

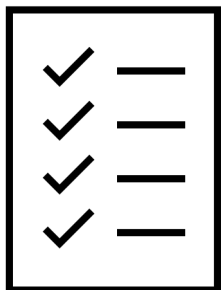
Technical workshop: Practical aspects of sustainable energy development in Kyrgyzstan

Quality control of energy performance certificates
Bishkek, October 6, 2023

Quality control of energy performance certificates – overall approach and main elements

Karolis Janusevicius, expert in energy audits, SECCA

THE CONTENTS OF PRESENTATION



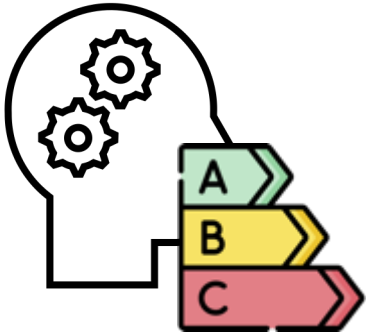
- How to understand quality control?
- What is the purpose of quality control?
- What are the key elements of quality control?
- What is the general process and levels of quality control?
- What can be done automatically?
- How to select EPCs for quality control?
- What aspects are checked manually?
- What is the purpose of the site visit?
- Additional follow-up actions after performing quality control?



HOW TO UNDERSTAND QUALITY CONTROL



The product or service is created



Quality control



Satisfied customer



Not satisfied customer



In simple terms – quality control should prevent or at least reduce the number of unsatisfied clients due to poor quality product or service

PURPOSE OF QUALITY CONTROL



The purpose of Quality Control processes in energy performance certification is to ensure the following elements:

Accuracy & Reliability:

Ensures certificates reflect true energy performance.



Consumer Protection:

Shields from misleading information, aiding in informed decisions



Reinforces Credibility:

By upholding local standards, the certification process boosts its trustworthiness among stakeholders.



Through rigorous Quality Control processes, we not only validate the energy performance of buildings but also safeguard consumer interests and reinforce the credibility of the certification system.

POSSIBLE ISSUES WITHOUT QUALITY CONTROL



**NO
QUALITY
CONTROL**

1. Lack of Trust and Credibility of EPC
2. Inconsistent Results in EPC
3. Potential for Misrepresentation of EPC
4. Reduced Incentive for Energy Efficiency
5. Economic Implications due to misguided investments
6. Regulatory Challenges due to quality variation
7. Reputation Risk of the EPC system
8. Barriers to International Collaboration
9. Missed Environmental Goals
10. Increased Long-Term Costs



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PURPOSE OF QUALITY MANAGEMENT SYSTEM



Energy performance certification (EPC) system -

is a framework combining **rules**, **processes** and **roles** that guide how energy performance should be evaluated. An overseeing institution ensures these EPC meet quality standards for effective outcomes.

Quality management system:

Part of the Energy performance certification system aims to ensure that energy EPC clients receive reasonable quality service, and that performance evaluation is reliable and replicable.

Embodies at least following functions:

- Check the quality (QC)
- Quantify the degree of quality of checked EPC
- Provide feedback to service providers
- Take action on those who are not able to provide reasonable quality

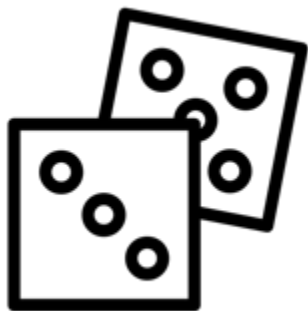


HOW EU EPBD DESCRIBES THE QUALITY CONTROL

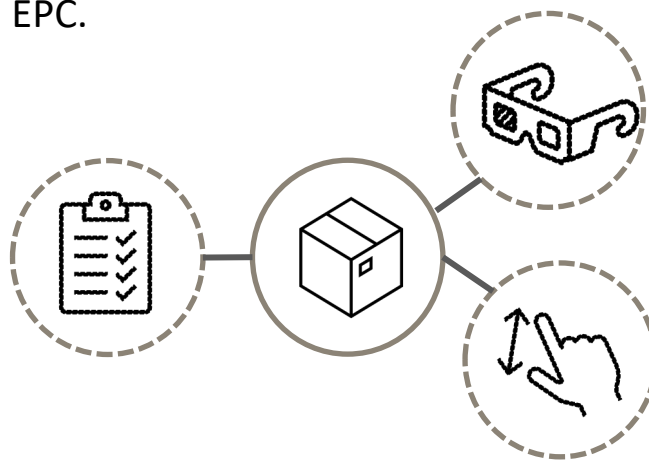


An **independent control system** (ICS) is a system that is designed to ensure the quality of energy performance certificates (EPCs). The ICS is independent of the experts who issue EPCs, and it is responsible for randomly selecting and reviewing EPCs to ensure that they are accurate and reliable. The key elements of an ICS include:

Random selection of EPCs for review: The ICS should randomly select EPCs for review and ensure that all certificates are being reviewed, regardless of who issued them.



