



## Project Fact Sheet

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### A System for Quality Assurance when Retrofitting Existing Buildings to Energy Efficient Buildings (SQUARE)

**Programme area:** SAVE, Social housing

**Status:** Finished

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**Objective:** To assure energy efficient retrofitting of multifamily housing with good indoor environment, in a systematic and controlled way.

**Benefits:** Improvement of the energy performance and indoor air quality of social housing apartments.

**Keywords:** Energy efficiency, multifamily housing, indoor environment, quality assurance, retrofitting

**Duration:** 11/2007 – 04/2010

**Budget:** € 862.722 (EU contribution: 50 %)

**Contract number:** EIE/07/093/SI2.466701



### Short description

The SQUARE project aims to assure energy efficient retrofitting of multifamily housing with good indoor environment, in a systematic and controlled way. To achieve this, a quality assurance (QA) system for retrofitting and maintenance has been adopted to conditions in several European countries and implemented in four pilot projects in Austria, Spain, Sweden and Finland. The QA system supports decision-making and ensures that the most suitable energy efficient retrofitting measures are chosen for each case. The QA system has been spread in several European countries by the use in pilot projects and in other renovation projects. The experiences from have been used to improve the QA system. The pilot projects act as good examples to inspire and encourage other multifamily housing owners and housing associations to carry through energy efficient retrofitting projects. A number of dissemination activities have been carried out in the project in order to spread knowledge and experience to owners, contractors, consultants, national authorities, municipalities, tenants etc. on local, national and international level.

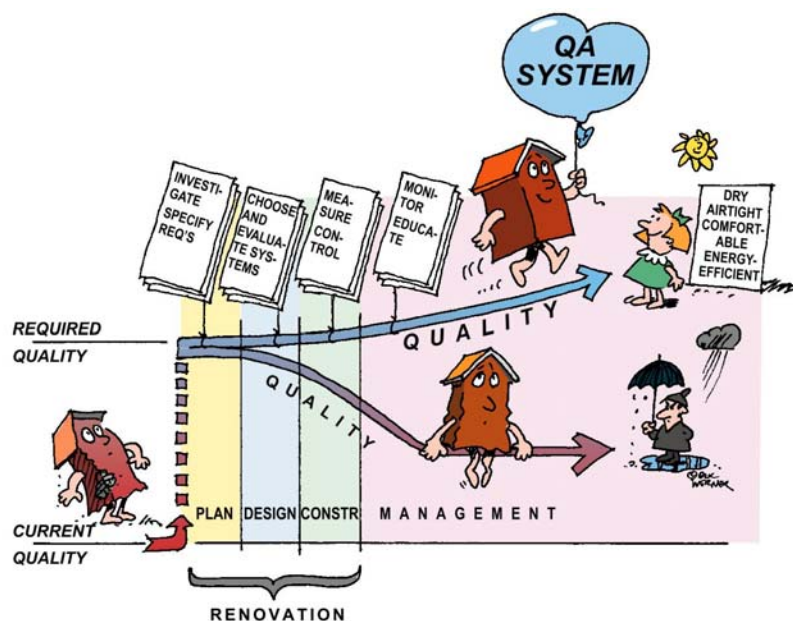
### Achieved results

- A quality assurance (QA) system has been introduced in the retrofitting process to ensure that the most efficient measures are chosen and that a high level of integrated energy and indoor environmental performance is maintained throughout operation of the buildings.
- Up-to-date knowledge, good examples of successful energy-intelligent solutions tailored to the multifamily housing sector have been collected from the participating countries and disseminated throughout Europe.
- A number of multifamily housing blocks in Austria, Finland, Spain and Sweden have been retrofitted to a higher standard of energy and indoor environmental performance by applying the QA system.

- Experience from pilot projects in the participating countries applying the QA system has been collected. The SQUARE project has provided visible and marketable data on savings and indoor air quality performance of the retrofitted pilot projects, which will be disseminated all over Europe and in international forums.

**Main conclusions and lessons learnt**

- A quality assurance system can not be forced onto organizations. If the organisation has an existing management system such as ISO 9001 or similar in place, the best thing is to integrate the new indoor environment and energy use aspects in the existing system and not create parallel QA Systems. If there is no existing system, the SQUARE QA system has all the basic elements of a quality management system. New elements must be customised to suit the organisations' culture, activities and routines. It can also be difficult to implement the QA system in those developments that involve several organizations, some of them having their own quality system and standard practices; in these cases, the principal developer must put special emphasis on communication with all the parties right from the beginning of the development, at the project design stages, so that eventual gaps in the parties' quality systems with respect to the SQUARE QA system can be identified and solutions planned in advance. Every organisation must find its own way to implement an effective QA system. It is better to start out with a modest ambition and increase it later than vice versa.
- Quality assurance is definitely an essential tool in the common efforts for improving the energy efficiency in the European building stock and this seems to be acknowledged by most parties, but as already mentioned the full practical implementation of a QA system is often difficult. Routines are carried out but documented feedback to the system, essential for the further improvement of the processes, is often missing. There is a need for a guideline to help the organisations to understand the practical implication content of the QA system. The guideline document shall contain examples of checklists, templates, routines, questionnaires etc that can help organisations adopting the QA system. The guideline must be adjusted to suit the local conditions in the respective countries and be written in local languages. We believe that a general software tool or platform, compatible to the windows environment, tailor made for this particular application (QA system and guideline including checklists, templates etc in one package) and easy for the user to customize to his environment would contribute to breaking down this barrier.
- The potential for carrying through energy efficient measures, such as façade and roof insulation, changing windows, changing heat and ventilation system etc. vary a lot from country to country due to different conditions when it comes to ownership, building regulations, climate etc. There are, however good examples of energy efficient solutions for social housing reducing the energy use with 50-90%. Far reaching improvements in the energy efficiency during renovation most often requires thorough actions on the building envelope. But due to the high costs, this is not done unless the outer facade is damaged and need to be replaced. Effectively, this means the many large renovation projects will only reach part of the way in improving the energy efficiency, compared to the potential. Targeted support to new approaches in e.g. product and method development and dissemination of knowledge is therefore required if this is to become a standard ingredient in modern building renovation. It might be important to offer national subsidies for comprehensive retrofit actions. The housing associations should have help with PR if necessary – “do good things and talk about it”. Therefore good examples are needed to encourage other buildings owners to do energy effective retrofitting resulting in low energy use and good indoor environment.



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