



D4.4. CRITERIA APPLICATION REPORT ON LATER-STAGE AND COMPLETED PROJECTS



QualitEE Project

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The QualitEE consortium comprises 12 partner organisations covering 18 European countries, an expert advisory board, including the European standards body CEN/CENELEC, and 59 supporters from major financial institutions, government bodies, trade associations and certification bodies.

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1 INTRODUCTION

During the project activities, quality criteria have been used *ex post* and applied to later-stage and completed projects. Feedback from later-stage and completed projects was collected. The aim of the later-stage pilot projects was to test technical criteria and financial guidelines in real life conditions before work with new pilots begins. Later-stage projects are projects where the client or ESP was contacted by the QualitEE partner after the procurement phase (contract already signed). This could also include completed projects. At least one later-stage project from each country was analysed and quality criteria were applied.

2 DESCRIPTION OF LATER-STAGE PROJECTS

Later-stage pilot projects gave us the opportunity to test technical and financial criteria *ex post* and to collect valuable feedback in real life conditions. Depending on investment, projects vary from small to large and they come from different sectors. The analysed later stage projects are listed in Table 1 below.

Table 1. Analysed later-stage projects

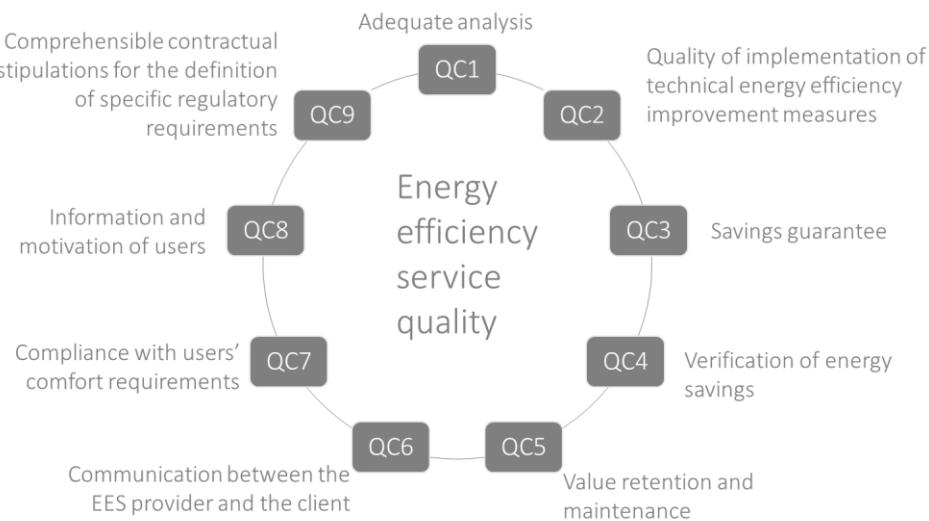
| Country | Sector | Investment, EUR |
|----------------|--|-----------------|
| Austria | EPC – Industry | n/a |
| United Kingdom | EPC – Hospital building (HVAC, lighting, control) | ~ 6 600 000 |
| Slovenia | Health centre and primary school | ~n/a |
| Germany | Energy delivery contracting | ~ 10 700 |
| Greece | ESC - Upgrade of the lighting system for office building | ~ 20 000 |
| Latvia | EPC – Residential building | ~ 340 000 |
| Slovakia | EPC – Hospital building | ~ 530 000 |
| Spain | EPC – Hospital building | ~ 270 000 |
| Czech Republic | EPC – Prague Congress Centre | ~ 4 615 000 |
| Belgium | EPC – Office building (HVAC, heating) | ~ 1 400 000 |
| Bulgaria | Energy delivery contracting (heating system) | ~10 700 |

It was agreed that the general description of the pilot projects will follow the input data sets required in the EEFIG De-risking Database, which potentially allows including the QualitEE later-stage pilot projects in the De-risking Database. De-risking Database is an open source database of energy efficiency projects for performance monitoring and benchmarking. The database allows benchmarking the performance of QualitEE pilot projects against each other.

3 FEEDBACK ON QUALITY CRITERIA

Feedback from pilot projects was collected in the form of a questionnaire. It contained identical questions for each criterion and three open-ended questions to collect qualitative information. For closed questions a limited number of options were given, and respondents were asked to evaluate each technical criterion separately. All nine quality criteria impact categories and 38 technical criteria have been analysed. The impact categories are given in Figure 1 below.

