



## D4.3 PILOT PROJECT APPLICATION REPORT LATVIA

### PILOT PROJECT – GULBENE PV



## 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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## Disclaimer

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# 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:

- City council building: 2249,7 m<sup>2</sup>
- Roof size: 920 m<sup>2</sup>
- Electricity consumption in 2018: 142 MWh/year
- Renewable electricity from PV
- Forecasted electricity production: 49,60 MWh/year
- Capacity of the system: 54,60 kW;
- Approximate project costs: 85 000 EUR + VAT



**Table 1** Energy Consumption Data

Electricity Consumption BEFORE intervention (actual) kWh/a	Energy Consumption AFTER intervention (expected) kWh/a	Value of planned EE investment EUR
142 000	92 400 kWh	EUR 85 000 + VAT

#### Overview:

##### City council building

##### Annual carbon savings:

5,406 tCO<sub>2</sub> emissions per year

##### Annual energy savings:

49 600 kWh/year (35% energy savings)

##### Renewable generation:

49 600 kWh (Electricity)

#### Business case description/economic parameters

- 5-year Energy delivery contracting

#### Stakeholders/companies involved

- Client – The municipality of Gulbene
- ESCO – Imre Ltd.

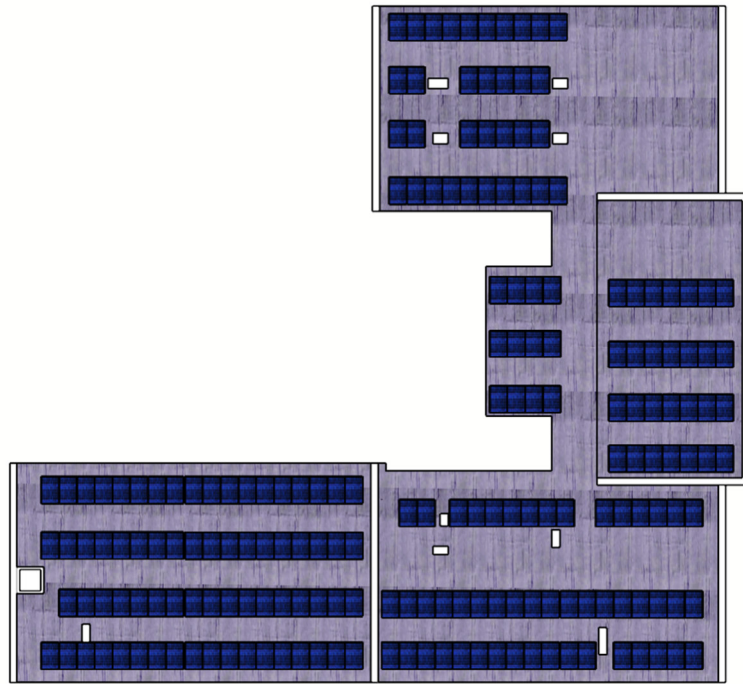
## 2.2 Technical aspects

### Building before renovation

Building	Municipal administrative building
Building Use	Council (Municipal) offices
Built	1962
Floor area	2249,7 m <sup>2</sup>
Roof area	920 m <sup>2</sup>
Electricity use	142 000 kWh

### Project aims & scope

Of all buildings owned by the municipality, the municipal administrative building on Abele Street 2 has the second largest electricity consumption, which tends to grow. The building consumes about 142 MWh of electricity during the year. The municipality of Gulbene plans to install a solar panel system with a total installed capacity of 54,60 kW<sub>peak</sub> but not more than 75 kW producing up to 49.6 MWh of electricity per year on the roof of the municipal council building (around 920 m<sup>2</sup> of roof area). The project as a whole should be carried out by 28 December 2020.



