Knowledge, responsibility and sustainability

GREEN CAMPUS
2020

Strategy for Resource Efficiency and Sustainability at the University of Copenhagen
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The University of Copenhagen (UCPH) is proud to announce its strategy for sustainability and resource efficiency leading up to 2020: Green Campus 2020. This strategy is the culmination of a long series of results in this area which the University has achieved since the board and management adopted ambitious targets to transform UCPH into a green University in 2008. We are proud of this strategy, as it contains more new approaches and suggestions for methods that have not been tried before at the University of Copenhagen; for example including the core environments even more.

In the coming years, both nationally and internationally, we face big challenges in terms of creating long-term sustainable development. We all have a responsibility to contribute actively to this, particularly a major university such as the University of Copenhagen. At the University of Copenhagen, our main task is to carry out world-class research and teaching, but at the same time we have a responsibility to ensure that we do so with an ever-decreasing environmental impact, both in our core areas and in our use of buildings and infrastructure in general. UCPH takes on the responsibility for producing knowledge, understanding and solutions to these challenges.

The University is a major player in Copenhagen. We help show the way and develop and collaborate on solutions that can inspire other universities, organisations and cities. Fortunately, there are many others who wish to draw on the good experiences, which are the product of the efforts of a large number of players.

With the formulation of the first-generation targets for a Green Campus in 2008, the University of Copenhagen made the first significant step towards creating a greener and more sustainable university. We have begun an exciting and important journey, and in the coming years we must take new significant steps. We need to go much further to ensure energy efficiency and reduce CO2 emissions. We need to ensure a sustainable and efficient use of resources and minimal pollution. Overall, this will also make good business sense. To take these essential steps, we must integrate energy and resource efficiency into our organisation and decisions to an even greater extent. We will then be able to spend the significant gains that we make by saving on energy, waste, water and transport on our core tasks: research, education and public outreach.

Staff and students will have even more opportunities to help realise the Green Campus 2020 strategy. Everyone should be able to experience the daily benefits of a sustainably run university. Knowledge, new solutions, and user involvement and ownership are key to making everyday life more sustainable.

The approaches and methods we pursue on our way towards sustainability and resource efficiency must be combined with other essential measures to ensure that the University of Copenhagen becomes a smarter and better university. Only in this way will we succeed.

By working together we can make a difference and create an even more sustainable and resource-efficient university that will benefit us all.

Ralf Hemmingsen
Rector, University of Copenhagen
In 2008, UCPH put a greener and more sustainable University on the agenda. The board adopted the ambitious targets of reducing energy consumption and CO₂ emissions by 20% per FTE (Full Time Equivalent for staff and students) in 2013 compared to 2006. This target has been reached. By 2013, CO₂ emissions were reduced by 28.8% per FTE and energy consumption was reduced by 20.4% per FTE. Against this background, UCPH has established the following strategy for a continued sustainable development leading up to 2020.

The main aims of the strategy are to ensure:

- sustainable physical settings: buildings, facilities, technology and infrastructure
- a visible and efficient culture of sustainability
- that UCPH becomes a living laboratory for sustainable solutions
- that UCPH becomes an international model of a sustainable university

The UCPH has therefore set out broad and ambitious targets for the four main sustainability themes and two other targets for important processes.

Specific success criteria and deadlines have been set out for all the targets:

**CO2/Climate:**
- 65% reduction of CO₂ emissions from energy consumption and transportation per FTE
- Reduction of growth of CO₂ emissions from transport to 1% per year.
- Mapping and reduction of the University’s overall climate footprint

**Energy**
- 50% reduction in energy consumption per FTE

**Resources**
- 20% reduction in overall waste volumes per FTE
- Recycling of 50% of waste

**Chemicals**
- Procurement and construction without health and environmental contaminants
- Reduction of the University’s total pollution and chemical environmental impact

**Organisation and behaviour**
- Sustainability and resource efficiency in all major decisions and actions
- Awareness of UCPH as a sustainable university, and sustainability as everyday practice
- Sustainable behaviour in practice

**Campus as a living lab**
- Development and demonstration of future sustainable solutions on campus
- Sustainable meals in canteens based on UCPH’s own research

The targets are to be achieved through seven focus areas in which all relevant stakeholders will contribute:

1. Communication and visibility
2. Sustainable construction and maintenance
3. Environmental and energy-conscious operations
4. Sustainable organisation and behaviour
5. Transport
6. Green IT
7. Green procurement

To achieve the targets, it is necessary to make significant investments and resource allocations leading up to 2020, both centrally and in the faculties. By 2020, the efforts are expected to result in an efficiency gain of DKK 70 million annually. These focus areas will be an integral part of the efforts that have already been planned.
KNOWLEDGE AND RESPONSIBILITY
– A SUSTAINABLE UNIVERSITY OF COPENHAGEN
A sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their needs.”


“Universities have a significant, independent, critical, constructive and agenda-setting role in society…”

from UCPH’s 2016 Strategy.

