



UNIVERSITY OF COPENHAGEN

GREEN *Campus*

Climate and energy actions at University of Copenhagen

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CERN, 24-10-13



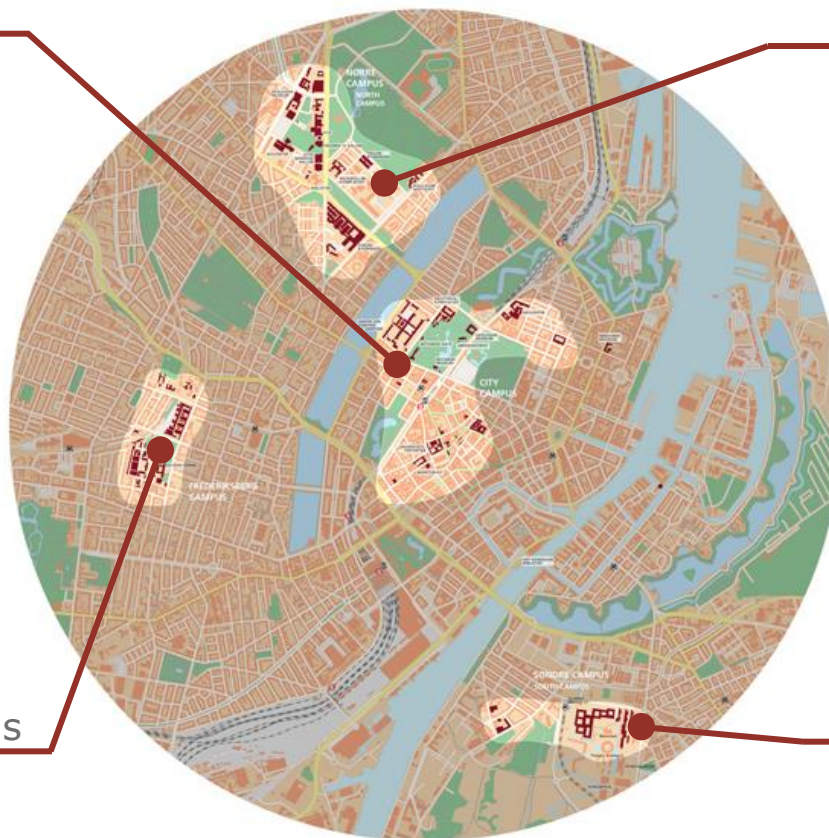
Four campuses in Central Copenhagen – 1.000.000 m²

City Campus

Faculty of Law
Faculty of Science
Faculty of Social Sciences
Faculty of Theology
Central Administration

North Campus

Faculty of Science
Faculty of Health Sciences



Frederiksberg Campus

Faculty of Science
Faculty of Health Sciences

South Campus

Faculty of Humanities

- 1 million m² buildings,
- >38,000 students, 8,000 employees, including 5,000 scientists



