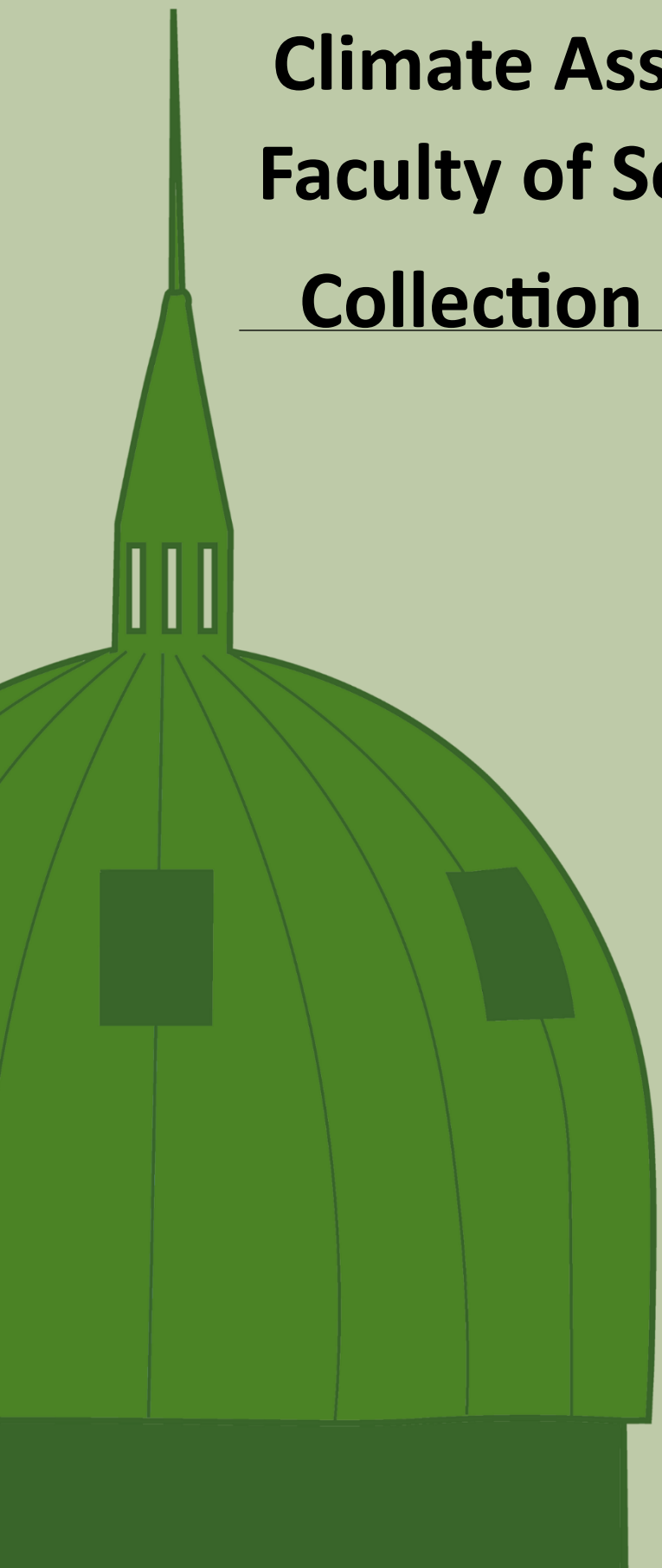
Climate Assembly at the Faculty of Social Sciences

Collection of Materials



KU

Foreword

Dear member of the Climate Assembly

Now the work with the Climate Assembly at the Faculty of Social Sciences (SAMF) is starting. 36 of you are either students, VIPs (academic staff) or TAPs (technical administrative staff), and you reflect the gender and educational composition of the faculty. Therefore, you will meet people who represent the different roles that exist at SOCIAL SCIENCE, who have knowledge of different parts of the faculty and therefore different perspectives on how the green transition can be realised. And that is precisely the point: that your different perspectives and opinions together will shed light on the question of how SOCIAL SCIENCE should prioritise in a green transition and what responsibility SOCIAL SCIENCE should take for society's green transition.

The purpose of the material collection is to give you access to knowledge about climate and the green transition, information about the Climate Collection and SAMF's climate footprint. We hope that with this collection of materials, you will feel well prepared for your work in the Climate Assembly.

While working with the Climate Collection, you will read, listen, talk, ask questions and work together in a cross-disciplinary way. In Part 1, you will find practical information about the Climate Assembly's purpose, organisation, task, mandate and timeline. In Part 2, you will find background information on the University of Copenhagen's sustainability goals and SAMF's current emissions. In Part 3, the expert group presents the selected material that they believe should form the first academic basis for the work of the Climate assembly.

We do not expect you to have read the collection of materials from cover to cover. The collection of materials is intended to serve as inspiration for relevant background knowledge and as a reference work that you can use along the way. If you find yourself lacking knowledge to answer the assignment, please let us know and we will do our best to find articles or speakers for you.

We look forward to working with you - and getting to know you much better.

Happy reading!

Third Party Secretariat, We Do Democracy

CONTENT

PART 1:
THE CLIMATE ASSEMBLY AT SAMF

Sender
We Do Democracy

What is the Climate assembly?

If we are to achieve the green transition, all sectors and systems must be rethought. This also applies to the University of Copenhagen (UCPH), which with its 50,000 employees and students is roughly equivalent to a small municipality. Therefore, UCPH has adopted sustainability goals for the year 2030 in six areas that will lead the way to a sustainable university. The six focus areas are: 1) climate, 2) resources and recycling, 3) biodiversity, 4) chemistry, 5) involvement, participation and behaviour and 6) collaboration and global knowledge sharing. You can read more about the goals in part 2.

This climate assembly will focus in particular on the climate target, where UCPH has a goal of reducing the university's CO2 emissions by 50% by 2030 compared to 2018. The Faculty of Social Sciences must also contribute to this goal.

In line with UCPH's focus on participation and behaviour, SAMF has decided to launch a climate assembly consisting of staff and students at SAMF. The climate assembly will be tasked with considering how SOCIAL SCIENCE can achieve the climate goal of a 50% reduction by 2030, as well as critically and ambitiously considering SOCIAL SCIENCE's role in the green transition both within and outside UCPH. The climate assembly draws on the citizen assembly method, but we call it a climate assembly because you are not citizens at SAMF, but part of the organisation as either students or employees. The climate assembly will follow the methodology for citizen gatherings and fulfil the OECD criteria, which you can read about below.

The method behind the Climate assembly

The Climate Assembly is similar in methodology to what is commonly referred to as a citizens' gathering in Denmark, but differs in that you are not invited as, for example, citizens of a municipality, but are instead part of the SAMF.

In short, a citizens' assembly consists of a group of citizens who, over the course of several days, discuss a given topic and end up making recommendations on one or more key questions posed by decision-makers. Typically, a citizens' assembly is started because decision-makers want citizens' help in making difficult decisions. A citizens' assembly is designed to reflect the population within an area on a number of demographic measures, such as gender, age, education, economy, etc. In the Climate Assembly, your composition will reflect the gender composition, the different departments and that all roles at SAMF are present: students, scientific or technical administrative staff (also called VIP and TAP).

As members of the Climate Assembly, you will meet several times over a period of time. Here you will be presented with neutral expert knowledge, presentations from relevant stakeholders and input from the general public. On this basis, the Climate Assembly discusses which measures will be the best solution for the greatest number of people.

The goal of citizen gatherings - and in this case, the Climate Assembly - is to produce a set of nuanced and reflective recommendations for the benefit of everyone affected by the recommendations. The recommendations are presented to the decision-makers who initiated the citizen or Climate Assembly. In this case, it is the Dean's Office at SAMF. With the recommendations, the Dean's Office gains insight into which priorities students and staff prefer - once they have had time to understand each other and take into account the many different needs and life situations that exist. In addition, the recommendations are published so that the Climate assembly's advice and thoughts can be read by anyone who could benefit from them.

You'll be writing your joint final product. This is to ensure that outside interests can't influence the final recommendations. If you can't reach full agreement on all recommendations, you have the option to create minority opinions on the areas you disagree on.

We Do Democracy's citizen and climate assemblies follow the OECD principles for deliberative citizen engagement. These are to ensure the quality of the Climate Assembly and that the Climate Assembly is representative, deliberative and democratic.

OECD GUIDING PRINCIPLES FOR DELIBERATIVE CITIZEN ENGAGEMENT

1) **Purpose** - A clear task formulated in neutral, everyday language.
2) **Mandate** - It must be clear how the client will process/act on the recommendations from the citizens' assembly.
3) **Transparency** - to the public about process design, materials, agendas, recommendations, lottery method, funding, etc.
4) **Inclusion** - must be achieved both around the table and in the work itself.
5) **Representation** - Participants should represent the demographics from which the citizen sample is drawn.
6) **Information -** Participants should have access to a wide range of reliable, relevant and accessible information and expertise and have the ability to call on knowledge and experts themselves.
7) **Joint discussions** - used to find common ground through active listening, equal speaking time and mixed formats.
8) **Time** - Deliberation takes time. Therefore, the OECD recommends a minimum of four full days of face-to-face meetings, unless a shorter timeframe can be justified.
9) **Arm's length** - The process must be planned and executed by someone other than the client. In the case of the Climate assembly, this is We Do Democracy in collaboration with the impact and expert group.
10) **Privacy** - Participants have the right to privacy from media and special interests. See more under "Rights".
11) **Evaluation** - An anonymous evaluation should be organised based on the goals of the project.

Read more about the principles here.[1]

[1] OECD principles for deliberative processes: https://www.oecd.org/gov/open-government/good-practice-principles-for-deliberative-processes-for-public-decision-making.pdf

THE CORE QUESTIONS OF THE CLIMATE ASSEMBLY

The core question you will be working with has been set by the SAMF Dean's Office and sets the framework for your work over the next few months:

The University of Copenhagen has a target of a 50% reduction in CO2 emissions by 2030 (compared to 2018). It's an ambitious goal - and one that requires us to adapt and make changes. At SAMF, we are committed to achieving this goal in a way that is meaningful to both students and staff. We therefore want to involve staff and students at SOCIAL SCIENCE in how the faculty will contribute to achieving this goal, and have set the Climate Assembly the following task:

We need your help to recommend and prioritise (1) how SAMF should reduce its CO2 emissions and (2) ensure that SAMF actively contributes to society's green transition.

Your task is to research, discuss and recommend what you think should be done at SAMF. Finally, you will develop a set of joint recommendations, which are your suggestions for prioritisation and proposals that answer the core question. Next, it is the task and responsibility of the SAMF management to decide which recommendations should be implemented.

MANDATE

The mandate ensures a clear agreement between the decision-makers (the Dean's Office) and the members of the Climate Assembly. The agreement is about what room for manoeuvre you as members can work within and how the Dean's Office will work with your recommendations afterwards. This agreement is called the Climate Assembly's mandate. A mandate can have different degrees of strength depending on what the decision-makers commit to. For the Climate Assembly, the mandate reads as follows:

- The dean's office mandates the Climate Assembly to prepare impartial recommendations on the core task that the Climate Assembly has been working on.
- The dean's office is obliged to ensure that the recommendations are processed and that the appropriate bodies investigate the possibilities for implementing the recommendations.
- In connection with the processing of the recommendations, the dean's office is obliged to account for how recommendations are followed and not followed - and in this context to justify why they are followed - and not followed.
- The dean's office will present and process the recommendations in relevant bodies (e.g. FSU, FLT, the Climate and Sustainability Committee at SAMF and the Academic Council)[2] and in this connection account for how the recommendations are followed - and not followed.

[2] FSU: The Faculty Co-operation Committee consists of the dean, department heads and union representatives.
FLT: The Faculty Management Team at the Faculty of Social Sciences consists of the Dean's Office and heads of department at the faculty. It discusses overall rules and principles for the Faculty of Social Sciences, such as the development contract, strategies and development plans.
SAMF Climate and Sustainability Committee: The committee's work is to support, strengthen and complement existing activities and facilitate the development of

- The dean's office commits to working with FLT to decide how the recommendations should be included in SAMF's next goal and action plan.
- The dean's office commits to investigating whether the Climate assembly method can be used to ensure the involvement of employees and students in other areas.
- The dean's office is obliged to provide a status report within the first three months after submission of the recommendations and again within 12 months.

WHERE DOES THE CONCEPT OF A CLIMATE ASSEMBLY COME FROM?

The idea behind the citizen assembly method is inspired by the democracy of ancient Athens. In Athenian democracy, citizens of the city-state were randomly selected by lot to make decisions on behalf of the community. All citizens (though only free men over the age of 30) would have the opportunity to represent the city across different positions in society.

Since ancient Athens, democracy has been the subject of much discussion. Questions about how democracy should be organised and which values are most important to base democracy on have been a regular part of public discourse for centuries. In the mid-20th century, a new movement of political thinkers emerged that emphasised that democracy should be based on constructive conversations. They believed that if citizens with different views and interests listened to each other properly, they would be able to agree on the best course of action for society. This form of democracy, which later became known as deliberative democracy, underpins the citizen assembly method.

Over the past 10 years, citizens' assemblies have become popular in many parts of the world. For example, policy makers in Canada, England, Bolivia, Kenya, France, Belgium, Japan, Columbia, Ireland and others have widely invited citizens to contribute their everyday expertise, views and recommendations.

In Denmark, citizen assemblies were first introduced in 2019 to help the City of Copenhagen decide how to prioritise public space in the city centre. Since then, a number of citizens' assemblies have been organised - including the national climate citizens' assembly Borgertinget, the Citizens' Assembly Sustainable Consumption and the citizens' assemblies in Albertslund Municipality, Rudersdal Municipality, Greve Municipality and Hørsholm Municipality.

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new activities

Academic Council: The Academic Council advises the dean on the internal distribution of grants, research and education and comments on other academic matters.

SCHEDULE AND PRACTICALITIES

The Climate Assembly meets on the following dates. All meetings take place at CSS, Øster Farimagsgade 5, 1353 Copenhagen K.

Collection 1	Tuesday 10 October 16:30-21:00	Local 15.3.01
Collection 2	Wednesday 25 October 16:30-21:00	Local 35.3.12
Collection 3	Thursday 9 November 16:00-21:00	Local 35.3.12
Open meeting	Tuesday 21 November 18:00-21:00	Local 15.3.01
Collection 4	Wednesday 29 November 16:00-21:00	Local 35.3.12
Launching the recommendations	Thursday 18 January 16:00-17:30	Festsalen, Frue Plads 4, 1168 Copenhagen K

ORGANISATION AND ROLES

SOCIAL SCIENCE

The faculty's management is the client. This means that it is SOCIAL SCIENCE's management that has taken the initiative for the Climate Assembly and formulated the topic and core questions that the Climate Assembly will work with. The client has also undertaken to allow the Climate Assembly to work undisturbed and to receive the recommendations at the end of the work.

THIRD PARTY SECRETARIAT WE DO DEMOCRACY

The We Do Democracy Secretariat plans and facilitates the work of the Climate Assembly. This is done independently of SAMF to ensure arm's length between SAMF's management and the work of the Climate Assembly. Your voices, knowledge and experiences are at the centre.

THE EXPERT GROUP

The task of the expert group is to ensure that the work of the Climate assembly is based on neutral, factual knowledge. The expert group has contributed articles, figures, reports, etc. to this collection of materials and also helps to find relevant speakers for the collection. The members of the expert group are presented in Part 3 of this collection.

IMPACT GROUP

The Impact Group has advised the third-party secretariat on the composition of the expert group and the implementation of the Climate assembly and will also contribute to building awareness of the Climate assembly and anchoring the recommendations of the Climate assembly.

MASTER COURSE IN DELIBERATIVE DEMOCRACY

In the autumn semester 2023, SOCIAL SCIENCE offers a master course in deliberative democracy. The students on the course will follow the work of the Climate Assembly and will act as process hosts and observers at the four assemblys.

ANALYSIS BUREAU

The draw of the members of the Climate Assembly was made by the independent analysis agency Analyse & Tal. Analyse & Tal has calculated the composition of the Climate Assembly so that it reflects SAMF in terms of gender, department and division and takes into account the different groups at the faculty (students, VIP and TAP).

ENTITLEMENTS

As a member of the Climate assembly, you have the following rights that you should be aware of:

- You have the right to participate in all sessions organised in connection with the Climate assembly.
- You have the right to ask questions about the choice of experts, speakers and content.
- You have the right to suggest and request additional knowledge and opinions from other experts.
- You have the right to express if you distrust the neutrality of the process host or lead facilitator in relation to the process and theme.
- You have the right to point out if you feel that not everyone is getting equal speaking time in group work.
- You have the right to participate in the discussion and development of recommendations.
- You have the right not to be the sender of recommendations that you do not recognise.
- You have the right to draft a minority opinion, alone or in a group, that will be included in the final product for decision makers.
- You have the right to remain silent about the work of the Climate assembly.
- You have the right not to be mentioned in other people's comments about the work of the Climate assembly.
- You have the right to know how the recommendations of the Climate assembly will be taken forward.
- You have the right to remain anonymous in public about your participation in the Climate assembly.
- If you are contacted by the press and would like to participate in an interview, you have the right to consult with the Third Party Secretariat in advance.

RESPONSIBILITY AND CONFIDENTIALITY

As a member of the Climate Assembly, you don't just represent yourself. You have been selected because you are in many ways similar to a group at SOCIAL SCIENCE: You represent people who are similar to you in terms of gender, your field of study, whether you study or work, and what you do. Therefore, as a member of the Climate Assembly, you have a responsibility to speak on behalf of others at the faculty, such as undergraduate students in sociology, graduate students in economics or administrative staff.

In addition, as a member, you have a responsibility to look after the other members of the Climate Assembly. The Climate Assembly is a confidential space where everyone's opinions are equally relevant and everyone should be able to safely share their personal stories, experiences and views. Therefore, we ask all members to listen and show respect when others share their perspectives on the topic - especially if you disagree.

IMPACT GROUP MEMBERS

The group includes representatives from the Climate assembly's target group: VIPs, TAPs, students, management and people with knowledge relevant to how the Climate assembly's recommendations reach out to and beyond the SAMF.

