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Round table discussion:

QUALITY CONTROL IMPROVEMENT OF MANDATORY ENERGY AUDITS IN INDUSTRY

ASTANA

2024-02-02

Stantec | intec | ACTED | European University Institute | FSR ENERGY Florence School of Regulation

AGENDA

09:00-09:30	Welcome coffee	
Welcoming & opening words		
09:30-09:35	Electric Power and Energy-Saving Development Institute	
09:35-09:40	SECCA project	
Quality Control of Energy audits Moderator: Ilze Purina, Key Expert in energy sector governance, SECCA		
09:40-10:30	Presentation of prepared implementation roadmap for the quality control system of energy audits	Karolis Janusevicius Expert in energy audits SECCA https://secca:eu
10:30- 11:50	Discussion, Q&A *(roadmap provided before the round table discussion)*	All participants
11:50- 12:00	Closing remarks	Electric Power and Energy-Saving Development Institute SECCA

STRUCTURE OF THE ROADMAP

OVERVIEW OF THE LOCAL SITUATION IN KAZAKHSTAN	THE PURPOSE OF QUALITY CONTROL SYSTEM	THE PROPOSED IMPROVEMENTS FOR EXISTING FRAMEWORK	THE IMPLEMENTATION ROADMAP
• Situation of Kazakhstan's energy efficiency policy. • Review of the basis and implementation of energy audits. • Identification of improvement opportunities in the energy audit system.	• Significance and role of energy audits in quality control. • Structure and organization of the energy audit system. • Standards and methodologies for high-quality energy audits. • Process and evaluation techniques in energy audits.	• Gap analysis in current energy audit practices. • Proposed enhancements for quality control elements. • External factors affecting energy audit quality. • Additional factors to enhance energy audit quality.	Outlines the **5 stage** implementation plan for improving Kazakhstan's energy audit quality control process.

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LOCAL SITUATION AND PURPOSE OF QUALITY CONTROL SYSTEM

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BRIEF OVERVIEW OF THE LOCAL SITUATION IN KAZAKHSTAN (1/2)

Energy Efficiency Initiatives and Policy Framework in Kazakhstan:

Law on Energy Saving and Efficiency (2012): Sets the basis for energy auditing procedures and standards.

Concept of Development 2023-2029: Aims at modernizing the energy sector and enhancing renewable energy use.

Energy Efficiency 2023-2029 Program: Focuses on key sectors, replacing the outdated 2020 program.

Challenges: Enforcement and quality control issues in mandatory energy audits.

Strategic Development Plan & Green Economy Concept: Targets sustainable energy practices and renewable energy utilization.

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BRIEF OVERVIEW OF THE LOCAL SITUATION IN KAZAKHSTAN (2/2)

Legal Framework and Stakeholder Roles in Energy Auditing:

Regulatory and Incentive Mechanisms: Mandatory energy audits, energy conservation specialists in enterprises.

Legal Basis for Energy Audits: 2012 Law, 2015 Bylaws, and 2023 updates on auditor certification and audit guidelines.

Types of Energy Audits: Overview of Mandatory, Express, and Targeted Energy Audits, highlighting their objectives and processes.

Identification of improvement opportunities in the energy audit system:

Overview of proposals:

1. Legislative and Procurement Enhancements
2. Staffing and Equipment Standards
3. Training and Qualification Enhancement
4. Systemic Auditing Implementation
5. **Quality Control and Transparency**:

5. Quality Control and Transparency:

- Enhance monitoring of audit reports.
- Diversify analysis techniques for accuracy.
- Foster transparency and public discussion of audit results.
- Ensure consistent submission of energy audit reports for accountability.

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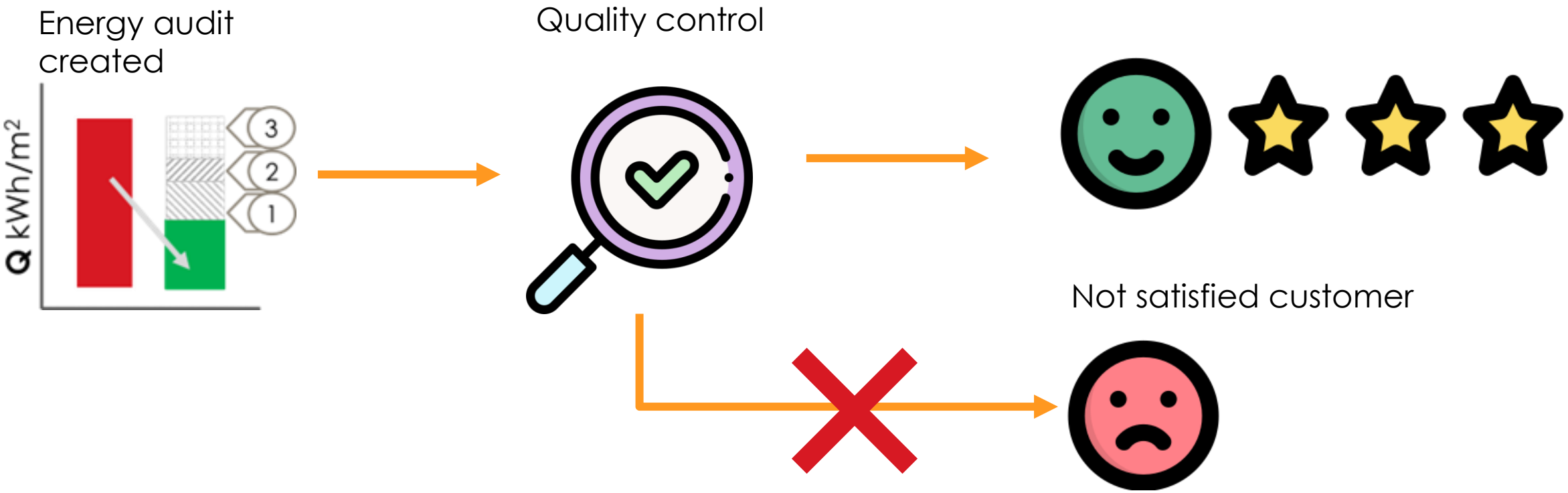
THE QUALITY CONTROL IS NEEDED TO ENSURE HIGH QUALITY ENERGY AUDITS IN THE MARKET



