The Research Council of Norway

Evaluation of Mathematics, ICT and Technology 2023-2024

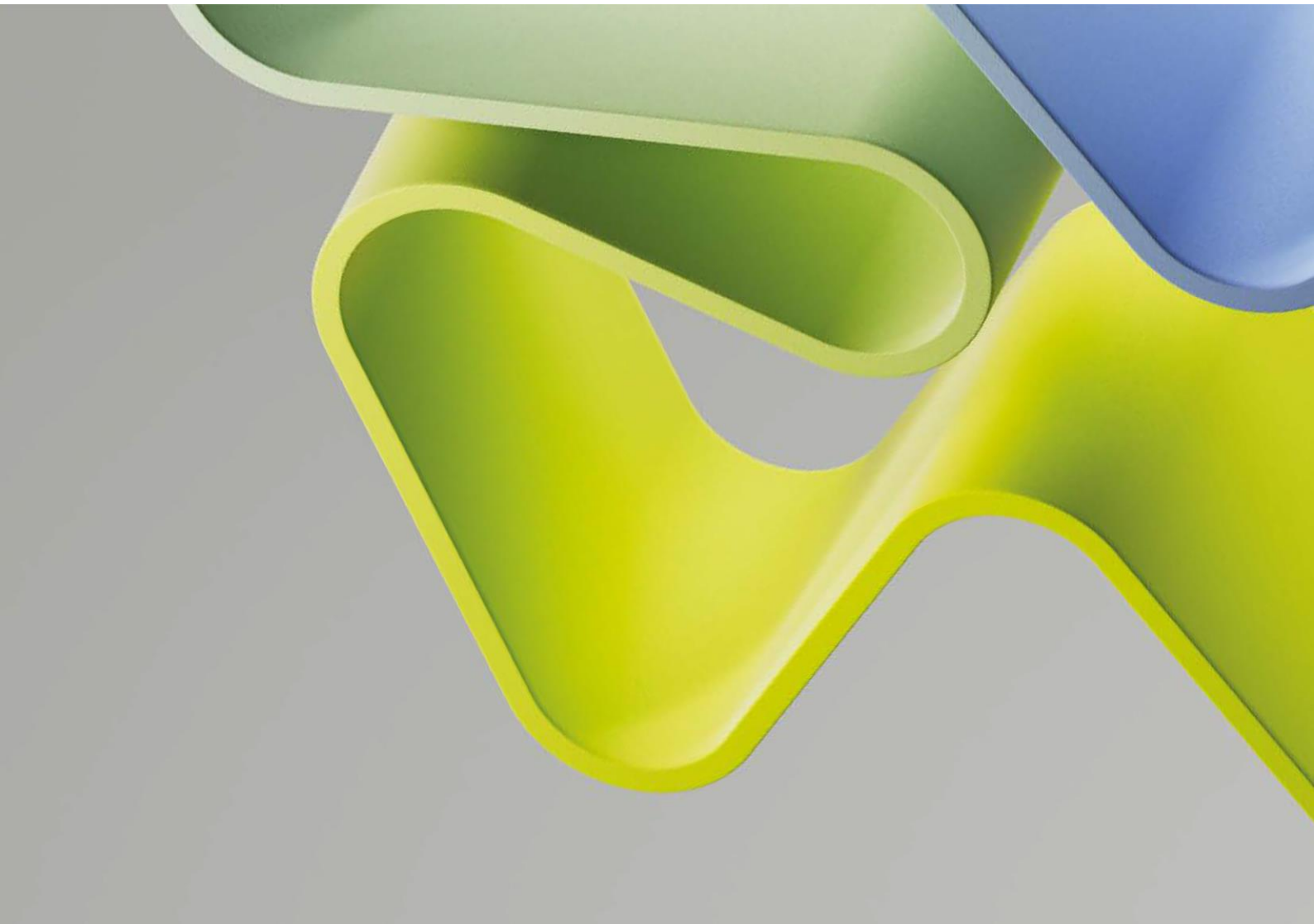
Evaluation Report for Administrative Unit

Administrative Unit: **Department of Building, Energy and Material Technology**

Institution: **The Arctic University of Norway (UiT)**

Evaluation Committee Higher Education Institutions 4

December 2024



Contents

Statement from Evaluation Committee Higher Education Institutions 4

The members of this Evaluation Committee have evaluated the following administrative units at the higher education institutions/research institutes within Mathematics, ICT and Technology 2023-2024 and has submitted a report for each administrative unit:

