

UN GLOBAL COMPACT
COMMUNICATION ON ENGAGEMENT

KEA'S SUSTAINABILITY REPORT 2020-2021



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FOREWORD

WELCOME READERS

The following report reaffirms KEA – Copenhagen School of Design and Technology's support to the UN Global Compact's ten principles.

The report focuses on the principles dealing with Human Rights, Labour, Environment and Anti-corruption.

The report presents the actions KEA has taken to support the UN Global Compact and its principles illustrated in initiatives carried out from 2020-2021.

This is the 4th report, following the publications covering the periods 2014-2015, 2016-2017 and 2018-2019.

LETTER OF CONTINUED SUPPORT TO THE UN GLOBAL COMPACT

By Rector, Steen Enemark Kildesgaard

At KEA – Copenhagen School of Design and Technology, we are proud members of the world's largest Corporate Social Responsibility and Sustainability initiative, the UN Global Compact. Our sustainability initiatives form an integrated part of our educational programme areas, Design, Tech, Build, Digital and Competence, as well as the department, Facility & IT.

The UN Global Compact's ten principles are incorporated in our present strategy and will also be a major part of KEA's future strategy. The endeavours with the ten principles should not be seen as isolated efforts, as they form an integrated part of KEA's strategy where Sustainability, Business and Technology constitute three focus areas.

At KEA, Sustainability is about solving societal challenges. We wish to integrate this mindset into all our educational programmes as well as our physical facilities. One of the main areas in KEA's new strategy is Sustainability. The purpose of having a focus area on Sustainability is that every time we make a choice at KEA, the focus area will help us navigate in the right direction. To KEA, Sustainability is a benchmark that responds to a common societal challenge, and through it, we wish to live up to our responsibility as a voluntary member of the UN Global agreement. However,

not only Sustainability and Environment are important principles but also Human Rights, Labour, and Anti-corruption. Our effort to support our students was prioritised during the Corona lockdown by, phone calls and conversation to ensure the students' wellbeing.

One should always consider if the materials used are recyclable and if it is possible to reduce the resource consumption, but our strategic goal at KEA is even bigger, as we want Sustainability to be embedded in all our educational programmes. Therefore, a broad range of KEA's new programmes are designed around Sustainability, including the top-up (bachelor's) to Energy Manager, which is described in more detail later in this report. Sustainability should be an integrated part of our institution and mindset.

As a school of Applied Sciences, KEA is expected to come up with solutions to societal challenges and to further develop the initiatives that we are already taking. Our students should graduate with a mindset and the qualifications to move industries in the direction of Sustainability in a broad sense.



INTRODUCTION TO REPORT

At a first glance, it seems obvious to direct the attention to KEA's design programmes, since they turn out graduates to industries that generate large and visible consumption, and they have long had Sustainability on the agenda. It might also seem obvious to focus on our construction-related programmes, as building and construction industries account for about 30 percent of Denmark's CO2 emission; but the reality is that all KEA's programmes have Sustainability as a focal point.

Educational programmes, such as Energy Technology and HVAC Installer (Heat, Ventilation, Air-condition, Control) have been working with energy optimisation and reduction of energy consumption for a long time, but there is still more to improve.

KEA sends graduates into the world with a sustainable mindset – graduates who can contribute with sustainable solutions to complex issues in the field of energy consumption.

In the industries related to KEA's educational programmes, the sustainable development is often driven by new technology. Therefore, it is important that our programmes equip our students to being able to use new technology critically and to assess different choices of materials and technological methods in

relation to a sustainability perspective while still maintaining a financial gain.

KEA's three focus areas, Business, Technology and Sustainability, are not to be seen independently, but rather in relation to each other. In other words, sustainable technology only makes sense if it is also good business, because then, it can make a difference.

KEA is not only concerned about our students' mindset, but also our physical facilities and IT have also been evaluated in relation to Sustainability. One initiative has been to seal facades and windows to lower the energy consumption. We have further reduced our campus area with one entire building and minimised the use of square metres on the other campuses, hereby reducing our energy consumption as well as material for cleaning and maintenance.

The ten principles also bring into focus Diversity and Equity. This includes social diversity, social responsibility and ensuring equal opportunities for all.

It is a strengthening factor that KEA's cohort of students are diversely admitted from secondary education, vocational training as well as directly from the business world. When this diversity is a success, it is beneficial to both the academic and the social environment.

However, it is also constant work to ensure diversity. It is part of our social responsibility to ensure that we have an educational offer for everyone.

It is our ambition to have substantial diversity amongst staff as well as students. This calls for some improvement because some programmes are slightly too homogeneous. There is for example a predominance of women in certain design programmes and a predominance of men in certain IT programmes.

Lastly, it is important to see Diversity and Sustainability as integrated parts of the everyday at KEA; not as isolated initiatives. Sustainability is fused into the students' and the employees' daily journey at KEA. It is a journey that starts when they arrive at KEA's premises and park in our bike basement. In the basement, they will find tools for maintenance etc, and when they proceed to enter the building, they will see that sustainable materials and resources form part of the construction, the cooling system and regarding the use of water and heat. If they have lunch at our canteen, they will experience Sustainability in the value chain, food waste reduction and bio recycling. Later in the day, they will attend classes where subjects or even programmes focus on Sustainability.

The ten principles also bring into focus Diversity and Equity. This includes social diversity, social responsibility and ensuring equal opportunities for all.

THE TEN UN GLOBAL COMPACT PRINCIPLES

KEA's engagement in the ten principles means operating in ways that meet fundamental responsibilities in the areas of human rights, labour, environment, and anti-corruption.

By incorporating the ten Principles of the UN Global Compact into our strategies, policies, and procedures and by establishing a culture of integrity, KEA is not only upholding our basic responsibilities on engagement, but also setting the stage for long-term success.

KEA's engagement in the ten principles means operating in ways that meet fundamental responsibilities in the areas of human rights, labour, environment, and anti-corruption.

The Ten Principles of the United Nations Global Compact derive from:

- The Universal Declaration of Human Rights
- The International Labour Organization's Declaration on Fundamental Principles and Rights at Work
- The Rio Declaration on Environment and Development
- The United Nations Convention Against Corruption

HUMAN RIGHTS

Principle 1: KEA will support and respect the protection of internationally proclaimed human rights

Principle 2: KEA will make sure that we are not complicit in human rights abuse

LABOUR

Principle 3: KEA will uphold the freedom of association and the effective recognition of the right to collective bargaining

Principle 4: KEA will uphold the elimination of all forms of forced or compulsory labour

Principle 5: KEA will uphold the effective abolition of child labour

Principle 6: KEA will uphold the elimination of discrimination in respect of employment and occupation

ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility.

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies.

ANTI-CORRUPTION

Principle 10: KEA will work against corruption in all its forms, including extortion and bribery.

AVOIDANCE OF ABUSIVE BEHAVIOUR

#HUMANRIGHTS

Principle 1: KEA will support and respect the protection of internationally proclaimed human rights

Principle 2: KEA will make sure that we are not complicit in human rights abuse

It is fundamental that employees as well as students at KEA are met in a respectful and professional way in their student- or working life. At KEA, all employees and students are obliged to contribute to a pleasant common attitude enabling everyone at KEA to work and study in a constructive, open and peaceful environment.

If an employee or a student at KEA is subject to abusive behaviour and they cannot or fail to deal with the abusive behaviour themselves, there are procedures on how the organisation should handle the situation. All complaints will be taken seriously, and relevant possibilities of action will be examined to ensure a respectful handling of the case and the involved parties. In dealing with a complaint, it is a basic principle at KEA that it will always be acknowledged that the offended party has experienced a violation.

At KEA, it is regularly communicated internally that no abusive behaviour will be tolerated. In that connection,

a dilemma game has been developed. The game consists of 11 dilemma cards with situations from student life which the students can discuss in groups. Each dilemma represents real experiences and incidents at KEA's programmes.

KEA has a process procedure for handling abusive behaviour. The procedure is often revisited and revised to optimise the processes and keep them up to date.

Further reading:
mit.kea.dk/en/studyguide/o#offensive

Rikke Sjöblom Nielsen, HR Consultant
Katrine Thostrup Thomsen, HR Manager
Helle Guldborg, Head of KEA Library and Student Life



WHISTLE-BLOWER LINE

#HUMANRIGHTS #ANTICORRUPTION

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Principle 2: KEA will make sure that we are not complicit in human rights abuse

Principle 10: KEA will work against corruption in all its forms, including extortion and bribery

The Whistle-blower Line at KEA has been adopted by KEA's Board of Directors and is available to all employees. The line gives employees the possibility to pass on knowledge about illegalities at KEA without fear of legal consequences to their employment.

