

Quality Assurance for energy-efficient Construction and Retrofitting



HEIKE ERHORN-KLUTTIG

Fraunhofer Institute for
Building Physics
heike.erhorn-kluttig@ibp.fraunhofer.de



LINDA LYSLOW

Fraunhofer Institute for
Building Physics



HANS ERHORN

Fraunhofer Institute for
Building Physics

In the scope of the KfW funding programmes “Energy-Efficient Construction and Refurbishment”, loans and subsidies from federal funds are granted, provided that stricter energy requirements than specified in legal regulations are met. To check on the effectiveness of the funding programmes, KfW has developed a comprehensive quality assurance concept.

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Context

The German KfW Bank is one of the world’s leading promotional banks. On behalf of the federal government and the federal states it aims at improving the economic, social and environmental living conditions for people all over the world. Among other issues, its work focuses on funding programmes in the field of

energy-efficient construction and refurbishment of residential buildings, to create incentives for energy-efficient new constructions and retrofitted existing buildings. In this context, KfW strives to promote a higher energy standard of the implemented structural measures than stipulated by the legal requirements specified in the German Energy Saving Ordinance



QUALICheck responds to the challenges related to compliance of Energy Performance Certificate (EPC) declarations and the quality of the building works. Find out more at <http://qualicheck-platform.eu>.

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(EnEV) [1]. This complex matter requires special expertise, meticulous planning and correct implementation. For these reasons, KfW has developed a comprehensive quality assurance concept that comprises several closely integrated elements, which ensure the correct implementation of the funding standards. The key elements of the quality assurance concept include the quality control of the required documents, applications and verifications on the one hand and on-site quality assurance on the other. The required documents, applications and verifications must undergo plausibility checks and randomly selected inspections. For on-site quality assurance, however, it is mandatory to consult an independent expert as early as in the planning stage. The expert will accompany the builder right through to completion of the project.

Quality assurance in four project phases

The quality assurance system consists of closely integrated elements, which become effective during four phases and are designed to ensure the implementation of the KfW funding standards. In detail, these four phases are: project planning, filing the application and commitment, implementation phase and completion of the project as shown in **Figure 1**.

The individual elements that are comprised in the quality assurance system are as follows:

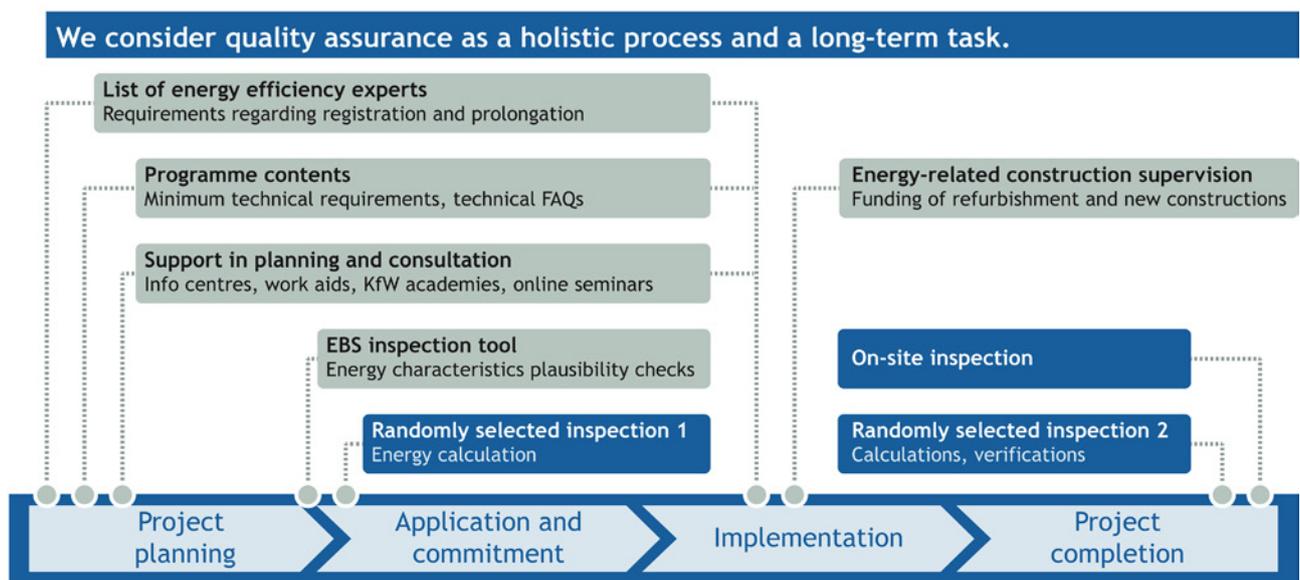
- Technical minimum requirements (programme boundary conditions)
- Obligation to consult an independent expert who is registered in the quality-assured list of energy-efficiency experts
- Automatic plausibility check (online) using the so-called “Energy-Efficient Construction and Refurbishment Inspection Tool” (EBS inspection tool)
- Randomly selected inspection 1 (random checks of the calculation documents)
- Funding of energy-related construction supervision conducted by an independent expert
- Randomly selected inspection 2 (random checks of the technical verifications and calculations)
- On-site inspection after completion of the construction work

