

STRATEGY 2020–2025

DEPARTMENT OF ENERGY AND PROCESS ENGINEERING

Preface

This document outlines the strategy for the Department of Energy and Process Engineering (EPT) at the Faculty of Engineering (IV), NTNU. The strategy document represents our response to NTNU's overall strategy (<https://www.ntnu.edu/strategy-2018-2025>).

Part 1 describes our values, social mission, key challenges and main goals for 2025.

Part 2 describes EPT's core tasks. These include our education and learning environment strategy, research, and innovation activities, as well as dissemination and communication.

Part 3 deals with organizational priority areas, careers and skills, work and study environment, internationalization and excellence building, and EPT's ability to change and develop.

For each section, we identify the development goals that EPT should strive to achieve during the strategic period. The strategies and the associated development goals shall contribute to realizing EPT's overall goals.

The strategy was adopted by the management group at EPT in spring 2020.

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01

**VISION
VALUES
MISSION
KEY CHALLENGES
MAIN OBJECTIVES**



VISION AND VALUES

EPT is committed to the overall vision of NTNU, which is Knowledge for a better world. This forms the foundation of all our activity, from education, research, and innovation through to dissemination. Our core activity revolves around sustainable energy production, energy-efficient processes and deepened understanding of the environmental impact of modern society.

Furthermore, EPT is strongly committed to living up to NTNU's values and reflecting an academic environment that is creative, critical, constructive and respectful.



For EPT the values represent:

Creative

Academic freedom is the basis for our activities. We take on challenging questions and tasks, and through interdisciplinary collaboration we seek to move the frontiers of science. At EPT, scientific fields, people and research groups develop. We value and stimulate creativity among students and employees, and we contribute to diversity and ingenuity.

Critical

Our activities build on fundamental democratic values and we represent an unprejudiced and independent voice. The hallmarks of our academic culture are debate, critical reflection, fact-based knowledge, impartiality and ethical integrity. We challenge conventional ideas and solutions, both regarding society and as part of NTNU. EPT aims to be the standard-bearer of research quality and education. Addressing knowledge to meet future critical sustainability challenges is part of such a standard.

Constructive

We engage in an open and solution-oriented dialogue with society and emphasize both external and internal development through collaboration. EPT places emphasis on co-determination and active involvement by students and employees.

Respectful

Every employee and student has a responsibility to contribute to a work and study environment characterized by respect and consideration. We facilitate personal growth and professional development. We contribute to diversity and equal opportunity in society and in our own activities. We promote equality and tolerance. As part of NTNU, EPT shows respect for varying attitudes and opinions.

MISSION

EPT shares the mission that as part of a university, we educate outstanding graduates with strong analytical and practical abilities, and our research focuses on expanding knowledge in science and technology for a better world. Furthermore, EPT's mission is to contribute to Norway's role in developing a viable foundation for society at the regional, national and global level.

Through research and education, the department shall contribute to the understanding of sustainable solutions, helping to solve complex problems and global challenges to assure effective resource utilization. In line with NTNU's goal to move from mission to action, we address the UN goals for sustainability (SDGs) (<https://www.ntnu.no/baerekraftmaal>) that are relevant based on the research and educational activity at the Department. These will be identified in more detail throughout the document.



Photo: United Nations

KEY CHALLENGES

EPT's activities address long-term challenges related to both societal and industrial needs for sustainable and energy-efficient solutions. At the same time, at a national and global level societal changes are extensive and fast. Development in society requires constant renewal of engineering knowledge, combined with interdisciplinarity and based on fundamental disciplines.



Photo: Maren Agdestein/NTNU

Foto: Per Humming

EPT will experience intense competition, both in recruiting excellent staff and students and in obtaining research funding. A higher proportion of research funding will come from external sources and in collaboration with international partners. This requires both organizational and economic robustness at departmental level to ensure future income. To succeed in the competition for research and learning environment excellence, and to be an attractive partner, we must continue to improve our core activities and support functions.

EPT is known for its wide range of research. This can be both a strength, fostering interdisciplinary activity and innovative research and a challenge to common identity and visibility. The broadness of research and educational tasks requires a well-defined strategy and long-term planning horizon. Predictability within the organization will become a key issue to achieve this. A common set of priorities must form the basis of the department's core activity, independently of fundamental or applied focus.

EPT provides a wide range of courses for bachelor's and master's/siv.ing study programs. Since study programs are anchored at Faculty level, they span departmental and faculty boundaries. We must ensure that the department maintains a strong position and visibility in the study programs. We must secure study and learning environments that are recognized for their high quality and relevance for further studies and career. We must further ensure that our students succeed in the job market and prevent drop-out and delays in the completion of studies.

For historical reasons, EPT has several different locations on the Gløshaugen Campus. This situation will continue for the foreseeable future, imposing organizational challenges in terms of both identity building and visibility as one Department. Furthermore, it requires attention to efficient communication, procedural structure for research and educational activities, as well as robustness of support functions.

MAIN OBJECTIVES

EPT's vision is long-term. At the same time are national and global societal changes happening fast, with the need for a rapid and flexible response. The value of knowledge and understanding of the core principles governing our activity is crucial to increase competence, and to meet society's demands and expectations with state-of-the-art solutions.

