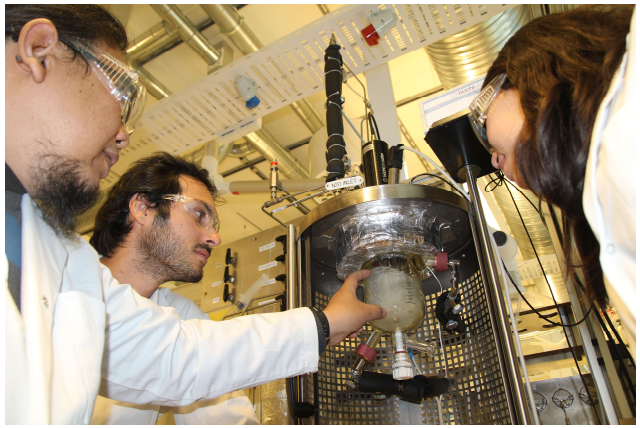
NTNU

Kunnskap for en bedre verden

CO_2 capture

Teaching and research activities



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CCS related teaching:

Bachelor level

- Projects/exercises in the different courses

Master level

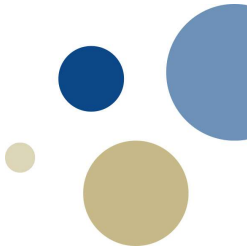
- Experts in Teamwork
  - students work interdisciplinary teams to find solutions for a specific project.
  - At the same time, as they work, they should take a metaperspective on how their cooperation in the project is functioning

- Specialization course

- Plant design projects
- Specialization projects
- Master theses

Reseach project propose topics and supervises the students

Teaching
Example - Master in Chemical Engineering



AUTUMN 1ST YEAR	PLANT DESIGN (7.5 SP)	7.5 SP	7.5 SP	7.5 SP
SPRING 1ST YEAR	EXPERTS IN TEAMWORK (7.5 SP)	7.5 SP	7.5 SP	7.5 SP
AUTUMN 2ND YEAR	7.5 SP	SPECIALIZATION COURSE (7.5 SP)	SPECIALIZATION PROJECT (15 SP)	
SPRING 2ND YEAR	MASTER THESES (30 SP)			

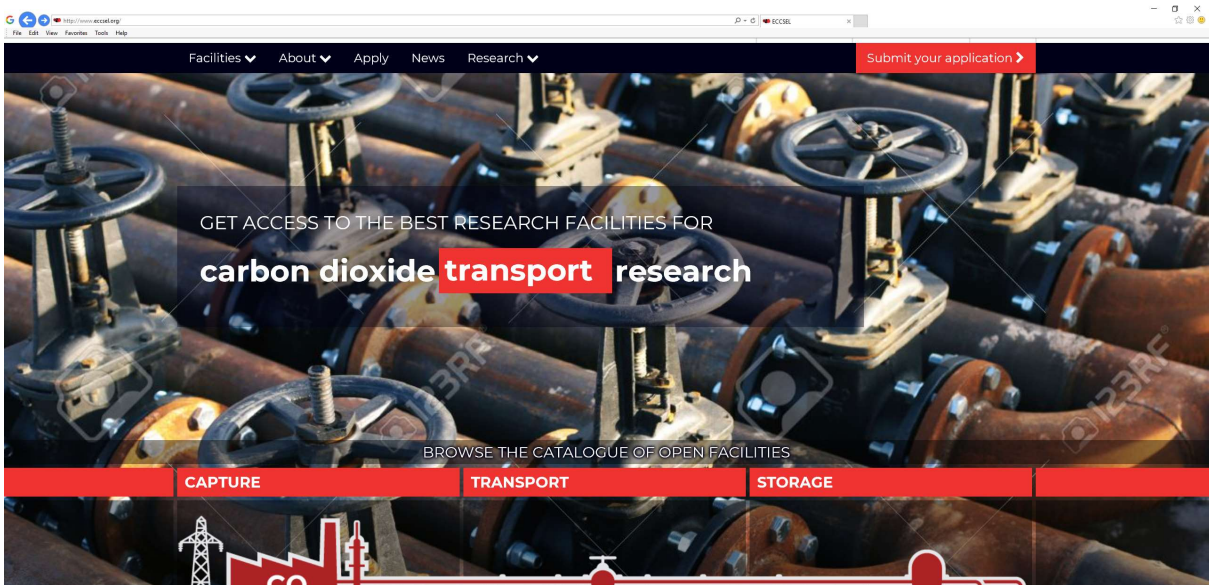
Research projects

EU projects / International projects	National projects
• **ECCSEL**	• 3GMC
• ALIGN	• Denovo design
• CLEO	• LEPS
• DECARBit	• **SUBPRO**
• iCap	• AEROSOLV
• HiPerCap	• BIGCCS
• CESAR	• CCERT
	• SOLVit

ECCSEL (www.eccsel.org)

- Opening access for researchers to a top quality European research infrastructure devoted to second and third generation CCS technologies.

- a European distributed, integrated Research Infrastructure (RI) for CO_2 capture, storage and transport research.



How do the large projects contribute on teaching?

Projects like

- Industrial Catalysis Science and Innovation (iCSI) and
- Subsea processing (SUBPRO)

Centres for research-based innovation

actively participate on

- Education of PhDs and master students
- As supervisors for project students
  - Plant design course
  - Spesialization projects
- On selected EiT village by proposing topics and supervising the coursework
- Presentations in different courses (internal and external)

Education of good candidates is part of the project goals

Interdisciplinary/Innovative teaching

Joint Nordic Master in **Polymer Technology**

- Norwegian University of Science and Technology (NTNU)
- Aalto University in Finland
- Chalmers University of Technology
- KTH Royal Institute of Technology
- Technical University of Denmark (DTU)

Innovative teaching

- Active learning in heat transfer course (bachelor)

Summer schools and courses organized by research projects

Experience

What is your experience in the development of new innovative modules?

- Students are very interested in the environment → the modules related to that are often popular.
- Industry being visible through out the process increases the students' interest

How cooperation with third parties and research on new topics can feed education programmes?

- Systematic work requires large projects
- Good results can also be gained in small research project but then typically one the course/training is only given once.
- Easy to include up-to-date topics to project based courses.

How this can translate into a quick and flexible production and delivery of these programmes to respond to new and urgent market demands?

- Project work in courses
- Specific courses (intensive) on selected topics and open for several student groups
- Requires capacity and motivation from the teachers/professors
- Administrative support needed