- Department of Building, Energy and Material Technology, UiT the Arctic University of Norway
- Department of Architecture and Technology (IAT), Norwegian University of Science and Technology (NTNU)
- Department of Civil and Environmental Engineering (DCEE), Norwegian University of Science and Technology (NTNU)
- Department of Geoscience (IGV), Norwegian University of Science and Technology (NTNU)
- Department of Structural Engineering (KT), Norwegian University of Science and Technology (NTNU)
- Department of Manufacturing and Civil Engineering (IVB), Norwegian University of Science and Technology (NTNU)
- Department of Energy and Process Engineering (EPT), Norwegian University of Science and Technology (NTNU)
- Department of Built Environment (BE), Oslo Metropolitan University (OsloMet)
- Department of Energy and Petroleum Engineering (IEP), University of Stavanger (UiS)
- Department of Mechanical and Structural Engineering and Material Science (IMBM), University of Stavanger (UiS)
- Department of Process, Energy and Environmental Technology (PEM), University of South-Eastern Norway (USN)

The conclusions and recommendations in this report are based on information from the administrative units (self-assessment), digital meetings with representatives from the administrative units, bibliometric analysis and personnel statistics from the Nordic Institute for Studies of Innovation, Research, and Education (NIFU) and Statistics Norway (SSB), and selected data from the National survey for academic staff in Norwegian higher education and the National student survey (NOKUT). The digital interviews took place in the autumn 2024.

The members of the Evaluation Committee are in collective agreement with the assessments, conclusions and recommendations presented in this report. None of the committee members has declared any conflict of interest.

The Evaluation Committee has consisted of the following members:

Professor Claudio Mazzotti, University of Bologna (Chair)

Professor David Baglee, University of Sunderland

Professor Elsa de Sá Caetano, University of Porto

Professor Sebastian Geiger, TU Delft

Professor Per Heiselberg, Aalborg Universitet

Professor Mohamed Pourkashanian, University of Sheffield

Description of the Administrative Unit

The Department of Building, Energy and Material Technology of the Arctic University of Norway (UiT) is staffed with three full-time, permanent professors, including one woman. There are 11 associate professors in total, with three in temporary positions and the rest in permanent roles. Among these, two are women, and two do not hold PhDs, one of whom is temporarily employed. Additionally, the unit includes six assistant professors, one lecturer, two researchers/postdocs, and eight PhD students.

Research and development activities are carried out by research groups within each department, led by a professor. These professors oversee relevant research funding opportunities, initiate applications and projects, knowledge exchange, researcher training, and outreach activities. The department is supported by a research support team led by the vice dean of R&D and has access to a central R&D office at the university. The research is organised in the following research groups:

- Building, Energy and Material Technology
- Applied Thermo-Dynamics
- Building Materials (DeTeA)

The unit follows the faculty's research strategy, which aligns with the university's 2030 vision, focusing on three main areas. Firstly, as the northernmost university, it aims to lead in Arctic and High North research, emphasising climate adaptation, energy use, and infrastructure in these regions. The department prioritises hiring staff with Arctic experience to ensure familiarity with local challenges. Secondly, it addresses major societal challenges such as climate change, food security, demography, and health, striving to develop innovative, democratic, and sustainable solutions. Lastly, the strategy emphasises talent development and diversity, recognising students and staff as key resources. The department aims to be a hub for nurturing competence and talent, encouraging professional and pedagogical growth. All teaching staff must complete basic pedagogical training, and researchers must undergo supervisor training before mentoring PhD candidates.

National and international partnerships are crucial for the department's research and education efforts. The type of partners varies from universities, public sector, private industry, or other research institutions. Every research project involves one or more partners, often including universities, public sector entities, private industry, or other research institutions. These collaborations are essential for achieving high-quality research results and gaining new insights. Staff exchanges, though less common, also occur, with visiting researchers staying for short periods ranging from one week to three months. Successful past collaborations often lead to invitations for future projects, fostering closer relationships and enhancing the department's reputation. This strong network of partnerships benefits the department in establishing new connections within the existing network.