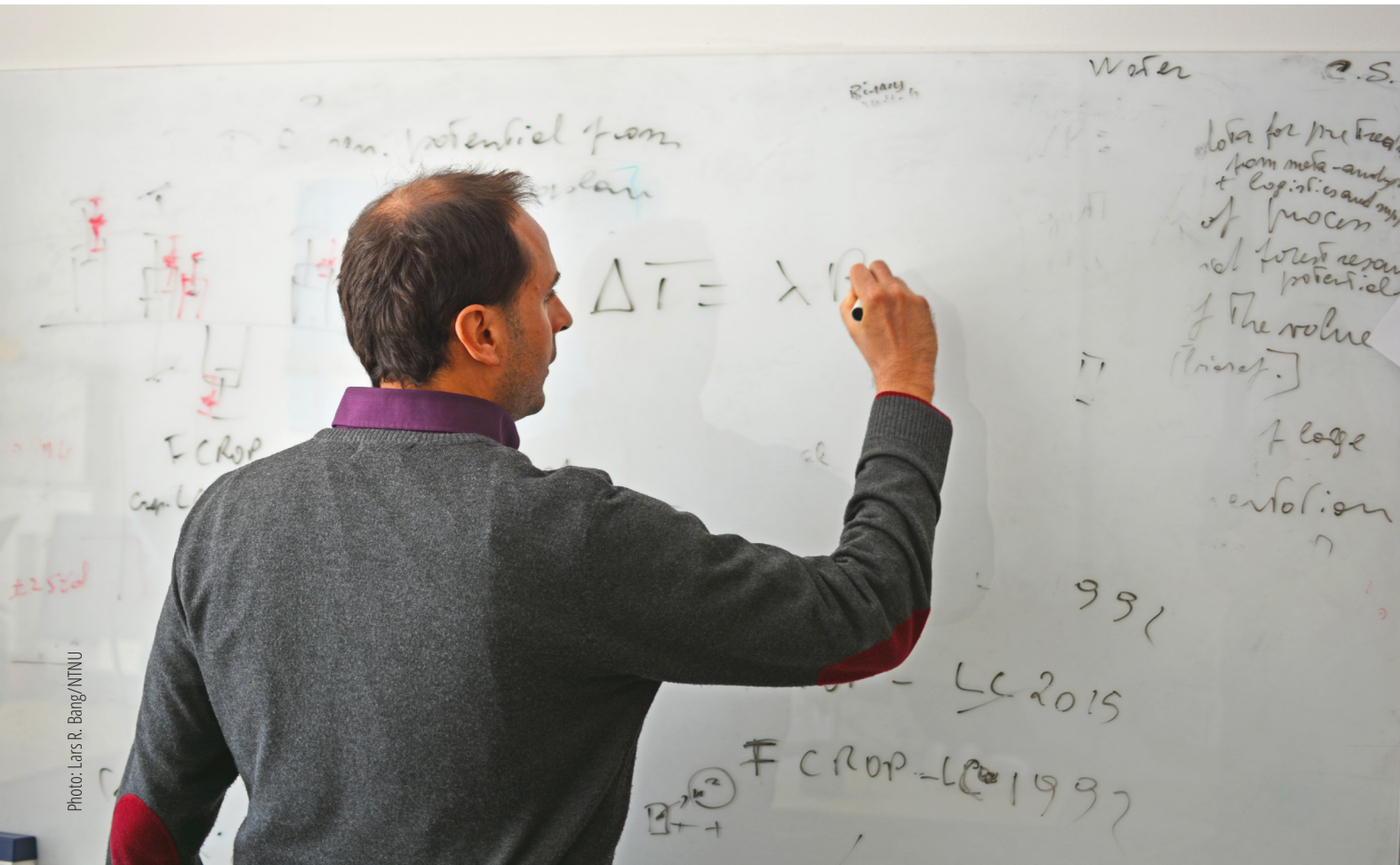


Photo: Lars R. Bang/NTNU

In 2025, EPT

- is nationally and internationally recognized as a provider of excellent research and research-based education within its core areas of energy engineering, process technology and industrial ecology.
- is a preferred partner in collaborative research with academic and industrial partners.
- hosts internationally leading research groups fostering theoretical and lab-based fundamental and applied science.
- is a provider of high-quality learning environments for candidates to private, public and academic sector, both in Norway and abroad.
- has a strong and unified, yet interdisciplinary, identity attractive to both employees and students.
- is a collaborative partner with the highest level of professionalism and integrity on all levels (scientific, education, administration and laboratory).
- a visible and active actor in societal debate.
- offers a work environment embracing diversity and gender balance.

02

EPT CORE TASKS WITHIN

EDUCATION

RESEARCH

INNOVATION

DISSEMINATION



EDUCATION AND LEARNING

EPT has the responsibility for education of candidates at bachelor's level in renewable energy and mechanical engineering, and at master's level in several of the 5-year and 2-year programs within energy and the environment, mechanical engineering, renewable energy, hydropower development, gas technology and industrial ecology. Most of EPT's educational activity is within the Faculty of Engineering's study program area energy and sustainability. Several of the 2-year programs are international study programs rooted in exchanges with foreign educational institutions within the same subject area.

