

Property name: Gonsiori 29, Tallinn
Property owner: Ministry of Social Affairs
Consultants: Estonian Society of Heating and
Ventilation Engineers

Total Concept method

Step 1. Creating the action package

Building and its use

Year built: 1950
Area: 6 797 m² Heated area
Type of building: Office

The building was designed in 1945-1946 and construction was completed in 1950. The building is included in the National Registry of Cultural Monuments, XX century architecture.

The building is used as an office for ministry and is mainly used from Monday to Friday 8: 00-18: 00.



Indoor climate

Standard EN 15251 "Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics" is recommended to be used to determine the parameters of the indoor climate.

Measurements of indoor temperature, relative humidity and CO₂ concentration showed that indoor temperature was mainly between 22-25 °C and CO₂ concentrations were below 800 ppm. Low CO₂ concentrations are caused by leaky windows which allow high infiltration rate.

Identified energy saving measures

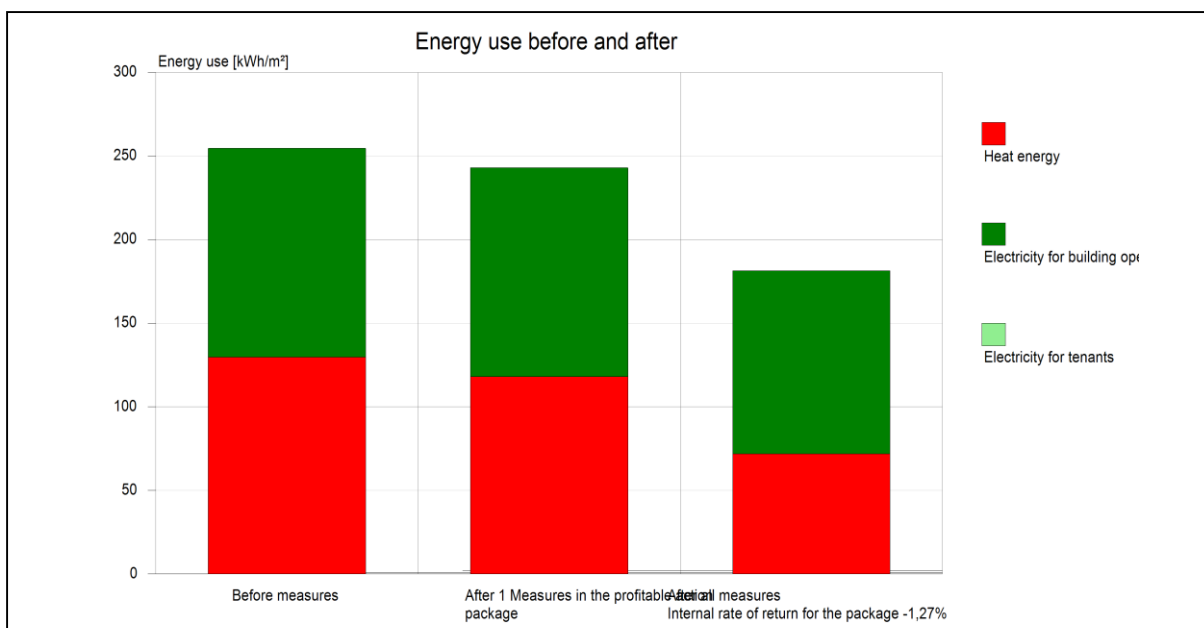
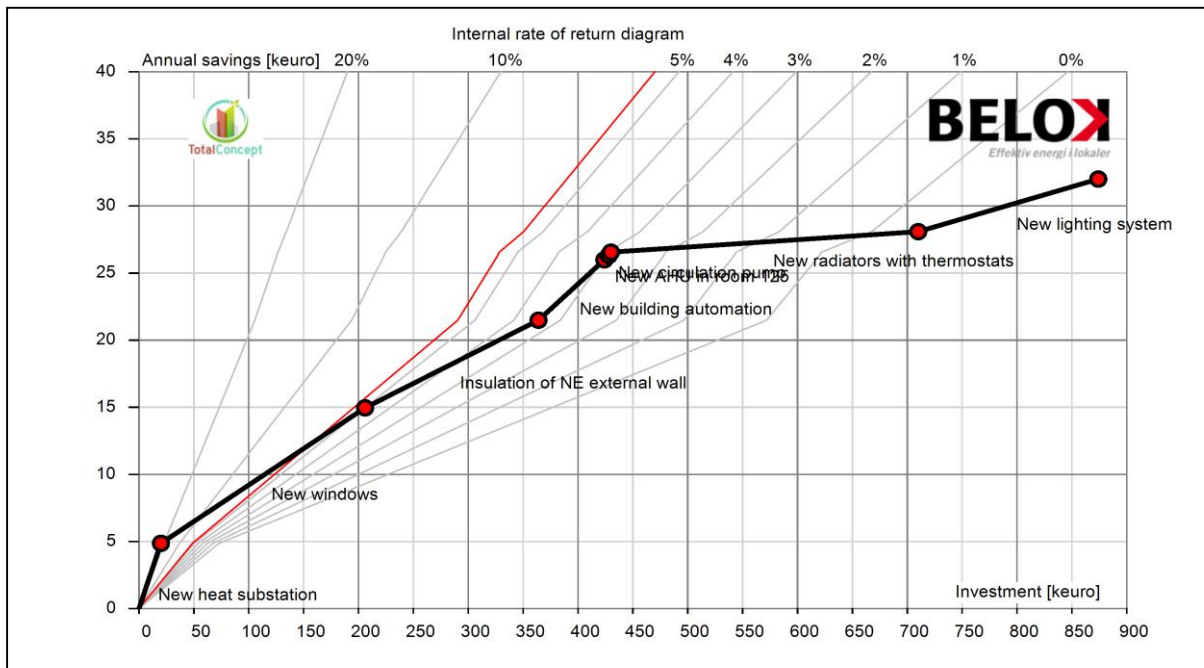
Eight energy saving measures were identified during the auditing. However, only two of them meets the property owner's profitability requirement 5.5% internal rate of return.

It is proposed to install new heating substation and replace existing windows. Those two measures as a package is in the range of the profitability requirement 5.5% internal rate of return.

Additionally the insulation of NE external wall, install new building automation, replacement of ventilation unit in room 125, installation of new circulation pump, installation of new heating distribution system and installation of new T5 lighting system are proposed as possible measures. Those measures did not meet the profitability requirement but contributed to reduction in energy demand and therefore reduced energy costs.

Summary of the measures in the action package

Measure		Investment cost keuro	Cost saving keuro/year	Energy saving MWh/year
1	New heat substation	20	4	79
2	New windows	186	10	164
3	Insulation of NE external wall	158	6	106
4	New building automation	60	5	81
5	New AHU in room 125	4	0.3	4
6	New circulation pump	2	0.2	3
7	New radiators with thermostats	280	1	25
8	New lighting system	164	4	90
-	Sum	874	31	552



Results

The property owner's profitability demand is 5.5%. First two measures of action package are in the required range. The total energy saving potential of action package is approximately 29%. District heating use can be reduced by 390 MWh/year and electricity use by 105 MWh/year.