Executive summary

RetroKit developed and demonstrated at three building pilots (Spain, Germany and Sweden), multifunctional, modular, low cost and easy to install prefabricated modules in order to significantly increase the EU retrofitting rate and contribute to EU energy reduction commitments. These innovative systems target existing multi-family residential buildings which represent more than 50% of the EU building stock and between 65% and 80% of its energy consumption.

RetroKit project brings the aspect of multifunctional façade and roof elements into the retrofit sector. Special integrated solutions have been developed which are dealing with the aspects of heating, ventilation, cooling, electricity and ICT in a flexible way. The key factors for RetroKit are the window element with a technical box taking in HVAC systems and interfaces for building services (ducting, piping) installed on the existing façade, and façade modules integrating ventilation systems, heat/cold supply systems, piping for heating and cooling, ICT and electricity, and photovoltaic, solar thermal and PV/T collectors into thermal insulation for façade and roofing solutions. To be attractive beyond affordability, multifunctional semi-prefabricated elements are developed which provides an opportunity to retrofit improving aesthetics, comfort, energy performance, and property value at the same time.

Partners investigated and identified negative factors that prevent positive retrofit decisions and the conditions, requirements, information, arguments and human factor aspects for the implementation of the retrofit toolbox. Monitoring and analysis of the results demonstrated the effects of the solutions on the inhabitants. Retrofitting components and technologies have been developed and characterized and tested in lab and real scale environment in parallel to the development of an optimised construction retrofitting processes that minimise intrusion, maximise work to the exterior and cavities of the building, reduce the time and cost of retrofitting, and increase safety. LCA and LCC analyses were also made. The findings are integrated in the RetroKit Toolbox, a real set of modular (semi)prefab solutions, supported by a software enabling decision for retrofitting options. Possible users, barriers, optimal market and marketing strategies have been coupled with an effective route for exploitation of the toolbox. Demonstration activities in Madrid, Frankfurt and Pitea allow for the verification and refinement of the entire RetroKit methodology (Figure 1), several selected developed technological solutions, and the appropriate construction processes.

RetroKit benefits (Figure 2) can be seen at different levels:

- at macro-level, by inducing important savings in terms of energy consumption and emissions and by increasing turnover for the benefit of the almost 3 million construction SMEs operating in building renovation with a consequent impact on job creation;
- as buying drivers for the apartment/building owners, as they can have clear economic savings in the energy bills and more attractive higher value properties, while at the same time avoiding the discomforts and burden often associated to retrofitting intervention;
- for the actors involved in the retrofitting supply chain, as new skills and profiles will be required, and new business opportunities can be generated.

