PROJECT

PRO-ENERGY – PROMOTING ENERGY EFFICIENCY IN PUBLIC BUILDINGS OF THE BALKAN MEDITERRANEAN TERRITORY

Work Package:	5. Pilot actions & Sustainability
Activity:	5.1. Definition of functional and technical specifications of the joint ICT platform
Activity Leader:	Region of Epirus – Regional Unit of Thesprotia
Deliverable:	D5.1.3 Joint cost-benefit analysis modeller

Version:	Final 1.0	Date:	17/05/22
Type:	Report		
Availability:	Confidential		
Responsible Partner:	Region of Epirus – Regional Unit of Thesprotia		
Editor:	TREK Development		

DISCLAIMER:

This publication has been produced with the financial assistance of the European Union under the Interreg Balkan-Mediterranean 2014-2020. The contents of this document are the sole responsibility of the Region of Epirus – Regional Unit of Thesprotia, and can under no circumstances be regarded as reflecting the position of the European Union or of the Programme's management structures.

CONTENTS

IDENTIFICATION SHEET

Project Ref. No.	BMP1/2.2/2052/2019
Project Acronym	PRO-ENERGY
Project Full Title	'Promoting Energy Efficiency in Public Buildings of the Balkan Mediterranean territory'

Security (distribution level)	Confidential
Date of delivery	17/05/22
Deliverable number	5.3
Type	Report
Status & version	Draft 1.0
Number of pages	13
ACTIVITY contributing to the deliverable	D5.1.3 Joint cost-benefit analysis modeller
Responsible partner	Region of Epirus – Regional Unit of Thesprotia
Editor	TREK Development

1. INTRODUCTION

PRO-ENERGY is a transnational cooperation project, co-financed by the Cooperation Programme "Interreg V-B Balkan Mediterranean 2014-2020", under Priority Axis 2, Specific Objective 2.2 Sustainable Territories. The project aims at promoting Energy Efficiency in public buildings in the Balkan Mediterranean territory and to create a practical framework of modelling and implementing energy investments interventions, through specific ICT monitoring and control systems, as well as through energy performance contracting (EPC). The specific objective of PRO-ENERGY is to reduce by more than 20% the energy spending in public buildings of the participating entities in one year after the implementation of pilot actions.

Based on the above, Work Package 5 (WP 5) "Pilot actions & Sustainability" includes the implementation of pilot actions designed & specified in the Joint Strategy (WP3) & the drafting of a follow-up plan for sustainability of results (pilot actions, trainings) & its consultation with stakeholders. Three types of pilot actions are foreseen:

1) Design & development of an open-source Joint ICT Platform,

2) The design & development of the Joint Cost-Benefit Analysis Modeller (open to all) &

3)The joint preparation of Energy Performance Contracts (open tendering). Pilot actions will valorise results (open to all) of WP3 energy audits on selected buildings.

One public building per area involved will be equipped with smart sensor systems. An integrated cloud-based joint ICT platform will measure & analyse energy consumed at any given period of the day from different sources. Then all data& measurements (available to the wide public) will be integrated & analysed, using specially designed ICT tools, algorithms, data analytics & statistical methods, thus producing the energy consumption profile of each building.

The Activity 5.3 "Joint cost-benefit analysis modeller" aims at supporting decision-making for retrofits, renovations, etc., which lead to increased energy efficiency in public buildings. Retrofits & investments will be planned using the cost-benefit analysis modeller to measure the net present value of energy efficiency interventions. These investments will be implemented outside the PRO-ENERGY project (mostly with the use of energy performance contracting), but their results & impact (energy savings) shall be monitored & measured with the use of the ICT platform.

1.1.   PURPOSE

Cost-benefit analysis is a process by which the PRO-ENERGY project aims to analyse decisions and systems related to energy savings. The cost-benefit analysis modeller is based on the diagnosis of the benefits of energy upgrades and energy saving investments and the costs associated with the implementation of these upgrades and investments. The aim is to draw conclusions on the net value of the investments, which can be used to make decisions on the implementation of the energy saving investments under consideration.

