



# INDEK 2023

Enhancing technology-based value creation  
and sustainable industrial growth



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**Our vision is to  
be a leading European  
center for research and  
education at the  
intersection between  
technology and  
management.**

Project manager: Hans Lööf assisted  
by Vardan Hovsepyan  
Design and interviews: Anna Gullers



## *Tackling critical topics and securing grants*

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*Our department's dedication to high-quality education, research, and fostering responsible academic citizens continued to flourish in 2023, building upon the momentum from the previous year.*

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**I**n addition to providing courses through our education portfolio, we're excited to highlight the launch of a Master of Science Program in Technology-Based Entrepreneurship. This program emphasizes the intersection of technology, entrepreneurship, innovation, and venturing. It equips engineering students with the management, innovation, and value-creation skills they need to thrive in today's dynamic industrial and technological landscape.

Additionally, INDEK successfully hosted our second annual Master's Thesis Day at the end of May. This event showcased over 140 Master's thesis presentations and defenses, drawing a crowd of students, industry representatives, faculty, and families.

INDEK's research continues to break ground, tackling critical topics that drive industrial, technological, and societal transformation.

Our dedication is reflected in securing competitive research grants. This year, our researchers made significant contributions with 27 high-impact, peer-reviewed journal publications. Furthermore, we're proud to celebrate the graduation of five Doctors in Industrial Economics and

Management, while also welcoming 3 new PhD candidates to our program.

During the year in review, we have been engaged in academic citizenship within KTH and third task related activities outside KTH. Among these, we have continued to engage with our advisory board which (reliably/ consistently/ frequently/unfailingly) gives us insights on industrial trends. In turn, our faculty has been providing advice and courses on, for instance, gender diversity and equality integration to KTH and beyond.

We have also been involved in faculty development and are pleased to announce the recruitment of two new Associate Professors and one Lecturer during 2023. In the following pages, we present more highlights and achievements that took place at our department during last year.

Finally, this is the second year book that we publish in order to highlight some of the achievements of our department. I would like to thank Professor Hans Lööf, who took on the challenge of editing it.

Professor Cali Nuur, PhD  
Head of Department

# This is INDEK

Industrial Economics and Management, commonly known by its Swedish abbreviation "INDEK", is a department addressing issues of management in the contexts of engineering and technology.

INDEK represents a multidisciplinary field revolving around management, organization, and development of technology-based businesses and sustainable industrial growth. Most of our research is pursued at the organizational level, but we also conduct studies of inter-organizational relations, industrial and technological transformations, as well as studies of jobs and work processes. Our research contributes to long term competitiveness and sustainable growth in close collaboration with both the private and the public sector.

Our education is student-centered, innovative, and strongly anchored in research and in practice. The learning objectives are to develop

the students' ability to understand and manage technology-based operations in different environments as well as to navigate technological, organizational, and social transformations. Annually, about 5,500 students participate in our courses at the bachelor and master levels. In addition, about 140 MSc thesis projects with industrial partners are conducted every year.

The department has an extensive academic network and various partners. In addition, we cooperate with a large number of companies and societal actors both in our research projects and educational activities.

Indek has a faculty of 34 professors, lecturers and doctors, 10 in-house PhD-students and 8 professors emeriti structured in three divisions: Accounting, Finance, Economics, and Organization (AFEO), Management and Technology (MT), and Sustainability, Industrial Dynamics, and Entrepreneurship (SIDE). Although the divisions are separate, there are significant interactions between them in terms of research and teaching activities.

## Did you know...

- INDEK got SEK 35 million in research grants during 2023.

- The department had five PhD dissertations 2023.

4

postdocs

60

courses

10

inhouse doctoral students

2

guest researchers

8

professors emeriti

140

master theses

29

peer review publications

35

academic staff

3

support administrators

MILESTONE 2023

## "This gives me more visibility"

A new professor has seen the day of light at INDEK, **Frauke Urban**, with a fresh professorship in industrial economics, with a specialization in the management of sustainable energy systems.



Frauke Urban

Congratulations to the professorship Frauke, what do you expect will be the biggest difference with this title/role?

"The difference to before is that the professorship helps me to gain more visibility in my field. I also hope to be able to dedicate more time to research."

Will this make it easier to pursue your issues or will it on the contrary become an (administrative) barrier?

"Yes, it provides a better platform, gives me more visibility and more authority in my field. I have recently been invited to join several new initiatives, such as academic advisory boards, research proposals, and presentations of my research for wider society. This might be because of the new title or it might just be coincidence. I have recently also become the undergraduate program director (GA) at the ITM School, which requires a lot of my time. As academics, we have to balance a lot of different tasks and functions, including teaching, research, administration, and third task."

How did you become so passionate about your subject?

"I have always been passionate about the environment and sustainability, even as a child. When I was growing up

in Northern Germany, the first wind turbines were installed and wind farms soon became a common sight. I later wrote my Master thesis about wind energy policy in the European Union. I interviewed wind farm developers and had the privilege to climb up on the top of their turbines. That's when I decided that I wanted to pursue a PhD in the field of sustainable energy transitions. Working on issues such as sustainable energy transitions and climate change mitigation makes a positive contribution to society, which in turn makes it worthwhile to work in this field."

What's next on your agenda?

"I have a lot of exciting research ideas and will be applying for more research funding in the next few months. My main research interests at the moment are about decarbonization of industry and transport, including aviation and maritime shipping. In my role as GA, I will lead the mapping of the ITM school's educational profile."

# Academic staff



**MOHAMMAD AKHBARI**  
Lecturer  
**Research areas:** Industrial engineering and management, Management accounting and control systems in the digital era.  
**Teaching area:** Industrial management.



**HENRIK BLOMGREN**  
Associate professor  
**Research areas:** Digital Transformation, Mobile Marketing:  
**Teaching areas:** Corporate Strategy, Entrepreneurship, Marketing, Disruption.



**ÅSA-KARIN ENGSTRAND**  
Associate professor  
**Research areas:** Work organization with a particular focus on bounded ethicality, precarious working conditions and inequalities.  
**Teaching areas:** Organizations, human resource management, ethical dilemmas and gender relations.



**ANDREAS FELDMAN**  
Associate professor  
**Research areas:** Circular economy, Recycling, circular supply chains  
**Teaching areas:** Circular economy, supply chain and operations management, industrial dynamics.



**PHILIP KAPPEN**  
Associate professor  
**Research areas:** International management, strategy, corporate entrepreneurship  
**Teaching area:** Entrepreneurship.



**JANNIS ANGELIS**  
Associate professor  
**Research areas:** Algorithmic management, data-driven decision making, EV battery ecosystems.  
**Teaching areas:** Operations strategy, performance management, quantitative methods.



**ANDRES BROSTRÖM**  
Associate professor  
**Research areas:** Innovation, entrepreneurship, economics of science and education.  
**Teaching area:** Data analytics.



**MATS ENGWALL**  
Professor  
**Research areas:** Business model implications of AI, digitalization, and electrification;  
**Teaching areas:** Technology and innovation management, operations management, theory of science.



**CHARLOTTE HOLGERSSON**  
Associate professor  
**Research areas:** Gender in organizations, management careers, homosocial cultures, work for change  
**Teaching areas:** Organization, gender studies, critical diversity management.



**EMRAH KARAKAYA**  
Associate professor  
**Research areas:** Sustainability transitions, business models and innovation diffusion  
**Teaching areas:** Research methods, sustainability transitions, industrial dynamics.



**NIKLAS ARVIDSSON**  
Professor  
**Research areas:** Innovation in payment system, cashless society, sustainability in digital systems  
**Teaching areas:** Strategic management in technology shifts, Management of innovation, Industrial dynamics.