HIGH-QUALITY ENERGY AUDIT - an energy audit that meets the **minimum requirements**, is **performed independently** by **qualified professionals**, and provides **significant benefits** for all stakeholders involved, while being **cost-effective**

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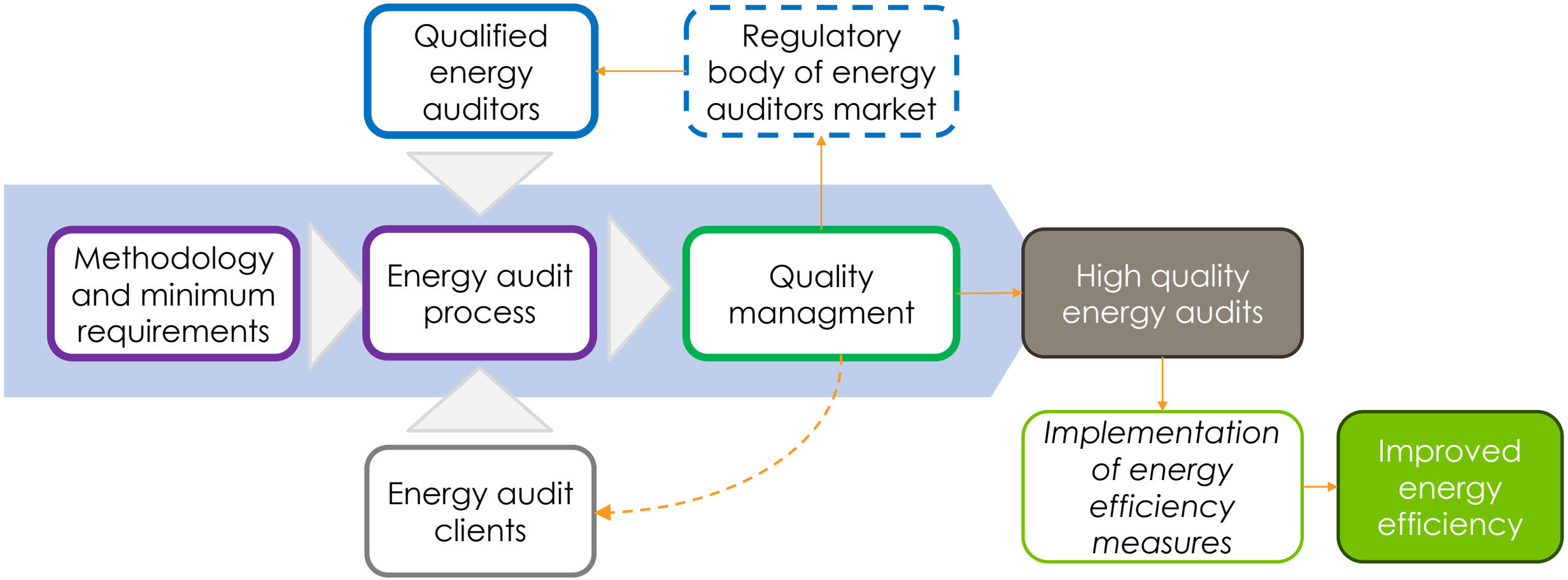
THE INFLUENCE OF QUALITY CONTROL TO OTHER ENERGY AUDIT SYSTEM ELEMENTS



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THE PURPOSE OF QUALITY CONTROL SYSTEM

- **Crucial Role of Energy Audits**: Identifying and quantifying energy-saving opportunities, setting baselines for energy-saving strategies.
- **Collaborative Framework**: Involves qualified energy auditors, a regulatory body, and standardized methodologies.
- **Feedback Loops**: Enhance auditor competencies and client satisfaction.
- **Attributes of High-Quality Audits**: Adherence to minimum requirements and professional standards for significant value creation.
- **EU Best Practices**: Adoption of 'minimum requirements' principle for high-quality energy audits.
- **Methodology and Requirements**: Need for a standardized approach to ensure consistency and reliability in energy audits.
- **Value Creation**: High-quality audits contribute to broader policy goals like climate change prevention.
- **Quality Evaluation Process**: Multi-tiered approach including automated checks, detailed screenings, and on-site verifications.