Overall Assessment

The Department of Building, Energy and Material Technology (DBEMT) is organised into 3 research groups and one research center. The research center serves as a contact point for industry. Only one of the three research groups is part of the evaluation as the RCN definition of research groups differs from the way UiT defines them (especially in terms of staff dimensions), thus not all groups qualify for evaluation.

The research strategy of the AU complies with UiT's strategy towards 2030 and has the potential to contribute to the development of a unique research environment, addressing the specific societal challenges of the Arctic and High North and promoting the development of key competences and high research quality and productivity for the benefit of the local area [ToR e, 3].

The research topics at the department are quite diversified, probably a consequence of the considerable distance from other academic and industrial centres in Norway, which creates constraints on both recruitment of staff, research infrastructure and funding as well as a wish to satisfy the competence needs of local industry. This makes it difficult to reach a critical mass on specific research topics, to establish and maintain state-of-the-art research infrastructures and the research outcomes becomes very dependent on single persons. It is important for the unit to focus on key research topics and to establish strategic collaboration agreements with other research groups, nationally [ToR a, b].

Research funding has been increasing in the last five year including the funding from EU. Although research collaboration with a number of local industries and stakeholders is reported in various projects, direct funding from industry for commissioned research has contributed minimally to the total funding over the last five years [ToR 3]. The report does not include information about support from the department regarding development of research proposals, review and quality assurance when applying for external funding [ToR a].

In the engineering field, access to research infrastructure is key to achieve and maintain a high scientific research quality. The research groups do not have the critical mass to be able to sustain extensive research infrastructures, but they do have access to standard laboratory-sized equipment. Research collaboration with national research centres with access to extensive research infrastructure does not seem to be a common practice.

The department considers collaboration with national and international partners as important and necessary to be able to provide high end research results and to get new impulses and knowledge. However, these national and international collaborations are not reflected adequately in research publications in terms of both quantity and quality. The publication volume is considerably lower than seen in other similar administrative units. This is also the case for the level of co-authorship with external partners [ToR b].

The Department has an ambition to be a centre for developing competence and talent of students and staff with equality and diversity as a driving force and resource. It has set up practices to support researcher careers and help early-career researchers to make their way into the profession. The self-evaluation mentions these without going into detail. However, considering that the number of staff has doubled between 2017 and 2021 and that the average age of staff categories are still above national averages, it seems only few early-career researchers have been able to make their way at the department [ToR a, c].

In relation to gender balance the total share of female researchers is much higher than in the administrative units in average in the evaluation, primarily due to a high share of female

PhD/postdocs. The share of female researchers among permanent staff is similar to administrative unit averages [ToR c, 2].

The self-assessment provides no examples on sector specific impacts, innovation or commercial activities in the local area. Given the geographical location there seems to be an untapped potential in strategic collaboration between the department and the local industry for the benefit of both. The department has a high social relevance in relation to ensuring the needed engineering expertise in the north region. Surveys show that most students come from the north region and stay in the region after completing their education [ToR d, 3]

The Terms of Reference for the administrative unit is attached to the report.

Recommendations

The evaluation committee recommends that:

1. The research is focused on a few topics which are highly relevant to society and the regional development and with strong links to the specific challenges of the local geographical area. There are opportunities as part of major international research initiatives to become a development and test site for new technologies, which have world-wide interest but also specific challenges and opportunities in the high north. This might also attract visiting researchers from other parts of the world.
2. A strategic approach to collaboration and team-up with key national and/or international research groups is established by identifying, selecting and nurturing collaborations with relevant leading national or international teams and industry. This includes that the department encourage co-publishing of research results to increase visibility and quality. This will help in profiling the group and decrease the barriers posed by the northern location. A narrower research focus and increased collaboration will also lead to research groups less vulnerable and dependent on single persons.
3. A strategic approach to research organisation, research collaboration and funding is established to obtain a less diverse portfolio of research activities and to strengthen internal collaboration and research education as well as exploiting synergies between research groups and themes. This would also allow for development of shared objectives for funding, researcher training, development of publications and dissemination, thereby promoting the department's financial stability, further academic development and cohesive scientific outputs.
4. A clear strategy for career planning and career development of young researchers is developed. Offering PhD students and postdocs an excellent environment for development can provide a competitive advantage in attracting high quality students. It is also recommended that a procedure for assistance to/mentoring of less experienced researchers is established in the application phase to improve the quality and funding probability.
5. The case-based collaboration and strong student involvement is supplemented by a strategic approach to develop collaboration with the local industry exploiting the funding opportunities available for SMEs.
6. It is considered to establish formal collaboration with and access to unique national research infrastructures or laboratory facilities, for relevant research groups as this will help in increasing research quality, profiling the research groups worldwide and decrease the barriers posed by the northern location and lack of critical mass to sustain extensive laboratory facilities.

