

NORDTEK

**Annual Report**  
**2023**



NORDTEK is a network of technical universities in the Nordic and Baltic Countries. A main mission for the network is to stimulate to more collaboration between the organisations in order to strengthen the engineering and technology sciences in the region. The goal is to help solving concrete challenges for society through joint efforts where technology and engineering education and research can contribute.

2023 was the year for keeping and develop NORDTEK as an attractive and competitive network for the members. On organisational level two important decisions were taken. First, the secretariate shall be hosted by one of the member universities. Second, all member countries shall be represented in the Board of Directors.

Two of the Focus Areas, NORDTEK Engineering Education and NORDTEK Mobility, continued to increase their activities and exchange of experiences. A new working group was established "AI in Engineering Education" and an initiative to establish a Network for PhD mobility started.

The collaboration with Association of Nordic Engineers did result in both new knowledge about Lifelong Learning and a Joint Statement directed to the Nordic Ministers of Education and Collaboration.

A Communication Strategy will show results during 2024 including new Webpage, LinkedIn page and a Newsletter.

## 1. INTRODUCTION.

The Board of Director's report on the activities in 2023 is presented below. This report also includes presentation of the planned activities for 2024.

The Board wants to invest in a wider network cooperation in NORDTEK to reach out more broadly in the members organisations. During 2023 the board has focused on the following activities:

- *Creating value for the members:*
- *Develop the strategic Focus Areas*
- *Develop a new organisational structure.*
- *Revise the Articles of Association*
- *Research and Education shall be more connected and integrated.*
- *Support an administrative group for the student cooperation.*
- *Establish stronger collaboration with engineering organisations.*
- *Stronger involvement of research in NORDTEK Activities:*
- *Marketing the NORDTEK PhD-course Database.*

### **Organisation**

#### **The Board**

Members of the board are:

*Øystein Lund Bø, University of Stavanger, President (until 18.08.2023)*

*Maarja Kruusmaa, TalTech, President (from 18.08.2023)*

*Mari Avarmaa, TalTech (from 18.08.2023)*

*Finn Borchsenius, Aarhus University*

*Mikael Elofsson, Umeå University*

*Elīna Gaile-Sarkane, Riga Technical University (from 18.08.2023)*

*Sigurður Magnús Garðarsson, University of Iceland (until 18.08.2023)*

*Mika Hannula, University of Turku,*

*Karl Henning Halse, Norwegian University of Science and Technology (from 18.08.2023)*

*Ólafur Eysteinn Sigurjónsson, University of Iceland (from 18.08.2023)*

*Eugenijus Valatka, Kaunas University of Technology*

*Geir Øien, Norwegian University of Science and Technology (until 18.08.2023)*

#### **Deputy Board members**

*Henning Andersen, University of Southern Denmark as deputy for Finn Borchsenius*

*Helka-Liisa Hentilä, University of Oulu as deputy for Mika Hannula*

*Juris Iljins, Riga Technical University as deputy for Elīna Gaile-Sarkane*

*Ruta Jankauskienė, Kaunas University of Technology as deputy for Eugenijus Valatka*

*Ólafur Petur Palsson, University of Iceland as deputy for Ólafur Eysteinn Sigurjónsson*

*Hendrik Voll, TalTech as deputy for Mari Avarmaa*

*Johan Ölvander, Linköping University as deputy for Mikael Elofsson*

#### **Associated members**

*Bente Dale, University of Stavanger, Mobility program Coordinator (until 18.08.2023)*

*Riina Potter, TalTech, Mobility program Coordinator (from 18.08.2023)*

## **Members**

2023 the NORDTEK Network consist of 28 member universities.

