



TotalTool

**A quick guide on how to get started with the
Total Concept profitability calculation tool**

Version: October 2014

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1 Introduction

This guide has been developed for providing basic guidelines on how to use the Total Concept calculation tool the *TotalTool* in order to carry out profitability calculations of an action package based on the Total Concept method.

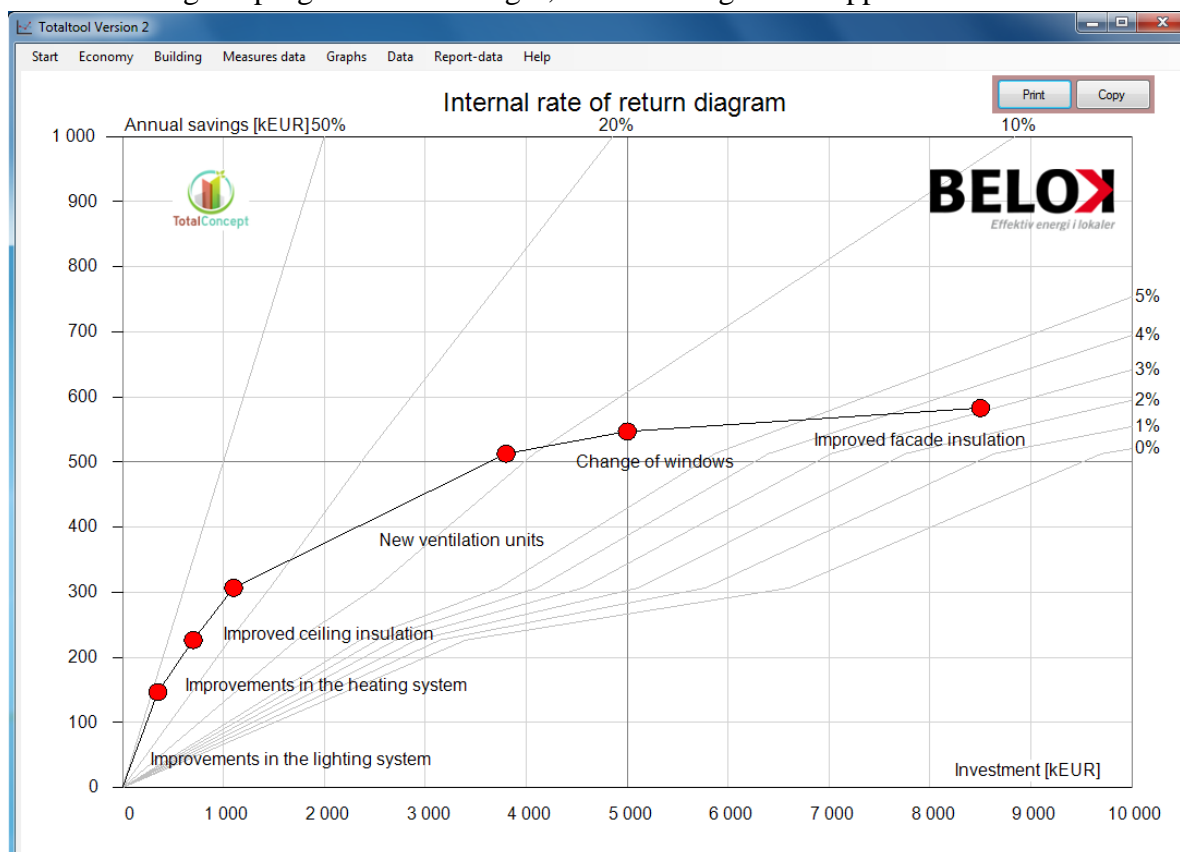
The *TotalTool* is an essential part of the Total Concept method. The program is used in Step 1 when all the possible energy saving measures in a building have been identified and the required investment cost and expected annual energy savings have been calculated for every measure, taking into account also the effects that each of the individual measure has on each other. How this is done is described in detail in chapter 4.11 in the Total Concept Guidebook. This data is then used as an input data in the *TotalTool*.

For profitability calculations with *TotalTool* it is also essential to know the profitability requirements, defined by calculation interest rate (in %), that have been stipulated by the property owner/client in addition to any other conditions affecting the calculations, for example, energy prices, estimated energy price increases, economic calculation periods for each measure, etc. A checklist for information needed can be found in Appendix 6 of the Total Concept Guidebook.

The *TotalTool* calculation tool is a separate program that can be installed in a Windows environment. Please note, the program is best used in full screen mode.

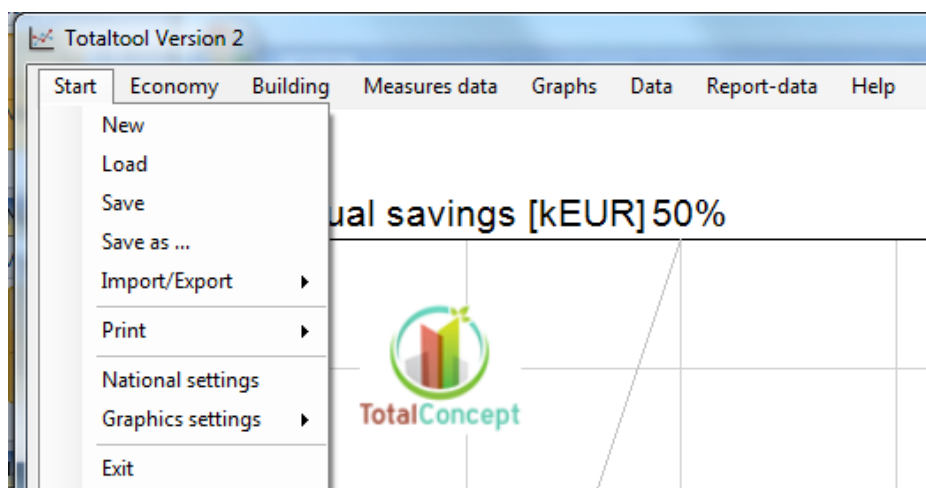
2 Start

After installing the program and starting it, the following screen appears:



The starting screen illustrates an internal rate of return diagram of an action package consisting of a number of example measures, which are based on default data. Once this default data is changed then also the diagram will change.

The main menu bar can be seen on the top of the starting screen. The first command on the main menu bar is **Start**:

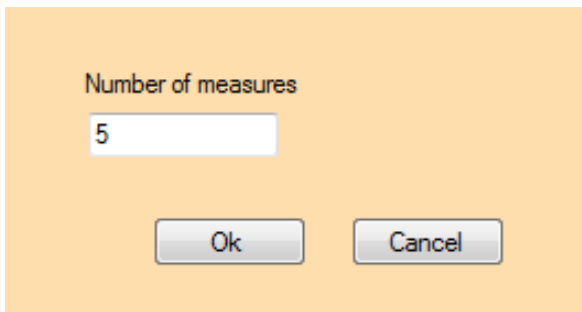


From the drop down menu under **Start** you can start a new project by choosing *New*, open previously saved files by choosing *Load* and save your files by clicking on *Save* or *Save as*. By choosing *Import/export* you can also transfer data to/from the program.

