BUNDLING

Matti Pylkkö

Environmental office of Lappeenranta region

EFFECT4buildings Final Conference

Webinar, 8th Dec 2020

Background

Bundling as a tool is based on deep understanding of Total Concept Method and Total Tool. Bundling is a way to **merge many smaller investments in to a bigger investment package**. By bundling multiple measures, can be reached the **better profitability / bankability** to invest on a larger scale or make a deep renovation instead of a single energy efficiency solution.

Different kind of bundling methods

1) bundle energy efficiency measures in one building/project

2) bundle multiple EE acts of the same type in many building/locations to make investment big enough, ie street lighting, HVAC.

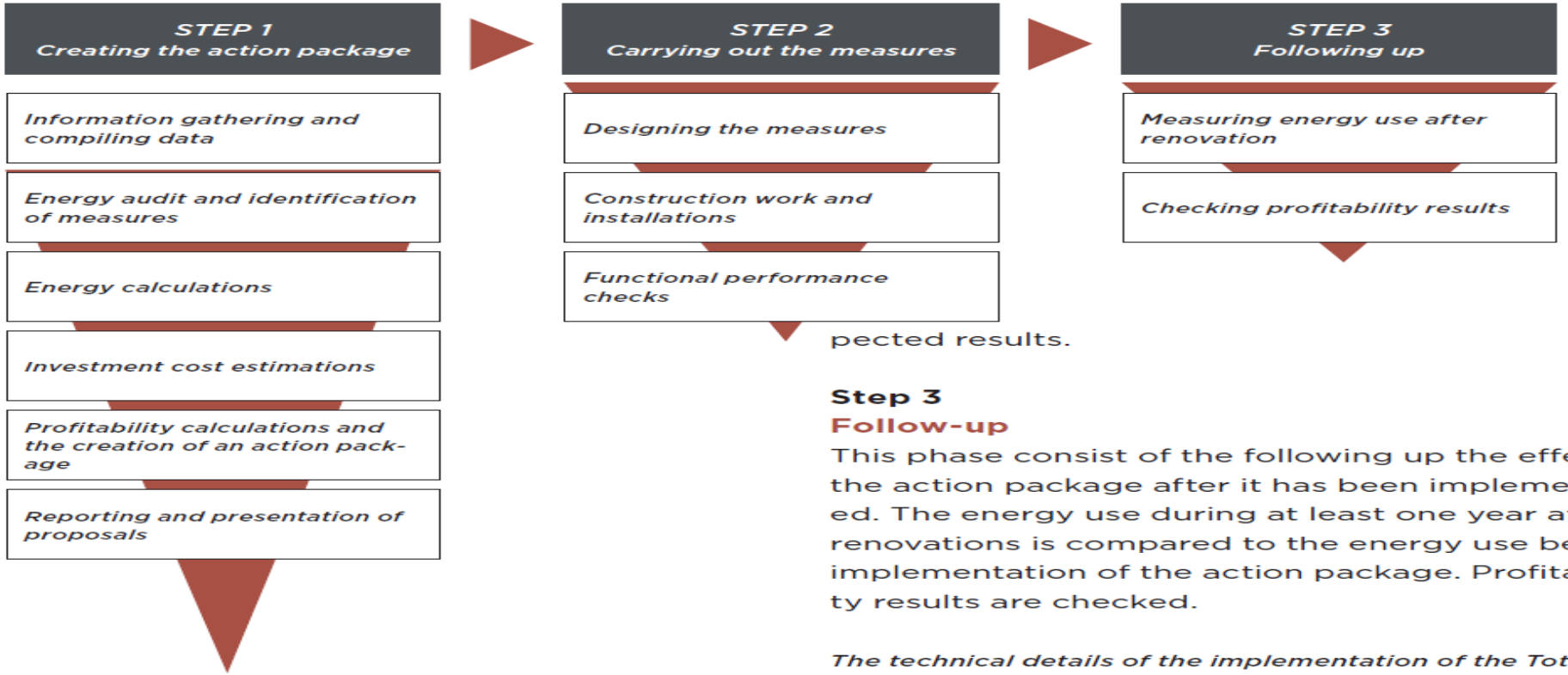
3) bundle multiple EE measures of different type in many buildings/locations

The reason to bundling small energy actions is to enlarge the overall project for reaching the minimum project size required in **application for EU funding**. In addition it is **more effective project preparation** regarding the technical and administrative management. It allows reducing of total project costs comparing to small separate activity implementation and gives the possibility to implement energy actions with longer payback time. **Not only the most profitable ”low hanging fruits”, but also less profitable measures will be included.** The profitability assessment in the Total Concept method is based on **internal rate of return method.** The requirement of **IRR-value** (internal rate of return) for the whole package shall be fulfilled.

TCM / TotalTool / Steps

- **Step 1 – Creating an action package**
- **Step 2 – Carrying out the measures**
- **Step 3 – Follow up**

Work process



pected results.

Step 3

Follow-up

This phase consist of the following up the effect of the action package after it has been implemented. The energy use during at least one year after renovations is compared to the energy use before implementation of the action package. Profitability results are checked.

The technical details of the implementation of the Total Concept is described in the guidebook "The Total Concept.

Preparations

Following issues shall be considered:

-what kind of energy renovation shall be carried out

-engage all relevant stakeholders

-determine the baseline for energy savings

-define an energy usage baseline / reference level. Final savings shall be compared to this.