### **Member Universities**

#### **Denmark**

*Aarhus University (AU)*

*University of Southern Denmark (SDU)*

#### **Estonia**

*TalTech*

#### **Finland**

*Åbo Akademi University (ÅA)*

*Aalto University (Aalto)*

*Tampere Universities (TUNI)*

*Lappeenranta-Lahti University of Technology (LUT)*

*University of Turku (UTU)*

*University of Vaasa (UWasa)*

*University of Oulu (Oulu)*

#### **Iceland**

*University of Iceland (HI)*

*Reykjavik University (RU)*

#### **Latvia**

*Riga Technical University (RTU)*

#### **Lithuania**

*Kaunas Technical University (KTU)*

*Vilnius Gediminas Technical University (VILNIUS TECH)*

#### **Norway**

*University of Agder (UiA)*

*The Arctic University of Norway (UiT)*

*Norwegian University of Science and Technology (NTNU)*

*University of Stavanger (UiS)*

#### **Sweden**

*Lund University (LU)*

*Linköping University (LiU)*

*Mälardalen University (MdU)*

*Uppsala University (UU)*

*Umeå University (UmU)*

*Mid Sweden University (MiUn)*

*Luleå Technical University (LTU)*

*Karlstad University (KaU)*

*Blekinge Institute of Technology (BTH)*

## 2. STRATEGIC FOCUS AREAS

In 2019 the Rector Meeting decided a strategy focused on three main areas,

- **Engineering education – content and pedagogy**
- **Entrepreneurship and Innovation**
- **Mobility**

### **NORDTEK Engineering Education**

The NORDTEK network for engineering education, NEE, was established in January 2020.

The vision for this network is:

*To be a point of reference, which delivers facts on STEM education (with focus on engineering education) that contributes to the development for education that foster sustainable societal development in the Nordic region.*

To reach this goal a steering group was formed. By the end of 2023 the NEE steering group includes:

- Gediminas Blaževičius, VILNIUS TECH, Chair
- Jens Bennedsen, Aarhus University
- Esa Räsänen, Tampere University
- Fjodor Sergejev, TalTech
- Magne Olav Sydnes, University of Stavanger
- Elina Kähkönen, Aalto University
- Erkki Kaila, University of Turku

### **Main results in 2023**

Two engineering education Working Groups were established. Each group had around 10 participants, representing multiple NORDTEK member universities. They successfully worked on-line throughout the academic year and finalised their findings at the NEE symposium during NORDTEK conference 2023

#### **“Teaching fundamentals in engineering studies”**

Working group leader Jens Bennedsen, Aarhus University.

Focused on different approaches how to teach math, physics, chemistry, biology or other fundamental subjects. In most engineering studies, a solid understanding of these subjects is essential, yet many engineering students dislike learning them. This tension has led to many different suggestions for how to teach the fundamentals: integrated into different courses, as separate courses, in projects etc. This NEE working group tries to figure out best approaches in the NORDTEK.

#### **“Integrating global sustainability goals in higher education”**

Working group leader: Esa Räsänen, Tampere University/ Elina Kähkönen, Aalto University.

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations (UN) in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. The integration of the sustainability goals in higher education is currently under progress in several Nordic and

Baltic universities. The aim of this NORDTEK working group is to share and discuss the good practices in the integration of SDGs in engineering education. The findings would help us to develop a joint understanding of the relevance of SDGs in the education of future engineers, and to facilitate and accelerate the integration of SDGs in the curricula of engineering degree programmes in Nordic and Baltic universities.

### **“AI in Engineering Education”**

Working group leader: Erkki Kaila, University of Turku

Late in 2023 a new working group “AI in Engineering Education” was established. The group accepted to organize the NEE symposium during the NORDTEK Conference 2024 in Turku.

### **NORDTEK Engineering Education symposium**

The first NORDTEK Engineering Education Symposium was organized at Aarhus University, Denmark on Wednesday, August 16th, 2023. It was full day event – from 9:00 to 18:00. First part of the day was dedicated to closed working group discussions and the afternoon session was open to public with presentations and discussions. The event was considered very successful, as feedback from participants was unanimously positive.

NEE steering group decided to continue the working group format in the future. We also decided to continue organising annual symposiums together with the main NORDTEK conferences. On the other hand, organizational continuity of the NEE still remains unsolved as working group leaders and steering group members are working on the voluntary basis. Nevertheless, the NEE is growing and getting more attention from the community. We are very happy to find new leaders for the 2024 working groups - Erkki Kaila and Elina Kähkönen.