Choose *Print* if you want to print the internal rate of return diagram or any other diagrams and/or the input data. You can also do this directly on the diagram page and/or the input data page.

2.1 New project

To start with a new project choose *New* from the drop down menu under **Start**. Then insert the number of measures you want to preliminary add to your action package in the appearing window:

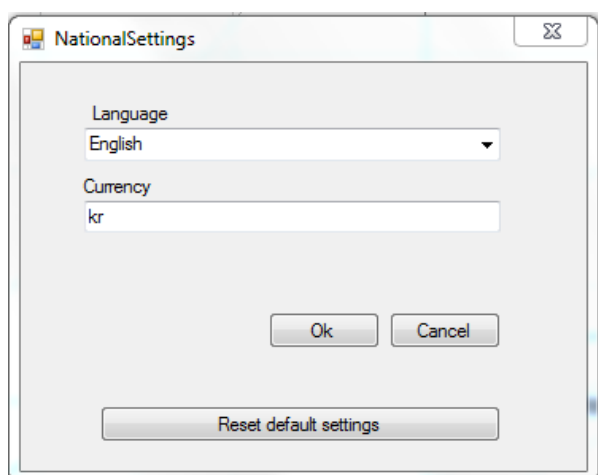


You can always add or delete measures later on. When providing this initial number the measures table will be cleared from the example measures with default values.

2.2 National settings

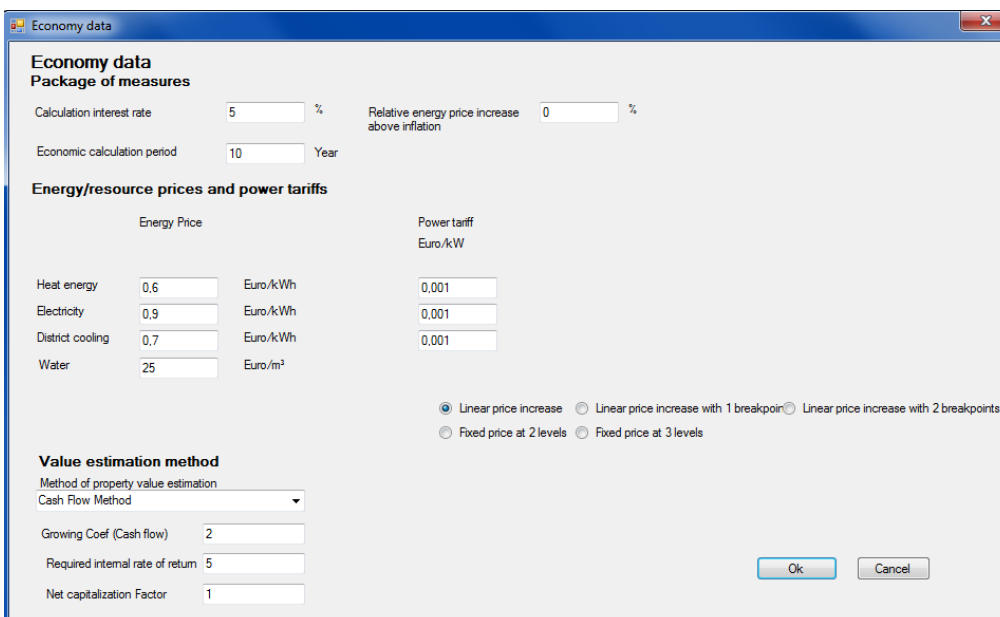
The *TotalTool* calculation tool is currently available in two languages: in English and in Swedish. The language options can be changed by choosing ***National settings*** from the drop down menu under **Start**. Please note, after changing the language you need to restart the program.

Under the ***National settings*** you can also add your own currency that will be shown in the tables and diagrams, e.g change from kr to NOK, EUR, etc



3 Economy

To set the basic input data for the different economical parameters choose ***Economy*** from the main menu bar, which opens the following window:



In this menu you should specify the profitability demand set by the property owner/client, the calculation interest rate (in %) and relative energy price increase above inflation (in %). How to take into account relative energy price increase in the internal rate of return diagram is described in detail in chapter 3.3.2 in the Total Concept Guidebook.

With the TotalTool it is also possible to make LCC calculations for each measure. In this menu you should specify the economic calculation period that applies for LCC calculation. **Please note, the economic calculation period in the *Economy data* window applies only for LCC calculations.** For profitability calculations of a package of measures based on internal rate of return method you should separately specify economic calculation period for each measure under ***Measures data*** window (see details in the next chapter of this guide).

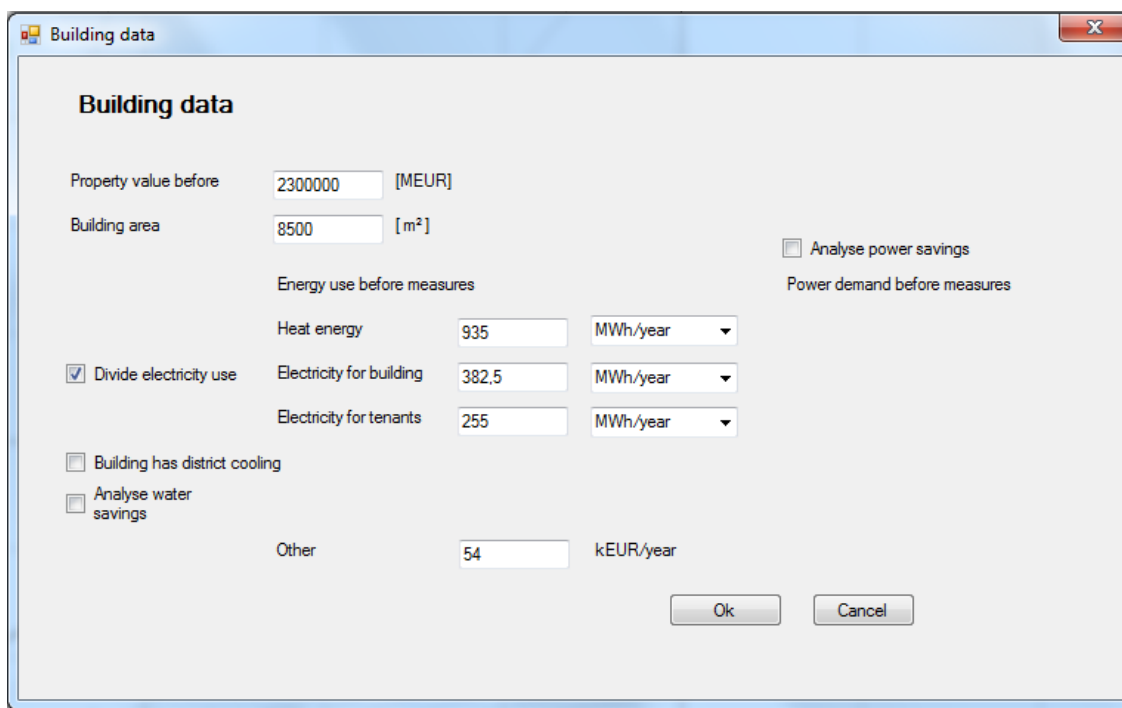
In the ***Economy data*** menu also the energy and resource prices as well as power tariffs should be specified. These prices are used to recalculate the annual energy savings to the annual cost savings. The units of the prices shown in this menu correspond to the monetary units specified under ***National settings***.