CLIMATE ACTION

UNIVERSITY OF COPENHAGEN

RESEARCH & DISSEMINATION IARU INTERNATIONAL SCIENTIFIC CONGRESS ON CLIMATE CHANGE

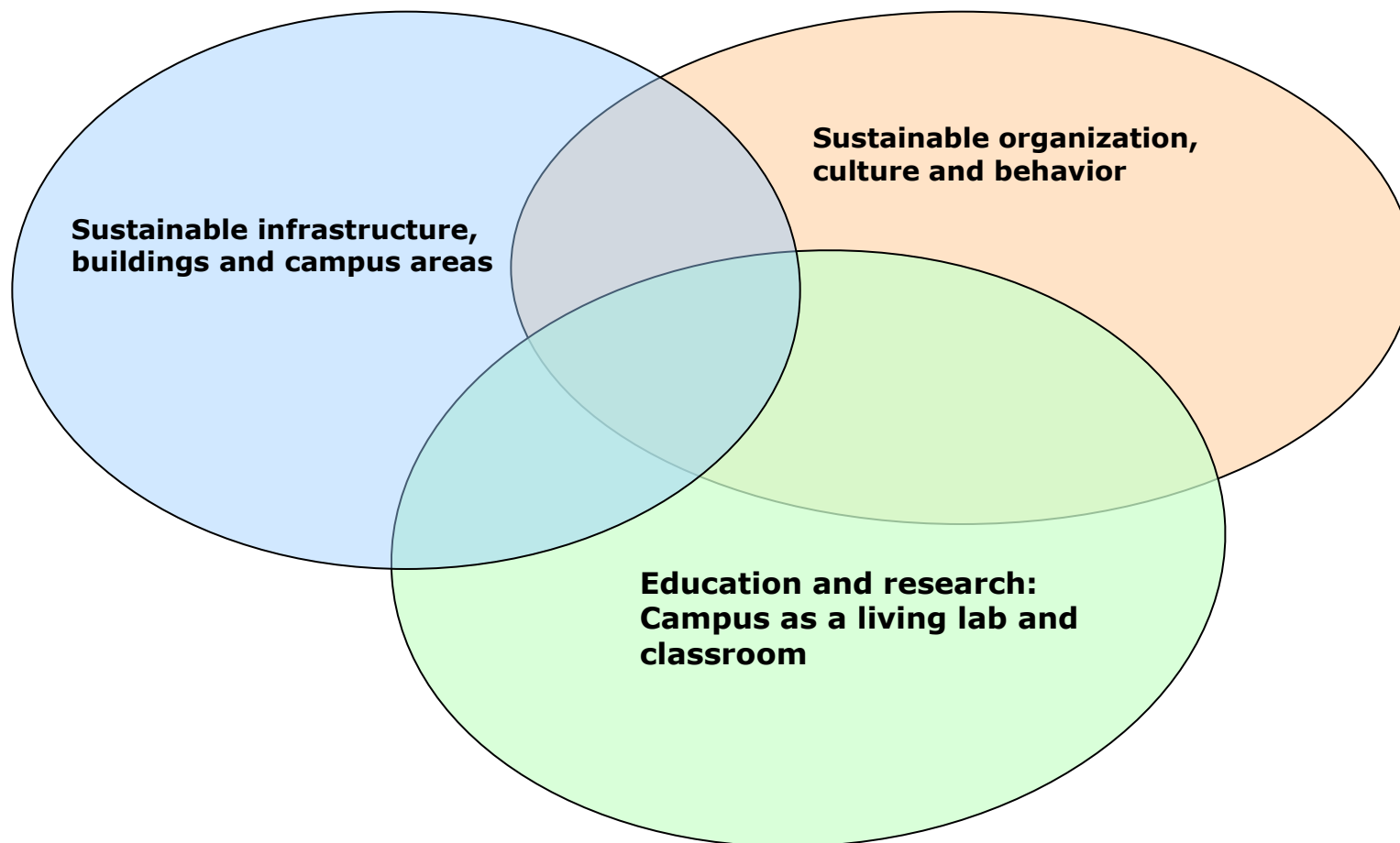
CLIMATE EDUCATION & DISSEMINATION

GREEN CAMPUS REDUCING THE UNIVERSITY'S CARBON FOOTPRINT

Study more: www.climate.ku.dk



Green Campus - resourceefficiency and sustainability



Becoming one of the greenest campuses in Europe

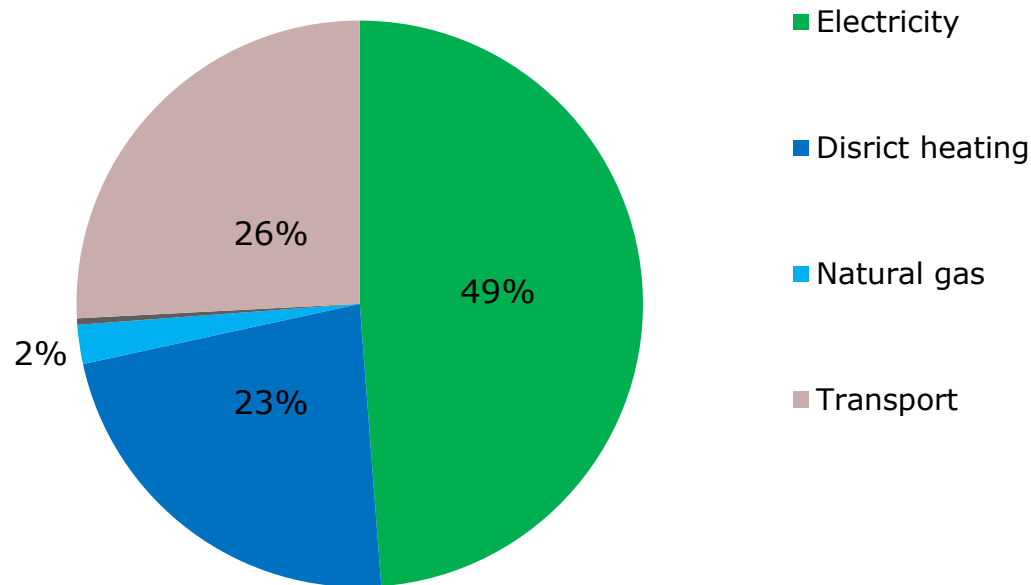
Focus on reduction in energy consumption and –expenses