**TERRENCE BROWN**  
Professor  
**Research areas:** Digital entrepreneurship, digital marketing, business model innovation.  
**Teaching areas:** Opportunity Development and business model innovation.



**MANA FARSHID**  
Associate professor  
**Research areas:** Digital marketing and e-commerce, Digital twin and sustainability, digital communications  
**Teaching areas:** Digital marketing, e-business strategy, Quantitative market research and business analytics.



**BO KARLSSON**  
Lecturer  
**Teaching areas:** Basic industrial management  
Management accounting  
Operations management.



**ANNA JERBRANT**  
Associate professor  
**Research areas:** Collective action and collaboration, knowledge ecosystems as meta-organizations, institutional influence.  
**Teaching areas:** Program & portfolio management, project management, organizing and management in knowledge-intensive businesses



**MATTI KAULIO**  
Professor  
**Research areas:** Project leadership, Management of knowledge work, Organizational learning.  
**Teaching areas:** People & Organization, Innovation & Entrepreneurship.



**FABIAN LEVIN**  
Associate professor  
**Research area:** Pollution and climate change.  
**Teaching areas:** Sustainability and dynamic entrepreneurship.



**JOHAN NORDENSVÄRD**  
Associate Professor  
**Research areas:** Innovation, Transformation, Innovation policy, Energy policy, Innovation governance  
**Teaching areas:** Technology and Innovation; Societal Transformation.



**KRISTINA NYSTRÖM**  
Professor  
**Research areas:** Firm dynamics and entrepreneurship, recruitment of competence in a regional perspective  
**Teaching areas:** Technology-based entrepreneurship.



**PER THULIN**  
PhD  
**Research areas:** Entrepreneurship and innovation  
**Teaching area:** Economics.



**VLADIMIR KOUTCHEROV**  
Docent, researcher  
**Research areas:** Sustainable energy, genesis of hydrocarbons  
**Teaching area:** Energy.



**HANS LÖÖF**  
Professor  
**Research areas:** Economics of innovation, green economics  
**Teaching areas:** Econometrics, economics.



**ANNA NYQUIST**  
Lecturer  
**Research areas:** Sustainability marketing and communication, sustainable supply chains, entrepreneurial marketing.  
**Teaching areas:** Industrial marketing, entrepreneurship, innovation management.



**JOHANN PACKENDORFF**  
Professor  
**Research areas:** Organisation theory, leadership, gender  
**Teaching areas:** Project management, organisational development, leadership.



**HENRIK UGGLA**  
PhD  
**Research areas:** Strategic Brand Management, Brand Portfolio Management, Strategic Marketing  
**Teaching areas:** Brand Portfolio Strategy, Mature Brand Leverage Strategy, Luxury Branding.



**MONICA LINDGREN**  
Professor  
**Research areas:** Organisation theory, leadership, gender  
**Teaching areas:** Project management, organisational development, leadership.



**MAXIM MITEREV**  
Assistant Professor  
**Research areas:** Project studies, business model innovation.  
**Teaching areas:** Project management, management of project-based organizations.



**CALI NUUR**  
Professor  
**Research areas:** Innovation processes, industrial and technological transformation processes, industrial dynamics, circular economy  
**Teaching areas:** Industrial and technical change.



**CHRISTIAN THOMANN**  
Associate professor  
**Research areas:** Financial Mathematics, Business and Management  
Corporate Finance  
**Teaching areas:** Financial Mathematics, Business and Management Corporate Finance.



**LARS UPPVALL**  
Associate professor  
**Research areas:** R&D Management and Innovation: Collaborative Work in Product Development, Sustainable Transport  
**Teaching areas:** Perspectives on Industrial Management, Change Projects in Industrial Management.



**LUCA URCIULI**  
Associate professor  
**Research areas:** Resilience and sustainable supply chains, climate risks, infrastructure intelligent access  
**Teaching areas:** Logistics, supply chain management, operations, risk management.



**ANNA WAHL**  
Professor  
**Research areas:** Gender and organization, management careers, homosocial cultures, heterosocial strategies, work for change and gender-based violence  
**Teaching areas:** Organization studies, gender studies, critical diversity management and theories on work for change.



**PERNILLA ULFVENGREN**  
Associate professor  
**Research areas:** Socio-technical system analysis, Complexity management/engineering, Sustainable innovation  
**Teaching areas:** Engineering methods, System change and risk management, Human factors/Ergonomics.



**MATTIAS WIGGBERG**  
Researcher  
**Research areas:** Digital transformation, Artificial Intelligence, Digital Skills and Competence  
**Teaching areas:** Digitalisation.



**FRAUKE URBAN**  
Professor  
**Research areas:** management of sustainable energy systems, sustainability transitions, energy and climate policy  
**Teaching areas:** Management of sustainable energy systems, industrial dynamics; management of innovation.

We are multicultural!  
One in three at INDEK has a foreign background.

## Inhouse doctoral students



**AMELIE BENNICH**  
**Dissertation area:** digitalisation and water  
Defense planned: autumn 2024.



**ELINA GOBENA**  
**Dissertation area:** Dynamic capabilities and reskilling  
Defense planned: Autumn 2024.



**ARI PRASETIA**  
**Dissertation area:** Resilient Supply Chain in Sustainable Built Environment  
Defense planned: 2028.



**ERIKA BLOMSTARND**  
**Dissertation area:** gender equality and diversity work in engineering cultures  
Defense planned: Spring 2026.



**EVELINA HÅDÉN**  
**Dissertation area:** Digital Innovation  
Defense planned: 2026.



**BEATRIZ PÉREZ HORNO**  
**Dissertation area:** Circularity systems and solutions  
Defense planned: 2027.



**EMILY CHRISTLEY**  
**Dissertation area:** Sustainable Energy Transformations in Aviation  
Defense planned: Autumn 2025.



**HANNES KRISTOFERSSON**  
**Dissertation area:** Electrification of road freight transports  
Defense planned: Autumn 2027.



**ISABEL WERNER RUNEBJÖRK**  
**Dissertation area:** Organizational behaviour: leadership in collaborative research  
Defense planned: Autumn 2025.



**ADAM BERTHOLD**  
**Dissertation area:** AI and Industrial transformation  
Defense planned: 2027.

## Post Docs and guest researchers



**CHARLOTTA LINSE**  
Post doc  
**Research areas:** Managing uncertain product development work, Adopting agile beyond software  
**Teaching areas:** Organization and knowledge-intensive work.



**MARK SACTUARY**  
Guest researcher  
**Research projects:** Climate risks.



**PETTER DAHLSTRÖM**  
Post doc  
**Teaching corporate finance**  
**Research areas:** Research on asset pricing of carbon emission targets and on Firm Innovation and carbon emission targets.



**ADAM UHRDIN**  
Post doc  
**Research projects:** Fostering Innovation Ecosystems for a Green Mobility Transition; Drive Sweden Business Model Lab; Urban Logistics Barkarby.



**EMMA RUI LU**  
Post doc  
**Research areas:** Research on managerial intent of climate target adoption and effects on firm performance, and research on AI technology and evolution of professional work.



**THOMAS DRACHBACHER**  
Guest researcher  
**Research areas:** Innovation ecosystems for green Mobility Transitions.

## Support



**CAROLINE AHLSTEDT**  
Operations Controller



**VARDAN HOVSEPYAN**  
Datasupport.  
IT and technical support.



**SÉBASTIEN GUSTIN**  
Webmaster and Informaster  
Local IT and technical support.

They make sure everything works

## Professors emeriti

Pontus Braunerhielm  
Jan Forslin  
Claes Gustavsson  
Bo Göransson  
Staffan Laestadius  
Lena Mårtensson  
Esmail Salehi-Sangrai  
Thomas Sandberg

# Education



## BSc and MSc Education

The department delivers a large number of courses to engineering programs across the five schools of KTH. During 2023, INDEK offered over 60 courses in total, of which about 20 percent at bachelor level and 80 percent at master level.

