

Determination of energy efficiency for water heating in eight South African hotels

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ABSTRACT:

This study presents a characterization framework for energy efficient hotels. It builds on existing frameworks of energy efficiency and the adopted characterization framework advances from the input-output framework. The theoretical framework was developed through an in-depth literature analysis. In contrast with other frameworks, this framework incorporates a wide range of environmental and sustainable development tools. It accounts for both financial and physical energy use and services quality parameters. Subsequently, the framework was tested in eight star-graded hotels. The results presented are based on two issues (1) the theoretical formulation of an advanced energy efficiency model and (2) the empirical testing or application of the framework among eight hotels in the Mpumalanga province, South Africa. The findings of the study confirm that energy efficiency characterization should be based on the ability of a hotel to save energy while it continues to provide output services that at least comply with minimum services standards. Furthermore, the study revealed that the input-output framework was limited to the determination of the level of efficiency, but could not determine if an activity or institution was efficient. The study shows that the adopted framework builds on the existing definition of energy efficiency and other frameworks.