- The most important direct environmental impact
- Demonstrating an green and responsible university
If not universities – who should then?
- Saving money for core activities: research and education



Key energy figures for UCPH

Total CO2-emissions 2012



- Annual energy consumption: 176 GWh
- Annual energy expenses: € 25 million



Key issues

- Top management focus and commitment
- Short term ambitious reduction targets
- Keep focus on where reductions are achieved
- Considerable targeted investments needed - but pay-back time is good



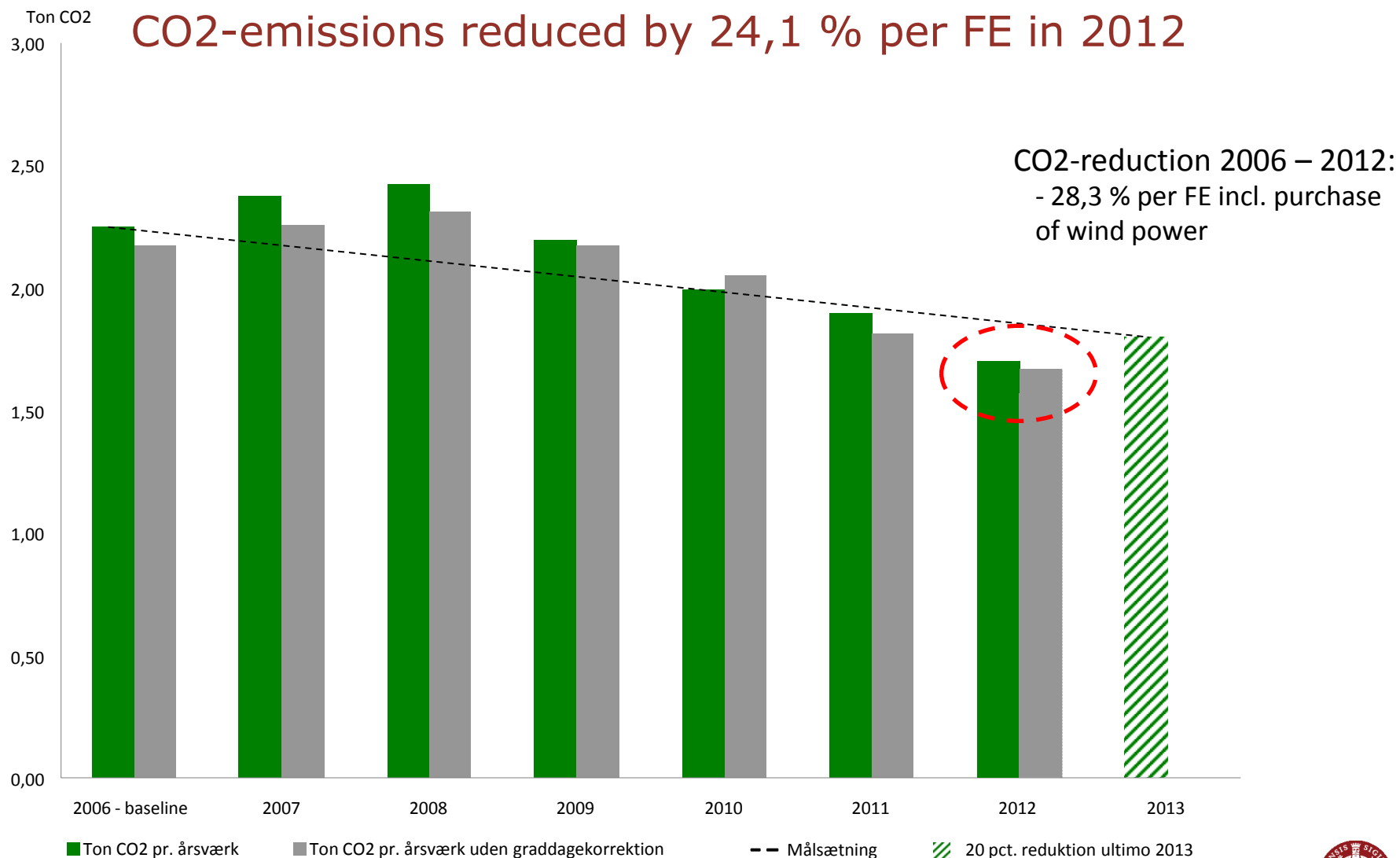
Key 2013 Goals for Green Campus at the University of Copenhagen

