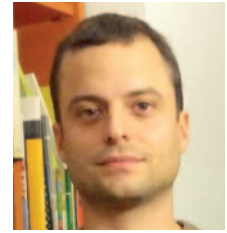


Energy renovation through RELS Methodology in Social Housing

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Abstract

RELS is a social housing retrofitting Project, funded up to 90 % by the EU¹.

The goal of the project is to build a database, a methodology of renovation and to implement it in case studies developed by the project partners.

AHC is responsible for the project coordination and is implementing the methodology in two case studies, Sant Adrià Building (Barcelona) and Taradell Building (60 km from Barcelona). The UPC team developed the methodology, structured in 6 phases: goal definition, initial state diagnosis and strategy, project, budget and contracts, work execution and quality control, final state diagnosis, analysis and goal redefinition.

An evaluation matrix has been generated, which defines the minimum goals for RELS, which are more ambitious than the current regulations and tend towards nZEB standard.

The matrix is built on 6 axes. The first 3 axes (CO₂ emissions, renewable energy and PE consumption) are indicators that refer to the building efficiency. They are built on the 20/20/20 targets of the 2010/31/EU². The other axes refer to energy bills vs. income, reliability of the analysis and Global Cost³ – Investment possibility.

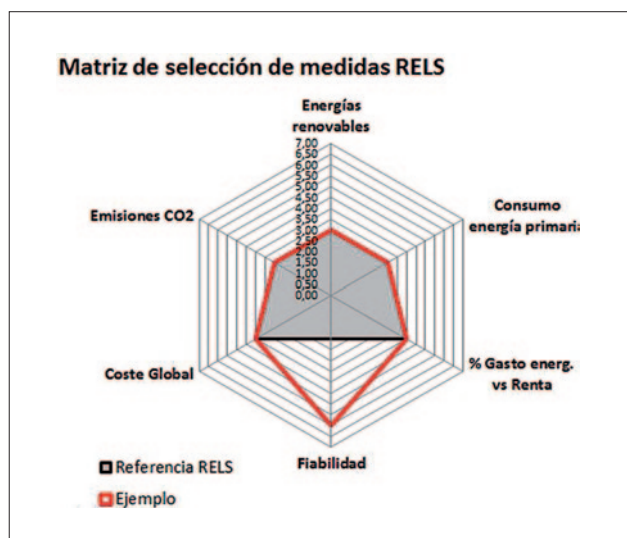
The verification matrix makes it possible to compare the actual conditions of the case studies. The Spanish cases, Sant Adria was closer to the RELS minimum goals than Tarradell. It was possible through the matrix to prioritize the necessary investment for the case of Taradell (75 %) and Sant Adria (25 %). The

two buildings were thoroughly analyzed, monitored, simulated and their occupants studied. Moreover, through the comparison of the two cases it was possible to recognize the situation of energy poverty in Taradell.

Through the comparison of the result matrix of the different scenarios, the best scenario (considering the relation between economic investment and yearly energy running costs) was chosen and implemented. The improvement scenarios were defined considering different options of investment in the management of the building and its system, and in passive and active improvements of the building. The different options and their combinations were evaluated together with the technicians of the AHC on the 2 case studies. Improvement “packs” were defined and ordered according to increasing investment costs in €/m².

The refurbishment has been carried out with all the improvement actions proposed in the scenario. Energy costs were reduced to less than the half of the costs of the original building and comfort conditions were drastically improved.

The two buildings are now again monitored, in order to compare the new actual conditions (inner temperatures, ppm of CO₂, energy consumption) to the simulated scenario and the initial conditions.



- 1) European Union, Border Cooperation Programme ENPI MED CT
- 2) Energy Performance Building Directive EPBD 2010/31/EU
- 3) Global cost according with the EU Methodology : COMMISSION DELEGATED REGULATION (EU) No 244/2012