Figure 1. Categories of quality criteria

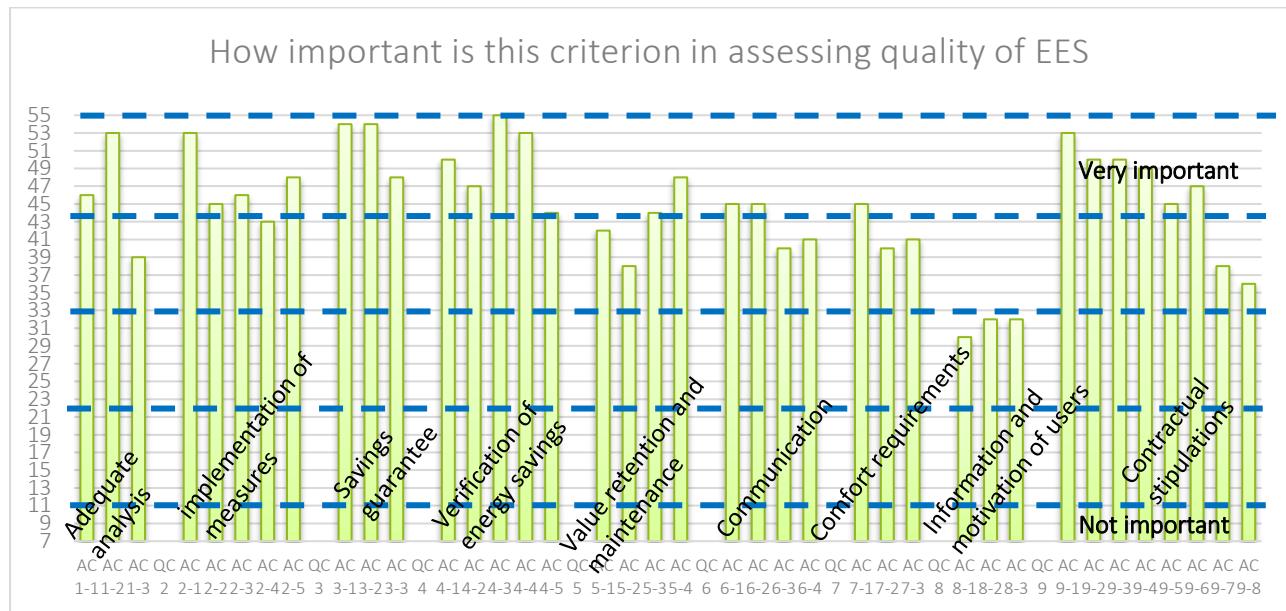


In total 11 later-stage projects from Austria, the United Kingdom, Slovenia, Germany, Greece, Latvia, Slovakia, Spain, the Czech Republic, Belgium, and Bulgaria have been analysed.

The main questions for each criterion are as follows:

1. How **important** is this criterion in assessing the quality of EES?
2. Is the criterion **specific** enough?
3. Is it possible to provide **evidence** (documents, references in contracts, measured data etc.) to assess the criterion?
4. How **time consuming** is the assessment of this criterion?

The first question was asked to evaluate how important the particular criterion is. Participants were asked to evaluate each criterion by rating it from 1 (not important) to 5 (very important). Their answers have been summarized in Figure **Error! Reference source not found.2**. We can see that QC3 (Savings guarantee) and QC4 (Verification of energy savings) were considered to be the most important categories. Impact categories QC5 (Value retention and maintenance) and QC8 (Information and motivation of users) were considered less important.

Figure 2. Importance of criteria

The following criteria were on average considered to be the most important for assessing the quality of EES:

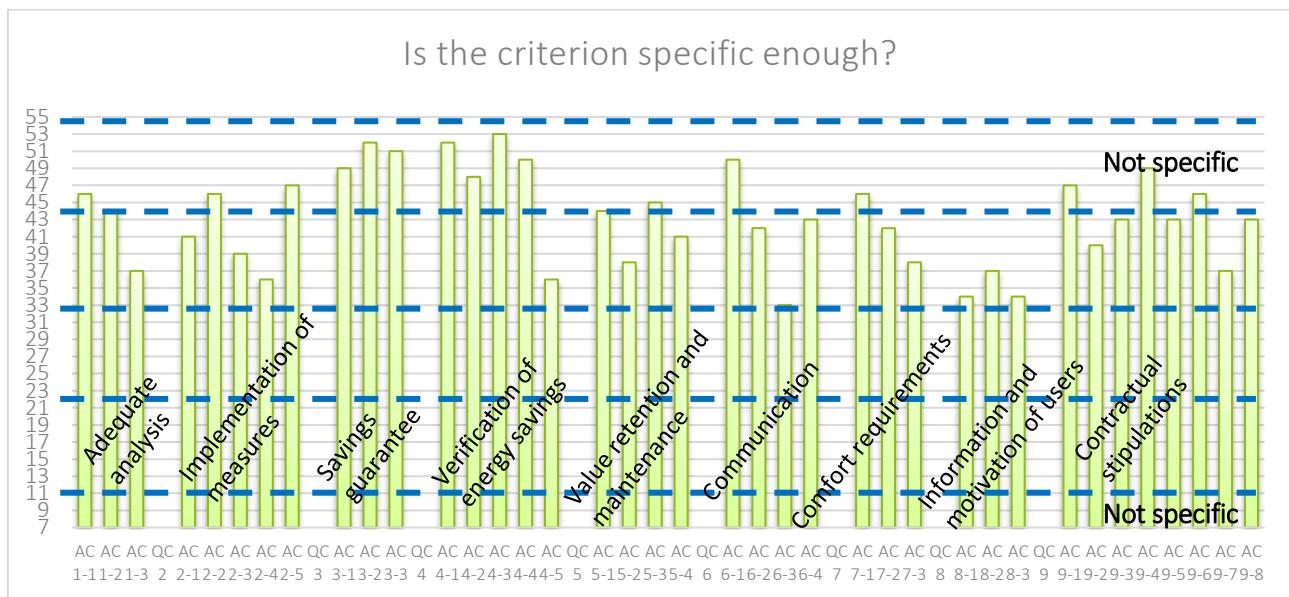
- AC 1-2: Adequate capturing of energy data and energy analysis;
- AC 2-1: Rendering of services in accordance with the applicable standards, statutes and approval conditions;
- AC 3-1: Dependency of remuneration on adherence with the savings guarantee;
- AC 3-2: Guaranteed savings achieved;
- AC 4-3: Clear definition of the baseline (reference consumption);
- AC 4-4: Clear definition of the basis of adjustment of the energy savings calculation;
- AC 9-1: Ownership transfer.

These criteria were on average considered less important for assessing the quality of EES:

- AC 8-1: Development of a concept for the motivation of users;
- AC 8-2: Establishment of a suggestion scheme for clients to improve energy efficiency;
- AC 8-3: Provision of action-oriented information on the subject of energy efficiency.

As we can see, the criteria around user motivation have been rated less important; however, depending on the pilot project, some of those criteria have been widely evaluated in a range from not important to very important. Analysis of open-ended questions showed a similar pattern where some of the respondents indicated that the application of criteria depends on a specific project, in particular regarding the criteria on information, motivation of users, and comfort. Similar comments were received regarding troubleshooting in the case of malfunctions of technical systems. User comfort is an extremely important quality criterion with, nevertheless, many difficulties in its determination and compliance assessment.

Participants were asked to evaluate each criterion by rating them from not specific (1) to very specific (5). Answers have been summarized in Figure **Error! Reference source not found.**3 below.

Figure 3. Specificity of criteria

On average QC3 (Savings guarantee) and QC4 (Verification of energy savings) were identified as the most specific categories of criteria. Criteria around QC8 (Information and motivation of users) were considered less specific.

The following criteria were considered to be the most specific:

- AC 1-2: Adequate capturing of energy data and energy analysis;
- AC 3-2: Guaranteed savings achieved (only applicable to Savings guarantee Type 1);
- AC 4-1: Application of a standardised method for calculating energy savings;
- AC 4-3: Clear definition of the baseline (reference consumption).

