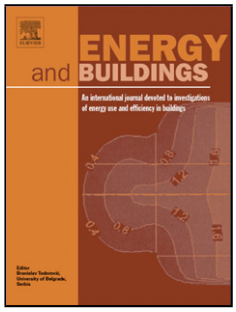

Title: A methodology for estimating Office Building Energy Use Baselines by means of land use legislation and reference buildings

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A methodology for estimating Office Building Energy Use Baselines by means of land use legislation and reference buildings.

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Highlights:

- Land use regulations and their influence on building typologies.
- Obtaining reference buildings without relying on existing construction databases.
- The effect of technical choices on the high-rise office building stock consumption.
- The use of archetype models to identify savings in the existing building stock.

ABSTRACT

Understanding the energy demand of cities is a challenge especially in countries such as Brazil where the lack of building energy consumption benchmarks makes it hard to decide upon interventions in the building stock, as neither the existing nor the attainable energy performance are known. Aiming to overcome these difficulties this study develops a framework to estimate the Energy Use Intensity (EUI) baseline of an existing building stock category based on the investigation of land use regulations, a land tax database and field surveys. These offer a starting point to estimate current energy consumption and promising interventions without having to study specific buildings in depth. A case study of the high-rise commercial building stock took place in the city of Belo Horizonte, Brazil. Three representative typologies were identified. For each of these, archetype energy models were created in order to assess EUI. The analysis of the EUI baselines highlights differences between archetypes, explaining the impact of technical choices on the overall electricity consumption and indicating a growing tendency of energy consumption for forthcoming buildings. The archetype analysis also provides knowledge to identify the most promising energy savings potential and thus to support further energy policies in the city.

Keywords: Building stock modelling; reference buildings; building energy performance simulation; energy use baseline.