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Title: Using Multiple Regression Analysis to Develop Energy Consumption Indicators for Commercial Buildings in the U.S

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Research Highlight

Building envelope parameters, occupant schedule and building operation are considered as design variables.

Stepwise regression was used to reduce the number of parameters and only include the most effective parameters.

Presents a simple model to predict and quantify energy consumption in commercial buildings in the early stages of the design.

Parametric study and sensitivity analysis between levels of most effective parameters were performed.

Regression models are able to predict annual energy consumption at the early design stage.

Using Multiple Regression Analysis to Develop Energy Consumption Indicators for Commercial Buildings in the U.S.

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Abstract

Multiple regression analysis plays an important role in evaluating the energy consumption of buildings. These models are commonly used to assess the energy performance of commercial buildings and to predict any potential for energy consumption reduction. In this study, the building simulation software DOE-2 was used to predict energy consumption. A total of 17 key building design variables were identified related to building envelope, building orientation, and occupant schedule. Since, building energy consumption depends on many operational and design parameters; therefore, large numbers of simulations are needed to generate data for the multiple

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