- **Energy consumption must be reduced to a level that is 20% below that of 2006, measured as energy consumption per man year for staff and students (FE*)**
- **CO2 emissions from energy consumption must be reduced to a level that is 20% below that of 2006, measured as CO2 emission per man year for staff and students (FE*)**

Goals were approved by the university's board in October 2008

* FE = Fulltime Equivalent





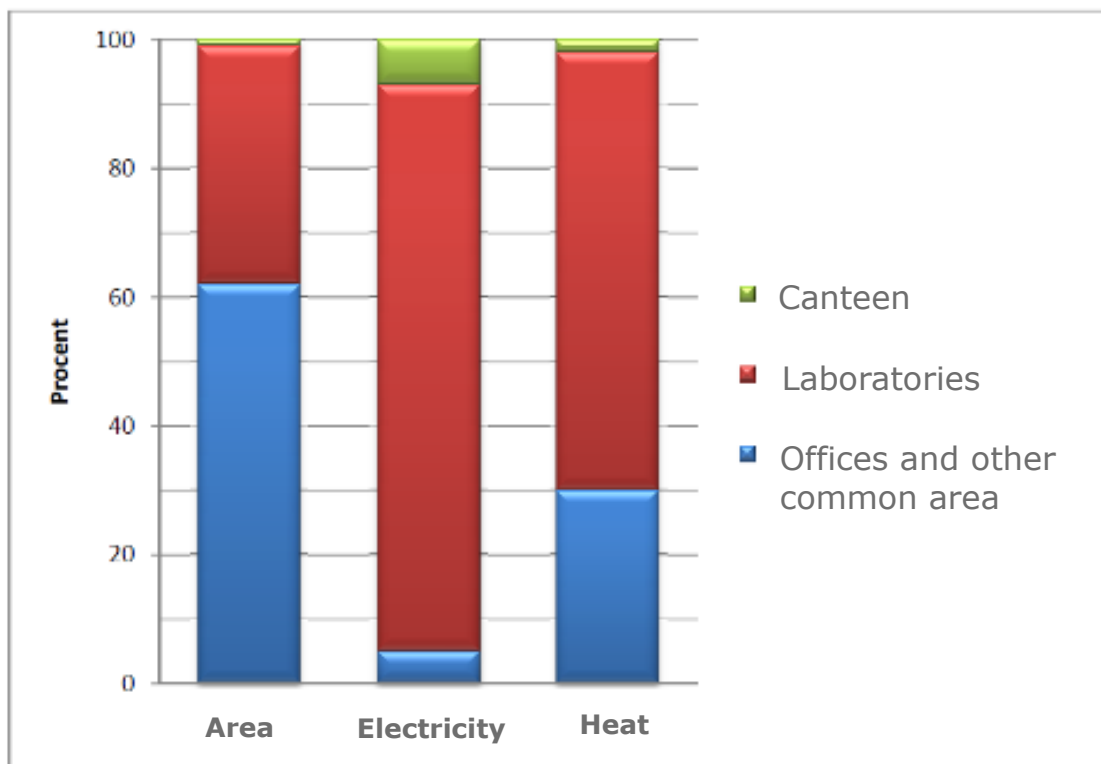
Internal Climate and Energy Actions – responsibilities

- **Campus Steering Committee:**
Project owner. Rector is head and includes prorector, university director, all 6 deans.
- **Green Campus (3 staff + 3 students), part of Campus Service**
 - **Overall strategy, planning and policies**
 - Annual green accounts, controlling etc.
 - Communication – internal and eksternal
 - Development and coordination of key transversal initiatives e.g. sustainable behavior, sustainable buildings, green purchasing
- **Faculties:**
 - **Energy management and operations**
 - Annual energy report, energy action plan and energyfriendly behavior
 - Pays their own energy bill
- **Other key units:**
 - The building section uses energy conscious design of building projects
 - IT Department on green IT (with Green Campus)
 - Purchasing Department works with green purchasing (with Green Campus)