RESPONSIBILITY

As knowledge institutions, universities have a special responsibility to develop proposals and solutions for ensuring sustainable development, and to demonstrate them in practice. In many areas, the technical solutions that are needed are already known, but when it comes to making them happen there are still significant challenges – challenges to do with how we organise ourselves and make decisions, as well as our behaviour as staff and students. There are more questions than answers, and as a knowledge institution UCPH has a central part to play when it comes to developing and implementing solutions.

UCPH is internationally recognised in major areas of academic research, and we want to ensure that we are also recognised for our efforts to become a sustainable University. The University of Copenhagen wishes to be known as one of the most sustainable universities in the world – as a place where knowledge, responsibility and sustainability go hand in hand.

WELL ON THE WAY

UCPH established Green Campus in 2008 to put a greener and more sustainable University on the agenda. In 2008, the board adopted the ambitious target of reducing energy consumption and CO2 emissions by 20% per FTE in 2013 compared to 2006. The target for energy consumption has been reached: UCPH has reduced CO2 emissions by 28.8% per FTE and energy consumption by 20.4% per FTE.

The efforts have been focused on energy and CO2, especially on investments in technical projects, campaigns to change behaviour and energy-efficient operations management. During this period, DKK 135 million has been invested in direct energy-efficiency measures, resulting in an annual energy saving of nearly DKK 35 million.

The results are clear, and both in Denmark and internationally UCPH has become a model of energy improvements and targeted CO2 reduction in the university sector. But there is still much to do, not only as regards energy and CO2 emissions, but also in a number of other sustainability areas.

THE WORLD AROUND US

UCPH is far from alone in addressing universities’ responsibility to become sustainable institutions. More and more universities are taking ambitious and extensive measures to improve their sustainability, notably Harvard University, MIT, the University of British Columbia and all the IARU1 universities, with which UCPH cooperates closely when it comes to sustainability.

Major, ground-breaking targets that UCPH must help to achieve are also being set outside the university community.

Essential climate targets that UCPH will actively contribute to achieving:

- The EU’s goal of reducing CO2 emissions by 20% by 2020 and 80-95% by 2050 compared to 1990
- The Danish government’s goal of reducing CO2 emissions by 40% by 2020 compared to 1990
- Copenhagen Municipality’s aim to make Copenhagen a carbon-neutral capital by 2025

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1 International Alliance of Research Universities
A SUSTAINABLE UNIVERSITY IN A SUSTAINABLE CAPITAL

Denmark and Copenhagen already have an international reputation for being among the countries and capitals that are furthest ahead when it comes to developing a sustainable society in practice. And the ambitions for the coming years are still high: For example, Copenhagen must be CO2-neutral by 2025, and UCPH will cooperate with Copenhagen Municipality to realise this aim. In the coming years we will see more ambitious targets and initiatives in the European Union, Denmark and Copenhagen Municipality, and the University of Copenhagen is expected to be an active participant.

The green image of Copenhagen and UCPH makes the University more attractive as a place to study and work for Danish and foreign researchers and students.

GREEN CAMPUS 2020

With Green Campus 2020, UCPH is launching an expanded and ambitious sustainable development strategy designed to make UCPH one of the world’s most sustainable universities.

UCPH is already well underway with energy-efficiency and CO2-reduction measures, but there is still a long way to go before we reach full sustainability. In addition to improvements in energy efficiency (an area where UCPH has much more to do), the strategy therefore also addresses a number of other key sustainability themes.

SYSTEMIC SOLUTIONS

UCPH’s sustainability efforts must create all-round value and benefits for UCPH, also beyond the environmental level. Fortunately, energy and resource efficiency often results in financial savings, thereby freeing up resources for the University’s core activities. But it is important to ensure that the efforts also strengthen quality and competitiveness in other areas, improve study conditions and make everyday life easier and smarter.

The staff and students should find the everyday sustainability efforts at UCPH easy and meaningful.

The core of the University’s Green Campus 2020 strategy is a significant, systemic reduction of the University's environmental footprint.

The main points of the strategy are as follows:

- UCPH must have sustainable physical settings (buildings, facilities, technology and infrastructure).
- UCPH must be a university with a sustainability culture in which all staff and students encounter and practice sustainable behaviour in everyday life. Sustainability and resource efficiency should be integrated effectively and meaningfully in the organisation and management of the University.
- UCPH should increasingly be the focal point for the development and demonstration of the sustainability solutions that UCPH itself researches and teaches. UCPH should be a living laboratory for the development of tomorrow’s sustainability solutions.
- UCPH needs to further develop its position as an international model of sustainable universities. UCPH must collaborate with other ambitious universities such as those in the IARU, use the best experiences and help improve sustainability in universities around the world through knowledge sharing.
THE MAIN SUSTAINABILITY THEMES
There are four main environmental sustainability issues that must be addressed if UCPH is to become a sustainable university:

1. **CO2/Climate**.
   Climate change is the biggest risk to the environment, and consequently UCPH’s carbon footprint and impact on the climate should be given high priority in our future sustainability efforts. UCPH affects the climate directly through CO2 emissions from energy consumption and transport, and this has been and will continue to be the main focus area, as the opportunities to act are greatest in this area. However, UCPH’s main climate footprint is “hidden” in the indirect CO2 emissions linked to our purchases of goods, services and food, as well as in our construction activities.