Review of EPCs (VERIFICATION): The ICS should thoroughly review EPCs to ensure they are accurate and reliable. This includes checking the methodology used to calculate the energy performance of the building, as well as the accuracy of the data entered into the EPC.

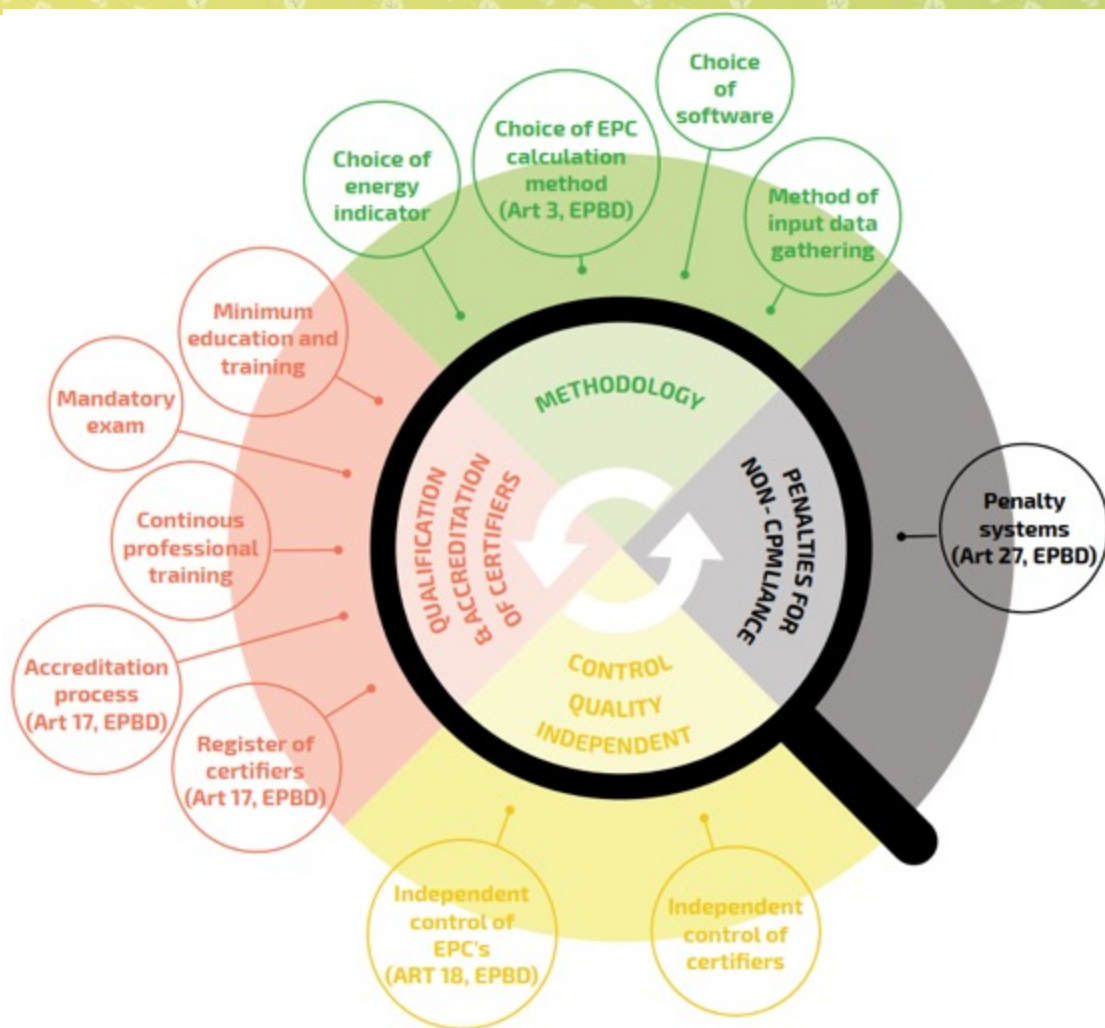


Effective sanctions: The ICS should have the power to take effective sanctions against experts who issue certificates that are unsatisfactory. This could include fines, the expert's license suspension, or legal sanctions.