Input data about the power tariffs is used when including the power demand improvements of a measure to the calculation of annual cost savings. Different price models for power tariffs can be used as input data, e.g. linear price increase, fixed price levels etc.

The last input data field in ***Economy data*** is used for calculating the impact of energy saving measures/action package on property value change. Property value estimation can be done using three different methods: Cash Flow Method; Net Capitalization Method; Dividend Yield Method. Insert suitable input parameters for using the different value estimation methods in the calculations.

4 Building

Everything related to the current building shall be specified in the menu ***Building***, found from the main menu bar.



Building data

Property value before: 2300000 [MEUR]

Building area: 8500 [m²]

Energy use before measures

Heat energy: 935 MWh/year

☒ Divide electricity use

Electricity for building: 382.5 MWh/year

Electricity for tenants: 255 MWh/year

☐ Building has district cooling

☐ Analyse water savings

Other: 54 kEUR/year

☐ Analyse power savings

Power demand before measures

Ok Cancel

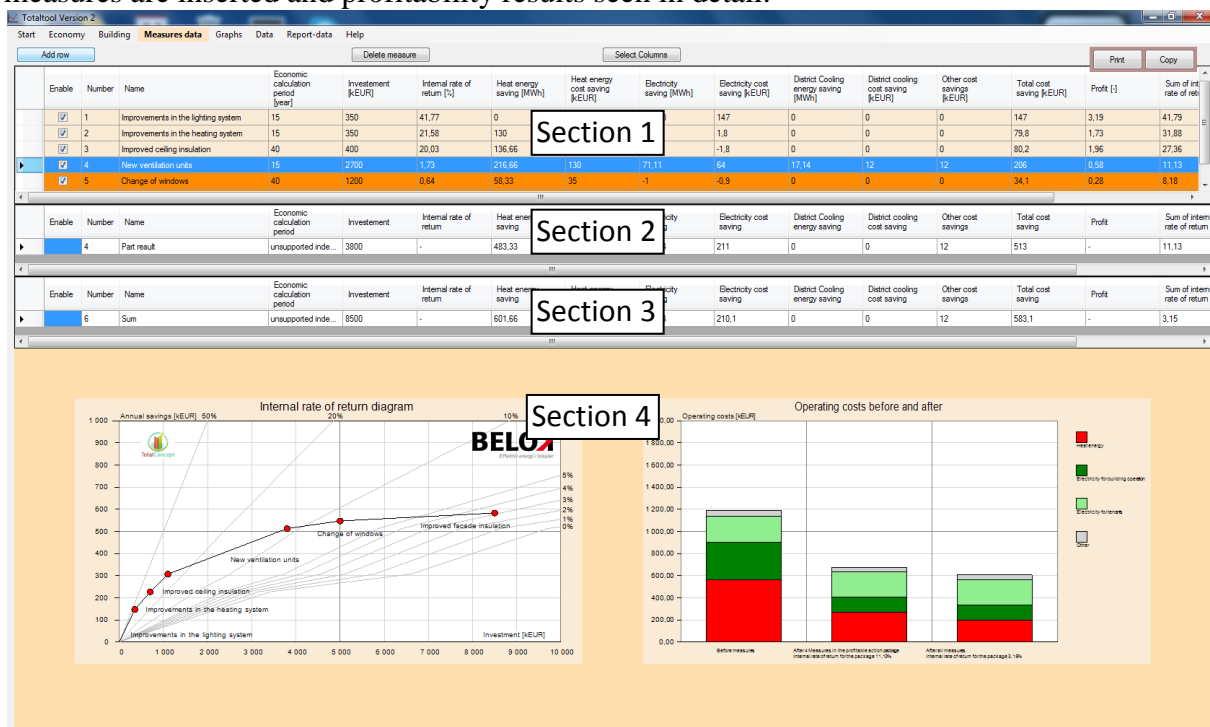
In the Building data menu you can specify the building area [m²], energy use before the measures (the baseline) and power demand before measures, if power savings are included. Also other annual operating costs, other than energy costs, can be specified here by inserting data in the box “Other”. This data is used when illustrating total operating costs before and after the measures.

The electricity use before measures is by default divided into building electricity (electricity for building operation) and tenants electricity. If this is not desirable you just unclick the box “*Divide electricity use*”.

Activate the box “*Analyse water savings*” when there are measures in the action package which besides the energy savings also lead to annual water savings (in m³/yr).

5 Measures data

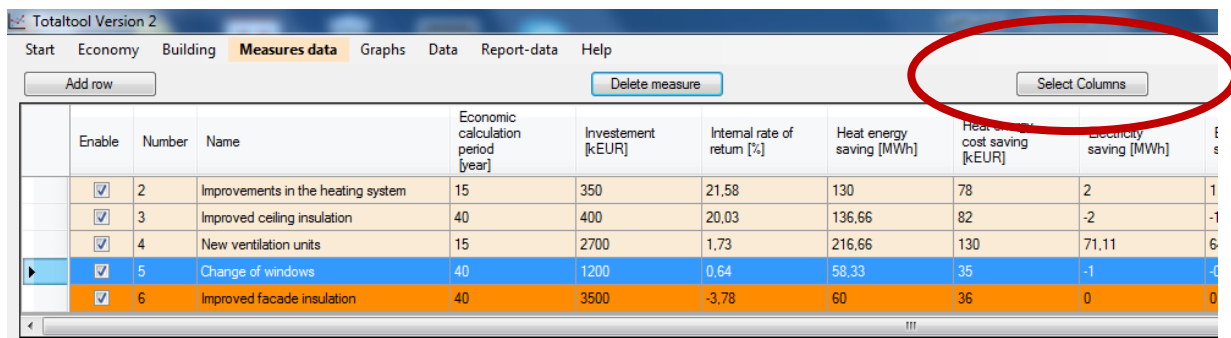
Measures data, selected from the main menu bar is the main window where data about all the measures are inserted and profitability results seen in detail.