2. **Energy**
   Not only does our energy consumption affect the climate, but the bulk of the energy resources we currently use are finite. At the same time, there is great demand for renewable resources for other, more socially beneficial purposes than energy production. Finally, there are a number of other negative environmental impacts associated with high energy consumption (emissions to air and water, as well as waste). With a construction volume of almost one million m² and essential laboratory activities, our consumption of energy for heating and operations will always have high priority, and is also a major expenditure item (approximately DKK 180 million in 2013).

3. **Materials and resources**
   The consumption of raw materials and resources has a significant environmental impact when they are extracted, manufactured, used and disposed of. A number of resources – e.g. copper, aluminium and phosphorus – are scarce and will eventually be depleted if they continue to be exploited as heavily as they are now. UCPH consumes a great deal of resources due to our extensive building activity and large daily procurement and consumption of products, materials and services.

4. **Pollution, chemicals and undesirable substances**
   Chemicals and problematic substances have a negative impact on the environment and people when they are produced, used and disposed of. Part of UCPH’s environmental impact results from the direct use of chemicals, particularly in laboratories, as well as the unwanted and problematic substances which are included in a range of products and services, e.g. in construction, IT equipment and office equipment.
GREEN CAMPUS 2020 – TARGETS

UCPH has set out broad and ambitious targets under the four sustainability themes. In addition to these targets, there are a number of overall goals for the organisation which are essential to ensuring a sustainable university.

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<th>Theme</th>
<th>Main targets</th>
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| CO2 /Climate | 65% reduction of CO2 emissions per Full Time Equivalent by 2020 compared to 2006  
1% reduction of growth in CO2 emissions from transport per year until 2020, compared to 6% until now  
The adoption of an action plan for reducing the University’s overall climate footprint in 2016 |
| Energy | 50% reduction in energy consumption per FTE by 2020 compared to 2006 |
| Materials and Resources | 20% reduction in overall waste volume per FTE in 2020 compared to 2012  
Recycling of 50% of the waste produced by 2020 compared to 24% in 2012  
Focus on resource efficiency in procurement, operations and new construction  
30% reduction in water consumption per FTE by 2020 compared to 2012 |
| Pollution, chemicals and undesirable substances | Prioritising products and solutions without health and environmental contaminants in procurement, operations, new construction and renovation  
Establishing an overview of the University’s total pollution footprint in 2015  
Mapping and adopting an action plan for the reduction of the University’s pollution and chemical environmental impact in 2016 |
| Organisation and culture | An environmental and energy-management organisation that ensures that sustainability and resource efficiency are part of all major decisions and actions  
In 2020, 9 out of 10 employees and students at UCPH are aware that UCPH is one of the world’s most sustainable universities  
All staff and students have the opportunity and be motivated to practise sustainable behaviour in their day-to-day life at UCPH |
| Campus as a living lab | UCPH will make its organisation, buildings and areas available to its own researchers and students to develop and demonstrate sustainable solutions for the future  
UCPH’s canteens will serve sustainable meals based on food research at UCPH |

The targets are to be achieved through efforts within seven areas:

1. Communication and visibility
2. Sustainable construction and maintenance
3. Environmental and energy-conscious operations
4. Sustainable organisation and behaviour
5. Transport
6. Green IT
7. Green procurement

From 2014 to 2020, the efforts will be planned and ranked in terms of priorities, and milestones will be formulated.
AN ENVIRONMENTALLY-FRIENDLY UCPH

- 65% reduction of CO2 emissions per FTE by 2020 compared to 2006

- Reduction of growth in CO2 emissions from transport in 2012-2020 to maximum 1% per year compared to 6% until now.

- Mapping and adopting an action plan for reducing the University’s overall climate footprint in 2016

Currently UCPH only counts CO2 emissions from our own energy consumption and transport, and the reduction targets reflect this. As the figure shows, electricity consumption makes up almost half of the CO2 emissions.

From 2006 to 2013, UCPH reduced CO2 emissions by 28.8% per FTE. In spite of the growth reflected by the rise in FTEs, the actual total emissions were reduced by 10% over the same period. The 2020 target means that in the period from 2012 to 2020, we must achieve a further reduction in CO2 emissions per FTE of around 36%.

CO2 emissions from energy production will fall leading up to 2025 as a result of a shift to renewable energy in electricity and heat production in Copenhagen/Denmark. The University’s own efforts will contribute to further significant reductions, so the overall objective can be achieved.

Transportation represents a significant challenge. From 2006 to 2012, CO2 emissions from transport increased by an average of 6% annually, mainly due to more air travel. To reach the reduction target, we need to ensure that CO2 emissions from transport do not rise by more than 1% per year from 2014 to 2020. The University will take various measures to reduce emissions from transport. It is also expected that national and international measures will be taken to reduce CO2 emissions from air travel.