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KEY ELEMENTS OF QUALITY ASSURENCE SYSTEM



QUALIFIED EXPERTS (QE) COMPETENCE

- What are the minimum requirements regarding training and professional experience for qualified and/or accredited expert? Is a mandatory training/exam required?
- What is the procedure for expert accreditation? Who is in charge of accreditation? How are the experts' skills taken into account?

CONTROL OF QE

- Is the official register of qualified and/or accredited experts publicly available?
- Is there a quality control mechanism in place? What are the penalties for non-compliance?
- Is there a programme of continuous professional development in place?

EPC ISSUING

- Which methodology is used for the EPC calculation?
- Is a verified software available on the market? Are the input data for calculation gathered onsite?
- Is the quality check of the EPC in the validation process?

EPC QUALITY CONTROL

- How is the system of EPC control organised? Who is in charge of controls?
- Is there an automatic check of input data in the software?
- How is the quality control organised? Does it take into account recertification of the EPC?

EPC REGISTER

- Does an EPC register exist? How is the process of data collection organised? What types of data are collected? Is there a public access to the EPC register?
- Who can access the EPC data? How is the EPC data used (when available)?



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Source: <https://www.bpie.eu/wp-content/uploads/2015/10/Energy-Performance-Certificates-EPC-across-the-EU.-A-mapping-of-national-approaches-2014.pdf>

ADDITIONAL NEEDS TO “CONTROL” THE QUALITY



Controlling the quality of Energy Performance Certificates (EPCs) is a complex task that requires a comprehensive approach. Here's what is typically needed to control the quality of EPCs effectively:

Transparent Processes and Methodologies

Comprehensive Review Mechanism of Legislation

Enforcement Measures
(control of the sector and the sanctions)

Public Accessibility

Data Management and Security

Integration with Other Systems

Continuous Monitoring and Improvement

Stakeholder Engagement

Adequate Resources

Quality control is a complex and resource-consuming task needed to unlock the benefits of the EPC system.



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THE PROCEDURES FROM THE PERSPECTIVE OF EPC ASSESSOR HAVE DIFFERENT RISK LEVELS TO INFLUENCE THE QUALITY



1. DATA COLLECTION



2. SITE VISIT



3. DATA APPROVAL



4. CALCULATION



5. RATING ASSIGNMENT



6. RECOMMENDATIONS



7. DOCUMENTATION



8. SUBMISSION

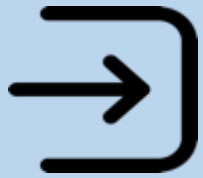
THE HIGHEST PROBABILITY FOR HUMAN ERROR AND FURTHER ISSUES IN THE NEXT STEPS

THE STEPS THAT COULD BE EASILY CONTROLLED BY DIGITALIZATION AND BY EMPLOYING THE SOFTWARE-BASED SOLUTIONS

THE RISK, THAT COLLECTED INFORMATION IS NOT DOCUMENTED AND LOST IN THE PROCESS



AFTER THE ASSESSOR SUBMITS EPC, THE QUALITY HAS TO BE CHECKED AND ASSURED



Certificates must be submitted and registered in public list



EPC reviewed for compliance, completeness, and data accuracy

Different levels of verification are going to be applied:



AUTOMATED CHECKS



Expert review



On-site Verification

Information is stored for public access

The purpose of quality supervision is to help EPC experts to improve the quality of their service and identify those, who refuse to follow the requirements by choice.

THERE MAY BE DIFERENT TIMES OF QC ACTIONS APPLIED DUE TO DIFFERENT AIMS



The EPC after completion:

1. The assessment procedure is **aiming to improve the quality of energy service before it is delivered to the client.***

2. The assessment procedure **aims to eliminate low quality service cases**, despite the delivery for the client.

3. The procedure which **observes the quality, indicates the level of quality and identifies areas for system improvement****

* Provides feedback for energy professional and reduces possibilities to deliver low quality product

**Identify the gaps in process, legislation and/or professional knowledge & Skill



0. Internal quality check may prevent to submit non-valid EPC



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LEVELS OF QUALITY CONTROL



1st level check

**Automated
Validation
(by software)**

According to EU best practices, described in EPBD:

(a) **validity check of the input data** of the building used to issue the energy performance certificate and the results stated in the certificate;

Based on
assumption that
information
collected by
assessor is valid



2nd level check

**Expert
check**

(b) **check the input data and verification the results** of the energy performance certificate, including the recommendations made;