The **Measures data** window is divided into following sections:

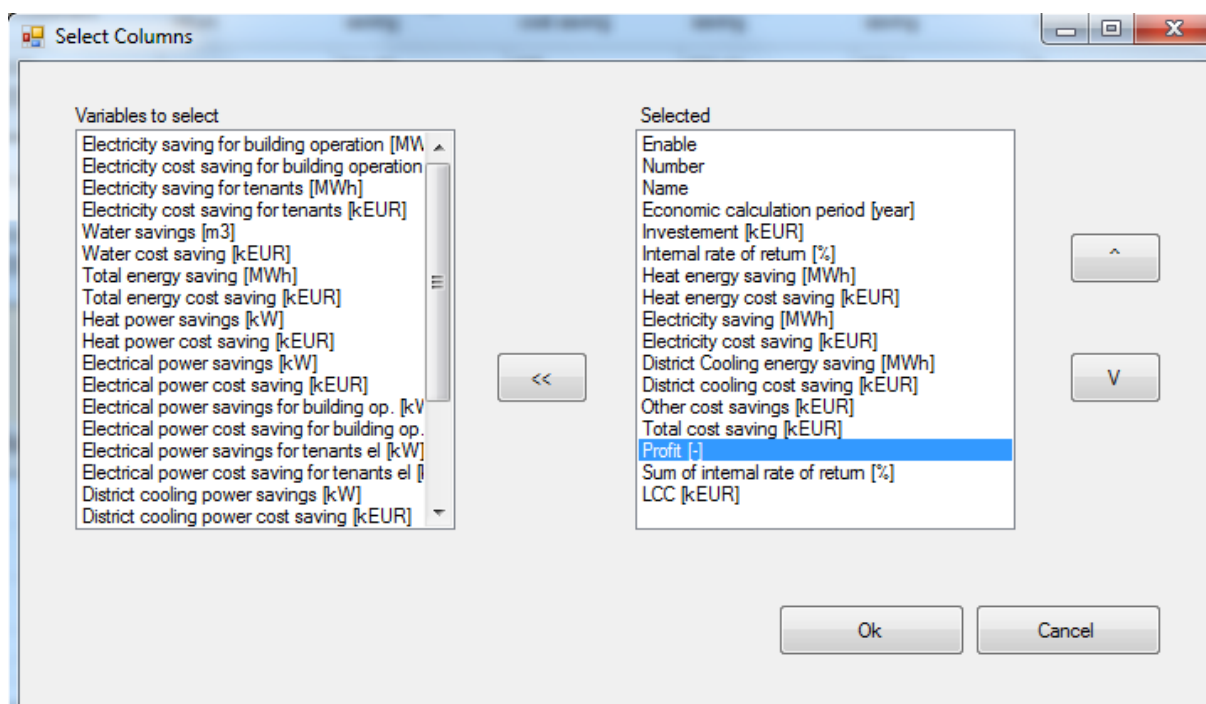
- Section 1: Input data and profitability results for all individual measures
- Section 2: Profitability part results, including measures up to specified row, which is marked with blue color. This means that if you for instance mark row four in the Section 1 table then the Section 2 table shows a summing of measure 1 to 4.
- Section 3: Profitability results including all measures in the Section 1 table.
- Section 4: Profitability results on an internal rate of return diagram (action package with “enabled” measures) and operating costs before and after carrying out the measures. These diagrams can be seen also when choosing **Graphs** from the main menu bar.

You can choose what data and results will be presented in the data table (Section 1, 2 and 3) by clicking on “*Select Columns*” shown above the data table:

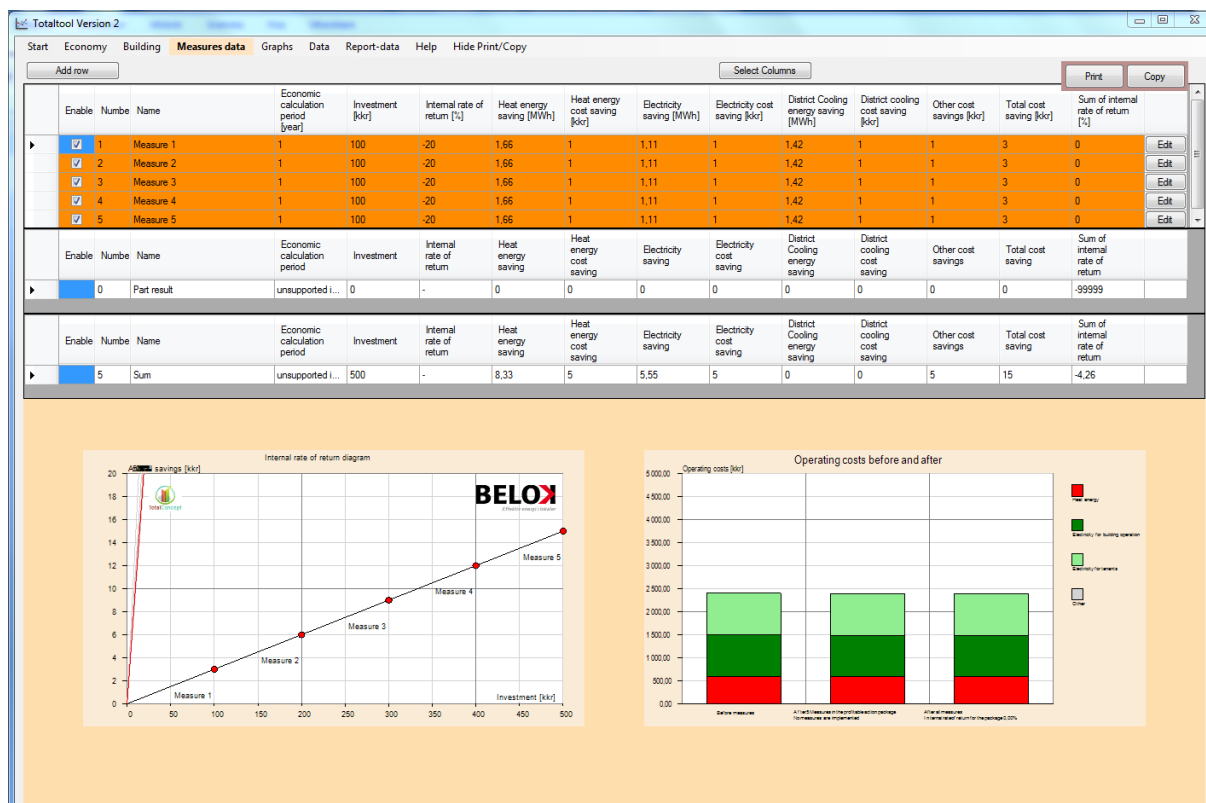


Enable	Number	Name	Economic calculation period [year]	Investement [kEUR]	Internal rate of return [%]	Heat energy saving [MWh]	Heat energy cost saving [kEUR]	Electricity saving [MWh]	Electricity cost saving [kEUR]
<input checked="" type="checkbox"/>	2	Improvements in the heating system	15	350	21.58	130	78	2	1
<input checked="" type="checkbox"/>	3	Improved ceiling insulation	40	400	20.03	136.66	82	-2	-1
<input checked="" type="checkbox"/>	4	New ventilation units	15	2700	1.73	216.66	130	71.11	6
<input checked="" type="checkbox"/>	5	Change of windows	40	1200	0.64	58.33	35	-1	-0
<input checked="" type="checkbox"/>	6	Improved facade insulation	40	3500	-3.78	60	36	0	0