1. Strategy, Resources, and Organisation of Research

The Department of Building, Energy and Material Technology (DBEMT) is organised in 3 research groups and one research center. The research center serves as contact point for industry. Only one of the three research groups is part of the evaluation as the RCN definition of research groups differs (especially in terms of staff dimension) from the way UiT defines them, thus not all groups qualify for evaluation.

The research strategy at the Department complies with UiT's strategy towards 2030, and is centred around three areas:

- The Arctic and High North. Research should focus on topics that relates to the local geographical area and with relevance to society and regional development. It includes topics like climate adaption, energy use, infrastructure in the arctic. The ambition of the Department is to be at the international forefront when it comes to knowledge and competence about and for the Artic and High North.
- The major societal challenges. Research should focus on challenges related to the Artic and High North and with relevance to UN's sustainable goals. It should cover major societal challenges related to climate and environment, food security, demography, and health. The ambition is to contribute to developing innovative, democratic, and sustainable solutions for major societal challenges.
- Talent development and diversity. The ambition of the Department is to be a centre for developing competence and talents of students and staff, with equality and diversity as a driving force and resource. It is important for the Department that staff has experience from working and living in arctic conditions to be sure that they are familiar with the challenges.

In the Terms of Reference, the Department ask the committee pay special attention to the following three aspects:

- Relevance to UN's sustainable goals
- Diversity and equality
- Relevance to society and regional development

1.1 Research Strategy

The research strategy formulated by UiT, and followed by the AU, has the potential to contribute to the development of a unique research environment addressing the specific societal challenges of the Arctic and High North and promoting the development of key competences and high research quality and productivity for the benefit of the local area.

The research topics at the department are quite diversified, including building construction, renovation and indoor climate; renewable energy and hydrogen technology; water engineering; sea ice, atmospheric icing and show drift and seems not to be directly linked to the specific challenges of the Arctic. This breath of the research domain is probably a consequence of the considerable distance from other academic and industrial centres in Norway, which creates constraints on recruitment of staff with the needed research profiles, research infrastructure and funding as well as a wish to satisfy the competence needs of local industry.

For a relatively small research environment a very diversified approach makes it difficult to reach a critical mass, to establish and maintain state-of-the-art research infrastructures and the research outcomes becomes very dependent on single persons.

Although arctic conditions pose unique challenges to buildings, the research group's impact remains largely localised due to the sparse population and relatively small industries, thus constraining its potential for expansion to other similar regions in the world.

Recommendations to the administrative unit.

- It is recommended that the department develop a process for selecting key research topics critical to fulfilling the UiT research strategy.
- It is recommended that the department focus on a few research topics which are highly relevant to society and the regional development and with strong links to the specific challenges of the local geographical area. There are opportunities as part of major international research initiatives to become a development and test site for new technologies, which have world-wide interest, but also specific challenges and opportunities in the high north. This might also attract visiting researchers from other parts of the world, like Canada and US.
- It is also recommended to establish closer strategic collaboration and team-up with key national or international research groups. This will help in profiling the group and decrease the barriers posed by the northern location. A narrower research focus and increased collaboration will also lead to larger research groups less vulnerable and dependent on single persons.

1.2 Organisation of Research

At the department, the research activities are conducted by three different research groups. Each research group is led by a professor, responsible for initiating research funding, coordination of education, knowledge exchange, researcher training, outreach activities etc., and assisted by a department research support team. In the research group, thematic leaders manage the research projects and supervise PhD students in their respective research areas. In the self-assessment it is stated that the researchers are more or less free to apply for funding and projects as long as the research field is within the general building, energy and material technology field of the department.

This is a suitable organisational structure securing a collaborative approach to research, teaching and supervision within each research group, but allowing each thematic area to develop freely in accordance with the available resources may also result in a very diversified research profile.

Recommendations to the administrative unit.