## **Entrepreneurship and Innovation – NORDTEK Incubator Forum**

### **Introduction**

Nordtek Incubator Forum (NIF) was established in 2019 to enhance collaboration among NORDTEK universities in entrepreneurship and innovation. The aim is to contribute to:

- *the Nordic Baltic region being internationally competitive and in the forefront of transferring innovations to the market.*
- *educate and train new generations of engineers in entrepreneurial and acquire leadership skills but also to contribute to*

The aim for NIF is to stimulate and create:

- more knowledge among NORDTEK member institutions about good practice, instruments and resources in the field of entrepreneurship and Innovation
- a stronger network between researchers and practitioners within entrepreneurship and innovation
- more collaboration between NORDTEK members on the topics, and potentially the start of more research, education and development projects

### **NIF activities 2023**

The Board has decided to put NIF on hold due to lack of interest from member universities.

## **NORDTEK Mobility**

**Chair:** Magnus Strandås, Uppsala University until 18.08.2023

Tea Vellamo, University of Tampere from 18.08.2023

**Mobility Program Coordinator:** Bente Dale, University of Stavanger until 18.08.2023

Riina Potter, TalTech from 18.08.2023

### **Members of the Mobility Contact Person Network, starting from June 23**

<b>Secretariat</b>	Mobility Coordinator	Bente Dale*/ Riina Potter*
	Focus Area Leader	Magnus Strandås* / Tea Vellamo*
	Secretary General	Peter Göranson*
<b>Denmark</b>	Aarhus University	Fie Bøje Misholt*
	University of Southern Denmark	Solvår Wium / starting from 14.12.2023 Søren Brolund Ulriksen
<b>Estonia</b>	Tallinn University of Technology	Riina Potter*
<b>Finland</b>	Aalto University	Kujanpää Eija / starting from 15.01.24 Kirsi Viitaharju
	Lappeenranta-Lahti University of Technology	Anne Makkonen*/ starting from 30.01.24 Tiina Savuaho
	Tampere University	Mira Kauppinen
	University of Oulu	Marita Puikkonen
	University of Turku	Annukka Väre
	University of Vaasa	Outi Anttila / starting from 25.09.23 Susanne Nylund-Torp
	Åbo Akademi University	Malin Wälitalo / starting from 24.10.23 Katie Fagerström *
<b>Iceland</b>	Reykjavík University	Guðlaug Matthildur Jakobsdóttir
	University of Iceland	Bryndís Jónsdóttir*
<b>Latvia</b>	Riga Technical University	Evita Miščuka*
<b>Lithuania</b>	Kaunas University of Technology	Rūta Jankauskienė *
	Vilnius Gediminas Technical University	Aušra Pelėdienė*/ al 19.10.23 Aleksandra Sokolova
<b>Norway</b>	Norwegian University of Science and Technology	Nina Moxnes
	The Arctic University of Norway	Jianfei Feng Sørensen*
	University of Stavanger	Bente Dale
	University of Agder	Terje Eugen Thorsdalen
<b>Sweden</b>	Blekinge Institute of Technology	Jessica Mattsson
	Karlstad University	Stefan Kaasalainen*
	Linköping University	Anna Andersson
	Luleå University of Technology	Amanda Henriksson / starting from 13.12.2023 Jenny Lundkvist
	LTH Lund University	Sara Pereira
	Mid Sweden University	Cathrine Gladh*
	Mälardalen University	Radu Dobrin
	Umeå University	Staffan Schedin/ new: Konrad Abramowicz
	Uppsala University	Emma Svensson*

\* Members of the Steering Committee

During spring 2023 the Mobility Programme Steering Committee had three meetings whereof one was an on-site meeting in Uppsala May 11-12. In August 2023 face-to-face meeting for all contact persons as well as steering group members was held in Aarhus, Denmark as part of the NORDTEK annual conference. In parallel there were four working groups formed. One group developing a new model for collecting mobility statistics led by Annukka Väre from University of Turku and one group led by Fie Bøje Misholt planning the contact persons conference programme. A third group working with the promotion of teacher mobility was led by Evita Miščuka from Riga Technical University addition and a fourth group led by Emma Svensson from Uppsala University was organising the successful joint online thematic fair about summer schools. Besides this the secretariat consisting with the mobility coordinator, focus area leader, and the general secretary had informal meetings approximately every second week.