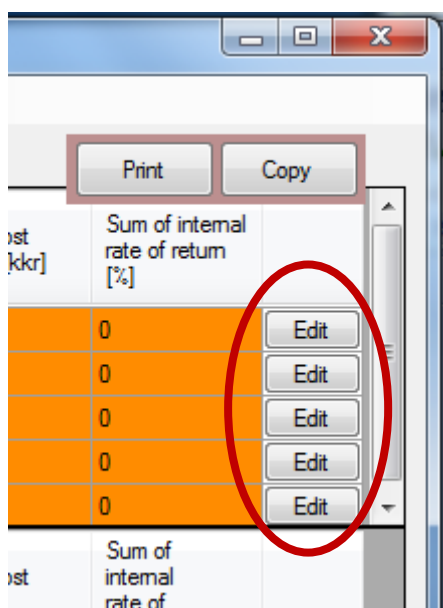
By activating the different column names on the left window or right window you can add or remove them from the data table. Left window shows list of data that can be added to the data table in Sections 1, 2 and 3 under **Measures data**. Right window shows list of data that is currently presented in the data table in Section 1, 2 and 3 under **Measures data**. **Please note, all the savings listed in the data table are annual savings.**



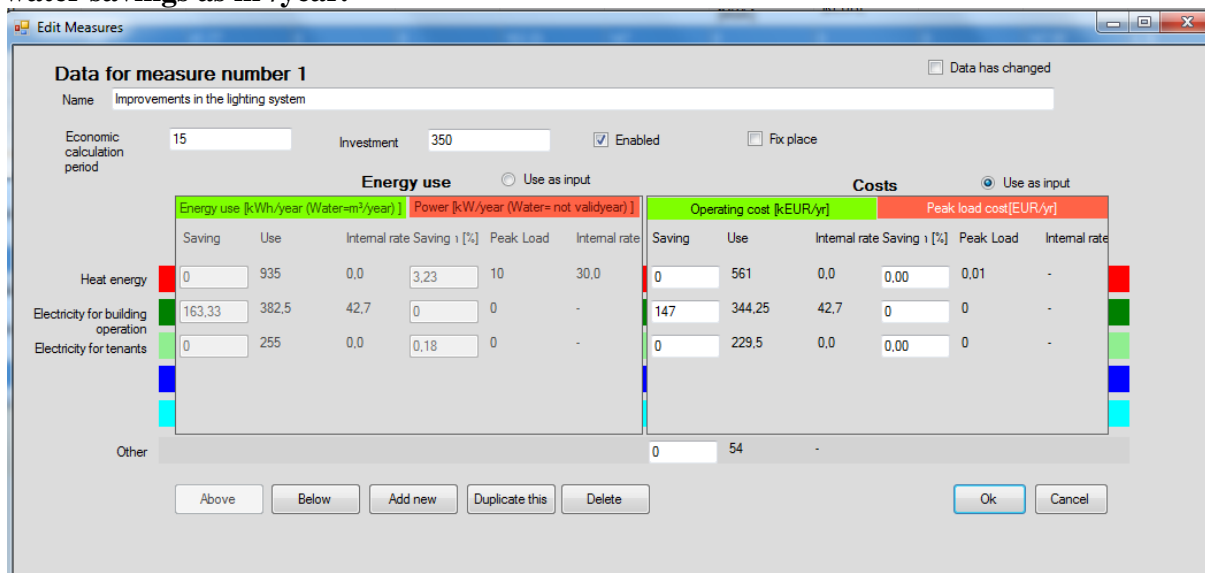
In chapter 2.1 of this guide guidelines were given how to start up with a new project. This is done by choosin **New** from the drop down menu under **Start** and then inserting the number of measures you want to preliminary add to your action package. After clicking OK the default data used for the example measures will be cleared as shown in the picture below.



To start to add input data for your measures click **"Edit"** at the end of each measure line.



In the appearing window (see below) you should specify the name of the measure, its economic calculation period (yrs), investment cost (kEUR, kSEK or other monetary unit) and its annual savings. The annual savings can be specified as energy savings (activate energy/resource use as input) or as cost savings (activate Costs as input). You can also choose to specify savings in power or peak load costs with the same way. All other annual cost savings (other than energy or power demand savings) can be specified in the box “Other”. **Please note that the energy use savings should be inserted as MWh/year and water savings as m³/year.**



Data for measure number 1

Name: Improvements in the lighting system

Economic calculation period: 15 Investment: 350 ☒ Enabled ☐ Fix place

Energy use ☐ Use as input **Costs** ☒ Use as input

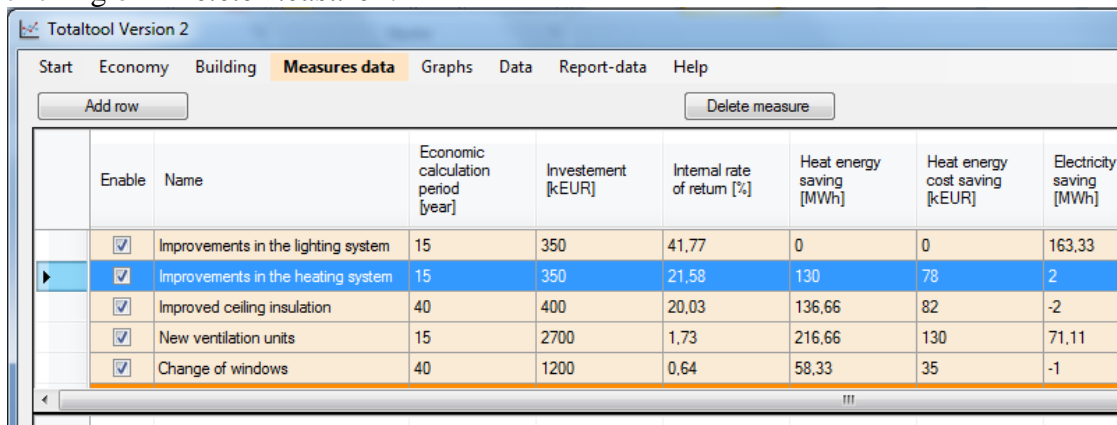
	Energy use [kWh/year (Water=m ³ /year)]					Costs [kEUR/yr]						
	Saving	Use	Internal rate	Saving 1 [%]	Peak Load	Internal rate	Saving	Use	Internal rate	Saving 1 [%]	Peak Load	Internal rate
Heat energy	0	935	0,0	3,23	10	30,0	0	561	0,0	0,00	0,01	-
Electricity for building operation	163,33	382,5	42,7	0	0	-	147	344,25	42,7	0	0	-
Electricity for tenants	0	255	0,0	0,18	0	-	0	229,5	0,0	0,00	0	-
Other						0 54 -						

Buttons: Above Below Add new Duplicate this Delete Ok Cancel

Activating the box “Enable” the specific measure is included to the action package calculation and shown on the results diagrams. When unclicking the box the measure will be excluded from the calculations, but it still appears in the measures table. The same can be done in the **Measures data** menu by clicking the box in the first column “Enable” of the data table in Section 1. This function helps to analyse how the action package would look like if a specific measure or specific measures would be left out.