The courses cover a broad range of subjects within the field of industrial economics and management, such as: accounting, costing, corporate finance, business economics, innovation management, operations and supply chain management, business analytics, industrial marketing, entrepreneurship, gender studies, organizational theory, project

management, industrial dynamics, and sustainability transitions.

Through our engagement at the Stockholm School of Entrepreneurship (SSES), INDEK also provides access to the thriving SSES-community of entrepreneurship scholars and students from six universities in Stockholm. INDEK is furthermore responsible for the execution of three master programs with about 1,000 students in total:

- **MSc in Industrial Engineering and Management (CINEK, TIEMM).** Five years, bachelor + master, about 160-170 students admitted annually.

- **Master in Industrial Management (TINEM).** Two years master, about 100 students admitted annually.

- **Master in Technology-based Entrepreneurship (TTBEM).** Two years master, about 40 students admitted annually.

In the fall of 2023, the first students, from all over the world, started the new master program in Technology-based Entrepreneurship. This novel program reinforces INDEK's role as a main player in the field of entrepreneurship in Sweden. The new program repla-

INDEK has more than 1,000 students

ces the one-year master program in Entrepreneurship and Innovation Management.

The Academic Year 2022/23 was the first time the new INDEK courses in the first year of the master program in Industrial Engineering and Management (TIEMM) were given. The new courses are designed to address the grand societal challenges that will shape the environment in which our graduates will work, i.e., climate change, digitalization, and globalization.

MILESTONE 2023

## He holds the secret to the students' hearts

Bo Karlsson, who has served as the director of studies at the department for ten years, is esteemed by his colleagues for his good report with students.

How do you cultivate such positive relationships with students?

"To begin with, I view myself as a teacher rather than a researcher or a director of studies. I thoroughly enjoy interacting with students – it is both rewarding and challenging. Most of our students are highly intelligent, many of them are smarter than I am, however, I bring years of experience to the table. I believe the key is to take students seriously and afford them the time they deserve. By treating them with respect, you earn their respect in return."

You seem passionate about your job. What motivates you?

"Having spent the majority of my career at KTH in various roles, I returned to INDEK in 2014 with a renewed focus on teaching and student engagement. It is really rewarding if you can make a difference in a young person's life. They arrive as high school graduates and leave as young adults."

How will INDEK continue to remain relevant and offer some of



Bo Karlsson

Sweden's most attractive engineering programs?

"We have to keep our eyes on the ball all the time. Engineers are problem solvers, so we must give them both the tools to formulate, analyze, and solve relevant problems, as well as to understand the broader context in which they will operate. This involves providing them with a strong foundation in mathematics and natural sciences, along with deep knowledge in their chosen technical field and a thorough understanding of industrial management. At INDEK, we emphasize the synergy between social sciences and the students' technical specialties. Collaboration with other departments at KTH enriches this interdisciplinary approach. It is the combination of these subjects that gives us the edge. This is what engineering is all about."

# Mana Farshid's master turns engineers into entrepreneurs

In August, Mana Farshid, associate professor, was part of launching a brand new master's program at INDEK: "Tech-based Entrepreneurship".



Mana Farshid

Why was the new program needed?

"The genesis of our new master's program, *Tech-based Entrepreneurship*, stems from a demand both within our student body and the market. We've transformed a one-year entrepreneurship program into a comprehensive two-year masters', offering students a deeper immersion into Stockholm's entrepreneurial ecosystem."

Are the students good enough?

"Absolutely. We had an impressive pool of 550 applicants from various corners of the globe. From this cohort, we carefully selected 35 students. The interest underscores the popularity of the topic and reaffirms KTH's reputation in this domain."

Why did you want to take on the job of starting a new master's program??

"My decision to lead this initiative was motivated by the shortcomings from the exist-

ing one-year program, where I previously served as program director. We aspired for enhanced international engagement, a stronger emphasis on practical application, and an opportunity to expand the connections with industry stakeholders."

What are the main challenges of starting a new master's program?

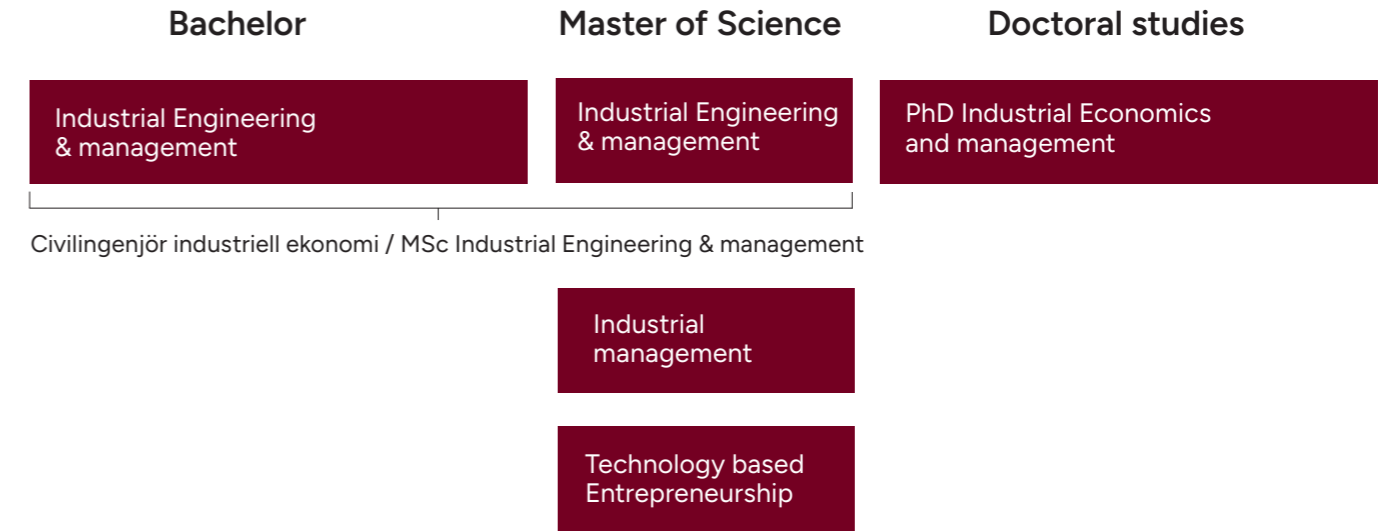
"Convincing KTH of the necessity for a business-oriented program within a technical university was undoubtedly our initial hurdle. However, it's crucial to recognize that such a program is invaluable for engineers, facilitating the translation of their innovative ideas into viable market solutions."

# Doctoral Education

INDEK's PhD program relies on the multi-disciplinary expertise of approximately 40 faculties, intersecting technology, management, social sciences, and humanities. Students joining the program have the possibility to conduct own research for a period of 5 years, during which 20% of the time is allocated to departmental duties. The research is expected to culminate into a doctoral thesis, an independent and original (theoretically and empirically) contribution to a selected field of research and scientific community. In some cases, students may opt to publish and defend a licentiate dissertation half-way to the completion of the doctoral studies.

The program usually admits 2-4 students per year. Currently, the program has 13 active inhouse PhD students. During 2023, five PhD theses were successfully defended within the program.

**CHIZARYFARD ARMAGHAN**  
The Industrial Transformation Towards the Circular Economy: Dynamics, Drivers and Constraints  
Main supervisors: Cali Nuur and Paolo Trucco  
Assistant supervisor: Emrah Karakaya.