Observe: check minimum requirements to be fulfilled in the building before any study of possible energy saving measures. The energy usage baseline is needed to be defined correctly. Furthermore the baseline may vary due to different regulations.

Step 1

Basic information of building

Energy audit and identification of measures

Investment cost calculation

Energy calculations

Profitability of the measures

Create an action package

Summary / report / suggestion -> to be presented for decision makers

(Observe: sensitivity analysis may be needed)

Step 2

Carrying out the measures, including:

- Planning and designing the measures
- Construction work and installations
- Functional performance checks

Step 3

Following up, including:

- Measuring energy usage
- Checking profitability results

Conflict between expected vs actual savings

In case of conflict between expected vs. actual results -> following issues shall be analyzed

do all technical systems work as planned (if not, corrective actions needed)

changes in operating conditions and/or use of the building since gathering basic information

difference between calculated / actual costs? Reason for that?

any other issues that could have affected the calculated energy savings (for ex. other works carried out at the same time and they were not connected to calculations)

Before starting to use TotalTool

EFFECT4buildings

-identify all the possible energy saving measures in the building

-define required investment cost

-calculate expected annual energy savings for each measure
- observe also the effects of individual measures to each other

-profitability requirement
- interest rate requirement given by owner of building

-also needed
- energy prices
- estimated energy price increases
- economic calculation periods for each measure, etc.

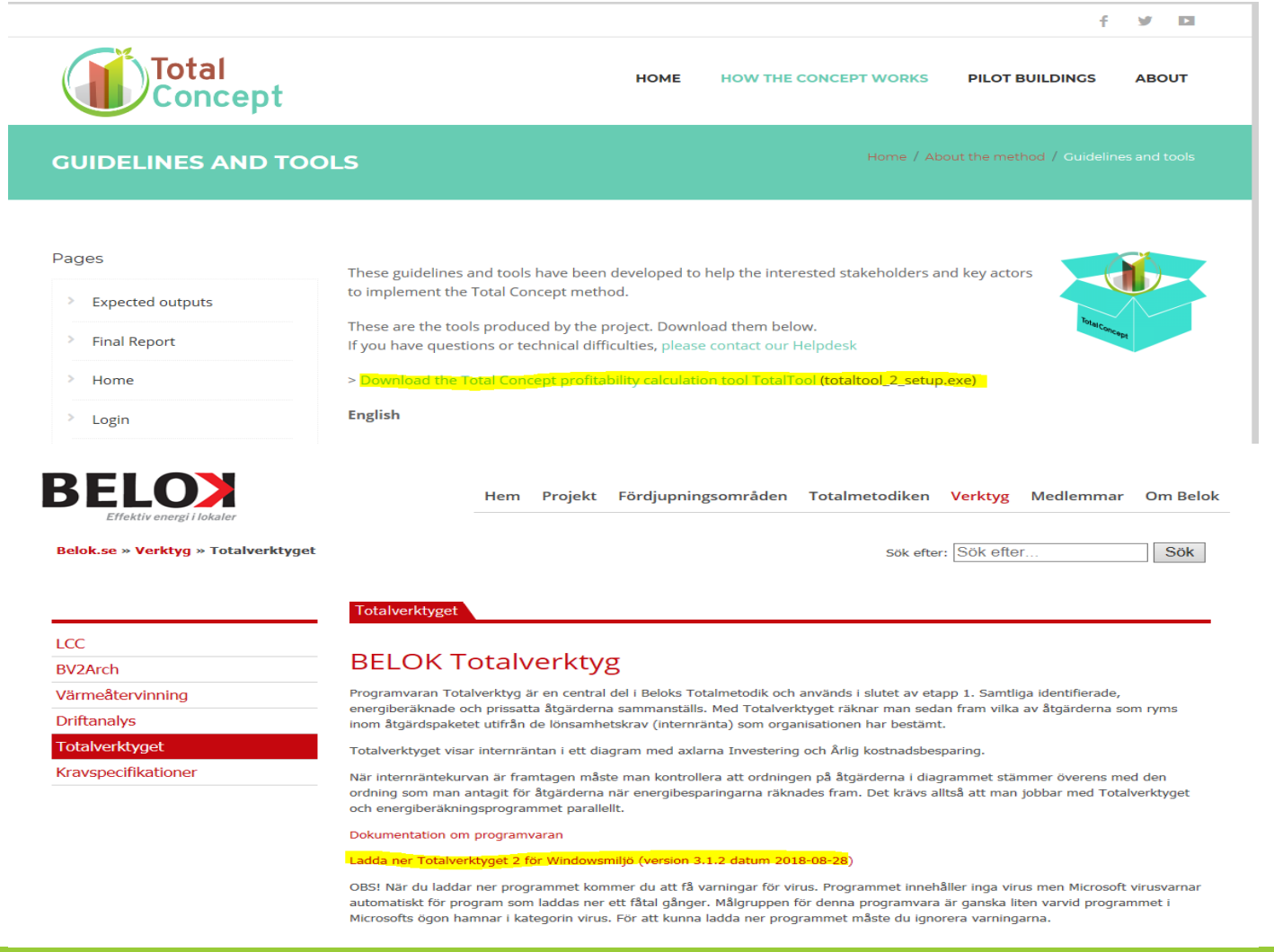
Where to find the tool?

-bundling a.k.a Total Concept Method (TCM) & TotalTool
http://totalconcept.se/

TotalTool can be uploaded

here ----------→

or here ----------→



Obs! Access given by your security organisation is needed!

