Preventive Methodology to Avoid Overheating in nZEB Schools

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ABSTRACT

Nowadays the Passive Standard for dwellings is experiencing an increase; in 2007 the Flemish Government launched the Pilot Project Passive Schools thanks to which 24 schools were build with the Passive Standard, but today much of them suffer of overheating. The aim of this research is to understand the reason which led to this problem, by using a meta-analysis which will allows to develop a preventive methodology to solve it.

KEYWORDS

Indoor Air Quality, Flanders, Energy Efficiency, PassivHaus, Learned Lesson,

PROBLEM

Some schools that have been built in the Belgian Region of Flanders, certified as Passive buildings, suffer of overheating.

OBJECTIVE/HYPOTESIS

- Improve comfort in nZEB Schools and inform designers regarding the overheating problem
- Meta analysis of nZEB Schools in Flanders
- Model cases studies of nZEB Schools to estimate overheating risk

AUDIENCE

Schools' users (teacher, pupils), designers, architects and engineers

RESEARCH QUESTION

Is it possible assess overheating risk in nZEB schools through a comparative analysis of several buildings?

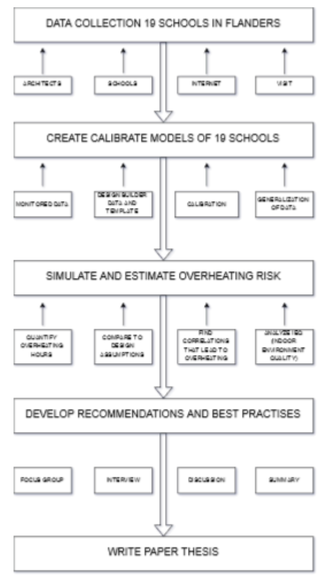
Is it possible to generalize the results of this research?

ORIGINALITY

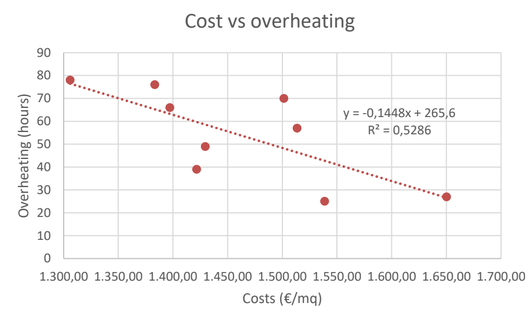
- There is a knowledge gap on overheating risk in schools
- Comparative analysis of several existing nZEB Schools in Flanders
- Performing post-occupancy evaluation for schools in Belgium

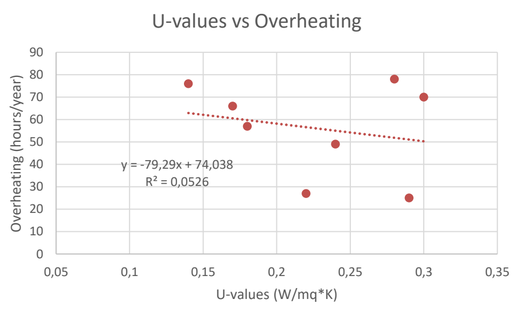
METHODOLOGY

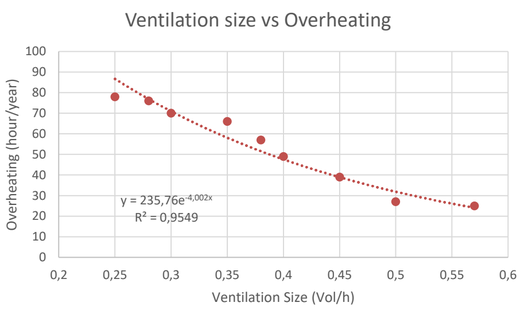
1. Data collection from 19 schools in Flanders
2. Create calibrate models of schools
3. Simulate and estimate overheating risk
4. Develop recommendations and best pratises

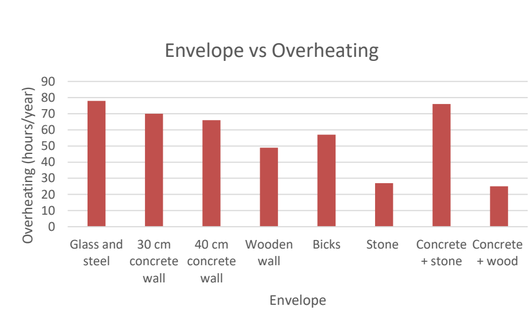


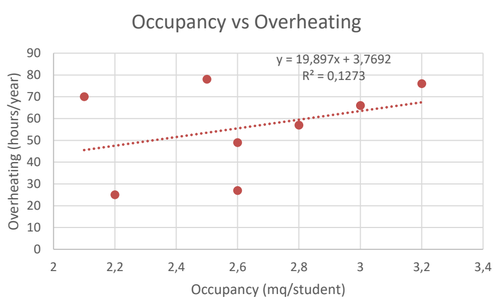
RESULTS

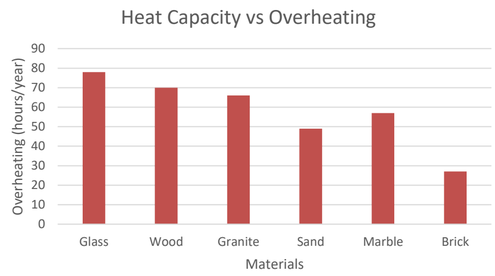












CONCLUSION

Under development.

Resources

- Attia, S., et al., (2016). Overview of the challenges of residential nearly Zero-Energy Buildings (nZEB) in Southern Europe, Suistanable Buildings Design Lab, Technocal Report, Liège, Belgium, 9782930909059.
- Gaitani, N., et al., (2015). Paving the way to nearly zero energy schools in Mediterranean region- ZEMedS project. Energy Procedia, 78, 3348-3353.
- Mlakar, J., & Strancar, J. (2011). Overheating in residential passive house: solution strategies revealed and confirmed through data analysis and simulation. Energy and Building, 43, 1443-1451.

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