These criteria were on average considered not specific enough:

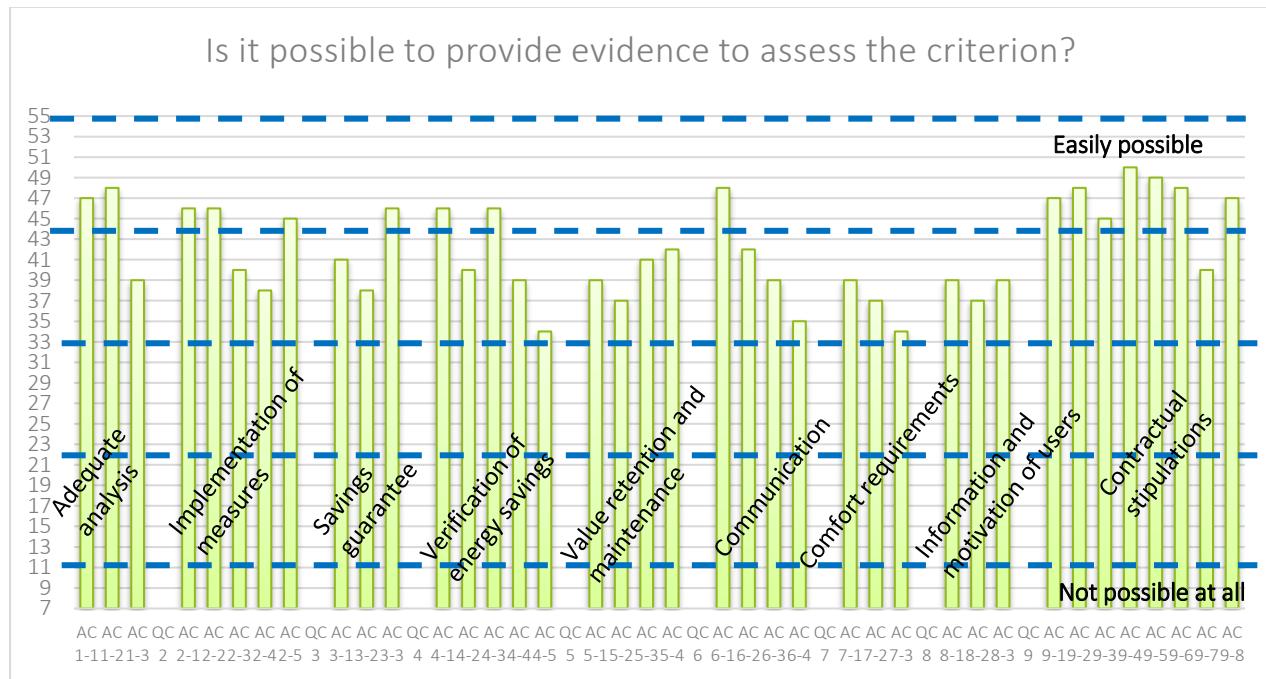
- AC 1-3: Adequacy of derivation from action recommendations;
- AC 2-4: Induction of users or operating personnel;
- AC 5-2: Easy troubleshooting in the case of malfunctions of technical systems;
- AC 6-3: Capturing and continuous updating of all EEI measures taken by the EES provider;
- AC 7-3: Assessment of user satisfaction;
- AC 8-1: Development of a concept for the motivation of users;
- AC 8-2: Establishment of a suggestion scheme for clients to improve energy efficiency;
- AC 8-3: Provision of action-oriented information on the subject of energy efficiency;
- AC 9-7: Permissibility of different types of financing (cession, leasing, forfeiting).

However, some of the respondents admitted that there is no need to indicate very precise standards or to provide reference values since precise requirements depend on the projects. For example, the best available technology or standard in the market is not always the most cost-effective solution – e.g. for criteria AC5-2 (Rapid troubleshooting in the case of malfunctions of technical systems), precise numbers should not be included as projects and requirements could be very different. Specific numbers could be used only as examples to demonstrate the meaning and applicability of the criterion. For different services, different standards should be applied;

thus, the contracting parties should agree on specific standards. Different standards could apply to the same services as well, depending on needs and costs.

Feedback was also collected with the aim to evaluate the ease of availability of evidence – documents, references in the contract, measured data etc. – to assess a specific criterion. Respondents were asked to evaluate each criterion and the possibility to provide evidence by rating each criterion from not possible at all (1) to easily possible (5). The answers have been summarized in Figure 4.