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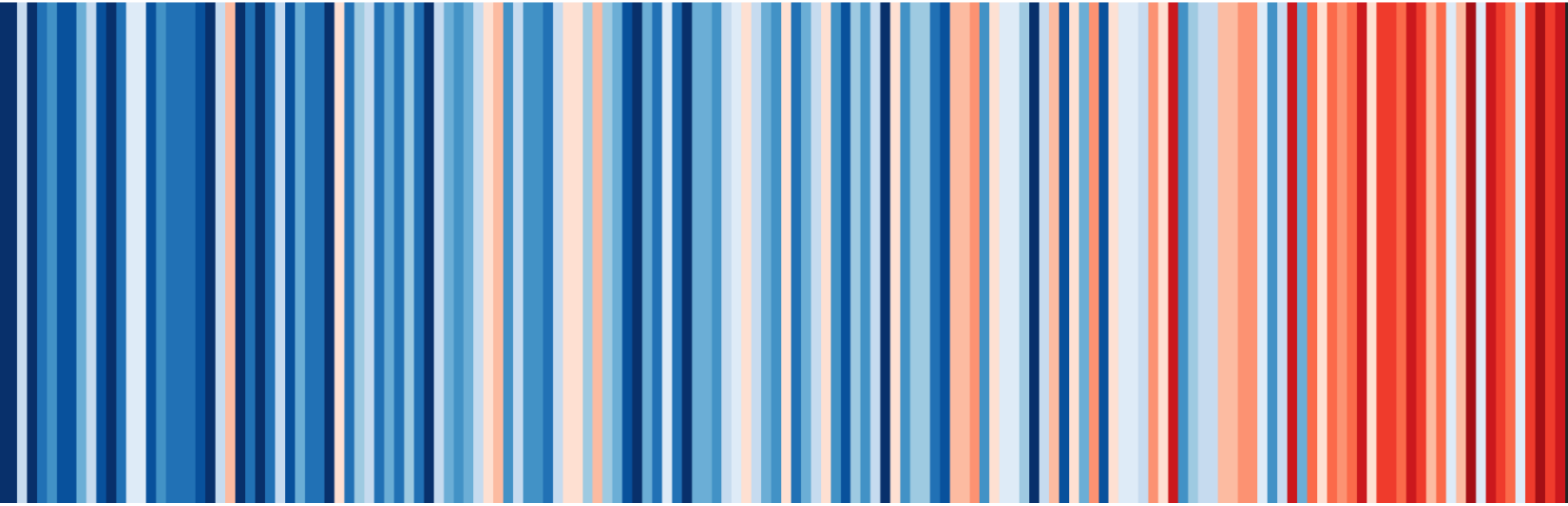

THE IMPROVEMENT POTENTIAL AND OPORTUNITIES

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HOW IDEAL QUALITY CONTROL SYSTEM COULD LOOK LIKE?

Desired future condition

- Auditors should remove basic issues before submitting the report
- Quality checking procedures should consume as little as possible resources
- All the process procedures must be clear and transparent
- The outcomes of the process must be quantifiable
- The auditors should learn as much as possible and not repeat identified issues
- The prevention of low-quality energy audits must be effective
- The evaluation of the energy audit should be based on actual situation
- The QC data are used to steer the development of the QC system
- The Energy audit methodology (or additional guidance document) should be improved based on the identified issues
- There must be process automation involved to save time and resources

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THE BARRIERS SEPARATING THE CURRENT SYSTEM FROM DESIRED ONE

Desired future condition

Barriers limiting the current system to adopt best practices

There is no feedback loop from QC to methodology improvement

The actual situation may not be reflected in the EA report

The QC data is not aggregated and used to make decisions.

The checking of basic information is time time-consuming.

The outcome of QC is not expressed quantitively

The prevention mechanism can be stronger

There is no self quality assurance on the auditor's side

The selection procedure for QC is not clear

The auditors are not well informed about the issues in their EA report

Current situation

Pre-audit → Do audit → Submit report → Select reports for QC → Quality control (QC) → Feedback for auditor & client

POTENTIAL SOLUTIONS TO IDENTIFIED BARIERS

There is no self quality assurance on the auditor's side	Provide framework for auditors to perform self check	The QC data is not aggregated and used to make decisions.	Aggregate quantified data from control procedure
The checking of basic information is time time-consuming.	Standartize and simplify checking procedure	There is no feedback loop from QC to methodology improvement	Ensure the identification of most common issues
The actual situation may not be reflected in the EA report	Introduce site visit to collect the information	The prevention mechanism can be stronger	Have clear warning and penalty system
The outcome of QC is not expressed quantitively	Quantify the results	The auditors are not well informed about the issues in their EA report	Establish the feedback loops for auditors
The selection procedure for QC is not clear	Clarify and document the procedure		

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IMPLEMENTATION ROADMAP

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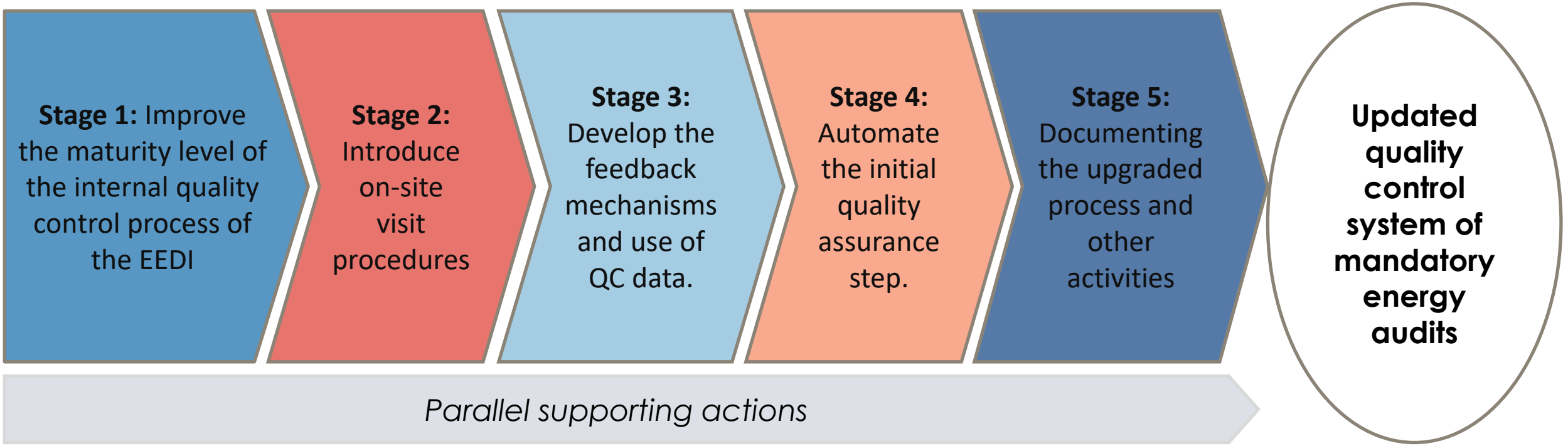
PRINCIPLES OF THE ROADMAP



