Barents region (2009 & 2010)
  - Introduction to sustainable energy (2010, 2011 on-going)
  - Environmental issues of the Barents region (springs 2010 and 2011)
- Further business and management courses can be taken from other faculties of Uoulu

## BEE/CP&WE started 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
  - Mature and motivated students with different backgrounds interested in taking BEE as a second (third...) degree.
- Issues that need to take into account
  - Students from BEE partner universities should be encouraged to apply.
    - Russian students have to pay a fee for Master studies
  - Need more input from Russian universities
    - More Russian teachers in joint courses
    - 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
  - NUC provides 40 ECTS
  - 30 ECTS diploma work project at home university



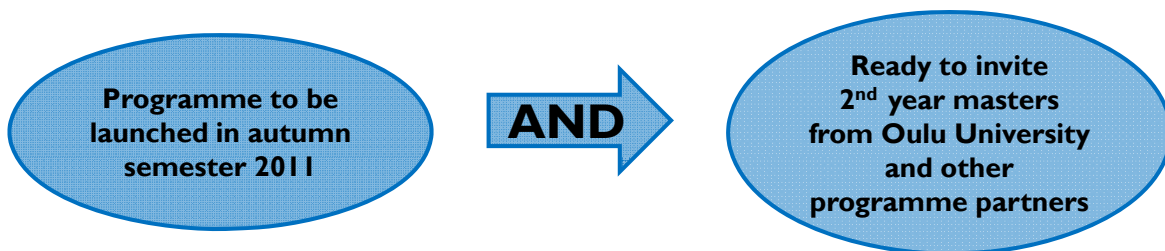
## Current status

- UOulu
  - Six 3<sup>rd</sup> year BSc students of DPEE plus two BEE students have started the orientation in Sept. 2010
  - Funding from Council of Education of UOulu received for 2010 to expand the programme to include LTU.
- NUC
  - Accreditation application yet unresolved, should be ready by 2011
  - First new course was piloted in May 2010 for BEE'09 students
- LTU
  - Negotiation in progress with Luleå Technical University 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
- Project application was to the Nordic Council of Ministers (December 2010) on "Jointly organized Nordic Master's Programme in Sustainable Energy Engineering". Decision expected early March 2011.

# Northern (Arctic) Federal University



## Plan for Cooperation and Realization of Master Programme «Environmental protection» with Barents partners in 2011



**2012** – the first NArFU bachelors for 2 years Master Degree Programme (120ECTS)

### Courses (total duration – 4-6 weeks):

- Monitoring of the environment. Regional aspects (5 ECTS, test)
- Ecoanalytics (5 ECTS, exam)

} 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 (1.4 ECTS)
- Distinctive Features of the Kola North Water Ecosystem (2 ECTS)
- Mechanisms of the Water Ecosystem Anthropogenic Damage (2 ECTS)
- Physical-chemical Processes of the Water Treatment Technologies (2.4 ECTS)
- Water Purification and Conditioning Technologies in the Murmansk Region (1.8 ECTS)
- Technical Facilities of the Enterprises Water Supply (2.9 ECTS)
- Hydro-Botanical Technologies of Waste and Natural Waters Treatment in Northern Conditions (2.9 ECTS)
- amount of courses to be extended...



## Petrozavodsk State University

### ➤ Courses in English available at

- Chair of Water-Supply, Hydraulics and Wastewater Management
  - 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
  - **7 lecturers have developed courses in English**
  - **Took part in English language courses (academic writing)**
- Chair of Construction Management



# Environmental Issues in the Barents Region

## – Example of 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 in Barents area
- 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
- **Will be arranged again in spring 2011**



## Marketing the BEE programme

- Russian students are very interested in the programme (chance for the programme)
- Partner Universities have started the planning of marketing work, but not yet launched marketing materials (except UOulu)
- BEE www pages (<http://bee oulu.fi>, Oulu; <http://petsu.ru>, Petrozavodsk)
  - Informative, serves also present and future students of UOulu
  - Need to be developed further
    - to include all orientations equally
    - to include the links to the partner Universities
  - BEE needs to be more present also on the pages of partner universities (development work needed)
  - Maybe “joint www-pages” for BEE should be done and via that the information can be delivered
- Joint marketing materials necessary.



# Issues discussed at the 14<sup>th</sup> BEE WG

- ***BEE Working Group accepted the Petrozavodsk State University as an Associate partner of BEE***
- Unclear situation of the programme status in Russia and no permission for admitting specialist graduate students to the budget places.
  - Difficult to attract them to take the master programme on the payment base
- Financial resources for implementing joint courses/exchange?
- Students mobility and living costs reimbursement have to be improved by e.g. stipends
- Currently the collaboration is based on the joint courses
- On-going improvement of the level of collaboration by changing information e.g. curricula and course scheduling.
  - Joint planning and preliminary workshops in arranging education by utilising video or tele conferences. Work will be started immediately after this meeting. In addition, joint seminars and conferences could be arranged in the fields of interests.
- It was found good that the conditional acceptance to the programme can be done already for students who will graduate as Bachelors in the spring term.