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Report on Session B3

- A brief summary

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Sustainability on Campus, implementation and outlook

Presented by Dr. Oliver Opel

A clear definition on what sustainability involves and a focus on soft issues on sustainability such as planning, inclusion, gender etc.

4 main fields are vital for campus sustainability: community, research, education and operations

Leuphana has a long history of working with sustainability tracing back to 1996, states that it is important to have dedicated management and tools on how to implement for instance a sustainability policy

To reach all parts of an institution high level decisions are needed

Another key is the ability to manage and measure the different fields leading to sustainability

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On energy matters a few conclusions from Leuphana university are explained:

As general refurbishment of buildings is costly so the advice is that if surplus heat is available it is more efficient to use that before insulating fully

PV is a good add on for power production.

In general new buildings have superior energy efficiency but also adds to sustainability by being a focal point for social meetings etc. User behavior becomes more interesting in efficient buildings.

Key in energy sustainability is to use the heat that is available locally, i.e. adapt technology to energy temperature

To reach sustainable energy solutions complex solutions needs to be considered

Finally, we need to understand what the society actually is looking for when it comes to sustainability

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The green campus project at University of Copenhagen

Presented by Mr. Tomas Refslund Poulsen

The green campus project has lead to an decrease in CO2 Emissions of 24.1% per staff from 2006 to 2012

Presentation is about the management on how they do in UCPH as well as change in behavior.

Key issues are:

- Top management focus and commitment
- Short term ambitious reduction targets
- Keep focus on where reductions are achieved
- Considerable targeted investments needed

Focus for last years has been energy efficiency and lowering the CO2 foot print. And during the project 2 goals were set: Lowering both energy consumption and CO2 emissions with 20% per staff.

Both goals fulfilled

The organization on campus, as overall tool, is vital for sustainability work and reaching set goals
Key is to have a direct link to top management as well as distributed energy management tools.
Awareness and incentives are keys on both mid and low level management

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A few conclusions on the energy matter:

It becomes clear that laboratories are heavy energy consumers, 4-8 times higher per m2 or employee

During 2008-14 18 M Euro is invested and savings annually of 5.4 M euro (50 000 MWH). Major part is technical investments but 30% is due to management and behavior change.

One challenge here is created by ownership of buildings, it is hard to change or lower if you don't own the building

Finally, why address behavior. Simply put is that energy saved is the fastest and easiest way. Key to reach change of behavior is to build a solid platform of awareness.

Only behavior is estimated to save up to 1 M Euro Annually

Such a platform could be simple instructions and information leaflets even reoccurring campaign plus creating ambassadors.

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Experience in implementing and installing co-generation and energy saving scheme

Presented by Dr. Piterà

Experience from Fermi Elettra laboratory

The laboratory has huge cooling loads where ordinary systems cant handle the seasonal variations.

The system solution is a Trigeneration system that is an evolution of co-generation systems.

Trigeneration refers to the simultaneous generation of electricity and useful heating and cooling

The system consists in overall of 2 TGPS and a connecting power link, both power and thermal line

The objective is to switch between the different TGPs

For Elettra and Fermi Lightsources the actions to improve energy efficiency are:

- Maximize the use of the thermal energy
- The adoption of trigeneration systems to take advantage of the heat produced in summer and middle season.
- The adoption of double-effect absorption chiller to maximize cooling capacity.
- The logics of operation and support of various systems.

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CERN campus: mapping of the building versus energy consumption and an example of design and construction of a green building

Presented by Dr. Luigi Scibile

The report is from ongoing work at CERN

How energy is mapped and why: OBS main focus is on heat energy, supply and losses

There are vast amount of buildings and the fact that they are old. CERN have developed over the years in waves. However major part is pre 80ths

CERN campus is split up in two sites for mapping - Meyrin and Prévessin and with 3 subgroups:

- work facilities
- social facilities
- visitor facilities

Energy is measured locally and models are developed for where heat is used and where heat is dissipated

Heat energy is one of the critical keys for future development.
Tools to improve will be renovation of buildings and new buildings erected under a new energy concept

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Mapping have been difficult due to big variety of systems and buildings.

A new energy concept is applied on a building 774 containing:

- New development standard for buildings

- Renewable energy usage (solar collector as much as possible with thermal storage) and energy recovery

- Designed to interact with other sources.

Summarized:
- Energy is key for buildings both old and new
- Mapping heat energy is vital for decisions on intervention and planning for future
- New building design needs to be open for future designs on energy supply and structure

Finally:
- the main driver to change is the reduction in operational cost along with the fact that energy is / has become major topic for management.
- Secondly it is about comfort for the people working and visiting the facility.

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Conclusions:

Awareness and commitment on top level management is critical for work with sustainability

Work done with sustainability needs to be able to be measured

Heat energy is often disregarded in supply but highly regarded in work done to lower CO2 impact as well as efficiency rates

Local and complex energy systems are often regarded as solution for the future