Figure 4. Availability of evidence



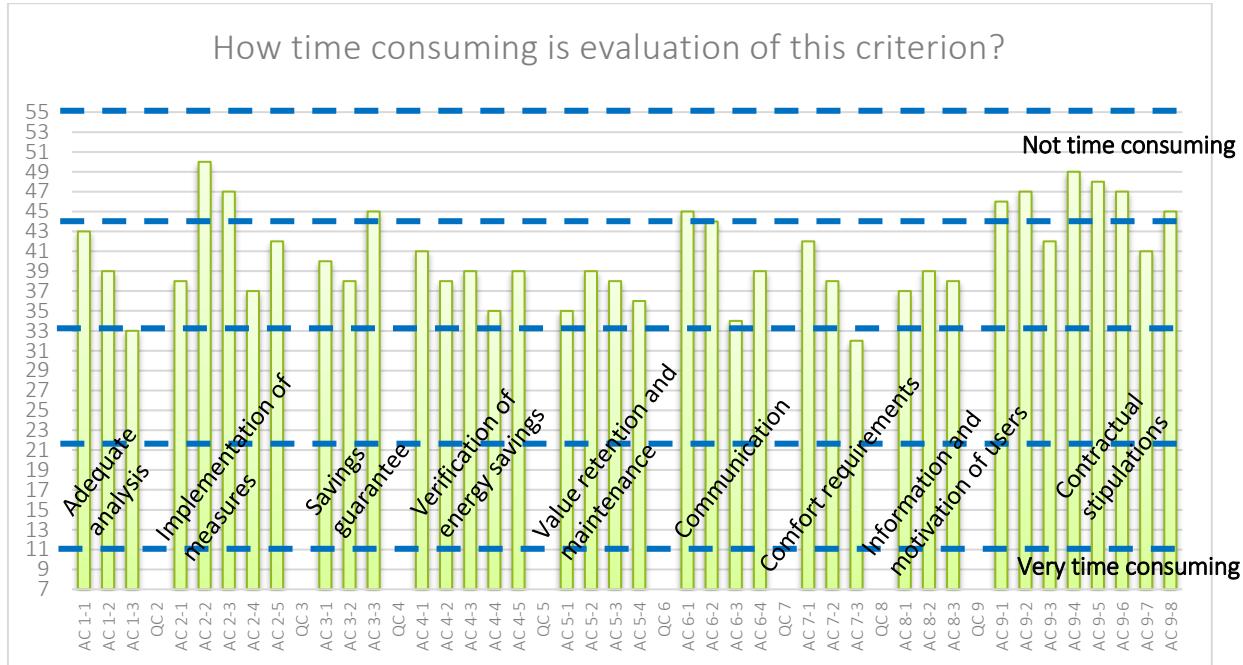
On average respondents admitted that it is easy to provide evidence for the criteria category QC9 (Comprehensible contractual stipulations for the definition of specific regulatory requirements) because these criteria can be checked in the agreements while it is more difficult to provide evidence for other criteria. The following criteria were considered difficult to provide evidence for:

- AC 4-5: Transparency and agreement of M&V processes and related responsibilities;
- AC 6-4: Organisational measures for committing internal operating personnel;
- AC 7-2: Regular verification of compliance with physical comfort parameters;
- AC 7-3: Assessment of user satisfaction.

Very often energy efficiency measures (new equipment or improvement of the facilities) can lead to both energy and financial savings and to improvements in comfort parameters, which should be somehow measured before and after the implementation of energy efficiency services. However, some respondents commented that user comfort is not often included as part of the EPC contract, even though it may be in the future. Although user comfort and satisfaction is a very important aspect, it is hard to measure and assess. There are requirements to comply with and maintain user comfort conditions but no ways of measuring these improvements as they happen.

When analysing later-stage pilot projects, respondents were also asked how time consuming is the assessment of each criterion. Respondents rated each criterion from very time consuming (1) to not time-consuming (5). Answers have been summarized in Figure 5 below.

