

A first zero – net energy consumption building for DTU

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INTRODUCTION

Many innovations that turned out to be crucial for sustainable future have sprouted out from academia's grounds. On the other, universities do surprisingly little to be sustainable communities themselves. For instance DTU policy does not require new campus buildings to be low-energy consumption structures (building energy frame 2020). How great it would be if sustainable ideas could be inspired by everyday work place? Following that, an alternative solution is presented: a first zero-net energy building for DTU that would accommodate student of Building Design bachelor. A hidden agenda is to convince that eco-friendly architecture can be fully functional, attractive and suitable for teaching purposes and that in the long term such architecture can stimulate more sustainable lifestyle.

INTEGRATED DESIGN

The design style adopted in our work is referred as an integrated design process. This innovative approach from the very beginning involves multidisciplinary consultants: architects, indoor environment experts and civil engineers. Hence, the concept arises as a consensus between domains that are often contradictory. Computer simulations, mainly on building energy performance, are actively used to support decision-making process.

In result none of the key matter are compromised in our project. The fields that were taken under consideration include: total building energy consumption, building functionality and architectural quality, indoor environment, daylight work conditions, integration of energy saving and energy producing building technologies, sustainable construction solutions, socio-urban campus needs.

OUTCOME

The design outcome is a complete building concept. Not only it doesn't consume any energy – it is fully functional and visually appealing. Excellent working environment is established for all users (space flexibility, air quality, daylight conditions). The zero-net energy consumption was archived by passive means: suitable space design (rooms size and location, enhanced natural ventilation, building insulation) and by active means: wide range of technologies (solar panels, heat recuperation technologies, thermal active slabs). The building itself has minimized embodied energy due to the structural solutions adopted. Furthermore, this initiative would enhance the sense of academic community. Structure is interactive and animates campus life. For instance, stakeholders would be invited to come up with the design proposals for the outdoor workshop. More public space is predicted hence the campus becomes more accessible for pedestrians and bikes and less for cars, in fact encouraging more sustainable lifestyle.

CONCLUSIONS

The project proves that if certain working regime is adopted, functional and sustainable college buildings can be created. Such project could stimulate creativity, sustainable lifestyle and raise one's environmental awareness. It is hoped that this initiative will encourage academic authorities to intensify efforts to become truly sustainable academic community.