Recent studies show that indirect CO2 emissions linked to the purchase of services and products ac-
Norway’s Technical University of Natural Sciences has calculated its total direct and indirect climate footprint in 2012. Its indirect environmental impact via the purchase of consumables, equipment, furnishings, construction and services makes up 52% and thus the bulk of its total impact. The rest is made up of direct energy consumption (25%) and transport (23%).

count for more than half of the total actual environmental impact of institutions such as UCPH. Therefore, UCPH wants to continue to identify the indirect emissions from our procurements and determine which measures should be taken in the areas of sustainable construction and maintenance and green procurement.

**Main focus areas**

1. Communication and visibility
2. Sustainable construction and maintenance
3. Environmental and energy-conscious operations
4. Sustainable organisation and behaviour
5. Transport
6. Green IT (less important)
7. Green procurement

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**AN ENERGY-EFFICIENT UCPH**

- **50% reduction in energy consumption per FTE by 2020 compared to 2006**

From 2006 to 2013, UCPH reduced its energy consumption by 20.4% per FTE. Thus, leading up to 2020, we will need to reduce our energy consumption by an additional 29.6% per FTE to reach the goal.

Due to the growth in our number of FTEs, however, the actual saving in the total energy consumption is somewhat less. From 2008 (when the University’s energy consumption was highest) to 2013, the absolute energy consumption was reduced by 9.1%. For 2020, we calculate a further actual reduction of approximately 20%. The total energy-efficiency improvements should amount to approximately 64,000 MWh, resulting in annual savings of approximately DKK 70 million from 2020.

The estimation of the development up to 2020 includes the estimated energy consumption of new buildings, vacating old buildings, and increases in consumption of heat and electricity of 1.5% and 2.5% respectively as a result of the increase of UCPH’s activities.
Halving UCPH's energy consumption per FTE requires a major, broad-based effort. The figure illustrates the main focus areas and how they contribute to meeting the targets.

**Main focus areas**
1. Communication and visibility
2. Sustainable construction and maintenance
3. Environmental and energy-conscious operations
4. Sustainable organisation and behaviour
5. Transport (less important)
6. Green IT
7. Green procurement

**Contribution from focus areas to 2020 targets**
- Technical energy projects: 26%
- Building envelope: 37%
- Behaviour and process energy: 24%
- Energy management: 13%

**20% savings in 2020 compared to 2012**
- 2012 consumption: 184.971 MWh
- 2020 target: 148,000 MWh
- 2020 targets: 148,000 MWh
- 20% savings compared to 2012
A RESOURCE-EFFICIENT UCPH

- 20% reduction in overall waste volume per FTE in 2020 compared to 2012
- Recycling of 50% of the waste by 2020 compared to 24% in 2012
- 30% reduction in water consumption per FTE by 2020 compared to 2012
- Focus on resource efficiency in procurement, operations and new construction

Waste
Every year, UCPH produces more than 4,000 tonnes of waste, which is sent to special treatment, landfills, incineration or recycling. The recovery rate is 24%.

Waste by treatment, 2012

UCPH wants to take the lead in the effort to reach this goal.

In 2014-15, UCPH will map out our waste management and resource consumption and on this basis develop a resource plan to ensure that the ambitious targets for waste reduction and recycling are met.

The efforts will include:
- Increased sorting of waste at the source, so that more waste is recycled. This must be ensured through improved and accessible sorting options for users, as well as information campaigns.
- Preventive action by incorporating waste minimisation at the time of purchase and reducing the need for procurement.
- UCPH’s extensive construction work is the source of large volumes of waste, and we must therefore focus on reducing waste and increasing recycling in connection with new construction projects. The buildings’ consumption of resources during their construction and operations must be considered already at the drawing board and lead to a more sustainable use of resources.

Main focus areas

| 1. Communication and visibility |
| 2. Sustainable construction and maintenance |
| 3. Environmental and energy-conscious operations |
| 4. Sustainable organisation and behaviour |
| 5. Transport (less important) |
| 6. Green IT (less important) |
| 7. Green procurement |

WATER
Copenhagen consumes much of the available water on Zealand and this, combined with the increasing pollution of the groundwater, makes clean drinking water a scarce and expensive resource. UCPH also consumes a lot of water, particularly in the laboratories, where large amounts of water are used for process purposes. The operations organisation has a key role to play in introducing water-saving solutions
and monitoring consumption so that leaks are detected and rectified quickly.

Solutions for reusing rainwater and preventing water wastage can be incorporated into new buildings, but the most significant gains can be made by focusing on water conservation in the day-to-day operation.

Main focus areas

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UCPH wishes to contribute to a sustainable development by choosing more products and solutions that do not involve the use of problematic substances.

Laboratories generally have the highest consumption of dangerous substances and products at UCPH. The occupational health and safety organisation has therefore worked for decades on creating safe working conditions and controlled storage and disposal of chemicals in laboratories. But there are still opportunities for improvement in many places.

Laboratories may also emit hazardous substances to the wastewater and air, but we do not currently have an overview of this potential pollution. UCPH will therefore establish a comprehensive overview of the University’s pollution and chemical consumption and on this basis identify the most important focus areas.