Laboratories are heavy energy consumers

- 83 % of total energy consumption at UCPH is used at laboratory faculties
- 4-8 times higher energy consumption per m2 or per employee



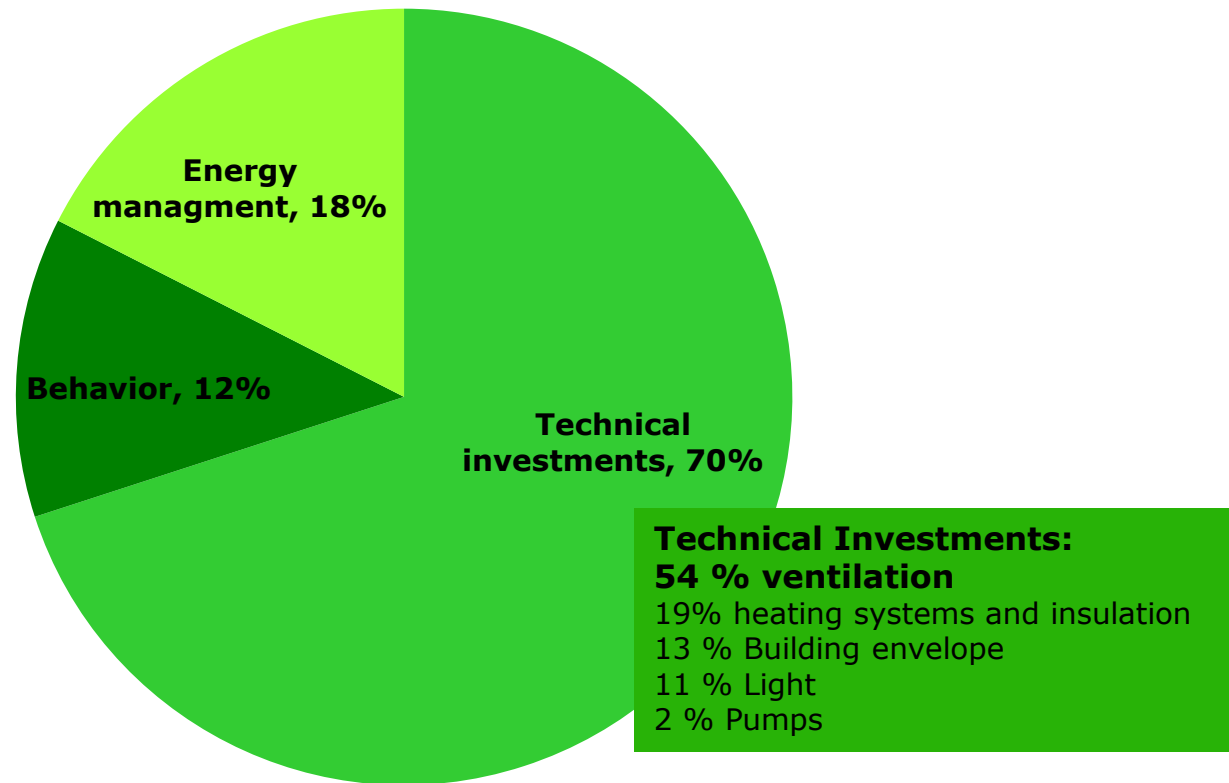
"Våde fag"