Other relevant material

-training material available in several languages

here ----------→

English

Total Concept tool-kit -v1.6 (ENG)

Dansk/Danish

Totalconceptets værktøjskasse-v1.6.zip (DAN)

Soumeksi/Finnish

Total Concept työkalupakki- v1.6 (FIN)

Eesti/Estonian

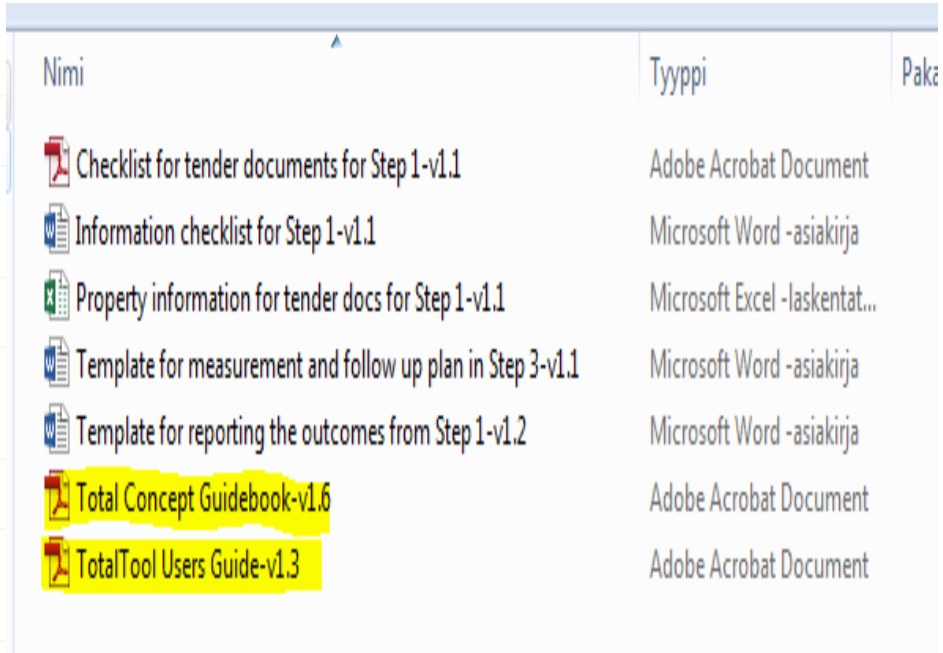
Total-Concept abimaterjalid-v1.6 (EST)

Norsk/Norwegian

Total Concept tool-kit -v1,6.zip (NOR)

Svenska/Swedish

Totalmetodikens verktygslåda-v1,6.zip (SVE)



How to use TotalTool 1

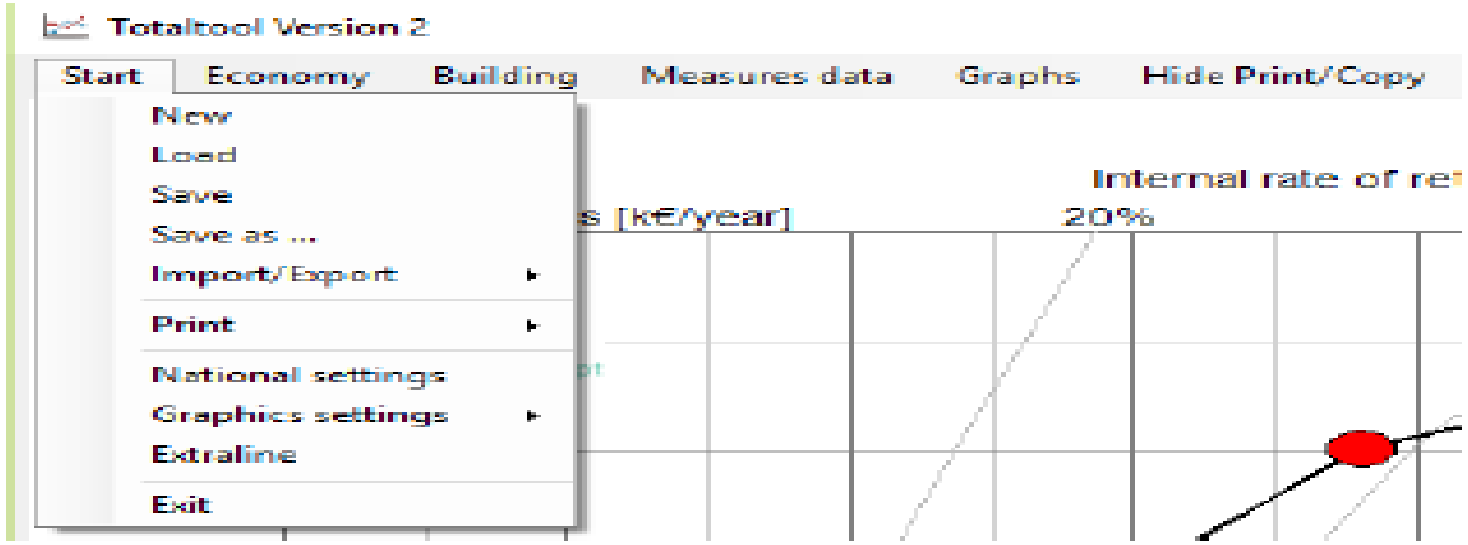
From the drop down menu under ***Start*** you can also

-open previously saved files by choosing *Load* and

-save your files by clicking on *Save* or *Save as*.

