



National Housing Authority



Energy and low income tropical housing

Energy and Low Income Tropical Housing: Summary of Baseline Data from Field Survey

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Introduction

- This research project will develop and disseminate methods to reduce energy consumption and carbon emission of low and middle income houses in tropical countries.
- The project partners comprise two institutions in East Asian countries (Thailand and China), two in East African countries (Uganda and Tanzania) and two in the United Kingdom.



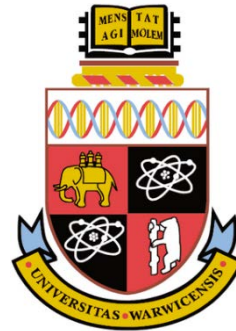
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Project Partners



The University of Cambridge



The University of Warwick



National Housing and Building Research Agency (NHBRA) Tanzania



The University of Nottingham Ningbo China



Uganda Martyrs University



King Mongkut's University of Technology Thonburi



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Project Personnel



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Project Work Plan

Work Plan 1 (WP1):
Operational Energy and
Architectural/Urban
Design

Work Plan 2 (WP2):
Embodied Energy and
Building Materials

Work Plan 3 (WP3):
Disseminating Good Energy Practice Relating to
Tropical Housing

Schedule of WP1

Implementation Plan	2013		2014				2015				2016		
	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	
1. Literature review													
Development of the project work plan	↔		Work plan and Gantt chart										
Review of low income housing in Thailand		↔	A review report of low income housing in Thailand										
Review of low income housing in other countries			↔		A review report of low income housing in foreign countries								
2. Field survey													
Survey preparation			↔		Survey data sheet, measuring equipment and field survey plan								
Survey 1 (houses and condominium: National Housing Authority)				↔		Survey data (3 trips)							
Survey 2 (other detached houses)					↔		Survey data (2 trips)						
Establishment of current baselines						↔		Characteristics of low income house in Thailand and its energy baselines					
3. Energy efficient technologies for low-income houses													
System performance analysis						↔		Status of energy efficiency of house, energy use, and thermal comforts					
Development of energy efficient technologies						↔		Energy efficient technologies					
4. Development of Thailand energy rating and labeling scheme													
Identification of indicators for energy efficiency in design and end-uses of house and condominium							↔		Reports of identification and development				
Energy rating scheme							↔		Label (for new house)				
5. Testing implementation of the energy label scheme													
Preparation of experimental house	↔		↔		Experimental house and facilities					Testing results in actual house plan			
Physical experiments at Bang Khun Tien Campus				↔		Testing results from physical experiments					↔		
Label assessment (from house plans of National Housing Authority)							↔						
6. Progress reports													
Progress reports	←				Reports (3-month period)								

Field Survey - Summary



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Schedule of WP2

Implementation Plan	2013		2014				2015				2016	
	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun
1. Literature review												
Low income housing	↔		Work plan and Gantt chart									
Projects under National Housing Authority	↔		Report of review of background information about low income housing and information of the projects conducted by National Housing Authority									
Construction materials in Thailand	↔		Report of construction materials information in Thailand									
Relevant publications	↔		Report of Thai and foreign literatures									
2. Survey												
Study of construction materials database 1. Thai databases (MTEC, TGO, SCG) 2. Other databases (SimaPro, Bath U.)	↔		↔		Embedded carbon and energy of the available construction materials from Thailand and other databases							
Survey of construction materials 1. Common construction materials in Thailand 2. Other alternative materials			↔		↔		Lists of available and alternative construction materials in Thailand					
Proposal of Thailand 's construction material database					↔		↔		Report of construction material database of Thailand			
Survey of low income housing 1. Projects under National Housing Authority 2. others (regional houses)					↔		↔		1. Report of classification of low income houses under projects of NHA 2. Report of classification of low income houses in regional area			
3. Analysis												
Draft of low income house plans and B.O.Q									↔		Construction material database relevant to the project	
Calculation of carbon footprint of low income houses									↔		Carbon footprint of the selected low income houses	
Proposal of new house designs (low carbon, low energy, and climate change adaptation)									↔		New designs for low income houses	

Field Survey - Summary



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Topics of Presentation

1. Introduction
2. Results on house configuration, construction, family size, income and age distribution
3. Electricity consumption and indirect carbon emission
4. Lighting and daylighting
5. Thermal environment and thermal comfort
6. Embedded carbon
7. Conclusion