3rd level check

**Site
visit**

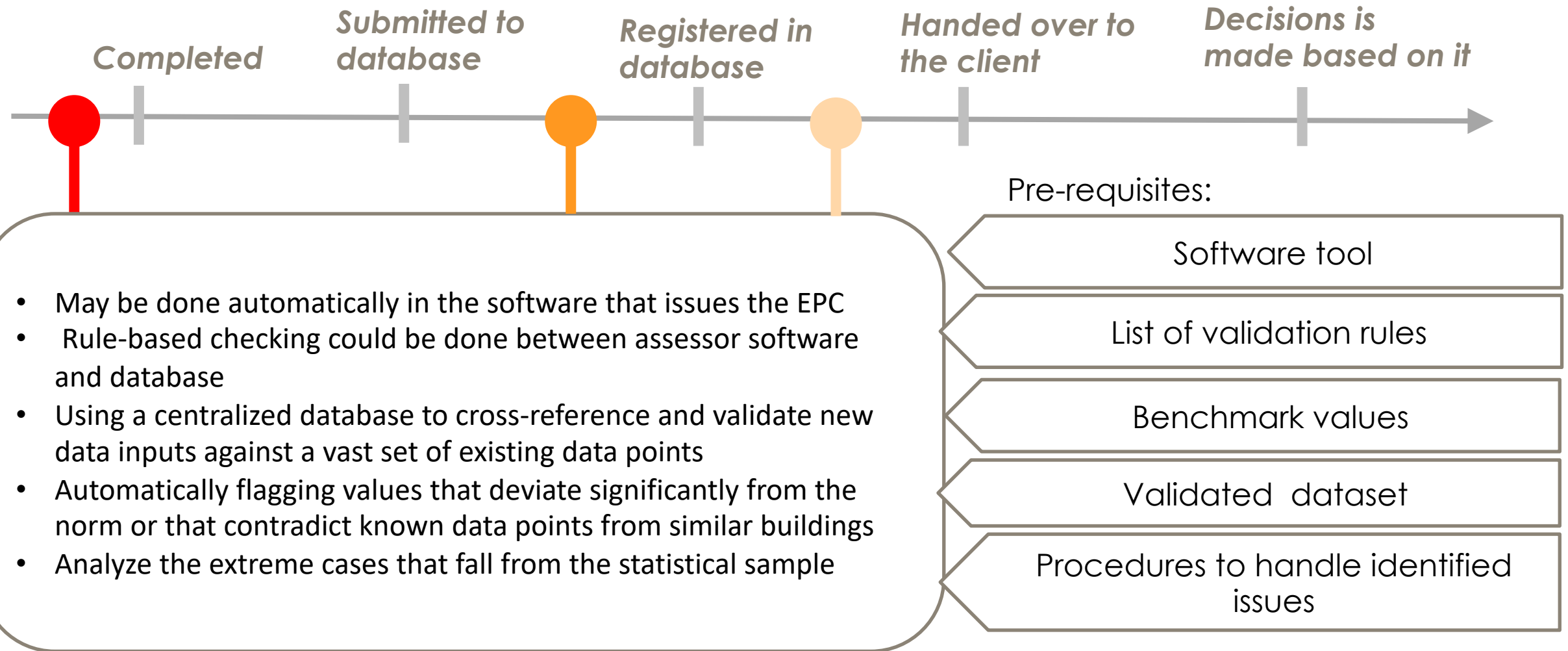
(c) **full check of the input data** of the building used to issue the energy performance certificate, full verification of the results stated in the certificate, including the recommendations made, and **on-site visit of the building**, if possible, to check the **correspondence between specifications given in the energy performance certificate and the building certified**.

Rejecting the
assumption and re-
collecting site
information



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1ST LEVEL CHECK: AUTOMATED VALIDATION – QUICK IDENTIFICATION OF ISSUES AND ERRORS

