



TotalConcept

Total Concept method implementation on a European scale

**Overall evaluation and
recommendations**



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Introduction

The IEE Project “The Total Concept method for major reduction of energy use in non-residential buildings” aims to demonstrate that large scale energy performance improvements in existing non-residential buildings can satisfy profitability demands set by the building owner/investor and thus become a market driver for major refurbishments in non-residential buildings sector. The project has introduced and adopted the Total Concept method in five Northern European countries: Sweden, Norway, Denmark, Finland and Estonia.

The pilot refurbishments, which were executed in all five participating countries, provide a great input on method implementation and valuable references for promoting the method of Total Concept on a broader scale in the participating countries. This report aims to provide the general recommendations for the implementation of the Total Concept method in Europe based on the results from the pilot studies.

National experiences

Experiences from implementation of the method in the national pilot studies allows drawing the following conclusions:

- *method is easily adoptable in different countries*
- *there are no major technical or legal barriers for using the method*
- *main barriers are non-technical*
- *method takes also into account indoor climate, by analysing and setting the baseline*
- *implementation of the method gives good knowledge about the building condition and maintenance need*
- *different kind of property owners require different approaches*
- *countries may already have their voluntary certification systems*
- *follow up strategies are very important*
- *all of the materials and tools are free to be used and can be adapted to any national conditions if needed*

Implementation of the method in participating countries showed that guidebook and tool-kit are easy to adopt and to translate into national languages. Also there were no technical or legal obstacles. Technical solutions were similar in participating countries and minimum energy efficiency requirements in national legislations do not restrict adoption of the method. One of the benefits with using the Total concept method is that it gives good knowledge about the building status that is a basis for maintenance planning also for other aspects than energy.

Main barriers were mainly the regular non-technical: low energy costs, lack of interest from the property owners side, tenant and owner relationship, knowledge and awareness. The Total Concept method partly can help to break these barriers. More detailed analysis of non-technical barriers is available in the report “National non-technical barriers and methods to overcome them¹”.

Another important non-technical issue is the main form of property owners. Large property owner groups (for example BELOK in Sweden) makes it easier to promote refurbishments in non-

¹ [IEE TotalConcept-Energy-renovations-in-Northern-European-Countries.pdf](#)

residential buildings sector. In case of many smaller owners, it is difficult to reach the property owners as there is no uniting organization through which to disseminate information among the property owners.

Countries also may already have voluntary certification systems which may raise the question whether another method is needed and reasonable. However, Total Concept method do not substitute existing schemes. It gives opportunity to guide the whole refurbishment process starting with the energy audit to end with measurements and analysis of the end results.

Follow up stage is one of main benefits of Total Concept method. Project QUALICHeCK² showed that absence of commissioning and verification processes is a problem in many European countries. Control mechanism often stops with building permit stage and relevant studies showed that non-compliance issues are frequent in building sector. Total Concept method has a self-control system within the method (follow up stage) which helps to reduce the risk of not achieving the expected end result. This is an important benefit for the property owners that need reliable results.

General recommendations

Successful implementations in countries that have no experience of the Total Concept method require:

- *good examples (pilot buildings)*
- *involvement of property owners (organizations) within an experience exchange group*
- *training of the energy consultants*
- *involvement of local energy agencies and/or authorities*

Implementation of the method showed that good examples with measured end results are needed in order to make property owners interested. Only estimated savings numbers in the energy audits may not be enough to make method interesting for the property owners. Prerequisite of successful pilot buildings is training of the energy consultants and involvement of property owners. Involvement of local authorities to fulfil the EPBD³ requirements and to prioritize non-residential buildings can also create an important market drive.

Recommendations concerning the method

When implementing the method, following circumstances should be kept in mind:

- *accuracy of input data is key factor for successful end results*
- *for establishing the status and baseline of the building before renovation additional monitoring of energy use may be needed*
- *possibilities of renewable energy solutions should be more clearly promoted in the method*
- *possibilities to cut power peak demands should be more clearly promoted in the method*
- *possibilities of better planning of maintenance by using the method should be promoted*
- *use of IT possibilities (online monitoring and control) should be promoted*

² [QUALICHeCK-Booklet-1.pdf](#)

³ [Energy Performance of Buildings Directive=EN](#)

Reliable input data (energy consumption, operating hours, indoor climate conditions, possible changes of tenants) gathered in energy audit phase is very important for the achievement of the expected results. Experiences from pilot buildings showed that main reasons for not achieving the expected energy consumption levels were higher indoor temperature than expected, longer operating hours of ventilation systems and inadequate control of the service systems. This means that monitoring of the service systems and indoor climate conditions may be needed during the energy audit process in order to establish the correct baseline conditions.

In the pilot studies, the method was mainly used for establishing the energy savings measures, but method can also be used to promote and evaluate the on-site renewable energy production measures. On-site renewable energy production reduces energy need from the grid and therefore reduces energy costs for the building owner. Calculation of the IRR shows if the on-site renewable energy production is reasonable renovation measure for the building owner.

Usage of online monitoring and control systems with the help of visualisation software is very useful. Property owner can see in real time what is happening in the building and this also may help to guide property owners to think more about energy efficiency. Online monitoring gives also the possibility to follow the effects of different renovation measures. Renovation measures of heating and ventilation systems do not only reduce the energy need. The power peak demands may also be reduced, which lowers the power tariffs. Another benefit of the constant online monitoring is the knowledge gained about the service systems, which may help to reduce the maintenance costs.