The line can be used if an employee does not feel comfortable using the regular channels - or if the employee has already reached out to the management about a serious matter without getting a solution.

Employees at KEA can submit information about:

- Other employees at KEA
- KEA's management
- KEA's board of directors
- KEA's suppliers
- KEA's partners

However, no information can be submitted about KEA's students.

In case of suspicion of serious irregularities or illegalities it is recommended that the employee contacts his or her manager or the HR or staff representative. If this is not an option, KEA's Whistle-blower Line should be used.

The contact person who handles the inquiries is impartial and is not subject to the organisational hierarchy in the processing of cases under the Whistle-blower Line. In addition, the contact person cannot be dismissed without the involvement of the board.

If you submit information to the Whistle-blower Line, it will be assumed that you have knowledge or justified suspicion that serious matters have been committed.

These are serious matters if the information relates to offenses and non-compliance with legal obligations, danger to the health and safety of individuals, danger to the environment, serious cases of neglect and the like. Information for the whistle blower scheme can be submitted in various ways:

- Orally
- In writing
- Scanned
- Copied
- Recorded, etc.

KEA uses an external partner (Whistle-blowing Center) to secure the data reported via the whistle-blower portal.

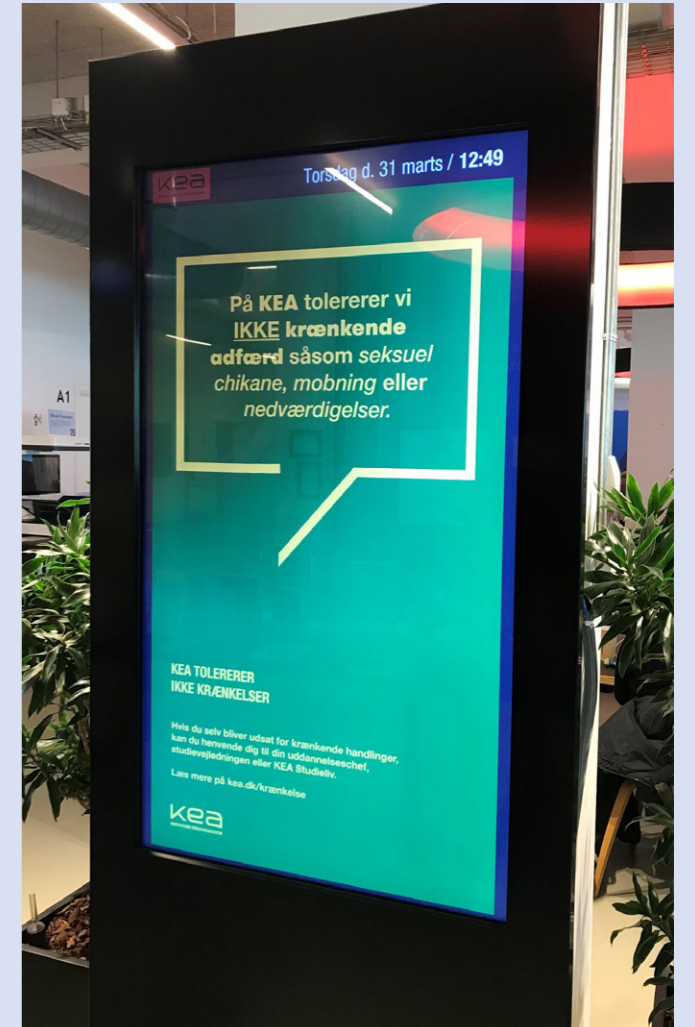
The whole process is encrypted, and password-protected, and it is possible to contact the Whistle-blower Line anonymously.

According to labour market law, it can lead to negative consequences if it turns out that an employee at KEA has committed serious negligence.

To report the Whistle-blower Line please use the following link: report.whistleb.com/kea

Rikke Sjöblom Nielsen, HR Consultant
Katrine Thostrup Thomsen, HR Manager

The line gives employees the possibility to pass on knowledge about illegalities at KEA without fear of negative consequences to their employment.



GENDER EQUALITY PLAN

#HUMANRIGHTS #LABOUR

Principle 1: KEA will support and respect the protection of internationally proclaimed human rights

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KEA has formed a network with other institutions of higher professional education and University Colleges in Denmark.

The European Institute for Gender Equality has published guidelines regarding Gender Equality in Academia and Research. In the specific context of research organisations and higher education institutions, the European Commission considers a Gender Equality Plan (GEP) as a set of actions aiming at:

- Conducting impact assessment/audits of procedures and practices to identify gender bias
- Identifying and implementing innovative strategies to correct any bias
- Setting targets and monitoring progress via indicators

We are working on a Gender Equality Plan specifically for KEA, which is a precondition for applying for EU funding (Horizon-2020 projects).

A Gender Equality Plan must only be completed when funding has been paid, but it does not have to be finished by the time of application.

The Gender Equality Plan is a strategic document, which describes how the organisation will strengthen gender equality. The compulsory requirements are a public document available at the institution's website signed by the management to certify that the institution has a GEP containing:

- Data and monitoring
- Dedicated resources
- Capacity building and training

The plan must demonstrate a commitment to promote equality among genders, set clear targets and describe the initiatives to meet the targets.

Data and monitoring: The Gender Equality Plan must be based on gender-disaggregated basic data, which is collected across staff categories e.g. wage statistics and the gender distribution at management levels, as known from the Gender Equality Statement. This data must form the basis of the plan's objectives, indicators, and efforts. The progression of the selected indicators must be measured annually.

Dedicated resources: Through the Gender Equality Plan, the organisations commit themselves to allocate dedicated resources to work on goal setting, implementation and monitoring the plan. The resources can come from specific positions such as a gender equality team, gender equality consultants or earmarked working hours for selected staff groups.

Capacity building and training: The Gender Equality Plan must be supported by training in the promotion of equality between the genders by e.g. raising awareness of unconscious gender bias among staff, managers and decision makers. The training can be integrated into the existing competence development and communication in the organisation. Training can also take place in reduced work groups, e.g. through the MED system or workshops on selected topics.

- If the requirements are met and the existing documents are signed by the management, this is equated with an equality plan. In these cases, a signed document is added on the organisation's website certifying the existing documents.
- The Gender Equality Plan is a dynamic document that is adapted each year in step with progression and goal achievement.
- The efforts should as far as possible be integrated into the already existing HR practice.
- There is no "one size fits all" - the requirements are assessed on the basis of e.g. the size of the organisation.

Line Palle Andersen, Consultant at KEA Research & Innovation, KEA Build & Tech

KEA STARTUP HUB

**#START-UPS #ENTREPRENEURSHIP #SUSTAINABILITY
#LABOUR #ENVIRONMENT**

Principle 6: KEA will uphold the elimination of discrimination in respect of employment and occupation

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

KEA Start-up Hub is the engine driving forward innovation and entrepreneurship at KEA. KEA student start-ups can join the Hub and are given access to office space, coaching, network, and a large variety of business-related workshops. Most of the start-ups related to educational programmes at KEA Start-up Hub work with or strive to work with sustainability. This is often done within the framework of the UN Sustainable Development Goals.

It is a clear mission of the Hub to be able to support the start-ups with knowledge and tools on how to work with sustainability, and the different Hub Programmes also support the strengthening of competences in sus-



tainability among the entrepreneurs. KEA's teachers as well as external partners offer specific workshops and seminars about sustainability to our entrepreneurs.

Furthermore, the physical environment of the Hub has been established according to principles of equal treatment, just as it has been stressed to create an inclusive environment promoting respect for diversity.

Annette Rye Larsen, Hub Manager, KEA Startup Hub
Gitte Jul, Internship & Ignite Coordinator, KEA Startup Hub
Helene Niclasen Jeune, Senior Lecturer, Nordic Entrepreneurship Hubs 2.0
Clarissa Berg, Project Manager, Nordic Entrepreneurship Hubs 2.0

IMPACT TOOLBOX

One programme within the KEA Start-up Hub is the Nordic Entrepreneurship Hubs (NEH), which is run in collaboration with partners from Skylab/DTU, Venture-Lab/Lund University and INKUBATOREN/Cphbusiness. It is funded by Interreg, the EU regional development fund. NEH supports start-ups to scale and grow and mixes start-ups in workshops and bootcamps across institutions, disciplines, and countries. The majority of the NEH start-ups across the four partners work with sustainability and the partners are in the process of developing an IMPACT Toolbox for start-ups and start-up coaches.