- It is recommended to establish a more strategic approach to research organisation, research collaboration and funding to obtain a less diverse portfolio of research activities and to strengthen internal collaboration and research education as well as exploiting synergies between research groups and themes. This would also allow for development of shared objectives for funding, researcher training, development of publications and dissemination, thereby promoting the departments 's financial stability, further academic development and cohesive scientific outputs.

1.3 Research Funding

The research funding has in average for the last five years consisted of basic funding (34% of which more than half is ear marked funding for PhD candidates and post.doc positions), national research grants (46%) and international research grants (20%). Research funding has been increasing in the last five year including the funding from EU. Although research collaboration with a number of local industries and stakeholders is reported in various

projects, direct funding from industry for commissioned research has contributed minimally to the total funding over the last five years.

The self-assessment does not include information about support from the department regarding development of research proposals, review and quality assurance when applying for external funding. However, all applications and budgets need to be approved by the department head before submission. The department is assisted by a research support team, led by the vice dean of R&D and, in addition, the department has access to an R&D office at the central level at the university. However, their role and task are not clear.

Recommendations to the administrative unit.

- The competition for research funding is increasing and it is essential, especially for less experienced researchers, to provide support in the application phase to improve quality and funding probability. Although the unit has been relatively successful attracting funding in recent years, it is recommended to establish a procedure for assistance to/mentoring of less experienced researchers in the application phase.
- The national funding remains decisive for the group's sustainability. As indicated earlier, focus on global research topics with the support of unique research infrastructure, such in the case of hydrogen, or through teaming-up with other national research centres, will probably help in profiling the group worldwide and give the possibility of attracting international research grants.
- Collaboration with the local industry is essential for a regional research unit. The unit already have considerable industrial collaboration through student projects (80% of Bachelor theses and 95% of Master theses in collaboration with industry) and the AU is known in the region for solving practical problems. It is recommended to further develop the case-based collaboration and strong student involvement with a strategic approach to collaboration with the local industry exploiting the funding opportunities available for SME's.

1.4 Research Infrastructures

The Department does not host or use any national or international research infrastructure.

In the engineering field, access to research infrastructure is key to achieve and maintain a high scientific research quality. The research groups do not have the critical mass to be able to sustain extensive research infrastructures, but they do have access to standard laboratory-sized equipment for research on water and wastewater, indoor environment, material characterisation and for producing hydrogen and oxygen, along with medium-pressure storage facilities for both. This is an important asset in research, in supporting local companies and collaborators as well as in engaging M.Sc students in research activities. However, for supporting more fundamental global research topics, research collaboration with national research centres with access to extensive research infrastructure does not seem to be a common practice. This observation applies to research on buildings, indoor environments, and water.

Recommendations to administrative unit.

- Many laboratory facilities are not used to the extent possible. It should be considered to establish formal collaboration with and access to unique national research infrastructures or laboratory facilities, for relevant research groups as this will help in increasing research quality, profiling the research groups worldwide and decrease the barriers posed by the northern location and lack of critical mass to sustain extensive laboratory facilities.

1.5 National and international collaboration

The department considers collaboration with national and international partners as important and necessary to be able to provide high end research results and to get new impulses and knowledge. All research projects at the department have one or more partners involved and many projects include both national and international partners. Partners are mainly known from previous projects or from the network of individual researchers. The type of partners includes both universities and research institutions, public sector bodies and private industry.

However, these national and international collaborations are not reflected adequately in research publications in terms of both quantity and quality. This is especially the case for the number of publications co-published with national partners and with top-ranked international institutions. The share of top 10% cited publications is also well below average for the construction and building technology field.

Recommendations to administrative unit.

- It is recommended that the department apply a more strategic approach to development of national and international research collaboration by identifying, selecting and nurturing collaborations with relevant leading national or international teams and industry and that the department encourage co-publishing of research results to increase visibility and quality. Teaming up with other national teams will also broaden the group's access to research infrastructure and enhance visibility both locally and globally.

1.6 Research staff

The Department has an ambition to be a centre for developing competence and talent of students and staff with equality and diversity as a driving force and resource.

The Department has set up practices to support researcher careers and help early-career researchers to make their way into the profession. The self-evaluation mentions these without going into detail about how it is implemented and how it works. However, considering that the number of staff has doubled between 2017 and 2021 and that the average age of staff categories are still above national averages, it seems only few early-career researchers have been able to make their way at the department. Also, the quite high share of female PhD and Post doc researchers (>60%) is not reflected in the share of female associate professors (13%).

