D4.3 PILOT PROJECT APPLICATION REPORT - SPAIN

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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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Contents

1 INTRODUCTION ____ 4

2 DESCRIPTION OF THE PILOT PROJECT ____ 5

2.1 Pilot project factsheet ____ 5

2.2 Technical aspects ____ 6

2.2.1 Parameters of the photovoltaic installation 6

3 FEEDBACK ON QUALITY CRITERIA ____ 10

3.1 Importance of the criterion ____ 10

3.2 Was the criterion specific enough? ____ 11

3.3 How easy is it to provide evidence? ____ 11

3.4 How time consuming is the assessment of the criterion? ____ 12

3.5 Lessons learned from consultations and pilot projects ____ 12

1 INTRODUCTION

During the project activities, quality criteria have been applied for new projects. Technical quality criteria and Financial Guidelines have been applied in new pilot projects. Partners have provided support to clients or ESPs from the procurement phase until the first measurement and verification phase if possible. Report follows the pilot project implementation in quantitative and qualitative manner and extract lessons learned.

During this report pilot project are described and description how and which technical and financial criteria had been used. Feedback on the application has been collected with the aim to refine and improve operationalised technical quality criteria and financial guidelines and to provide real-world insights and advice on the establishment of national certification frameworks.

2 DESCRIPTION OF THE PILOT PROJECT

2.1 Pilot project factsheet

Project details:

- Spanish multimedia group in the communications sector
- Project stage - concluded
- Implementation of a solar photovoltaic system for self-consumption
- Clean energy produced that is consumed instantly, without injection into the grid

Table 1 Distributed generation from solar energy

Energy Consumption kWh	Renewable generation kWh	Demand coverage	Value of RES investment EUR
5.687.188	146.047	2,6%	74.751 €

Business case description/economic parameters

- Investment (VAT and IGIC included) of € 74.751
- Payback period of 4,7 years

Stakeholders/companies involved

Client - Spanish Communication company

Facilitator - CREARA CONSULTORES, S.L

Overview:
Solar power installation for self-consumption in the infrastructure of a multimedia company in Madrid, Spain.

Peak power:
97.2 KWp (240 PV panels with 360 Wp each)

Renewable generation:
146,000 kWh / year

Demand coverage:
2,57%

Annual carbon savings:
51,11 tCO_2 emissions per year

Annual economic savings:
15,133 €/year (savings)

2.2 Technical aspects

2.2.1 Parameters of the photovoltaic installation

Determination of PV power

In order to determine the power to install, different aspects have been considered:

- Regulatory environment. The project was executed in accordance to Royal Decree 244/2019, which classifies the type of installation and the capacity installed
- Power demand. CREARA carried out different simulations of PV power to be installed to determine, based on the demand of the installation, the degree of coverage of the demand reached with photovoltaic energy, and the percentage of PV generation absorbed by the installation itself.

In addition, it was deemed necessary that the PV installation allows an adjustment in fixed power costs according to the production of the plant.

Arrangement of PV panels

For reasons of orientation, use and architectural security, the roof was determined to be the optimal area for the installation of the panels.

For the installation of an estimated peak power of 100 kW a panel area of 610 m² was required and the proposed inclination of the panels was 10º with orientation -18º South (see Figure 1). Although such inclination produces approximately 7% less energy compared to an installation with a 30º inclination, the energy production is more than compensated as the power is increased due to the reduction of shadows and a shorter distance between rows.

Figure 1.Racking used to support PV panels

In total, 240 panels have been installed with a unit power of 360 Wp. The inverters will be placed near the secondary panel on the 4th floor of the building.