From KU:

- Christian Riis Stenby, Chief Consultant, Rector's Secretariat
- Troels Claus Baagland, Chief Consultant, Faculty Secretariat
- Alice El-Wakil, tenure track assistant professor, Department of Political Science
- Jonathan Eilert Raaberg, student, Department of Anthropology

Outside of KU:

- Sarah Hellebek, teacher at Krogerup Højskole and board member of Andelsgaarde
- Dorte Fænø Mondrup, Senior Project Manager, Circular Economy, Gate 21
- Simon Weber, member of the Youth Climate Council and co-creator of Danish Seaweed
- Hanne Harmsen, Associate Dean for Sustainability, Copenhagen Business School
- Tanja Nyrup Madsen, Editor-in-Chief, Mandag Morgen
- Nille Skalts, Founder and CEO, Nordic B Corp Movement

The project team from We Do Democracy and SAMF:

- Simone Klint, Senior Consultant, We Do Democracy
- Sofie Puntervold Kristensen, Consultant, We Do Democracy
- Lars Tønder, Professor with special assignments and Head of Studies, Department of Political Science
- Ditte Helsted-Amskov, Chief Consultant, Faculty Secretariat
- Christopher Emil Gersbøll Ilfeldt, Communication, Faculty Secretariat

PART 2:

CLIMATE FOOTPRINT AND VISIONS AT SAMF AND UCPH

Sender
Faculty of Social Sciences

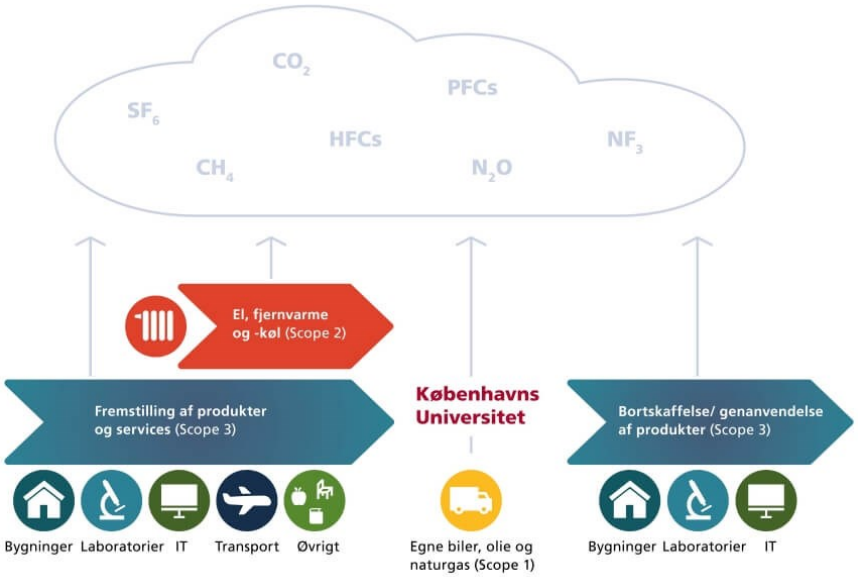
This chapter provides an introduction to how UCPH currently works with the university's role in the green transition. Firstly, it provides an insight into UCPH's and SAMF's climate footprint for 2022 as well as some basic knowledge about the various items in the climate accounts today. Next, the chapter introduces UCPH's sustainability goals for 2030, which concern the university's climate footprint, but also biodiversity and material consumption, among other things. At the end of the chapter, a small insight is given into how sustainability fills up SOCIAL SCIENCE's degree programmes today.

UCPH'S CLIMATE FOOTPRINT

Climate impact knows no national boundaries, so UCPH's targets cover all emissions, regardless of where CO2eq emissions occur globally.[3] This lifecycle-based and holistic approach is necessary to take responsibility for the organisation's actual climate impact and to take action in the areas that matter most.

UCPH's calculation of its climate footprint is based on the internationally recognised life cycle-based approach described in the Greenhouse Gas Protocol.[4] The CO2eq emissions attributable to an organisation can be divided into three categories:

- Scope 1: Direct emissions, e.g. fuel for own vehicles and ships or oil and natural gas boilers.
- Scope 2: Indirect emissions from energy consumption, i.e. district heating, electricity and district cooling.
- Scope 3: The emissions associated with the production, transport and subsequent disposal of the materials, products and services that UCPH consumes. For example, when UCPH builds, concrete is used, windows are replaced, paint is used. All the products have been produced and have thus generated CO2 emissions. And the craftsmen use electricity and fuel when they build.

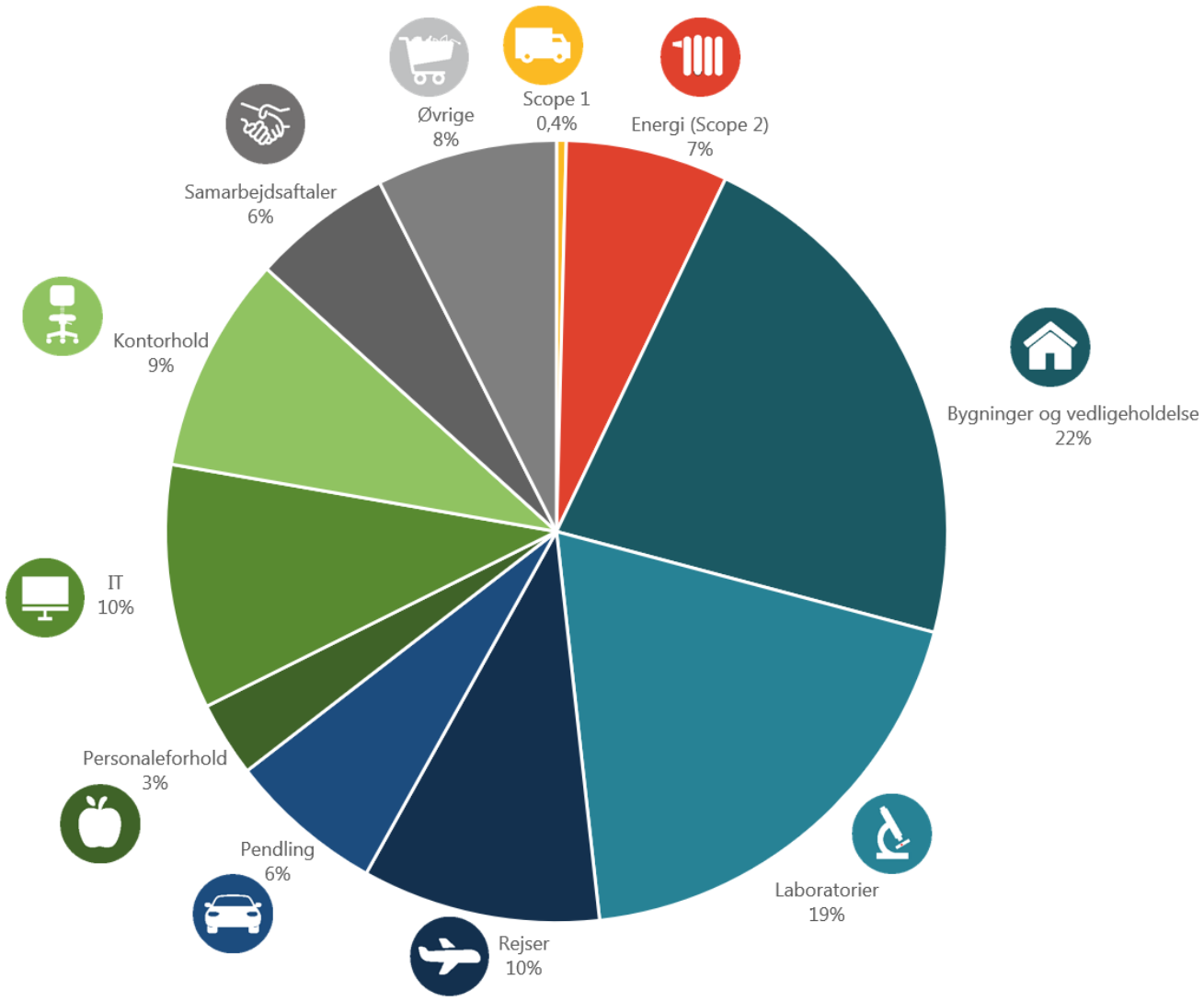


[3] CO2eq = CO2 equivalent. In addition to CO2, a number of other gases contribute to the greenhouse effect, including methane. The greenhouse effect from these gases is converted to CO2 equivalents to calculate the total greenhouse gas emissions.

[4] https://ghgprotocol.org/

The figure above illustrates scopes 1-3 in the carbon footprint approach.

It is especially the scope 3 emissions that are significant in the calculation of the climate footprint, and it is therefore these emissions that are in focus in UCPH's and SAMF's sustainability work.

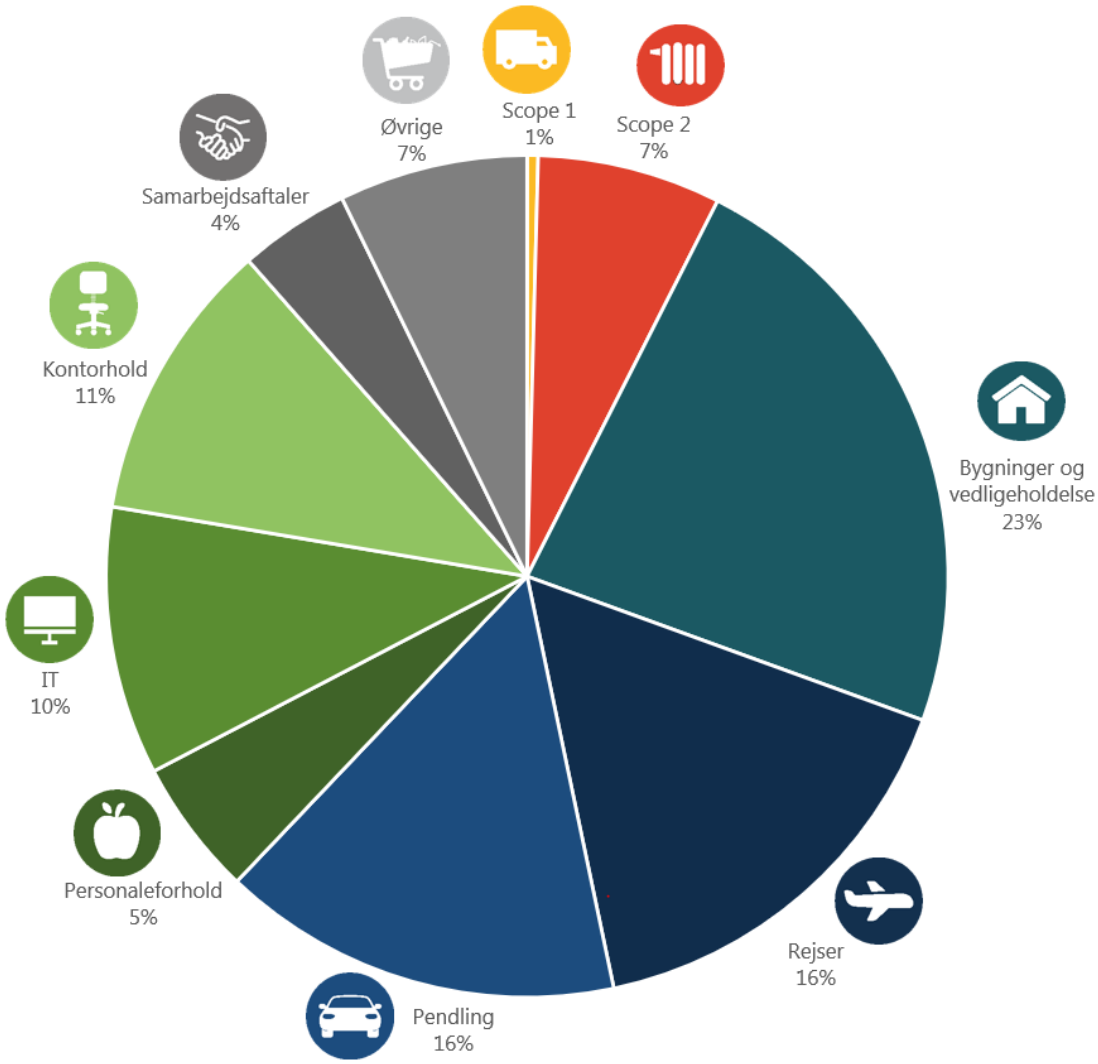


UCPH's total climate footprint 2022.

SAMF'S CLIMATE FOOTPRINT

The figure below shows the first inventory of the climate footprint for the Faculty of Social Sciences. The carbon footprint inventory shows which categories are the largest in the faculty's carbon footprint, and thus which areas of focus are important.

Note: There is greater uncertainty associated with the footprint at faculty level than there is for the total footprint for UCPH due to purchases that are not automatically associated with faculties, but are distributed on the basis of square metres and student and employee FTEs.



SAMF's climate footprint 2022.

GOOD TO KNOW

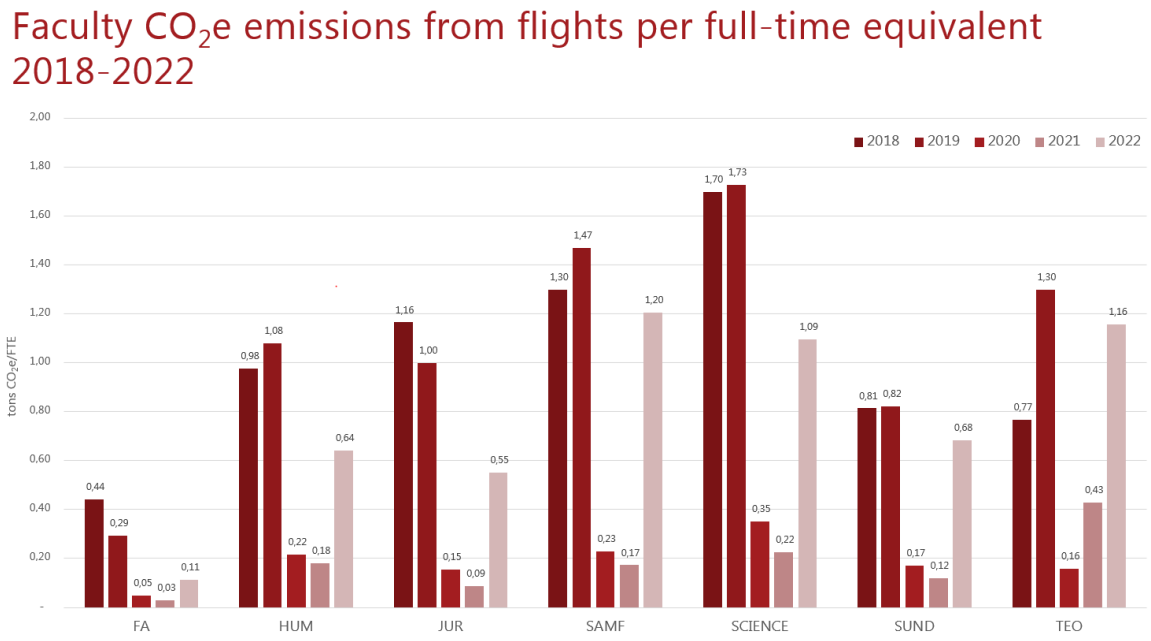
Read more about climate and sustainability at SAMF: bit.ly/greencampus(Internal link. Requires UCPH login)

Buildings and facilities

SOCIAL SCIENCE is housed in rented buildings and does not have full control over maintenance and consumption. However, it has been decided that SOCIAL SCIENCE will move to South Campus on Amager and be co-located with the faculties of humanities, law and theology. Architects are currently in the process of comparing the needs of the four faculties with the available space, after which different scenarios will be presented to form the basis for final management decisions.

Travel

Emissions from travel account for 16% of the total emissions from the Faculty of Social Sciences. This is a higher percentage than for the other faculties. In May 2023, it was decided by the Rectorate that all faculties and departments must reduce their travel emissions and set their own specific reduction targets. Comprehensive data has been provided where each department can see their own travel and carbon footprint. At SAMF, the requirement for all departments and divisions is that in addition to setting a reduction target, they must define a set of ambitious prototype travel reduction guidelines to test in 2024. Only at the end of 2024, when the first guidelines have been tested in all departments, will the final guidelines and reduction targets be defined.



CO2e footprint from flying per FTE for each faculty.

Office

This also includes furniture, cleaning and the necessary services from the faculty's operations service. Some agreements are administered by UCPH, some follow government regulations, while others are administered locally at faculty or department level and are easier to adjust.

IT

IT equipment is reused and repaired whenever possible, and the lifespan of ordinary computers has been increased. When computers are deemed to pose a security risk to the University or to be too slow, the company Edgemo Green takes them
off the market. They clean them, refurbish them and resell them.

UCPH'S SUSTAINABILITY GOALS

In 2020, UCPH set sustainability goals for 2030 with contributions from staff and students. They can be read in their entirety here: https://baeredygtighed2030.ku.dk/. Below is a small excerpt.

UCPH will realise the SDGs based on four overarching principles:

1. Ambitious - find the way and walk the talk!
2. Research-based - data, holistic and life-cycle based.
3. Behaviour, participation and co-creation - staff and students.
4. Campus as a living lab.

Introduction

UCPH has been working with sustainability since 2008. With a strong tradition of research and education in sustainability, it is natural for UCPH to take the lead and take responsibility for its own consumption of resources and impact on the climate and environment.

UCPH is a city within a city with 9,500 employees and 37,500 students with a large climate and
resource footprint. The transition of our society and consumption to sustainability requires a major change and massive effort. Many believe that humanity is facing one of the greatest challenges of all time. It is a challenging and demanding journey we are on - globally, nationally and at UCPH. At UCPH, we want to be able to say that we took our share of responsibility.

Overall UCPH goals

UCPH has decided on a number of overall goals towards 2030. The goals are ambitious and should be clear benchmarks for the coming years' efforts. If significant results are achieved quickly, UCPH expects to tighten the targets. The goals cover four major national and global environmental sustainability challenges: 1) climate, 2) resources and recycling, 3) chemistry and 4) biodiversity. In addition, there are objectives that are particularly important for UCPH as a university and knowledge institution: 5) involvement, participation and behaviour, and 6) collaboration and global knowledge sharing.