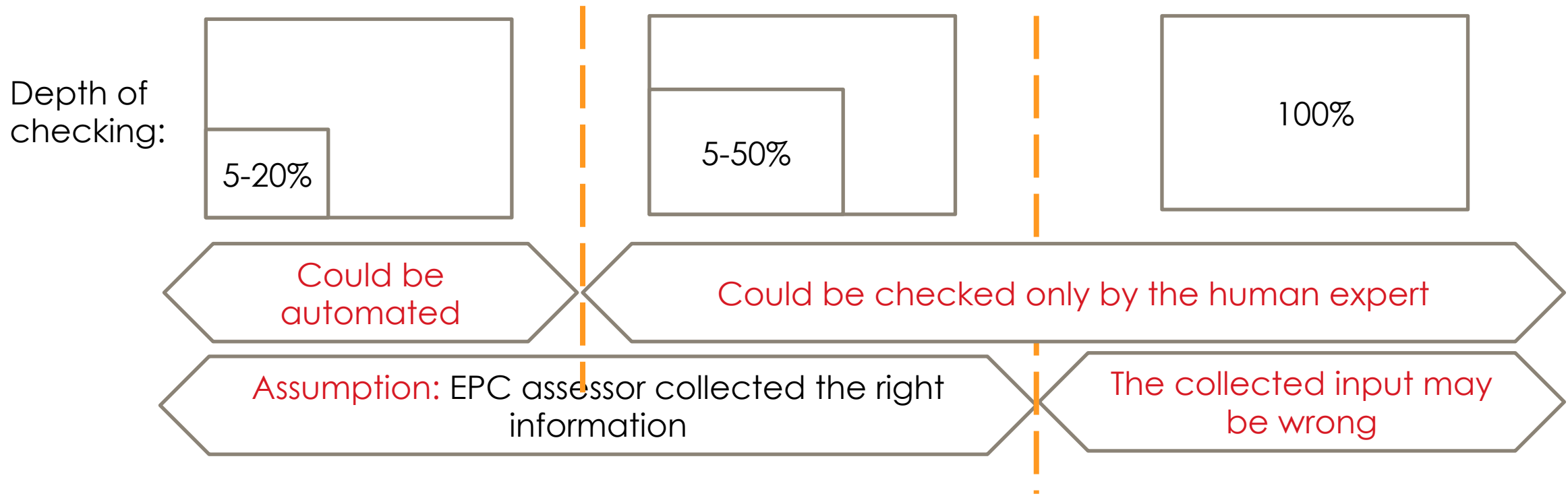


COST OF QUALITY CONTROL PROCEDURES DEPENDS ON THE DEPTH OF CHECKING



The cost of running a quality control system depends on the following aspects:

- **Depth of checking**
- **Digitalization level of checking procedure**
- **Number of checking procedures**



There has to be a reasonable amount of checking procedures to ensure that the acceptable quality level is maintained and the resources are well utilized

TO MANAGE THE RESOURCES, STATISTICAL SAMPLE COULD BE USED INSTEAD OF CHECKING ALL THE EPC



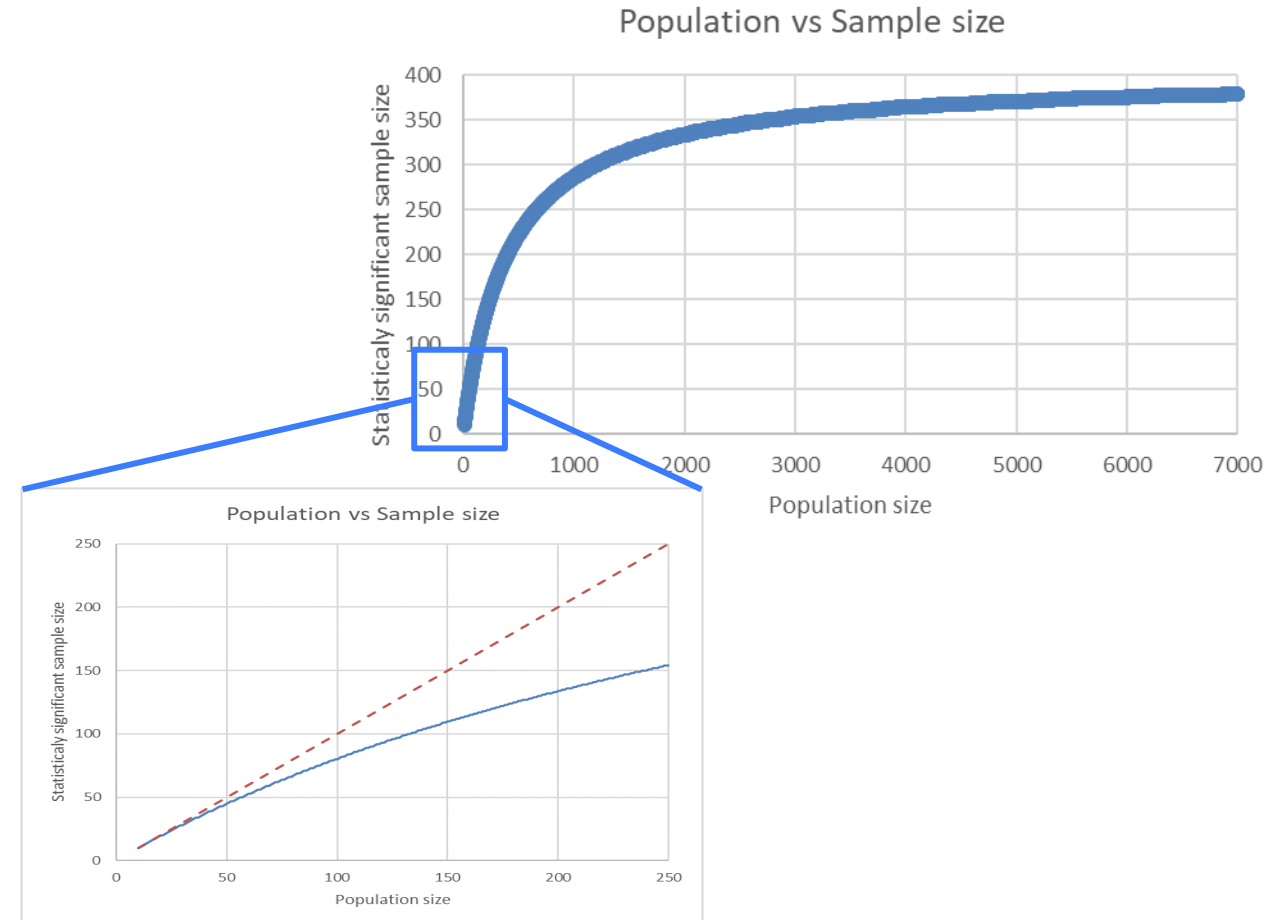
Have to check at least 5% OR “statistically significant” sample size?