Various types of waste can also be a source of pollution if they are not disposed of properly. It is therefore important to ensure an effective daily sorting of waste throughout UCPH, so that e.g. electronic waste, batteries and other products with problematic ingredients do not end up in the incinerator.

Another important focus area is construction and maintenance. Materials and products that can affect the natural and working environments are often used in construction – e.g. problematic sealing products that can cause problems with the indoor climate and have adverse environmental impacts.

Main focus areas

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A SUSTAINABLE ORGANISATION AND CULTURE AT UCPH

➢ Building an environmental and energy-management organisation which ensures that sustainability and resource efficiency are part of all major decisions and actions

➢ In 2020, 9 out of 10 employees and students at UCPH should be aware that UCPH is one of the world’s most sustainable universities

➢ All staff and students should have the opportunity and be motivated to practise sustainable behaviour in their day-to-day life at UCPH

Students, researchers and employees at UCPH must help to create a sustainable culture so UCPH can meet its goal of becoming a resource-efficient and sustainable University.

The operation of buildings and services is the foundation for a more sustainable day-to-day running of the University. In order to integrate sustainability into the University’s operations, there is a need for:

- Staff and resource allocation that increases focus on energy and resources at each faculty
- Enhanced environmental management and integration of environmental and energy awareness throughout the operations organisation
- Skills development in environmental and energy management

Sustainable culture and behaviour

To ensure that UCPH can become a sustainable university, sustainability awareness must be anchored in the organisational culture. We therefore need to establish an organisation that can serve as a platform for the employees’ and students’ involvement in the transition to a sustainable university and give them a basic understanding of the importance of sustainable behaviour. By involving staff and students more, we can promote an increased sense of ownership of the sustainability efforts, so they are perceived as effective and meaningful locally.

At the same time, the sustainability organisation should serve as a hub for communicating the University’s sustainability efforts and raising awareness among students.

In a sustainable culture, staff and students:

- integrate resource efficiency into their daily routines (e.g. only switching on equipment, lights and fans when needed)
- contribute ideas and proposals that reduce environmental impacts
- have the knowledge and skills to act sustainably in their day-to-day life

A solid organisation also provides a platform for:

- a systematic introduction of UCPH as a sustainable university to all new employees and students
- clear responsibilities and guidelines for handling environmental and energy issues in day-to-day life
- Well-planned efforts to create sustainable laboratories, offices and teaching environments, including effective use of fume cupboards and equipment, practical implementation of policies for operations/use (freezers, procurement, service, etc.), and realisation of ideas and proposals for technology and equipment that removes poor energy behaviour
- Promoting virtual meetings (i.e. meetings that do not involve travelling)
- Better separation of waste at the source
CAMPUS AS A LIVING LAB

- **UCPH will make its organisation, buildings and areas available to its own researchers and students to develop and demonstrate sustainable solutions for the future**

- **UCPH’s canteens will serve sustainable meals based on food research at UCPH**

With its world-class research and education, UCPH has the potential to develop the solutions needed to create a sustainable development of society. Among other things, this potential should be realised by UCPH making its organisation, buildings and areas available to our own researchers and students to enable them to develop and demonstrate the sustainable solutions of the future.

Staff and students should see that the sustainable solutions that UCPH researches and teaches are also being realised at UCPH. This will strengthen the link between research and practice, as well as the commitment of the staff and students to the University's sustainability efforts. It can also strengthen practice-oriented research and teaching.

Three obvious areas where the University's research and education have been or could be linked up with sustainability are:

**Sustainable food in UCPH's canteens**

The world faces major challenges when it comes to producing sustainable food with much less impact on the climate and the environment. UCPH conducts state of the art research into food and is already developing proposals for new sustainable Nordic cuisine. It is in the canteens, when they choose their meals, that many of the University’s students (who don’t work in laboratories) have the biggest environmental impact in their day-to-day lives at UCPH. UCPH should offer suggestions and options for a sustainable food and lunch culture at competitive prices, developed on the basis of the University’s own research.

**Sustainable campus areas**

Concepts such as green urban spaces, local rainwater drainage, urban ecology and sustainable landscape planning are already being practiced to some extent in the University’s facilities and new buildings. This practice needs to be further expanded, developed and promoted.

**Sustainable behaviour, attitudes, ethics and culture**

Habits, opinion-forming, decision-making behaviour and culture are important areas for developing a culture of sustainability, both at the University and when it comes to the green transformation of society as a whole. Sociology, anthropology, political science, law, theology, psychology, communication, rhetoric and many other subjects include methods and approaches that can and should be used to further the development of a sustainable society. UCPH should be the natural place to study these disciplines while at same time benefitting from the efforts towards a sustainable UCPH.
Green investments from 2008 to 2013

During this period, a total of approximately DKK 135 million was directly invested in the development of Green Campus activities (primarily energy-related), distributed as follows:

- Technical energy-efficiency improvements, approx. DKK 125 million
- Sustainable behaviour, campaigns, etc., approx. DKK 2.5 million
- Organisation, pilot projects, etc., approx. DKK 7.5 million

Fully realised, the direct investments produce estimated energy savings of up to DKK 35 million per year compared to “business as usual”, or approximately four years’ payback.