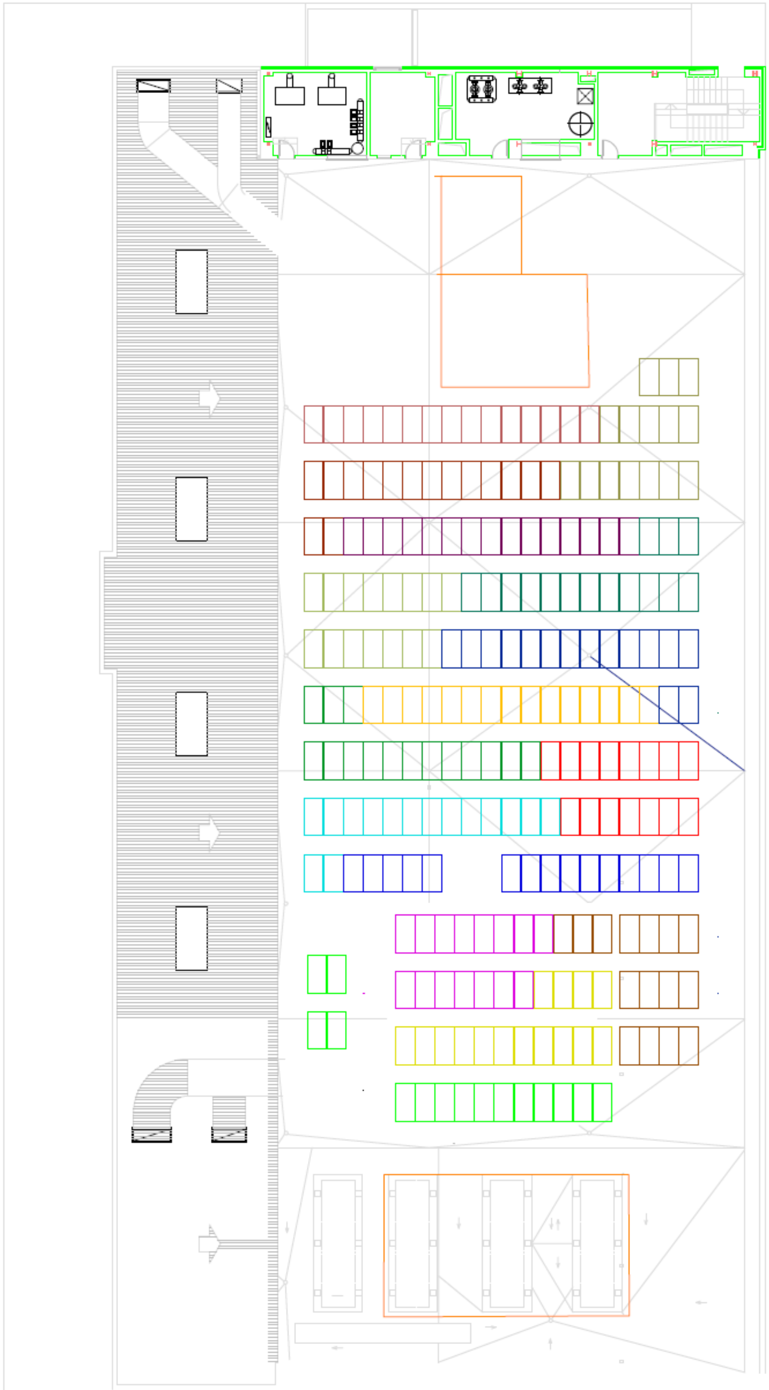

Figure 2.Arrangement of PV panels on the roof

Connection and single-line diagram

The panels are distributed in different "strings", groups connected in series. Considering that, the number of panels in series depends on:

- Maximum intensity and tension of the panels

- Maximum current and voltage allowed by the inverter
- Possibility of minimizing the intensity, to avoid energy losses

The following configuration (see Figure 2) has been chosen, with 1 string of each colour. Detail configuration follows:

Nº inverters	3
Nº strings/ inverters	5
Nº panels in series	16
Maximum PV voltage [V]	704
Maximum allowable voltage by the inverter [V]	1.000
Nº of panls/ inverter	80
Maximum intensity [A]	12,9
Maximum allowable intensity by the inverter [A]	30

The single line diagram of the PV installation connected to the CGBT is shown below (Figure 3):