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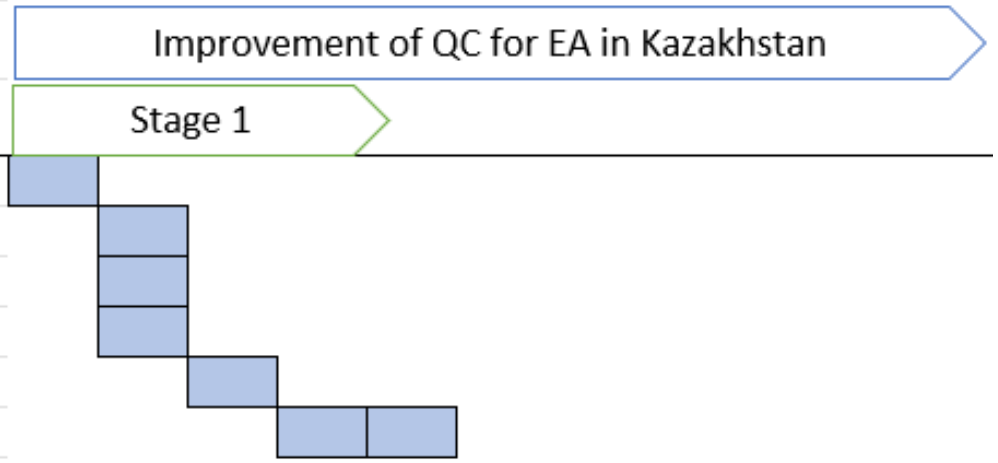
STAGE 1: IMPROVE THE MATURITY LEVEL OF THE INTERNAL QUALITY CONTROL PROCESS OF THE EEDI

Stage 1 focuses on enhancing the internal process of EEDI by developing and refining internal quality control processes, ensuring that energy audits are carried out to the highest standards of accuracy and integrity.

WHAT	*HOW LONG*
Quality control system improvement for industrial energy audits in Kazakhstan	**10-12 months**
Stage 1: Improve the maturity level of the internal quality control process of the EEDI	**5 months**
1.1. Establishment of transparent selection procedures for quality screening	
1.2. Developing the procedure of quality screening	
1.3. Developing the selection procedure for in-depth quality checking	
1.4. Developing the procedure of in-depth quality checking	
1.5. Field testing of the QC procedures	
1.6. Review and adjustment of established procedures based on the Field test	



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STAGE 1: IMPROVE THE MATURITY LEVEL OF THE INTERNAL QUALITY CONTROL PROCESS OF THE EEDI

Stage 1: focuses on enhancing the internal process of EEDI by developing and refining internal quality control processes, ensuring that energy audits are carried out to the highest standards of accuracy and integrity.

1.1. Transparent Selection for Quality Screening: Implement clear, unbiased procedures to establish audit screening credibility.
1.2. Quality Screening Procedure: Develop a detailed process for the early identification of potential audit issues.
1.3. In-depth Quality Check Selection: Create rigorous review procedures for comprehensive audit scrutiny.
1.4. In-depth Quality Checking Method: Utilize extensive tools for a thorough evaluation beyond preliminary screening.
1.5. Field Testing QC Procedures: Conduct practical tests to evaluate and refine QC process effectiveness.
1.6. Review and Process Optimization: Use field test results and feedback to improve procedures systematically

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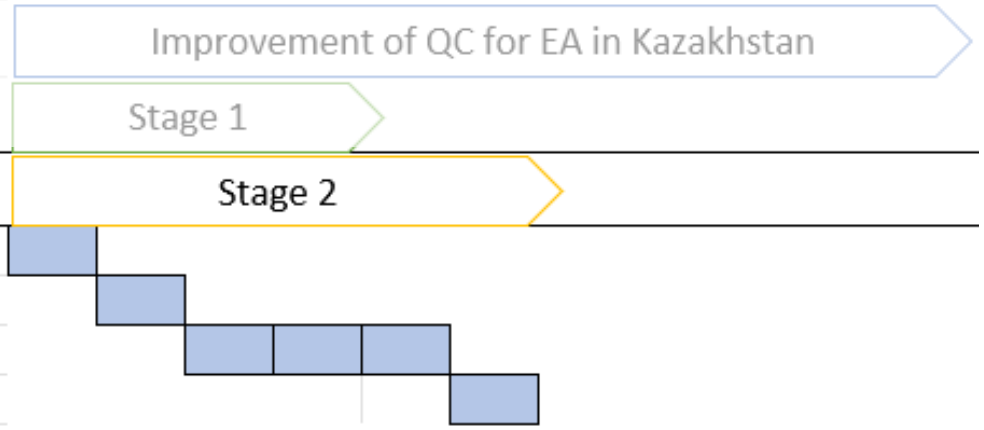
STAGE 2: INTRODUCE ON-SITE VISIT PROCEDURES

Stage 2: introduce and develop on-site visit procedures to directly verify and enhance the accuracy of mandatory energy audits

WHAT	*HOW LONG*
Quality control system improvement for industrial energy audits in Kazakhstan	10-12 months
Stage 1: Improve the maturity level of the internal quality control process of the EEDI	5 months
Stage 2: Introduce on-site visit procedures.	**6 months**
2.1. Development of procedure: Selection for Site Visit	
2.2. Developing the Quality Evaluation procedure for the On-Site Visit	
2.3. Field testing of the on-site visit procedures	
2.4. Review and adjustment of established procedures based on the Field test	



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STAGE 2: INTRODUCE ON-SITE VISIT PROCEDURES

Stage 2: introduce and develop on-site visit procedures to directly verify and enhance the accuracy of mandatory energy audits

2.1. Development of Procedure: Selection for Site Visit: The procedure for selecting which energy audits receive on-site visits has been formalised, incorporating risk-based criteria and random sampling to ensure a balanced and fair selection process.