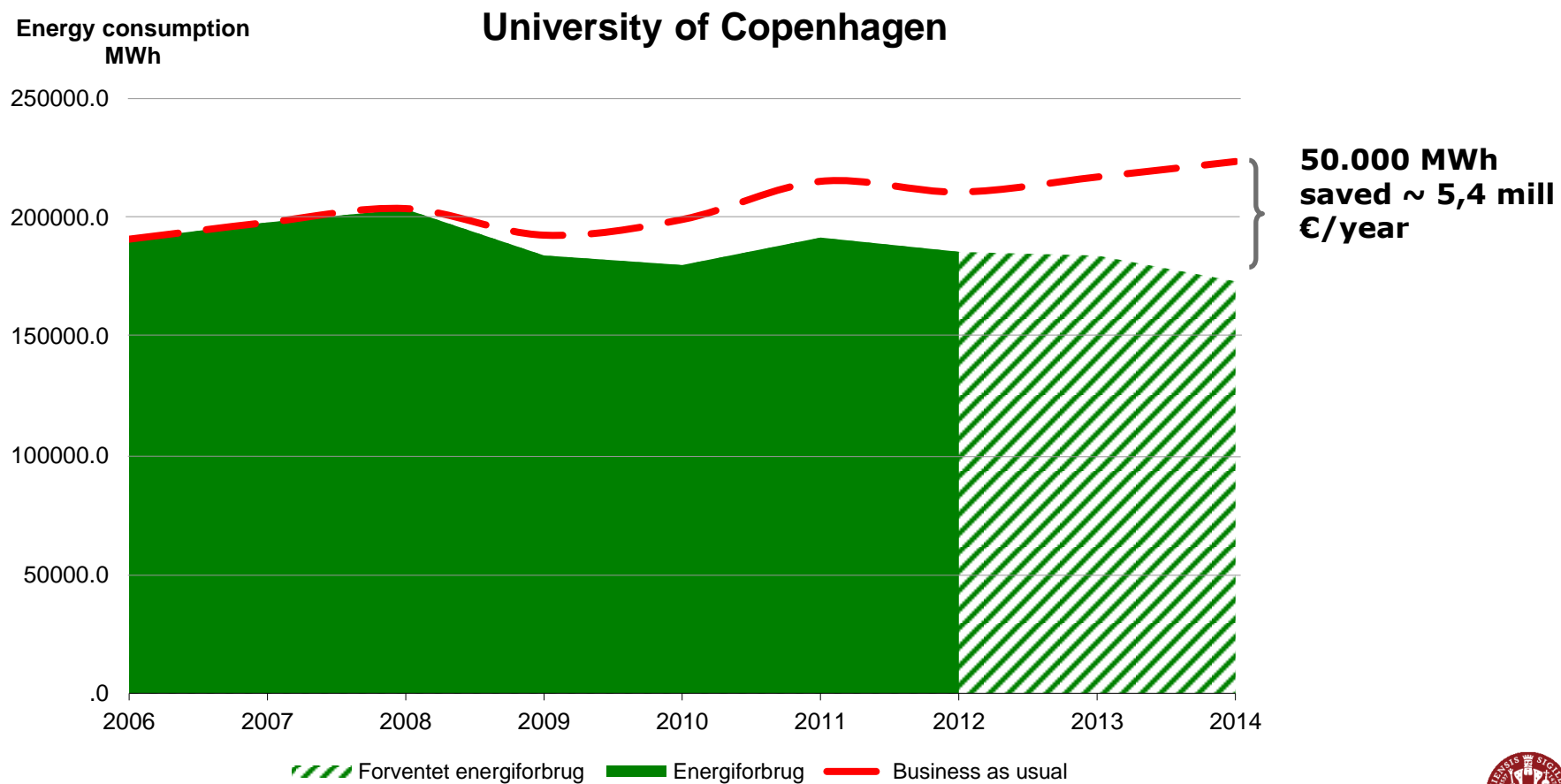
Investments and savings

Investments, 2008-2014: € 18 mill.

Savings: annually approx. € 5,4 mill.



Great savings



Green Action



Green Action is the University of Copenhagen's campaign for energy-efficient behavior.



Why addressing behavior?

- We have a **responsibility**
- At least **5 % of total energy consumption can be saved** just by energy-efficient habits -> more money for the University's research and education
- The **best pay-back time** on any energy saving activity
- **Platform for communicating** internally on sustainability
- Building a **platform of awareness** among staff -> support of technical energy saving initiatives/policies on operations

Total annual estimated savings at UCPH > € 1 mill. annually



Green Action – the UCPH approach

- Engage staff
- Focus on the important actions - time and attention is limited
- Communication and campaign materials
- Maintain focus



Engage staff

Culture and behavior is formed and transformed among colleagues

Recruitment of approx. 250 voluntary green ambassadors among staff, taking local actions

- Task: to engage colleagues and address recommended actions
- limited required actions and expectations
- offered communication and campaign materials



Focus on the important actions - time and attention is limited

Simple advice on most important issues to be targeted:

- What can you do individually
- What can you do together

The little green guide for the laboratorie

UNIVERSITY OF COPENHAGEN

Green Action
- join the movement for an energy efficient university.