The Region of Epirus – Regional Unit of Thesprotia (LP) was responsible for defining the specifications of the tool. Once the specifications were defined, the tool was designed and shared with all Project Partners in order to contribute and provide their suggestions and/or comments. The final version was jointly produced and is attached to the present document (Annex 1). The Cost-Benefit Analysis modeller is hosted on the PRO-ENERGY website in all project languages: pro-energy-project.eu.
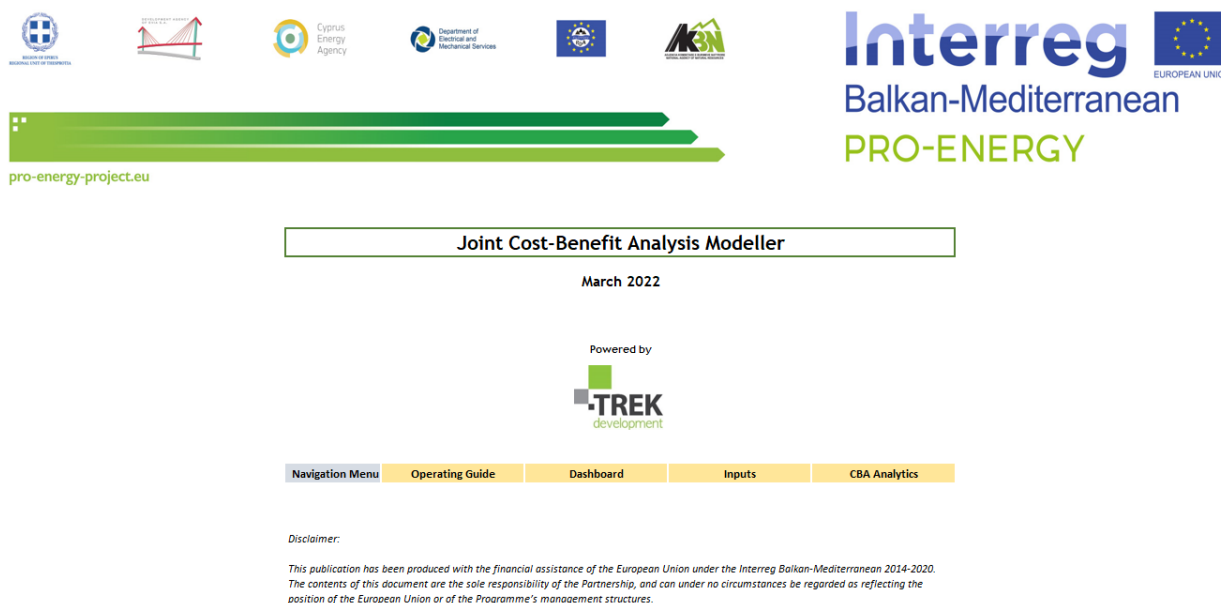
1.1.   PURPOSE

2.   JOINT COST-BENEFIT ANALYSIS MODELLER

The present section of the document provides a detailed description of the designed and developed cost-benefit analysis modeller (CBA). The modeller is composed of the following key features (sheets):

- ▪ Cover page
- ▪ Operating guide
- ▪ Dashboard
- ▪ Inputs
- ▪ CBA analytics

1.2.   Cover page

The cover page acts as the front page of the CBA tool and includes its key information (name of the tool, logos and visual identity, navigation menu, disclaimer, etc.). The cover page provides the key information of the designed tool to the end users.

The cover page also provides the Navigation Menu which will automatically lead the end users to all additional model features (sheets):

1. Operating Guide
2. Dashboard
3. Inputs
4. CBA Analysis

1.3. Operating Guide

The Operating Guide provides a detailed description of the architecture of the cost-benefit analysis modeller. Its acts as the manual prepared containing all operational procedures, instructions and other directives related to the use of the CBA tool. The Operating Guide provides the following information to the end users:

1. Introduction

The present sheet includes instructions of how to use Joint Cost Benefit Analysis Modeller tool, developed within the framework of the PRO-ENERGY project which is co-financed by the Interreg Balkan-Mediterranean Programme.

The CBA Modeller comprises five (5) separate sheets, is coded in Microsoft Excel Windows and is approximately 400 KB in size.

The tool is to be used in order to evaluate energy efficiency projects, both in financial and environmental terms. The project is modelled periodically on a year basis, both for construction and operations periods. All cashflows are assumed to take place at period end dates. An operations period must be inserted at the relevant cell at the "Inputs" sheet in order for the modeller to become operational.

2. Architecture

The CBA Modeller is laid out over five (5) sheets in order to enhance user's convenience and minimize calculations' time.

- Cover: Title page, including disclaimer. It also includes four (4) buttons for navigation to the additional model sheets.
- Operating Guide: The present sheet provides a manual on using the CBA tool.
- Dashboard: A simplified and snapshot presentation of the Key Inputs inserted, the CBA Key results and the Project's Financial Structure. Furthermore, the "Dashboard" sheet presents the main Operating and Investment Flows during both construction and operation periods, concluding to the Free Cash Flow per period examined.
- Inputs: The "Inputs" sheet has mainly to do with data entry. The user has to insert its estimations in this sheet.
- CBA analytics: It is a financials output sheet, thus presenting both the occurring financial KPIs of the analysis conducted.

3. Navigation

To aid movement around the model, navigation macros are incorporated in the "Cover" and "Inputs" sheets. Clicking on the options offered, transports the user directly to different locations in the Model.

4. Colour Coding

Data entry cells are yellow. They are located at the "Inputs" sheet and are the only cells which should be altered by a user. Negative amounts are presented in curved brackets (parenthesis) and are highlighted in red coloured text. In case NVP either/or DSCR ratios are negative, the relevant cells are marked in red colour and texting.