Candidate education is consistent with the needs of industry, public and academic sectors, and motivates and enables the development of new energy and process solutions for Norway. Our graduates should have core competence enabling them to make good decisions to help shape the development and necessary renewal of society by implementing new knowledge and technology. Our graduates are critically minded, highly skilled in their disciplines and with excellent teamwork skills. Digitalization is an increasing part of everyday life, and we need to meet the expectations of our students in both learning outcomes and teaching methods. Here it will be essential to address the advantages, limitations and risks associated with increased use of digital solutions.

EPT strives to maintain high international standards for our teaching. By looking towards highly acknowledged international academic institutions, we aim to continue recruiting the best students from abroad to our international master's programs as well as individual projects.

THE EDUCATION STRATEGY IS BASED ON THE FOLLOWING PILLARS:

Quality in education and evaluation, aligned with both national and international standards. This includes theoretical specialization, interdisciplinary work and critical reflection.

Education based on a solid **research foundation** in academic disciplines and educational competence, ensuring relevance in our educational programs.

Education and training providing candidates with **knowledge, skills and perspectives needed to contribute to UNs Sustainable Development Goals**.

High level of **practically based learning** on all levels of our study programs. This includes both laboratory and digital skills.

High standards for the learning environment with emphasis on teaching quality, with stimulating and varied approaches to learning and self-assessment, facilitating lifelong learning.

Teaching staff at EPT are engaging and highly competent.

DEVELOPMENT GOALS:

Improve student recruitment procedures targeting early-stage students.

Contribute with positive role models to increase gender equality among students

Improve EPT's visibility and identity in study programs.

Increase the level of digitalization in teaching and evaluation.

Increase awareness of skills training in teaching, including digital and technical skills.

Increase implementation of new teaching methods through systematic training of teaching staff.

Improve dialog with study program leadership and administration to ensure predictability and long-term planning.

RESEARCH

EPT has strong research groups aligned with the research strategy of both NTNU and the IV Faculty. Close interaction between basic and applied research is our strength and resonates well with NTNU's strategy. Basic research is the foundation for development for all areas, and EPT aims to advance scientific frontiers. We also have a strong profile in applied research, and a broad-based platform for collaboration with the private and public sectors where we see our role as identifying the areas of research through solid scientific foundation. Our research infrastructure is one of our competitive advantages. External funding will continue to provide a substantial foundation for building capacity and developing quality in our research projects. EPT seeks to continue to publish our research results and research data through renowned channels and increasingly together with international partners, complying with the requirements of open access and data management.

EPT's research activity further aligns with the research areas and societal goals identified by the IV faculty (<https://www.ntnu.no/iv/forskningsstrategi>): sustainable and reliable energy, the green shift in the built environment, sustainable exploitation of mineral resources, and world-leading in the oceans and the High North.

EPT is very well positioned to obtain an increased level of funding from EU's Horizon Europe program, especially pillar 1 (excellence) and 2 (global challenges and industrial competitiveness) and should strategically identify the relevant missions where our research is internationally competitive. It will thus be important to focus resources to ensure sufficient support and coordination in application processes, project management as well as securing intellectual property rights (IPR) and the impact of our research.

The department is structured into research groups (divisions), each with their own research profile. These are identified with their own research strategy, outlining the strategic priorities and ambitions related to scientific goals, infrastructure, productivity and human resources.

THE OVERALL DEPARTMENT'S RESEARCH STRATEGY IS BASED ON THE FOLLOWING PILLARS:

Internationally recognized and outstanding research within both fundamental and applied sciences related to our core research areas.

Contribute to the UN Sustainable Development Goals (SDGs) within the core areas of our research.

Collaborative research with strong national and international partners, including academic and research institutions through joint projects and PhD exchange.

External funding of approximately NOK 125 million per year, of which 25% comes from EU funding.

Leading our own research activities in strategically prioritized areas.

Research in line with NTNU's ethical guidelines and the SDGs.

DEVELOPMENT GOALS:

Further implement procedural structures to coordinate and enable strategic focus

Develop procedural structures for professional project management and support

Increase the level of EU funding through active positioning and well-coordinated initiatives

Increase international mobility of PhD students according to NTNU's strategic goals

Improve international visibility by more targeted publishing in high impact journals and periodicals

Increase impact of our core research areas by more actively taking roles in national and international boards, steering committees and evaluation panels

Increase public awareness for our research by actively contributing to public debate with factual knowledge



PROCESS AND POWER

The Process and Power group is related to process engineering, energy efficiency in industrial processes, with a strong profile in applied engineering. The thematic areas and their relation to the UN SDGs are:

- **Thermal energy** production and conversion (SDG 7, 13)
- **Renewable energy**, with emphasis on hydropower technologies, solar and bio (SDG 7)
- **Energy efficiency** and heat recovery (SDG 12)
- **Sustainable heating and cooling** technologies (SDG 2, 12)
- **Multiphase transport** (SDG 12)

The basic research activities within the group are strongly motivated by industrial innovation needs. The Process and Power group is recognized by its strong coupling to relevant industries both nationally and internationally, and work on a high technology readiness level (TRL) level.