In addition, there have been significant investments in energy-efficiency improvements in new construction projects, as well as in district cooling in the North Campus.
many laboratories still have no green ambassadors. There is a need for a general organisation of designated persons in the areas of environment and energy in the faculties, especially in the laboratories, where the major gains can be made.

In addition, we need to create an even closer collaboration between Green Campus/Campus Service and key persons in the faculties, including energy controllers.

Finally, there is a need for increased coordination and project management of cross-cutting initiatives in focus areas which are not currently being addressed. The investments in technical projects have been estimated based on the existing Green Campus initiatives, current proposals for energy-efficiency improvements, energy screenings and energy-labelling reports, assessments of the potential for improved efficiency through resource and energy management, as well as changed behaviour.
GREEN CAMPUS 2020
- FOCUS AREAS
In the following we present the seven focus areas and the measures that need to be implemented in the coming years. The overall GC 2020 targets serve as the fixed goals of UCPH’s sustainability efforts. UCPH will monitor the efforts and focus areas and keep them under review.

The focus areas are:
1. Communication and visibility
2. Sustainable construction and maintenance
3. Environmental and energy-conscious operations
4. Sustainable organisation and behaviour
5. Transport
6. Green IT
7. Green procurement

1. Communication and visibility

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Knowing that the entire organisation is taking ownership of the sustainability tasks and the concrete results will make the individual staff and students feel it is meaningful to contribute.

Good communication is two-way – and UCPH will seek out and benefit from good experiences nationally and internationally to achieve the best possible solutions.

At the same time, UCPH should help increase universities’ focus on sustainability and their special role in promoting it. UCPH already has good opportunities to communicate and share our sustainability efforts in a number of national and international cooperation forums. Our IARU cooperation in particular provides a strong platform for communicating internationally and sharing experiences with universities around the world. UCPH will work to enhance this communication.

Efforts
- As a responsible world-class university, UCPH wishes to actively communicate our sustainability efforts both nationally and internationally
- UCPH will work to increase the international focus and cooperation on sustainability between universities. The IARU cooperation in particular should be a focal point for our sustainability efforts.
- UCPH wishes to develop new methods to make our energy consumption and environmental impact visible to employees and students, in order to encourage more sustainable behaviour

Active ongoing communication and dialogue with relevant stakeholders internally and externally is a natural part of all the focus areas.

Internal communication and dialogue is essential to creating a sense of ownership of the sustainability efforts at all levels in the organisation. Communication and dialogue must be experienced as meaningful and accessible, and consumption and environmental impacts must be made visible in ways that contribute to the changed behaviour.
2. Sustainable construction and maintenance

UCPH is currently seeing a wave of construction activity. We are constructing and renovating a number of buildings that will serve as the setting for world-class research and education for the next 50-100 years.

The main CO2 and energy footprints from the buildings do not originate from the actual construction, but from the many years of operation and activities in the buildings, and it is vital that this is taken into account at the planning stage.

New solutions must be developed that can ensure sustainable and economical operations in the buildings’ lifetime. The laboratory buildings are the biggest consumers of energy, e.g. for ventilation. By integrating energy-efficient and needs-adapted operations into the buildings from the start, the energy consumption can be reduced significantly.

Many of the University’s existing buildings are to be renovated in the next few years, and since there is still significant potential for energy optimisation, especially in laboratory buildings, the work on maintenance and energy efficiency can be usefully linked. This will mean both financial and energy-related benefits.

Overall, new energy-efficient construction, vacating of older buildings and internal and external energy renovations are expected to contribute about 50% of the total energy savings by 2020.

The construction and maintenance activities also have other significant environmental impacts. For example, chemicals and materials are often used that affect the environment both during the construction phase and in the working environment after the buildings are completed, and in general the construction activities produce a lot of waste.

To achieve sustainable buildings at the University, it is vital that a high level of ambition is set from the first sketches and pursued throughout the construction project. Sustainability certification schemes for buildings are an ideal tool for ensuring this consistent and holistic focus throughout the process. They also provide an effective platform for communication about the buildings’ sustainability. Sustainability certification schemes are used on a large scale in Europe, the United States and Asia, including in the other IARU universities.

Major infrastructure solutions such as district cooling on the North Campus can yield significant environmental improvements as well as financial and operational benefits. We need to explore the opportunities for implementing similar major infrastructure solutions in all the campus areas in cooperation with greater Copenhagen Utility, Copenhagen Municipality and Frederiksberg municipality.

**Efforts**
- UCPH wants to ensure that sustainability is consistently integrated into campus planning, new constructions and renovation
- UCPH will use certification schemes for sustainability (such as DGNB-dk) to ensure a documented, consistent and systemic focus on sustainability in our new constructions

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**New ventilation technology in animal stables results in huge savings**

The installation of frequency converters and conversion of the ventilation system in an experimental animal stable at Panum has produced many benefits. The capacity for laboratory animals has increased, maintenance work has been handled, the working environment has improved significantly, and more than three million kWh has been saved per year, amounting to a financial saving of around DKK 2.6 million per year, with a payback period of around five years.
UCPH will incorporate needs-adapted operation in new constructions, so that the process energy consumption is reduced.