The box “Fix” is used to force a measure to lie in a specific place in the diagram, i.e not following the profitability listing done as default by the program.

To add a new measure you click “Add row”. To delete a measure then first activate the measure by clicking on the first cell of the measure line (the line becomes blue) and then clicking on “Delete measure”.



TotalTool Version 2

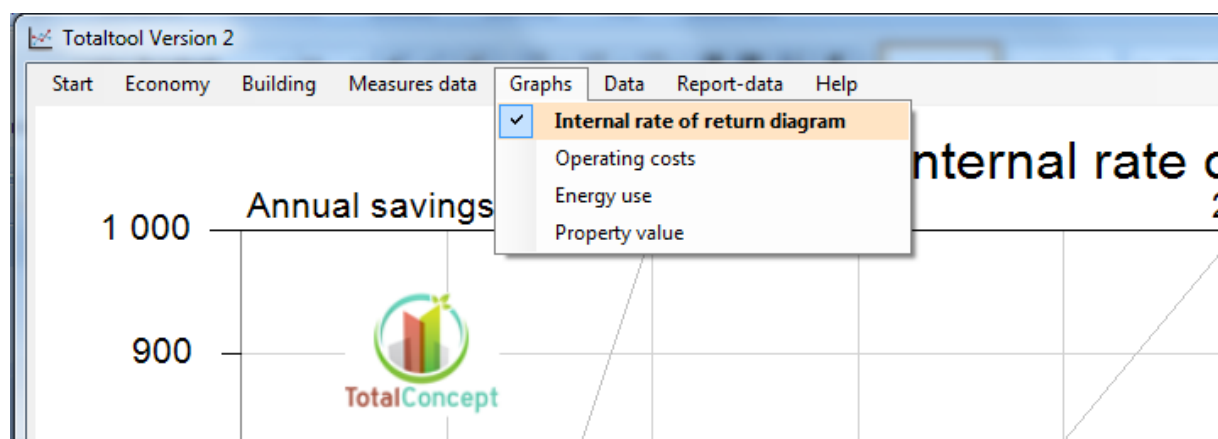
Start Economy Building **Measures data** Graphs Data Report-data Help

Add row Delete measure

Enable	Name	Economic calculation period [year]	Investment [kEUR]	Internal rate of return [%]	Heat energy saving [MWh]	Heat energy cost saving [kEUR]	Electricity saving [MWh]
<input checked="" type="checkbox"/>	Improvements in the lighting system	15	350	41,77	0	0	163,33
<input checked="" type="checkbox"/>	Improvements in the heating system	15	350	21,58	130	78	2
<input checked="" type="checkbox"/>	Improved ceiling insulation	40	400	20,03	136,66	82	-2
<input checked="" type="checkbox"/>	New ventilation units	15	2700	1,73	216,66	130	71,11
<input checked="" type="checkbox"/>	Change of windows	40	1200	0,64	58,33	35	-1

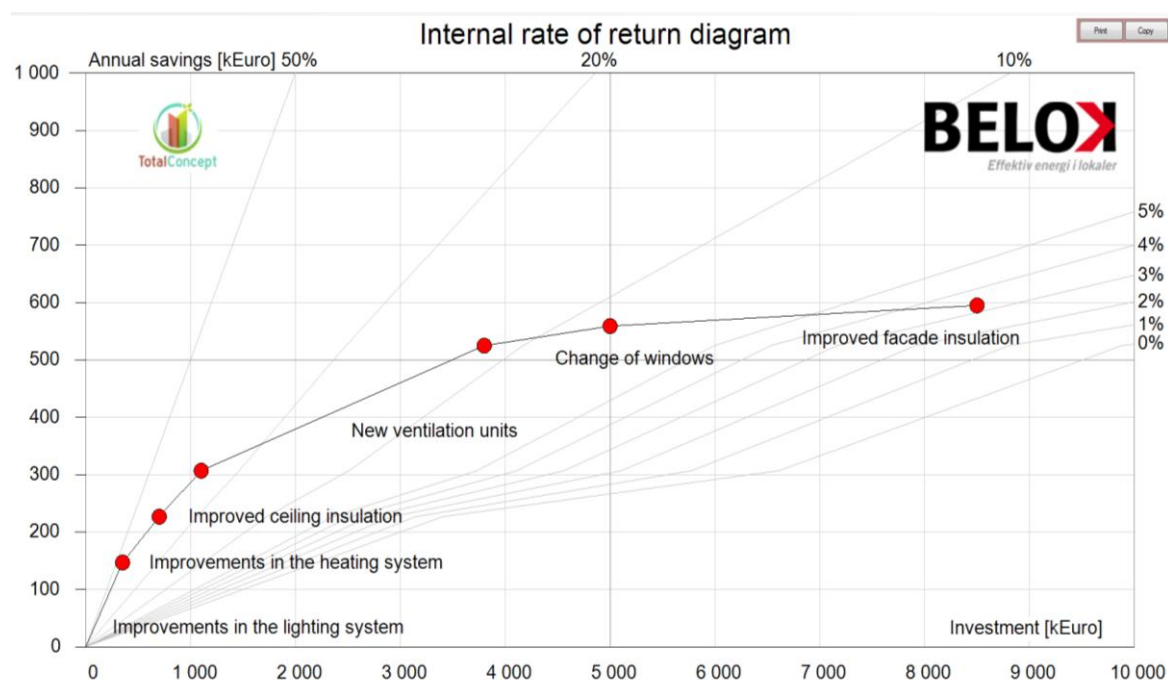
5 Graphs

To see the results illustrated on the graphs in full screen and to print or copy these graphs go to **Graphs** on the main menu bar and then choose the diagram you want to display. These diagrams illustrate the main outputs from the *TotalTool* calculations.