STRATEGIC PRIORITIES

Strategic priorities for the group are within the following areas:

- Thermal energy production and conversion including CCS/CCU, biogas, hydrogen, gas turbines and gas technology
- Renewable energy including hydropower, bioenergy systems, solar, ambient heat – heat pumping
- Energy efficiency and heat recovery i.e. process integration and heat transfer
- Sustainable heating and cooling technologies for food security and processing and heat pumping technologies with natural working fluids

EXPERIMENTAL AND/OR NUMERICAL FACILITIES

Over time, the group has established several large-scale experimental facilities through close industry collaborations and securing funds from national infrastructure projects. The group's ambition is to maintain and upgrade these to ensure competitiveness and industrial relevance. The most important infrastructure is listed below:

- HighEff Lab for improved utilization of available energy and increased efficiency
- Wet gas compressor and a multiphase pump test facility for offshore applications
- Hydrogen and biogas technology laboratory for renewable fuel production
- Waterpower laboratory for development of global hydropower, including efficient design of hydro turbines

Computational tools such as computational fluid dynamics (CFD), fluid-structure interaction (FSI) large-scale optimization, and machine learning tools will be important to further develop to increase productivity and reliability of future technology.

INTERNATIONALIZATION

The group has a strong reputation and leading positions in several areas of research and development. We aim to continue building on the existing pillars within our core activity. The international activity will be focused on the EU and Asia (Japan, China, India, Nepal), and low-and middle-income countries (LMICs). This includes

- Maintaining an already international leading position within hydropower and hydropower technologies.
- Maintaining the leading position within refrigeration technology phasing in natural working fluids (natural working fluids, system development for ammonia (NH₃), carbon dioxide (CO₂) and hydrocarbons (HC)).
- The wet gas compression laboratory is in a leading position worldwide and has close cooperation with industry, including engineering, operation and manufacturing companies. In the future, ammonia/hydrogen will be of high importance.
- Work and Heat Integration: our ambition is to maintain and improve our position as one of the leading groups in the world. Collaboration with Massachusetts Institute of Technology (MIT) to develop a new paradigm for process modeling and optimization based on new results in non-smooth analysis.
- The attractive indoor infrastructure for multiphase flow has had a strong international position in education, research and software development with a focus on flow phenomena and structure dynamics. This will be strengthened towards Brazil and China.

PRODUCTIVITY GOALS

The activity within the group has the following ambitions:

- Manage, operate and maintain large scale research centers such as FME, SFI etc.
- Manage, operate and maintain the joint program within the European Energy Research Alliance, EERA.
- Establish at least 5 NFR and/or EU research applications every year as a coordinator.
- Establish at least 10 NFR and/or EU research applications every year as a research partner.
- Each professor, PhD student, postdoc and researcher should publish a minimum of two papers per year in a recognized journal (minimum 2.5 publication points per year).

Develop more than three innovations per year through patents, spinoffs and new industrial applications.

HUMAN RESOURCES

The group's goal for gender balance is 50/50 in the future. There is an ambition that each professor has a minimum of three PhDs, 1 postdoc/1 researcher, 3 MSc/project or BSc (group) students at any given time.

The large infrastructures need permanent dedicated staff to support the experimental activity, hence continuity of trained personnel is a high priority.



Photo: Geir Mogen/NTNU



SUSTAINABLE ENERGY SYSTEMS

The Sustainable Energy Systems group initiates and leads projects on energy systems in an integrated energy perspective. The thematic areas and their relation to the UN SDGs are:

- **Efficient low-emission buildings and neighborhoods** including heating and energy systems, as well as energy use and planning (SDG 11)
- **Energy-efficient solutions for the indoor environment** including future ventilation systems for both residential and industrial applications (SDG 11)
- **Sustainable energy storage technologies** and solutions for buildings and transport including battery and fuel cell systems (SDG 7)
- **Large and diverse energy systems** analysis including big data (SDG 7, SDG 11)
- **Conversion and integration** between different forms of energy and their systems (SDG 11)

STRATEGIC PRIORITIES

Strategic priorities for the group are:

- Maintain the energy and indoor-environment laboratory to continue to serve as a base for both teaching and research on energy efficiency, energy supply, thermal comfort, and indoor environmental quality.
- Expand experimental infrastructure for cutting-edge research on energy storage systems. Hydrogen, biofuel production, and battery production and systems testing are core activities.
- Establish new competence and strengthen existing competence within machine learning of energy production and consumption of buildings and neighborhoods. Internet of Things in combination with Industry 4.0. for the energy sector is key.
- Virtual energy grids and digital twins are central and growing fields to apply and expand competence within. This is within the fields of zero emission buildings and neighborhoods, as well as materials processing systems for and using energy storage technologies.

Conversion and integration between different energy forms.

EXPERIMENTAL AND/OR NUMERICAL FACILITIES

We shall invest in and improve laboratory facilities that are fit for PhD and postdoc/researcher studies on a low technology readiness level (TRL) (up to 7). This will make us attractive for research funds from NFR (all types) and H2020 (all types), and as a partner for large centers like SFF, SFI and FME.

We shall support numerical studies and establish and expand competence development within the fields of energy systems and data analysis, particularly with a linkage to experimental and practical applications.