UCPH will perform TCO (total cost of ownership) assessments of energy measures in all relevant maintenance and construction projects.

UCPH will invest approximately DKK 400 million from 2014 to 2020 in direct energy renovation and energy-efficiency improvements of existing buildings and facilities.

3. Environmental and energy-conscious operations

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The focus area’s importance for achieving the targets

The day-to-day operations account for a substantial part of the University’s energy consumption and environmental impact, so major environmental and financial gains can be made by ensuring resource efficiency in all major areas.

Energy-efficient operation is expected to contribute about 25% of energy savings by 2020. These savings are to be realised by monitoring and controlling all building complexes and adapting consumption to actual needs. Laboratory buildings are central in this context, as they consume by far the most energy, have the biggest environmental impact, and are the most complex buildings to run.

UCPH’s faculties and building complexes are very different, as is the level of day-to-day focus on energy and the environment. A joint energy and environmental management model can enhance the management in this area throughout the organisation and foster knowledge-sharing between faculties.

To realise the potential for savings, we must boost skills and knowledge and clarify the responsibilities for environmental and energy management throughout the operations organisation. An effective organisation can lay the foundation for developing and implementing policies and solutions that ensure efficient operation in interaction with the users. These could for example include policies for procurement and operation of freezers and ventilation.

There is a need for investment in management and monitoring systems, as well as technical solutions, so the operation can be further adapted to the users’ actual needs, especially regarding heat and ventilation.

Electricity, water and heat consumption are primary focus areas, but other operating activities also have a significant environmental impact, e.g. cleaning and maintenance of green areas.

New operational and business models can provide significant environmental and energy gains. They can take the form of common core facilities where users rent or purchase the necessary services, e.g. -80 degree freezer volume. Together with other incentive schemes, such as illustrating the energy consumption and environmental pollution, this can give users a greater sense of ownership and interest in resource and energy efficiency.

Efforts

- UCPH intends to develop and implement a step-based environmental and energy management system for the entire University which ensures the development of a coherent demand-driven
operation with the least possible energy, re-
source and chemical impact

- All faculties must have established the basic
  level of the University’s environmental and ene-
  rgy management system by 2016
- All employees in the operational organisations
  must have undergone appropriate competency
development training in environmental and ene-
rgy management
- UCPH will develop new management and opera-
tional solutions for the most environmentally
damaging and energy-consuming laboratory fa-
cilities

4. Sustainable organisation and beha-
vior

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A sustainable organisation is the foundation for mak-
ing savings by adapting technology and changing
behaviour. It is all about having an organisation that
is geared to launch, operate and evaluate ongoing
sustainability efforts in various areas. At the same
time, the organisation should facilitate a meaningful
dialogue between staff, students, the operations or-
ganisation and developers, so the best ideas are
translated into practice. There are also a number of
functions and activities that will benefit greatly from
training in sustainability efforts. It is very much about
creating an effective organisation that makes it easy
and natural to practise sustainable behaviour in all
the University’s essential activities.

More sustainable behaviour resulting from a strong
sustainability organisation, better technical solutions
and optimised management of process energy (e.g.
fume cupboards) is expected to contribute about 25%
of the total energy-efficiency improvement by 2020.

Efforts

Employees

- UCPH will establish a formalised sustainability
  organisation at the University consisting of a
  central coordination committee and green am-
  bassadors with clear responsibilities and authori-
  ties at all departments, laboratories and divi-
sions. The organisation must be adapted to the
primary needs. For example, it needs to focus
primarily on laboratories.
- Key personnel, such as green ambassadors,
sustainability coordinators and procurement of-
ficers must be given relevant and targeted trai-
ing to help them realise the vision of making the
University sustainable.
- UCPH should serve as a living laboratory for the
  University’s research and development activities

Students

- In 2015, we need to develop an organisation that
  facilitates the students’ active participation in the
  University’s sustainability efforts. The physical
  environment must make it easy for students to
  act sustainably, and there should be offers to
  take active part in making UCPH more sustaina-
ble.
- We need to carry out campaigns on energy-
efficient behaviour, proper waste handling, etc.
UCPH should also increase the opportunities for
students to complete academically relevant
study projects on sustainable solutions on cam-
pus.

Changed behaviour saves 9% on elec-
tricity consumption

During the most recent Green Campus sustain-
able behaviour campaign at UCPH, the buildings
in the Central Administration competed for who
could reduce their electricity consumption most.
This resulted in an average of 9% savings dur-
ing the period. The Central Administration’s en-
ergy project group, which consists of a green
ambassador from each division, played a crucial
role in the campaign: The group explained the
sustainability efforts, inspired colleagues and
illustrated the development of the electricity con-
sumption.
5. Transport
The University’s transportation makes up an ever-growing part of our total CO2 emissions. This growth is primarily linked to international flights, which account for more than 90% of the total CO2 emissions from transport. In order to realise the University’s CO2 objective, the growth of CO2 emissions from transport must be limited to an average of max. 1% per annum by 2020, compared to 6% annually from 2006 to 2012.