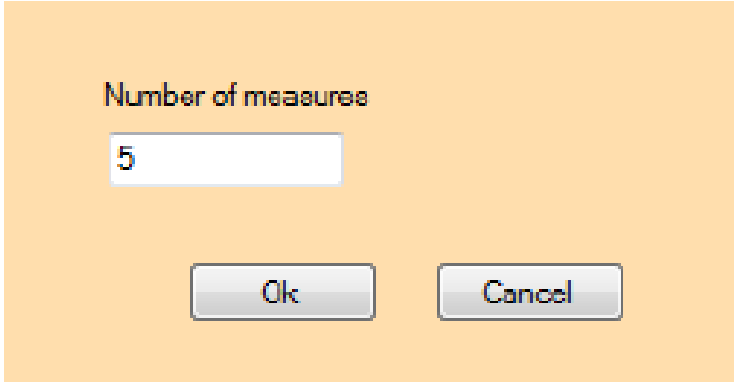
-by choosing *Import/Export* you can also transfer data to/from the program.

-the language options can be changed by choosing National settings.



How to use TotalTool 2

Give the number of measures of your action package. Observe, this is an editable value. You are always able to add or remove measures later.

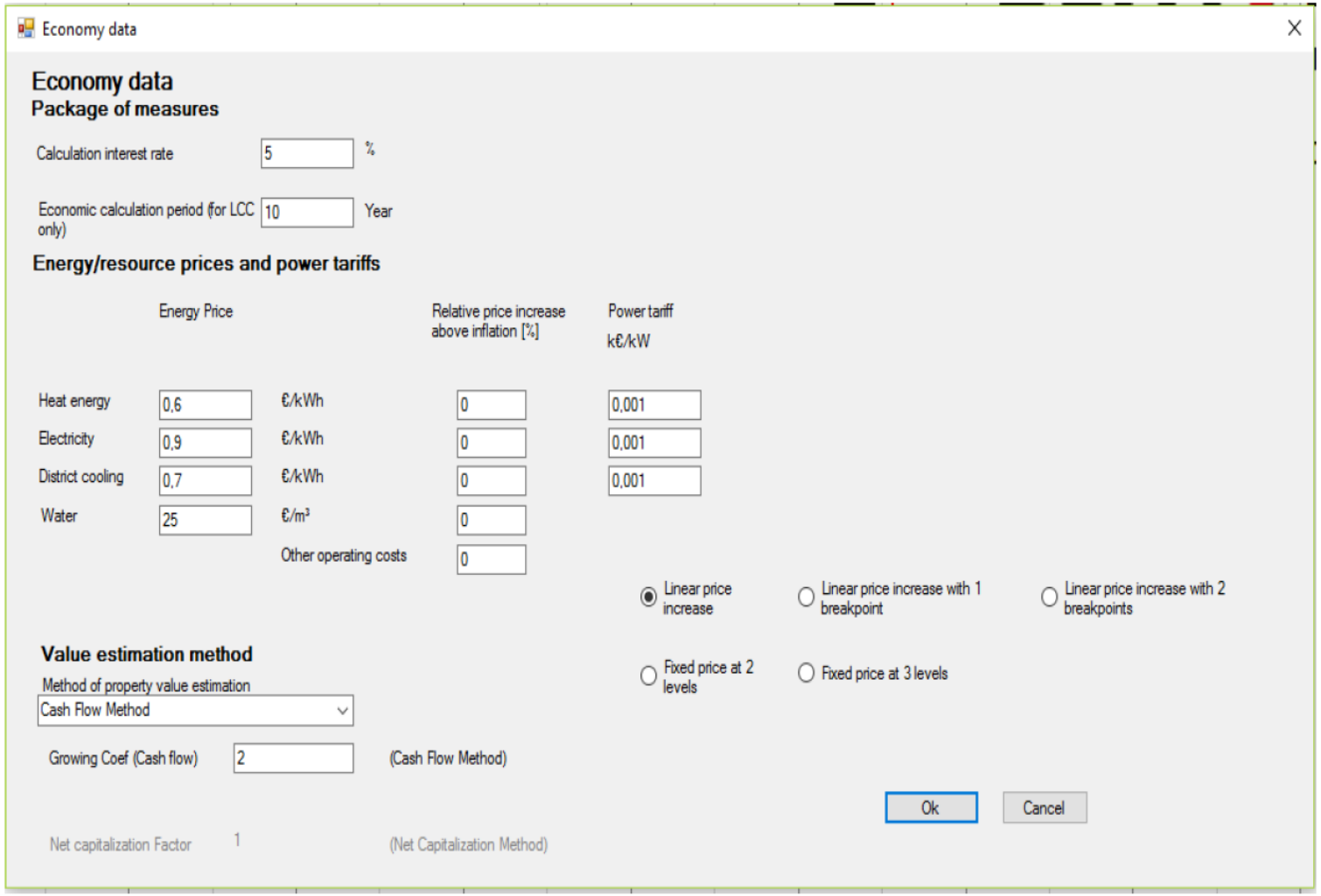


How to use TotalTool 3

Profitability requirements

Energy price including price increases

Economic calculation period



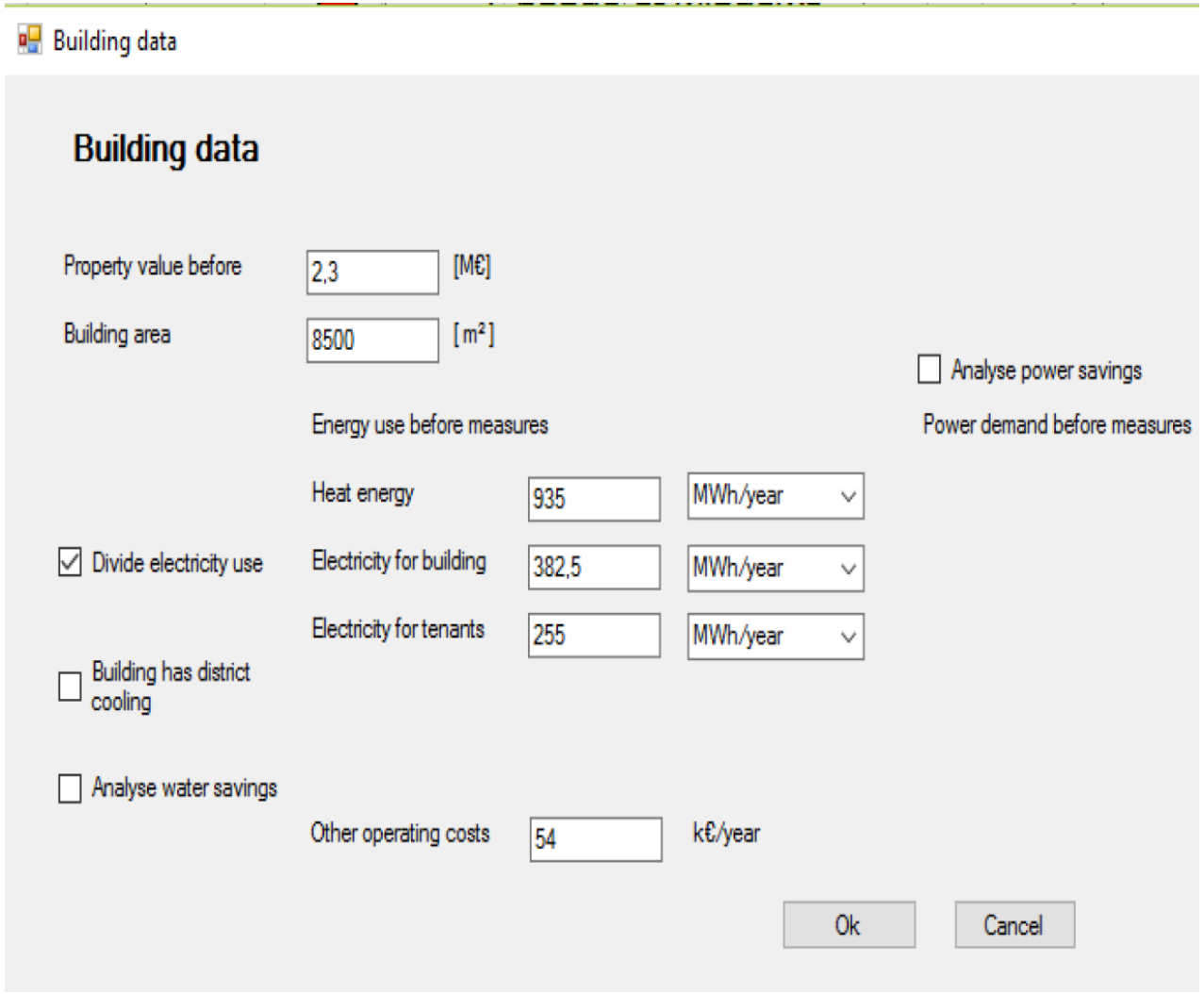
How to use TotalTool 4

The building area [m2]

Energy use before the measures (the baseline)