Green Action

IT IS ALSO WORTH REMEMBERING:

Keep standby consumption under control - get an energy-saving plug bank and save DKK 150 a year - the equivalent of DKK 2.3 million a year if everyone at the University of Copenhagen did the same.

Apparatus rooms (containing servers or other equipment) with cooling facilities/fan coil units
Switch off and close when they are not in use, assess the need for cooling and set the temperature at an acceptable level.

A water cooler uses up to DKK 1,000 a year in electricity. Consider installing a timer.

Autoclaves
Make sure they are completely full before autoclaving and share with other departments if possible. Ensure that the size of the autoclave meets your needs.

A switched on incubator costs approx. DKK 4,000 - 12,000 a year in electricity.

Computers for research and analysis devices
Consider when they could be switched off and agree on switch-off times.

Miscellaneous devices (pipette suction apparatus and chargers, scales, magnetic stirrers etc.)
Switch off completely when they are not in use and, if necessary, order a free timer from www.groengerning.ku.dk.

Water coolers
Only switch them on when you need to use them; if necessary, order a free timer from www.groengerning.ku.dk. Assess whether you need to use them and set the temperature at the highest acceptable level.

Ice machines
Switch them off when they are not in use.

Cold storage/freezer room
Assess and adjust temperature requirements.

Warm and treated water
Save water and assess whether ordinary water is adequate.

THE LITTLE GREEN GUIDE FOR THE LABORATORY

What can you do yourself, and what can you do together with your colleagues in the laboratory, to promote energy-efficient habits?

- ENERGY-EFFICIENT HABITS BEGIN HERE

Freezers at temperatures of minus 80/150 °C use electricity to the tune of DKK 10,000 a year - an annual expense of at least DKK 3.5 million for all of the 300 Freezers at the University of Copenhagen.

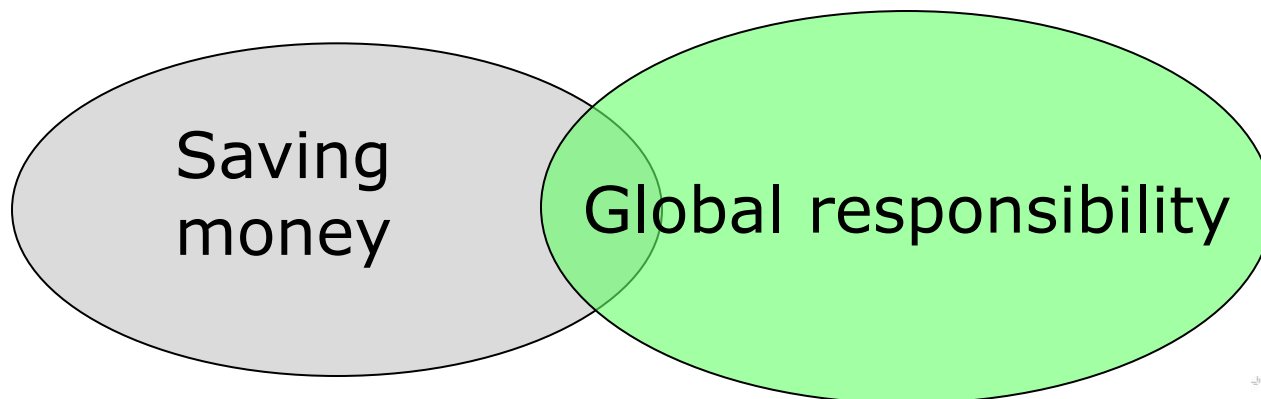
VISIT WWW.GROENGERNING.KU.DK FOR MORE INSPIRATION AND INFORMATION ABOUT WAYS IN WHICH YOU CAN INTRODUCE GREEN ACTION INTO YOUR LABORATORY.

Most important typical energy consumers in the bio/chemistry laboratory

Fume hoods/LAF benches/point suction	Worst case: an open fume hood: up to 40.000 DKK/year	<ul style="list-style-type: none"> - Always close down when not in use. - Turn of if possible.
Freezers - particularly ULT-freezers (-80/-150 °C)	<ul style="list-style-type: none"> -150 °C: up to 60.000 DKK/year - 80 °C: up to 20.000 DKK/year 	<ul style="list-style-type: none"> - Go through your freezers and tidy up. - Share space and reduce numbers
Incubators, ovens, heating blocks and stages	Ovens: 6 – 12.000 DKK/annually	<ul style="list-style-type: none"> - Remember to switch off - assess and adjust the temperature.
Lights	Counts for approx 40% of electricity use in offices	<ul style="list-style-type: none"> - Switch off desk lights and overhead lights when not necessary