Figure 5. Time taken for evaluating criteria



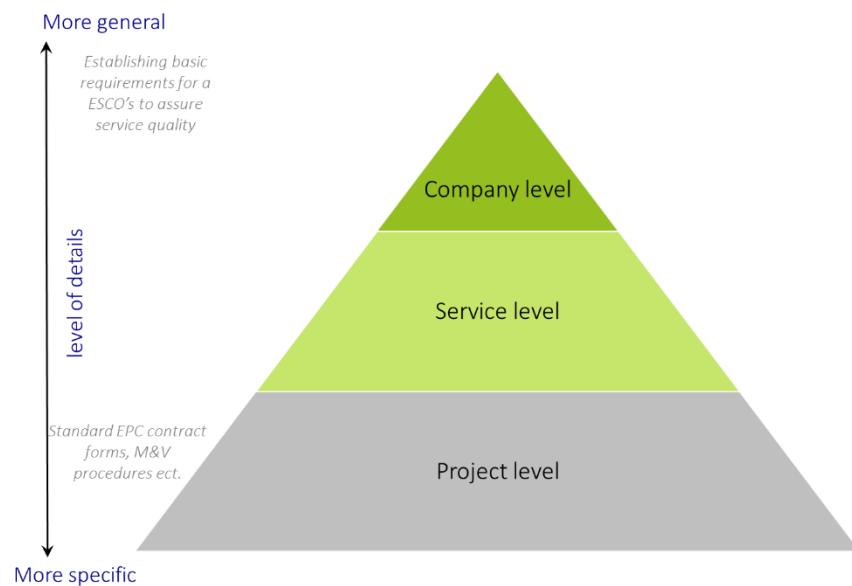
According to the respondents, the most time-consuming criteria for the assessment are the following:

- AC 1-3: Adequacy of derivation from action recommendations;
- AC 2-4: Induction of users or operating personnel;
- AC 4-4: Clear definition of the basis of adjustment of the energy savings calculation;
- AC 5-1: Compliance with the required system availability;
- AC 6-3: Capturing and continuous updating of all EEI measures taken by the EES provider;
- AC 7-3: Assessment of user satisfaction.

Respondents were also asked open-ended questions to collect qualitative information. The three questions were as follows:

1. Have we missed anything? List three significant issues you have recognized when applying criteria (if there are any).
2. Are there any other criteria that should be added? List up to three criteria.
3. Are there any criteria that should be removed?

Some respondents replied that environmental aspects are not covered by the existing criteria and could be introduced in the future. The *ex-ante* verification of many criteria could be stronger if the contract included not only the relevant obligations (which are currently specified in many criteria), but also what would happen in the case of non-compliance with the obligations. Respondents admit that the details of the criteria depend on whether quality is assessed at company-, service- or project-level. Requirements for criteria depend on the way in which they are intended to be used.

Figure 6. Requirements for criteria

For example, technical criteria can be used when assessing quality at service-, company- or project-level. The general requirements for criteria can be defined for a company and a more detailed description of the criteria is needed when they are applied at project-level.

4

CONCLUSIONS

Technical criteria were tested in real life conditions. The feedback collected from later-stage projects has shown that, to a large extent, the use and applicability of each criterion depends on the specifics of the project – type of services, sector, etc. However, building on the results and the collected feedback, we were able to identify some common conclusions:

- QC3 (Savings guarantee) and QC3 (Verification of energy savings) were identified as the most important categories in assessing the quality of EES. Some respondents stressed that the adoption of a simple monitoring and verification plan is very important and makes things easier at all stages of the project. Third-party assessment of the monitoring and verification of energy savings was also noted as important;
- Criteria around QC3 (Savings guarantee) and QC4 (Verification of energy savings) were identified as the most specific. Criteria related to QC8 (Information and motivation of users) were considered less specific;
- Several respondents suggested that, although questions about comfort are very important, they are not often included as part of the EPC contract. It is usually hard to measure and assess such quality criteria. Some respondents recommended distinguishing between mandatory criteria and the rest of the criteria, such as requirements on user comfort that could be applied only in specific cases.

Recommendations were also received regarding adding new or removing some of the existing criteria. Some respondents suggested adding aspects regarding project facilitators and requirements for companies and EES providers, for example the number of projects already implemented by the provider / supplier, qualifications, financial resources.

Suggestions were received to include more details regarding timescales and expectations of project management. Respondents noted lack of organized connection between different project implementation stages – improvements could be made in project management between the energy audit stage, the project sign-off stage, and the later stages of designing and execution. Many of the proposed quality criteria can be included at the design stage but during the process, the responsible parties are not able to implement what has been committed to, either in terms of the technologies, timescales, or M&V. Some respondents suggested improving or adding a more detailed description to project management expectations in QC2 (Quality of implementation of technical energy efficiency improvement measures) or QC6 (Communication between the contractor and the client).