It is a requirement that all teaching staff undergo basic pedagogical training, and all researchers have undertaken a supervisor training course before being allowed to supervise PhD candidates.

The share of research time for professors/senior researchers is 50%, which is a little higher than the sector in average. The department has a policy for distribution of research time among research staff. For professors/associate professors it is 47.5 %, if they are supervising PhD students. Otherwise, it is only 28,5%. This provides an incentive for senior researchers to be involved in training of new researchers. For assistant professors the research time is only 19%, which limits their possibilities to improve their research qualification and be qualified for associate professor positions.

It is possible for permanent employees to apply for a research and education term and conditions are well-defined. However, the self-evaluation report states that the department is very positive towards such applications and supports the staff as much as possible, but the motivation among the staff is rather low.

Recommendations to the administrative unit

- The departments strategy and practices on developing staff talents is not reflected in recent years developments, considering staff average age and gender balance among permanent staff. The distribution of research time is supporting the strategy to increase the number of PhD's and postdocs while the limited research time allocated for assistant professors is limiting the career development of young researchers. It is recommended that the department develops a clear strategy for career planning and career development of young researchers.

1.7 Open Science

The Department has a policy to make all academic publications accessible in open access journals or repositories and has established a portal with information about requirements and university support services for publishing and open access. This policy and information portal has been quite successful. The department's publication profile during recent years reflects a significant shift towards open access publication practices with more than 60% published as gold open access, which is considerably higher than the sector in average, and with only 15% of publication not open access.

The department follows the FAIR principles and has a clear policy regarding ownership of research data, data management and storage as well as open access and confidentiality and provides support services for researcher to comply with this policy in the complete life cycle of research data management.

Recommendations on how to promote open science

- The department is well underway to ensure open access to its publications and data.

2. Research production, quality and integrity

Considering the size of the department and number of staff, the research areas within the department are rather wide including both energy use in buildings, reduction of greenhouse gas emissions from buildings, building materials with a focus on concrete, water and drainage technology, reuse of building materials, operation and maintenance of buildings and infrastructure, hydrogen technology. The department does not have a clear strategy for focusing on specific areas. Each researcher can decide for themselves which research projects to initiate or participate in. This has led to a wide span of thematic areas and a low number of researchers within each research area.

The publication volume compared to the number of research staff is considerably lower than seen in other similar administrative units. This is also the case for the level of co-authorship with external partners. The departments share of the 10% most cited publications (7,1%) is below the average level of similar departments (around 10%) with no publications co-published with selected top ranked international institutions.

The department does not have a specific policy for research integrity but relies on research output being reviewed and controlled by other external researchers. However, the department has not had any reported incidents where the research integrity of the department, or any of its staff, has been questioned.

2.1 Research quality and integrity

Research group Building, Energy and Materials (BEaM) overall assessment

BEaM strengths stem from a multitude of factors. It has an inclusive organisation, adapted to the considerable distance from other academic and industrial centres in Norway, which creates constraints on both staff and research funds. The research activities are structured into thematic areas, each overseen by a theme leader and coordinated by a research group leader. This framework fosters collaboration in teaching and PhD student supervision, while also accommodating individual research interests. Moreover, this approach establishes shared objectives for publications, funding, and dissemination, thereby promoting the group's financial stability and cohesive scientific output. Through a dedicated mobility program and the utilisation of MSc projects, the group has earned valuable contacts but also increased own resources for the conduction of pre-studies, which are then used as bases for research project applications.

Although the group has demonstrated the ability to attract independent research funding, it remains highly dependent on strategic state funding. For example, recent financial support by the Research Council of Norway for hydrogen technology research bolstered the group's personnel and enhanced the research environment. Another example is the “One health” programme, launched by the Norwegian Agency for Development Cooperation, which aims to support the capacity development in education and research between Norway and far south countries. These supports have the potential to attract researchers worldwide, but a plan to fully utilise this opportunity is currently missing.