Priority is put on

- Projects for PhD and postdoc/researcher with external funding for laboratory equipment.
- Equipment that is needed by several PhD and PDRF, so that it remains operational.
- Equipment that with low maintenance needs from technicians.
- Equipment where master students can be educated while supporting PhD and postdoc/researcher.
- Infrastructure that motivates international researchers of excellence to visit us.
- Big data analysis on energy systems

INTERNATIONALIZATION

The group has increasing international activity in many of its core areas and a growing reputation with leading positions. Important activities:

- Strengthen existing networks, and prioritize the existing basis
- Exchange of personnel, both outward and inward
- Active role in international annexes and boards. EERA, ISHE, International Energy Agency (IEA), standardization committees, etc.
- Co-authored papers with international partners
- Increase coordination and initiation of new EU projects
- Participate on advisory boards and evaluation panels
- Hosting international conferences/workshops
- Peer review; journals and research councils

PRODUCTIVITY GOALS

We strive for:

- Journal papers/transactions of high quality
- Proposals – EU, Research Council of Norway, industry, European Economic Area (EEA)
- Ensure high completion rates for PhD student dissertations
- Inclusive work environment
- Include bachelor/master projects in ongoing research projects
- Patents and innovations and securing IPR

HUMAN RESOURCES

We target balance between backgrounds, gender and age:

- We should have competence in sustainable energy systems, particularly related to neighborhoods and transport.
- Complementary competence between 2-3 colleagues combined with niche competence of individuals for a strong group dynamic and high level of excellence.
- Target 1 new PhD student or postdoc per faculty member annually. Co-supervision from group faculty members (when relevant) promotes competence growth.
- Master's students should do their master's project in relation to a PhD or PDRF position.
- Bachelor's students are supervised by faculty members, postdocs and PhD students when possible.





THERMO-FLUID MECHANICS

Our research group focuses on both fundamental and applied research in the general areas of thermal energy and fluid mechanics. We develop and use cutting-edge theoretical, experimental and numerical methods to help address major societal challenges in energy, sustainability, transport, health and the environment. Our research focus is in the following general areas:

- Multiphase and free-surface flows: Research activities include boiling and condensation, microfluidics, biomedical flows, surface waves and currents, gas-liquid interfaces, reacting and non-reacting particle-laden flows (SDG 3, SDG 6, SDG 7, SDG 13)
- Sustainable combustion and thermal conversion: Research activities focus on reacting flows and thermal conversion concentrating on future fuels such as bio-derived fuels and hydrogen, combustion dynamics, low-emission gas turbine technologies and fire safety (SDG 7, SDG 13)
- Turbulence and aerodynamics: Research activities include turbulent mixing, wall-bounded flows, wind turbine aerodynamics, turbulence-particle interactions and fluid-structure interaction. (SDG 7, SDG 13)

Our teaching principles are grounded on fundamentals, rigor and problem solving with the aim of inspiring and training the next generation of engineers to successfully address the challenges society faces in energy and the environment.

We provide a vital benefit to society through teaching and research.

STRATEGIC PRIORITIES

Strategic priorities for the group are:

- Continue to build upon our strong international reputation for excellence in fundamental and applied research within the core areas of the group.
- Maintain a good balance between fundamental and applied research.
- Actively seek new opportunities to work with relevant industries and academic groups to carry out cutting-edge research that can lead to increased innovations.
- Continue to foster international collaborations with leading researchers and research groups.

EXPERIMENTAL AND/OR NUMERICAL FACILITIES

- Curate state-of-the-art infrastructures, numerical and experimental, to maintain international competitiveness.
- Replace/update infrastructure to serve the group as a whole, maintain competitiveness, and secure long-term research funding.
- Ensure access to supercomputing.
- Improve lab-based teaching facilities and ensure they are fully integrated into courses.

INTERNATIONALIZATION

We will strive to continue to do the following:

- Maintain and extend international collaborations through research excellence.
- Disseminate research results and data at leading international arenas and to relevant industrial stakeholders.
- Increase membership on world-renowned/internationally leading journal editorial boards, panels, conference committees in thermo-fluids.
- Invite world-leading researchers for sabbaticals, research visits, and seminars.

PRODUCTIVITY GOALS

- Increase the impact of journal publications.
- Maintain high proposal submission rates to EU, NFR and other funding mechanisms.
- Improve research-based teaching in our core areas.
- Contribute to prioritization of technician resources to promote timely delivery of project goals.
- Design MSc projects and production of theses around existing, funded, research activities to lead to publications or conference presentations.

HUMAN RESOURCES

- Cultivate an international group.
- Foster more Norwegian applicants to PhD positions via undergraduate teaching and MSc project interactions.
- Apply for funding for postdocs for 3-4 years.
- Ensure a good balance between experienced researchers (e.g. postdocs) and PhD students to maintain continuity of skills and expertise.
- Expand the group's activity within advanced computing to enhance expertise in this area.