Researchers and staff will and must be increasingly international, but travel is expensive when it comes to CO2 emissions, time and money. Some researchers and staff members travel so much that they may well find that travelling less will have beneficial effects on both their work and their private lives. Offers of well-functioning and accessible virtual communication solutions can result in more meetings without travelling, but these offers are currently limited at UCPH.

In the coming years we expect to see international measures to reduce CO2 emissions from air transport, e.g. more energy-efficient planes and the use of second-generation biofuels. At the same time, virtual meeting solutions will presumably be further developed and used as ever-better alternatives to travel.

**Efforts**
UCPH will establish a cross-cutting working group to investigate and recommend decisions to the management in 2015 on measures to restrict the growth of CO2 emissions associated with transport.

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The working group should assess the following measures, among others:
- Use of virtual forms of communication at UCPH, including video-conferencing facilities
- Establishment of a climate travel pool, whereby travelling by air contributes DKK 0.02 per air kilometre to a faculty-specific pool to promote virtual meetings or other measures that can limit the growth of CO2 emissions from air transport
- Offers from airlines focusing on transport with fewer CO2 emissions

6. Green IT
The power consumption for IT is growing in the public sector and at UCPH, and there are substantial energy and financial gains to be made by reducing it. Save Energy (an institution under the Danish Energy Agency) estimates that Danish municipalities could save DKK 1.5 billion if they purchased energy-efficient IT equipment.

**Central server facilities are the way forward**
In 2009-11, the Faculty of Health and Medical Sciences and the Faculty of Humanities each purchased a central server facility. The closure of physical servers in the Central Administration alone has meant that the electricity consumption for operation and cooling has been reduced by up to DKK 600,000 per year. The corresponding increase in electricity consumption in the central server rooms represents < 10% of the savings.

Apart from energy consumption, when it comes to the production, operation and disposal of IT, there are a

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number of environmental issues that need to be addressed to ensure a resource-efficient and sustainable UCPH. These include making sure that the materials and chemicals in the equipment are suitable for recycling.

Measures to make the IT systems more efficient are closely linked to financial and operational considerations. For example, central server solutions are more energy-efficient than local server solutions, in part because less energy is needed for cooling. A good organisation and coordination of copy and print facilities adapted to the users’ actual needs can also provide significant savings on energy consumption, operations/service and procurement.

**Efforts**
- UCPH will establish a Green IT committee under the University IT Coordination (KIK), which will recommend decisions on measures to ensure sustainable and resource efficient IT at UCPH
- UCPH will develop a two-year Green IT action plan setting out the main ways in which the IT area can contribute to significant savings in energy and resources and a lessening of the environmental impact
- UCPH will ensure resource efficiency and IT security through optimal use of central server facilities
- UCPH will develop IT solutions, including better virtual solutions, that make the users’ day-to-day life at the University smarter, easier, and more resource efficient
- UCPH will develop standards and projects that ensure environmental and energy-efficient setups, management and use of IT equipment

**7. Green procurement**

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Many people are currently responsible for procurement at UCPH, and it is a big and complex task to coordinate and ensure loyalty to a common procurement policy. In the purchasing situation, many requirements need to be weighed up against each other and environmental and energy requirements are often not considered, since knowledge and focus on these areas is limited. From the University’s perspective, the best solution for the purchaser is rarely the most financially or environmentally beneficial.

As regards laboratories, there is a need to prioritise the purchase of energy-efficient machines and equipment. The equipment is often very energy-intensive; it stays switched on for a long time, and there is a lot of it.

Big energy and environmental savings can be made if we increase the energy-efficiency of UCPH’s purchasing. Environmental and energy requirements must be made when we negotiate central purchasing agreements.

**Efforts**
- UCPH will ensure energy-efficient procurement contracts and consistent use of these for purchases of energy-consuming equipment, including laboratory equipment such as fume cupboards, heating cabinets, standard freezers and refrigerators
- UCPH will train procurement officers in environmental and energy-efficient procurement
- UCPH will ensure a consistently high level of environmental and energy considerations in all relevant procurement agreements

**Purchase of energy-efficient ULT freezers**

UCPH currently has 450-500 ultra-low temperature freezers (-80 degrees), and we replace or buy about 50 freezers a year. Each freezer consumes power amounting to up to DKK 10,000 a year, and the rooms where the freezers are placed often need to be cooled as well. So in 2013, we tested freezers, issued tenders and signed a purchase agreement for ULT freezers, so we can now acquire the most energy-efficient freezers on the market at half the price. Over four years, this agreement is expected to save UCPH up to DKK 14 million in procurement and lead to less energy consumption.
WE CAN WORK TOGETHER TOWARDS A SUSTAINABLE UCPH IN 2020

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