The group is in its early stages, and building a strong research program will take time. While publications are increasing, there's room for improvement in selecting publication types and targeting journals, especially in hydrogen research, which has received significant funding. The group's remote location in a small community poses challenges for attracting researchers, so research topics should be chosen carefully and focused on e.g. challenges in the north region to avoid overlap with larger research entities with stronger infrastructure (grade 4; quality dimension – contribution). The group is essential for the local society, attracting young people and providing education to future industry professionals relevant to the local context. Despite some efforts, research collaborations with local industries and the community remain limited.

3. Diversity and equality

The university has developed an action plan for equality, diversity and inclusion that is published on a university portal together with notification guidelines for reporting any form of discrimination. It is not mentioned how this action plan is implemented in the department.

The research staff is relatively small with 3 professors, 8 associate professor and 11 PhD/postdocs. In relation to gender balance the total share of female researchers is much higher than in the administrative units in average in the evaluation (41% compared to 25%), primarily due to a high share of female PhD/postdocs (65% compared to 27%). The share of female researchers among permanent staff is similar to administrative units averages (2 females out of 11 positions), although the share of female associate professors is only 13% (one female).

The share of permanent staff with a foreign PhD-degree is similar to the administrative units in average in the evaluation (30%, 3 out of 11), while none of the researchers/postdocs has a foreign PhD-degree.

4. Relevance to institutional and sectorial purposes

The department strategy states that research should focus on topics that relates to the local geographical area and with relevance to society and regional development. The self-assessment does not reflect on this or give examples on sector specific impacts, innovation or commercial activities in the local area. The department does not have a formal practice for innovation and commercialisation neither for own staff and students, nor in collaboration with local industry. Given the geographical location there seems to be an untapped potential in strategic collaboration between the department and the local industry for the benefit of both.

The department delivers a research-based education and integrates research achievements in the lessons while a strong link between thesis projects, research and industry collaboration seems still to be developed. M.Sc. students are a valuable resource for research and development and for establishing collaboration between the university and the local industry and other relevant partners. Students are naturally, more attracted to industry collaboration in their final thesis work than to research, so it is important to combine industry collaboration and research in M.Sc. thesis projects. This is also a way to get local industry more familiar with research and the potential benefits for their business and maybe paving the way for new research activities.

It is important for PhD students to be directly involved in the research activities at the department and that PhD projects are linked to ongoing research activities. This is especially important considering the low number of staff in each research field, but it will also improve the research quality and make it easier for students to develop a relevant research network.

5. Relevance to society

The department has a high social relevance in relation to ensuring the needed engineering expertise in the north region, which is very important considering the challenges we face in the building industry in connection with climate change and the green transition. Surveys show that most students come from the north region and stay in the region after completing their education. The department educates approx. 60-80 bachelor's students in Construction and building technology, Civil engineering, Mining operation and mineral technology and HVAC and approx.15-25 master's students in Integrated Building Technology and Water and Wastewater Technology.

The selected research areas of the department (energy use in buildings, reduction of greenhouse gas emissions from buildings, building materials with a focus on concrete, water and drainage technology, reuse of building materials, operation and maintenance of buildings and infrastructure, hydrogen technology) address important challenges both locally, nationally and globally and are very relevant to society and all areas are covered by UN's sustainability goals (Clean water and good sanitation, Clean energy for all, Industry, innovation and infrastructure, Sustainable cities and local communities and Stopping climate change).

5.1 Impact cases

No impact case has been provided for evaluation.

Methods and limitations

The evaluation is based on documentary evidence and online interviews with the representatives of Administrative Unit.

The documentary inputs to the evaluation were:

- Evaluation Protocol that guided the process
- Terms of Reference
- Administrative Unit’s self-assessment report
- Administrative Unit’s impact cases
- Administrative Unit’s research groups evaluation reports
- Bibliometric data
- Personnel and funding data
- Data from Norwegian student and teacher surveys (only for HEI’s)

After the documentary review, the Committee held a meeting and discussed an initial assessment against the assessment criteria and defined questions for the interview with the Administrative Unit. The Committee shared the interview questions with the Administrative Unit three weeks before the interview.

Following the documentary review, the Committee interviewed the Administrative Unit in an hour-long virtual meeting to fact-check the Committee’s understanding and refine perceptions. The Administrative Unit presented answers to the Committee's questions and addressed other follow-up questions.

After the online interview, the Committee attended the final meeting to review the initial assessment in light of the interview and make any final adjustments.