Photo: Øyvind Bujle/NTNU



INDUSTRIAL ECOLOGY

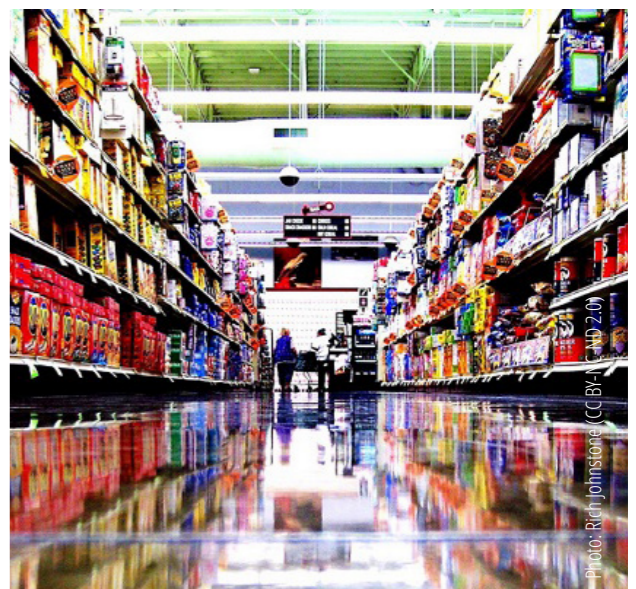
The overarching objective of our research is to establish a next-generation industrial ecology framework for supporting the global community in realizing sustainable development goals. Our research areas are framed around the UN's SDGs and include:

- **Ecosystems and Bioresources:** address the preservation of ecosystem services, biodiversity, and climate regulation, under rising societal demands for bioenergy, food, and biomaterials (SDG 7, 9, 12, 13 and 15)
- **Energy, Transport and Buildings:** address the nexus of energy, land and maritime transport, pollution, and climate associated with transformation pathways and human settlement (SDG 7, 9, 11, 12 and 13)
- **Circular Economy and Resources:** address resources, materials, recycling and environment under different scenarios for material demand for products and capital infrastructure (SDG 7, 9, 12 and 13)
- **Sustainable Production and Consumption:** address production, consumption, trade and economic growth in terms of environmental sustainability (SDG 8, 9, 12 and 13).

We also host the NTNU Sustainability office, which represents one of four strategic research areas («TSOs») at the university.

We work together with industry, institutions, and organizations. Our researchers contribute to major international reports and working groups and publish in highly ranked journals. Our expertise is used to consult industry and policy makers on how the environmental impacts of modern lifestyle can become more viable.

NOTE: INDECOL's current research strategy will be implemented into the format presented here early Spring 2020.



INNOVATION

The three pillars of our innovation strategy are:

- Collaborating with established business
- Collaborating with the public sector
- Supporting new businesses

EPT is an important contributor to research-based sustainable value creation, innovation and increased competitiveness. Focusing on creating value for businesses and the public sector, we collaborate with our partners to help solve problems and seize opportunities by combining theory and practice. This makes us an attractive partner.

Based on ideas from our employees and students we stimulate and realize commercial activities. This is especially so for activity within the Process and Power group. We put knowledge into practical use through a well-functioning ecosystem for innovation. In cooperation with partners, we succeed in creating societal impact by supporting the activity within new businesses.

Our students take on issues relevant to business and the public sector. In this way, our graduates become attractive employees, contributing to innovation and development.

DEVELOPMENT GOALS

- Stronger awareness of innovation in our educational programs to train future innovators
- Increased awareness of opportunities of support to explore innovation from research and to increase the number of patents, Disclosures of Invention (DOIs), and licenses.



Photo: Lars R. Bang/NTNU

■ DISSEMINATION

EPT follows NTNU's dissemination strategy. The three pillars of our dissemination and outreach strategy are:

- Dissemination of results from research to the research community and to students through publications in high-impact journals
- Communication and outreach to share knowledge with the public through digital and public arenas
- User-oriented communication of research aimed at specific groups who can apply the knowledge and technology in their work practice

We ensure that knowledge developed at NTNU becomes visible and accessible to individuals and society. Our communication and outreach spark interest and understanding of our science among children and young people. We contribute to an evidence-based public debate.

We adapt our communication to the different user groups and contribute actively to the design of knowledge-based work practice, policymaking and public administration.

Our communication is open, true, engaging and involved. We use innovative methods, arenas and media.

Our work with dissemination, communication and outreach strengthens our reputation and helps us to recruit talented employees and students nationally and internationally. It makes us an attractive collaborative partner for business, the public sector and research organizations in Norway and abroad.

DEVELOPMENT GOALS

- Improve strategic focus and awareness of scientific profile.
- Increase awareness among both new and current students of our topical areas through active participation in recruitment events.
- Increase involvement in knowledge-based policymaking in our core areas of energy and sustainability.
- Increase our activity in public debate related to our expert areas.