2.2. Developing the Quality Evaluation During the On-Site Visit: During on-site visits, a specific set of evaluation tools and checklists are utilised to ensure comprehensive and consistent audit quality assessments.

2.3. Field Testing of the On-site Visit Procedures: The on-site visit procedures have been field-tested, providing valuable data on their effectiveness and areas for improvement.

2.4. Review and Adjustment of Established Procedures Based on the Field Test: Feedback from field tests has led to further refinement of the on-site visit procedures, ensuring they are both robust and practical.

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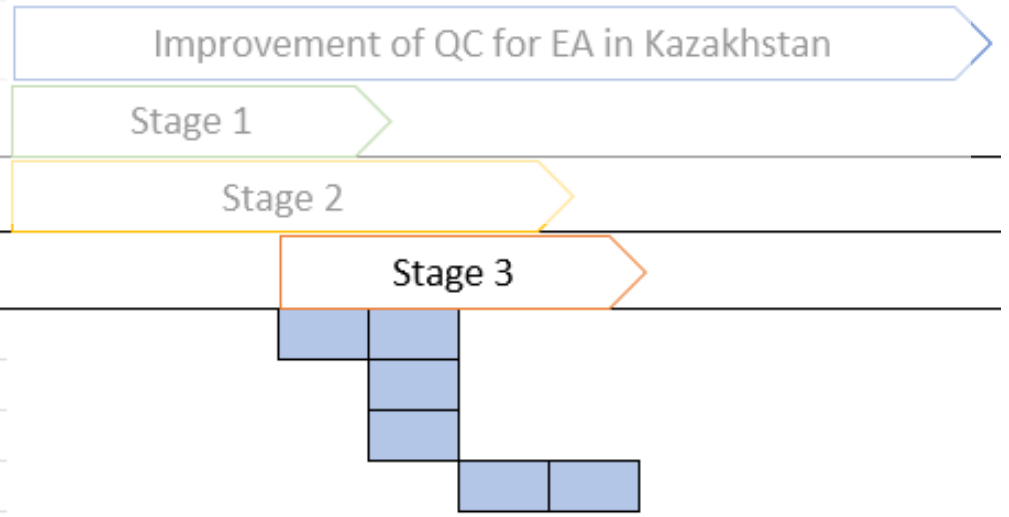
STAGE 3:DEVELOP THE FEEDBACK MECHANISMS AND USE OF QC DATA

Stage 3: develop feedback mechanisms to utilise QC data for continuous improvement of the audit process from the energy auditor and policy implementation sides

WHAT	*HOW LONG*
Quality control system improvement for industrial energy audits in Kazakhstan	10-12 months
Stage 1: Improve the maturity level of the internal quality control process of the EEDI	5 months
Stage 2: Introduce on-site visit procedures.	6 months
Stage 3: Develop the feedback mechanisms and use of QC data.	**4 months**
3.1. Aggregation of QC Process Generated Data	
3.2. Feedback and Actions After Checking	
3.3. Warnings and Sanctions	
3.4. Testing and adjustment of the procedures	



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STAGE 3:DEVELOP THE FEEDBACK MECHANISMS AND USE OF QC DATA

Stage 3: develop feedback mechanisms to utilise QC data for continuous improvement of the audit process from the energy auditor and policy implementation sides

3.1. Aggregation of QC Process Generated Data: A systematic approach has been established for aggregating QC data. This process allows for monitoring QC effectiveness and identifying trends that can inform future improvements.

3.2. Feedback and Actions After Checking: A structured feedback loop provides auditors with clear and actionable insights derived from QC checks. This system ensures that auditors are continually informed and can improve their practices.

3.3. Warnings and Sanctions: A framework for warnings and sanctions has been set up to address non-compliance. This framework is constructed to be fair, aiming for constructive engagement rather than punitive measures.

3.4. Testing and Adjustment of the Procedures: The feedback mechanisms are subject to continuous testing and refinement, ensuring that they are effective and maintain relevance over time.

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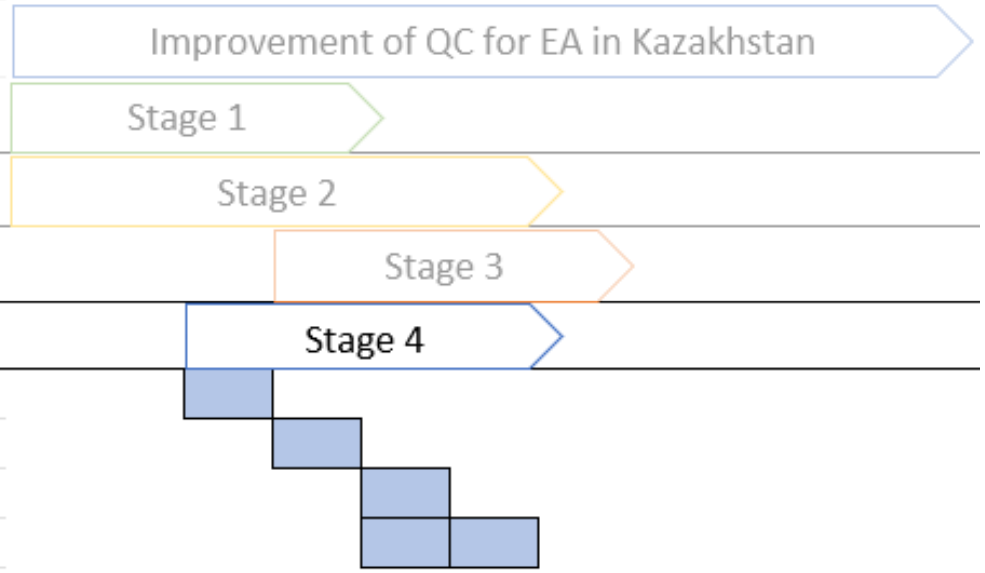
STAGE 4: AUTOMATE THE INITIAL QUALITY ASSURANCE STEP