1. CLIMATE

Goal setting

- UCPH will reduce its total climate footprint per FTE by 50% by 2030.

UCPH has reduced CO2 emissions from energy consumption (scope 1 and 2) and transport (scope 3) by 71% per FTE from 2006 to 2019. Energy efficiency efforts and more renewable energy in the energy supply have contributed to energy consumption making up an increasingly smaller part of UCPH's total climate footprint.

2. RESOURCES AND RECYCLING

KU will:

- Work for sustainable procurement, utilisation and recycling of resources throughout the value chain that contributes to a significant reduction in UCPH's resource consumption.
- Ensure 60% of waste is recycled.

- Reduce total volumes sent to incineration and landfill by 50% per FTE.

3. CHEMISTRY
KU will:
- Prioritise products and solutions without substances that are harmful to health and the environment in procurement, operations and construction.
- Work to reduce the use of substances that are harmful to health and the environment in teaching and research.

4. BIODIVERSITY
KU will:
- In 2021, investigate the areas in which UCPH's activities have the greatest impact on biodiversity and, on this basis, develop specific goals and initiatives for UCPH as an institution.

5. INVOLVEMENT, PARTICIPATION AND BEHAVIOUR
UCPH's goal is to:
- Ensure that all employees and students are offered good opportunities and motivated to practice sustainable behaviour in their everyday life at UCPH.
- Ensure that all employees and students have the opportunity to engage in concrete efforts to develop a more sustainable UCPH.

6. COOPERATION AND GLOBAL SHARING OF KNOWLEDGE
UCPH will:
- Engage nationally and globally in university sustainability efforts to harvest best practices and share lessons learnt.
- Continue to be internationally recognised for its sustainability work.

GREEN EDUCATION PROGRAMMES

At SAMF, we have a list of courses where climate is included to a greater or lesser extent:
https://samf.ku.dk/klima/kurser/
The list is updated manually once a year. This is done by reading through the course descriptions to identify the courses that have a climate or sustainability focus.

At the UCPH level, there is also a search function where it is possible to search for courses based on keywords. If you search for courses with the keyword "climate" at SAMF for the academic year 2023/2024, you will get a list of 33 courses. Most of them are 7.5 ECTS credits; a few of them more. It's a mix of courses from different disciplines. Some focus directly on climate, while others have a different topic, but with "impact on climate" mentioned in the description.
University of Copenhagen – courses (ku.dk)

A search for courses with the keyword "sustainability" at SAMF for the academic year 2023/2024 returns 14 results.

University of Copenhagen – courses (ku.dk)
The Sustainability Science Centre (SUSY) page also has a list of courses - but for the entire university. The list is based on the UN Sustainable Development Goals, and you can select a goal and see the courses that match that goal. University of Copenhagen – courses (ku.dk)

PART 3:

EXPERT GROUP MATERIAL COLLECTION

Sender
Expert group

INTRODUCING THE EXPERT GROUP

The task of the expert group is to ensure that the work of the Climate assembly is based on neutral and professional knowledge. The expert group has contributed articles, figures, videos and other relevant knowledge to this collection of materials. In addition, the group helps to find relevant speakers for the collections.

The members of the expert group have been chosen based on their areas of expertise and different knowledge of the green transition, including behaviour and consumption, transport, buildings and facilities, education and research, and ways to influence outside the SAMF. The experts come from outside UCPH, as the Climate Assembly takes place at UCPH. The role of the experts is solely to provide neutral advice - they are to be experts, not opinion leaders.

In this collection of materials, the expert group has selected knowledge that the group believes is relevant to you in connection with the Climate Assembly. As members of the Climate Assembly, you have the opportunity to request other and more knowledge or to have something elaborated on if there are issues or knowledge that you do not find adequately covered in the material collection or during the collections.

The expert group consists of:

- **Andreas Roepstorff**, Professor and Deputy Head of Department, School of Culture and Society, Aarhus University.
- **Julie Emontspool**, Associate Professor, Department of Business Administration and Climate Cluster, University of Southern Denmark.
- **Peter Arnfalk**, Senior Lecturer, International Institute for Industrial Environmental Economics, Lund University.
- **Thorbjørn Hyldgaard Lønberg**, PhD student, Department of Architecture and Technology, The Royal Danish Academy.
- **Jeppe Læssøe**, Professor Emeritus, Danish Institute for Education - Educational Science, Aarhus University.

FOREWORD FROM THE EXPERT GROUP

It is with enthusiasm that we introduce this collection of materials that serve as a foundation for the important conversation about how organisations can be part of the green transition and reduce CO2e emissions. In the following, our expert group seeks to provide insights and perspectives on a number of key themes that touch on this transition, but also the broader discussion on how we organise ourselves for a sustainable future.

This foreword is also an introduction to the topic and our approach to it as an expert group.

Role and approach to the Climate Assembly's task

Firstly, let's briefly introduce our role as an expert group in this process.

We represent different fields and disciplines ranging from the university's role in the green transition to behavioural change, cultural change and sustainability in transport, buildings and education. Our purpose is to contribute knowledge and insights to strengthen the basis for democratic decision-making on how to realise a green transition.

It is crucial to understand that the green transition is a complex task that requires a collective and holistic approach. It's not just about individual behavioural change, but also about rethinking the system that shapes our behaviour. The challenges of sustainable transition go far beyond the technical aspects and include socio-cultural and psychological aspects as well as ethical and political choices.

We are particularly aware of the importance of integrating the sustainability dimension into social science education. Students trained in this field will play a crucial role as future experts, leaders and middle managers who will navigate the green transition. Therefore, it is crucial that they are equipped to initiate change and manage the complexity of this process.

The challenge of sustainable transition is not just a matter of technology and science, but very much a social and collective learning process. We want to emphasise the importance of involving more people in this process, sharing knowledge and exploring new ways to involve people from different parts of the system in the change process.

Our knowledge and aspiration

We contribute to the Climate Assembly process as researchers with knowledge about specific areas of the field. But we also speak from an uncertainty about what the right approach is for the process of change that you have become part of and must help the university with. We do what we can to help the process get started and assist along the way, but we are aware that there may also be other important areas that our research fields and outlook do not cover. An uncertainty that we recognise that society in general is facing in the green transition. An uncertainty that the Climate Assembly and similar processes may be able to reduce over time.

We also want to be inspired and learn from this process of change and hope that others working in institutions and organisations will do the same. Social and collective learning are key elements and we

look forward to seeing how this process unfolds and connects to more participation and learning from the recommendations you make.

The process is especially exciting because it can inspire us all: How should we implement the green transition in our institutions and organisations? The Climate Assembly is an interesting way to explore and investigate how to do just that. Both in relation to the green transition and in relation to rethinking our democratic processes and ways of involving people in change processes.

In the material collection, you can find knowledge on the following selected topics:

1. the role and impact of the faculty.
2. Education and research.
3. Behavioural, cultural and organisational change.
4. Transport.
5. Buildings and facilities.

Finally, we would like to emphasise that although we as an expert group offer knowledge and perspectives, it is you as members of the Climate Assembly who must assess and weigh this knowledge in relation to the key tasks you face. This is a task that requires patience, curiosity and critical thinking. We wish you a good process, where we will be available for your questions and search for professional knowledge.

Sincerely yours

The expert group

Table of contents for expert contributions

READING GUIDE

The expert contributions consist of five chapters, each of which sheds light on the core issue from different angles. The chapters can be read from cover to cover or used as a reference. Each chapter is equipped with an introduction that motivates and introduces the topic, as well as a reading guide that summarises the individual parts of the chapter, so you can easily orientate yourself in the knowledge contained in the chapters.

For chapters 1-4, the materials from which the quotes and text extracts are taken are listed for each part of the chapter. In chapter 5, you will find a standard reference list at the end of the chapter. To get a quick introduction to the topic, read the introduction and the reading guide. For more in-depth knowledge, you can read the entire chapter, and if you really want to dive into a topic, inspiration for additional reading material is provided at the back of the material collection.

Each expert has provided input on their core field. These include Andreas Roepstorff, who contributed to chapter 1 on SOCIAL SCIENCE's general role in the green transition, Jeppe Læssøe, who contributed to chapter 2 on sustainable education and research, Julie Emontspool, who contributed to chapter 3 on consumption and lifestyle, Thorbjørn Hyldgaard Lønberg, who contributed to chapter 4 on buildings and facilities, and Peter Arnfalk, who contributed to chapter 5 on travel, mobility and digital solutions. The first two chapters largely address the second part of the core question, while the remaining three chapters provide an academic basis for the first part of the core question.

Enjoy!

CHAPTER 1 - SAMF'S ROLE IN SOCIETY'S GREEN TRANSITION

Introduction
Do universities have a special role in the green transition? From one perspective, a university is primarily a business that uses energy and raw materials in its operations. Like any other business, it can be made more or less sustainable. But a university is also an educational and knowledge institution that moulds generations of young people and produces knowledge. Therefore, there is a special role for universities in the green transition that is about their core service and self-understanding, not just their operations. In this section, we explore the additional role universities play through a report from UNESCO and a concrete example from Erasmus University Rotterdam.

Reading guide

Part 1 contains clips from a UNESCO report from 2022 that examines how universities play a role in achieving the 2030 Sustainable Development Goals, including climate and sustainability goals. Among other things, the report argues that the university as an institution of knowledge and education has a greater role to play in the green transition than simply reducing their carbon footprint through their operations as a business. Three general directions that educational institutions should move towards in order to fulfil their responsibility for the SDGs are presented, as well as specific recommendations for education, research and knowledge exchange.

The article in **Part 2** argues that the current dominant model in social science education is inadequate in light of the challenges facing the world. It unfolds a concrete case of institutional change at Erasmus Universiteit Rotterdam, whose overall 2020 strategy includes an ambition for greater scholarly relevance and collaboration beyond the university to respond to these complex social challenges. The idea of the transformative university is presented as a place where transdisciplinary, collaborative and action-orientated academic work is practiced.

Part 1: Universities have a crucial role to play in society's green transition

Material

- **Report:** UNESCO. 2022. *Knowledge-driven actions: Transforming higher education for global sustainability report:* https://unesdoc.unesco.org/ark:/48223/pf0000380519
  Note: See especially the executive summary, introduction and recommendations.

The 2022 UNESCO report argues that universities need to do more than take responsibility for the emissions caused by their operations. Universities have played a central role in bringing enlightenment and change to society in the past. Their role is very much that of free and critical institutions, but in the future this role must be combined with problem-solving activities:

"HEIs [Higher Education Institutions] have played a crucial role as bringers of societal enlightenment and change over the centuries, maintaining their role as free and critical institutions while also - to varying degrees - aiming to perform a service within societies. It is essential to

maintain and encourage these important roles and enable HEIs to combine their traditions of critical thinking with problem-solving activities, while also adjusting their role in the light of societal changes. The future of humanity and our planet is under threat, and the need for critical thinking and societal change is therefore more pressing than ever." (UNESCO, 2022, p. 13)

As a consequence of the important role universities play in helping to solve society's problems, the report emphasises three fundamental directions universities should take:

1) Universities must increasingly go beyond traditional disciplinary boundaries in their operations.

2) Universities must develop and secure different forms of knowledge that actively integrate and investigate sustainability.

3) New partnerships are needed between universities and the community.

The three directions are unfolded below:

1) If the SDGs are to be integrated into university work, universities need to have ample opportunity for inter- and transdisciplinary work. However, there may be incentives and structures both inside and outside universities that hinder transdisciplinary work and teaching.

"The report proposes that SDGs [Sustainable Development Goals] should not be mere add-ons to the classic curricula but embedded as a premise for all education and research. While reward systems and university rankings promote competition and select for high productivity, citations, and visibility, HEIs should rather be scored, and then also rated according to their performance on the SDGs. Similarly, selection criteria for positions should also consider merits related to SDGs and societal interactions. A key challenge in doing so is how to promote inter- and transdisciplinarity, which implies gradually giving way to inter- and transdisciplinary approaches to knowledge. Complex problems like the ones the SDGs address require explanations, and later solutions, that demand the convergence of multiple disciplines working together interdisciplinarily and transdisciplinarily. Sustainability is perhaps the best example of a new science where disciplines converge to both understand, and try to face and solve, the complex problems that unsustainable production and consumption create." (UNESCO, 2022, p. 26)

2) The report suggests that to solve complex problems, educational institutions need to be more open to diverse epistemological approaches. This should be done through action learning and participatory research, where students research as they learn and outsiders are invited into the research.

"The report makes a strong case for the need for HEIs in general to open up to multiple and plural views of the world, as well as to very diverse ways of knowing that can add value to strict science-

based knowledge, and with a potential for, among other things, explaining and protecting the environment. HEIs should be privileged spaces for epistemological dialogues among diverse views of the world and should show openness to diverse ways of knowing. [...] The report argues in favour of making the most of the learning potential in the process of implementing change, where learning can be enhanced when accompanied by research objectives (action research) and when social participants are included in the definition of the need for change and in the research that goes with it (participatory research). Experimental and quasi- experimental interventions have the advantage of allowing for the testing of causal hypotheses that may make way for scaling successful local developments and for influencing public policy." (UNESCO, 2022, p. 26)

3) The third direction is about the role of universities in society more generally, where universities influence policy development and the development of solutions, as well as play a role in ensuring education and the formation of society more generally. The report calls for universities to play a more active role in society in the future than they do today.

"In response to the call to contribute to the SDGs, HEIs must play a much more dominant role in society as a whole and in the different sectors that compose it. Knowledge and science should be democratised, and HEIs have an accepted role to play in this process. However, some of the knowledge generated, and much of the education students receive in HEIs, can be translated into policies and intervention projects that involve solutions to problems or potential improvements to well-being and social justice. This involves strengthening the outreach that HEIs already do and directing it towards advocacy for change and transformation, and towards social impact. HEIs have an important role to play in decision-making and a commitment to having a place and a voice in government and society in congruence with their ethical principles. Because they occupy the highest rank in the educational system hierarchy, HEIs in general can play a key role in democratising quality Education for All, as well as in educating society regarding sustainability and the SDGs." (UNESCO, 2022, p. 26-27)

Within these efforts, the report contributes a number of recommendations for universities with specific implications for research, education and knowledge exchange.

Because universities educate and mould many young people, the report recommends more transdisciplinary courses and more opportunities to integrate learning with being active outside of university:

"[S]tudy programmes must include inter- or transdisciplinary courses related to the SDGs, and education in general should employ inclusive approaches and respect for diverse cultures and knowledge systems. Students need more opportunities for engaging in experiential and dialogic activities with different communities in society." (UNESCO, 2022, p. 15)

One of the core tasks of universities is research, and the report recommends that universities move beyond the classic division between basic and applied research:

"HEIs should not cease to protect and expand academic freedom for the promotion of systemic

change. Basic and curiosity-driven research should also be maintained as a core principle where relevant. However, HEIs should also strive to move beyond the traditional separation of basic and applied research. Internal incentives should be adapted to foster research projects, programmes and centres that deal with the degradation of nature, climate change and inequalities, as well as those that require the participation of multiple disciplines; these should in all cases include the social sciences and the humanities." (UNESCO, 2022, p. 15)

One of the recommendations for knowledge exchange is that universities should develop greater co-operation between civil society, the economic sector and academia:

"Creating and participating in networks between academics, civil society, and economic sectors with a focus on collaboration towards the SDGs should also be stepped up. Existing multilateral networks between HEIs for the purposes of fostering collaborative research and education projects should be strengthened, and new ones developed. Partnerships between HEIs in high, middle and low-income countries should be revised to make room for more equal and productive relationships and emphasise capacity-building for sustainability." (UNESCO, 2022, p. 15)

Both the premises and the recommendations paint a picture of a rather different university than the one we know today. This raises some questions that can inspire you in your dialogue about the role of the university. This is, of course, up to you:

- To what extent can/should the analysis be transferred to SAMF/KU?
- Are the premises compatible with the obligation to conduct research at the highest possible level? What are the implications for classical academic disciplines?
- Are there specific recommendations that would be beneficial to implement at SAMF/KU?

Part 2: Is there a need for structural change at the university?

Material:

- **Scientific article:** Loorbach, D. A. and Wittmayer, J. 2023. "Transforming universities." *Sustainability Science.* https://doi.org/10.1007/s11625-023-01335-y

This article argues that the classic approach to knowledge production in universities, with its focus on separate academic disciplines, objectivity and linear knowledge exchange, is not suitable for contributing to the transition towards a green and just society. Since 2020, Erasmus Universiteit Rotterdam has been working to transform the university to be better able to contribute to this agenda. The Design Impact Transition (DIT) project is one of several strategic projects to help the university along this path. The project aims to explore how change at the university can be accelerated and experiment with what a new model for a 'transformative university' might look like. A transformative university in this context is a university that not only focuses on descriptive and analytical knowledge production, but where knowledge production is also seen as having an important role in promoting democratic change.

"DIT aims to establish the institutional basis for the development of design-, impact- and transition-orientated education, research and engagement. As a facilitator and catalyst for impact-orientated academic ecosystems, co-creation with stakeholders in transitions and societal engagement, it has a three-part mission:

1. *Advance transdisciplinary design, impact, and transition methodologies and programs.*
2. *Develop and nurture transformative academic ecosystems to impact the envisioned changes.*
3. *Help scholars develop their design, impact, and transition career* (Loorbach & Wittmayer, 2023, p. 8)

Reflection: For your work, it is worth considering whether there is a similar need to formulate principles for transformative academic practices at SAMF/KU.

The DIT project takes an experimental approach to the idea of the transformative university - a university that practices transformative teaching and research:

"To summarise, transformative research refers to academic practices in which 'academic' researchers work together with practitioners to reframe and interpret existing contexts, the persistent problems present and their historical origins. Based on this, they can collaboratively explore and experiment with transformative alternatives (narratives, futures, scenarios, practices, models, structures). Subsequently, they can reflect, learn, and adapt their understanding and approaches based on progress made and insight developed. To do so, they need to be able to use different methods, tools, and approaches, and play different roles (e.g., researcher, knowledge broker, facilitator, mediator, and translator). In these processes, researchers become engaged with their subject and explicitly explore desired future changes." (Loorbach & Wittmayer, 2023, p. 6)

What values would such a university promote, what institutional elements would it contain, and what does transformative academic work look like when practised? DIT has outlined the following principles and values to support a transdisciplinary academic environment:

- *" Together: providing space to connect, collaborate, and exchange*
- *Profound: value and apply academic rigor*
- *•Systemic: research and develop new ways of thinking,*
- *doing, framing, and organizing*
- *•Appreciative and respectful: being inclusive and honor-*
- *ing different points of view*
- *•Experimental: learning-by-doing*
- *•Reflexive and self-reflexive: Challenging ourselves and others.."*

(Translated from Loorbach & Wittmayer, 2023, p. 9)

Reflection: Is it relevant to develop similar values for the academic environment at SAMF/KU?

