

TOTAL CONCEPT

A method presenting economic rationales for major reduction of energy use in non-residential buildings



Intelligent Energy Europe Programme
of the European Union

Energy renovation of non-residential buildings - a wise investment

In existing non-residential buildings energy savings can often be achieved by improving the building climate shield and the performance of HVAC systems and other energy consuming technical installations. In addition, changes in user behavior can be effective - without loss of comfort. Owners of existing non-residential properties need reliable information about what measures are cost effective, and what returns can be expected on energy related investments.

Major energy savings involving existing buildings are necessary if EU member states are to live up to the goals set for energy efficiency and CO₂ reduction, and is a prerequisite conditions for the shift from fossil energy to the sustainable or regenerative production of energy. Total Concept helps to make this shift both cost-effective and a good business proposition.

The method and the tool in brief

- ◆ The method applies a holistic approach to work with energy issues in the building with the aim to achieve maximum savings in a cost-efficient way.
- ◆ It includes economic realities a building owner has to take into account, while at the same time increasing the ambitions and making it possible to come much further with improving buildings' energy performance than with traditional methods.
- ◆ The method is based on an action plan comprising a package of measures that as a whole fulfils the property owner's profitability requirements.
- ◆ With the Total Concept tool the expected returns on investment of the various identified measures and for the action package can be determined, taking into account different economic lifetimes of the measures.
- ◆ The Total Concept is divided into three steps in a systematic approach covering the entire building process.

Total Concept offers a method and a financial tool that can provide the information required by establishing an informed platform for decisions about investments in energy-saving measures.

Action package

For forming the action package both the single cost-efficient measures ("low hanging fruits") and more costly measures are considered. What will be included to the action package will be determined in the profitability calculations based on the criterion that the internal rate of return for the whole package fulfils the investor's demands on cost of capital. The most economically profitable measures will assist the less profitable measures while the complete action package will fulfil the profitability frames set by the building owner. This way of working has shown that total energy savings of more than 50 percent are possible.

A process in three steps

The work process of Total Concept has been structured into three main steps. Each step includes a number of tasks to be carried out and requires a certain involvement from the specified stakeholders and key actors of the method implementation.

STEP 1
Creating the action
for decision

STEP 2
Carrying out the
measures

STEP 3
Follow-up

- ◆ **In Step 1** a comprehensive inventory is carried out in the building to identify all conceivable energy saving measures, whereas the data from the energy certificates can be used as a starting point.

starting point.

Various calculations and an analysis based on the compiled data lead to an action package and provide an informed basis on which the owner of the building can make decisions.



Photographer: Jonas Löfvendahl

- ◆ **In Step 2**, the action plan is put into effect. The focus needs to be on the quality of the work done, making sure that technical inefficiency does not cancel out the expected energy savings.

- ◆ **Step 3** involves measuring and checking procedures to ensure that the expected result has been achieved. If this is not the case, the cause must be found and any errors or deficiencies corrected and remedied.



Photographer: Jonas Löfvendahl

Total Concept gives the holistic approach on energy and economy:

66

LENNART LIFVENHJELM

Energy Expert at Vasakronan:

It has been clearly profitable to work with Total Concept. We reduced energy consumption from 287 -> 124 kWh / m² / yr and got an internal rate of return on 15%. Today we have reached 100 kWh / m² / yr. We use the experiences from this case in a major rebuilding project, Klara C, in Stockholm, where the goal is 55 kWh / m² / yr and LEED Platinum certification.

Total Concept is the right tool to use because of the holistic approach including construction, installation and economic rationales.

Total Concept helps Jernhusen from thought to action:

66

JAN-ERIK DANIELSSON

Energy & Technical Coordinator, Jernhusen:

Total concept represents for us the basic model, which we have adapted to our own terms and conditions. We are using or have used the concept in approximately 15 properties throughout Sweden. A common methodology gives us many synergies. All our technicians using the concept, finds it useful. A common model supports cooperation and exchange of experience and it provides greater efficiency and a better overall grip on energy consumption. Total Concept makes us go from thought to action, and a notion like durability becomes not just a cliché. The result of applying the method is also used as a management tool for decision making.

Who are the users?

Total Concept method and its results are aimed at primarily four types of users and interested stakeholders:

- ◆ owners and administrators of non-residential buildings used for e.g. offices, health care, shopping malls, administration, trade, schools, and the like
- ◆ technical and financial advisors of the client and energy consultants who work professionally with the planning, auditing, calculations, analyses and design which are a presupposition for using the method and its associated tools
- ◆ large entrepreneur companies and developers of existing non-residential buildings who carry out the construction work for the client and/ or are able to use the concept directly in their own companies
- ◆ those public authorities who lay down the political, legal and financial frameworks for national energy- saving efforts.

Who is behind the idea?

The development of the Total Concept method has been carried out within the BELOK group, which is a collaboration between the Swedish Energy Agency

and 18 of the largest non-residential property owners in Sweden. More information: www.belok.se

The method has been successfully applied on a number of non-residential buildings in Sweden, and on this basis a northern European cooperative venture has been established, involving Sweden, Norway, Finland, Estonia and Denmark. The aim is to further develop the method and try out the concept in the various national contexts, with a view to subsequently implementing it in the building sector of the respective countries.

Project partners:

- ◆ CIT Energy Management, Sweden (Project coordinator)
- ◆ Swedish Construction Clients (Byggherrarna)
- ◆ The Danish Building Research Institute at Aalborg University
- ◆ Danish Association of Construction Clients (Bygherreforeningen)
- ◆ Rambøll, Denmark
- ◆ State Real Estate Ltd (Riigi Kinnisvara AS), Estonia
- ◆ Estonian Society of Heating and Ventilation Engineers (EKVÜ)
- ◆ Bionova, Finland
- ◆ SINTEF Byggforsk, Norway

The project runs from April 2014 to April 2017.



DANISH BUILDING RESEARCH INSTITUTE
AALBORG UNIVERSITY COPENHAGEN

 **Riigi Kinnisvara**
Estonian State Real Estate Ltd  EKVÜ

DANISH ASSOCIATION
OF CONSTRUCTION CLIENTS

 **CIT** Energy
Management AB
A Chalmers Industriteknik Company

BIONOVA
Your partner for sustainable performance

RAMBØLL



 **SINTEF**

More information
www.totalconcept.info