## Project implementation and communication

- ✔ A detailed project implementation plan has been developed. It focusses on the completion of the project, before 28<sup>th</sup> December 2020.
- ✔ During the project, the consultant evaluates the technical specification prepared by the municipality of Gulbene, carries out an assessment of the use of solar energy for the production of electricity, including:
  - supplement the contract template with the requirements for the energy development level to be achieved (the amount of electricity produced per year);
  - draw up an Annex to the Treaty on the procedures for measuring and verifying the requirements, taking into account climate indicators and sun radiation;
  - Assess the assembly of solar panels in accordance with the technical specification, technical design and the Treaty;
  - Determine the amount of electricity actually produced after assembly and adjustment, calculate the actual efficiency.
  - Performs system optimization consisting of an evaluation of the existing system and recommendations to improve it.
- ✔ The procurement contest was announced and won by the ESCO company Imre Ltd. on 25 November 2019 for 76 674,60 EUR. The financing of the project involves co-financing of the “Reduction of greenhouse gas emissions by smart urban technologies” of projects financed by the Instrument for the auctioning of emission allowances, amounting to a total of EUR 64 039.38 or 63%. Calculated payback time: 5 years with the support of the grant from National Fund (Emission Trading Instrument).
- ✔ There was a constant communication between the representative from the municipality of Gulbene and the representative of Ekodoma Ltd. in relation to the supplements to the tender relating to Energy delivery contracting.



### Savings guarantee and performance verification (M&V)

- ✔ Under this framework the savings guarantee is structured to run for at least 5 years. This means that the full value of the capital investment is protected under the guarantee.
- ✔ The applicant must install such a system to produce for a period of five consecutive years at least 49,60 MWh of electricity per year, provided that the average total solar radiation in a cut of 12 months, according to the measurements made by the Latvian Environment, Geology and Meteorology Centre, is at least 930 kWh/m<sup>2</sup>. If the total solar radiation in the Aluksne meteorodiostation is less, the condition for a minimum generation of electricity of 49,60 MWh does not apply.
- ✔ If the system installed does not produce for two consecutive measurement years the amount of electricity indicated in the tender at the average amount of radiation per year at least 930 kWh/m<sup>2</sup> in Aluksne, the applicant is obliged to carry out the capital repair of the installed system with his own resources to ensure that the system produces the amount of electricity indicated in the tender. Prior to the commencement of the capital repair, the applicant must submit a detailed repair plan to be carried out. After completion of the repair work and re-commissioning of the system, the warranty time report specified in the tender shall start anew.

### 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 the figure below.

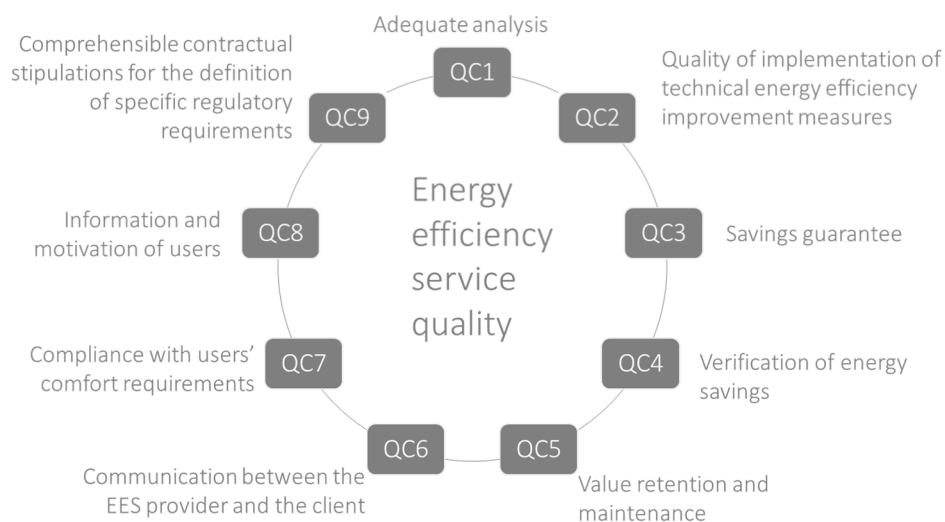


Figure Categories of quality criteria

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

Respondents were asked to identify the three most important criteria:

 Client:

Criteria category	The three most important criteria:
QC 1 ADEQUATE ANALYSIS	<ol style="list-style-type: none"> <li>1. Ordered regulatory framework</li> <li>2. Feasibility study — Specifications prepared by specialists for an existing situation with all data and results (X)</li> <li>3. Energy audit</li> </ol>
QC 2 QUALITY OF IMPLEMENTATION OF TECHNICAL ENERGY EFFICIENCY IMPROVEMENT MEASURES	<ol style="list-style-type: none"> <li>1. Ordered regulatory framework</li> <li>2. The standard for assessing the quality of equipment is uniform across the EU</li> <li>3. Qualifications of the performer of work</li> </ol>
QC 3 SAVINGS GUARANTEE	<ol style="list-style-type: none"> <li>1. Energy security has been developed</li> <li>2. There are defined exit data against which it will be measured</li> <li>3. Penalties have been imposed as a result of non-attainment of energy efficiency</li> </ol>
QC 4 VERIFICATION OF ENERGY SAVINGS	<ol style="list-style-type: none"> <li>1. Clear measurement by means of accounting apparatus</li> <li>2. Minimum level</li> <li>3. The difference between the margins to be achieved and the readings actually achieved is subject to a contractual penalty</li> </ol>
QC 5 VALUE RETENTION AND MAINTENANCE	<ol style="list-style-type: none"> <li>1. Definition of maintenance measures</li> <li>2. Determination of the responsible parties</li> <li>3. Establishment of conditions for the prevention of defects during the guarantee</li> </ol>
QC 6 COMMUNICATION BETWEEN THE EES PROVIDER AND THE CLIENT	<ol style="list-style-type: none"> <li>1. A single platform where both sides can follow the real-time situation</li> <li>2. Quick reaction of the Parties</li> <li>3. Non-metering of “responsibility ball”</li> </ol>
QC 7 COMPLIANCE WITH OF USERS’ COMFORT REQUIREMENTS	<ol style="list-style-type: none"> <li>1. Whether the measure affects comfort</li> <li>2. How to measure it</li> <li>3. What is the responsibility of the infringer</li> </ol>
QC 8 INFORMATION AND MOTIVATION OF USERS	<ol style="list-style-type: none"> <li>1. Information on energy savings</li> <li>2. Publishing good practices</li> <li>3. Financial motivation</li> </ol>
QC 9 COMPREHENSIBLE CONTRACTUAL	<ol style="list-style-type: none"> <li>1. The conditions are understandable to both sides</li> <li>2. Conditions are directly related to the work to be performed</li> </ol>

STIPULATIONS FOR THE CONTRACTING OF SPECIFIC REGULATORY REQUIREMENTS	3. Conditions do not conflict with national regulatory frameworks
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✅ ESCO:

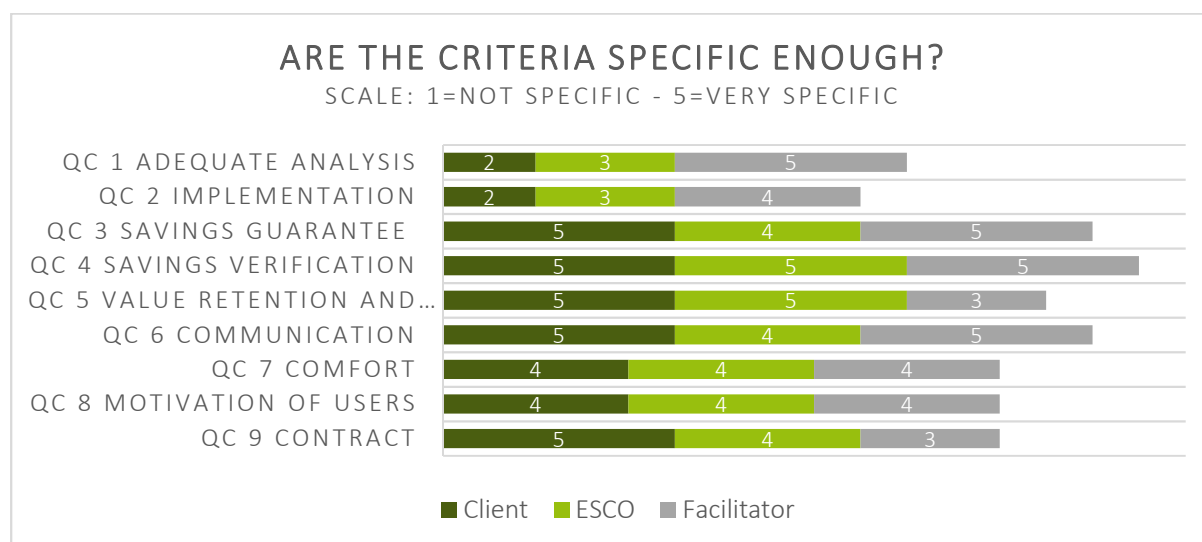
- QC 2 QUALITY OF IMPLEMENTATION OF TECHNICAL ENERGY EFFICIENCY IMPROVEMENT MEASURES
- QC 3 SAVINGS GUARANTEE
- QC 4 VERIFICATION OF ENERGY SAVINGS