Stage 4: implement automation to streamline the initial stages of quality assurance, enhancing efficiency and precision

WHAT	*HOW LONG*
Quality control system improvement for industrial energy audits in Kazakhstan	10-12 months
Stage 1: Improve the maturity level of the internal quality control process of the EEDI	5 months
Stage 2: Introduce on-site visit procedures.	6 months
Stage 3: Develop the feedback mechanisms and use of QC data.	4 months
Stage 4: Automate the initial quality assurance step.	**4-6 months**
4.1. Development of the tool to submit energy audit tool.	
4.2. Development of the rules for checking the validity of data inputs	
4.3. Automated Validation in Reporting Framework	
4.4. Field testing of the automated validation in reporting framework	



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STAGE 4: AUTOMATE THE INITIAL QUALITY ASSURANCE STEP

Stage 4: implement automation to streamline the initial stages of quality assurance, enhancing efficiency and precision

4.1. Development of the Tool to Submit Energy Audit Data: An intuitive tool has been developed for submitting energy audit data. This tool reduces manual entry errors and facilitates a more efficient audit process.

4.2. Development of the Rules for Checking the Validity of Data Inputs: Rules and algorithms have been created to validate data inputs automatically, ensuring consistency and reliability in the data collected across all audits.

4.3. Automated Validation in Reporting Framework: The reporting framework now includes an automated validation step, significantly reducing the time and effort required for data checking.

4.4. Field Testing of the Automated Validation in Reporting Framework: Field testing of the automated validation system has provided insights into its efficiency and effectiveness, leading to further refinements.

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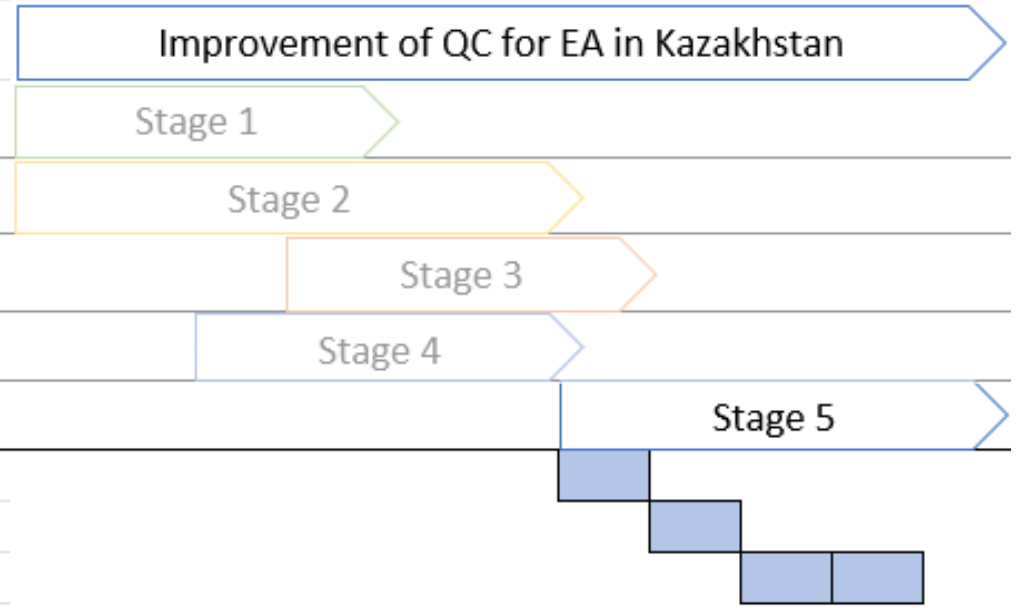
STAGE 5:DOCUMENTING THE UPGRADED PROCESS AND OTHER ACTIVITIES

Stage 5: document all updated processes and engage in awareness activities to ensure widespread adoption and understanding of the new QC system

WHAT	*HOW LONG*
Quality control system improvement for industrial energy audits in Kazakhstan	**10-12 months**
Stage 1: Improve the maturity level of the internal quality control process of the EEDI	5 months
Stage 2: Introduce on-site visit procedures.	6 months
Stage 3: Develop the feedback mechanisms and use of QC data.	4 months
Stage 4: Automate the initial quality assurance step.	4-6 months
Stage 5: Documenting the upgraded process and other activities	**4 months**
5.1. Documentation of the overall quality framework	
5.2. Material preparation for stakeholder awareness rising	
5.3. Awareness rising activities (events)	



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STAGE 5:DOCUMENTING THE UPGRADED PROCESS AND OTHER ACTIVITIES

Stage 5: document all updated processes and engage in awareness activities to ensure widespread adoption and understanding of the new QC system

5.1. Documentation of the Overall Quality Framework: A comprehensive set of documents has been created to capture all aspects of the QC framework, serving as a reference for current and future stakeholders.

5.2. Material Preparation: Educational and training materials have been developed to facilitate a clear understanding of the QC processes and to support their correct implementation.

5.3. Awareness-Raising Activities (Events): A series of events have been planned to raise awareness about the new QC framework, targeting all relevant stakeholders to foster an environment of quality and continuous improvement.