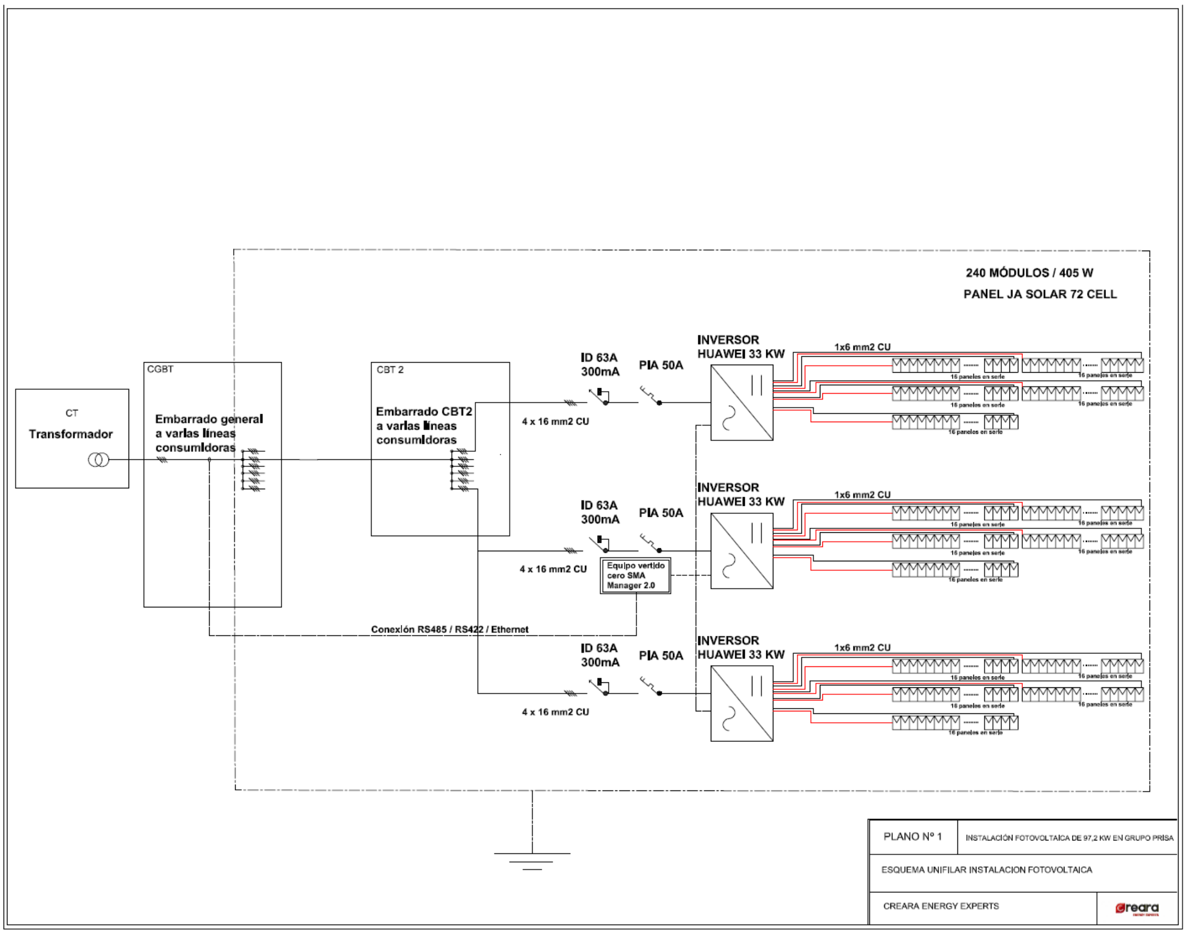

Figure 3. The single line diagram of the PV installed

Economic and environmental implications

The following economic study has been carried out:

Annual savings (€/year)	12,459
Revenue from solar energy produced sold (€/year)	N/A
Savings from power adjustment (€/year)	1,938
Savings in electric tax (€/year)	736
Total savings (€/year)	15,133
Initial investment (€)	61,777
Payback period	4,7

In addition, as the energy generated by the PV installation does not suppose the emissions of CO2 to the environment, the emission reduction is considered to be equal to the energy generated taking into account an emission factor of 0,35 kg CO2 / kWh emission factor. The annual carbon savings is hence 51.11 Ton CO2 / year.

3 FEEDBACK ON QUALITY CRITERIA

Feedback from pilot projects was collected in the form of a questionnaire. It contained identical questions for each quality categories and some open-ended questions to collect qualitative information. For closed questions a limited number of options were given, and respondents were asked to evaluate quality criterion category separately. All nine quality criteria impact categories have been analysed. The impact categories are given in Figure 2 below.

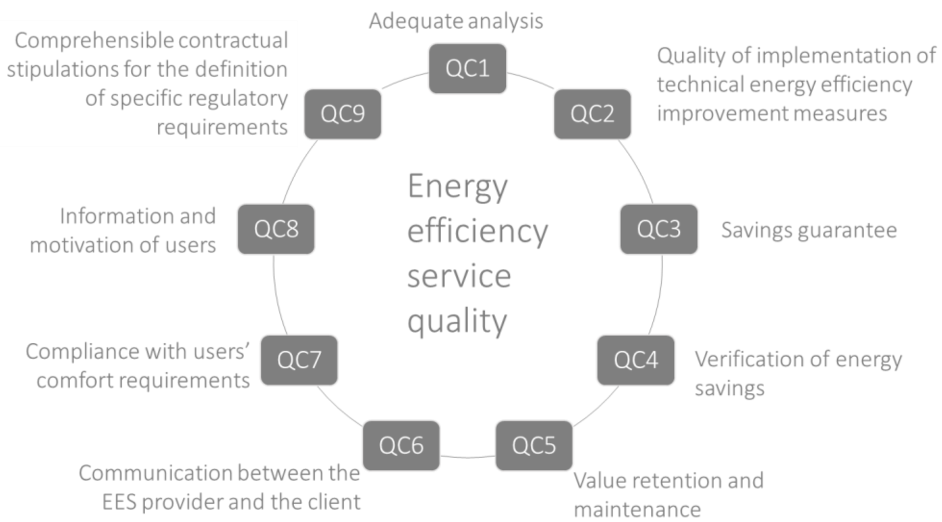

Figure 2. Categories of quality criteria

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?
5. How many criteria have been used in the project?

