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## **APLIKACE UDRŽITELNÉHO ROZVOJE V RÁMCI FM UNIVERZITY**

### **APPLICATION OF SUSTAINABILITY WITHIN UNIVERSITY FM**

This article discusses application of sustainability within university facility management. Sustainable approach within the facility management of building could be often successfully implemented, because there are a lot of possibilities to get better economical or social benefits for users (students, teachers and other staff) in the university buildings and areas. The main goal of this article is to compare sustainable activities within universities and to show the experiences from Denmark.

The paper also discusses sustainability in relation to energy and water consumption, waste management, design of new buildings and urban planning within campus area.

#### **Introduction**

Sustainability is defined as the ability to meet our needs without compromising the ability of future generations to meet theirs. During last few years, there are efforts in a business and also in a public sphere to be more sustainable. To be sustainable does not mean just to be “green” but the term sustainability is wider. We can understand it as a possibility for government, industry and business to increase their social, economic and environment benefits. I decided to focus on facility management of universities and their system of implementing the sustainable standards and solutions. Due to my experiences from Technical University of Denmark I could see an efforts leading to implementing of sustainable solutions in the university environment.

The main task for my next work is to do a research in the universities in the Czech, maybe Slovak Republics and try to explain how they could implement any fragments from sustainable solutions into their facility management.

#### **What does „TBL“ mean?**

Before thinking about sustainability there was stress just on the economic profits. During the last years, how the civilization demands were higher, are increasing also other segments of the life. Economic profit has been supplemented with social and environmental standards. These three entities are now mentioned with much more emphasising for their impact on people and the environment. According to [1], TBL is an acronym for three words - Triple Bottom Line. The Triple bottom line in another case known as well as 3BL or “the three pillars” means that everything we do is measured by three critical aspects of life and work in the modern age; by the social, environmental and economic impact of life on earth.

If the companies work in accordance to the system TBL they are usually proud for their low environmental impacts and corporate social responsibility as well as economic profit. The most of companies need for their operations buildings. Facility managers are responsible how the buildings and the processes work and how the people whose use them feel. With increasing quality of a building, indoor environment and functional processes is usually also increasing the productivity of the people who occupy them.

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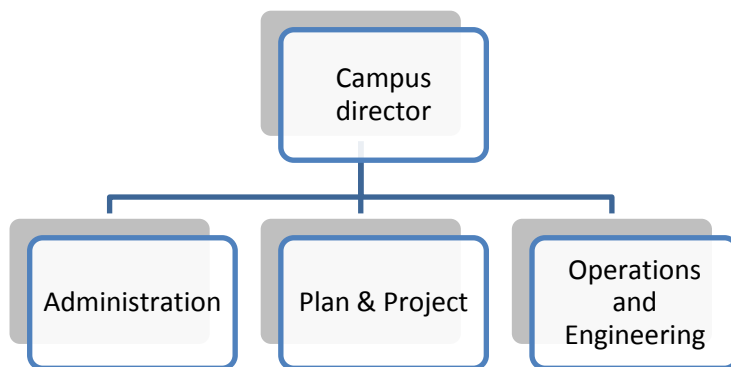
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## Sustainability as a main goal in the university

The Technical University of Denmark (DTU) is a big education institution. There is an operational unit within the university organization with name Campus service. The Campus service is responsible for planning and project management of construction projects, operation, and maintenance of DTU's buildings, installations, roads, squares and parks etc.

### *Organization of the services in DTU*

Campus service is controlled by the Campus Director and to him are subordinated three managers, planning and project manager, administration manager and operations manager.



A Department of Campus service is responsible not just for the main campus in Lyngby, but since 2007 also for more than 15 places in Denmark as the nationwide university. The fixed staff is located at 6 of these sites.

**Fig. 1:** Easy scheme of the organization of Campus service in DTU [4]

### *Sustainability within DTU*

Organisation unit Campus Service should set processes, which must be set according to the principle of sustainable development and must ensure sustainable energy consumption and other sources.