A one-page summary of the Administrative Unit was developed based on the information from the self-assessment, the research group assessment, and the interview. The Administrative Unit had the opportunity to fact-check this summary. The Administrative Unit approved the summary with minor adjustments.

Limitations

The Committee judged that the Administrative Unit self-assessment report was insufficient to assess all evaluation criteria fully. However, the interview with the Administrative Unit filled gaps in the Committee's understanding, and the information was sufficient to complete the evaluation.

List of administrative unit's research groups

Institution	Administrative Unit	Research Groups
The Arctic University of Norway (UiT)	Department of Building, Energy and Material Technology	Building, Energy and Materials (BEaM)

Terms of Reference (ToR) for the administrative unit

The board of Faculty of Engineering science and technology at UiT - The Arctic University of Norway mandates the evaluation committee appointed by the Research Council of Norway (RCN) to assess the Department of building, energy and material technology based on the following Terms of Reference.

Assessment

You are asked to assess the organisation, quality and diversity of research conducted by the Department of building, energy and material technology as well as its relevance to institutional and sectoral purposes, and to society at large. You should do so by judging the unit's performance based on the following five assessment criteria (a. to e.). Be sure to take current international trends and developments in science and society into account in your analysis.

a) Strategy, resources and organisation

b) Research production, quality and integrity

c) Diversity and equality

d) Relevance to institutional and sectoral purposes

e) Relevance to society

For a description of these criteria, see Chapter 2 of the mathematics, ICT and technology evaluation protocol. Please provide a written assessment for each of the five criteria. Please also provide recommendations for improvement. We ask you to pay special attention to the following 3 aspects in your assessment:

1. Relevance to UN's sustainable goals
2. Diversity and equality
3. Relevance to society and regional development

In addition, we would like your report to provide a qualitative assessment of the Department of building, energy and material technology as a whole in relation to its strategic targets. The committee assesses the strategy that the administrative unit intends to pursue in the years ahead and the extent to which it will be capable of meeting its targets for research and society during this period based on available resources and competence. The committee is also invited to make recommendations concerning these two subjects.

Documentation

The necessary documentation will be made available by the mathematics, ICT and technology secretariat at Technopolis Group.

The documents will include the following:

- a report on research personnel and publications within mathematics, ICT and technology commissioned by RCN
- a self-assessment based on a template provided by the mathematics, ICT and technology secretariat.

Interviews with representatives from the evaluated units

Interviews with the Department of building, energy and material technology will be organised by the evaluation secretariat. Such interviews can be organised as a site visit, in another specified location in Norway or as a video conference.

Statement on impartiality and confidence

The assessment should be carried out in accordance with the *Regulations on Impartiality and Confidence in the Research Council of Norway*. A statement on the impartiality of the committee members has been recorded by the RCN as a part of the appointment process. The impartiality and confidence of committee and panel members should be confirmed when evaluation data from the Department of building, energy and material technology are made available to the committee and the panels, and before any assessments are made based on these data. The RCN should be notified if questions concerning impartiality and confidence are raised by committee members during the evaluation process.

Assessment report

We ask you to report your findings in an assessment report drawn up in accordance with a format specified by the mathematics, ICT and technology secretariat. The committee may suggest adjustments to this format at its first meeting. A draft report should be sent to the Department of building, energy and material technology and RCT]. The Department of building, energy and material technology should be allowed to check the report for factual inaccuracies; if such inaccuracies are found, they should be reported to the mathematics, ICT and technology secretariat within the deadline given by the secretariat. After the committee has made the amendments judged necessary, a corrected version of the assessment report should be sent to the board of the Faculty of engineering science and technology and the RCN no later than two weeks after all feedback on inaccuracies has been received from the Department of building, energy and material technology.

Appendices

1. Description of the evaluation of EVALMIT
2. Invitation letter to the administrative unit including address list
3. Evaluation protocol
4. Template of self-assessment for administrative unit (short-version)

The Research Council of Norway

Norges forskningsråd
Besøksadresse: Drammensveien 288
Postboks 564
1327 Lysaker

Telefon: 22 03 70 00

post@forskningsradet.no
www.forskningsradet.no

Publikasjonen kan lastes ned fra
www.forskningsradet.no/publikasjoner

Design: [design]
Foto/ill. omslagsside: [fotokreditt]

ISBN 978-82-12-04137-0 (pdf)