This toolbox is an online platform focused on IMPACT/sustainability with the latest knowledge, products, tools, and links to relevant places. It is where our start-ups and coaches go to seek the latest curated knowledge on how to work with sustainability, how to get proper data, partnerships and so forth.

This toolbox is an online platform focused on IMPACT/sustainability with the latest knowledge, products, tools, and links to relevant places.

All partners have identified the need for such a platform, as it is complex to work with and coach on the topic of sustainability. The field is developing every day and, consequently, there is a need to make knowledge and tools more easily accessible for start-ups and coaches. It is work-in-progress, and the internal platform is open to members of the NEH network.

Start-ups enrolled at KEA Start-up Hub are very diverse and work within different fields. Therefore, their work with sustainability takes many forms and requires different kinds of advice and support.

In the following are three examples:

- Movement-el
- Vivere
- Cherry pop

Helene Niclasen Jeune, Senior Lecturer, Nordic Entrepreneurship Hubs 2.0
Anne Marie Mathiasen, Project Manager, KEA Research & Innovation
Kristian Søndergaard Colvay, Senior Lecturer at KEA Tech

MOVEMENT-EL

Thomas Lau Jensen is studying Energy and Installation at KEA and has established his own company within this field named Movement-EL. Movement-EL works with the UN Sustainable Development Goals as its cornerstone (specifically goal 4, 7, 8, 13, 14 and 15). This is done via the technology used and its collaboration with Valified - www.valified.com and Lekon - lekon.dk who are responsible for ISO Certification e.g. ISO 14001.

Thomas has also decided that all work cars will be electric driven (ë-Jumpy Van), and the company aims to use electric cargo bikes in larger cities in the future. Movement-EL will document all its efforts with green solutions in a concrete climate account.

Thomas further explains that it is not only sustainability from an environmental perspective that he wishes to promote: *“Movement-EL will also ensure a healthy work environment and include aspects around sustainability from a social perspective and ensure the well-being of employees as well as profit sharing among employees.”*

Thomas has spent his time in KEA Start-up Hub (the Ignite programme) as an intern in his own company, and his specific focus has been how to integrate all efforts within sustainability in his entire business model.

Thomas Lau Jensen, student at KEA Energy and Installation



VIVERE

Signe and Helene got the idea for their business, “Vivere”, this summer when they were at a market with their brand, Nordic Twins. The brand consists of unique and sustainable products such as bags and hair ornaments sewn from recycled textiles. At the market, they met many other creative women, who expressed difficulties in taking the step further and becoming established businesses. Only around four percent of Danish women aged 18-64 are new entrepreneurs and that is half as many as male entrepreneurs. This gender gap ignited the desire to start Vivere and support women in becoming entrepreneurs. Their work supports the promotion of SDG 5: Gender Equality.

Signe and Helene Skov Udsen, who both study Entrepreneurship & Design and are enrolled in the KEA Startup Hub say: *“We want to promote, celebrate and support female creators - who have either already taken the step and pursued their dreams, or those who are afraid to take the step and need support and encouragement.”*

“Through Vivere women get the opportunity to set up a shop, where we run the platform, they get marketing through our channels and knowledge-sharing about entrepreneurship and become part of an empowering community with the opportunity for feedback, inspiration and support among female entrepreneurs.”

The two entrepreneurs have already received approval from 30 creative women who wish to become part of the platform and who all focus on sustainable products. The vision is that Vivere will become the Nordic region’s leading market platform for creative women who dream of creating and being independent with respect to sustainable principles.

“In the long run, we want to scale the concept to the rest of the Nordic region to promote women and pay tribute to Scandinavian design. We will do this through the platform, but also through workshops, events, and lectures - just as Female Invest has managed to do within women and investments - we will empower women to become strong entrepreneurs.”

Signe and Helene are part of the NEH-program at KEA Start-up Hub and have received tailored coaching, just as they are part of workshops focused on sustainability, systems thinking and how to make an impact as a start-up.

Signe Skov Udsen, student at KEA Entrepreneurship & Design
Helene Skov Udsen, student at KEA Entrepreneurship & Design

CHERRY POP

Cherry Pop is a website and app made mostly for schools to teach sexual education. The website and app will answer questions, bust myths, visualise what is difficult to explain and start conversations. It seeks to create a healthy and open way to teach young people about sex, puberty, consent, sexual health, mental health, body image, sexuality and more. Cherry Pop uses pop-art design and illustrations to grab the readers' attention and make difficult and often painful subjects easy to understand and relate to.

"Our goal is to make sure everyone will find a drawing they can familiarise themselves with, no matter their gender, sexuality, ethnicity, size or handicap. We want everyone to feel included and we want to make sure our drawings represent real people," Co-founder Madeleine Malling Breen states.

Cherry Pop wishes to contribute to a world where people feel comfortable in their own skin, no matter what. They want people to feel safe and secure in their sexuality and able to express themselves however they desire without discrimination. Cherry Pop wishes to play a part in moving the world towards better health, both physical and mental, and actively promotes SDG 3, 4 and 5 in all aspects of their business.

Cherry Pop has created a reliable, gender-neutral, sex-positive sexual education curriculum where everyone is included. Through fun activities, quizzes,

stories, cases and illustrations, they seek to inspire conversations and educate both students and teachers. Teachers now have a tool that is easy to use, and if a teacher is uncomfortable with teaching these topics, the students can still find all the information they need in the app. Thereby it is a safe space to be curious.

Cherry Pop is founded by four women, Madeleine Malling Breen, Izabela Ewa Hetmanowska, Asa Valdirmarsdottir and Ludmila Zimermanova. They all are or have been students at KEA Design & Business.

Cherry Pop was part of the NEH-program during spring 2021 and received tailored coaching and took part in workshops on the UN SDGs and value creation. They are still part of the KEA Start-up Hub and use the office space facilities and coaching sessions.

Follow the Cherry Pops Instagram account here:
www.instagram.com/cherry_pop_ed

Madeleine Malling Breen, student at KEA Design & Business
Asa Valdirmarsdottir, student at KEA Design & Business
Ludmila Zimermanova, student at KEA Design & Business
Izabela Ewa Hetmanowska, student at KEA Design & Business



WOMEN IN DATA SCIENCE, STANFORD CONFERENCE AT KEA

#HUMANRIGHTS #LABOUR

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The Women in Data Science (WiDS), Stanford conference, is a technical conference featuring outstanding women in Data Science and related fields such as Artificial Intelligence across a wide range of domains.

The gender gap in technology and data science has grown significantly over the last two decades, raising global concern about internal biases within tech industry as well as data and algorithms. According to BCG's article, "What's Keeping Women Out of Data Science," achieving diversity while building data science teams is not just favourable, it is crucial. In order to build more inclusive and diverse data driven societies we need to equip women with data and digital skills. This will not only solve the problem bias due to underrepresentation of women in data science, but also ensure that women and girls have the necessary skills needed to navigate through the changing career landscape.

WiDS aims to inspire and educate data scientists worldwide, regardless of gender, and to support women in the field. WiDS started as a one-day technical conference at Stanford in November 2015. Six years later, WiDS is a global movement. The initiative includes regional events hosted around the world featuring speakers from their respective regions. KEA was pleased to host Women in Data Science, Stanford conference, at KEA on 26 April 2022. The event highlighted cutting-edge research and featured a wide range of women Data Scientists and attracted a diverse audience interested or active in the field of data science.

Muniba Talha, Lecturer at KEA digital



ACCESSIBILITY AND DIGITAL INCLUSION ONLINE

#HUMANRIGHTS #LABOUR

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In this project, we research principles, guidelines and concrete practices that may lead to better web accessibility.

This project is concerned with social sustainability as it, ultimately, aims to make websites more accessible to all. We research on and with NGOs, end-users, and web developers. For instance, one significant group of web users that we research on is people who are visually impaired. The goal of this project is to provide web developers with tools to make websites accessible to all.

This project should lead to a better understanding of the challenges faced by web developers in relation to creating better web accessibility and to complying with WCAG 2.1. Also, it should lead to a better understanding of web users that may struggle with

accessibility issues. This project is currently in its developmental phases but is expected to bring great results in the future.

