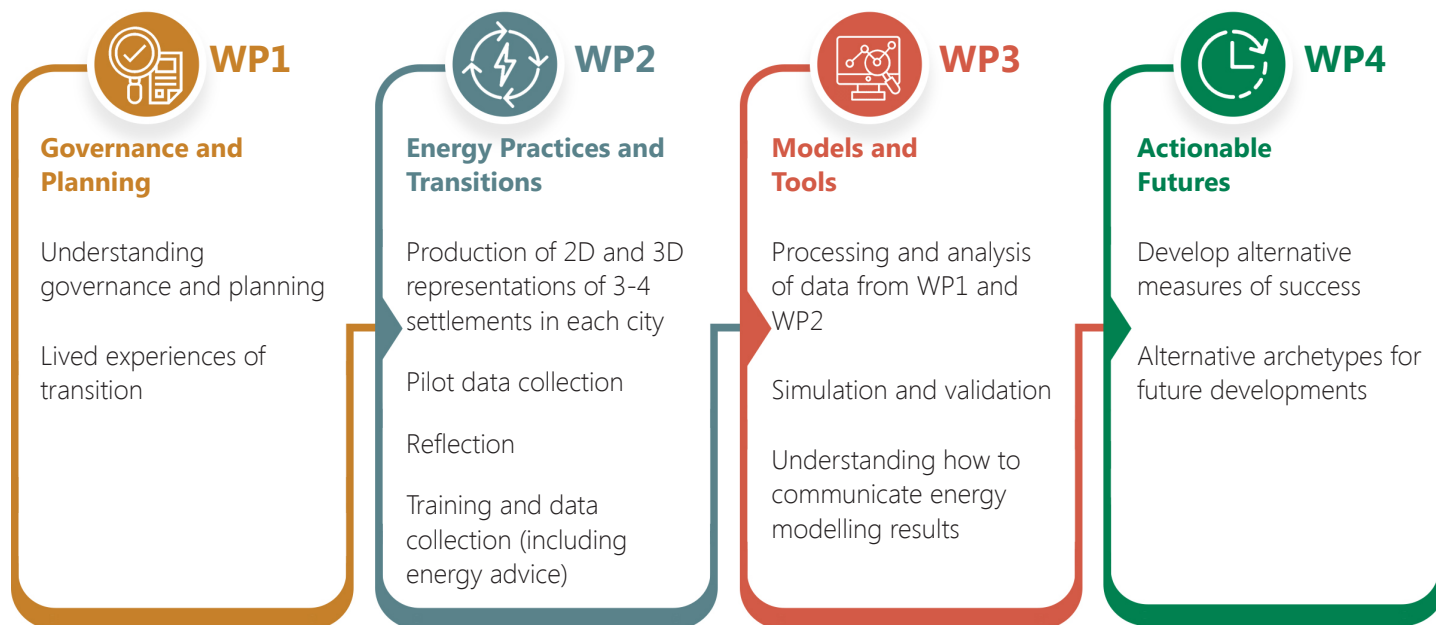# Grounded Energy Modelling for Equitable Urban Planning Development in the Global South (GEMdev)

Insecure and informal access to energy impacts on all aspects of life for poor communities living in sub-standard housing in the global South. Access to affordable, reliable and safe forms of energy services has particularly profound effects on health and economic opportunities. However, the ways in which these communities' access and use energy in their day-to-day lives are poorly understood.
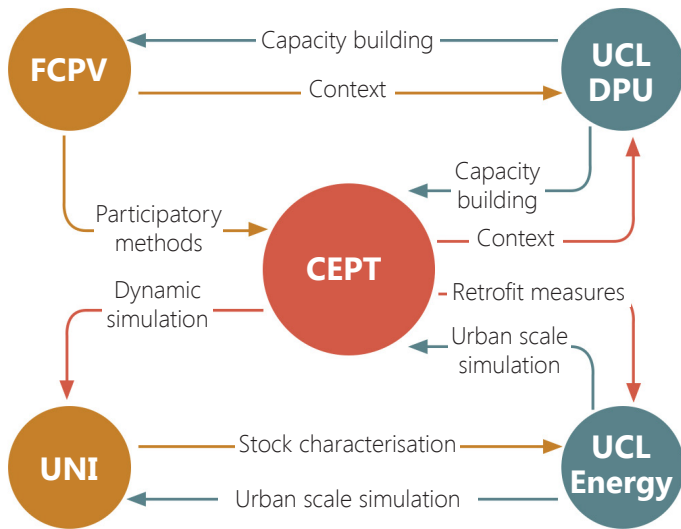
As data-driven approaches to energy planning, such as Urban Building Energy Models (UBEMs), gain increasing importance as planning tools, this lack of understanding risks further marginalising the most vulnerable communities as their needs are either entirely overlooked or planned solutions fail to address their needs.

Aims:

- To develop participatory methods with energy modelling expertise to ensure that no one is left behind.
- To enable inclusive decision making towards dignified housing and habitat for all through the co-production of methodologies and tools to inform alternative energy futures at three different scales - individual, neighbourhood and the city, in Lima and in Ahmedabad.
- To better understand the access and use of energy in the day-to-day lives of inhabitants focusing on the nexus between energy, comfort and housing in the cities of Lima and Ahmedabad.
- To examine how these practices change over time through different policies and processes related to low-income housing, such as consolidation, eviction, upgrading and relocation.

WP1

Governance and Planning

Understanding governance and planning

Lived experiences of transition

WP2

Energy Practices and Transitions

Production of 2D and 3D representations of 3-4 settlements in each city

Pilot data collection

Reflection

Training and data collection (including energy advice)

WP3

Models and Tools

Processing and analysis of data from WP1 and WP2

Simulation and validation

Understanding how to communicate energy modelling results

WP4

Actionable Futures

Develop alternative measures of success

Alternative archetypes for future developments

The project foresees and explains through the four largely sequential Work Packages (WPs)

Methodology

The project is fundamentally interdisciplinary and its participatory nature and the research process followed is itself an impact strategy that provides opportunities for non-academic research users - to state agencies and infrastructure utilities - to question assumptions on the access and consumption of energy and inform the design and application of grounded energy modelling.

Above figure illustrates the knowledge flows through which each of the participants in GEMDev contributes their specific expertise to build capacity and in turn benefits from the expertise of the partners as part of a process of mutual learning and support.

Expected Outcomes & Deliverables

- WP1 will establish a detailed understanding of the governance processes in both contexts – housing and energy.
- WP2 will produce 2D and 3D representation of 3-4 settlements in each city – Lima and Ahmedabad.
- WP3 will analyse and structure the data collected through WP1 and WP2 into datasets.

- WP4 will develop alternative measures of successful outcomes by drawing on the body of knowledge created through WP1, WP2 and WP3.

Partners

Funded by

Centre for Advanced Research in Building Science and Energy, CEPT University, www.carbse.org