The DIT project is still in development, but it is already clear that such a transformation of the university affects a number of key structural, process and value mechanisms that can initially act as barriers to creating a transformative university.

"With no claims to be all encompassing, this example [Erasmus Universiteit Rotterdam] shows that a university transition implies institutional work: career incentives, organisational structures and funding schemes often work against collaboration, transdisciplinarity and entrepreneurship. But also, the approach to research, definitions of 'academic quality', epistemological perspectives, and attitudes towards working with practitioners are often hampering steps forward and, thus, need to be addressed. Within EUR [Erasmus Universiteit Rotterdam] discussions on these topics as well as initiatives within and around the existing organisation have been developing for a while, but to build up the momentum and pressure for transformative change requires a much more concerted and strategic effort." (Loorbach & Wittmayer, 2023, p. 12)

Reflection: Can the barriers identified by Loorbach and Wittmayer be transferred to a SAMF/KU context? Is there the will and momentum to create change?

CHAPTER 2 - SUSTAINABLE AND GREEN EDUCATION AND RESEARCH

Introduction
The challenges of sustainable transition are not only scientific and technical, but also socio-cultural and (social) psychological. Sustainable development is not only about knowledge, but in particular about ethical and political choices. It is the domain of the social and human sciences, dealing with drivers, inertia and change in societies and among people in general, as well as barriers, opportunities and alternative visions for sustainable transition specifically. Areas that are all important to investigate, understand and communicate in the context of society's green transition.

A focus on climate and sustainability in social science programmes is also important because a large proportion of students will become middle managers, leaders and/or mediators in their working lives, facilitating other actors' participation in sustainable change processes in the green transition.

Reader's guide

As an introduction to this chapter, a definition of 'education for sustainable development' (ESD) is presented based on the UNESCO definition.

In **Part 1,** you will find excerpts from an analysis that aimed to uncover the approaches to sustainability that can be found at universities and university colleges in Denmark. The clippings show the three different main trends the analysis found across different educational institutions: sustainability as growth, sustainability as supporting practice and UBU as complex, holistic change. The three approaches are relevant to gain insight into because they also highlight different levels of ambition for the role of education in society's green transition.

An illustration is also presented that can be used in discussions of institutions' level of ambition for ESD. In particular, three things are worth considering: 1) the extent of focus on sustainable development, 2) the level of ambition in relation to learning and 3) the depth of the sustainable transformation process.

Part 2 briefly reviews eight cross-cutting key competences that UNESCO identifies as important for working with sustainable development. Within the research on SDD, the development of competences has been given great importance and should be seen as a counterpoint to a classic and narrow knowledge approach.

Part 3 looks at different change strategies in universities that together form a whole institution approach. When we look at sustainable transformation of universities, we often see that leaders create a consultation and then a plan that technical staff are tasked with executing - processes that typically do not include teaching and research, but only green campus. This section presents a holistic approach that illustrates the essential elements of a green transformation not only of the campus, but also of the university and its role as a whole.

Definitions of Education for Sustainable Development (ESD)

UNESCO has been promoting Education for Sustainable Development (ESD) for decades. Here is how UDE is defined:

"ESD [Education for Sustainable Development] gives learners of all ages the knowledge, skills, values, and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality. It empowers learners of all ages to make informed decisions and take individual and collective action to change society and care for the planet." (https://www.unesco.org/en/education-sustainable-development/need-know)

In Denmark, more than 80 organisations from the education and sustainability fields have worked through eight partnerships covering all forms of education to develop and adopt a national action plan for UBU. The work has been based on the following definition:

"Education for Sustainable Development (ESD) focuses on the broad concept of sustainability and the relationship between environmental, social and economic sustainability. ESD is based on systemic thinking and interdisciplinarity, where pupils, students and course participants develop competences to reflect, identify and act on their knowledge of sustainable issues, dilemmas and development opportunities." (*Towards Education for Sustainable Development*, 2022, p. 217)

Part 1: Approaches to sustainability at Danish educational institutions

Material:

- **Scientific article:** Lysgaard, J. A. & Haase, S. 2022. "Education for sustainable development at Danish university colleges and universities." *Journal of Professional Studies*, *18*(35): 32-41.

Over the past 30 years, several international networks have emerged to promote sustainable transition in education, and numerous books and articles have been published on the topic. In other words, there is plenty of experience and inspiration from other universities. The following examples of approaches to sustainability are from the article "Education for sustainable development at Danish university colleges and universities" by Jonas Andreasen Lysgaard and Sanne Haase. The first approach understands and works with sustainability from the perspective of how education and research can ensure innovation and green growth in companies, as this is crucial for Denmark's competitiveness and thus the national economy. The second approach focuses on what students are trained in and for, and links sustainable development with the responsibility of education programmes to train practitioners. The third approach sees sustainability as a purpose and sustainable development as a holistic, complex and multifaceted transformation of the entire institution. This has implications for the understanding and practice of science, the content and forms of teaching, the role of the university in relation to society, and the university's culture and physical facilities.

It is important to say that the three approaches should not be understood as clearly delineated concepts that are mutually exclusive, but rather as ideal types that the different institutional strategies seem to draw on.

1. Sustainability as growth

Aalborg University links the task of education with sustainability by acting within a growth discourse that aims to provide skilled labour for the surrounding business community, which can thus be kept going and further developed.

"Almost 90% of Aalborg University's researchers in green research have collaborated with companies [...] and more than 60% of these collaborations have led to green innovation in the company." (AAU, 2021)

"The common growth discourse, which almost all institutions address in one way or another, articulates sustainability as something that emphasises the institutions' responsibility in relation to the national economy. It emphasises the importance of educational institutions for competitiveness and the ability to translate knowledge into commercialisable products and services. There is focus on the importance of research, innovation and development activities at the institutions, but when we look in isolation at how the institutions link the educational task with sustainability, within a growth discourse, it is very much about the task of supplying competent labour to a surrounding business community that can thus be kept going and further developed. One institution focuses on self-preservation, so a sustainable institutional strategy involves ensuring future student recruitment (AAU 2021). Elsewhere, sustainability is understood as growth, recognising that it is a contextual condition for both the institution and its graduates that there is an increasing scarcity of resources, which implies a need for streamlining and new ways of solving core tasks in the educational institution." (VIA, 2021a)

"Seeing sustainable development as an opportunity for growth is both a general trend, also in education, and a highly criticised approach. On the one hand, fundamental discussions about the possibilities for continued growth on a finite planet have been part of the discussions in the field since the Limits to Growth report from 1972 (Meadows et al. 1972). On the other hand, the use of the concept of sustainability, especially since the Brundtland report, has specifically focused on the importance of the economic perspective, alongside environmental and social considerations (Brundtland 1987). That growth is linked to sustainable development in this way, including in education, is thus not surprising (Jickling 1992), but it does raise questions about which growth paradigms are promoted by individual educational institutions and how these growth paradigms affect approaches to education as part of a vision for sustainable development."

2. Sustainability as an underpinning of practice

At university colleges, sustainability is particularly linked to the education of practitioners and collaboration with practice partners. Universities generally have a "third mission" of dissemination and outreach, but it seems that sustainability has not been connected to this practice.

"The vast majority of university colleges and a few of the universities articulate sustainability as a task that is about regional development and concrete collaboration in order to support practice partners. The professionals educated at university colleges - often in collaboration with internships, e.g. in the welfare system - are seen as core actors for a relatively simplified notion that knowledge can be added to practice through the knowledge that students bring with them from the educational institution to practice. [...] 'We are the centre of sustainable growth and welfare. We share everyday life with the world around us and develop competences and knowledge for practice across disciplines and professions. In the meeting between education, research and practical reality, we create solutions that make a difference. Both now and in the future (UCL 2021)."

3. UBU as complex, holistic change

For some educational institutions, sustainable development is perceived as something that goes beyond a focus on transforming growth to green growth and emphasising the 'green' in education. This means that sustainability is becoming part of governance, practice, collaborations, teaching and strategy, etc. but it also means that complexity is increasing.

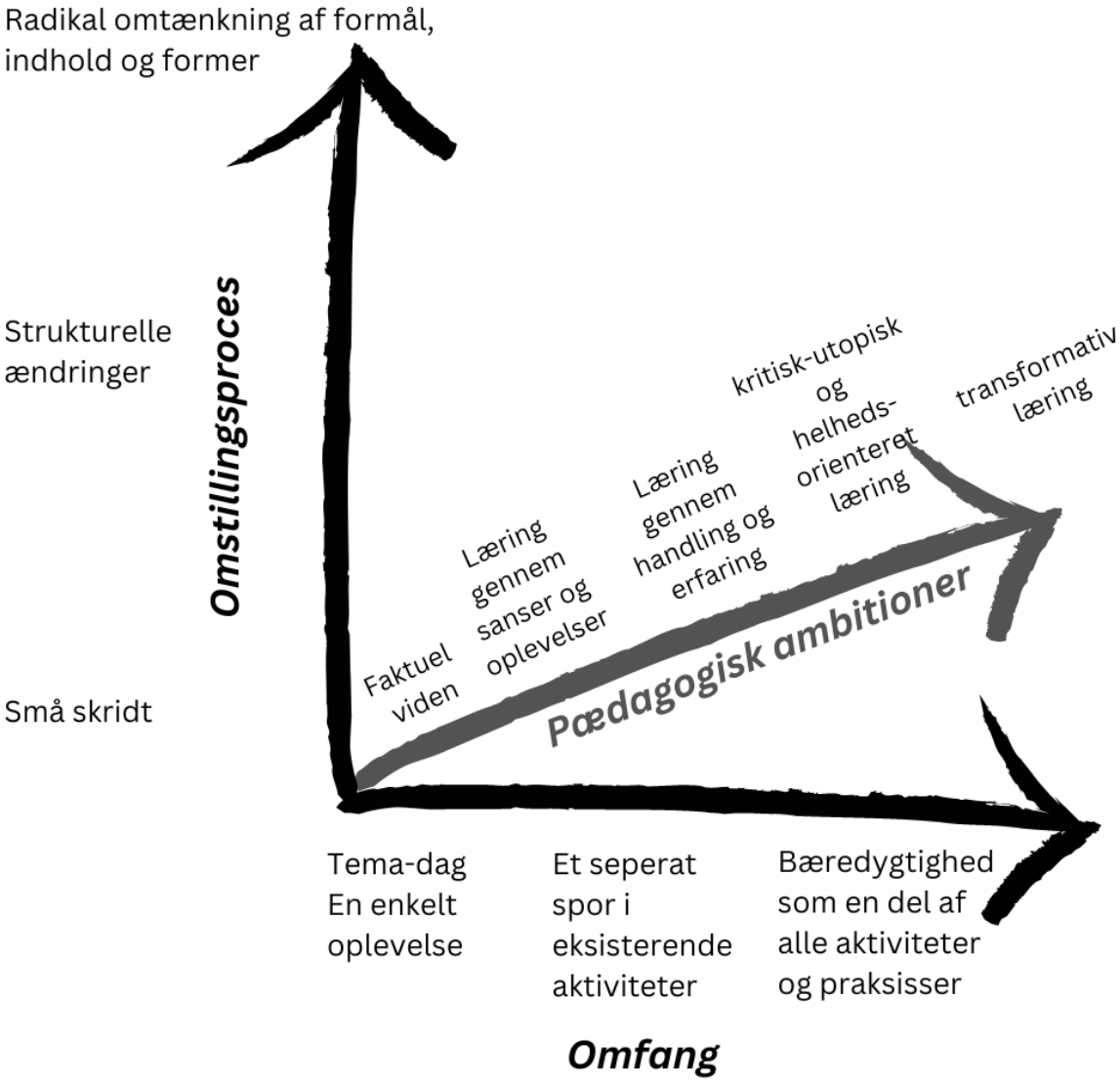
"With a steady gaze on the world, we support breakthroughs in knowledge and breakthroughs in practice. We do so with an equally firm eye on future generations. Sustainable development requires innovative solutions across disciplines, sectors and borders." (SDU, 2021)

"The University of Southern Denmark (SDU) is a striking example of how sustainable development can be used as a fundamental framework for an institution's self-presentation. Specifically, the UN's Sustainable Development Goals are used as a prism to present all parts (or large parts) of an educational institution's activities, both in terms of research and education. For example, faculties have mapped their programmes and categorised them according to the various SDGs, and a broad and pervasive link to sustainability is argued for as a starting point for both the institution's activities and the fundamental challenges that graduates face after graduation. VIA also proposes a broad engagement with the sustainability agenda, which must be able to permeate most of the everyday life of both employees and students [...]: 'VIA educates and researches sustainable solutions that can create a better future. Therefore, sustainability must permeate the entire organisation. From the principles in our strategy to the teaching in the individual classroom. From new innovative research collaborations to more thoughtful use of plastic and paper in our canteens. Our students must have the right tools in sustainable development and circular thinking so that they can carry out their future work in a socially responsible way'." (VIA, 2021b)

"The level of ambition in these and several other institutions goes beyond the understanding of sustainability as the object of, or content of, teaching and points towards a sharpening of the institutions' social responsibility towards a broad processual understanding of sustainable development that emphasises the connections between management, operations, research, education and practice. This approach does not exclude overlap with the previously mentioned approaches to sustainability as growth or as concrete support of practice, quite the contrary." (Lysgaard & Haase, 2022, p. 36-38)

Three levels of ambition for the transformation of educational institutions

In the process of developing a national action plan for UBU, Jeppe Læssøe created the following figure of different ambition levels for the transition of educational institutions. It can help you identify and think about which ambition level different initiatives are placed at.



Part 2: Eight cross-cutting key competences for sustainable development

The UNESCO report "Education for Sustainable Development Goals - Learning Objectives" proposes a set of learning objectives for each of the 17 Sustainable Development Goals. In addition, the report operates with eight cross-cutting key competences. Within the research on SDD, the concept of competences has gained a lot of weight as a counterbalance to a narrow knowledge-focused approach to SDD. Competence is often perceived as identical to technical skills. In ESD research, it is used more broadly as a set of intellectual, social, emotional and practical qualities that are important for working with sustainable development. As such, they are learning objectives within a broader concept of sustainable education. There are several suggestions as to what these competences are. The UNESCO report attempts to synthesise them into the following eight cross-cutting key competences:

- *"Systems thinking competency: the abilities to recognise and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.*

- *Anticipatory competency: the abilities to understand and evaluate multiple futures - possible, probable, and desirable; to create one's own visions for the future; to apply the precautionary principle; to assess the consequences of actions; and to deal with risks and changes.*

- *Normative competency: the abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.*

- *Strategic competency: the abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield.*

- *Collaboration competency: the abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.*

- *Critical thinking competency: the ability to question norms, practices and opinions; to reflect on one's own values, perceptions and actions; and to take a position in the sustainability discourse.*

- *Self-awareness competency: the ability to reflect on one's own role in the local community and (global) society; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.*

- *Integrated problem-solving competency: the overarching ability to apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive, and equitable solution options that promote sustainable development, integrating the above-mentioned competences."*

An important point, however, is that sustainability in education is not only about the content, but also about the teaching methods.

"ESD is holistic and transformational education that addresses learning content and outcomes, pedagogy and the learning environment. Thus, ESD does not only integrate contents such as climate change, poverty and sustainable consumption into the curriculum; it also creates interactive, learner-centred teaching and learning settings. What ESD requires is a shift from teaching to learning. It asks for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity and the linking of formal and informal learning. Only such pedagogical approaches make possible the development of the key competencies needed for promoting sustainable development." (UNESCO, 2017, p. 7)

Exemplary/action-based learning
As illustrated in the figure in Part 1, new pedagogical approaches may be needed to provide students with the knowledge and competences necessary for sustainable development. One approach I (Jeppe Læssøe) will focus on is action-based learning.

Action learning/research and problem-based learning are examples of teaching concepts where students learn by participating in change projects with stakeholders in society. For example, in the past, there was a university collaboration called the joint courses of the educational institutions, where students worked in interdisciplinary groups on projects within the environment, urban planning, communication, etc. In the Netherlands, universities have had "science shops" for many years, where citizens have been able to submit requests for projects of general relevance, which students and their teachers have then carried out as part of the teaching. There have also been science shops at Danish universities in the past, including DTU, where students could also take the course "Collaboration with users" to strengthen their competences to collaborate with actors in society. In Belgium, the universities of Brussels and Ghent have established Urban Academies as joint platforms with municipalities for university-municipality co-operation on local sustainable development.

In pedagogy, learning through concrete, real-life cases is referred to as exemplary learning. This means that students not only gain knowledge about the specific case, but also learn something general through it, just as they learn not only to apply general theories to specific cases, but to understand how the general is embedded in concrete, more complex and specific forms.

Exemplary learning can take place in relation to specific cases in the surrounding community, but it can also take place at the university, even through student involvement in the university's sustainable transition. This is what the following is about.

Part 3: Change strategies

In many places, sustainable transformation of universities is handled by management creating a consultation and then a plan that technical staff are tasked with executing. Such processes typically don't include teaching and research, only the design of a sustainable campus.