Per Liljenberg Halstrøm, Docent at KEA Research & Innovation, KEA Digital
Dannie Vinther, Lecturer at KEA Digital

This project is concerned with social sustainability as it, ultimately, aims to make websites more accessible to all.

AVOIDING BOTTLENECKS FOR GROWTH IN THE DANISH ELECTRIC VEHICLES CHARGING INFRASTRUCTURE

**#ENERGYCONSUMPTION #STUDENTASSIGNMENT
#BUSINESSECONOMICS&INFORMATION
TECHNOLOGY #ENVIRONMENT**

Principle 7: KEA will support a precautionary approach to environmental challenges

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Based on an investigation of the Danish market for Electric Vehicles (EV) charging infrastructure and a presentation of a Danish EV mobility service provider, groups of students from the Bachelor degree Programme in Business Economics & Information Technology were to propose a set of recommendations that would enhance the adoption of electric vehicles and support a sustainable society.

The purpose of the assignment was to analyse the challenges faced by the Danish EV Mobility Service Providers (MSPs) from multiple perspectives.

From a Macro Economic perspective, students were asked to explain how the Danish Government and

municipalities can intervene in the EV charger market and provide incentives to the MSPs, thereby facilitating continuous growth within the charger station infrastructure.

From a Supply Chain perspective, students were asked to describe and illustrate the general landscape of the current fossil-based infrastructure and how they expect the general landscape of the future EV charging-based infrastructure will look. Following this, students were asked to discuss how Danish EV MSPs can best manage the expected steep acceleration in the future EV-charger demand through relevant supply chain strategies, policies, principles and tools.

From an organisational perspective, students were asked to identify, classify, and assess the different risks that Danish EV MSPs face, as they attempt transition of the existing fossil fuel-based Supply Chain with an EV charging-based supply chain. Following this, they were asked to discuss which risk handling strategy they would see as the most relevant for the risks scored with a high probability and/or consequence.

From a business economics perspective, students were asked to make a budget/forecast for the development of revenue, gross margin, and profit as well

as a balance sheet budget including expectations for future liquidity challenges.

Additionally, students were asked to optimise an app used by customers for curbside charging based on an analysis of the context of use, a description of the requirements as well as a design and implementation of a new and better app solution for the customers.

The case was a success because the students were given the chance to work with an actual case where they could both come up with some innovative solutions to improve a business and at the same time support a more sustainable society. Additionally, the case worked well as an interdisciplinary case where the students could use their skills both from the subjects within information technology and the more business-oriented subjects.

Morten Boesen, Docent at Research & Innovation, KEA Digital & Tech

Finn Andersen, Lecturer at KEA Digital

Jens Andersen, Senior Lecturer at KEA Digital

Morten Kjærgaard, Senior Lecturer at KEA Digital

Guillaume Nadon, Lecturer at KEA Digital

Jens Rasmussen, Lecturer at KEA Digital

Janni Høyer Thoft, Lecturer at KEA Digital

Jan Ivan Andersen, Lecturer at KEA Digital

DEVELOPING A TOOL TO MEASURE SUSTAINABLE WEB DEVELOPMENT

**#ENERGYCONSUMPTION #STUDENTASSIGNMENT
#ENVIRONMENT**

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

Together with the consultancy company, Advice, we developed a tool to measure and enable dialogue on web design and sustainability with companies.

The purpose of this project is to engage companies in a dialogue about Web Design and its potential impacts on our climate. Today, the Internet produces around 3.8 % of global CO₂ emissions. We aim to raise awareness around this issue and show how Web Design can combat this problem. Also, we aim to introduce this project to our students so that they may become future change agents.

The project is an example of an applied research project with industry partners that aims to change the industry and produce relevant knowledge for the industry and, ultimately, relevant knowledge to our

students at KEA Digital. The case is ongoing, so we are excited about the future results.

Per Halstrøm, Docent at KEA Research & Innovation, KEA Digital
Alan Engelhardt, Senior Lecturer at KEA Digital
Jonas Fannikke Holbech, Senior Lecturer at KEA Digital
Christina Runstrøm, Senior Lecturer at KEA Digital
Julia Polinna, Senior Lecturer at KEA Digital

Today, the Internet produces around 3.8 % of global CO₂ emissions. We aim to raise awareness around this issue and show how Web Design can combat this problem.

ARTIFICIAL INTELLIGENCE AND ETHICS

**#ELECTIVESTUDENTSUBJECTS
#DIGITALCONCEPTDEVELOPMENT #HUMANRIGHTS**

Principle 1: KEA will support and respect the protection of internationally proclaimed human rights

Principle 2: KEA will make sure that we are not complicit in human rights abuse

Artificial intelligence is a big topic to cover, and even more so if it is to be viewed in an ethical perspective. Nevertheless, ethical consideration regarding the development and use of Artificial Intelligence is being addressed in the elective subject for students at the programme, Digital Concept Development.

If you develop systems where artificial intelligence is a key element, the ethical perspective must be included. Many Digital Decision Support Systems use Artificial Intelligence, among these the sectors of Health, Insurance and Finance. Often, but not always, the final decisions will be made by humans based on recommendations from Artificial Intelligence.

These decisions influence people's lives to different extents, which is why those who work with the systems, must ask themselves the question, *"Why am I making this decision now and is it based on the right data?"*

A harmless example is when streaming services provide bad recommendations for end-users. However, it can also have bigger consequences, like decisions about credit approval on bank loans and the size of insurance premiums.

The ethical considerations regarding self-driving cars can be simplified with the famous case of the Trolley Problem, where the person must choose to either intervene with the self-driving car and kill one person or sit back and watch five people die and bear the moral weight of his own decision.

The case is always a good kick-starter when students need to discuss the ethical issues associated with Artificial Intelligence. The challenges regarding Artificial Intelligence range widely, and can resolve in systemic discrimination in relation to age, gender, race, economy, medical history etc.

The elective subject, Value-Creating Algorithms, contains educational dilemmas and demands for transparency, while at the same time including the ethical considerations in the case work and concept development with Artificial Intelligence.

Mikkel Meldgaard, Senior Lecturer at KEA Digital

FUTURE SUSTAINABLE FASHION CONSUMERS

#SUSTAINABILITY #ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

In this project, we focus on understanding the future sustainable fashion consumers. To get to know them, we have studied today's fashion consumers with a view to the future.

The relevance of this project rests on the urgent need to accelerate the green transition within the fashion industry. It builds on the insights from the Innomission Partnership Report, "Circular economy with a focus on plastics and textiles – 2030 & 2050 roadmaps" (Innovation Fund Denmark).

In this project, we have created archetypes of future sustainable fashion consumers to better understand upcoming consumers. Ultimately, the purpose is to design better products and services for given consumers. From a sustainability perspective, we are creating tools for companies to target their products to actual needs and, hopefully, avoid pro-

ducing short term products and products for landfill.

This project is conducted in five steps. We started with 12 students from Design School Kolding interviewing seven companies with a sustainable mindset. The interview data was then formulated in five skeletons for the second group of students to continue working with. The skeletons were delivered to 15 teams of students from KEA to reflect on and conduct the Wardrobe studies with. In the end, they created visualisations of the archetypes and created scenarios of the future everyday consumers.

We applied the Wardrobe studies method in this research. It is an ethnographic design research method where the actual wardrobes at the research participants' homes are used as mediators. Further, it is a qualitative design research method that allows researchers to connect with their target group. It also provides insights into the research participants' every day.

It is a very intimate research setting, since wardrobes are often placed in the bedrooms, the most private areas of homes. We provided interview question lists for the students but expected them to conduct the research according to their own research design. Altogether, students opened 34 wardrobes in this study.

Upon the initial insights of the study, we can conclude that consumers have a growing interest in prolonging

the lifespan of their fashion possessions. This is shown by the increasing interest in re-selling clothes, buying pre-owned clothing and in mending clothes.

During the first phase of the project, a good base was created for understanding the future fashion consumers. Enough knowledge was collected to continue studying the future sustainable fashion consumers and building them into personas.

Archetypes are inspirational characters created on the journey towards building personas. Next in this study, more details will be added according to the exact target group parameters or specific sustainability approaches from the participating companies. When the personas are created according to exact frameworks, they can be utilized in the decision-making processes in design and product development.