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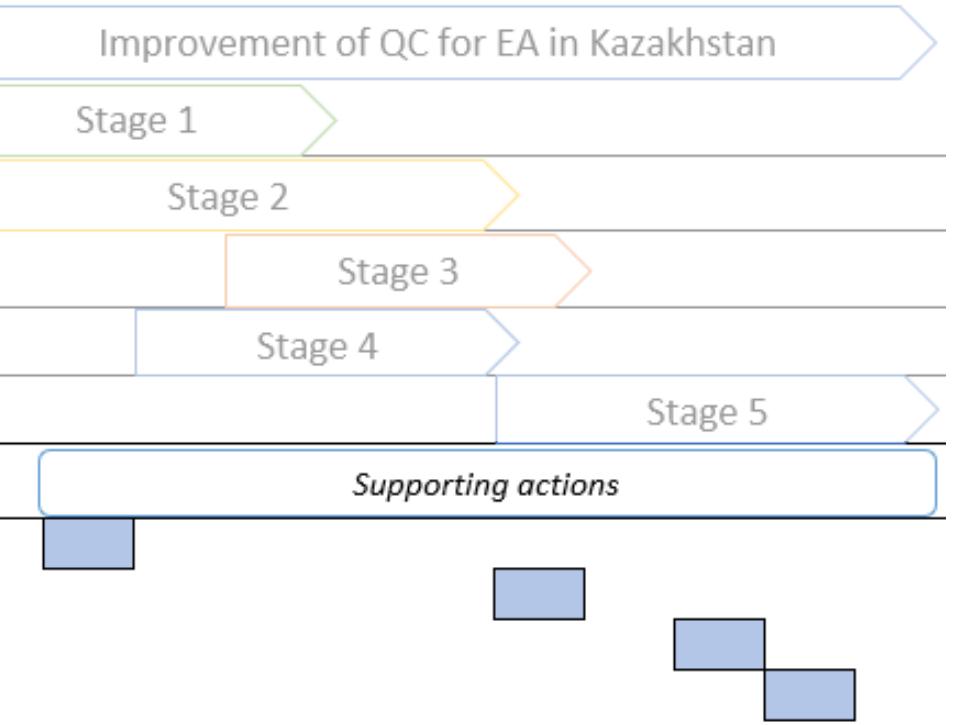
SUPPORTING PARALLEL ACTIONS

Supporting Actions: To reinforce the QC system, ensuring comprehensive support and alignment with objectives throughout the implementation process.

WHAT	*HOW LONG*
Quality control system improvement for industrial energy audits in Kazakhstan	10-12 months
Stage 1: Improve the maturity level of the internal quality control process of the EEDI	5 months
Stage 2: Introduce on-site visit procedures.	6 months
Stage 3: Develop the feedback mechanisms and use of QC data.	4 months
Stage 4: Automate the initial quality assurance step.	4-6 months
Stage 5: Documenting the upgraded process and other activities	4 months
6. Supporting parallel actions:	
6.1. Establish Key Performance Indicators (KPIs)	
6.2. Regular Reporting and Analysis	
6.3. Feedback Loops	
6.4. Adjustment Mechanism	



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SUPPORTING PARALLEL ACTIONS

Supporting Actions: To reinforce the QC system, ensuring comprehensive support and alignment with objectives throughout the implementation process.

1. Establish Key Performance Indicators (KPIs): Develop specific, measurable KPIs for each implementation stage. These could include metrics like the accuracy of Energy audit reports, the turnaround time for issuing certificates, and the level of stakeholder satisfaction.

2. Regular Reporting and Analysis: Set up a regular reporting system where data collected through the KPIs is analysed. This analysis will provide insights into the progress, highlighting successes and identifying areas for improvement.

3. Feedback Loops: Create mechanisms to gather feedback from key stakeholders, including energy auditors, business owners, and policy implementers. Their input will be invaluable in refining processes and addressing practical challenges.

4. Adjustment Mechanism: Establish a clear adjustment process based on M&E findings. This ensures the roadmap remains agile and responsive to real-world challenges and opportunities.

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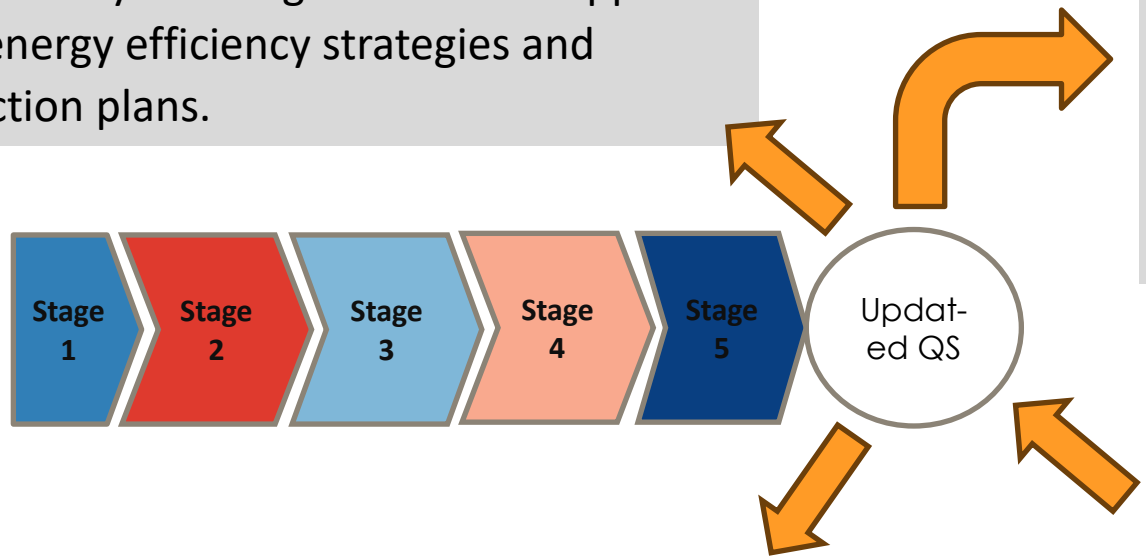
INTEGRATION WITH BROADER POLICY GOALS

Alignment with National Energy Strategies: Ensure the EA system aligns with and supports national energy efficiency strategies and climate action plans.