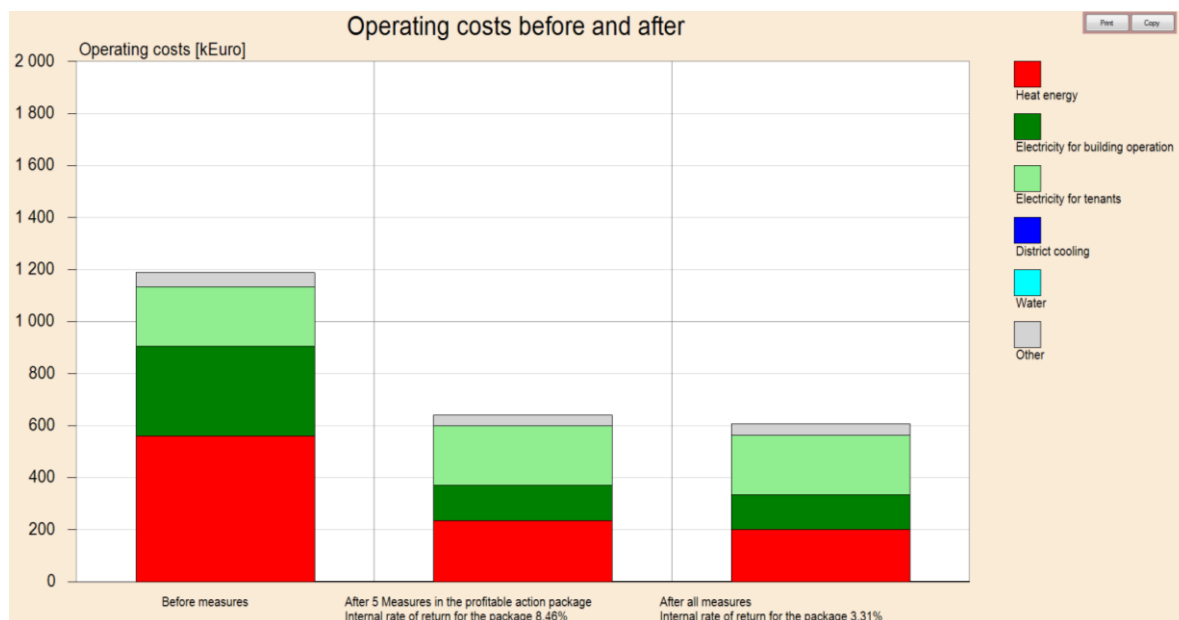


The results are displayed in the following diagrams:

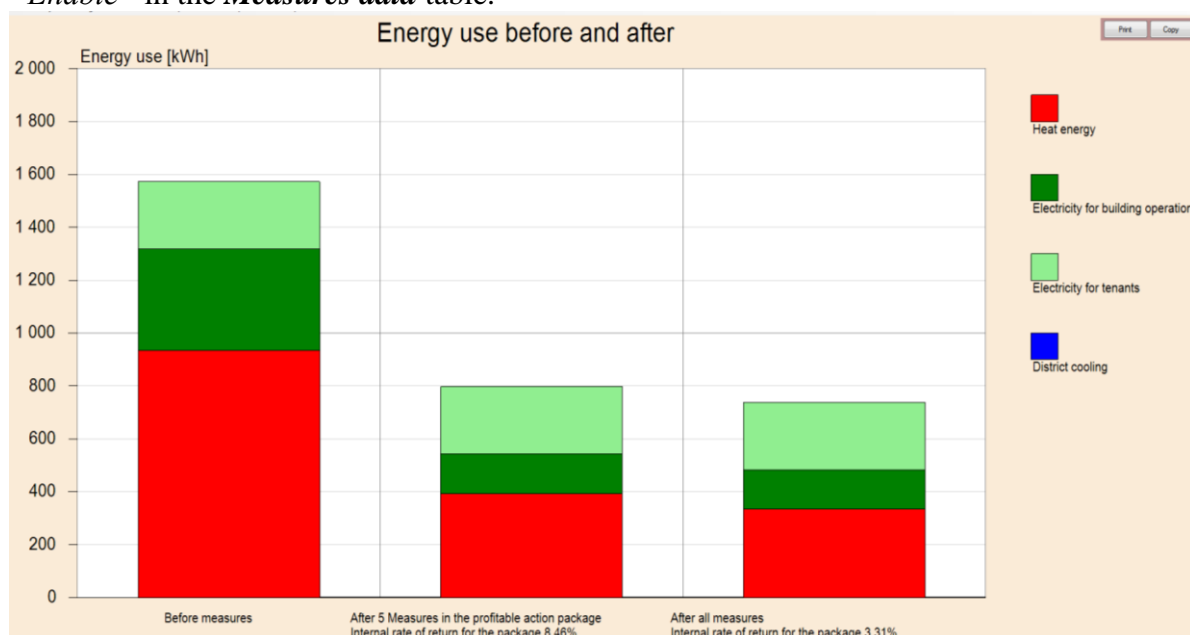
1) **The internal rate of return diagram**, showing the action package with all the measures that are selected as “Enable” in the *Measures data* table.



2) **Operating costs before and after** diagram, showing the total annual operating costs before the action package (left bar) and after the action package (middle and right bar). The results are given for two different cases: results with the action package that fulfills the profitability demand of the property owner (middle bar) and results with all measures that are selected as “Enable” in the *Measures data* table.



3) **Energy use before and after** diagram, showing the annual energy use before the action package (left bar) and after the action package (middle and right bar). The results are given for two different cases: results with the action package that fulfills the profitability demand of the property owner (middle bar) and results with all measures that are selected as “Enable” in the *Measures data* table.



4) **Property value before and after** diagram, showing the estimated property value before the action package (left bar) and after the action package (middle and right bar). The results are based on the selected calculation method in the input data field under **Economy** and are displayed for two different cases: results with the action package that fulfills the profitability demand of the property owner (middle bar) and results with all measures that are selected as “*Enable*” in the **Measures data** table.



5.1 Graphics settings

You can change the design (text font, lines, color) of the different graphs by choosing **Start** from the main menu bar and **Graphics settings** from the drop down menu.

The **Graphics settings** are divided into the following sub-menus:

- General
- Lines for interest rate
- Curves

In **General** you can change font size, colour and placement of text in the header and on the axes in the *internal rate of return diagram*. Unactivate “Default” and “Auto” box to enable changes for these settings.

Settings for internal rate of return diagram

Header
Font ☒ Default
Arial, size :16
Adjustment X = 0 Y = 0

Investment axis
☒ Auto
Max value 10000
Grid 1 5000
Grid 2 1000
Font ☒ Default
Arial, size :12
Adjustment X = 0 Y = 0

Annual savings axis
☒ Auto
Max value 1000
Grid 1 500
Grid 2 100
Font ☒ Default
Arial, size :12
Adjustment X = 0 Y = 0

Ok Cancel

In **Lines for interest rate** the graphical settings for the interest rate lines can be adjusted.

Settings for internal rate of return lines

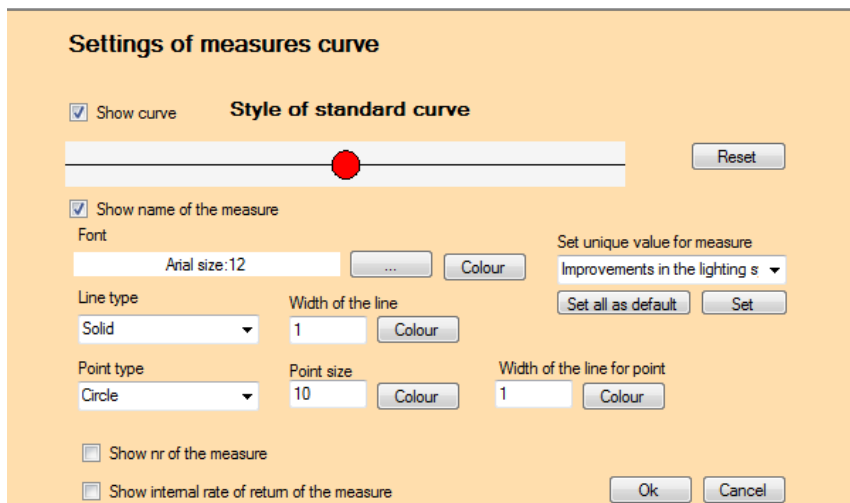
	Internal rate of return [%]	Line width	Enable	Text	Colour
▶ 1	0	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2	1	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3	2	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4	3	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
5	4	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
6	5	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Font Arial, size :12
Line type Solid