For more information of the project please see the following: ldcluster.com

Petra Ahde-Deal, Docent at KEA Research & Innovation, KEA Design
Mette Julie Bungaard-Nielsen, Teaching Assistant Professor at Design School Kolding
Trine Stark, Senior Lecturer at KEA Design
Martin Hesseldahl, Senior Lecturer at KEA Design



CREATIVITY AND INNOVATION – WORKING WITH UNDP’S ACCELERATOR TOOLBOX

**#EDUCATIONALMODULE #DESIGN&BUSINESS
#UNDEVELOPMENTPROGRAM #ENVIRONMENT**

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

2022 is the second year the 200 students on the bachelor programme, Design & Business at KEA Design, take a mandatory module called Creativity and Innovation, where the method of the module is the UNDP’s SDG Accelerator Toolbox.

The goal of the module is to strengthen the students’ skills to join creative innovation processes. Based on applicable SDGs, the students work on a relevant industry case containing a specific challenge in relation to sustainability.

This year, the module was kicked off by an inspiring talk by Camilla Marie Thiele, Private Sector Partnership, Manager from UNDP Denmark. Camilla introduced the Toolbox by explaining what it is, why it was developed, the need for it and how to use it. After the

kick-off, the students worked in groups with different companies for six weeks, which is also the length of the module.

During the module, the students work with the tools of the Accelerator Toolbox. Alongside the work with the Toolbox, they attend lectures and workshops about how to analyse the Value Chain of a company, how to analyse the stakeholder relations of a company and how to work in an innovative process etc. The knowledge and the competencies obtained through the module enable the students to come up with new sustainable and profitable business ideas for the different companies. This year, the groups work on companies from the fashion, food, and service industries.

The assignment outcome of the module is to make a short video where the students present their ideas and explain how their solutions create an impact both in relation to sustainability as well as profit. The five best videos will be shown to a jury of experts on the last day of the module in a conference format. At the conference, experts from the industry are invited to give their feedback and perspectives on the students’ work with the SDG Accelerator Toolbox. Katrine Weicker, a Business Developer from Erhvervshuset, Heidi Boye, owner of Too Good to Go, and Mikkel Trym, expert in measuring Impact and consultant from Third Room will be amongst the experts joining the conference.

The module is a success because it is in line with Global Compact’s mission to mobilise a global movement of responsible companies to create a better world. By offering a mandatory module at the bachelor programme of Design and Business, KEA makes sure that the around 200 students not only get knowledge about the importance of Developing Sustainable Business Solutions, but also get concrete hands-on tools and competencies to change existing Value Chains or Business Concepts to getting a more positive impact on both social and environmental issues.

As the students present their work on their case companies and their best ideas to the real companies, the module also helps nudging and inspiring existing companies to begin a journey to becoming more sustainable. If the students on the course invent new sustainable and profitable business ideas that have the potential of becoming a start-up company, the students get the opportunity to continue their work on the following entrepreneurship module as well as to apply for KEA’s Start-up programme. In this perspective, the module also works as a facilitator for new sustainable business start-ups in Denmark.

Marie-Louise Lynge, Senior Lecturer at KEA Design
Helene Niclasen Jeune, Senior Lecturer at KEA Design

SÆT SUMMER SCHOOL

#ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

SÆT is a collaboration between Roskilde University, Copenhagen Business School, ARKEN Museum of Modern Art, CATCH Centre for Art, Design & Technology and KEA.

SÆT was founded with the aim of Social and Ecological Inclusion. The purpose was to overcome the digital divide and challenge the dominant commercial narrative of tech. This is done by exploring and rethinking new technologies for our society through aesthetic methods and theory.

- SÆT is a new collective and ecocritical approach to future technology
- SÆT puts art and aesthetics at the centre of the development
- SÆT wants to include a more diverse group of people in the often complex and exclusive conversation about new technology

- SÆT insists that solutions must not only apply to the few, but need to consider the planet as a whole

The first summer school was held in Elsinore at catch.dk from 16-19 August 2021.

It included SDG-relevant workshops on:

- **Aesthetics of Abstinence:** Can techniques used to deal with abstinence be applied to regulate consumer behaviour towards more sustainable habits?
- **Anthropocene Pedagogy:** How does the climate crisis impact the role of teaching?
- **Wearables:** Wearables today often have a very “gadgety” appearance and are mainly focused on individual performance or health. What if we shift the focus so they are also for the greater good - for the community, for making a social impact/ connection, sustainability, something that also is aesthetically pleasing and gives us an aesthetic experience?
- **Ecosystem design principles:** How can actual ecosystems and chemical and biological dynamics be used as inspiration for words and metaphors that better capture the dynamics of the system that we live in and hence as inspiration to create design that interacts with the reality that we live in.

A total of 15 workshops were held and educational material was developed for each workshop. The material is accessible online for all participants, and curated versions are being published.

See further information: www.catch.dk/saet

Jesper Balslev, Research Consultant at KEA Research & Innovation
Rasmus Simonsen, Senior Lecturer at KEA Design
Annette Dreyer, Lecturer at KEA Design
Mette Laier, Lecturer at KEA Design
Benjamin Hughes, Lecturer at KEA Design

SÆT was founded with the aim of Social and Ecological Inclusion. The purpose was to overcome the digital divide and challenge the dominant commercial narrative of tech. This is done by exploring and rethinking new technologies for our society through aesthetic methods and theory.

MICROROGANISMS GROW SUSTAINABLE SOLUTIONS FOR DINESEN

#WORKSHOP #ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

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Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

Within the frame of the Datemats project, Material Design Lab invited 14 students from Politecnico di Milano, Tecnum and Aalto to join seven selected students from KEA in an interdisciplinary design challenge for the company, Dinesen.

The 21 students, from more than seven different cultural backgrounds and more than 11 different study lines, solved an interdisciplinary design challenge employing microorganisms in proposed realisation of their material concepts.

Apart from lectures and presentations from five inspiring SMEs, the consortium's developed tools and methodologies were trialed on the topic of Advanced Growing Materials. With a very hands-on approach, the students developed five concepts.

Datemats is a European Knowledge Alliance project looking at transferring knowledge on Emerging Materials and Technologies between academia and industry.

The workshop was organised as one of four theme-specific mobility workshops on Emerging Materials and Technology and the knowledge transfer between academia and industry with Material Design Lab's focus area of Advanced Growing Materials.

Within the five days, the student groups were introduced to the area of Advanced Growing Materials, what it means to design with microorganisms, how to develop visions, ideate and find applications through their potentials and limitations.

As a result, Dinesen received five diverse takes on how to grow sustainable, beneficial solutions from their residues ranging from whole ecosystems to holistically applied products and 'bio-intelligent' product tracing. The workshop was a great success for everyone involved.

The company has gained new directions for a circular approach to their production residues and stands representative for similar challenges within the field.

The students had an interdisciplinary experience and

gained knowledge by hands-on exploration and assimilation of theoretical knowledge, tacit samples and practical experiments within an area where they had no prior expertise.

As an end-result, the project was a proof of concept for the project's framework and allows conclusions for other possible areas of application. The insights are published as open-source material accessible for industry and academia alike.

Anke Pasold, Researcher and Senior Lecturer at Material Design Lab, Datemats

The company has gained new directions for a circular approach to their production residues and stands representative for similar challenges within the field.



GREEN TRANSITION OF A SMALL ISLAND IN DENMARK

#ENVIRONMENT #GREENTOURISM

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

This project concerns green transition of small islands. Small islands are analytically interesting as they can be considered large societies in a mini format. As such, the islands can tell us about the gains and challenges that come with the roll-out of the green transition at a societal level. By zooming in on the background mechanisms that affect the depth and scope of the green transition, we can prepare decision-makers, local citizens, and other stakeholders how to facilitate a social inclusive discourse to help legitimate green transitions of small as well as large communities.

The aim of our research is to uncover how communication amongst the inhabitants and tourists influences the decision-making and practical execution concerning the green transition. Since tourism plays a critical role, both financially and socially, the status of the tourists in the communicative processes surrounding the transition to a more sustainable and climate

responsible island will also be included as a central element in the study.

Our analysis of the communication related to the green transition is based on citizen meetings and public hearings combined with in-depth interviews with citizens like fishermen and women, hand-craft artists, and local businesses.

The necessity of the green transition may seem obvious as the transition can contain some of the worst consequences of the climate change in the long run. However, the green transition can nevertheless contribute to strong feelings in citizens or local businesses who believe that their interests are being neglected or ignored by government officials, politicians or by advocates of initiatives that promote the green agenda in the local communities.