A more ambitious strategy is known as the 'whole school approach':

"For Education for Sustainable Development to be more effective, each HEI must be transformed as a whole. Such a whole-institution approach aims to integrate sustainability into all aspects of each HEI. It involves rethinking the curriculum, operations, organisational culture, learner participation, leadership and management, community relations, and research. In this way, the institution itself acts as a role model for the learners." (Rieckmann & Bormann, 2021, p. ix)

Example of a whole school approach: Transition UGent

Material:

- **Website:** https://bit.ly/transitionugent

At the University of Ghent in Belgium, the sustainable transition process has been driven for several years by a think tank called Transition UGent and a number of working groups under it. The think tank and working groups are made up of students and staff. They are supported by a green secretariat funded by management, with whom the think tank is in close dialogue on an ongoing basis. In 2018, the green coordinator described their process as follows:

"We looked into which initiatives already existed in terms of sustainability, formulated appealing targets for education, research, mobility, food, purchasing and energy, we worked out a transitional path and we proposed a lot of short term actions, experiments, policy instruments [...]. All this we published in a memorandum and we made a lot of noise about it. We invited ourselves on a lot of commissions, platforms and that led to 2 things. A lot of the experiments / short time actions we had proposed were picked up by the people who are in charge with this. And the second thing was that sustainability policy became one of the strategic options within the strategic plan of the Ugent, because the board really felt the pressure of these 150 people of the think tank Transition Ugent. Not at least the pressure of the students and the pressure of some members of the board who we had convinced to join our think tank." (Transition UGent coordinator Riet van der Velde in interview by Jeppe Læssøe, 2018)

The memorandum is evaluated every two years, after which a new memorandum is drawn up for the coming years.

The university has a Centre for Sustainable Development, which conducts research, promotes research collaboration across departments and runs courses in the 'Politics of Sustainability' and 'Transition management theory'. The latter theory of change is also utilised in Transition UGent's working groups.

CHAPTER 3 - CONSUMPTION AND LIFESTYLE

Introduction

Recent news about Denmark's climate footprint emphasises that, contrary to what many might assume, Denmark is among the countries with the highest climate impact per capita. New figures from the research organisation the Norwegian Institute for Climate and Environment (NILU) in Norway indicate that *"when including the CO2 emissions from the goods we import and consume in Denmark, we have the 33rd highest climate footprint per capita out of 176 countries in the world included in the study. [...] Denmark is among the top 20 per cent of countries in the world with the highest carbon footprint, says Daniel Moran. He is a senior researcher and has collected the material, which is used by the EU and the World Bank, among others."* (https://www.dr.dk/nyheder/viden/klima/sort-plet-paa-vores-groenne-selvbillede-tal-afsloerer-danmark-er-blandt-verdens).

A recently published report from CONCITO also concludes that our consumption plays a key role in our climate footprint and that *"extensive changes in our consumption patterns and lifestyles are needed if Denmark is to truly be a green pioneer."*[5] According to the report, the largest consumption emissions come from transport, food, housing and energy consumption.

SAMF consumption is crucial

Like any other social actor, SAMF participates in global consumption and negatively impacts our planet's CO2 emissions. This happens through SAMF's direct purchases as well as through the activities of staff and students, whether on campus or travelling to and from campus. As this collection of materials will describe, long-lasting changes in these consumption activities can best succeed if they are facilitated at a collective, systemic level rather than being solely delegated to the responsibility of individuals.

Reading guide

Before you start reading this chapter, it's worth mentioning that the study of consumer behaviour cuts across a wide range of research fields such as business studies, sociology, anthropology and psychology. This means that a number of the relevant insights are scattered across the different fields, and sometimes the insights are complementary, other times they contradict each other. In continuation of this, it is important to emphasise that this chapter should not be seen as an exhaustive summary of consumer behaviour research.

Part 1 addresses the challenge of defining climate-friendly consumption because climate-friendly consumption requires less consumption. At the same time, context-specific definitions may be necessary.

In **Part 2,** you'll find a useful overview of the factors that influence human consumption. It may be tempting to assume - or hope - that consumers will make climate-friendly consumption choices if given enough information, but it's not that simple. Emotions, habits, social influence play just as much of a role, and it is therefore essential that we consider these factors when changing consumption and lifestyles.

[5] https://concito.dk/nyheder/hoeje-forbrugsudledninger-svaekker-danmarks-rolle-groent-foregangsland

In **Part 3,** we look at some of the things that prevent people from transforming their consumption and lifestyle. Why is it so difficult and why do we often fail? This is an area that has been studied for years, and this section highlights points from an article that summarises some of the factors or limiting mechanisms that we know make it difficult to transform our consumption.

Finally, a few words on the relationship between changes that consumers can make themselves and actions that should be taken collectively, in organisations and structurally.

Some of the texts are used in several of the sections, others only in one. Under each heading, you can see which materials are used in the section. Some are listed multiple times.

Part 1: Defining climate-friendly consumption

Material:

- **Short article:** United Nations. N.d. "Sustainable consumption and production". Sustainable Development Knowledge Platform. https://sustainabledevelopment.un.org/topics/sustainableconsumptionandproduction
- **Scientific article:** Boström, M. & Klintman, M. 2019. "Can we rely on 'climate-friendly' consumption?" *Journal of Consumer Culture*, *19*(3): 359-378. https://doi-org.ep.fjernadgang.kb.dk/10.1177/1469540517717782.
- **Scientific Article:** Prothero, A., Dobscha, S., Freund, J., Kilbourne, W. E., Luchs, M. G., Ozanne, L. K. & Thøgersen, J. 2011. "Sustainable Consumption: Opportunities for Consumer Research and Public Policy." *Journal of Public Policy & Marketing*, *30*(1): 31-38. https://doi-org.ep.fjernadgang.kb.dk/10.1509/jppm.30.1.31

Fundamentally, it can be a contradiction in terms to talk about climate-friendly consumption, as consumption in rich parts of the world heavily utilises natural resources and the processing of them has a large impact on the climate (Boström & Klintman, 2019). In light of this, climate-friendly consumption can actually only focus on reducing the harmful consequences of human consumption rather than mitigating them entirely.

Defining sustainable consumption in a universally accepted and constructive way is more challenging than you might think. The UN's definition of the term, developed during the Oslo Symposium in 1994, combines sustainable consumption and production as follows:

"The use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations."

However, as highlighted by Prothero et al. (2011), there are many different definitions of sustainable consumption in existing research, and the many definitions may at times appear to disagree or even be incompatible. For an evolving concept like sustainable consumption, there is a risk that a fixed definition can have negative consequences by prescribing one way of doing things. This can limit the development of context-specific solutions and exclude human creativity (Prothero et al., 2011; Dolan, 2002). From this perspective, it is therefore crucial that collectives that want to create a lasting change in consumption habits in a more climate-friendly direction develop a context-specific understanding of climate-friendly consumption, rather than adopting pre-determined definitions and action plans.

Part 2: Factors that drive sustainable consumption

Material:

- **Scientific paper:** White, K., Habib, R., & Hardisty, D. J. 2019. "How to SHIFT Consumer Behaviors to be More Sustainable: A Literature Review and Guiding Framework." *Journal of Marketing*, *83*(3): 22-49. https://doi-org.ep.fjernadgang.kb.dk/10.1177/0022242919825649.

As described in the introduction, changing people's consumption habits and lifestyles is more complex than one might hope. In a text by White et al. (2019), they make it clear that while consumers express positive attitudes towards environmentally friendly behaviour, they often do not take sustainable actions afterwards:

"Although consumers report favourable attitudes toward pro-environmental behaviours (Trudel and Cotte 2009), they often do not subsequently display sustainable actions (Auger and Devinney 2007; Gatersleben, Steg, and Vlek 2002; Kollmuss and Agyeman 2002; Young et al. 2010). This discrepancy between what consumers say and do is arguably the biggest challenge for marketers, companies, public policy makers, and nonprofit organisations aiming to promote sustainable consumption (Johnstone and Tan 2015; Prothero et al. 2011)." (White et al., 2019, p. 23-24)

This "gap" between attitude and behaviour is not unique to climate and sustainable consumption, but is more often the rule than the exception. Psychological and behavioural approaches to the study of sustainable consumption focus on identifying the factors that motivate or hinder sustainable consumption behaviour. A useful overview of these factors can be found in the SHIFT framework developed by White et al. (2019):

"Social influence": Covers the effect that norms, identity and desirability have on our consumption. White et al. (2019) suggest that social norms can predict behaviour, such as not littering.

"The first route to influencing sustainable consumer behaviours is social influence. Consumers are often impacted by the presence, behaviours, and expectations of others. Social factors are one of the most influential factors in terms of effecting sustainable consumer behaviour change (Abrahamsen and Steg 2013). [... The] three different facets of social influence - social norms, social identities, and social desirability - can shift consumers to be more sustainable." (White et al., 2019, p. 24)

"Habit formation: Everyone knows that changing habits is hard, but many green choices require just that. New habits can be easier to form when old habits are broken due to external circumstances, such as a move, when good habits are encouraged and bad habits are penalised (although this can also have negative effects), and when you reflect on the reason why you are changing habits and make it easy for yourself.

"Whereas some sustainable behaviours (e.g., installing an efficient showerhead) require only a one-time action, many other sustainable behaviours (e.g., taking shorter showers) involve repeated actions that require new habit formation. Habits refer to behaviours that persist because they have become relatively automatic over time as a result of regularly encountered contextual cues (Kurz et al. 2014). Because many common habits are unsustainable, habit change is a critical component of sustainable behaviour change (Verplanken 2011)." (White et al., 2019, p. 25)

"Individual self": Most people want to see their own actions as good and reject the knowledge that their actions have negative consequences. They want to be consistent in their identity ("I am a car lover" or "I am a sustainable consumer"). Self-interest can also motivate action.

"Self-efficacy involves beliefs that the individual can engage in the required action and that carrying out the behaviour will have the intended impact. [...] According to Peattie (1999, 2001), consumers are most likely to choose sustainable options when consumer compromise is low and when there is high confidence that a particular behaviour will make a difference (i.e., self-efficacy is high)." (White et al., 2019, p. 28)

"Feelings and cognition": The path to action typically follows either a knowledge-based, cognitively driven route or an intuitive, emotion-driven route. Both negative and positive emotions can engage people in more sustainable choices. Knowledge about climate impact is also necessary, although it generally proves to have a more limited effect than most people expect.

"Consumers are more inclined to engage in pro-environmental actions when they derive some hedonic pleasure or positive affect from the behaviour (Corral-Verdugo et al. 2009)." (White et al., 2019, p. 29)

"Meta-analytic reviews suggest that information has a significant albeit modest influence on pro-environmental actions (Delmas, Fischlein, and Asensio 2013; Osbaldiston and Schott 2012). However, research also reveals that interventions providing information only are often not enough to spur long-term sustainable changes (Abrahamse et al. 2005; Osbaldiston and Schott 2012)." (White et al., 2019, p. 30)

"Tangibility: Green choices have positive effects on the climate that can be perceived as distant from the consumer in time and place and as abstract. Consumer choices are often about the here and now, while sustainability is focussed on the future. People who focus more on the future than the present tend to act more sustainably, and making the consequences of choices more tangible has an effect.
"One unique facet of sustainable consumption is that ecofriendly actions and outcomes can seem

abstract, vague, and distant from the self (Reczek, Trudel, and White 2018). Most sustainable consumer behaviours involve putting aside more immediate and proximal individual interests to prioritise behaviours with ill-defined consequences that are focused on others and are only realised in the future (Amel et al. 2017; Spence, Poortinga, and Pidgeon 2012). Moreover, consumers are not likely to act on issues that are impalpable in nature (Griskevicius, Cantú, and Vugt 2012)." (White et al., 2019, p. 30)

Part 3: What prevents us from transforming our consumption to become more sustainable?

Material:

- **Article:** Eckhardt, G. M. N.d. "From fashion to fast food: the myth of sustainable consumption." *Financial Times.* https://www.ft.com/partnercontent/kings-business-school/from-fashion-to-fast-food-the-myth-of-sustainable-consumption.html

- **Scientific article:** Boström, M. & Klintman, M. 2019. "Can we rely on 'climate-friendly' consumption?" *Journal of Consumer Culture*, *19*(3): 359-378. https://doi-org.ep.fjernadgang.kb.dk/10.1177/1469540517717782.

- **Lecture:** Weijo, H. 2022. "The 'Sustainable Consumer' Zombie Theory - Henri Weijo." YouTube. https://www.youtube.com/watch?app=desktop&v=-c1Fjzrp6EA

Research drawing on anthropological and sociological studies of consumption identifies a wide range of cultural, structural and practical factors that prevent individuals from adopting sustainable consumption behaviours. Boström and Klintman (2019) summarise these factors - or limiting mechanisms - under five themes:

Gap between attitudes and behaviour

Although many consumers say they are willing to make sustainable choices, this is often not reflected in their actual behaviour.

"Why are people not acting at the same climate-oriented level as they express through their climate-conscious attitudes? Studies discuss various mechanisms explaining the gap [...]. Climate concerns are connected to abstract and distant issues. Compared with organic food purchases, shopping in a climate-friendly way can less easily be translated into private concerns such as health and taste (Röös and Tjärnemo, 2011)." (Boström & Klintman, 2019, p. 365-366)

"Studies discuss various mechanisms explaining the gap (see, for example, Halkier, 2009; Klintman et al., 2008; Martinsson and Lundqvist, 2010; Moisander, 2007; Peattie, 2010; Pedersen and Neergaard, 2006):

- *Reported bias linked to the acceptability of pro-environmental responses;*
- *Lack of willingness to pay a price premium for green products;*
- *Social dilemmas ('why should I pay a more for green products if most other consumers don't');*
- *Motivational complexities (individuals have competing values and priorities);*
- *Lack of trust and perceived efficiency of the available 'green' options;*
- *Absence of practical arrangements that facilitate climate-friendly choices."* (Boström & Klintman, 2019, pp. 365-366)

Individualisation of responsibility

Citizens are largely addressed as individual consumers, which can be criticised from several perspectives. According to Brostöm and Klintman (2019), it is, among other things, about citizens' unequal opportunities to consume green and the cynicism and lack of faith in change that can follow when citizens see how their changed consumption creates relatively small changes over time.

"There are a number of critical perspectives emphasising how unfair it is to allocate so much responsibility to the individual end-consumer, while ignoring structural factors. Such factors include unequal income distribution among consumers, the roles and responsibilities of more powerful business and government actors as well as the constraining structural conditions that limit the capabilities of consumers to engage in green consumption (Akenji, 2014). Others argue that individualisation of responsibility is not just unfair but may have more profound negative effects, such as cynicism, narrow views and loss of political imagination." (Boström & Klintman, 2019, p. 366)

Information gap

Consumers are challenged in terms of knowledge about sustainable consumption in three ways: 1) translation of abstract information into everyday knowledge (e.g. "What does 18 kg CO2e/kg beef mean compared to 5 kg CO2e/kg pork, and why should I use this information?"), 2) misleading climate information and 3) a lack of knowledge and reflection.

"Intuitively appealing frames such as 'low food miles' and 'buy local' - if they are used in marketing or informational devices - can be considerably misleading, from a climate perspective, because they ignore the complexity of carbon emissions (Brenton et al., 2009). [...] blind trust may lead to cynicism if the consumer is confronted with negative, surprising information regarding the label and its certified practices. [...] Organic food production may have a negative climate impact, biomass for household heating also has its climate downsides, local food may require more energy than imported and so on." (Boström & Klintman, 2019, p. 367-369)

Ethical fetishism

By over-focussing on what you do "right" as an ethical or green consumer, you can fall into the trap of ignoring the ongoing harmful effects of your consumption.

"Some 'green consumers' - and we are most likely to find them among white and middle-class high cultural capital consumers (see Carfagna et al., 2014) - may naively celebrate their own green identities and seemingly good deeds. At the same time, they may remain ignorant and anti-reflective concerning their continuing unsustainable practices." (Boström & Klintman, 2019, p. 370)

The rebound effect

When a product is "made sustainable", it can encourage greater consumption of the same or other products.

"Akenji (2014) argues that green consumerism, in general, fails to address the root problems. Sustainable consumption requires reduced consumption, whereas global market economic system needs constantly increased consumption. Green consumerism falls between these two poles. [...] This effect implies that green consumerism can encourage more efficient use of natural resources and energy while such savings per unit mean that people can buy even more in absolute terms, thereby outperforming the efficiency gains. Climate-friendly consumers may engage in low carbon consumption in some areas of their everyday lives, while their total carbon footprint may remain constant or even increasing." (Boström & Klintman, 2019, p. 371)

Professor Giana M. Eckhardt from King's College London also focuses on which types of sustainable consumption companies are not interested in promoting:

"Consumers can contribute by slowing down and consuming less. This is a message that companies, even those publicly committed to being driven by responsible business, such as Unilever, are slow to advance. Consuming less is more about upending the consumption system. It is about repairing one's current shoes for example, instead of buying new ones, even if those new shoes contribute profits to social organisations. This is the power of the consumer to drive social change: to not consume." (Eckhardt, n.d.)

Despite the fact that promoting sustainable consumption is rarely easy or even possible, consumers and consumption remain a central focus in discussions about the consequences of (global) capitalism and markets. The
following public lecture by Associate Professor Henri Weijo from Aalto Business School explains why the focus on consumption remains central to the climate debate. See bit.ly/Zombietheory

Round-up: How do we achieve lasting consumption and lifestyle changes?

There is no doubt that changing people's consumption and lifestyle habits is difficult, but that doesn't mean that we as individuals should stop trying to behave in a climate-friendly way. However, individual efforts are far from enough and it is therefore important that they are combined with and embedded in collective, social, political and market actions. This is necessary if we are to 1) create structural changes towards more sustainable consumption in both the short and long term and 2) shift the responsibility for reducing CO2 emissions back to the biggest (corporate) polluters.[6]

"Individual action does not have to become isolated and fragmented. It can go together with a collective frame, either through a collective sense making of individual actions or by (social movement) concerted efforts among individuals (Autio et al., 2009; Grosglik, 2017; Halkier, 2004; Holzer, 2006; Kennedy et al., 2018; Micheletti, 2003). Scholars stress that people need to sense that their consumption and actions have meanings, make a difference and involve a larger group [...] beyond the scope of the actor-oriented approach to policy, citizen-consumers can provide support and legitimacy of more structural and progressive climate politics and planning (Klintman and Boström, 2015)." (Boström & Klintman, 2019, p. 373)

An important argument I (Julie Emontspool) would personally like to make is that individual consumption changes can at best complement structural (regulatory, economic or market) changes. We should be careful not to fall into the false assumption that leaving our climate to one of the least informed and powerful actors in society: the consumer, is a sustainable solution to a societal problem.

