

Laboratories

Most of our research work is experimental and is performed in our laboratories. The Department has 8 laboratories covering 6000 m² in 3 different buildings.

- Combustion and laser diagnostics laboratory
- Thermal engineering laboratory
- Refrigeration engineering laboratory
- Multiphase flow laboratory
- Energy and indoor environment laboratory
- Dewatering and food engineering laboratory
- Water power laboratory
- Fluid engineering laboratory



Degree programs

The Department gives courses within these degree programs:

Graduate engineer/Master program 5 years

- Product development and materials
- Energy and environment
- Engineering science and ICT

MSc-program/Master program

- Product development and materials
- Energy and environment
- Industrial exology

Many of our students spend one or two terms at a foreign university. A good cooperation between the Department and industry and commerce helps secure high motivation among the studies and relevant problems to be addressed.

Further information on the degree programs can be found on:
www.ept.ntnu.no/studier.php

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Department of Energy and Process Engineering



Department of Energy and Process Engineering

- is part of the Faculty of Engineering Science and Technology (IVT). The Department has approx. 130 employees including 50 PhD Fellows. Each year 10-15 PhD students and 70-90 Master students earn their degrees at EPT.

Our research areas and courses are organized in four specialist groups:

Thermal Energy

- Combustion and Bioenergy
- Fluid Flow Machinery and Power Production
- Energy System Analysis and Industrial Ecology

Industrial Process Technology

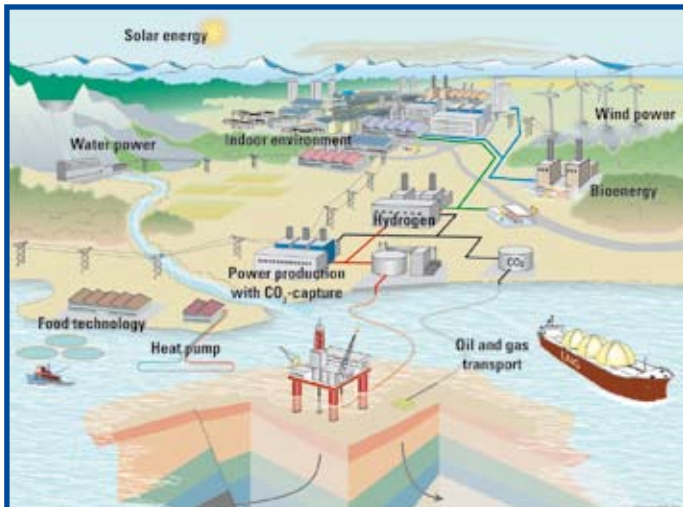
- Heat and Refrigeration Engineering, Components and Systems
- Natural Gas and Multi Phase Engineering
- Food Industry Technology

Fluids Engineering

- Hydraulic Fluid Flow Machinery
- Pipe systems and Fluid Power/Pneumatics
- Fluid Mechanics

Energy and Indoor Environment

- Energy Consumption and Supply
- Building Automation
- Indoor Climate and Working Environment
- Ventilation Technology



A glimpse at our research activities

The Department of Energy and Process Engineering researches on how to produce energy which can be used by man and machine in a sustainable way, taking into consideration health, climate changes and available resources. We perform research encompassing the entire process, from resource to consumer, says Professor Johan Hustad, Head of Department and Manager of the **Centre for Renewable Energy NTNU-SINTEF-IFE** (www.sffe.no).



The Department of Energy and Process Engineering is a fascinating place to study considering the increasing focus on climate issues and climate change. Currently, we are expanding our activities regarding technological solutions for energy production and energy consumption. Several PhD- and Master students receive financing from industry for their projects. The Department cooperates extensively with SINTEF via two Gemini-centers.

Bioenergy

One of today's main challenges is to reduce the use of electricity for heating in Norway. Bioenergy will play an important role in this respect. Our aim is to increase the use of bioenergy. The European Union is focusing considerably on the development of new, advanced technologies and system solutions for production of electricity and transport fuels using biomass.



Small scale waterpower and ocean energy

Professor Torbjørn Nielsen is in charge of the development of new, cost efficient and reliable turbines and systems. The Energy obtained from the ocean is virtually limitless, provided that the competence developed in the Norwegian oil and gas industry can be used related to wave- and tide energy.



CO₂ capture from gas power plants

Professor Olav Bolland was one of the first Norwegian researchers to investigate CO₂ capture from gas power plants. Together with other international experts, he was engaged by the United Nation's Climate Panel to prepare a special report on CO₂ capture. Through the **Gas Technology Center NTNU-SINTEF** (www.ntnu.no/gass) our Department cooperates with other research groups to find solutions of the climate gas problems by developing new processes, process integration and new chemicals.

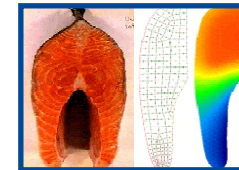
Energy consumption in buildings

Professor Sten Olaf Hanssen has established state-of-the-art interdisciplinary studies of the relationship between indoor climate and health. This was done in cooperation with St. Olav Hospital in Trondheim. The group participates in the **Gemini Centre Energy and Climatization of Buildings**, working on energy planning, district heating and cooling as well as on ventilation systems, automation and new and smart low energy solutions for buildings.



Food processing technology

Professor Trygve M. Eikevik and his colleagues have developed a brand new energy efficient technology for drying and dehydration of food, which deliver products with unique quality. The technology is industrialized, and further research is performed to develop new applications within biotechnology. Conservation of food using super cooling and super freezing are high priority research topics. The group participates in the **Gemini Centre Applied Refrigeration**, working on development of environmental friendly refrigeration and heat pump technology utilizing CO₂ as working fluid ("HFC-free"); and development of liquefied gas technology (LNG, CO₂ and hydrogen).



Sports aerodynamics

Professor Lars Sætran cooperates with Olympiatoppen in sports aerodynamics. During recent years, most of the Norwegian Olympic Medalists in ski jumping, alpine skiing and speed skating have measured air resistance in our wind tunnel in order to obtain optimal results. The research work also comprises development of new clothing for base jumping to secure optimal lift.



Industrial ecology

Professor Edgar Hertwich works with environmental assessment of energy technologies and global models for environmental systems analysis, i.e. Life Cycle Assessment (LCA). The establishment of new models for environmental studies and testing of these models in real industrial applications are some of the challenges with which this group works.

