University Of Twente
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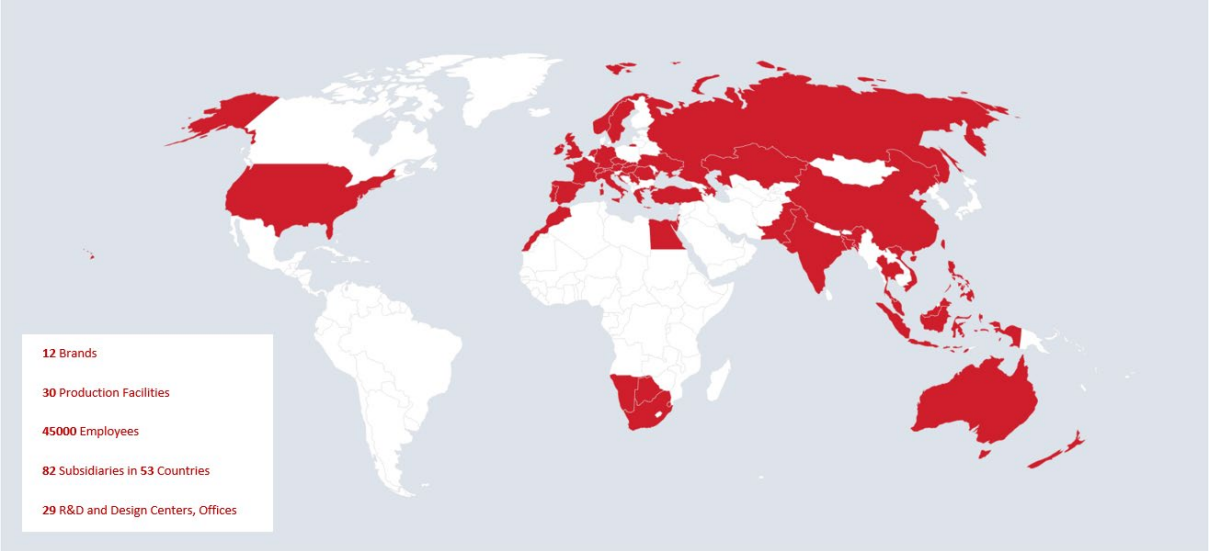
UNIVERSITY OF TWENTE.

beko

Thermo-Economic Analysis of Cutting-Edge Hybrid Energy Systems for Eco-Friendly District Heating

ABOUT BEKO



Beko, a pioneering global brand in large home appliances, has been transforming lives since 1955. Over the past 68 years, our commitment to customer-centric innovation and environmental sustainability has propelled us to be the fastest-growing brand in the European white goods market, and among the top 3 large home appliance brands in Europe. Operating in over 135 countries, we continually strive to create a healthier generation and a greener planet by developing groundbreaking products that cater to consumer needs and minimize environmental impact.

INTRODUCTION

As worldwide energy demands soar, heating, air conditioning, water heating, and appliances account for approximately 75% of the energy supplied to residential areas. To address this significant energy consumption, innovative and sustainable technologies must be employed to make homes more energy-efficient. This cutting-edge project will harness thermo-economic analysis to develop optimal energy solutions for households, culminating in the identification and optimization of the most promising option for enhanced thermal efficiency under ideal operating conditions.

RESEARCH QUESTIONS

1. What is the annual energy need for a residential area with a defined number of households at the selected location?
2. Which options can be used alone or in hybrid form, with priority to meet the heating need in the specified location?
3. How do the available heating/energy source options operate regarding thermo-economic analysis?
4. How can these heating/energy source options be utilized for maximum thermo-economic benefit?

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OBJECTIVES

This trailblazing study seeks to accomplish the following objectives:

1. Assess the energy needs by season and month, categorizing household energy consumers (e.g., heating, appliances, lighting, media equipment, etc.).
2. Design and model integrated solutions for heating and energy consumption in the selected region, considering natural gas boilers, hydrogen solutions, fuel cells, heat pumps, solar panels, wind energy, and more.
3. Conduct comprehensive thermo-economic analyses for the chosen solutions.
4. Evaluate and optimize the most promising integrated configuration to achieve peak operating performance.

ROLE OF BEKO

As an industrial partner, Beko will provide an external supervisor who will offer guidance and feedback through regular meetings, ensuring a successful research journey.

YOUR BACKGROUND

We invite ambitious master's students with a background in mechanical engineering or sustainable energy technology to embark on this exciting project that will shape the future of eco-friendly district heating solutions.