# Dissertations of 2023

**DANIEL BERLIN**  
Industrial Networks: Purposes and Configurations in the Circular Economy.  
Main supervisor: Andreas Feldman.  
Assistant Supervisor: Cali Nuur.

**CAMILLA RUNDBERG**  
Critical conversations: Constructing gender in career counselling.  
Main supervisor: Monica Lingren,  
Assistant Supervisor: Charlotte Holgersson.

**IVAN RIDDERSTEDT**  
Improving the Efficiency of Public Procurement: Empirical evidence using micro-level contract data.  
Main supervisor: Hans Lööf  
Assistant Supervisor: Jan-Eric Nilsson.

**INGRID VIKLUND ROS**  
Exploring the links between knowledge spillovers, trade, productivity, and innovation.  
Main supervisor: Hans Lööf  
Assistant supervisor: Anders Broström



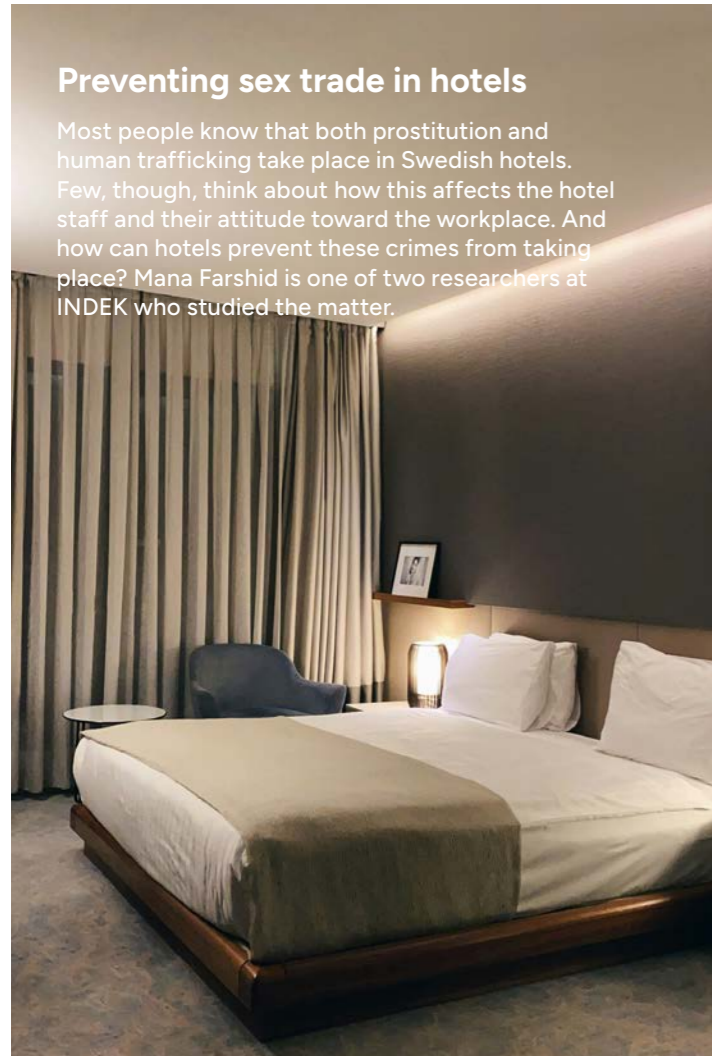
# In the flow

The vibrancy and dynamism of an academic institution are reflected in the breadth and depth of its external engagements and societal impact. "INDEK in the flow" shows some examples of the rich tapestry of our participation in the broader academic and professional communities.

Kristina Nyström appointed to the Industry's Economic council and climatic hazards.

Christian Thomann debates in SVD about government support for industrial restructuring.

Fabian Levihn has been appointed member of the expert group on carbon removals at European Union DG CLIMA.



## Preventing sex trade in hotels

Most people know that both prostitution and human trafficking take place in Swedish hotels. Few, though, think about how this affects the hotel staff and their attitude toward the workplace. And how can hotels prevent these crimes from taking place? Mana Farshid is one of two researchers at INDEK who studied the matter.

## Upgrading of a journal founded by Terrence Brown

The International Journal of Entrepreneurial Venturing, founded by INDEK Professor Terrence Brown who is also editor-in-chief, is now indexed in Studies on Women and Gender and was granted an initial Impact Factor of 1.5 by Clarivate Analytics (Web of Science).



## AI focus at WASP-HS Summer School

The Wallenberg Foundations initiative for humanistic and social scientific research in AI and autonomous systems (WASP-HS) Summer School, hosted by INDEK in August, brought together more than 70 doctoral students for a dynamic exchange of ideas.

## A debate forum in research and education

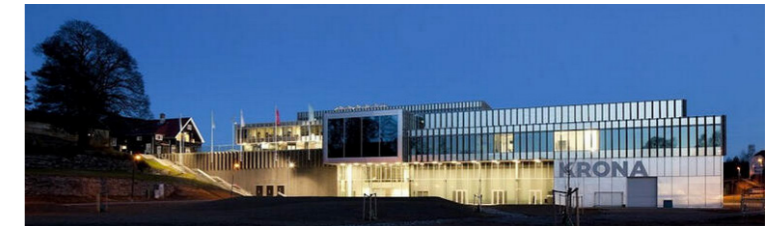
During the year INDEK launched a new debate forum aimed at discussing contemporary scholarly issues on research and education. Weak performance of Swedish professors and a skewed distribution of their societal impact were the first issues presented, based on a study by Mats Alvesson, Lund universitet och Fredrik Sjöholm Research Institute of Industrial Economics.

*"Circular thinking must move from being something that is optional to something that is mandatory. This should run like a red thread through both the academy's work and when running companies."*

Former Scania CEO Henrik Henriksson who initiated the new doctoral course "Sustainable Industry" 2023.

## New PhD course launched at Winter School

Frauke Urban (INDEK) and Saman Nimali Gunasekara (EGI) organized a PhD Winter School on "Sustainable Energy Transitions – Technology and Management Perspectives" on 13 – 15 March 2023 at KTH.



## INDEK shines at the SCAIEM conference

The 11th Scandinavian Academy of Industrial Engineering and Management (SCAIEM) conference was held at the University of South-Eastern Norway, Kongsberg between 29/11-1/12 (INDEK and KTH hosted the 7th edition in 2019). As tradition dictates, at SCAIEM Conferences various prestigious awards are given on exceptional contributions to education and research. This year researchers at INDEK have excelled; Armaghan Chizaryfard received the Thesis-of-the-Year Award, Adam Urhdin received the Seeding Grant.

## Initiative to protect buildings against climate threats

An ambitious and innovative European project, MULTICLIMACT, designed to revolutionize the protection of the built environment against locally relevant natural and climatic hazards.

This collaborative initiative is set to advance resilience, sustainability, and safety for communities throughout the European region. KTH will participate to the project, with Luca Urciuoli from INDEK as Principal Investigator Qian Wang from ABE, and 2 PhD students, Ari C.G. Prasetia, INDEK, and Giorgos Aspetakis, ABE.



# Some granted research projects



## Innovation Capacities in Water Utilities – what’s the best practice?

Water systems are vital but struggle to innovate due to high costs and focus on daily operations. Climate change and other pressures demand new approaches. The researchers will explore how to organize for long-term technical development, plan for future technologies, and implement new solutions. The goal is to find common patterns for all utilities to learn from. The project will involve studying innovative water utilities in Sweden and other countries, like Denmark, England, and the Netherlands. This will be done through case studies to identify best practices.