The year 2023 started with the establishment of a new action plan and one of the first actions was to hand in the annual project application to Nordplus for student and teacher mobility scholarships. The theme of the project, *Mobility towards a socially sustainable future*, was chosen to reflect the phase of post pandemic rebuilding and to align with the ambitions of the Nordic council of ministers' programme. The application was successful and the full amount of 27 995€ was awarded (compared to 36 740€ in 2022, 39 945€ in 2021 and 101 000€ in 2020). Since NORDTEK is gradually transferring the mobility funding from Nordplus to Erasmus+ it is a challenge to estimate the demand for Nordplus funding in the network. Therefore it was a lucky circumstance that there was an excess of funding and that the network was able to give a small contribution in funding to Ukrainian students, mainly hosted by Vilnius Gediminas Technical University and Åbo Akademi University during spring 2023.

To better promote the educational offer at partner universities and make use of the experiences of digital meetings made during the pandemic, the idea of an online student fair was realised during spring 2023. This initiative showed to be a success and there was increase in the number of express mobility applications. There were in total 6 express mobilities during 2022/2023-3 of the express mobilities were for NORDTEK summer schools and because of the educational fair. (3 more applicants were granted express mobility scholarships for summer schools, but these students later withdraw and did not go.)

The main activity during the year was as usual the annual meeting and staff training event for the contact persons. As previously it was held in parallel with the annual NORDTEK conference, this year hosted by Aarhus University. The staff training focused on green and sustainable mobility and gave a lot of inspiration and input for the action plan of 2024.



## 2023/2024 " Mobility towards a socially sustainable future "

2023	Number of students. One semester	Number of Ukrainian students. One semester	Number of Ukrainian students < 3 months	Number of students on express mobility*	Number of teachers
<b>Spring 2023</b>	2	7	10 (one cancellation)	6	5
<b>Autumn 2023</b>	0	0	0	0	3
<b>Total</b>	2	7	10	6	8

\* *Mobility under 1 month.*

The table shows the Nordplus-financed mobility within NORDTEK.

*Comments: Express mobility: 3 students attended NORDTEK summer schools + 3 students attended another express event at a NORDTEK partner.*

### 3. PROJECTS

#### **NORDTEK/ANE Expert Group on Lifelong Learning**

In 2022 the NORDTEK/ANE (Association of Nordic Engineers) Expert Group on Lifelong Learning was established.

The mandate of the group is to:

- Identify areas of high strategic potential for the field of Lifelong Learning,
  - Competence areas and educational content
  - Framework conditions and models for educational delivery
- Propose and initiate collaboration activities between NORDTEK and ANE in these areas.
- Be a joint NORDTEK–ANE advisory group for Lifelong Learning issues.
- Establish contact with other relevant stakeholders.
- Report to the Boards of ANE and NORDTEK twice per year

#### **Members:**

Geir Øien, NTNU, **Chair** (NO)

Teemu Rauhala, Tampere University (FI)

Pär Weihed, Luleå Technical University (SE)

Anders Johansson, KTH (SE)

Jens Bennedsen, Aarhus University (DK)

Sune Maegaard Løvsø, IDA (DK)

Olle Dahlberg, Sveriges Ingenjörer (SE)

Marianne Bevum, NITO (NO)

Miihkali Härkönen, IRLY, (FI)

Tapio Heiskari, TEK (FI)

During 2023 The Expert Group presented their findings and a list of recommendations to the Board of NORDTEK and ANE.

**Prioritize lifelong learning opportunities for STEM professionals in the Nordic Region,**

- *adopting a Nordic approach to identifying and addressing the skills needed for the green transition.*

**Facilitate stable long-term funding for and investment in lifelong learning, by**

- *evaluating current funding and governance models for continuing education*
- *developing these models to systematically encourage and incentivize higher education institutions (HEIs) to engage in lifelong learning provision.*
- *removing legislative barriers acting as showstoppers and disincentives for LLL development*
- *allocating long-term funding for the development and maintenance of a Nordic-wide portal for flexible lifelong learning offerings - fostering exchange of the best courses in the Nordic countries and expanding the market by spreading these courses to other countries.*

**Put an obligation on HEIs to adapt their education offerings to meet the twin transition, by**

- *strengthening their provision of flexible lifelong learning offerings at large,*
- *opening up, to all qualified learners, courses previously only accessible for full-time degree students,*
- *encouraging development of digitally delivered micro-credentials.*

**Increase knowledge sharing and collaboration on LLL within the Nordic region, by**

- *efficiently facilitating regional collaboration*
- *ensuring alignment of national legislation and governance across countries*
- *developing a joint Nordic perspective towards a more holistic ‘phenomenon-based’ type of governance of lifelong learning*
- *exploiting the Nordic-wide LLL portal to stimulate more coordinated transnational collaboration.*

Outcome

Based on the group’s recommendations The NORDTEK and ANE Boards launched a Joint Statement in September. The statement was sent to Nordic Council of Ministers.