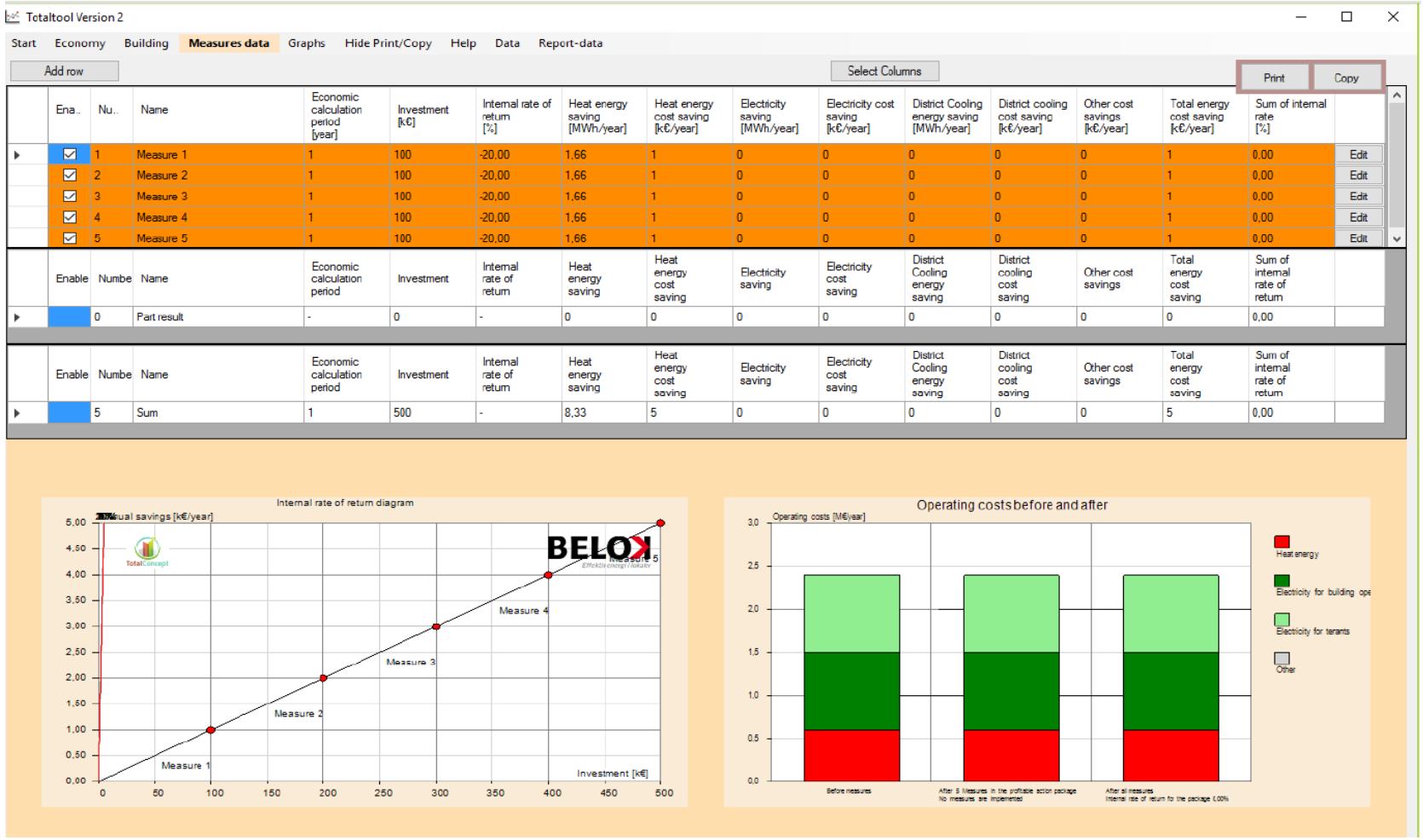
Power demand before measures

Other operating costs



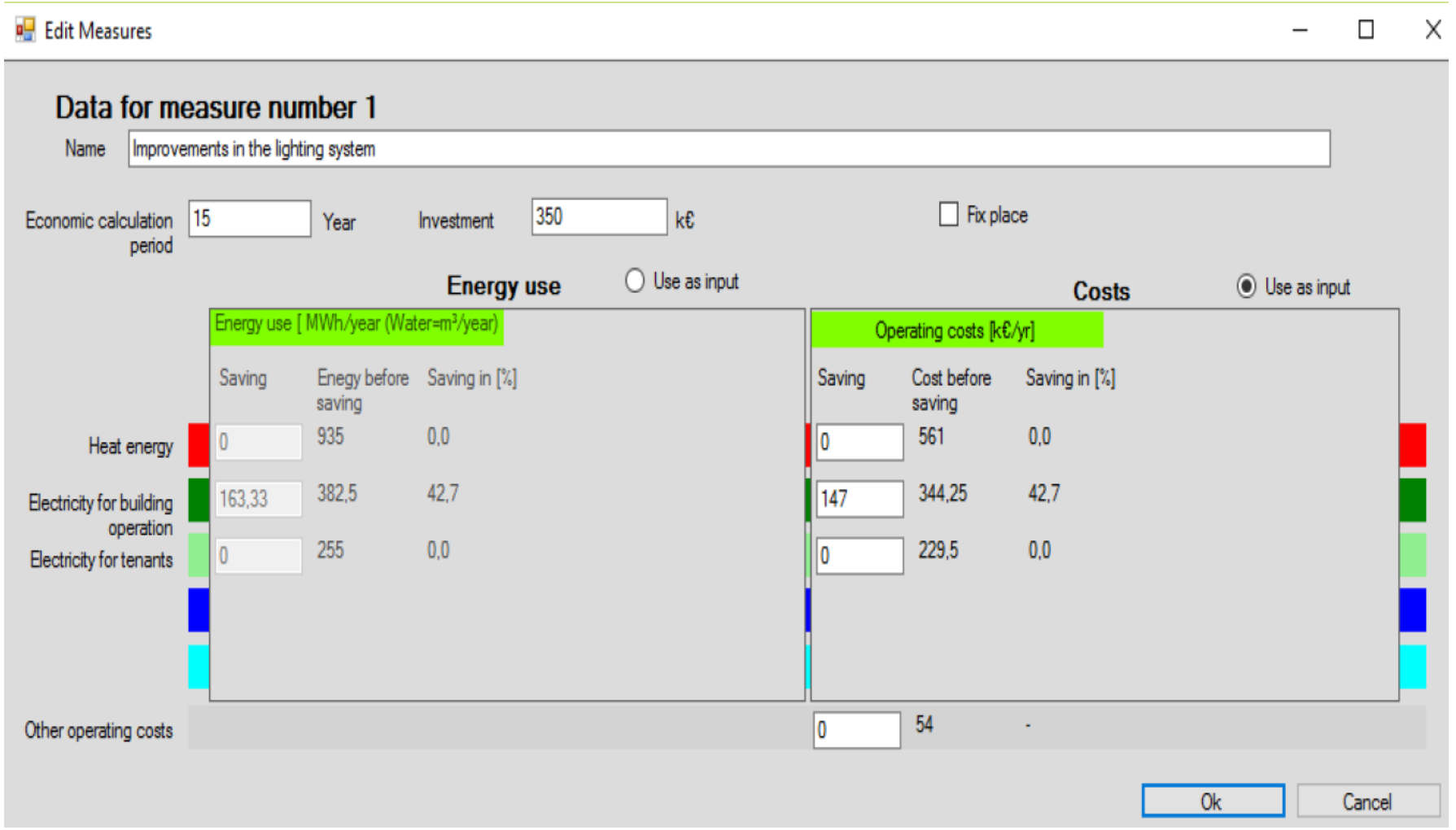
How to use TotalTool 5

Add input data



How to use TotalTool 6

Fill in all specified details



How to use TotalTool 7

In the ***Measures data*** menu by clicking the box in the