[6] https://www.theguardian.com/sustainable-business/2017/jul/10/100-fossil-fuel-companies-investors-responsible-71-global-emissions-cdp-study-climate-change

CHAPTER 4 - BUILDINGS AND FACILITIES

Introduction

In Denmark, the built environment accounts for a total of 40% of national energy consumption.[7] The high carbon footprint comes from the operation of buildings and the construction process in connection with new construction, renovation and production of building materials. For the carbon footprint of buildings, a distinction is made between embodied energy and operational energy. Embodied energy covers the resources used to construct a building and covers everything from the transport of materials to the climate impact of the specific resources. Operational energy covers the resources used to operate and maintain buildings and includes everything from ongoing cleaning and maintenance to indoor climate, lighting, etc.

10% of Denmark's CO2 emissions can be attributed to the building and construction industry and the production of building materials. At the same time, 20% of Denmark's CO2 emissions can be attributed to the energy used in our buildings, and it is especially the operation and our requirements for the indoor climate in the buildings that have a high climate footprint.

If we look at SAMF's total carbon footprint, a similar picture emerges, with 23% coming from the operation and maintenance of the buildings. This means that there is significant sustainable potential in working with the operational energy used in SAMF's total building stock.

Reading guide

Part 1: When rethinking the physical university and how the carbon footprint of buildings and facilities can be reduced, it is important to recognise that the framework for your discussion is crucial to how different sustainable initiatives are assessed. Are the effects and climate footprint considered from a person perspective, a building perspective, a university perspective or a societal perspective? Depending on the framework, an initiative can be assessed as sustainable in the university's climate accounts, but be said to have the opposite effect in a societal context. Sustainable initiatives can also have consequences that take place outside the immediate framework of the SAMF. For example, a relocation could result in buildings remaining empty for a longer period of time or undergoing major remodelling to be used for other purposes - consequences that, in a societal context, can overshadow the initiatives' immediate sustainable potential on SAMF's own climate footprint. At the same time, a broader framework opens up for the inclusion of sustainable initiatives that cannot be directly quantified in SAMF's climate accounts, but which are beneficial at a societal level. An example could be renting out SAMF's buildings in the evenings for purposes and contexts other than the faculty's own activities.

It is therefore necessary to consider the SAMF in a larger societal context before strategies and initiatives can be assessed. The first part of the collection of materials deals with the difference between two different approaches to framing environmental assessments of products or processes throughout their life cycle. The approaches are called consequential life cycle assessment ("consequential" LCA) and contributional life cycle assessment ("contributional" LCA). The material

[7] Climate, Energy and Utilities Committee 2019-20.

should be seen as an inspiration to emphasise the importance of the framework and the complexity you will be working with.

Part 2 emphasises the fundamental human tendency to solve problems by adding something new - a tendency that, in architecture, contributes to the large carbon footprint attributable to the built environment. For example, sales of air conditioning systems in Denmark are on the rise as Northern and Western Europe experience more frequent heat waves. However, by incorporating the issue into our existing architectural framework, for example by changing the colour of our houses or adding shaded planting, we can address the consequences of a warmer climate without increasing the strain on the planet's resources. This human tendency to "solve by adding" is therefore important to keep in mind when working on sustainable strategies for the operation of buildings and facilities. Part 2 therefore briefly describes a number of architectural strategies that can be applied in this context.

Part 3 highlights that it's not just architectural and technological solutions that are important if we want to reduce the energy consumption of buildings. Human behaviour - in this case, the behaviour of you, your students, teachers and other staff - is crucial if you want to reduce the carbon footprint of your physical environment. Cultural and behavioural aspects such as dress, metabolism, habits and lifestyle can all play a role in the energy consumption used to operate buildings and facilities. And since people adapt more easily than buildings, and technological changes are expensive and slow, behavioural changes can be considered effective and economical strategies for energy savings that can be implemented today.

Part 1: Awareness of climate footprint framework and context

Material:

- **Film:** "Attributional vs Consequential LCA." YouTube. https://www.youtube.com/watch?v=3Rj7IlustcQ
- **Website:** https://consequential-lca.org/clca/why-and-when/
- **Scientific article:** Brander, M., Burritt, R. L., & Christ, K. L. L. 2019. "Coupling Attributional and Consequential Life Cycle Assessment: A Matter of Social Responsibility." *Journal of Cleaner Production*, *215*(April): 514-521. https://doi.org/10.1016/j.jclepro.2019.01.066.

"Consequential" Life Cycle Assessment

"Consequential LCA focuses on analysing changes in a system as a result of decisions or changes in market, policy or behaviour. This approach takes into account potential long-term consequences and attempts to predict how decisions may affect supply and demand for products, resource allocation, technology choices, etc. This strategy looks beyond the framework of the system being analysed.

"Contributional Life Cycle Assessment

"Contributional" LCA focuses on assessing the impact of a product or process on the environment without taking into account changes in the wider system. It aims to identify and quantify the direct environmental consequences of the specific product or process in a given life cycle.

In essence, the difference between the two approaches is whether they take into account indirect and long-term consequences. Whereas 'contributional' LCA can be used to identify potential areas for sustainable action, 'consequential' LCA can be used to investigate impacts that go beyond the immediate scope of the task.

Part 2: Strategies for sustainable architecture

Material:

- **Book:** Beim, A., Hau, I., Thomassen, M., Mossin, N., Much-Petersen, P., & Petersen, T. L. 2023. *Innovation of Nothing - The Capabilities Needed to Lead Change in The Build Environment*. Copenhagen: The Royal Academy, Department of Architecture and Technology.

Based on the premise that people are more likely to solve problems by adding functions rather than subtracting problems, the book summarises a number of architectural strategies in relation to materials, technology and indoor climate.

Materials:
When using materials in the construction and operation of buildings, endeavour to:

- Materials with the lowest possible carbon footprint "upfront".
- Raw materials that are renewable and in abundance, that are by-products of other industries that would otherwise go to waste, or that can be recycled directly from selective demolition.
- Materials that can be recycled and remanufactured with low impact.

Technology:
The technology of architecture should:

- Ensure that structures are reversible and can be disassembled again in a non-destructive way.
- Ensure that structures are protected against wind, weather, fire, wear and tear, etc. For example, large roof overhangs will significantly extend the lifespan of exterior walls and cladding.
- Aim for simple designs and reuse rather than using virgin materials and construction, i.e. "do more by doing less".

Indoor climate:
Passive indoor climate systems should be sought through simple and non-high-tech solutions, such as natural ventilation, heat accumulation in thermal mass, utilising the heat that is a by-product of computers, refrigerators and the like. This will contribute to simplified constructions and spatial qualities.

"[T]he climate crisis we face [...] is a crisis of over-consumption, which means that solving it by adding new products, and new structures, can at worst add to the challenges we are responding to. In the construction industry today, we are overstepping planetary boundaries, using too many material resources and claiming too much land for human settlements." (Beim et al., 2023, p. 28)

"When adding is our preferred strategy for problem-solving, it means that a solution model of subtraction will require us to work harder on identifying subtraction potential, to think more in order to produce less. Simple solutions may be more time consuming or complex to design. The complexity is heightened by the fact that our systems, regulations and building codes are also the result of a solution model that rewards adding rather than subtracting, thus potentially making simple solutions more difficult for existing frameworks to acknowledge." (Beim et al., 2023, p. 29)

Part 3: What matters for building energy consumption?

Material:

- **Scientific Article:** Harputlugil, T. & de Wilde, P. 2021. "The Interaction between Humans and Buildings for Energy Efficiency: A Critical Review." *Energy Research & Social Science*, *71*(January): 101828. https://doi.org/10.1016/j.erss.2020.101828.

The article reviews a number of research articles on operational energy consumption in buildings. The study suggests that the primary energy consumption in buildings can be attributed to indoor climate maintenance systems (ventilation, temperature, humidity, etc.) and that these can be related to user-oriented and cultural aspects such as clothing, metabolism, habits and lifestyle. Thus, savings in the operational energy consumption of buildings can be achieved technologically or through behavioural changes. Behavioural changes refer, among other things, to our conventional approach to indoor climate, where we strive for a constant and uniform temperature in all rooms, without really assessing whether this is necessary according to the different functions of the rooms. Another example could be the relationship between the way we dress and the way we heat the rooms. An economical way to reduce the operational energy consumption of buildings is therefore behavioural changes, as these are easier, faster and cheaper to implement than large and resource-intensive technological modifications. Education and awareness of one's own energy consumption are widespread and effective measures to initiate behavioural change.

Furthermore, it emphasises the need for a holistic view of energy consumption, which is often overlooked when studies of operational energy consumption focus on individual buildings. Thus, it is necessary to consider interactions and relationships with neighbourhoods, communities, cities, etc. For example, many heated buildings are empty in the evenings when not in use. If other user groups could benefit from these, there would be an energy saving to be made elsewhere in the city. This again refers to the importance of framing and context, which is touched on in Part 1.

"Since people are spending more and more time indoors (2), (3) there is a strong need to save energy from buildings. It is well-known that 1/3 of primary energy (4) and 40% of energy resources worldwide is consumed by the built environment (1), (4), (5), (6), (7). Contrary to general belief, "buildings do not use energy: people do." (Harputlugil & de Wilde, 2021, p. 2)

"Maintaining comfort conditions of occupants is the main reason for energy consumption in buildings. Variation in building design, building systems, weather, indoor air temperature, relative humidity, air speed and occupant-centric parameters such as clothing, metabolic rate, cultural habits, attitudes, and lifestyles all may contribute to varying comfort conditions in which occupants consume energy. Furthermore, occupants are individual human beings, and therefore it is hard (and often controversial) to group them into predefined categories using a classification based on their culture, location, society, status, lifestyles, income, vulnerability, age, gender etc. (4). To conserve energy in buildings, occupant comfort conditions should be maintained while accommodating the occupants' habits, attitudes, profiles, lifestyles, demographics, socio-economic status, vulnerabilities, and other limitations." (Harputlugil & de Wilde, 2021, p. 3)

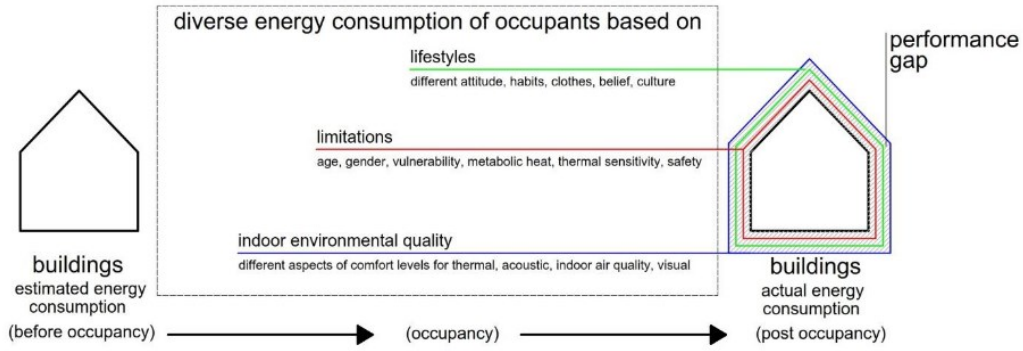


Figure 2. Effects of Occupant Behaviour on the building energy performance gap

(Harputlugil & de Wilde, 2021, p. 4)

"In principle, the reduction of energy use in buildings can be achieved in two ways. The first is to invest in technology and the second is to invest in changing occupant behaviour. In general, human beings can be considered as quite flexible to changes of climate conditions, lifestyles, developing technology, attitudes etc. Buildings, on the contrary, are a lot less flexible than humans over their operation period. Technological modifications of buildings take time, need a serious amount of investment, and payback times cannot fully be estimated. Using the human capacity for adaptation may allow societies to get fast paybacks and efficiency results. This is not expensive and has a fast response time. Supporting this idea, Ting et al. (37) argue that promoting the use of energy-efficient technologies, as well as further developing such technologies, is not enough to tackle high levels of environmental pollution and energy consumption. Occupants should not be considered as the only actors who will solve the problems. It is obvious, however, that the challenges of reducing energy consumption and bridging the energy performance gap in buildings require a deep understanding of occupant behaviour." (Harputlugil & de Wilde, 2021, p. 4)

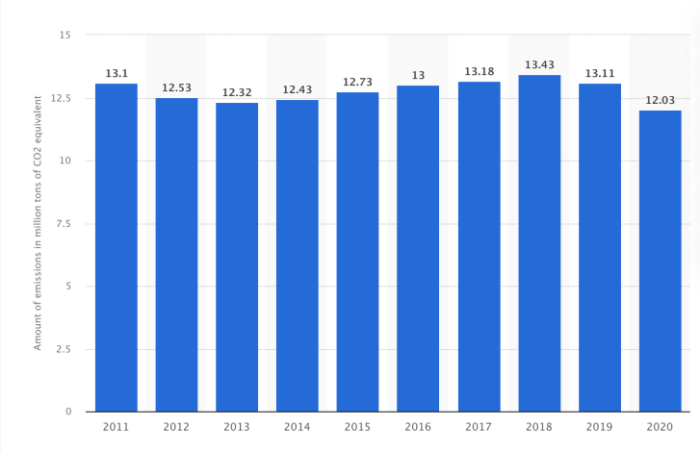
CHAPTER 5 - TRAVELLING, MOBILITY AND ACCESSIBILITY THROUGH DIGITAL SOLUTIONS

Introduction

The transport sector's environmental and climate problems have long been unsolvable. Despite the introduction of various policy instruments, technological improvements, efficiency improvements, alternative fuels, electrification and a number of other initiatives, the amount of emissions in the transport sector has not been reduced.

Most of our targets for reducing the environmental and climate impacts of transport have therefore (with the exception of the pandemic years) not been met, and the ambitious targets set at EU, national and organisational level are at risk of not being met. This is largely due to the fact that the increased efficiency per vehicle and/or per passenger kilometre compensated is outpaced by an increase in transport volume: We are travelling more and longer and the number of vehicles is increasing: *"The mobility system has so far failed to deliver a significant reduction in greenhouse gas emissions. Gradual increases in efficiency have been overcompensated by increases in demand for mobility services*" (European Environment Agency, 2022).

Therefore, if we want to reduce emission levels, we also need to reduce transport volumes, i.e. travel less.



Greenhouse gas emissions from fuel combustion in the transport sector in Denmark 2011-2020 (Statista, 2023).

However, it is an unattractive and hard-to-sell solution, as most people want to be able to travel, both privately and for business. Mobility has also long been seen as closely linked to and a prerequisite for economic growth, making it almost impossible to gain broad political support for measures that limit mobility in society. A further complicating factor is that the people who travel the most in different organisations (companies, government agencies, universities) for the organisation's money are often top managers and executives. They are rarely interested in creating policies that limit their own options. Influencing transport demand has therefore been a difficult and, in practice, almost impossible task.

However, the COVID-19 pandemic has caused many people to rethink and new preferences and behaviours around meetings and work have emerged. The increased acceptance and use of digital meetings is affecting the demand for business travel, especially for simple routine activities and less "attractive" trips. Many people have discovered that telecommuting a few days a week can provide more freedom and contribute to better wellbeing. An average of two days of working from home per week can reduce commuting by up to 40%.

What we now call "the new normal" therefore gives us a unique opportunity to establish new, more sustainable practices where old "truths" can be challenged and redefined in a more sustainable and climate-smart way. Let's take a closer look at where we are today, what the alternatives are and what the challenges are, and let's be inspired by some great examples.

At SAMF, passenger transport accounted for about 1/3 (32%) of CO2 emissions in 2022, evenly split between CO2 from commuting (16%) and business travel (16%). Overall, passenger transport is therefore by far the largest source of emissions from the SAMF.

Reading guide

This chapter is longer than the other expert contributions, as it includes general information on the topic of transport and mobility. This is useful for understanding our general consumption of transport and the resulting climate footprint. As a reader, you can use the headings and the reading guide as a guide to what the chapter contains and assess what you need to know more about.

Part 1 starts by providing background knowledge about passenger transport and its climate emissions in Denmark. It's important to note that the chapter only covers passenger transport, business travel and commuting and not freight transport. Next, the chapter touches on why university employees travel so much and which group of employees is particularly responsible for CO2 emissions.

Part 2 touches on the experience we have with digital solutions in a Swedish context. As Denmark and Sweden are at the same level of digital development and maturity, the Swedish experience is comparable to the Danish and therefore relevant in this context. Digital accessibility can complement physical mobility and partly reduce the need to travel, and it is therefore interesting to delve into digital solutions when talking about transport and mobility. Research has shown that increased use of digital meetings usually doesn't significantly change an organisation's meeting and travel culture; rather, digital meetings become a supplement and travel continues. That's why Sweden has had an initiative called REMM for more than 10 years with the aim of changing the meeting culture of government organisations by increasing and improving digital collaboration within and between authorities.

At the end of the section, you can read about the connection between working from home and personal transport and, by extension, the difference between the carbon footprint of travelling and digital meetings.

Part 3 reviews different strategies that can be used to reduce climate emissions from a university's personal transport and travel. This is not easy and often a big challenge, but there are four strategies and below them a number of tools that can be used to reduce the carbon footprint. The four strategies are: 1) avoid, 2) substitute, 3) shift and 4) improve.

Finally, a study of over 700 travellers employed at a Canadian university is touched upon. It examined the relationship between their business travel, how productive they were in their research, and how it affected their career development and expertise. Is there a link between aviation emissions and academic productivity?

Part 1: Background

Passenger transport and its climate emissions

Transport is responsible for the largest average carbon footprint of a Danish citizen.

In Denmark, passenger transport generates around 2-3 tonnes of CO2 per person per year. Compared to our Nordic neighbours, Danish emissions are at the same level as Finland and Iceland, higher than Sweden (1.5-2.5 tonnes), but lower than Norway (2.5-3.5 tonnes).

Driving a private car accounts for the largest share of emissions from passenger transport in Denmark (approx. 1-1.5 tonnes of CO2 per person per year), followed by air travel (0.3-0.5 tonnes), public transport (0.3-0.5 tonnes) and other modes of transport (0.1-0.2 tonnes). For an average family, driving a car accounts for about half (47%) of climate emissions (Statistics Denmark, n.d.).

