Optibuild

Optibuild, which has been developed by Cenergia, is a computer programme that can calculate the lifecycle costs of buildings. The lifecycle costs are the total amount of building, maintenance and running expenses. The expenses are adjusted according to inflation, interest rates and different life-span so different energy saving measure can be compared. Optibuild processes different possibilities, e.g. the following energy saving measures:

- Improved insulation;
- Improved windows/passive solar heating;
- Heat recovery of the ventilation air;
- Solar heating system for domestic hot water;
- Solar heating system for room heating;
- Water and electricity savings;
- Improvement of distribution system and furnace;
- Use of PV-cells.

The energy calculations for a building are based on the European standard PREN832 – Thermal Performance of Buildings – Calculation of Energy Use for Heating – Residential Buildings. As the costs and savings come at different times a net present value method has been chosen for the optimisation process. The energy consumption for domestic hot water and electricity is also included. The consumption of cold water will be adjusted according to the present total expenses in a building.

The energy saving measures are collected in a large database, which includes detailed information on both energy and economy. This database is the main element in the optimisation process.

Optibuild calculates the value of all possible energy saving measures. As the programme includes a database with the investment costs, Optibuild can make a list of energy saving measures, in order according to cost-effectiveness. Then the user is going to assess how many energy saving measures that are going to be in a profitable package deal.

A typical Optibuild calculation will show that the operation costs will be reduced when a new energy saving measure has been introduced. At the same time the expenses for investments and maintenance increase. The total expenses will, however, often be less than for the reference situation.

The above mentioned calculations can be very time consuming as each calculation easily can consist of 20-50 calculations of the annual heat consumption. It will, however, be necessary to change some of the conditions, such as interest rate, energy prices and building costs, so it is necessary to repeat the process. In Optibuild this process take place automatically. A display

from an EU/Save funded project in Turin is shown figure 5.1. Here are shown the energy savings, the investments and the present value together with different energy saving measures, with the most profitable measure on the top,
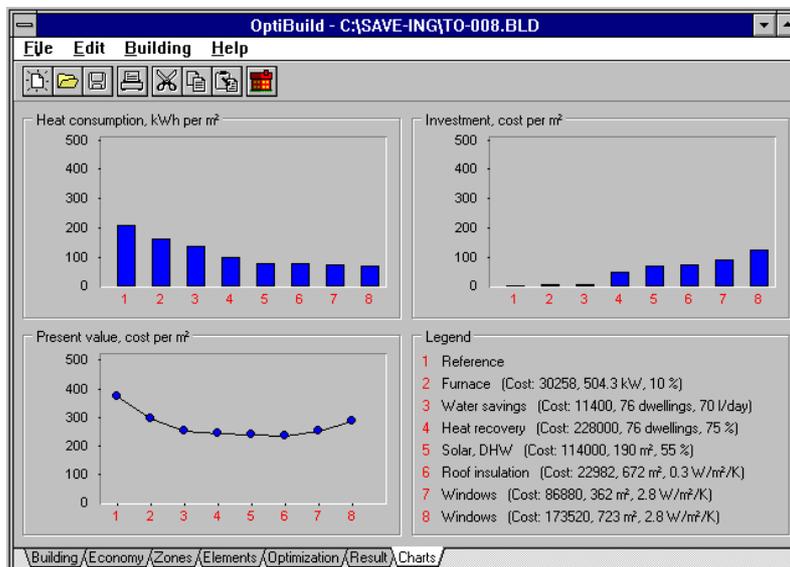

Figure1. Display from Optibuild, a computer programme for optimisation of lifecycle costs.

The database

To illustrate the importance of the Optibuild database we can take e.g. the windows in a rehabilitation project. Is it worth to replace windows with one layer of glass with windows with two layers or even super low-energy windows? The Optibuild database includes information on several windows. Each window is described with U-value, solar contribution, investment and maintenance costs and life-span. By calculating the lifecycle costs of each window in the building (and all the other energy saving measures in the database) Optibuild can calculate which window is the best. This method secures that new technologies can compete with traditional solutions as you avoid that personal preference for some products comes into play.