Not just targeting the "already saved":



Communication and campaign materials for labs

Materials for Green ambassadors:

- Little Green Guides
- Fume hood stickers
- Timers
- Energy monitors
- Sweets
- “The angry penguin”
- Stickers addressing equipment that could be turned of
- Posters

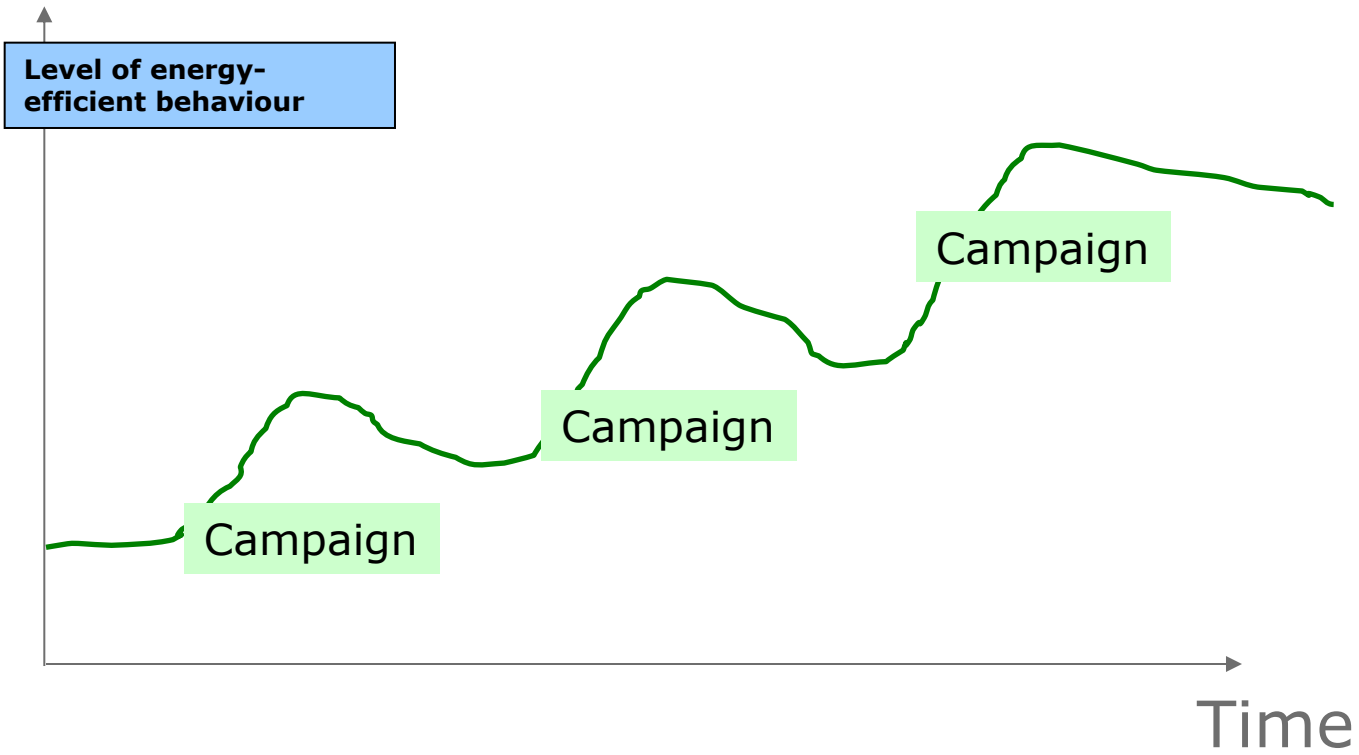


Central communication

- Posters
- Banners
- Competitions
- Homepage
- Students energy advisors “light”



Maintain focus



District cooling in North Campus

Niels Bohr Building – Faculty of Science, 45,000 m²



Maersk Building – Faculty of Health, 40,000 m²



The estimated demand for cooling on North Campus is 11-12 MW. This includes planned buildings.





Maersk Building :
SUSTAINABLE
TRIPLE
BOTTOM LINE

Green Lighthouse: Denmarks first CO2-neutral public building



Thank you!

www.klima.ku.dk/groen_campus