Contact: Mats Engwall  
Funder: Mistra  
Grant: SEK: 5 096 469

## Expert Learning Lab project

Swedish industry faces a challenge when it comes to retaining, attracting, and developing experts in advanced digitalization. To address this need, Advanced Digitalization is funding a cutting-edge initiative: Expert Learning Lab. Leading companies and universities collaborate in establishing a lab that will rapidly and effectively enhance the skills of technical experts.

Contact: Mattias Wiggberg  
Funding: Vinnova  
Grant: SEK: 9 806 645

## Climate impact of payment services

This project examined the climate impact of retail payments in Sweden in 2021, including cash, card, Giro payments, Swish payments, and payment apps. The aim is to develop a method for measuring the climate impact of existing retail payment services in the Swedish market and to evaluate their individual and aggregate climate impact. The study identifies areas that can be targeted to reduce the overall impact and provide valuable information for sustainable decision-making related to payment services.

Contact: Niklas Arvidsson  
Funder: Riksbankens Jubileumsfond  
Grant: SEK: 1 600 000

Mastering research proposals:

## “Every rejection is a lesson”

Despite his fairly young age, Andreas Feldmann, associate professor, has written quite a few research proposals in his life. Last year, he helped the research project CircSolar receive 2,7 mkr grant from Vinnova.

What is the secret of writing good research proposals? What does the topic do, how do you formulate it??

“There is a lot of debate on circular economy and materials, which means there are many opportunities for grants. I’ve started to work more closely with researchers that develop new technologies and materials. The projects grants that we got were probably a combination of luck and the work that we have done in the past five years. We’ve submitted a lot of proposals – and I mean a lot – and every time we got a rejection, we refined the ideas for the next time. In two of the cases, I think the consortium was essential to dedicate more time to research.”

The CircSolar project received a decent bag of money, what is this project about and what problem will it solve?

“For CircSolar, a big portion of the sector was joining the consortium and this is important for Vinnova.



Andreas Feldmann

This was much thanks to our advisory board, where one of our consortium partners is a member. The purpose of the project is to help develop a future infrastructure for circularity of solar panels. Today, there are very few panels that are scrapped, but with the expansion in the last couple of years, we risk getting in trouble if we don’t start to plan for how to handle their end-of-life. Blades2Circ is an EU-project with a similar purpose but for

recycling of wind turbine blades.”  
You are involved in many things at INDEK, both within research and education, what do you find most fun??

“I think the best part of my job is the variation. We have very good students, so if I want to deliver high quality education to them, I need to constantly develop. It’s a cliché, but I think research and education strengthen each other.”

... Some granted research projects



## Drive Sweden Business Model Lab

The purpose of the Drive Sweden Business Model Lab project is to support Drive Sweden's work to tackle sustainability challenges that society and businesses are facing by accelerating the implementation and use of automated, connected, autonomous and shared mobility. The goal is to identify opportunities and remove obstacles to the business model innovation that is necessary for these technical solutions to have a commercial impact both in Sweden and abroad.

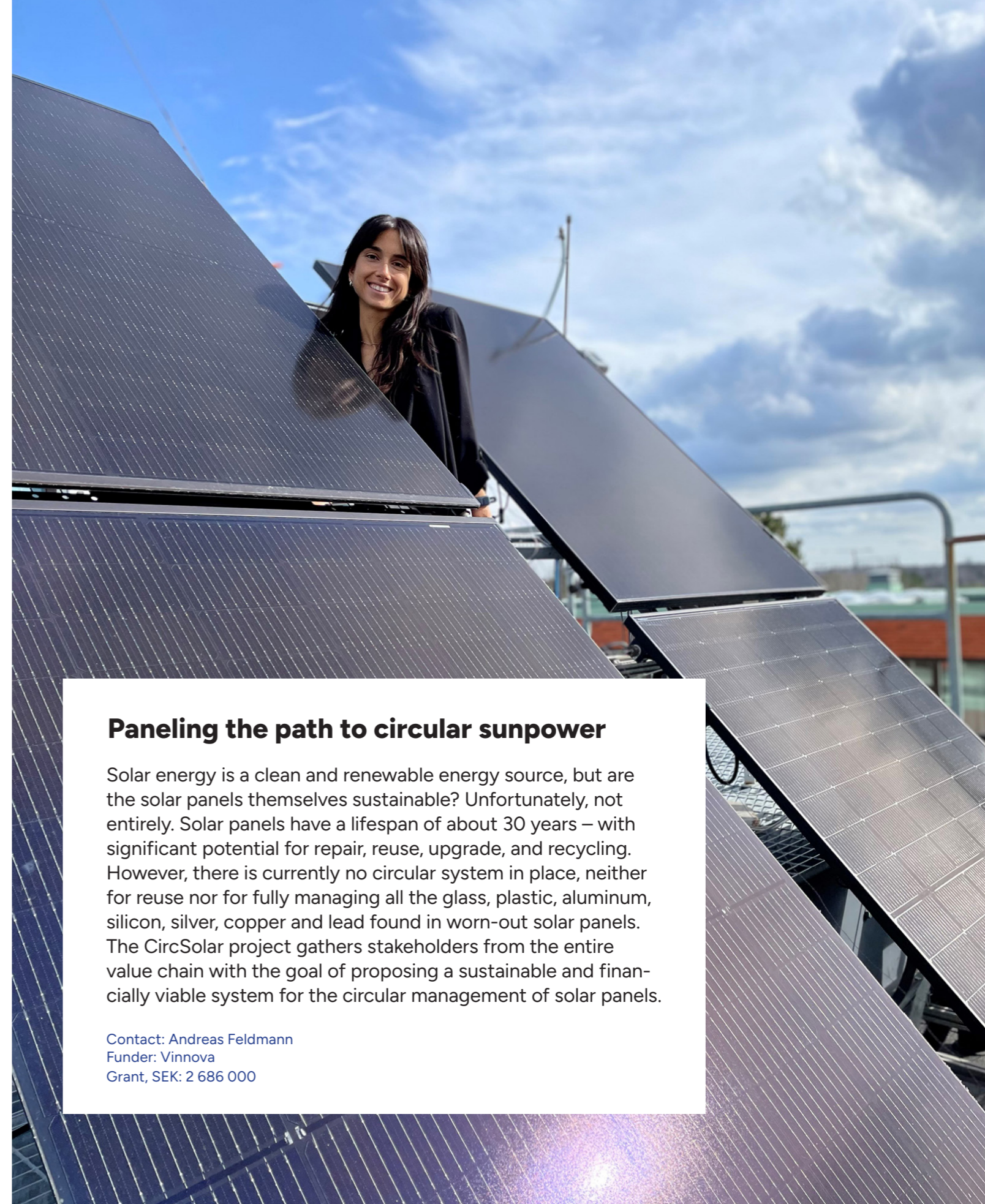
Contact: Adam Uhrdin  
Funder: Vinnova  
Grant: SEK: 1 600 000

A large part of the research centers around digitization and climate change

## The impact of the EU emissions trading system on behavior and CO2 emissions

Carbon pricing is often emphasized as one of the most important policy tools for achieving decarbonization and creating a more sustainable growth path for the economy. Still, there is a lack of comprehensive empirical evidence as to how different ways of pricing carbon affects firm behavior and most notably carbon dioxide (CO<sub>2</sub>) firm-level emissions. In this project, which is part of a broader research agenda on carbon pricing, we will investigate how Swedish manufacturing firms have responded to the incentives provided by the world's largest carbon pricing market (European Union Emission Trading System, EU ETS), which came into place in 2005. The research will provide novel insights into how firm-level CO<sub>2</sub> emissions change in response to the pricing from emissions rights provided by the EU ETS.