If population size is:

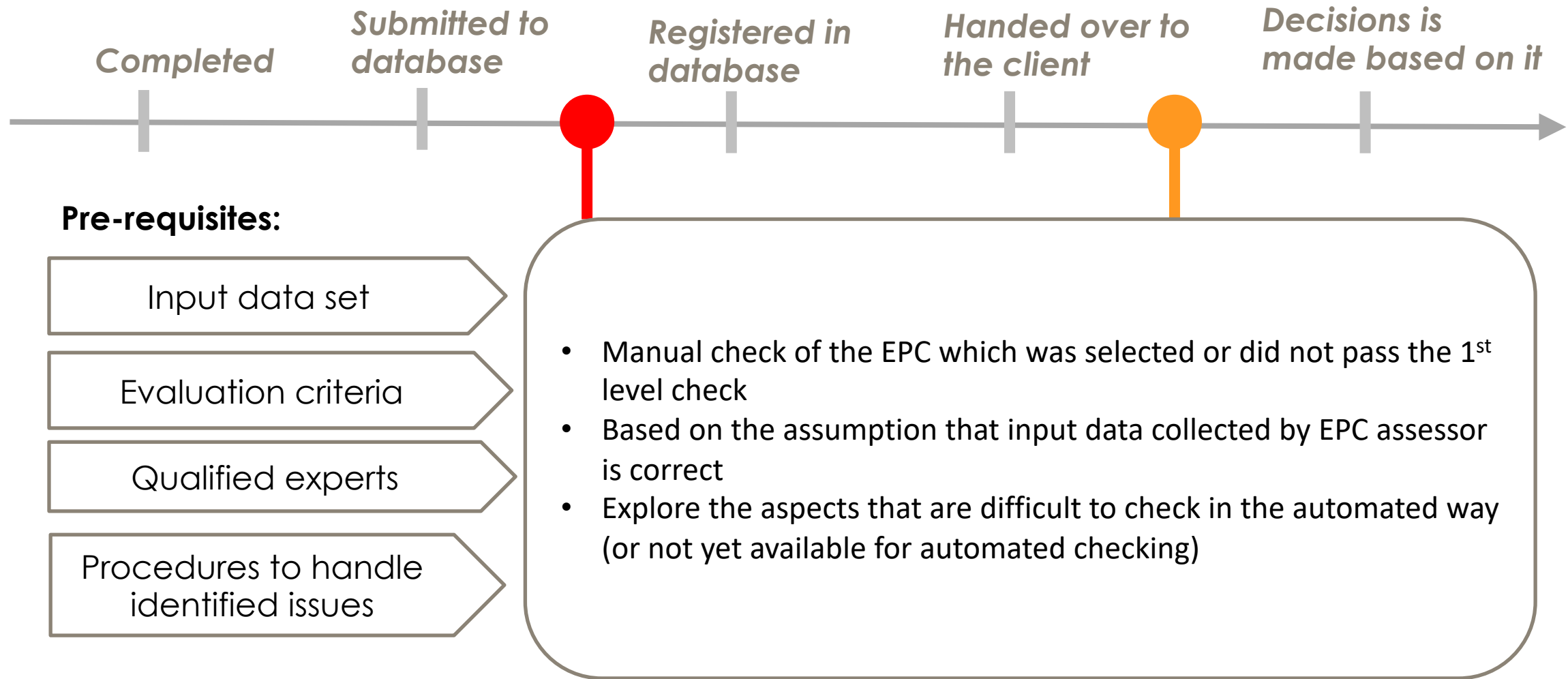
- ≤ 20 then [Sample size] = [Population size]
- > 20 with 95% confidence level and $p = 0.5$ are assumed, it is appropriate to use Yamane's formula:

$$n = \frac{N}{1 + N \cdot (e)^2}$$

- The statistically significant sample size are always more than 5% up to population size of 6900
- 10% - 3810
- 15% - 2180
- 20% - 1550



2ND LEVEL CHECK: EXPERT CHECK – FOR THE ASPECTS WHICH COULD NOT BE CHECKED BY THE SOFTWARE



THE EVALUATION CRITERIA SHOULD BE BASED ON REQUIREMENTS STATED IN METHODOLOGY



Requirements stated in the methodology:

- WHAT specifically must be done
- HOW should it be reflected in the report



Quality control checklist

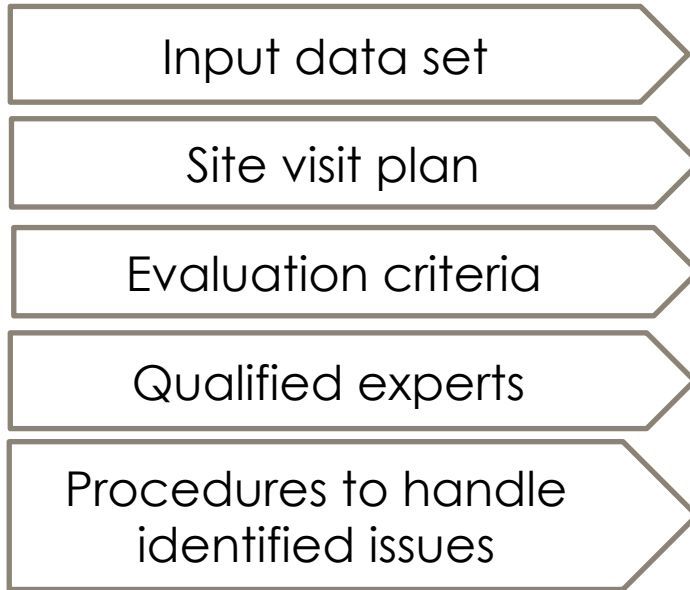
- ☐ Are the specific actions done?
- ☐ Is the specific information provided in the documentation
- ☐ Is it accurate
- ☐ Are the assumptions are backed by...

In principle, it is difficult to ask EPC assessors to follow specific requests if it is not stated in a legal document.

3RD LEVEL CHECK: SITE VISIT – TO CHECK IF INPUT INFORMATION WHERE CORRECTLY COLLECTED



Pre-requisites:

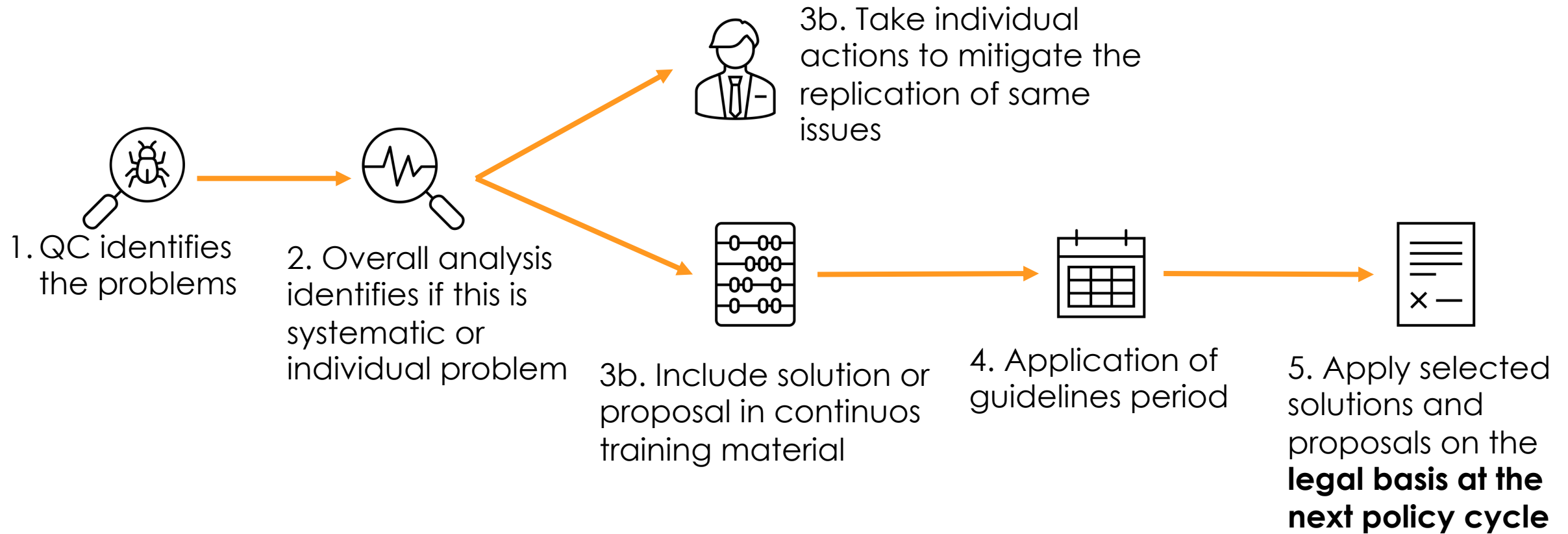


- Rejecting the the assumption that input data collected by EPC assessor is correct and collecting the input data by another expert
- Workload is equal or higher than creating and issuing EPC without any initial effort.
- The results of submitted and newly created EPC are compared, and differences are explored on higher detail

THE OUTCOME OF QUALITY CONTROL COULD BE USED AS A SOURCE FOR PROCESS AND LEGISLATION IMPROVEMENT



Practical example, from identified systematic issues to legislation:



THE ASSESSORS SHOULD BE TREATED BASED ON THEIR PERFORMANCE



GENERAL PRINCIPLES:

BEST PERFORMERS

Recognition: Celebrate their accomplishments and dedication.

Showcase: Highlight their best practices and achievements.

Role Models: Use them as examples for others to emulate.

AVERAGE PERFORMERS

Consistency: Encourage them to maintain their current quality.

Growth: Motivate them to seek improvement and aim for excellence continuously.

POOR PERFORMERS

Guidance: Provide feedback, resources, and training to elevate their performance.

Accountability: Monitor progress and ensure they meet the required standards.

Action: If performance doesn't improve, consider reevaluation or removal to uphold certification quality.



IMPROVEMENTS OF THE OVERAL QUALITY COULD BE PERFORMED AT INDIVIDUAL AND MULTI-PERSON SCALE



Example:

Multiple
scale



Awareness rising of EPC assessors and clients



Guidelines for EPC assessors



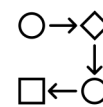
"Best EPC assessor" awards or public recognition



Provide support tools to improve evaluation practice



Sufficient training programs



Clearly defined processes and procedures in legislation



Continuous training events

Individual
scale



Warnings and penalties



Individual feedback about the quality of a single EPC



Remove the right to act as EPC assessor



Additional checks if non-conformities are identified

Short term

Long term



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SUMMARY: KEY TAKE AWAYS

1. *Quality control should prevent or at least reduce the number of unsatisfied clients due to poor quality products or services. It should safeguard consumer interests and reinforce the credibility of the certification system*
2. *Quality control is a complex and resource-consuming task needed to unlock the benefits of the EPC system.*
3. *Key elements of the effective system are **selection procedures**, **quality review**, and **penalty system***
4. *The system may contain 3 different levels of control, which can be done by software and manually, based on provided or on-site collected data*
5. *The outcome of quality control could be used to improve the quality in the market, manage the EPC assessors status and improve the legislation*

THANK YOU FOR YOUR ATTENTION !



Karolis Januševičius, PhD ⚡

Energy consultant | Energy efficiency professional

*„Helping to Unlock the Value of Energy Efficiency
and Sustainability for a More Resilient Future “*



Karolis Januševičius



karolis.janusevicius@gmail.com



<http://karolis.janusevicius.lt>



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