

Energy benchmarking and legislation in Brazilian commercial buildings: challenges and experience from a recent work

Energy Epidemiology: using building data to support energy and carbon
policy in Brazil and the UK - 23-25 April 2018, Sao Paulo, Brazil

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A) Impact of energy efficiency labelling regulation on Brazilian buildings: Investigating the challenges, barriers and opportunities

- Comparison between EPBD and RTQ-C implementation
- Evaluate challenges of RTQ-C implementation in Brazil and what we could learn from European experience
- Key findings
 - Improvement required for calculation method
 - More training and support required to increase the number of qualified independent energy assessors
 - Lack of enforcement of RTQ-C regulation
 - Only 121 certificates issued to date
- Output: <https://doi.org/10.1016/j.enpol.2017.07.005>

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B) Study on the cost and energy saving implications of the Brazilian energy efficiency labelling system (RTQ-C) on commercial buildings

- Energy analysis and classification of 72 bank branches in Curitiba
- Critical design parameters evaluated using Multiple Regression Analysis (MRA) and Linear Discriminant analysis (LDA)
- Key findings
 - Four bank typologies according to sizes and shapes
 - Least correlation using MRA, but a number of parameters identified in LDA
 - Analysis of construction age of bank branches shows modern bank buildings (post-2010) consume more energy than the rest

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How/ what can we learn from the works?

- RTQ-C Regulations
 - Plays major role in reducing energy consumption in building sector through enforcement
 - Still a long way to go before full implementation in Brazil
 - Support and training
 - Awareness campaign
 - Lack of incentives for certification
 - Lack of penalties for non-certification
 - Improved accuracy of calculation method (ANN for future)
 - Single user-friendly interface recommended for assessor (currently prescriptive and simulation methods)

Benchmarking – challenges in Brazil

- **Range and complexity of buildings**
 - Varying sizes, shapes, ages, etc
 - Classification necessary
- **Availability of building details/ design parameters**
 - Depend on the age of the buildings
 - Design details mostly unknown for older buildings
 - Client/ occupants don't have the details
 - Depend on the ownership of the buildings
 - Difficult to get details for rented buildings
 - Occupants don't own the properties

Benchmarking – challenges in Brazil

- **Availability of energy consumption data**
 - Important for bottom-up energy audit
 - Not many buildings/ companies/ organisations have/ keep a record of them
 - Mostly large organisation with facilities management team (e.g. bank)
- **Understanding of energy use in buildings**
 - Generally only overall energy consumption is available (i.e. electricity consumption)
 - Directly from monthly electricity consumption
 - Not knowing breakdown for lighting, air conditioning, etc.
 - No monitoring on energy consumption for various activities

Thank you for your attention

Any questions?