There are two ways in which academic institutions advance sustainability principles on their campuses that authors introduce in [2]: going green and promoting education for sustainability (EfS). Greening campuses implies infusing environmentally friendly practices in all dimensions of university operations and infrastructure. EfSS refers to the set of ethical standards for academia to become sustainable.

Campus Services is according to [3] responsible for coordination of sustainability initiatives in relation to DTU's physical the design and operation. Campus Service carries out monitoring, prepare green accounts and Carbon Foot Print, set up simulation models and implement sustainability projects at DTU.

DTU followed way to EfS and DTU's sub-policy for sustainability was approved by on 8 June 2011 and the main purpose mentioned in [3] is to supports the university's vision to be a globally recognized technical university. Sustainability was defined and shouldn't be seen as an end in itself but as a framework and a means to support DTU's core activities: Research, Education, Public Sector Consultancy and Innovation. Sustainability policy is indicative of efforts to reduce the university's climate and impact as much and be visible internally and externally, to DTU as an elite university in a responsible and credibly relate to environmental sustainability and climate challenge.

DTU under [4] has a development contract with the Ministry of Science, Innovation and Higher education defined targets for energy and waste: Energy consumption should be reduced by 15% in 2015 and the percentage of recycled waste from DTU campus areas increased from 35% to 40% by 2015.

One of the main factors introduced in [5] how to contribute in institutions achieving environmental sustainability is facilities-driven sustainability. DTU needed highly progressive, environmentally engaged, and environmentally knowledgeable facilities staff leaders. There was established position for sustainability coordinator in Campus Service and its responsibility is to implement sustainability principles into practice. The sustainability coordinator has not only grasped the possibility for reduction of costs associated with innovative energy production and consumption strategies, but also understood sustainable impact from the wider perspective. The competences of that coordinator are to recognize the impact of universities's carbon footprint and understood the responsibility to model sustainable facilities management and operations that educate students, faculty, and the community.

### *Sustainable waste management in Lyngby campus*

Waste is sorted to sixteen groups in the DTU. There are 16 groups of different waste in the DTU standard for waste shown in [6]. You can find all kind of waste which is produced by different buildings and departments in the sorting guide of DTU. In the sorting guide is describe which waste is produced and how should be treated. According to the [3], until 2015 should be achieved 40% share of recycled waste in total.

Good example for the waste management is the collection point in the areal DTU. There is waste collected and sorted. Employers can recycle bio waste directly in the collection point thereby it is not necessary to transport the waste off-site and the environment is protected.



**Fig. 2:** Site for containers for bulk materials in Lyngby Campus [own photo, 2012]

### *Energy consumption in Lyngby campus*

DTU is big consumer of electricity, heating and water. Authors in [7] emphasize that the equipment for research is often very energy/water consuming, and even through researcher have to do their research, but it is able to optimise operation and to minimise the consumption, when the facilities are not in use. For example, there is in process a project for retrofitting fume cupboards in DTU. In DTU were built 1,000 fume cupboards around 1970, they were designed without stress on energy consumption. They were usually designed with full ventilation, but they are used in many different ways and with different intensity in practice, some only a few times a year. There was organized user innovation workshop and result of the workshop was a new facility design for fume cupboards. New design is now tested in practice, before will be implemented on a larger scale.

## *Planning to multifunctional buildings*

According to the principles of sustainability can be also accessed to the space planning and design of new buildings project. Because the most ecological is the building that could not be build. The space management should be developed as much as is possible. Within DTU campus is located few spaces that are designed in multifunctional idea. These spaces can be used as lecture halls, spaces for leisure, dining, quiet study rooms, etc...



**Fig. 3:** Multifunctional room in the DTU campus [own photo, 2012]

## **Conclusion**

The idea of TBL is developed within sustainable approach to operation of existing building and planning new projects. University could have an advantage in the close cooperation on the development of new technologies. Some of the sustainable solutions can be developed and come into practice in university buildings. The main goal for university should be increased knowledge hand in hand to get better economic, social and environmental benefits. The system should be set on the optimal processes that are in accordance with needs of people and standards of buildings.

## **References**

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