Part of our analysis focuses on how the conflict between different interests can challenge the legitimacy behind the green initiatives and thus slow down and reduce the progress of the transition of society to a greener version than the existing one. As a popular tourist destination, the island of Christiansø is a natural part of the experience economy. Green initiatives can create a more climate-responsible experience economy that matches the UN's global goals of developing sustainable cities and communities, responsible consumption and production and sustainable energy.

The project will be a success if the inhabitants, government officials and tourists take the recommendations generated from the analysis into account. Students have an important function as they are involved in the design of the communication material addressed to the inhabitants of Christiansø. Furthermore, the project has led to the publication of scientific papers which will be included in the teaching of students and contribute to expanding our understanding of the greening of our society. Overall, the project contributes to support the UN's efforts to develop sustainable cities and communities at a local level in Denmark.

Robert Schönrock Nielsen, Senior lecturer at KEA Tech
Morten Boesen, Docent at KEA Research & Innovation, KEA Digital & Tech

MATBRIDGE – AN LCA SCREENING TOOL FOR NEW MATERIALS

**#BACHELOR #ELECTIVES #APPLIEDRESEARCH
#PRODUCTDEVELOPMENT&INTEGRATIVETECHNOLOGY
#ENVIRONMENT #PRODUCTIONTECHNOLOGY**

Principle 7: KEA will support a precautionary approach to environmental challenges

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Principle 9: kea will encourage the development and diffusion of environmentally friendly technologies

MatBRIDGE is an ongoing applied research project that seeks to discover a data driven eco design approach with using newer materials. It is meant to bridge the gap between relying on extensive Life Cycle Inventory libraries for known materials and the ability to quantify new materials with comparable eco-data. The goal is that students, designers, and SMEs can then make better more informed decisions in material selection processes for products at the design stage.

The project looks to develop tool sets and provide a new didactical approach in working with newer alternative materials. It leads students towards measuring and characterising these materials' lifecycle data. Since the last Commitment on Engagement, we have

developed, tested, and validated a lifecycle analysis tool and the accompanying didactical approaches surrounding working with new materials. The design of this tool is built to emulate well known methodologies for product life cycle screening and focuses primarily on raw material acquisition, primary and secondary product processes and transport. It is tested and validated by our students in incorporating the tool in coursework. The value for students is to be able to visualise relative energy and CO2 contributions in a product/component lifecycle, through measurement and input of primary data for new materials they may be exploring.

Validation of this didactical approach has been manifold. Students participating in the elective, Advanced Material Science course taught by Jon Emil Stenz, explored facets in both creating new materials, and similarly mapping the eco data for suppliers of proposed material changes in a reference product. Here the main take aways were the relative difficulty in getting a hold of reliable eco-data from potential suppliers, as many of them do not have it themselves. Another challenge has been the issue of validating available data based on available measurement methods.

The students have used the tool directly in the elective, Sustainability in Product Development taught by

Dina Jacobsen, which validated the tool through the development of their own material using KEA's Material Design Lab. The tool has then been taken into use in at least three semester projects, in which the students working with real companies used the tool to define and compare material solutions with an eye towards sustainability and reducing impact of products with the experience gained from working with the tool. There has been an increased competency for students in understanding the hidden trade-offs in working with material production data. This is especially true with new vs. established materials. A separate research initiative as a part of this in examining the competency needs of SMEs regarding working with eco-data in their design processes has shown

that there is a large knowledge and competency gap in working with sustainability of materials in product development.

This research is ongoing, and there is a vision that we will be able to create a tool set for our students, designers and SMEs that uniquely allows them to work in a data driven perspective with sustainability of materials.

Kristian Søndergaard Colvey, Senior Lecturer at KEA Tech
Dina Jacobsen, Senior Lecturer at KEA Tech
Christian Lystager, Senior Lecturer at KEA Tech
Jon Emil Stenz, Senior Lecturer at KEA Tech

The project looks to develop tool sets and provide a new didactical approach in working with newer alternative materials.

SUSTAINABLE CLIENT CONSULTANCY

#ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

According to a UN report from 2020, the building and construction industry was responsible for 38% of the total CO₂ - emissions in 2019. Depletion of resources, construction waste and pollutants used in the industry all add to the urgency for change in the way we approach construction.

The industry has witnessed emerging awareness of the need to solve the above-mentioned problems. Seen in this light, it was interesting to approach important stakeholders – the clients' advisors – and investigate their role in this development. The research focused on major engineering consultancies and their strategic business approach to sustainability.

The purpose of the research was to obtain a better understanding of the options of a client's advisor to encourage a more sustainable development within the construction industry in Denmark.

To get closer to the core, the primary research question was: When and how does sustainability become a commercially successful business?

Secondary questions were: What options do client advisors themselves point to when considering how to act and influence their clients? How do they distinguish between their types of clients (public/private sector, industrial/housing etc.)?

As seen above, the research question was predominantly specific and context dependent (new buildings in Denmark) and sprung from a recent development in the industry (sustainability and climate change). It can therefore be seen as a case study.

The purpose of the research was to obtain a better understanding of the options of a client's advisor to encourage a more sustainable development within the construction industry in Denmark.

The research was conducted using a phenomenological approach where the researcher focuses on the experiences of a certain phenomenon expressed by representative informants. Three semi-structured qualitative interviews were carried out with large engineering consultancies chosen for their probable strategic approach to the topic.

The interviews were based on an interview guide moving from an overall set of questions regarding their approach to sustainability to their options for influencing clients, the business potential and the demands from the clients themselves.

The research has not yet been finalised. However, there is one preliminary observation to be taken from the analysis pointing to a development where large private investors are moving the industry towards a more sustainable practice by demanding for example DGNB-certified housing projects. This will in turn be commercially beneficial since their investors demand it of them and they can ask for a higher rent/prices.

Mille Wilken Bengtsson, Senior Lecturer at KEA Build & Senior Consultant at KEA Research, Career and Relations
Jan Johansson, Docent at KEA Research & Innovation, KEA Build

BEYOND SUSTAINABILITY – “EOI” MULTI-STOREY RAMMED EARTH CONSTRUCTION

#RESEARCHPROJECT #ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

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Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

Clay soil is one of the most widely used materials in the history of construction, and in Denmark it has been used extensively throughout the years. When used as a building material, clay soil possesses several useful properties and, in addition, it is a local resource that requires very little energy when extracted and can be returned directly and safely to nature after use.

During the industrial revolution, the use of clay soil in buildings largely disappeared from Denmark and today the use of clay soil is almost non-existent in the Danish building industry.

Reducing the use of concrete and other CO₂-heavy building materials in construction by reintroducing the use of clay soil structures could lead to a considerable reduction in the construction industry's current CO₂ emissions. For such a development to take place, new

methods are required that would enable us to construct multi-storey buildings in clay soil.

With this project it will be investigated whether rammed earth construction can be used to build multi-storey buildings in a Danish urban context. The work intends to investigate the potential areas of application of rammed earth construction within modern Danish multi-storey buildings and where and how the material's functional properties can be brought into play in terms of strength, architectural expression, and especially indoor climate.

The project will focus on the development of a clay soil-based building system that can be used in multi-storey building constructions of up to five storeys.

The framework for the project consists of a theoretical case where project material in the form of compacted clay soil is to be used for a five-storey urban property. Part of the work will thus be a combination of artistic development and construction engineering consisting of drawings, model studies and calculations. The project material will be developed on an empirical basis consisting of several qualitative and quantitative analyses, such as the collection of data and interviews with relevant professionals in the field.

At present, we are in the process of obtaining technical

documentation and reviewing the relevant scientific articles within the subject. In addition, we have conducted a number of interviews with some of Europe's leading experts in the field of rammed earth construction, including Austrian rammed earth pioneers, Lehm Ton Erde, and the Swiss engineering company, Lehmag.

From abroad, we have multiple build examples of multi-storey rammed earth constructions of more than five storeys. However, it remains uncertain whether a building system mainly consisting of rammed earth is implementable in a modern Danish urban context. The main barrier is to live up to today's higher security standards, something which we wish to investigate in our further studies.

For the prefabricated rammed earth elements to be competitive on price with more conventional solutions such as concrete elements, a significant upscaling of production is required as well as the development of faster production methods. However, the low CO₂ footprint of rammed earth is a significant factor that we believe holds the potential of becoming a major contributor to the conversion towards a more sustainable building industry.