✅ Facilitator:

- QC 3 SAVINGS GUARANTEE
- QC 4 VERIFICATION OF ENERGY SAVINGS

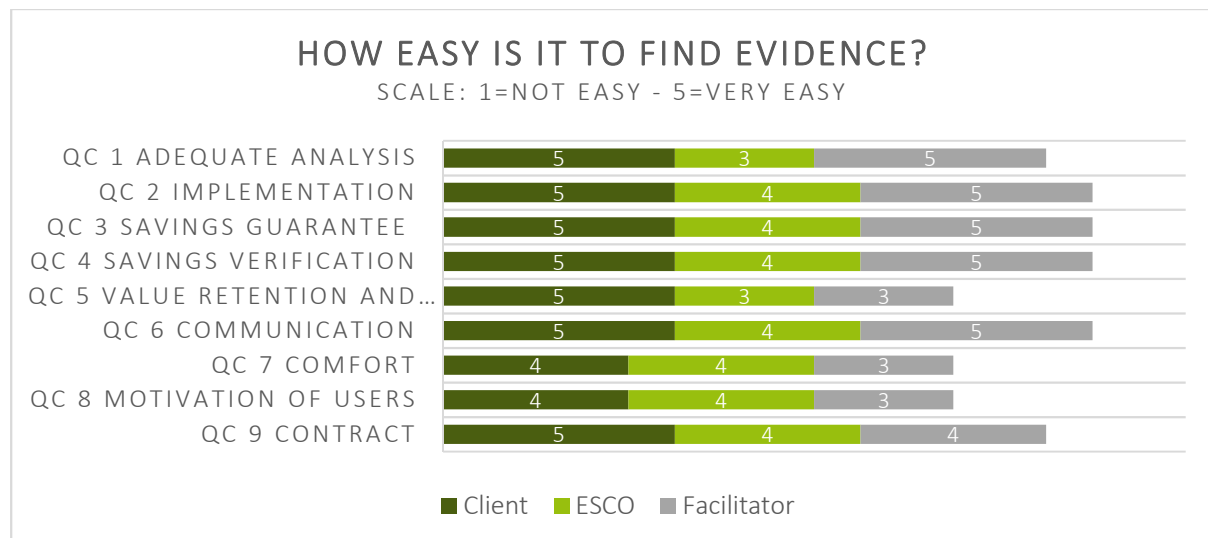
### 3.2 Are the criteria specific enough?

Participants were asked to evaluate each impact category by rating them from not specific (1) to very specific (5). Answers have been summarised in the figure below.



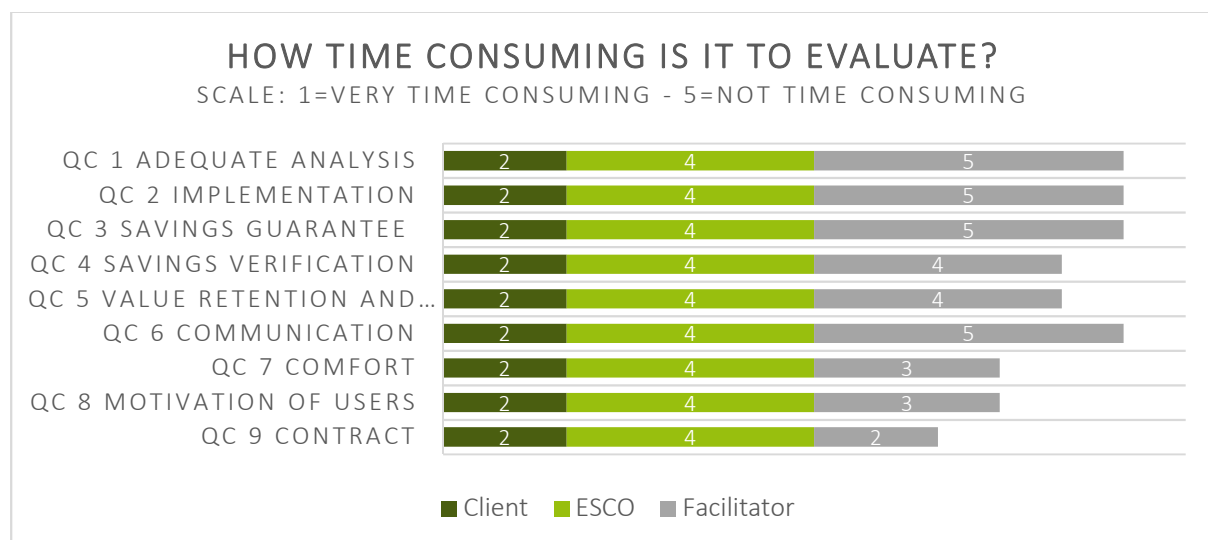
### 3.3 How easy is it to provide evidence?