Contact: Christian Thomann  
Funder: Wallenbergstiftelserna  
Grant: SEK: 857 300



## Paneling the path to circular sunpower

Solar energy is a clean and renewable energy source, but are the solar panels themselves sustainable? Unfortunately, not entirely. Solar panels have a lifespan of about 30 years – with significant potential for repair, reuse, upgrade, and recycling. However, there is currently no circular system in place, neither for reuse nor for fully managing all the glass, plastic, aluminum, silicon, silver, copper and lead found in worn-out solar panels. The CircSolar project gathers stakeholders from the entire value chain with the goal of proposing a sustainable and financially viable system for the circular management of solar panels.

Contact: Andreas Feldmann  
Funder: Vinnova  
Grant, SEK: 2 686 000

# 5

## ongoing projects

explained by the researchers

### AI related projects

Contact: Jannis Angelis



As the focus on digital technologies, particularly AI, continues to grow, my research team explores *algorithmic management*, the academic term for autonomous decision-making based on data. My current work investigates four key areas. First, we're examining how AI can be used for more than just optimizing existing performance metrics, developing models for AI-driven performance systems that support management in dynamic business environments. Second, I'm collaborating with researchers to understand the factors influencing successful technology adoption,

identifying strategies to overcome challenges in today's complex ecosystems. Third, we're exploring how companies can capture value from AI through appropriate business models, focusing on customizing smart blockchain contracts. Finally, building on existing research, I'm continuing to develop tools and understanding of AI's role in anti-money laundering and other financial applications. This research translates into real-world impact through publications and collaboration with professionals to ensure practical application of these advancements.

### APIS

Contact: Pernilla Ulfvengren

APIS – Acoustics and annoyance of future aviation – simulation Platform and Implementation Systems a project that develops a simulation platform for future drones' noise footprint on ground. EU-strategies and Swedish Government assignments drive development of a competitive drone industry. Urban Air Mobility (UAM) is envisioned to become a new fossil-free transport economy. Arguments are made for its potential for reducing challenges of urbanization, such as mobility, congestion, and replacement of fossil-dependent transport. APIS works with concept of operations and scenarios to evaluate environmental goal conflicts and innovation challenges. Noise has severe effects on Stockholmers' health and well-being. A full-scale UAM comes with benefits and costs. APIS develops guidelines and identifies knowledge gaps for Stockholm city and its region to maintain disposal over its airspace to maximize benefits and minimize costs for its citizens. APIS is part of a project portfolio derived from research calls from KTH Centre for sustainable aviation and is funded through TRV Aviation research.



## Are green funds more sustainable?

Contact: Mark Sancturary

Investment funds that claim to contribute to sustainable development are growing rapidly, yet there is little evidence to support their sustainability claims. In our research, we investigate thousands of European equity fund portfolios. Our aim is to identify differences, fund portfolios and in particular to understand the extent to which funds with a sustainable investment label actually invest in assets that conventional funds do not. We use numerical methods borrowed from other scientific disciplines to analyse 24 500 securities held by 6888 equity funds traded on European markets as of March 2023. This

methodology reduces the fund comparison matrix from thousands of dimensions to two dimensions. We classify each fund into three sustainable investment categories by the EU Taxonomy: dark-green, light-green, or conventional funds. With a few exceptions, the results indicate that the compositional differences in fund holdings across these three types of funds are small: green fund portfolios are largely the same as conventional fund portfolios. Our preliminary findings suggest that the EU's regulatory effort on sustainable finance has not yet delivered on anti-greenwashing objectives, and that the way green funds allocate is doing little to shift the way funds in general allocate.



## A big data analysis on labour market performances

Contact: Hans Lööf

Aging populations in most OECD countries are causing labor shortages across both intellectual and manual occupations, even with increased efficiency from automation and digitization. This could hinder long-term productivity, innovation, and growth. My research, conducted with an international team, explores whether asylum seekers can help address this problem. Using data from six administrative registers at Statistics Sweden (coordinated by unique identification codes), we analyzed wages for 100,000 refugees granted asylum in Sweden between 1980 and 1996. We compared their wages across 426 occupations,

6 industries, 5 company sizes, 6 municipality types, and 5 regions, to a control group of Swedish-born wage earners. Preliminary results show that immigrants working full-time have higher median wages than comparable Swedes with similar jobs, a few decades after receiving asylum. This positive outcome is true for both cognitive and manual tasks, routine and non-routine, and is partly driven by female immigrants. The project database with project numbers and program codes will be available at SCB for replication studies or future research database updates.



## The start of something new

Contact: Adam Uhrdin

New research at Indek often blossoms from collaborations like the recently proposed EU project, "Cooperation for Hubs in Urban Logistics" (CO4HUB). It began with a paper presented by me and Mats Engwall at an R&D conference. There, we met Thomas Draschbacher (PhD student), who, interested in our work on electric vehicle business models, requested our paper. This shared interest sparked an initial collaboration through friendly paper reviews. The connection grew stronger when Mats invited Thomas to Indek as a guest researcher. Meanwhile, to secure funding for a project on sustainable transport business models, me and Thomas sought a third partner. Esko Hakanen (researcher, Aalto University) joined the team, receiving funding for a joint workshop to prepare a European research grant proposal. A small consortium formed and submitted a preproposal. To refine it, me and Esko leveraged additional funding for a development week in Graz. This intensive work, along with expanded partnerships (including two French universities), resulted in a complete proposal for a three-year research project led by Indek's new, multinational, cross-disciplinary research group.



MILESTONE 2023

## "Sweden's carbon taxation offers valuable lessons"

Christian Thomann is Indek's "Mr Emission" after having received a lot of attention for his research on emission allowances.



Christian Thomann

Why do you think this has gained so much interest?

"Carbon pricing is increasingly recognized as a crucial policy tool for reducing greenhouse gas emissions and combating climate change. Sweden's long-standing experience with carbon taxation, introduced in 1991, offers valuable lessons. Our study leverages unique Swedish data to shed light on how effective carbon pricing can be in reducing emissions, providing new insights that have garnered significant interest."

What are your key findings?

"Our primary discovery is that carbon pricing significantly lowers emissions. Our analysis suggests that, without carbon pricing, Sweden's emissions could have been approximately 30% higher in 2015. Additionally, we found that high-emission firms require financial support to achieve substantial emission reductions."

Will your results change anything and for whom?

"The findings of our study have important implications for

policymakers. We highlight that while carbon pricing effectively reduces emissions, it is insufficient on its own for high-emission firms. These companies also require access to finance (e.g., bank loans or sufficient cash flows) to invest in clean technologies. Therefore, our research suggests that governments should consider enhancing carbon pricing strategies with financial assistance programs for these firms."

What will be your next project/passion??

"We will investigate the impact of carbon prices on corporate investment behaviors, particularly in sectors with high emissions. Recent years have seen a surge in investments in these sectors, and our research aims to determine whether shifts in carbon pricing have driven this trend."

## Engagements within KTH

- KTH Appointment Board – Monica Lindgren
- ITM – Deputy head school and director of undergraduate studies: Anna Jerbrandt
- KTH Faculty Development – program director: Johann Packendorff
- KTH Equality Office – expert advisors: Monica Lindgren, Johann Packendorff, Åsa-Karin Engstrand, Charlotte Holgersson
- The Stockholm School of Entrepreneurship, Head, KTH Entrepreneurship Lab – Terrence Brown
- KTH Entrepreneurship Lab - Terrece Brown
- KTH – Stockholm Environment Institute partnership – steering committee: Emrah Karakaya
- ITM School Management – vice dean of education: Anna Jerbrandt
- ITM IRIS Program – project director: Anna Jerbrandt; Area Coordinators: Anders Broström, Frauke Urban, Mats Engwall
- MSc in Industrial Engineering and Management (CINEK) – Åsa-Karin Engstrand
- Master in Industrial Engineering and Management (TIEMM) – program director: Andreas Feldman
- Master in Industrial Management (TINEM) – program director: Emrah Karakaya; deputy program director: Lars Uppvall
- Master in Innovation and Entrepreneurship – program director: Mana Farshid
- MSc in Industrial Engineering and Sustainability – program director: Pernilla Ulfvengren
- KTH Centre for Sustainable Aviation – director: Pernilla Ulfvengren
- Digital Futures – digitalized industry: Mats Engwall; educational transformation: Mattias Wiggberg
- SCI School, strategic council – Anna Wahl.