1.4. Dashboard

This sheet provides a simplified and snapshot presentation of the Key Inputs inserted, the cost-benefit analysis key results and the project's financial structure. Furthermore, the "Dashboard" sheet presents the main Operating and Investment Flows during both construction and operation periods, concluding to the Free Cash per period examined.
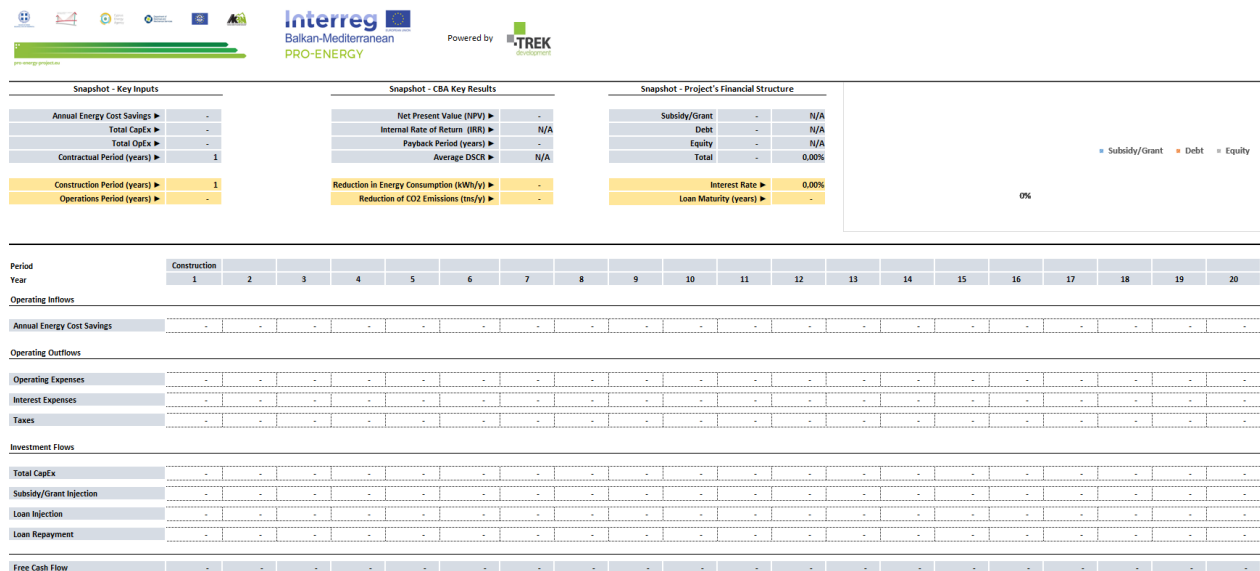
1.5. Inputs

As described before, the present section of the modeller involves the input of data to be analysed in the next sections. The user has to insert its estimations regarding:

- Annual Energy Cost Savings: The estimated annual energy savings to be triggered by the project's accomplishment, in currency terms.

- Total Capital Expenditure: The amount of the total capital expenditures for project's construction, in currency terms

- Subsidy/Grant Amount: The grant to be received for financing the project's construction.

- Debt: The debt % to be used to cover own financing.

- Loan inputs: Interest rate (the loan's interest rate), Maturity years (the loan's maturity period), Loan type, Grace period (if applicable), Total Operating Expenses (automatically calculated the sum of total operating expenses).

- Financial and Fiscal inputs: Inflation rate (according to the national CPI index), Energy Inflation rate, Tax rate, Discount factor.

- Environmental Inputs: Reduction in Electricity Consumption (kWh/y), Reduction in Diesel Consumption (kWh/y), Operations Period (the project's estimated operational period in years).

Besides the aforementioned data entry cells, the "Inputs" sheet also incorporates:

1. A presentation of the project's overall financial structure, taking into consideration the information provided by the user regarding the subsidy to be received and the amount of debt to be used to cover own financing. Within this framework, equity is automatically calculated.

2. The loan balance at the end of the grace period as well as the occurring interest, in case such a period is projected, according to the financing institution's term sheet. The aforementioned amounts are automatically calculated. Please note that in case the option of "No" grace period is selected, the amount of the loan balance equals to the total debt amount, while no relevant interest is accruing.

3. A snapshot presentation of the CBA Results regarding financial KPIs, reductions in total energy consumption and reduction of CO2 emissions.

4. Three macros for navigating to the CBA Results' Analytics, Dashboard and Operating Guide sheets.

5. Instructions for data entry in two ways: First, each data entry cell has an advice on filling-in, in excel comment format. Second, a color code is provided for user's convenience.

1.6. CBA analysis

The present section provides a financial output sheet, thus presenting both the occurring financial KPIs of the analysis conducted, as well as Investor's Profit & Loss statement, Investor's Cash Flow statement, Payback Analysis and Debt Service Cover Ratio Analysis. The very analysis takes place under the Discounted Cash Flows investment valuation framework.

3. ANNEXES

3.1 Annex 1. Cost-benefit analysis modeller (excel file attached)