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 summarised in the figure below.



### 3.4 How time consuming is the assessment of the criteria?

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



## 3.5 Barriers and success factors for the application of criteria

✔ How have the criteria been used in the pilot project?

The most important criteria used in this project are QC 3 SAVINGS GUARANTEE and QC 4 VERIFICATION OF ENERGY SAVINGS. This project successfully implemented 5-year Energy delivery contracting to ensure planned energy production. In the treaty it was determined that the applicant must install such a system to produce for a period of five consecutive years at least 49,60 MWh of electricity per year, provided that the average total solar radiation in a cut of 12 months, according to the measurements made by the Latvian Environment, Geology and Meteorology Centre, is at least 930 kWh/m<sup>2</sup>. As for energy savings verification, a verification methodology was drawn up which included the determination of the overall effectiveness of the system for 5 years.

✔ What are the possible barriers in using them?

One of the key barriers from the clients and ESCO perspective is the large number of criteria to evaluate. Especially difficult to evaluate the criteria was for the ESCO, because not all criteria apply to their responsibilities, there for it is hard to evaluate what you are not responsible for.

✔ Potential further applications for the criteria

The criteria can be used in the procurement documentation for the definition of quality requirements and in service/construction contracts. The criteria may be used to review the quality of the project and to assess the proposed options from ESCO. Such criteria help to verify the quality of the project prior to the commencement of work, thereby motivating other projects of this type, as well as increasing confidence in the participating sides.

The criteria help participants who may not be so experienced in carrying out such projects. The criteria can be used as a tool to explain the process, help understand what is important for a successful project, what problems to expect and how to ensure from them.

## 3.6 Lessons learned from consultations and pilot projects

### 3.6.1 Are all criteria relevant?

✔ Which criteria been used in the pilot project and how?

Clients side

- QC 1 ADEQUATE ANALYSIS: Feasibility study and Energy audit
- QC 2 QUALITY OF IMPLEMENTATION OF TECHNICAL ENERGY EFFICIENCY IMPROVEMENT MEASURES: The standard for assessing the quality of equipment is uniform across the EU, Qualifications of the performer of work
- QC 3 SAVINGS GUARANTEE: Exit data against which it will be measured was defined, penalties were imposed for non-attainment of energy efficiency

- QC 4 VERIFICATION OF ENERGY SAVINGS: Clear measurement by means of accounting apparatus, Minimum level; The difference between the margins to be achieved and the readings actually achieved is subject to a contractual penalty
- QC 5 VALUE RETENTION AND MAINTENANCE: Establishment of conditions for the prevention of defects during the guarantee
- QC 6 COMMUNICATION BETWEEN THE EES PROVIDER AND THE CLIENT: A single platform where both sides can follow the real-time situation
- QC 9 COMPREHENSIBLE CONTRACTUAL STIPULATIONS FOR THE CONTRACTING OF SPECIFIC REGULATORY REQUIREMENTS: The conditions were understandable by both sides, Conditions are directly related to the work to be performed, Conditions do not conflict with national regulatory frameworks

ESCO:

- QC 2 QUALITY OF IMPLEMENTATION OF TECHNICAL ENERGY EFFICIENCY IMPROVEMENT MEASURES
- QC 3 SAVINGS GUARANTEE
- QC 6 COMMUNICATION BETWEEN THE EES PROVIDER AND THE CLIENT
- QC 9 COMPREHENSIBLE CONTRACTUAL STIPULATIONS FOR THE CONTRACTING OF SPECIFIC REGULATORY REQUIREMENTS

Facilitator:

- QC 2 QUALITY OF IMPLEMENTATION OF TECHNICAL ENERGY EFFICIENCY IMPROVEMENT MEASURES
- QC 3 SAVINGS GUARANTEE
- ✔ Have we missed anything? List up to three (3) significant missing areas you have recognized when applying criteria?

Client:

- QC 1 ADEQUATE ANALYSIS: Economic justification of the measure

✔ Are there any other criteria that should be added? List up to three (3) criteria.

Nothing needs to be added.

✔ Are there any criteria that should be removed?

None of the criteria needs to be removed.

✔ How should the criteria be used?

Client

- QC 1 ADEQUATE ANALYSIS: Before planning the measures.
- QC 2 QUALITY OF IMPLEMENTATION OF TECHNICAL ENERGY EFFICIENCY IMPROVEMENT MEASURES: At the time of implementation.
- QC 3 SAVINGS GUARANTEE: Guarantees or other agreed period.
- QC 4 VERIFICATION OF ENERGY SAVINGS: Guarantees or other agreed period.
- QC 5 VALUE RETENTION AND MAINTENANCE: Guarantees or other agreed period.

- QC 6 COMMUNICATION BETWEEN THE EES PROVIDER AND THE CLIENT: Guarantees or other agreed period.
- QC 7 COMPLIANCE WITH OF USERS' COMFORT REQUIREMENTS: Before the project.
- QC 8 INFORMATION AND MOTIVATION OF USERS: In everyday life.
- QC 9 COMPREHENSIBLE CONTRACTUAL STIPULATIONS FOR THE CONTRACTING OF SPECIFIC REGULATORY REQUIREMENTS: If they are intended specifically to be attached, and If they can be obtained from them, for example, the security of contracting party.



## 4 CONCLUSIONS

Gulbene municipality is one of the first few municipalities in Latvia which will use solar energy to cover their municipal buildings energy needs. Solar PV panel system with a total installed capacity of 54,6 kW will cover up to 35% of their municipal council buildings electricity consumption needs.

Comments from the client:

"Currently, it is not very clear construction permits needed to install PV system for existing buildings. And at this moment there no clear quality guidelines from the industry to follow and to ensure needed efficiency. for client it was possible to learn how to include quality aspects in technical specifications, the development of construction documentation/agreement and how to plan M&V procedure"

It was found that the criteria were sufficiently specific and relatively easy to find evidence. How time consuming is evaluating the criteria dependent from the projects and documentation available. However, client found all criteria relatively time consuming to evaluate, while ESCO were in opposite opinion.

It was noted that criteria QC7 (Compliance with user's comfort requirements) and QC8 (Motivation of users) were not entirely relevant to this project as project deals with production of energy and most attention has been paid to efficiency guaranty for the installed system.

All criteria except from QC 7 (user comfort) and QC 8 (information and motivation to users) were used in this project. The most important criteria used in this project was considered QC 3 (saving guarantee) and QC 4 (verification of energy savings).

## 5 ANNEX – MEETINGS

Meeting date	Summary
02/06/2018	Kick-of-meeting Discussion about quality criteria and possibilities to apply them for solar PV project in Gulbene
11/12/2018	Discussion about procurement documentation and needs for energy baseline analyses
29/05/2019	Agreement about the pilot project and inclusion of criteria
21/08/2019	Energy audit for the municipal building and energy baseline analyses. Proposals for quality criteria for procurement and technical specification for contractor. Focuses on how to ensure certain energy efficiency indicators.
04/10/2019	Changes to the procurement documentation and review of possible technologies.
10/12/2019	Review of possible technologies and suppliers. Question from suppliers addressing question about energy efficacy guaranty.
14/02/2020	Questionnaire to client and ESCO. Analyses of results and feedback from the process in general.
20/02/2020	Summary of lessons learned, replicability and discussion about publication in national press.