

# Web-based Application for Screening Energy Efficiency Investments: A MCDA Approach

Aikaterini Papapostolou

*School of Electrical and Computer  
Engineering, Decision Support Systems  
Laboratory, Energy Policy Unit  
National Technical University of  
Athens  
Athens, Greece  
kpapap@epu.ntua.gr*

Filippos Dimitrios Mexis

*School of Electrical and Computer  
Engineering, Decision Support Systems  
Laboratory, Energy Policy Unit  
National Technical University of  
Athens  
Athens, Greece  
pmexis@epu.ntua.gr*

Elissaios Sarmas

*School of Electrical and Computer  
Engineering, Decision Support Systems  
Laboratory, Energy Policy Unit  
National Technical University of  
Athens  
Athens, Greece  
esarmas@epu.ntua.gr*

Charikleia Karakosta

*School of Electrical and Computer  
Engineering, Decision Support Systems  
Laboratory, Energy Policy Unit  
National Technical University of  
Athens  
Athens, Greece  
chkara@epu.ntua.gr*

John Psarras

*School of Electrical and Computer  
Engineering, Decision Support Systems  
Laboratory, Energy Policy Unit  
National Technical University of  
Athens  
Athens, Greece  
john@epu.ntua.gr*

**Abstract**— Energy Efficiency (EE) has been identified as one of the most cost-effective means aiming at reducing energy consumption, while maintaining an equivalent level of economic activity. Mainstreaming EE financing is considered as a key priority to avert climate change. The lack of evidence on the performance, commonly agreed procedures and standards for EE investments, particularly during the first stages of investments generation and pre-selection/ pre-evaluation, are the key problems hampering EE investments financing. It is also true that often project developers do not have the expertise or resources to make a convincing financing case for investors. In order to boost EE investments, this paper proposes a Multi-Criteria Decision Analysis (MCDA) methodology with the aim to support financing institutions to identify attractive EE project ideas in the early development phase of project initiation and planning. The study implements the ELECTRE TRI method, in order to benchmark EE project ideas in a standardized, investor recognizable credit rating form. A respective web-based tool facilitating the methodology and the screening of EE projects is also developed, supporting financing bodies and EE funds to rapidly detect and aggregate projects that meet the necessary criteria to be financed.

**Keywords**— *Energy; Energy Efficiency; Green Financing; Decision Making; Multi-Criteria Decision Analysis; Python.*