The first question was asked to evaluate how important the particular criterion is.

3.1 Importance of the criterion

The client was asked to rate the criteria in order of importance, with the three most important ones being:

1. QC2 – Quality of implementation of technical energy efficiency improvement measures
2. QC3 - Savings guarantee
3. QC1 – Adequate analysis

The clients also expressed they felt safety and health guidelines, or criteria were excluded from the QC developed, which they consider to be of the outmost importance. In fact the client required that an Specific Risk Evaluation was conducted which aims to reduce the risks of accidents at work and occupational diseases, as well as to diminish their consequences by virtue of compliance with Law 31/1995, of 8 November, on the Prevention of Occupational Risks, and the regulations that develop it. All of this determines the basic body of guarantees and responsibilities required to establish an adequate level of protection for the safety and health of workers.

3.2 Was the criterion specific enough?

In general, the QC is really thorough and considers the most relevant factors to be taken into account. In fact, a few of the subpoints of the QC were considered to be "nice to have's" rather than "must have's" in the implementation of the project.

3.3 How easy is it to provide evidence?

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 impact categories 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.

Overall, many of the elements were included in the contract, which helps provide evidence from the get-go and provides contractual obligations with which the executer complied.

Figure 4. Availability of evidence

3.4 How time consuming is the assessment of the criterion?

Respondents rated each impact categories from very time consuming (1) to not time-consuming (5). Answers have been summarized in Figure 5 below.

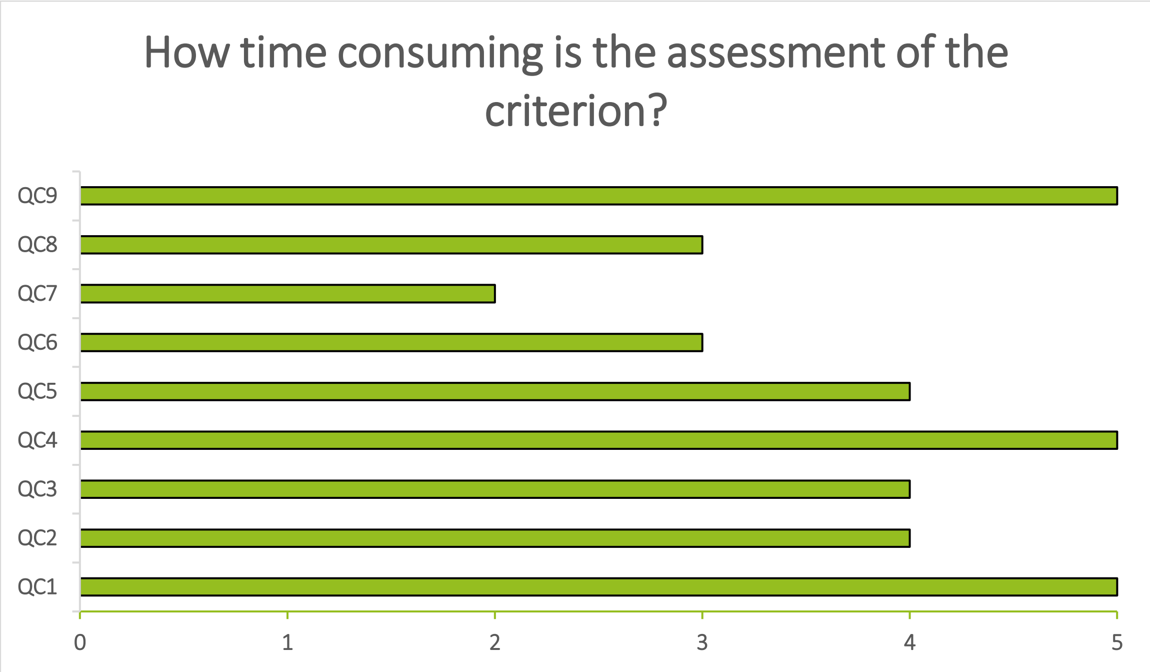

Figure 5. Time taken for evaluating criteria

3.5 Lessons learned from consultations and pilot projects

The main feedback received after the implementation of the project is listed below:

- The importance of safety and health is to be highlighted, as it is not only required by regulation but it also acts as a core part of PV project implementation
- Risk assessment and mitigation is key to smooth project delivery
- Also, compliance with regulation in general can indirectly ensure the implementation of QualitEE's QC