Aviation, which is primarily an international phenomenon and therefore best discussed globally in terms of emissions, accounts for around 5-6% of climate emissions (Wynes et al., 2019). Aviation has been the fastest growing mode of transport for several decades, with an average annual growth rate of around 7%, and before the COVID-19 pandemic, it was expected that by 2035 the aviation industry would account for up to 22% of total CO2 emissions.

Part of the explanation for our high climate emissions is that we Scandinavians are relatively well off economically, and the amount of travel and its cost is strongly linked to the amount of financial resources available, both for individuals and organisations. In an international comparison, Denmark was the country in the world that spent the most money on business travel per employee in 2019: 27,000 Swedish crowns per year per employee according to the World Travel and Tourism Council (2020 cited in Cisco, 2020). Sweden was the country that spent the second most money on business travel.

At the same time, Copenhagen is one of the most bike-friendly cities in the world, and many people use the bicycle as a regular means of transport, even when commuting to work. Around 38% of Copenhagen's population cycle to work.

Public transport in and around Copenhagen is also of high quality by international standards, and further efforts are being made to improve the service. Before the COVID-19 pandemic (2019), around 44% of Copenhageners commuted to work by public transport or train - a relatively high figure compared to many other cities in the world. The 2019 Copenhagen City Plan aims for 75% of all journeys in the city to be made on foot, by bike or by public transport (City of Copenhagen, n.d.).[8]

Passenger transport at universities

Travel is a major - often the largest - source of CO2 emissions for universities. In Sweden, for example, universities and university colleges (which are public authorities) have long reported some of the highest CO2 emissions from business travel per capita among all public authorities (Naturvårdsverket, 2020). Emissions for individual universities have been around 1-2 tonnes per employee per year, but some higher education institutions have reported the equivalent of 3-4 tonnes. As universities are large workplaces with many employees, this means that they are also some of the authorities with the highest overall greenhouse gas emissions. Unfortunately, similar data for commuter journeys is not available, as these are not subject to mandatory reporting.

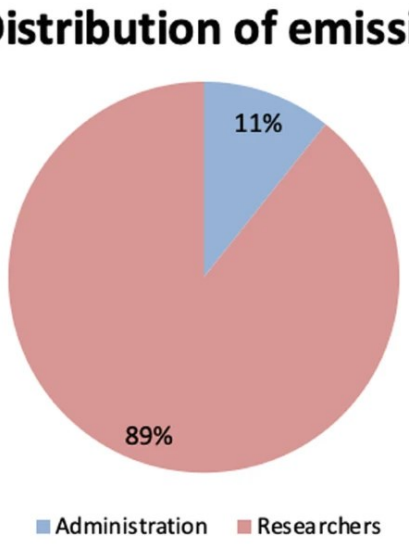
Why do university employees travel so much?

The most common purposes for business travel are often related to research, teaching, collaboration, finance and administration. Researchers and research leaders often travel to attend research collaborations, workshops and conferences. In some disciplines, fieldwork is essential to collect data and conduct empirical studies. University staff often travel to other universities or institutions to give guest lectures, teach, hold seminars or organise workshops. They also travel to participate in collaborations with industry and business for various research projects, consultancy or technical co-operation. In addition to research and teaching, they also travel to establish and maintain international collaborations, establish student and PhD student exchanges, fundraise or evaluate activities.

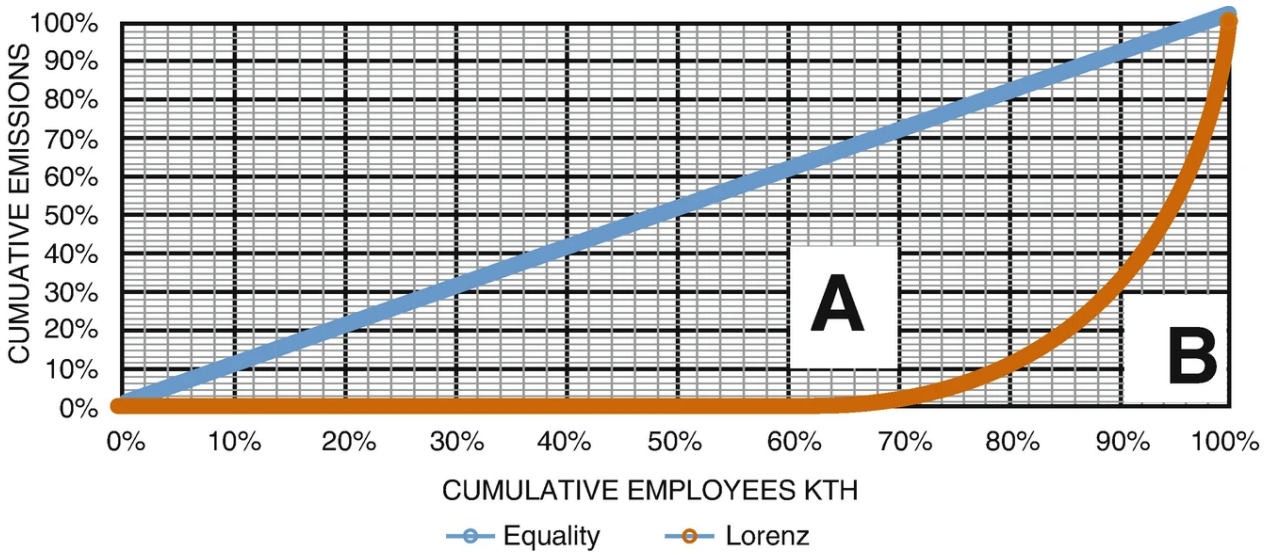
University employees, especially senior researchers, have a relatively high degree of freedom to organise and design their activities, including when and how they travel for work. If you have applied for and been awarded research funding for a project, a certain amount of which is usually budgeted for travel, there is little or no incentive not to use up the travel budget. On the contrary, it is expected that a portion of these funds will be used for travelling, as this is the budget allocation agreed with the funder.

Researchers also tend to account for the majority of travel and related emissions at universities, which has been recognised and studied at KTH Royal Institute of Technology in Stockholm. Here, around four out of 10 employees had flown during a year (2019) and around 20% of employees accounted for 89% of business travel emissions. A deeper dive into the statistics shows that 10% of employees accounted for 2/3 of the emissions and the 5% most frequent travellers accounted for almost half of the air emissions (47%) at the Royal Institute of Technology (KTH). The graphs below show the distribution of CO2 emissions from air travel within the university (Bjørkdahl & Duharte, 2022).

[8] A share already achieved for commuter trips: 82%.



The breakdown of CO2 emissions from air travel at KTH is divided into two categories: administration and researchers. The former category accounts for 26% of all employees, but their CO2 emissions from flying only account for 11% of KTH's total emissions (Bjørkdahl & Duharte, 2022)



This Lorenz curve shows the total aircraft emissions distributed across all employees at KTH.[9] The X-axis represents the cumulative share of employees and the Y-axis represents the cumulative emissions from flying (Bjørkdahl & Duharte, 2022).

[9] The Lorenz curve was originally developed to show the national income distribution across populations and income groups, but it is used here to show the distribution of CO2 emissions across KTH employees.

Part 2: Digital solutions

In this section on digital solutions, I mainly refer to our Swedish experiences, but since the digital development and maturity in Sweden and Denmark are at the same level (Arnfalk, 2020)our Swedish experiences should be comparable to the Danish ones and therefore also relevant in this context.

Digital solutions can help create access to various functions in society: work, commerce, education, meetings and collaboration, entertainment, etc. which we can call digital accessibility. Digital accessibility can complement physical mobility and partly reduce the need to travel. However, it is not a given that increased digital use leads to less travelling; it depends on a number of different parameters and the correlations are complex (Arnfalk & Winslott Hiselius, 2022).

Let's take a look at how this can be interesting and applicable for SAMF and UCPH. We focus on how digital meetings can affect business travel and its carbon footprint, and how an increased share of homeworking and distance learning can affect commuting emissions.

Digital meetings

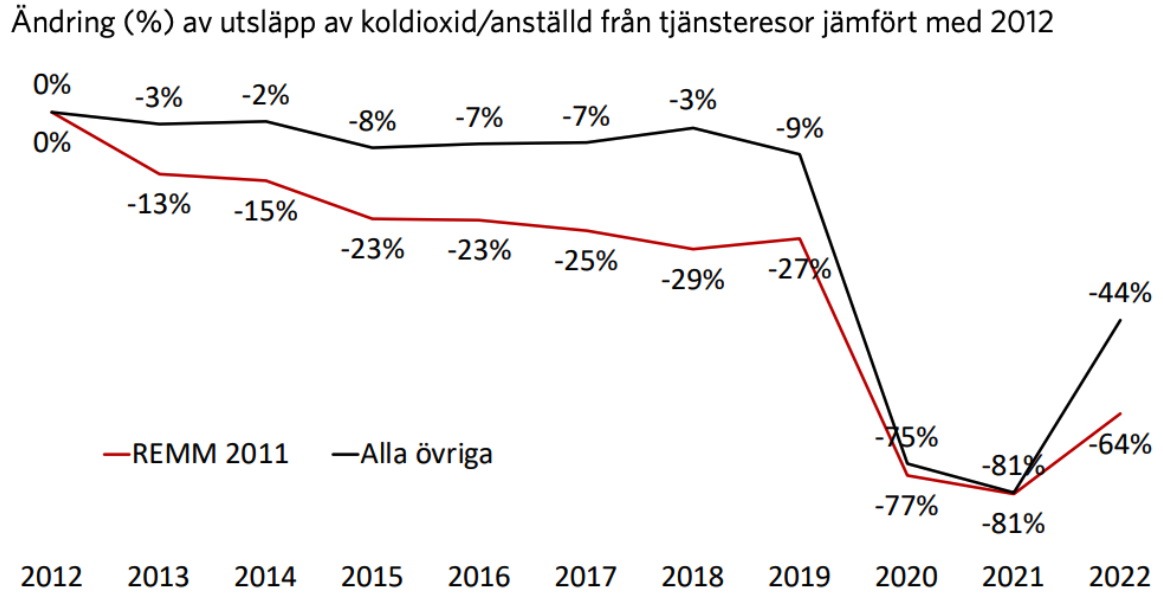
Video conferencing has been around for over 50 years, and for a long time it was an expensive and complicated technological solution with very limited use. But thanks to technological developments, real-time meetings with audio and video are now widely available and a reality for most people in Denmark, including employees and students at UCPH. The recent pandemic accelerated this development and forced even the more technologically sceptical to use digital meetings, for better or worse. But universities in Sweden have, perhaps surprisingly, been relatively slow to adopt a digital meeting culture.

The proportion of digital meetings out of all relevant/usable meetings was low (15%) in research and education in Sweden before the pandemic, the second lowest of all categories, with only media, culture and social work having a lower proportion (12%). This compares to industries such as IT, data and programming, where 67% of corresponding meetings were digital, 52% of meetings in analytics and law, and 41% in finance and administration (Cisco, 2020). Although the share of digital meetings increased significantly during the pandemic, the education sector still has a relatively low share of digital meetings compared to other sectors.

This pattern is also seen when comparing universities to other Swedish authorities: before the pandemic, universities reported an average of three digital meetings per employee per year (2016), compared to an average of around 20 in other authorities. During the pandemic, universities' use skyrocketed thanks to distance learning with 169 digital meetings per employee per year, but after the pandemic, universities have again reduced their use of digital meetings by around 40% (Naturvårdsverket, 2022).

Research has shown that increased use of digital meetings usually does not significantly change an organisation's meeting and travel culture; rather, digital meetings become a supplement and travel continues - "business as usual". Therefore, for more than 10 years, Sweden has had an initiative called REMM[10] with the aim of developing the meeting culture of authorities by increasing and improving digital collaboration within and between authorities. In this way, the goal is to reduce climate emissions and the environmental and economic costs of business travel by public authorities.

The effect of the REMM initiative on travel has been monitored annually through the authorities' mandatory reporting of emissions data to the Swedish Environmental Protection Agency, but also through other studies (Arnfalk et al., 2016). The authorities that participated in REMM in 2011 have reduced their CO2 emissions from business travel significantly more than other authorities. From 2012 to 2019, the year before the COVID-19 pandemic, the original REMM authorities reduced their CO2 emissions per employee by 27%. This compares to a 9% reduction for other governments. During the pandemic, they all significantly reduced their emissions by more than 80% compared to 2012. After the pandemic, the increase has been much smaller for the original REMM authorities compared to the other authorities. In 2022, the original REMM authorities had a 64% reduction compared to 2012, while the corresponding reduction for other authorities was 44%. (Naturvårdsverket, 2023).



REMM has worked to support the individual authorities in their work to develop the meeting culture in their respective organisations. The work is based on the so-called 10-step method, which is a tool for systematic organisational development.[11] REMM also supports the more than 90 participating authorities through various consultations, training programmes and webinars, as well as by producing reports and guides.

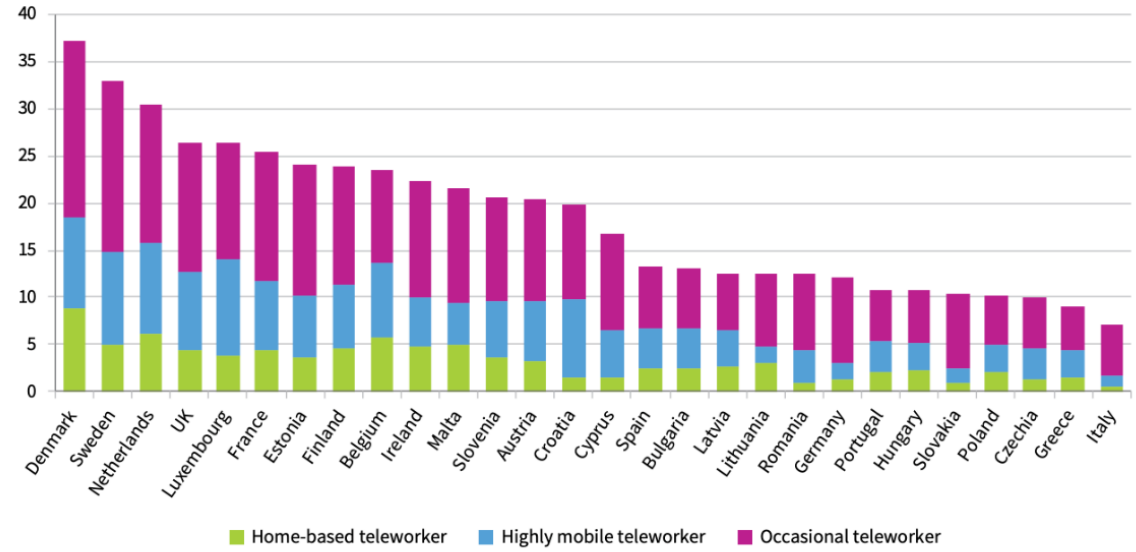
[10] REMM: Travel-free/digital meetings in public authorities, led by the Swedish Transport Administration. See https://trafikverket.diva-portal.org/smash/get/diva2:1773470/FULLTEXT01.pdf

[11] For REMM's 10-step method, see: https://www.remm.se/10-stegsmetoden/

Home/telecommuting

Even before the pandemic (2015), Denmark was the country in Europe with the highest share of homeworkers (37%) - followed by Sweden (33%) (European Foundation for the Improvement of Living and Working Conditions, 2019). However, few people telecommute full-time, and the most common is to telecommute from once a month to two or three days a week.

Figure 25: Percentage of workers teleworking in Member States, by type, 2015



Source: *EWCS 2015*

In Sweden, most universities are state institutions, and here remote working was a fairly rare phenomenon before the pandemic, as government policies were either very restrictive or banned their employees from working remotely altogether. After the pandemic, most public institutions now allow employees to work from home for up to 49% of their working hours, which many office workers are now taking advantage of by working from home two to three days a week (Winslott Hiselius & Arnfalk, 2021).

This has led to an increase in the frequency of remote working from around one working day a month (5% of all working days) to an average of two to three days a week for the third of the working population that can work remotely, which equates to around 13-20% of all working days in total. This has implications for commuting, not least for long-distance car commuting.

University employees have had slightly different conditions for remote working depending on their position: many researchers and lecturers have had ample opportunities to work outside of their offices. On the other hand, technical, administrative and financial staff at universities have had a more restrictive policy on working from home. After the pandemic, views on working from home have changed, even for these groups.

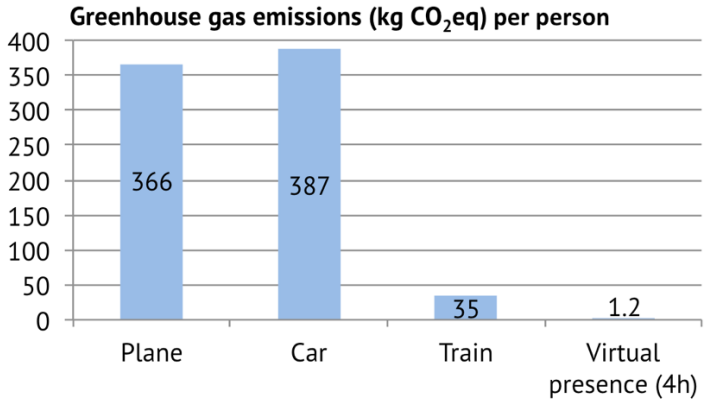
Is there a link between working from home and transport consumption?

The link between increased homeworking and reduced personal transport is complex, and it is far from obvious that it leads to fewer person kilometres travelled by car and thus reduced emissions. Different studies point to different results. For example, an unused commuter car can be made available for other types of trips, saved commuting time can be used for more private trips, not having to commute every day can lead to moving to a location further away from the office, etc. (Malmaeus et al., 2021). These so-called recoil or rebound effects can eat up a large part or even all of the commuting gains. The size of rebound effects can be partially regulated by different kinds of informative, financial and mandatory instruments, but there must also be a willingness to introduce such controls.

The digital carbon footprint versus the carbon footprint of travelling

Digital devices also have a large carbon footprint and a number of other environmental and social costs. The increasing use of digital technologies requires both user equipment and investments in networks and large energy-intensive server centres. Looking at the full lifecycle of all digital services, they account for 3.7% of global greenhouse gFas emissions.