Reset Add Delete
☐ Show label corrections
☒ Show demand rent line
Ok Cancel

Clicking in the box “Enable” displays the specific interest rate line on the diagram (it will become visible). When activating the box “Text” the interest rate text (1 % for instance) will be displayed next to the interest line. Font size of the text and colour of the lines can also be changed in this menu. The number of interest rate lines can be adjusted with clicking on “Add” (new line appears at the end of the list) or “Delete”. To delete a line you have to first activate the specific line in the table by clicking on the first cell of the interest rate line (the line becomes blue) and then clicking on “Delete”.

It is also possible to adjust font, colours and other settings for measures curve (action package line) in the *internal rate of return diagram*. You can choose to change the settings for the entire curve (including all measures) or set unique parameters for different measure lines in the action package. To set unique parameters choose a measure from the list and click "Set".



Settings of measures curve

☒ Show curve **Style of standard curve**

☒ Show name of the measure

Font: Arial size: 12 ... Colour Set unique value for measure: Improvements in the lighting s

Line type: Solid Width of the line: 1 Colour Set all as default Set

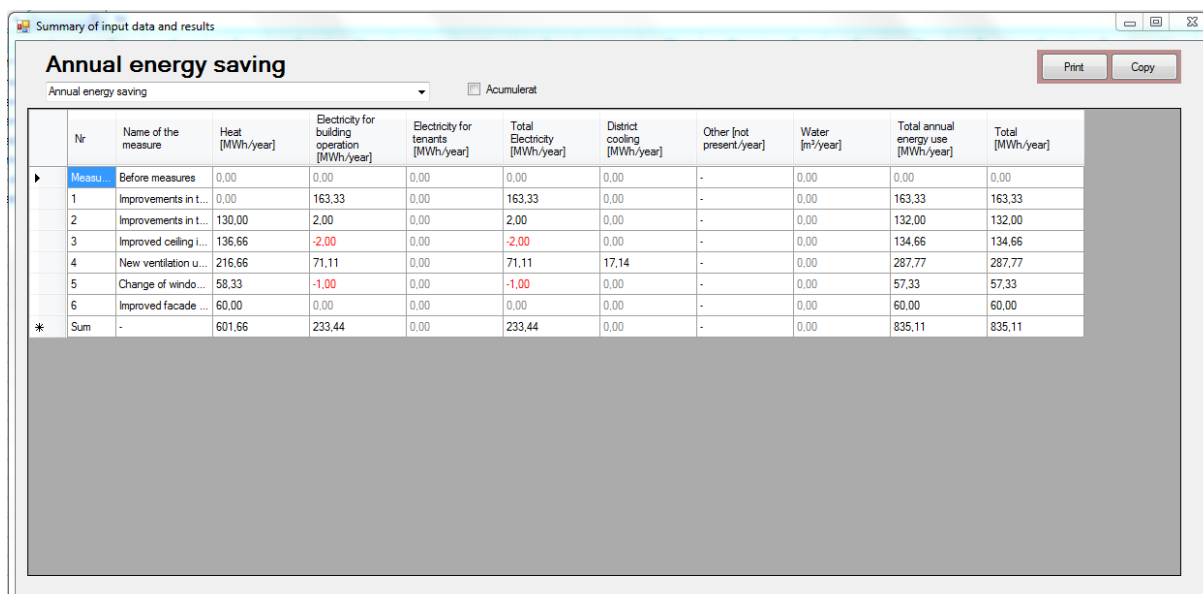
Point type: Circle Point size: 10 Colour Width of the line for point: 1 Colour

☐ Show nr of the measure ☐ Show internal rate of return of the measure

Ok Cancel

6 Data

When choosing **Data** on the main menu bar you can see a summary of input data used in the calculations and results of the calculations in a table form. You can print it out or copy the text.



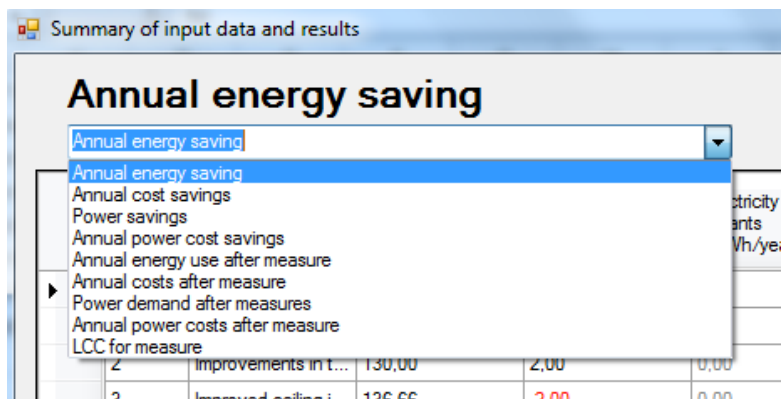
Annual energy saving

Annual energy saving ☐ Accumulat

Nr	Name of the measure	Heat [MWh/year]	Electricity for building operation [MWh/year]	Electricity for tenants [MWh/year]	Total Electricity [MWh/year]	District cooling [MWh/year]	Other [not present/year]	Water [m³/year]	Total annual energy use [MWh/year]	Total [MWh/year]
▶	Measure: Before measures	0,00	0,00	0,00	0,00	0,00	-	0,00	0,00	0,00
1	Improvements in t...	0,00	163,33	0,00	163,33	0,00	-	0,00	163,33	163,33
2	Improvements in t...	130,00	2,00	0,00	2,00	0,00	-	0,00	132,00	132,00
3	Improved ceiling i...	136,66	-2,00	0,00	-2,00	0,00	-	0,00	134,66	134,66
4	New ventilation u...	216,66	71,11	0,00	71,11	17,14	-	0,00	287,77	287,77
5	Change of windo...	58,33	-1,00	0,00	-1,00	0,00	-	0,00	57,33	57,33
6	Improved facade ...	60,00	0,00	0,00	0,00	0,00	-	0,00	60,00	60,00
*	Sum	601,66	233,44	0,00	233,44	0,00	-	0,00	835,11	835,11

Please note, it is recommended to copy the input and results data first to Excel table and then make a copy to Word document.

From the drop down menu seen under the header of the data table you can choose which input data and results are displayed in the table.



7 Report data

Report data function selected from the the main menu bar gives a factsheet template. After filling in the different fields a short fact sheet is created as pdf, describing the building, the action package and profitability results (outcomes of Step 1).

This function is currently only for Swedish use.