## Engagements outside KTH

- European Academy for Industrial Management – fellow: Mats Engwall
- Institute of Management of Innovation and Technology (IMIT) – board: Cali Nuur; fellow: Mats Engwall
- Marie Cederschiöld University – faculty board: Johann Packendorff
- Politecnico di Milano; School of Management – advisory board: Mats Engwall
- Ratio Institute – board: Elina Gobena; researcher: Kristina Nyström
- Scandinavian Academy of Industrial Engineering and Management (ScAIEM) – chairman: Mats Engwall
- Stockholm School of Entrepreneurship – board: Cali Nuur
- Swedish Entrepreneurship Forum – managing director: Anders Broström; researchers: Pontus Braunerhjelm, Per Thulin
- Swedish Gender Equality Agency – scientific committee: Anna Wahl
- Swedish Human Factors Network – board: Pernilla Ulfvengren
- Swedish Project Academy – fellows: Mats Engwall, Anna Jerbrandt, Johann Packendorff
- Swedish Royal Academy of Engineering Sciences (IVA) – fellows: Pontus Braunerhjelm, Mats Engwall
- Swiss National Science Foundation – gender equality commission: Anna Wahl.
- Centre for Innovative Human Systems (CIHS) - Trinity College Dublin affiliated lecturer and researcher – Pernilla Ulfvengren
- Trustee, Institute for Management of Innovation and Technology, (IMIT) – Terrence Brown
- Entrepreneurial Marketing Special Interest Group, American Marketing Association. – Terrence Brown

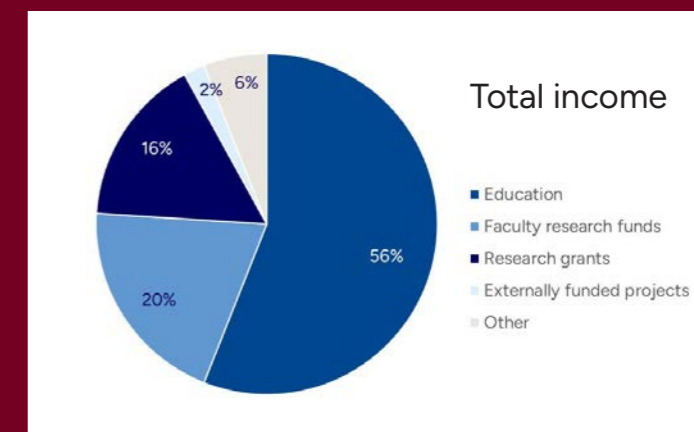


## Scientific Journals Editorial boards and board members

- Annals of Regional Science, Hans Lööf
- Industry and Innovation, Anders Broström
- International Journal of Empirical Economics, Hans Lööf
- International Journal of Project Management, Maxim Meterev
- International Journal of Project Organisation and Management, Johann Packendorff
- International Journal of Information Technology Project Management, Johann Packendorff
- Journal of Change Management, Monica Lindgren, Johann Packendorff
- Journal of Family Business Management, Johann Packendorff
- Project Leadership and Society, Maxim Meterev
- Project Management Journal, Maxim Meterev, Johann Packendorff
- Scandinavian Journal of Management, Monica Lindgren
- The International Journal of Entrepreneurial Venturing, Terrence Brown.

# Financial report

Indek has a total turnover of SEK 93 million. Activities are financed to three-quarters of internal grants for undergraduate, masters and post-graduate education. The major cost items are personnel (52%), KTH common costs (28%), and premises (12%).



## Our measures to improve the economy

Caroline Ahlstedt, operations controller at Indek, how do you assess the financial statement?

"We have seen some deterioration over the past year, with a deficit of three million kronor."

What were the main reasons?

"Costs for premises have increased significantly and the external research grants have decreased slightly."

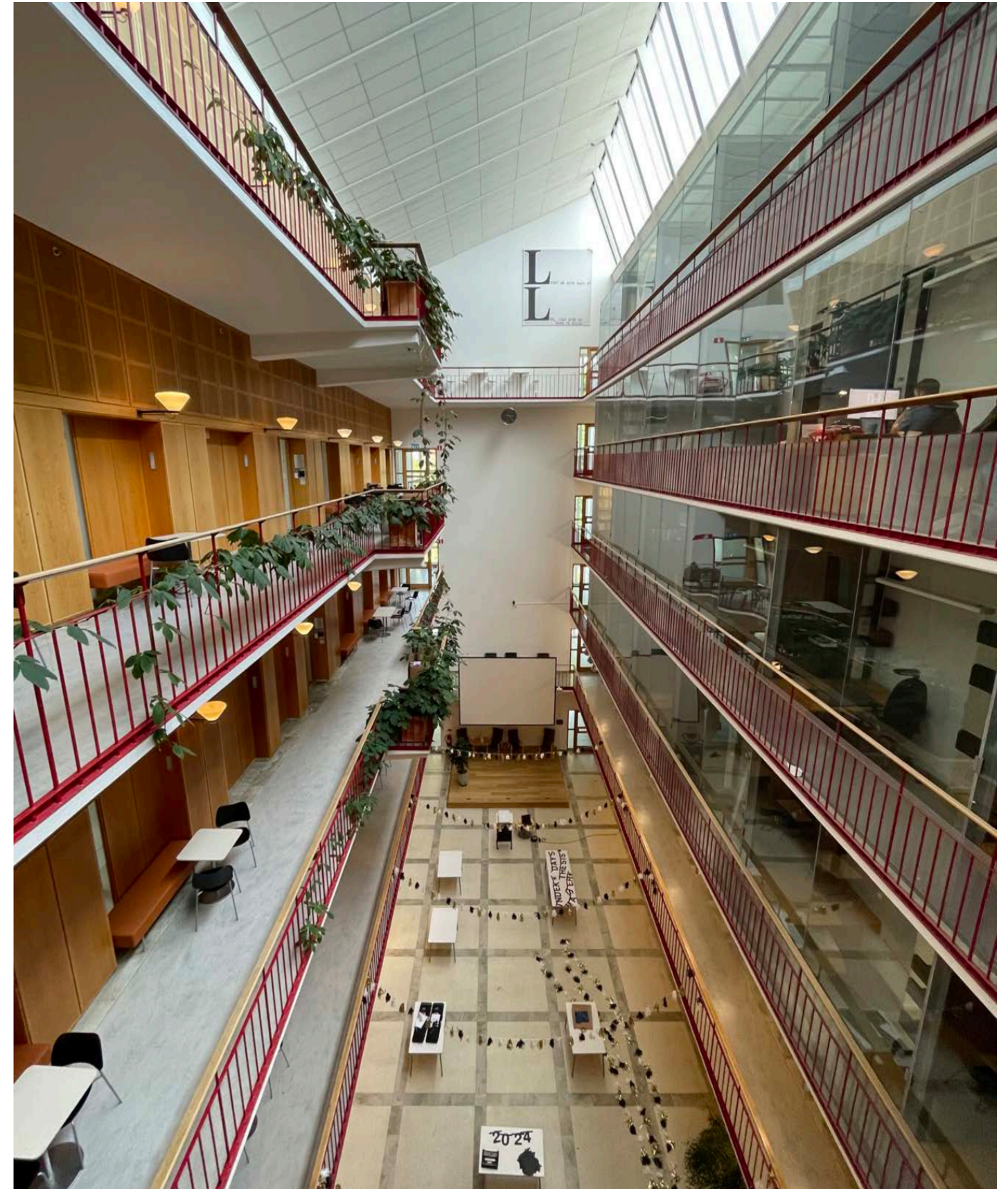
What measures are you taking to improve the financial situation?