As digital meetings have increasingly replaced travel during the pandemic, studies comparing the environmental and climate impact of physical meetings and conferences with their digital counterparts are increasingly in the spotlight. A one-hour video conference has been estimated to generate up to 1kg of carbon dioxide (Nateghi & Madani, 2021).[12] However, in a comparison between travelling to and from a meeting and a video conference, it is estimated that travelling generates 300 times more carbon dioxide than the digital meeting (Warland et al., 2016).



In a comparison between a digital and a physical conference (Faber, 2021) the result was in favour of the digital version: a physical conference resulted in 66 times more CO2 emissions than an equivalent digital one.

Another comparison between a fictional conference in Innsbruck and a digital conference showed an even greater difference: the travel-induced CO2 emissions were between 250 and 530 times higher than the emissions from the digital conference (Bjørkdahl & Duharte, 2022, p. 61).

[12] Based on an almost entirely coal-based US energy mix.

Table 2.3 The carbon footprint of the virtual ECPR GC 2020 compared to the situation if it had taken place in Innsbruck as initially planned (in tons CO_2 eq)

Carbon footprint of	Virtual	Innsbruck (baseline estimation)
Participants' devices	4.26	–
Internet transfers (Zoom)	0.43	–
Travel	–	1210–2493
Total	4.70	1210–2493

According to major network providers, the increased strain on networks and servers caused by more digital meetings during the pandemic hasn't been very noticeable. It has been overshadowed by rapidly growing streaming services like YouTube and Netflix (NCTA, 2020).

Part 3: Ways to reduce the climate impact of university personal transport

Possible strategies

As described above, reducing climate emissions from university personal transport is a challenge, not least due to a number of conflicting incentives. But let's look at some possible tools and strategies that can be utilised.

Avoid, shift, improve and replace are ways to climate adapt travelling.[13] We'll also look at some other more indirect strategies.

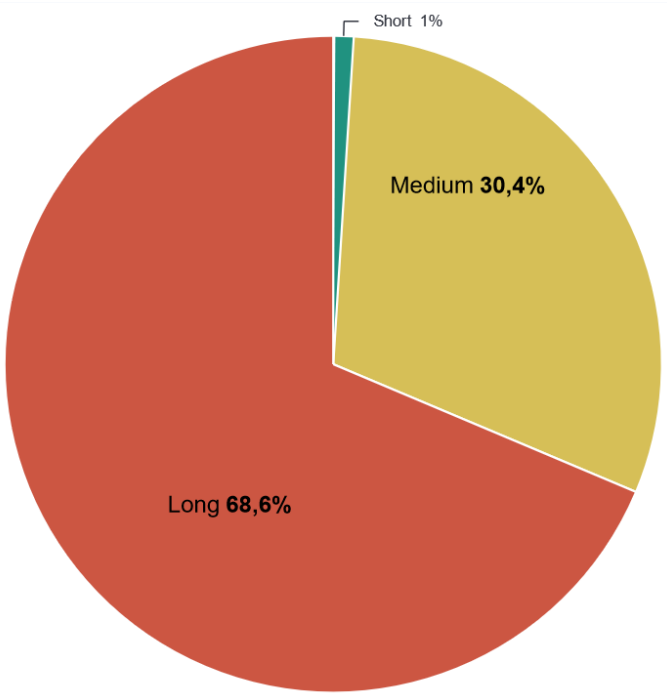
Strategy 1: Avoid

- A first step is to question whether your participation in the meeting or conference is really necessary. If not, spend your time on something more important/better/fun.
- Review and reduce the frequency of different types of activities - such as conferences, symposiums and workshops - that generate meetings. Reduce the number of attendees. Avoid measuring success by the number of attendees, but focus more on the quality of what comes out of the event

- Replace travelling with digital participation. In practice, this can mean that:
    - Join a conference digitally.
    - Organise a purely digital conference instead of a physical conference.
    - Organise a hybrid conference with a number of digitally connected meeting hubs around the world.
    - Deliver a guest lecture digitally.
    - Invite guest speakers, opponents, etc. to speak digitally.
    - For example, replace every other physical research meeting with a digital meeting.

[13] https://en.wikipedia.org/wiki/Avoid-Shift-Improve

It is especially the long-haul journeys that generate the highest emissions and where measures have the greatest impact. A pie chart of emissions from academic flights at KTH Royal Institute of Technology in Stockholm shows the effect of reducing the different categories of short-haul (Nordic), medium-haul (European) and long-haul (global) travel. Halving long-haul travel reduces CO2 emissions by 34%, while halving short-haul travel reduces emissions by 0.5%.



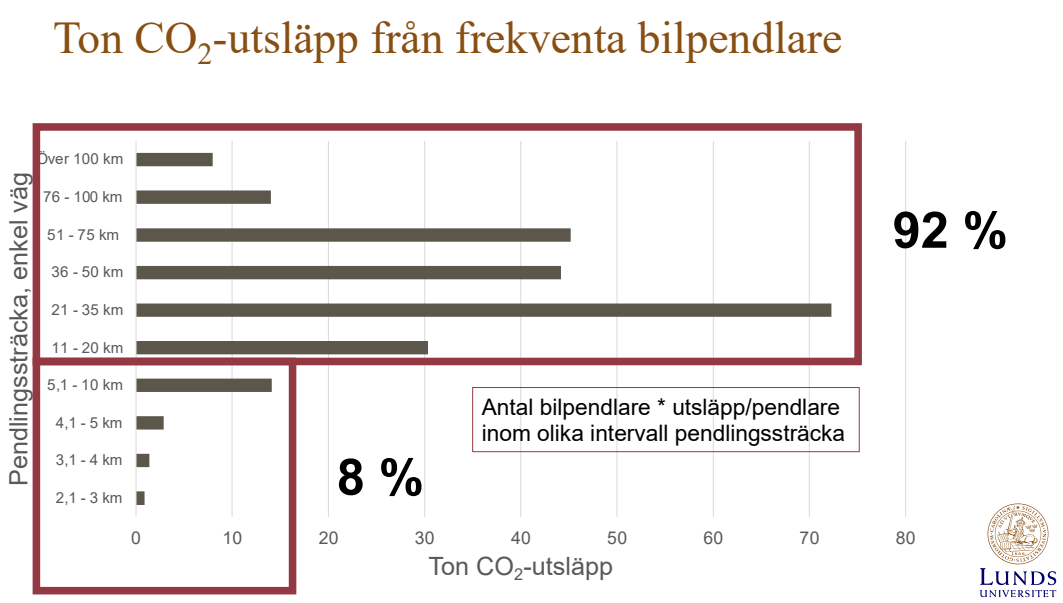
Maps: 0-780 km

Medium: 79-3,700 km

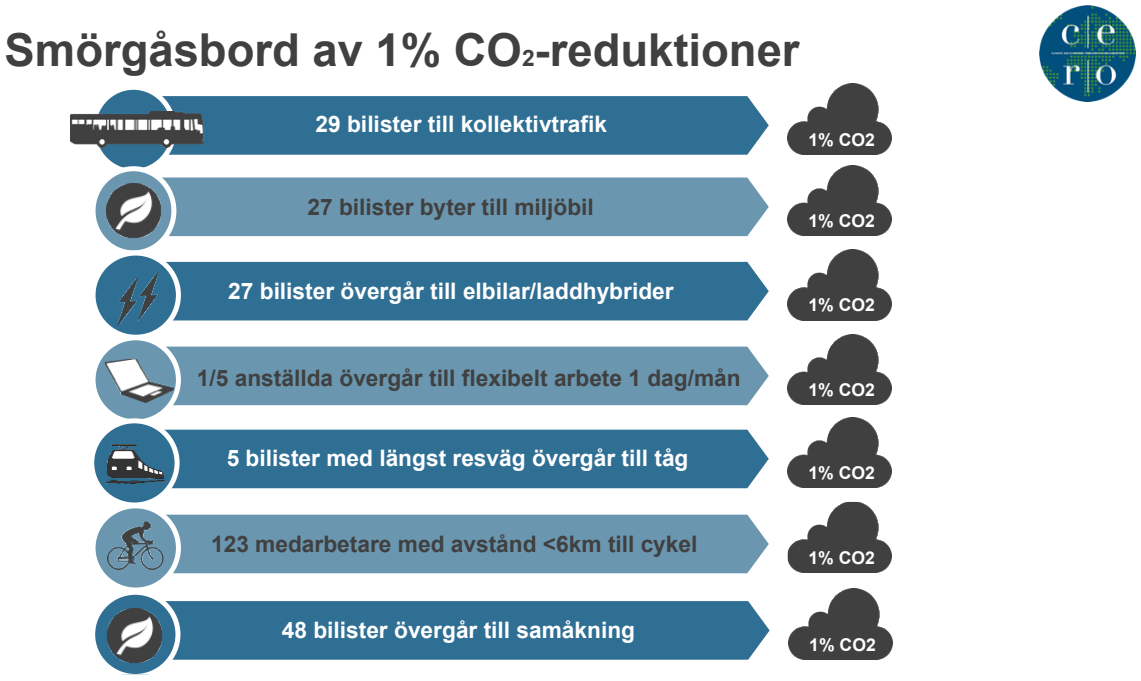
Long: > 3,700 km

Strategy 2: Replace

Replace the car commute with a day of remote work, either from home or from a nearby job centre. Not every day of the week, but maybe one day a week or one day every two weeks. It is mainly the long car commute (over 20 kilometres each way) that causes the highest CO2 emissions and where a reduction can have the biggest impact. For example, see a chart of car commuters in a number of different municipalities in Skåne, categorised by their distance to work. Let's say it's possible to replace a quarter of all car commuting trips under 10 kilometres with public transport and/or cycling. The CO2 reduction would then be 2%. If the longer car commute is replaced by one day of homeworking per week, the reduction is 18%.



The figure shows that it is important to understand where, how and to what extent emissions are generated. A good review of an organisation's emissions can be achieved, for example, through a CERO analysis[14] - something that both the University of Gothenburg and KTH Royal Institute of Technology have done. Without this insight, there is a risk of investing in actions that are relatively easy to implement (e.g. cycling campaigns) instead of more difficult ones (e.g. getting management to make fewer trips to New York).



[14] https://cero.nu/

Strategy 3: Shift

- If possible, travel by train and/or bus to the meeting, conference, etc. However, note the limited potential for this type of modal shift. The limit for what distance is considered reasonable to travel by train or bus is usually 500-700 km, which can affect air travel, which in KTH's case only accounts for 1% of emissions.
- Replace some (or all) car journeys to work with public transport and/or cycling. The potential here is likely to be a few per cent at most, as car commuters are a hard-to-convince group and only a small proportion of them are willing to switch to public transport or cycling.

Strategy 4: Improve

More efficient flights and biofuel blending

For those flights that are deemed necessary, airlines that have a relatively high proportion of biofuel can be required or rewarded (Alternative Airlines, n.d.). The blend of biofuel in aviation fuel can vary from a few per cent to 50% or more. Biofuel can reduce carbon dioxide emissions and help reduce the environmental impact of aviation.

It can also reward airlines that have relatively modern and more fuel-efficient aircraft, which can reduce fuel consumption and emissions per passenger kilometre.

From fossil-fuelled to electric aircraft

One option for greening aviation is the development of electric aircraft and their use in the commercial aircraft fleet. It is difficult to predict when significant integration will take place, but even the most hopeful forecasters believe it will take at least one to two decades. The transition to electric aircraft depends on technological developments in battery storage, efficiency and sustainability, but also on investment, regulation and societal acceptance of new solutions. Infrastructure for charging electric aircraft must also be developed and available at airports around the world. To summarise, we will have to wait until well after the university's CO2 reduction targets before electric aircraft will make up a significant part of the aircraft fleet.

From fossil-fuelled cars to electric cars

The share of electric cars on the road in Denmark is just over 5% of the total car fleet, but this share is increasing rapidly as electric cars make up around 40% of cars sold to households and 20% of those sold to businesses. The act of driving an electric car emits significantly less CO2 (around 40 g/km) compared to fossil-fuelled cars (around 130 g/km), but a lot of CO2 is generated in the production of electric cars - more than fossil-fuelled cars. However, if you look at the entire lifetime of the car, the climate emissions of the electric car are significantly lower ("break even" after about 10,000 km), and the size of the difference depends mainly on where the electricity, car and batteries are produced. You can compare different scenarios using an online tool (Transport & Environment, 2022).

Here, the transition is now fast and if you want to reward a switch to electric car commuting, car parks should be equipped with charging points.

Other ways:

- Influence donors: Write to major donors and urge them to set stricter environmental and climate requirements for the research funds they allocate. They often portray themselves as being in favour of sustainability, but in reality, up to 20% of their funding is spent on air travel. In 2018, I got a number of higher education institutions to sign a letter that went out to Sweden's largest research donors, which resulted in several of them tightening their requirements and procedures around academic flying.
- Start a climate collaboration: KTH and Chalmers University of Technology started a climate framework and gathered a large number of universities and university colleges around the question of how to adapt your activities to climate change (SUHF, 2019). They have produced a collection of examples with suggestions for measures that can reduce the environmental and climate impact of both business travel and commuting (SUHF, 2021).
- Raise awareness: Raise awareness of the climate impact of aviation through opinion pieces, petitions, etc.
- Challenge academic systems where travelling to conferences and other events is a merit.

Management plays a crucial role

When it comes to reducing their climate emissions from travel, universities are not so different from companies, governments, municipalities or other organisations: it's a difficult challenge and requires committed, long-term work with good support from management to succeed.

As mentioned above, an organisation's leadership has a very large, if not decisive influence on the success of an initiative to reduce CO2 emissions from travel. In part by:

- Develop and approve a progressive meeting and travel policy that is linked to clear ("must", not "should") guidelines for travelling and meetings.
- Put your money where your mouth is and actually follow the policy and guidelines you have set, sending a signal to the rest of the organisation.
- Communicate this as part of the university's sustainability initiative and sell UCPH as a progressive, responsible and climate-smart university, education centre and workplace.

Academic Flights: Is there a link between travelling and professional success?

One of the main reasons for business travel is that it is necessary to perform and succeed in your job. In a study of over 700 travellers employed at a Canadian university, the relationship between their business travel, how productive they were in their research, and how it affected their career development and expertise was examined (Wynes et al., 2019). No significant correlation was found between aviation emissions and academic productivity (as measured by the h-index)[15] mainly in terms of the number of papers published and cited. However, there was a positive correlation between emissions and salary, which remains significant even when controlling for seniority. It was also found that academics researching sustainability did not have lower emissions from aviation than their 'non-green' colleagues or the most avoidable types of emissions.

A Swedish study has investigated how computer scientists at KTH Royal Institute of Technology reason about their academic flight (Eriksson et al., 2020). These IT researchers were the most frequent travellers of all researchers at KTH, although IT researchers can be expected to be familiar with digital meetings as an alternative to physical attendance. A possible explanation for the high level of travelling could be that conference papers make up a relatively large part of the researchers' publications and that active participation in important events is seen as meritorious. Even researchers who have or want to reduce their CO2 emissions seem to experience pressure from the "system" to publish at conferences, conduct research visits and build international networks, and thus fly a lot.

It's therefore not enough to rely on employees to take moral responsibility and fly less. The allure of travelling "for other people's money", the link to professional success and the built-in expectations of travel in the academic system mean that even environmental and climate scientists don't play by the rules. In practice, "flight shame" only affects a very limited number of environmental and climate activists. A rule of thumb in large organisations is that around 20% of employees account for 80% of air travel and emissions, and among this fifth, there is little or no air shame. The justification is often that the tasks are so important that they can justify the emissions from travelling. Even the former head of UNEP, Erik Solheim, was dismissed in 2018 after abusing his position and flying excessively and expensively at the organisation's expense.

However, the pandemic proved that much of what was previously thought impossible to do digitally/remotely is actually possible to handle (and in some cases, even better), putting many of these arguments to rest. Universities were able to handle 84% of the errands they would have travelled to during the pandemic. They generally had poorer equipment for digital meetings and less experience than other agencies when they were thrown into the pandemic, which contributed to them also faring worse in the transition to digital collaboration than both other agencies and businesses (Arnfalk & Winslott Hiselius, 2021). Good preparedness for digital collaboration is therefore not only a climate issue, but also a preparedness issue in various crisis situations where travelling is not possible. COVID-19 was not the first and will probably not be the last pandemic we will experience.

[15] From Wikipedia: The H-index is an author-level metric that measures both the productivity and citation impact of the publications originally devoted to an individual scientist or scholar. The H-index correlates with success indicators such as winning the Nobel Prize, being accepted for research grants and holding positions at top universities.

Göra det omöjliga möjligt - tjänsteresor

- *Innan Corona:* Undersökningar i 6 REMM–myndigheter genomförda sept. 2017 - april 2019 visade att:
  - nära hälften (45%) av de tillfrågade tjänsteresenärerna trodde att ***ingen*** av de tjänsteresor de då gjorde kunde ersättas med digital möten.
  - 15 % trodde att mer än hälften av deras tjänsteresor kunde ersättas med digital möten.
- *Under Corona:* För möten, workshops etc. som de anställda hade planerat att resa till:
  - 90 % kan hantera praktiskt taget alla, eller majoriteten av möten genom digitala möten.
    (U: 84 %, F: 88 %)
  - Endast 3 % angav att alla eller nästan alla möten ställs in
    (U: 6 %, F: 4 %)

⇒ *Bäst beredskap och digital ”mötes-backup” i de undersökta myndigheterna*

Achieving our ambitious environmental goals, not least in the area of transport, requires drastic and transformative solutions, and if we are ever going to achieve this, it is NOW, after the pandemic, where we create the conditions for the 'new normal'. I fear that business travel will return to previous levels and even increase unless travel is limited by either restrictions or economic conditions. We have now seen that digital collaboration works, but in most cases, business travel is "want to travel" and not "must travel". "Have money - will travel." But no one wants to recognise that their own travel is not absolutely necessary.

One suggestion is to make a simple list of which trips and events are necessary for the organisation to complete (the "must do" trips), which can be run digitally every time or every other time, for example, and which can be run as hybrid meetings (where some participants are physically present while others participate remotely). Do a backcasting exercise and assume a 50% reduction to start with. You can find help and inspiration in REMM's Meeting Selector.[16]

[16] https://www.remm.se/motesvaljaren/

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