Results of the on-site inspections

After completion of the construction work, KfW carries out on-site inspections in the scope of a random spot check, during which compliance with the Efficiency House standard and/or the technical minimum requirements is examined. These on-site inspections are coordinated by the German Energy Agency, “Deutsche

»» Quality assurance in the KfW programmes “Energy-efficient construction and refurbishment”

Instruments relating to the entire construction process



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Figure 1. Quality assurance scheme relating to the KfW programmes “Energy-efficient Construction and Refurbishment”, describing individual instruments applied during the entire construction process.

Energie-Agentur GmbH (dena)”. Coordination is based on cooperation with about 30 specialized inspectors who record all relevant data on site. An assessment procedure was developed especially for the analysis of these inspections to ensure standardisation of the process. By performing these on-site inspections, KfW also aims at increasing the quality awareness of all parties involved. Between 2013 and 2015, more than 1,300 residential buildings were subjected to an on-site inspection. This corresponds roughly to about 430 inspections per year and a sampling rate of about 0.3%. Based on the on-site inspections performed between 2013 and 2015, KfW gained the following insights [2]:

- In the case of both KfW Efficiency Houses and KfW individual measures, the quality of planning and implementation is high
- In the case of KfW Efficiency Houses under refurbishment, the number of cases in which a KfW Efficiency House standard was not achieved and cancellation followed, has declined to 3%
- In the case of new constructed KfW Efficiency Houses, the number of cancellations has increased to 5%
- Risks for non-compliance with programme requirements result from:
 - Calculation errors
 - Modifications in the construction progress that have not been compensated for
 - Absence of compliance verification documents

The results confirm that quality assurance plays an important role in the entire planning and construction process.

Overall evaluation

The comprehensive quality assurance concept developed by KfW for ensuring and checking the effectiveness of its funding programmes “Energy-Efficient Construction and Refurbishment” is very elaborate and well-structured. The individual elements that are comprised in this quality assurance system are interrelated and become effective as early as in the planning stage. The examination covers the entire construction process right through to completion of the project. However, KfW’s quality assurance concept implies additional effort and additional expenditure for all parties involved. For instance, communication and the exchange of information and data among all stakeholders are vital for the successful completion of a construction project and must not be neglected. The quality assurance concept is not only useful for KfW - it is also beneficial for the builders to whom it provides additional security for their construction projects. ■

More information

More detailed information on the KfW quality assurance scheme [3] and similar schemes can be found at <http://qualicheck-platform.eu/results/fact-sheets/factsheets-by-date>

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