"On the cost side, we are working on densifying the premises. On the revenue side, we focus on increasing external research grants, attracting more students and increasing the proportion of paying students."



# Peer Reviewed Publications 2023

- Agrawal, T. K., Angelis, J., Khilji, W. A., Kalaiarasan, R., & Wiktorsson, M. (2023). Demonstration of a blockchain-based framework using smart contracts for supply chain collaboration. *International journal of production research*, 61(5), 1497-1516.
- Bennich, A., Engwall, M., & Nilsson, D. (2023). Operating in the shadowland: Why water utilities fail to manage decaying infrastructure. *Utilities Policy*, 82, 101557. Björklund, M., von Malmborg, F., & Nordensvärd, J. (2023). Lessons learnt from 20+ years of research on multilevel governance of energy-efficient and zero-carbon buildings in the European Union. *Energy Efficiency*, 16(8), 98..
- Berthon, P., Pitt, C., Park, A., & Pitt, L. (2023). When memes program the genes: What managers need to know about the emerging genetic revolution. *Business Horizons*, 66(4), 423-431.
- Björklund, M., von Malmborg, F., & Nordensvärd, J. (2023). Lessons learnt from 20+ years of research on multilevel governance of energy-efficient and zero-carbon buildings in the European Union. *Energy Efficiency*, 16(8), 98. g firms. *The Review of Financial Studies*, 35(10), 4518-4560.
- Blomkvist, K., Kappen, P., & Zander, I. (2023). Weathering storms—Technological exploration of MNCs in times of financial crisis. *Journal of World Business*, 58(2), 101416.
- Braunerhjelm, P., & Lappi, E. (2023). Employees' entrepreneurial human capital and firm performance. *Research Policy*, 52(2), 104703..
- Braunerhjelm, P., & Svensson, R. (2023). Inventions, commercialization strategies, and knowledge spillovers in SMEs. *Small Business Economics*, 1-23..
- Chizaryfard, A., Lapko, Y., & Trucco, P. (2023). Strategic closed-loop supply chain configuration in the transition towards the circular economy of EV batteries: an evolutionary analytical framework. *The International Journal of Logistics Management*, 34(7), 142-176..
- Compañero, R. J., Feldmann, A., Samuelsson, P., Tillander, A., Jönsson, P. G., & Gyllenram, R. (2023). Appraising the value of compositional information and its implications to scrap-based production of steel. *Mineral Economics*, 36(3), 463-480 .
- da Silva, E. R., Lohmer, J., Rohla, M., & Angelis, J. (2023). Unleashing the circular economy in the electric vehicle battery supply chain: A case study on data sharing and blockchain potential. *Resources, Conservation and Recycling*, 193, 106969..
- Dzhengiz, T., Riandita, A., & Broström, A. (2023). Configurations of sustainability-oriented textile partnerships. *Business Strategy and the Environment*, 32(7), 4392-4412.
- Eliasson, G. (2023). Bringing markets back into economics: On economy wide self-coordination by boundedly rational market agents. *Journal of Economic Behavior & Organization*, 216, 686-710.
- Hajoary, P. K., Ramani, V., & Nuur, C. (2023). New for Some, Old for Others: Circular Economy Practices in Ancient Time. *Circular Economy and Sustainability*, 1-11.
- Harahap, F., Nurdiawati, A., Conti, D., Leduc, S., & Urban, F. (2023). Renewable marine fuel production for decarbonised maritime shipping: Pathways, policy measures and transition dynamics. *Journal of Cleaner Production*, 415, 137906.
- Holgersson, C., & Hvenmark, J. (2023). Gender in nonprofit organizations: A critical review and research agenda. *Nonprofit Management and Leadership*, 34(1), 195-209
- Kutcherov, V. G., & Serovaiskii, A. Y. (2023). Contribution of Deep Hydrocarbons in Gas Hydrate Formation. *Chemistry and Technology of Fuels and Oils*, 59(3), 465-470.



## ... Peer reviewed publications 2023

- Laakso, L., & Hallberg Adu, K. (2024). 'The unofficial curriculum is where the real teaching takes place': faculty experiences of decolonising the curriculum in Africa. *Higher Education*, 87(1), 185-200.
- Löf, H., Sahamkhadam, M., & Stephan, A. (2023). Incorporating ESG into optimal stock portfolios for the global timber & forestry industry. *Journal of Forest Economics*, 38.
- McMullan, K. (2023). A checklist for managers to enhance influencer partnerships and avoid potential pitfalls. *Business Horizons*, 66(4), 443-452.
- Muerza, V., Urciuoli, L., & Habas, S. Z. (2023). Enabling the circular economy of bio-supply chains employing integrated biomass logistics centers-A multi-stage approach integrating supply and production activities. *Journal of Cleaner Production*, 384, 13562
- Nordensvärd, J., Sefton, T., & Godenhjelm, S. (2023). Interpreting the state-citizen nexus in contemporary Nordic legal and social citizenship: the case of divergence in restriction on freedom of movement as a mitigation policy in the COVID-19 pandemic. *Journal of International and Comparative Social Policy*, 39(1), 28-41
- Nurdiawati, A., Zaini, I. N., Wei, W., Gyllenram, R., Yang, W., & Samuelsson, P. (2023). Towards fossil-free steel: Life cycle assessment of biosyngas-based direct reduced iron (DRI) production process. *Journal of Cleaner Production*, 393, 136262.
- Papanikolaou, E., Angelis, J., & Moustakis, V. (2023). Which type of ecosystem for distributed ledger technology?. *Technology in Society*, 72, 102143.
- Papanikolaou, E., Angelis, J., & Moustakis, V. (2023). Unique or Adjustable Business Model for Distributed Ledger Technology? *Journal of Business Models*, 11(1), 13-26.
- Ribeiro da Silva, E., Lohmer, J., Rohla, M. and Angelis, J. (2023). Unleashing the circular economy in the electric vehicle battery supply chain. *Resources Conservation & Recycling*, 193:106969
- Ridderstedt, I., & Nilsson, J. E. (2023). Economies of scale versus the costs of bundling: Evidence from procurements of highway pavement replacement. *Transportation Research Part A: Policy and Practice*, 173, 103701
- Smith, A. S., Nilsson, J. E., Ridderstedt, I., & Johansson, O. (2023). Efficiency measurement in the tendering of road surface renewal contracts. *Journal of Productivity Analysis*, 60(2), 189-202.
- Susur, E., & Engwall, M. (2023). A transitions framework for circular business models. *Journal of Industrial Ecology*, 27(1), 19-32.
- von Malmberg, F., Björklund, M., & Nordensvärd, J. (2023). Framing the benefits of European Union policy expansion on energy efficiency of buildings: A Swiss knife or a Trojan horse. *European Policy Analysis*, 9(3), 219-243.
- Zaini, I. N., Nurdiawati, A., Gustavsson, J., Wei, W., Thunman, H., Gyllenram, R., ... & Yang, W. (2023). Decarbonising the iron and steel industries: Production of carbon-negative direct reduced iron by using biosyngas. *Energy Conversion and Management*, 281, 116806.







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