03

ORGANIZATIONAL PRIORITY AREAS



ORGANIZATIONAL **PRIORITY AREAS**

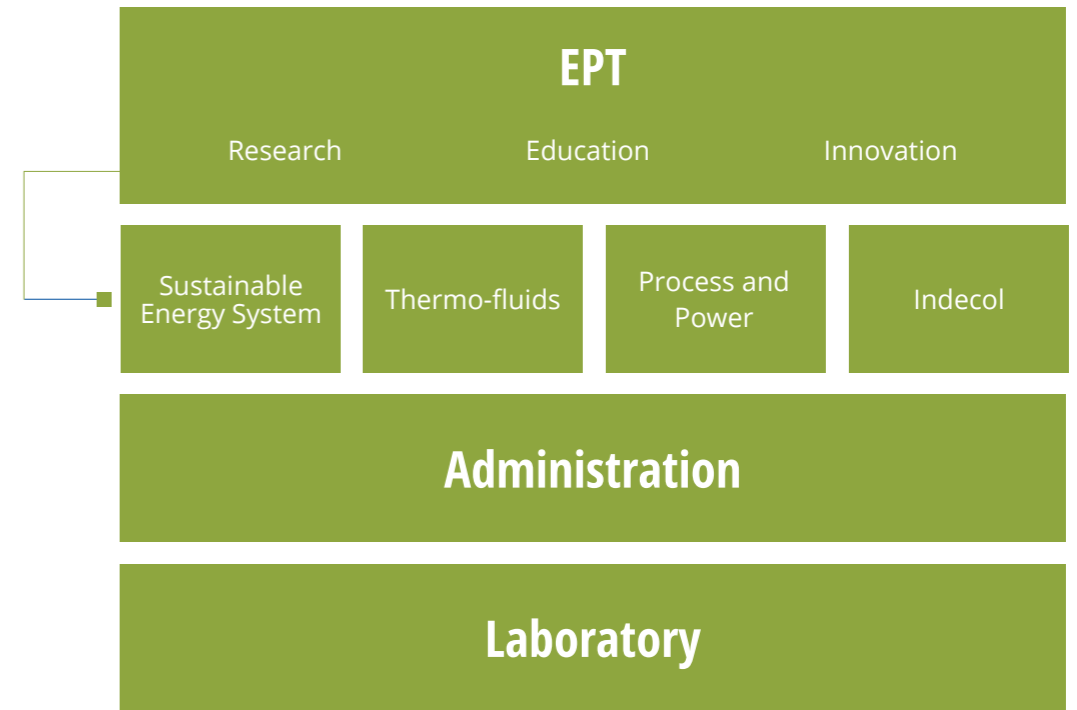
EPT is one of the larger departments at NTNU, with a high level of activity within all core tasks. EPT strives to be an attractive and professional employer, which offers favorable working conditions and a basis for all employees to develop throughout their careers. EPT has motivated, competent and ambitious employees who build upon a collaborative and supportive culture.

Leadership is based on professional development of good practice, on opportunities for involvement, and on transparency. EPT’s strategy is to further develop the organizational structure to address key challenges related to size and locations, as well as our robustness and flexibility in managing change within the complex nature of the university. This includes a high level of coordination within administrative support functions, as well as good prioritization of technical resources to promote timely delivery of project goals.

The organizational structure comprises four research groups (divisions) headed by a group leader whose mandate is anchored in that of the IV Faculty. Within each research group, the activity evolves around the professors’ group, whose responsibility is to manage their research including management of the project portfolio and its associated research staff.

Within administrative support functions, EPT strives to strengthen the teams around both research and educational activity. EPT will strive to improve administrative processes constantly to enable efficiency and robustness, and actively seek to increase the level of competence in the supporting teams. EPT believes it is of utmost importance to ensure a high level of management of the increasing research portfolio through good practice in the proposal phase, in the initiation phase and in the running phase.

EPT is recognized for its large and well-functioning laboratory facilities. The research groups depend on maintaining and developing their experimental infrastructures to sustain competitiveness and secure long-term research funding. EPT’s laboratory facilities are also key elements in education and serve many large student groups in laboratory exercises, project assignments, and bachelor’s and master’s projects. It is EPT’s ambition to increase our visibility among students following our study programs and to promote the opportunity for relevant and practical assignments in high-standard laboratories. It is EPT’s ambition to strengthen organizational procedures to ensure good prioritization of tasks, based on the importance to our core activity and level of funding.



CAREER AND SKILLS

Academic staff have several career paths of equal value. We aim for recruitment that meets high international standards, based on open processes. We have capable academic leaders who generate enthusiasm and pave the way for PhDs, postdocs and researchers to develop and use their abilities under the supervision and coordination of the professors, thus making them attractive for permanent positions on the international job market in industry and academia.

In this era of technology and globalization, we will focus on increasing gender equality and diversity in the workplace. This requires active measures in recruitment processes, development tracks and mentoring to enable the flexibility necessary to increase gender balance both among employees and students. We will furthermore have no tolerance for disrespectful behavior and promote an inclusive work environment.

Administrative staff are highly trained for the tasks assigned to them, with a high level of professionalism. Administrative support is based on the development of efficient procedures, good productivity and collaboration with employees in the Department as well as related institutions at Faculty and central level. The administration aims to build supportive teams around our core tasks, where each member of the team has a high level of motivation to develop and use their abilities. EPT constantly seeks to increase its knowledge base through recruitment and offering host opportunities for members of NTNU's administrative and organizational network. We believe that facilitating short-term mobility and training of personnel within our organization including the Brussels office will increase understanding of the university's complexity and our ability to meet the future challenges of change within the organization as well as from external pressures.

Technical staff for experimental and numerical activity are highly trained for the tasks assigned to them, with a high level of professionalism. This involves uncompromising attention to health and safety in the laboratories, as well as the development of efficient procedures, good productivity and collaboration within the Department as well as with partners outside the organization. It is EPT's ambition to have a broad base of technical competence to meet the demands for developing state-of-the-art infrastructure, aimed at enabling a high degree of in-house built solutions. This implies securing competence within traditional technical skills, as well as strengthening future competence to meet needs such as additive manufacturing and advanced automation systems.