#### 4. COLLABORATION

##### **Student network**

After the student meeting 2023 in Aarhus there has been no activity in the network. The secretariate has put large efforts to reestablish the student network and Board. Thanks to students from Åbo Akademi University and University of Turku that have engage themselves in arranging the Student Meeting 2024 where a new Student Board shall be elected.

##### **Association of Nordic Engineers, ANE**

ANE represents more than 340,000 engineers in the Nordic Region. Its member organizations are the Swedish Association of Graduate Engineers (Sveriges Ingenjörer), the Danish Society of Engineers (IDA), the Norwegian Society of Engineers and Technologists (NITO), Icelandic Association of Chartered Engineers, VFÍ and Engineers Finland.

In 2018 NORDTEK and ANE signed a cooperation agreement. Focus of the cooperation are:

- **Promote the STEM skills** and create synergies between the existing initiatives both at regional and at EU level.
- **Endorse the lifelong learning opportunities for IT and digital competences.**

In 2020 the two organisations presented a joint policy paper “**Boosting the digital transition through lifelong learning**” followed by a conference. The conference was directed to Nordic collaboration on Lifelong Learning for development of digital competence.

One of the recommendations from the conference was to establish an Expert group in Lifelong Learning. In 2022 NORDTEK took initiative to establish this group with members from both ANE and NORDTEK. See under 3. Projects

### **Nordic Council of Ministers**

In 2021 The Ministers for Nordic Collaboration establish The Nordic Civil Society Network. NORDTEK was invited and accepted to join the network. The network consists of 30 different organisations, both Nordic and National, small and big. The purpose of the network is to advice and evaluate the activities run by Nordic Council of Ministers. Focus is at activities under “Our Vision 2030”. The vision has three pillars: A Competitive, A Green Nordic and Socially Sustainable Nordic region, NORDTEK’s main area of interest is A Competitive Nordic Region. During 2023 the collaboration in the network and with NCM continued. NORDTEK has focus to collaborate in the group “A Competitive Nordic” and especially Lifelong Learning.

## **5. CONFERENCES AND MEETINGS**

### **NORDTEK-Conference 2023**

Aarhus University hosted the Annual NORDTEK Conference, 8-10 August 2023.

Theme for the conference was “**SUSTAINABILITY- How do we educate engineers for a sustainable future**”

### **Rector Meeting/Annual General Meeting 2023**

#### **Participants**

23 Representatives participated in the meeting.

#### **Important decisions**

##### New organisation

The AGM decided the new organisation of NORDTEK shall be based on a strong Secretariate hosted by one of the member universities. And asked the Board to continue the process in realising the new organisation.

The AGM also increase the Board with members representing all 8 member countries.

##### Articles of Association

The Articles of Association, §11 and §11 was revised to follow up the new organisation.

##### Election of Board members

Mari Avarmaa, TalTech, was elected as Estonian Board member.

Elina Gaile-Sarkane, Riga Technical University, was elected as Latvian Board member.

Ólafur Eysteinn Sigurjonsson, Reykjavik University, was elected as Icelandic Board member.

Karl Henning Halse, NTNU was elected as Norwegian Bard member.

### Conferences

Theme for the 52<sup>nd</sup> Annual NORDTEK Conference 2024, hosted jointly by Åbo Akademi University and University of Turku, will be “**Artificial Intelligence in engineering**”

The 53<sup>rd</sup> Annual NORDTEK Conference 2025 shall be hosted by VILNIUS TECH.

### **Round Table Discussion**

Topic for the Round table discussion was:

“**Relevance and role of university in a fast changing and unstable world.**” - *How do we prepare students, what is the role of the university as a democratic (and somewhat international) institutions.*

The discussion was introduced by: Aldert Kamp, Former Director of Education at TU Delft.

**Maarja Kruusmaa**  
TalTech  
President

**Mari Avarmaa**  
TalTech

**Finn Borchsenius**  
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**Peter Göranson**  
Secretary General