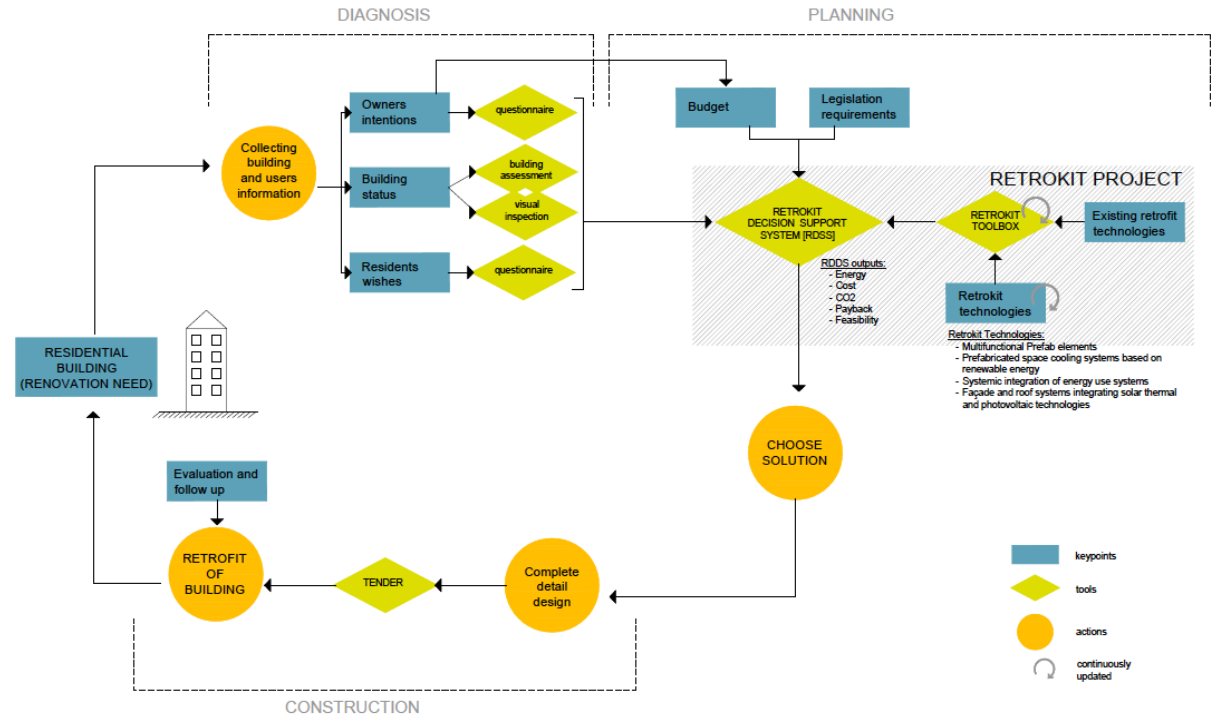

Figure 1 RetroKit Methodology

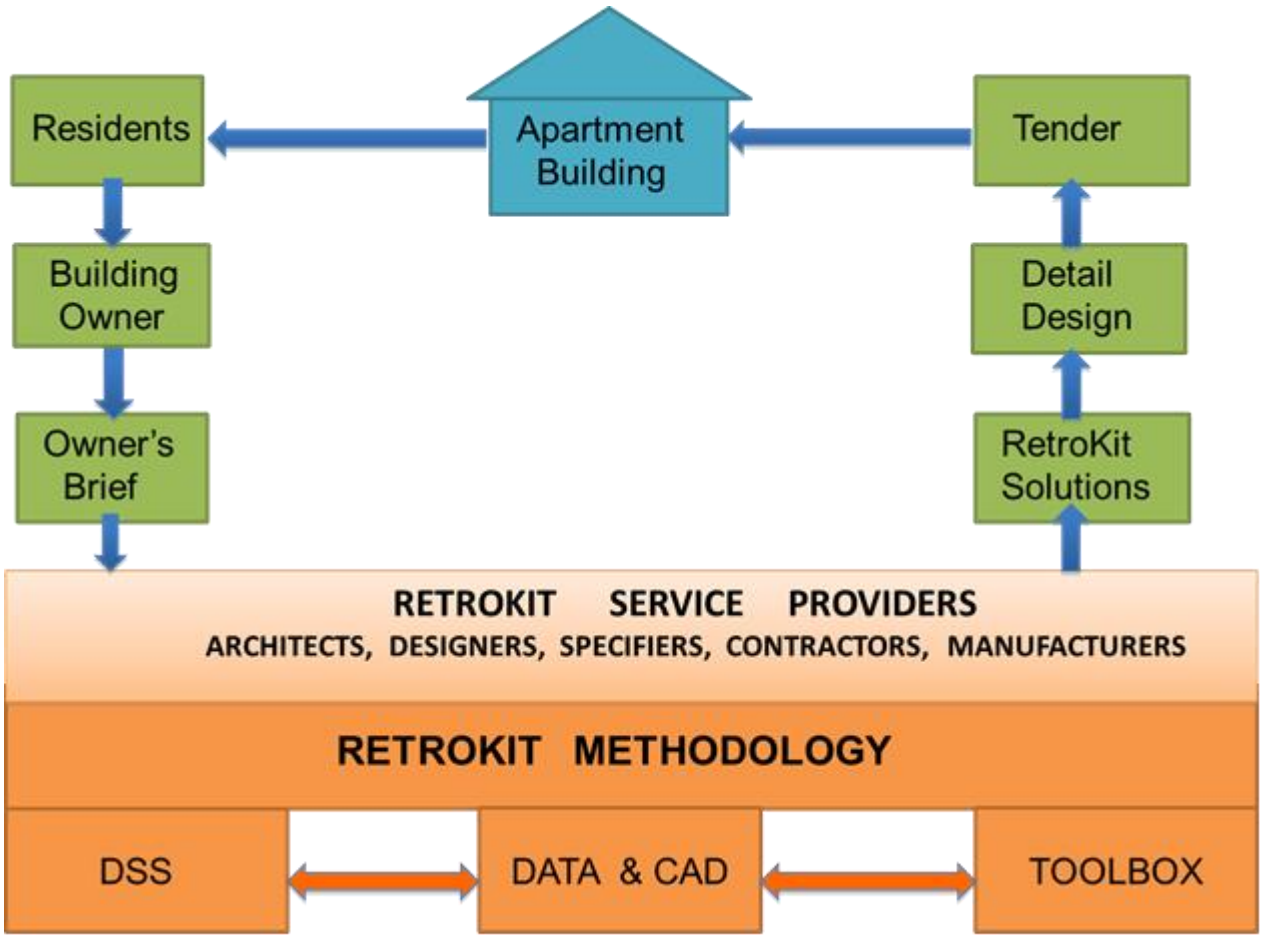

Figure 2 Exploitation scheme for RetroKit methodology