

## Housing refurbishment for energy efficiency in subtropical climate of Vietnam

**Keywords:** housing, refurbishment, energy efficiency, climate design, Vietnam, tropical

**Architectural Engineering + Technology Department/Climate Design & Sustainability**

**Area of Research:** Green Building Innovation



**Research Summary:** In Vietnam, it is estimated that there are more than 22 million residential units totally and every year there are more than 1 million more are being built. However, in some areas like Hanoi and Ho Chi Minh City, the housing supply still does not meet the demand due to population growth and rapid urbanization. Moreover, the limitation of construction techniques and the lack of urban management has led to the poor outcomes of housing quality in terms of indoor air quality, energy consumption, health and safety, and so on.

The research aims to develop design strategies for housing refurbishment project in Vietnam to achieve greater energy performance. The design strategies are investigated in different refurbishment levels. On the other hand, the cost-benefit analysis is also an important part to assess the application of a potential refurbishment action. Apart from the strategies, the research also establish a set of recommendations for the legalisation of energy efficiency regulation for private housing for the coming years.

**Research Methodology:** The research is conducted following the following steps:

- Literature review: systematically organize and compare housing typology, design strategies in different regions
- Develop refurbishment strategies based on literature review and case studies
- Simulate the results of the strategies in existing housing
- Validate and justify the effectiveness of different strategies.
- Summarize findings and propose recommendations.

**Key Publications:** Nguyen, P. (2016). Towards a sustainable plan for new tube houses in Vietnam. International Planning History Society Proceedings, 17(2).



**Phan Anh Nguyen**

PhD started in: 2015

MArch Environmental Design – University of Nottingham (UK) 2011

B.Arch Hanoi Architectural University (Vietnam) 2009

Promoter(s): Prof. Andy van den Dobbelsteen

Daily Supervisor(s): Dr. Regina Bokel

Email: [p.a.nguyen@tudelft.nl](mailto:p.a.nguyen@tudelft.nl)

Phone: 0638499226

**Main Question:** How can the refurbishment design strategies improve the energy performance of current existing housing in Vietnam?

**Deliverables:** end of year report, draft chapter 1, conference paper, interview report.

**Link:**

<http://dx.doi.org/10.7480/iphs.2016.2.1237>

**Updated:** November 2, 2016