first column *"Enable"* of the data table in Section 1 the specific measure is included to the action package calculation and shown on the results diagrams.

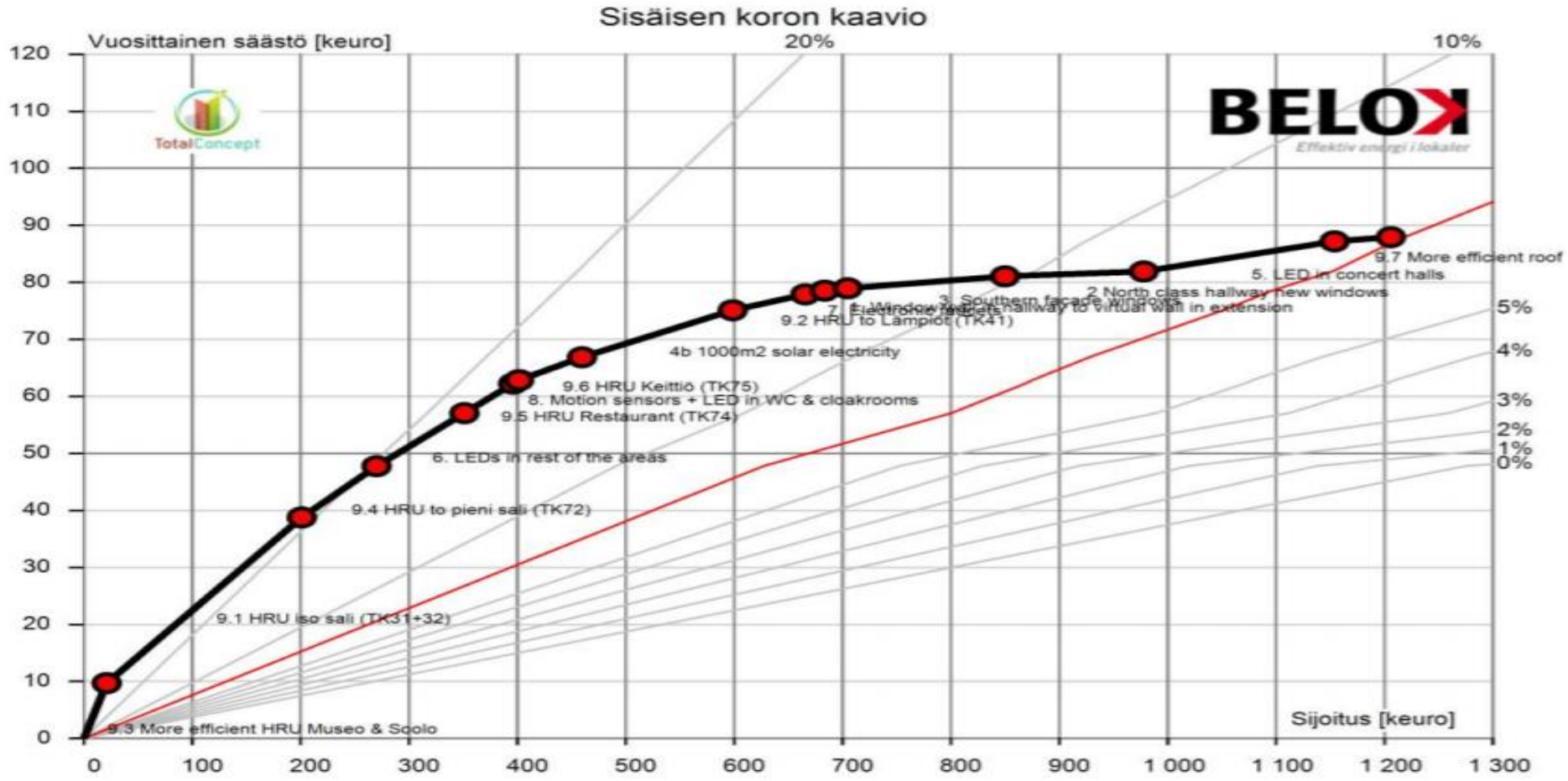
When unclicking the box the measure will be excluded from the calculations, but it still appears in the measures table.

