

CLIMATE CHANGE & THE ENVIRONMENT

As environmental issues become an increasingly acute concern worldwide, Turkey is a country of prime interest in the field of climate studies. Due to its location, it presents an ideal opportunity for exploring and understanding climate development and the history of global environmental change within the context of contemporary international relations. Lake sediments, tree-rings, speleothems and peat deposits represent valuable natural 'archives' of environmental change that have been under-explored in both Turkey and the wider Black Sea region. This programme of research into the vegetation and climate history of the region focuses on changes in vegetation, water resources, landscape stability and hazards in Turkey, the Black Sea area and much of the wider Middle East over time. It also provides a key context of interaction concerning human use of the landscape from prehistory to the present day.

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Retrofitting existing housing stock to achieve CO₂ reduction targets

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Climate change has become a major global challenge as it reaches unprecedented levels. This has led to the declaration by major cities and countries around the globe of a climate emergency, and reducing carbon emissions remains the main means by which to tackle this situation. Various ways to achieve such a reduction have long been debated; these range from alterations in the behaviour of individuals, such as taking fewer flights, to more structural changes, such as the carbon-neutrality targets set by many cities. Despite these efforts and increasing public awareness of the need to reduce emissions, the built environment remains a key producer of carbon emissions, and it is perhaps one of the hardest elements to restructure in the short term due to its long-term use and fixed status.

The fifth assessment report of the Intergovernmental Panel on Climate Change (IPCC) reveals that buildings account for 32% of total global final energy use. Data reveal that 34% of global end-use energy consumption in residential buildings and 40% in commercial buildings are related to interior heating and cooling. Therefore, the IPCC recommends building retrofitting as a key priority in climate-change mitigation. Carbon emissions released by the existing building stock stand as a major barrier to climate-change mitigation in both developed and developing countries, particularly in terms of the need simultaneously to provide better living environments for inhabitants. This challenge becomes even more taxing with regard to older and historic buildings, as these are even harder to adapt due to limitations set by their age, structure and/or heritage status. The difficulties further expand as a consequence of

socioeconomic, geographic and climatic conditions, such as health issues due to damp homes, fuel poverty as a consequence of high energy and maintenance costs, and a higher carbon footprint due to relatively high energy consumption.

Reflecting upon these challenges, our research explores the problems experienced in existing housing stocks in Scotland and Turkey in terms of retrofitting for carbon-emission reduction. The project aims to identify and explore the problems and requirements of these two countries, while also determining the sub-actions of retrofitting requirements. We are considering alternative solutions and actions by creating reciprocal learning platforms for both locations. We are also comparing and contrasting common and differing problems related to retrofitting the existing housing stock in these contexts and their related policy solutions. These matters are being assessed through two case studies: one focused on the city of Glasgow and the other on the Kadikoy municipality of Istanbul. These locations offer a sound comparative basis in terms of their scale and the climate-change adaptation policies being adopted in each city.

Thus, expert workshops have been held in Istanbul and Glasgow in October and November 2019, respectively. The former was hosted by the Istanbul Policy Centre at Sabanci University and the latter workshop was hosted by the UK Collaborative Centre for Housing Evidence at the University of Glasgow. Experts from academia, the public service, civil society and architecture practices working on retrofit issues were invited to participate in these meetings. The workshops were half-day events, and included brainstorming



discussions of problems associated with retrofitting the existing housing stock for carbon-emission reduction, of solutions to these problems and of policy recommendations, as well as a networking lunch. The networking element of these workshops is of great value in terms of the participatory methodology employed by the research project, which aims to facilitate engagement and collaboration beyond academia.

The initial outcomes of the workshops demonstrate that there are both common and differing problems in the two contexts. Measuring energy consumption correctly and in a timely manner was identified as a key challenge in both locations. In the Turkish case, energy consumption data collection has been identified as a principal problem, due to conflicting spatial databases. In the Scottish case, on the other hand, data-related problems are more about real-time access to previously collected energy consumption data. Planning-related problems emerged as another common issue for both locations. Planning is considered to be a key area in which

solutions to retrofitting challenges can be produced. However, the top-down approach adopted in Turkey and the piecemeal approach identified in Scotland hinder this potential.

Tenure structure and property ownership patterns were identified as divergent issues. In Scotland, various tenures within the same district and buildings limit the intervention options for retrofitting housing for carbon-emission reduction. In Turkey, variegated tenure was not identified as a key issue, although private property ownership patterns remain a challenge in terms of the remit of local authorities to enforce retrofitting. Funding was identified as another divergent issue. This is a major challenge in Scotland, but not in Turkey. However, for Turkey, problems associated with the existing legal and regulatory frameworks were identified, and it was concluded that restructuring of these is required in order to develop a more effective retrofitting policy.

Common solutions also emerged from the discussions at the expert workshops. One that was particularly highlighted is that incentives are required in order to promote retrofitting in both locations. These incentives vary depending on the context and policies, and may include monetary incentives such as tax incentives or zero-interest credit provision for retrofitting costs. The need for better planning systems that enable local authorities to implement more comprehensive retrofitting policies emerged as another common solution from the two contexts. Therefore, a holistic planning approach is recommended as a solution to the organisational problems related to retrofitting the existing housing stock.

With the generous support of the British Institute at Ankara, this research project is revealing that the two locations in Scotland and Turkey share common difficulties but also face different challenges in terms of retrofitting existing housing stocks. This research offers us the opportunity to rethink retrofitting actions, with input from both developing- and developed-country perspectives. In addition, the project is also revealing potential future sub-research areas that could be explored through the involvement of different actors from both countries.

