

# Energy Efficiency projects in a living lab Higher Education Institution: a connection between sustainability and wellbeing

Dirk V. Franco <sup>1,2</sup>, Debby Cotton <sup>3</sup>, Arminda do Paço <sup>4</sup> and Marleen Schepers <sup>5</sup>

<sup>1</sup> *U Hasselt, Faculty of Science, dirk.franco@uhasselt.be*

<sup>2</sup> *PXL, Central Administration, Building dirk.franco@pxl.be*

<sup>3</sup> *Pedagogic Research Institute and Observatory (PedRIO), D.Cotton@plymouth.ac.uk*

<sup>4</sup> *University of Beira Interior apaco@ubi.pt*

<sup>5</sup> *PXL Tech marleen.schepers@pxl.be*

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Interest in strategic approaches to sustainability has been steadily increasing. After the birth of “environmentally sustainable development” (Brundtland commission 1987), there was the introduction of the millennium goals (2000), subsequently replaced by the Sustainable Development Goals (SDGs). This concept yields the opportunity to combine overall, regional and specific targets in combination with health and wellbeing improvements.

Greenhouse Gases (GHG) emissions linked to energy use in buildings are significant (6, 5% direct and 12% indirect) worldwide. Thus to be successful in the transition into the *Post Fossil-Carbon Society*, there is a need to reduce the energy consumption as well as to minimize GHG emissions (27% in EC by 2030). Energy efficient campus buildings not only save money, but also are more comfortable and contribute to a more effective learning environment.

PXL has initiated a customized postgraduate Energy Efficiency Services (EES), and has introduced sustainability into their professional (technical) bachelor courses as well as into teaching methods (curriculum renewal). Because of the EES, Energy Quick Scans (EQS) have been performed and the scope for the introduction of an Energy Performing Contract (EPC) is now studied. Plymouth University has long been a leader in sustainability education in the UK and is renowned for working towards a model of the sustainable university. Research on energy literacy forms a key part of these developments in collaboration with other UK universities as well as the University of Beira Interior (UBI). UBI has put significant work into conserving buildings with historical, cultural and architectural value, as well as revitalizing these into teaching and investigation spaces.

Data on students' energy-related attitudes and the effects of EE projects on their health and wellbeing will be collected through a survey of students. This will take the form of a self-administered online questionnaire, based on that used in the UK and Portugal (Cotton et al., 2015; 2016). The survey is made available to students via the institutional web-pages, and/or by direct emails from administrative staff. As well as assessing students' energy literacy, the instrument was designed to gather information about students' perceptions of the environmental practices of their institution in relation to energy use. Findings from analysis of this work will be discussed, alongside the introduction of this questionnaire in PXL. A preliminary comparison with the results of other HEIs in the UK and Portugal will be given.

The results suggest that students in different national and institutional contexts have differing attitudes and report undertaking different types of energy saving behaviours, as well as having differing perceptions of their own energy usage. The new data will be situated within the context of a rollout of this approach to other departments/buildings through the introduction of an EPC contract.

The interactions between the physical environment (buildings) and students' knowledge, attitudes and behaviours (energy literacy) form a crucial context for EE projects in higher education. The link between sustainability and wellbeing offers the opportunity to shift the attention of students in a HEI more to corporate social responsibility in combination with the SDGs.