To add a new measure, click *"Add row".*

To delete a measure, first activate the measure by clicking on the first cell of the measure line (the line becomes blue) and then click *"Delete measure".*

Now charts are available ->

How to use TotalTool 8



EFFECT4buildings

How to use TotalTool 9

Name	Economic calculation period [year]	Investment [keuro]	Internal rate of return [%]	Heat energy saving [MWh/year]	Heat energy cost saving [keuro/year]	Electricity saving [MWh/year]	Electricity cost saving [keuro/year]	District cooling energy saving [MWh/year]	District cooling cost saving [keuro/year]	Other cost savings [keuro/year]	Total cost saving [keuro/year]	Profit [-]	Sum of internal rate [%]	LCC [keuro]
9.3 More efficient HRU ...	20	13,6	79,14	169	10,14	3	0,27	0	0	0	10,41	8,11	79,16	-160,21
9.1 HRU iso sali (TK31+...	20	180	19,12	520	31,2	0	0	0	0	0	31,2	1,84	23,62	-340,34
9.4 HRU to pieni sali (TK...	20	69	15,33	161	9,66	0	0	0	0	0	9,66	1,48	21,52	-92,04
9.5 HRU Restaurant (TK...	20	43	13,60	90	5,4	0	0	0	0	0	5,4	1,33	20,45	-47,00
6. LEDs in rest of the are...	15	81,3	8,98	-142	-8,52	174	15,66	48	1,44	0	8,58	0,96	18,44	-103,15
8. Motion sensors + LED...	15	5,6	8,10	-7,1	-0,42	10,5	0,94	1,3	0,03	0	0,55	0,91	18,32	-6,55
9.6 HRU Keittiö (TK75)	20	56	7,14	72	4,32	0	0	0	0	0	4,32	0,82	17,05	-15,91
4b 1000m2 solar electricity	25	139	5,73	0	0	90	8,1	0	0	0	8,1	0,68	14,43	-49,96
7. Electronic faucets	25	18,4	2,04	4,9	0,29	0	0	0	0	0	0,68	0,43	14,07	-0,12
9.2 HRU to Lämpiöt (TK...	20	67	1,56	50	3	0	0	0	0	0	3	0,47	13,05	17,25
1. Window wall in hallwa...	30	21,2	-0,26	7,3	0,43	0	0	0	0	0	0,43	0,26	12,67	13,89
3. Southern façade wind...	30	145	-1,75	37,7	2,26	0	0	0	0	0	2,26	0,19	10,46	107,27
2 North class hallway ne...	30	128	-5,37	15,4	0,92	0	0	0	0	0	0,92	0,09	8,81	112,58
5. LED in concert halls	15	176	-6,89	-91	-5,46	105	9,45	28	0,84	0	4,83	0,25	7,37	6,34
9.7 More efficient roof ve...	20	52,5	-7,47	0	0	8	0,72	0	0	0	0,72	0,15	6,94	40,71

How to use TotalTool 10

Should **internal rate of return of each individual measures be presented more clearly**? At the moment only the **IRR-summary** of the chosen measures **is presented clearly**.

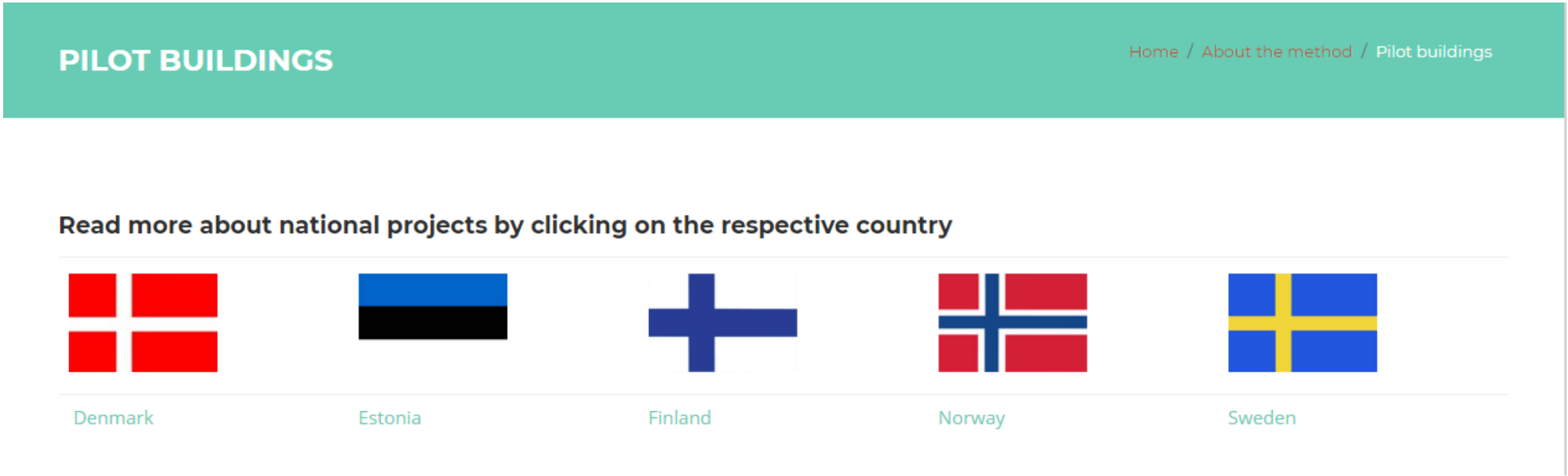
Building managers, decision makers and other stakeholders may be **confused**, **how profitable each individual measures are in practice**, if individual IRR's are not presented.

At least the person presenting (or training) Total tool results, shall be prepared to tell all the details behind to charts and how results shall be interpreted.

Samples regarding this issue on the next two slides.

Existing pilot samples

http://totalconcept.se/method/pilot-buildings/



These can be used as exercise cases / work shop themes / also own cases for training purposes.

Any questions & comments?

Thank you!

Homepage: https://www.effect4buildings.se/