Niels Brix, Lecturer at KEA Build
Johan Jeppesen, Lecturer at KEA Build



WHY ARE WE NOT SEEING MORE WOMEN IN CONSTRUCTION?

#EQUALITY #LABOUR

Principle 6: KEA will uphold the elimination of discrimination in respect of employment and occupation

Each semester, a mere 16-18% of the uptake on the Danish programme for architectural technologists have been women. This tendency is also reflected in the construction industry. As the programme is aimed at educating managers for the industry, it would be interesting to explore why women are not attracted to the construction industry.

We aim to research why women are refraining from taking education within the construction industry. Education as architectural technologists would give women access to:

- Manage construction projects
- Ensure the quality of the projects and
- Handle all phases in a construction project

The knowledge gained from the research could enable KEA to increase the awareness of short- and medium-term education at KEA within construction (Architectural Technologists, Construction Coordinators, and Construction Technicians).

It is our hope that this would inspire other educational institutions to follow and attract more women through improved marketing of the programmes.

The motivation and objective led to the following research question: Why do women not choose short- and medium-termed education within construction?

The method and analysis of the research are based on a qualitative phenomenological approach using semi-structured qualitative interviews based on an interview guide. The method implies that the empirical data are analysed using a phenomenological approach that uncovers the essence of the experiences expressed by the interviewees.

Three key interviewees were chosen and they were

Each semester, a mere 16-18% of the uptake on the Danish programme for architectural technologists have been women.

women in managerial positions in the construction industry and students at KEA. Data such as statistics, the historical development of women in construction, other research projects and international tendencies provide a knowledge base for the research.

The research will result in a research article presented at a conference and it will support the recruitment of more women for the educational construction programmes at KEA.

Stakeholders in the industry and students at KEA

Jan Johansson, Docent at KEA Research & Innovation, KEA Build

Bo Mahs, Lecturer at KEA Build

KEA COMPETENCE

KEA Competence offers qualifying continuing education at academy and diploma level.

The courses are scheduled so that studies can be followed alongside a job and so the students get updated on new knowledge and theory to improve their academic profile.

SUSTAINABLE PROJECT MANAGEMENT

#ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

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Sustainable Project Management is a new course developed at KEA which aims at providing students of Construction Coordination with the core competencies to manage and coordinate sustainable projects.

The course deals with the UN 17 sustainable development goals and 169 sub-goals and consequently with climate, social conditions and economy from a human and corporate perspective.

The students will learn how to contribute to a positive sustainable development and how to put the UN sustainable goals into practice in the form of concrete sustainable initiatives.

The course thus places project management in a sustainable perspective and provides the students with the necessary tools to enable them to become coordinators who will contribute positively to the global

agenda of sustainability. At the same time, the students will learn to use classic and concrete tools in the management of small and medium-sized projects and gain an understanding of agile projects and resource allocation.

The below topics will be included in presentations by expert guest lectures:

- UN Sustainable Development Goals
- Circular economy
- The triple bottom line
- Sustainable partnerships
- Sustainability in the project plan
- Green initiatives and objectives
- Motivation for sustainable projects
- CSR communication

The reason for this initiative is that the global sustainability agenda is gaining ground. This is bound to create a future need for employees with the competencies to coordinate and manage core functions of different types of sustainable projects.

The students of Sustainable Project Management will learn how to act in times of change and how to get their colleagues and other partners involved in the processes. They will learn how to implement new procedures, sustainable initiatives, and changes in the organisation and in the company.

SUSTAINABLE ENERGY

#ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

Principle 8: KEA will undertake initiatives to promote greater environmental responsibility

Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

Ensuring the implementation of Green Energy Transition through technology and energy efficiency requires different types of players. There is a need for developers of the relevant technologies, persons to market the technologies, advisors to give specific advice on their implementation and installers to make the actual implementation.

The focus of our project is to train skilled installers of Renewable Energy and Energy Efficiency to advise customers about the green energy transition. Based on their experience with installing and the education they get at KEA, the installers can help the customers choose the right solutions and investment.

The project takes place at KEA's programme, the Energy Technologist, more specifically on the module, "Renewable Energy Heatpump-installer".

The project has been running over a period of three years and was intensified over the past 1½ years. Apart from people from KEA, the project partners include the Trade Union of Electricians, the Trade Union of Technical Designers and Plumbers, the Business Organisation for Technical Installers and the Danish Ministry of Climate, Energy and Utilities.

The project has mainly focused on certifying heat pump installers to give energy calculations and ensure that the suggested technical solutions are suitable for a given building.

During the period from 2019 to 2021, KEA has educated and certified more than 200 installers of small heat pump installations. Certification was a necessity for customers to get access to a co-financing scheme for converting oil/gas-burners to heat pumps. In the first year, over 90,000 homeowners applied for co-financing. Approx. 9,000 of these were granted, and the installations were to be delivered by certified installers only.

By training the installers, KEA has enhanced the quality of the calculations that the installers make and thereby improved the efficiency of the converted installations. This has contributed to a marked interest from a large group of homeowners and a general awareness that the heatpump-technology is reliable and worth investing in. When individual homeowners make decisions for more than € 15-20,000, there is a need to be reas-

sured about the long-time sustainability of a solution. The training of these Renewable Energy Heatpump-installers to give more objective advice and less marketing or sales-focused communication has enabled them to contribute to providing sufficient investment security and thereby promoting the green transition.

As to technical installations, businesses react to the need for certification rather than a general push for more knowledge. Further training of staff is often seen as nice-to-have rather than need-to-have.

The Danish installer business is already forced in the direction of certification concerning electrical installations and plumbing. The obligation to be a certified Renewable Energy installer makes businesses react

directly to the demand and therefore they send their staff for further training.

To implement national Renewable Energy and Energy Efficiency policies, mandatory certification of businesses is a strong tool. By cooperating with the educational institutions and the different parties for businesses and workers, the awareness about and the quality of the provided training can be further enhanced and targeted. The most important focus point of the training situation is not to fail the "relevance criteria" when staff are being sent for further training.

Janus Hendrichsen, Educational Consultant in-service training, KEA Competence, Energy

The focus of our project is to train skilled installers of Renewable Energy and Energy Efficiency to advise customers about the green energy transition.

THE LOCATION OF KEAS' CAMPUSES

#ENVIRONMENT

Principle 7: KEA will support a precautionary approach to environmental challenges

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Principle 9: KEA will encourage the development and diffusion of environmentally friendly technologies

In 2021 the project "KEA Moves Closer Together" was launched. New principles of timetable planning enabled more intensive use of classrooms and other facilities.

KEA Facility is the unit at KEA that handles the daily operations and maintenance of KEA's campuses and surroundings. Sustainability and social responsibility are important elements in the department's work, and Facility and IT has a focus on reducing energy consumption, the use of pollutants, waste management, and procurement.

KEA Facility is constantly working to raise awareness on aspects of sustainability within the campuses and their operations. We wish to foster a general understanding amongst students and staff of the value it brings to take care of the resources at KEA. Also, we wish to push for an understanding that it is our common responsibility to promote the sustainable development agenda.

With the termination of a building lease, one location was disposed of, which decreased KEA's total net area by 20%. Further, costs for rent and heating at rented locations were thus reduced by 18% and costs for water and electricity for the total stock of buildings by 10%. The surplus furniture and equipment from the vacated building were either reused at the other addresses or taken back by the supplier. KEA is still in the process of optimising the functions of remaining buildings with a focus on experimental facilities for the various programmes.

As part of "KEA moves closer together" and the optimisation of buildings, one at the Campus, Lygten 16, was renovated. Installations were made to allow students to control the heating and lighting in the classrooms as part of their educational activities. Sensors thus enable ventilation according to needs, resulting in savings of 10%. In 2022-23, the front building is to be renovated following the same principles.

At Campus Frederikkevej, the same heating control system as at the other locations has been implemented. By reducing the consumption, this has led to improved cooling.

In 2022-2024 KEA plans to develop its campuses further with a focus on reduction of energy use, biodiversity and an even healthier indoor climate for students and staff.

KEA GULDBERGSGADE

Campus Guldbergsgade includes KEA's central administration, educational facilities for Design, IT and Multimedia and Technology, Tech Lounge, KEA Library, Makerlab, Material Design Lab and Material ConneXion.



KEA PRINSESSE CHARLOTTE GADE

Prinsesse Charlottes Gade houses the programmes within Construction and the Start-up Hub.



