

## User instructions for the **BioHeat Profitability Assessment Calculator** version 68

The purpose of this Excel tool is to assist the user in conducting an economic pre-feasibility analysis for biomass heating systems, and enable a general comparison with an adequate fossil fuel heating system, with the method of a discounted cash flow analysis. Scopes of this Excel-Tool are biomass heating plants with and without district heating networks, in a capacity range from 0.1 to 20 MW.

### Required operating system

The tool was programmed for Windows operating systems using Microsoft Excel 2010 and is compatible to run with Microsoft Excel 2013.

### Microsoft Excel Settings

Before using this tool we kindly ask you to enable macros in Excel: Please click File > Options > Trust Center > Trust Center Settings. In the Trust Center, click Macro Settings. Choose Enable all macros. Click OK (reset the macro setting after using the tool for protecting your computer of potentially malicious code).

Please activate the Excel Add-in "Solver" too: Please click File > Options > Add-ins. In the Manage box, click Excel Add-ins, and then click Go. In the Add-ins available box, select the Solver Add-in check box. If you don't see this name in the list, click the Browse... button and navigate to the folder containing Solver.xlam. Then click OK.

In case you change the language during calculations, please set all drop-down menus accordingly, so that they show the chosen language. Otherwise calculated figures may show errors displaying "#NV".

### General

We kindly ask you to read the information on sheet "1. General" carefully, before starting your analyses. Please use the tools' internal manual for your guidance.

### About the tool

The **B4B BioHeat Profitability Calculator** can be used for a comparison of the economic efficiency (pre-feasibility level) of mid-scale, solid biomass and fossil fuel fired (district & in-house) heat-only plants (in 10 languages).

By this Excel-Tool the economics of a fossil fuelled reference system and of an alternative biomass fuelled system are assessed using a discounted Cash-flow analysis (based on VDI Guideline 2067).

The Calculator contains country-specific reference values for investment (of various plant components) and for outgoing and incoming payments (price base 2015 of 12 countries). Scopes of this Excel-Tool are biomass heating plants with and without district heating networks, in a capacity range from 0.1 to 20 MW. Default values are given within this capacity bandwidth only.

The Excel Tool consists of 6 data input sheets and 1 data output sheet (Results). To start the calculation procedure, fill in the Excel-Sheets from left to right in the given order. Input sheets are organized as lists, each parameter has one row. In the left column (next to the input parameter name) you will find a link to the corresponding manual entry. In the column "Input Value", you will find dark blue cells where the correct values for your project need to be typed in.

To provide some guidance on plausible parameter values, you will find estimated reference values, or typical value ranges in the column "Reference Value". These values are based on a national survey conducted in the year 2015 by the Bioenergy4Business project partners. All cost related reference values are increased by means of the inflation rate set, only. This cost increase is calculated automatically, based on the year you chose to be the start year of your project (see below). In some cases you will also find reference values for capacities, technical parameters etc. Please note that all these reference values serve as rough first estimates for plausible input/parameter values only. The real, site specific values, which you should take as input/parameter values for your specific project can deviate substantially from the reference values, based on local conditions.

Please note that the tool and the related national survey for reference parameter values have been prepared with meticulous care and to the best of our knowledge. For the sake of convenience, calculations assumptions had to be agreed on which might result in (slight) deviations from precise results. Furthermore the results of this tool depend strongly on user inputs, such as heat demand assumptions and plant sizing parameters.

Please note that an in depth heat demand inquiry is essential for the sizing of the plant components at optimal cost, and consequently has a strong impact on the feasibility of biomass heat projects. This tool does not replace site specific planning by professionals and collecting several offers from manufacturing companies. Hence investment decisions cannot be based on the usage of this tool.