Photo: Geir Mogen/NTNU

WORK ENVIRONMENT

Everyone at EPT takes independent responsibility for contributing to an inviting, health-promoting environment for work and study, and to a workday in which staff and students experience challenges, development, and joy in their work. Management takes a particular responsibility for the work environment and works systematically with health, safety and the environment. NTNU's values are strongly embedded in work environment development. EPT has a special focus on activities that promote health, identity and gender balance.

EPT'S CAPACITY FOR DEVELOPMENT

EPT's capacity for development is based on the robustness of the support functions (both administrative and technical). EPT strives to ensure maneuverability and strategic investments in resources (staff and infrastructure). EPT contributes actively to the development of NTNU as a whole, sharing expertise and experiences to ensure best practice in organizational matters.

DEVELOPMENT GOALS

- Improve communication and information flow within the organization.
- Improve awareness of organizational structure among our temporary staff and awareness of channels for influencing decisions.
- Improve awareness of the Department's health and safety routines, also outside laboratory-related activity.
- Improve gender equality and diversity at all levels in the organization.
- Increase transparency on prioritization of resources related to teaching, research and external contracts.

IMPLEMENTATION

EPT is committed to ensuring that the strategy is realized through active implementation within the entire organization. To accomplish our strategic objectives and goals, the strategy will be linked to budgeting, strategic personnel plan, employee incentives and yearly action plans. This implies a continuous focus on performance management and monitoring of key performance indicators for each core area.

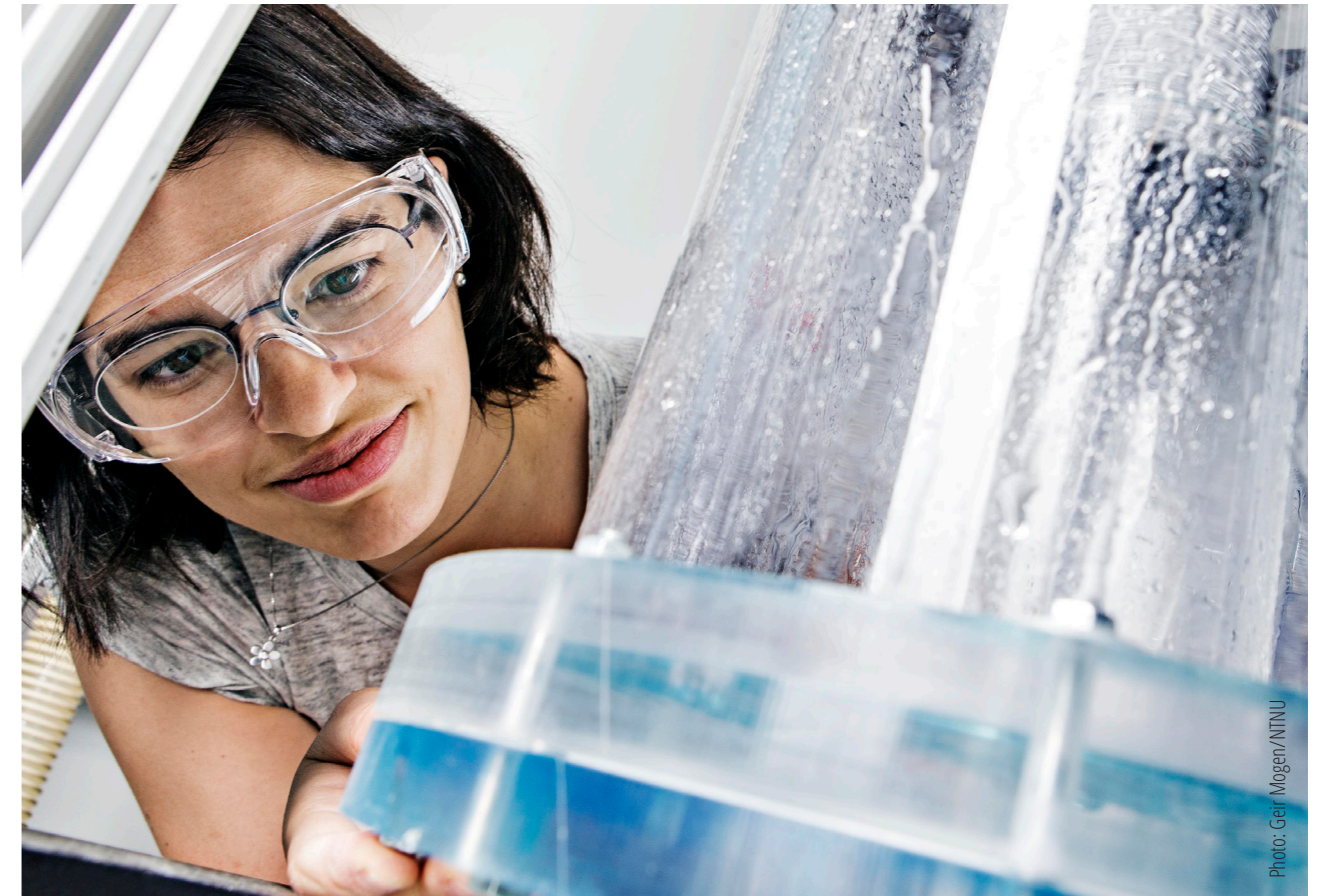


Photo: Geri Moger/NTNU

