

Three detailed cases

Three projects are analysed in detailed. For each projects 6 to 7 involved actors are interviewed including the client and owner, tenant, architect and sustainability engineer.

The three detailed case studies show a development in time of sustainability goals. Lysaker Park, realized in 2009, was the first renovation project to achieve Norwegian energy label B, while FS4 obtained the passive house standard. Powerhouse Kjørbo takes the next step and offsets operational energy use and embodied energy with the generation of renewable energy. In all three projects the owner also acted as client.



Lysaker Park (Chapter 6)

- Location: Lysaker
- Size: 38.000 m²
- Sustainability goal: quality program (incl. energy label B)
- Completed in December 2009



Fredrik Selmers vei 4 (Chapter 7)

- Location: Oslo
- Size: 36.000 m²
- Sustainability goal: passive house and BREEAM-NOR very good
- Expected completion: October 2013



Powerhouse Kjørbo (Chapter 8)

- Location: Sandvika
- Size: 5.200 m²
- Sustainability goal: net zero energy and BREEAM-NOR outstanding
- Expected completion: February 2014

Two pilot cases

Two pilot cases are used as a reference. The cases provide evidence of a shift in investment direction, as well as a shift in minimum requirements. The Norwegian low energy standard is experienced as a minimum standard nowadays.



De Monarch (Section 5.4)

- Location: The Hague
- Size: 19.500 m²
- Sustainability goal: BREEAM-NL excellent
- Completed in February 2012



Nesøyveien 4-6 (Section 5.5)

- Location: Asker
- Size: 15.000 m²
- Sustainability goal: energy label B
- Expected completion: 2015

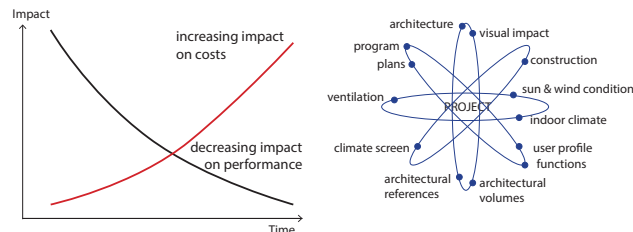
Introduction

Sustainability is a hot topic, both in the construction industry and on the global agenda. Sustainability in buildings requires to optimise contradictory parameters, such as daylight and operational energy use. Therefore, an integrated design process is needed.

Integrated design

Integrated design covers the complete life cycle of a building. In the earliest design stages, where the impact of a design change on costs is low and the impact on performance is high, clear goals should be set by a multidisciplinary design team, preferably including the contractor and future tenant.

Integrated design also includes knowledge transfer and evaluation, for example by monitoring real energy use and providing feedback to improve future projects. A committed and competent client is necessary to keep all project members on track towards the design goal.



Design choices in the early stages have a low impact on costs and a high impact on performance

A multidisciplinary design team has to optimise contradictory parameters (after Knudstrup, 2004)

More information

The guidelines in this booklet are the result of a master thesis project at Delft University of Technology performed in 2013. 25 actors with decision-making power in office renovation projects are interviewed to research the best way to organize a design process to involve sustainability.

The complete master thesis, including detailed descriptions of the case studies can be found online:

- Go to <http://repository.tudelft.nl>, and search on "Daan Boonstra" or "sustainable office renovation"
- Contact the author via daan.boonstra@gmail.com

REVISED DESIGN PROCESS GUIDELINES

For sustainable office renovation.

based on research on integrated design processes in Norwegian practice