KEA LYGTEN 16

Lygten 16 houses the programmes within technology.



KEA FREDERIKKEVEJ

Frederikkevej houses KEA Competence and administration and classrooms for continuing and further education.



OPTIMISING THE USE OF BUILDINGS AND HEATING

Several initiatives have been taken at KEA's campus Princess Charlottes Gade to significantly reduce heat consumption, for example optimisation of the heating plant and a thorough cleaning of all exchangers and filters have led to improvement. Furthermore, over 300 dynamic radiator valves have been replaced providing for much better heat utilisation which, again, is further improved by better control of both heat and ventilation.

Due to these initiatives, Engineer Kurt Hansen employed at KEA Facility became the winner of the Golden Thermostat in early 2020. The award was granted by the utility company HOFOR and given to a person who made a significant contribution to energy savings and made an extraordinary effort in the work of intelligent energy management.

The older buildings at the various addresses have undergone several major renovations such as an improvement of the building envelope through installation of new front windows and thermo-windows in several of the buildings.

At KEA's Campus at Lygten, the central heating has been renovated with great significance for improved heat management at the location. The heat exchangers at all KEA's addresses are "closed" during the summer; all central heating is closed from the beginning of May to mid-October, and this procedure results in a noticeable saving on heat consumption.



ENERGY CONSUMPTION

Lighting at all addresses is continuously changed from conventional to intelligent LED lighting, where typically a saving of 30-50% of the power consumption is achieved. Transformation from conventional lighting to intelligent LED lighting continues to be carried out.

As far as possible, KEA Facility is trying to standardise the lighting with similar luminaires at all locations and this will, in the long term, limit the need for different light sources and spare parts and thus optimise the procurement processes.

Facility management is carried out centrally using various CTS systems at the locations, where the different systems can be observed from a digital monitoring system. In addition, KEA users report service disruptions via the Service Desk, so improvements can be made as quickly as possible.

KEA Facility's janitor team is continuously trained through courses in operation and maintenance of technical installations to gain a better understanding of everyday energy optimisations at KEA.

In addition, Facility is working to create a common culture at KEA with a focus on energy use, inviting the individual user to understand how they contribute to energy use by exhibiting behaviour that takes individual energy consumption into account.



PROCUREMENT

At KEA we aim to make purchases that live up to the UN Environmental and Labour principles. An area where this is relevant is the purchase of supplier products that have been produced under consideration to sustainability and the rights of the labour force.

Therefore, Facility uses SKI Suppliers (the Danish centralised public procurement unit), and tender documentation takes the 17 UN SDGs into consideration. All suppliers are thus tested for their ability to meet these requirements. In addition, Facility limits the number of deliveries by collecting purchases to avoid unnecessary transport. Facility also makes energy-saving purchases focusing on TCO (Total Cost of Ownership), both from a financial point of view and based on considerations to the overall energy account (CO₂).

KEA continues to focus on financially sustainable purchase and supply. KEA Facility aims at adhering to the Danish SKI public procurement framework as all their agreements are built around green and sustainable purchases. Therefore, KEA buys office equipment from a supplier who is working on extending their total green line. Other examples of agreements made according to SKI are KEA's elevator servicing and the purchase of IT equipment, such as PCs and appliances and telephony.



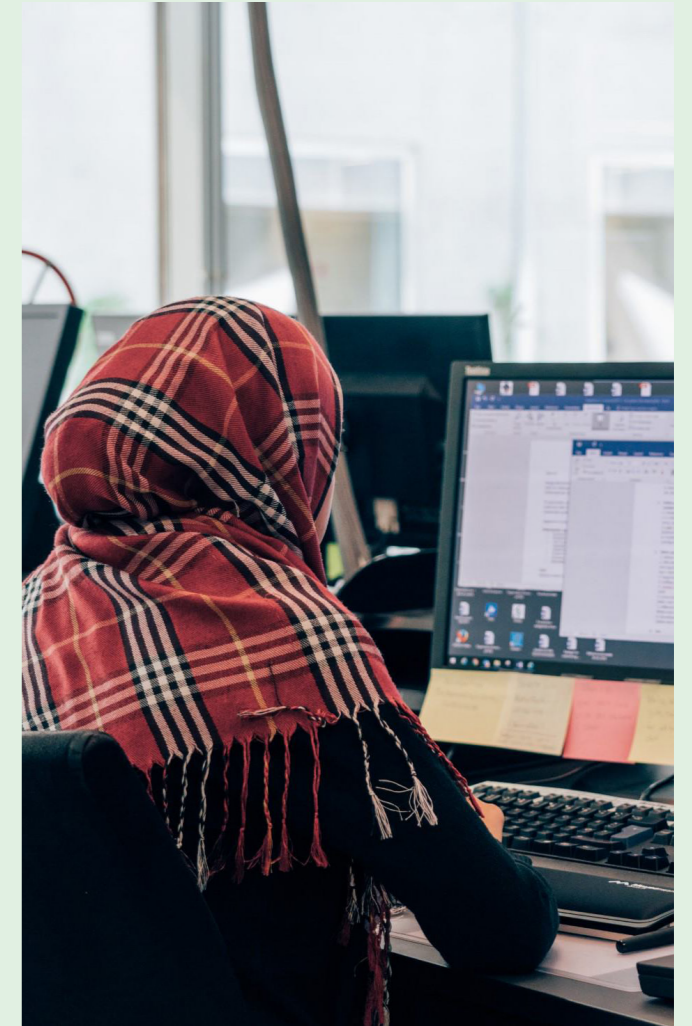
IT

As to IT, KEA maintains a focus on service life and the possible re-use of equipment purchased. Employees' PCs have an expected service life of 3-5 years after which they are re-used e.g. as kiosk computers where possible. Outdated AV equipment is sold for re-use, and KEA has given away several PCs to Red Cross refugee camps. Further, in collaboration with Fair Denmark, approx. 40 projectors were sent to Malawi.

In 2021, AV equipment was renewed at the locations of Frederikkevej, Guldbergsgade A and the back building at Lygten 16 to enable all equipment to switch to stand by after 15 minutes thus reducing energy consumption. A similar renewal is expected at Prinsesse Charlottes Gade and the front building of Lygten 16.

Sustainable purchases are also in focus regarding telephony: As a supplement to iPhones and Android phones, KEA IT Service have purchased a number of Fairphones which are assembled in modules, enabling KEA IT Service to replace component parts. It is standard procedure to give Fairphones to employees, whereby KEA IT Service makes the sustainable choice for the user.

The quantity of prints continues to fall each year, and in 2021, a process was initiated to minimise the number of printers. In this process, more power-friendly models using sustainable elements are to be purchased. The thickness of paper has been reduced from 80 to 75 gr.



MAKERLAB

KEA's Makerlab, a prototype workshop, is focused on both recycling of materials and waste sorting. The workshop's 3D printers use only bioplastics (PLA) and work is being done to recycle excess ink from textile printers to screen-printing. Efforts are also being made to integrate sustainable technology into the screen-printing process, which, in addition to shortening the process, will also eliminate the use of harmful substances and contaminated water.

Makerlab continues to focus on recycling materials and waste sorting. The lab uses wax as new model material for CNC. The wax can be reused in new forms in connection with new model production. Further, Makerlab is investigating whether PLA and excess material in connection with 3D printing can be recycled and used for new projects. Excess material is also offered to the users of the lab instead of being discarded.

Makerlab's employees encourage students to buy their material from KEA owing to its sustainability and quality. Makerlab at Lygten 16 does not use aerosol cans but have an airbrush station. Over time, this solution will also be implemented at the lab in Guldbergsgade. Chemicals are no longer used in serigraphic printing and the frames are reused for new prints.

In 2021, Makerlab took the initiative to establish a Bike Lab to support those at KEA who use this sustainable form of transport. The lab offers inspiration, help and

tools for maintenance and repair of the users' bikes and form the framework of knowledge sharing in a common bike community. A KEA Bike Club is under development and will offer joint outings on Mountain Bike.



BIKES FOR EMPLOYEES

KEA employees can borrow bikes from the campus at Guldbergsgade. This is important as the campuses are placed at different locations in the city. Bikes are an eco-friendly alternative to cars and even public transportation, and it has been organised so that the keys can be picked up at the reception at campus Guldbergsgade and the bikes are placed in the basement. In future, helmets will also be available for the security of the bike riders.



**KNOWLEDGE ALONE IS NOT ENOUGH.
YOU NEED SKILLS.**



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