Educational and Awareness Initiatives: Leverage the EA system as a platform for broader educational and awareness initiatives, promoting energy conservation and sustainable business growth practices among the sector



Driving Sustainable Development: Position the EA system as a key tool in driving sustainable development in the industry sector, encouraging energy-efficient business growth

International Collaboration: Explore opportunities for international collaboration and knowledge exchange to continually enhance the EA system and align it with global best practices.

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PROPOSED ELEMENTS FOR QUALITY CONTROL SYSTEM

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PROPOSED ELEMENTS

Automated Validation in Reporting Framework

Selection Procedure for Quality Screening

Quality Screening of Energy Audits

Selection for In-Depth Quality Checking

In-Depth Quality Checking of Energy Audits

Selection for Site Visit

Quality Evaluation During the On-Site Visit

Feedback and Actions After Checking

Aggregation of Quality Control Process Generated Data

Warnings and Sanctions

Additional Elements Contributing to the Quality of Energy Audits

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PROPOSAL: PROVIDE FRAMEWORK FOR AUDITORS TO PERFORM SELF CHECK

Automated Validation in Reporting Framework

Input:

Table 8. INFORMATION ABOUT THE COMPANY'S ENERGY CONSUMPTION

Validation		Consumption of energy, energy resources and water	Type	Quantity 2020	Quantity 2021	Quantity 2022	Notes
	2.1.	**Purchased**					
	2.1.1.	**Fuel:**					
TRUE	2.1.1.1.	Coal (MWh/year)	Fuel	20	1	5	
TRUE	2.1.1.2.	Gasoline (MWh/year)	Fuel	5	5	5	
TRUE	2.1.1.3.	Fuel Diesel (MWh/year)	Fuel	3	3	3	
TRUE	2.1.1.4.	Natural gas (MWh/year)	Fuel	15	15	15	
TRUE	2.1.1.5.	Biofuel Liquid (MWh/year)	Fuel	300	300	300	
TRUE	2.1.1.6.	Biomass Solid (MWh/year)	Fuel	3	3	3	
TRUE	2.1.1.7.	Other fuels (MWh/year)	Fuel	0	1	0	
	2.1.2.	**Thermal energy:**					
TRUE	2.1.2.1.	Amount of steam (t/year)	-	30	50	50	
TRUE	2.1.2.1.a	Thermal energy from steam (MWh/year)	Heat	22,6	37,6	37,6	
TRUE	2.1.2.2.	Thermal energy for production purposes (MWh/year)	Heat	3	2	3	
TRUE	2.1.2.3.	Thermal energy for space heating (MWh/year)	Heat	0	0	1	
TRUE	2.1.2.4.	Waste energy (MWh/year)	Heat	2	3	0	
	2.1.3.	**Electric power:**					
TRUE	2.1.3.1.	Purchased quantity (MWh/year)	Electricity	400	450	415	
TRUE	2.1.3.2.	Fraction of renewable energy in purchased electricity (%)		20%	20%	20%	
TRUE	2.1.4.	Industrial water (thousand m3/year)	Water	0,3	0,5	0,6	
TRUE	2.1.5.	Drinking water from supply network (thousand m3/year)	Water	0,3	0,5	0,6	
TRUE	2.1.6.	Water from local wheel (thousand m3/year)	Water	0,3	0,5	0,6	
TRUE		Total purchased energy:		773,6	820,6	787,6	
	2.2.	**Internaly generated**					
	2.2.1	**Thermal energy:**					
TRUE	2.2.1.1.	Amount of steam (t/year)	-	30	50	60	
TRUE	2.2.1.1.a	Thermal energy from steam (MWh/year)	Heat	22,6	37,6	45,1	
TRUE		Thermal energy for production purposes (MWh/year)	Heat	0,0	0,0	0,0	
TRUE		Biomass generated heat (%)	%	0%	0%	0%	
TRUE		Other renewable generated heat (%)	%	0%	0%	0%	
TRUE	2.2.1.3.	Thermal energy for space heating (MWh/year)	Heat	1	2	3	
TRUE		Biomass generated heat (%)	%	0%	0%	0%	
TRUE		Other renewable generated heat (%)	%	0%	0%	0%	
TRUE		Internaly produced and used waste heat (MWh/year	Heat	1	1	0	
	2.2.2.	**Electric power:**					
TRUE	2.2.2.1.	Generated from non-renewable fuel (MWh/year)	Electricity	23	56	78	
TRUE	2.2.2.2.	Solar PV generated electricity (MWh/year)	Electricity	2	3	4	
TRUE	2.2.2.3.	Wind generated electricity (MWh/year)	Electricity	0	0	0	
TRUE	2.2.2.4.	Biomass generated electricity(MWh/year)	Electricity	0	0	0	
TRUE	2.2.2.6.	Other renewable generated electricity (MWh/year)	Electricity	0	0	0	
TRUE		Total generated energy:		48,6	98,6	130,1	
	2.3.	**Sold or transferred outside from enterprise**					
	2.3.1.	**Thermal energy**					
TRUE	2.3.1.1.	Amount of steam (t/year)		5	10	10	
TRUE		Thermal energy from steam (MWh/year)	Heat	3,8	7,5	7,5	
TRUE	2.3.1.2.	Thermal energy (MWh/year)	Heat	0	0	0	
	2.3.2.	**Electricity**					
TRUE	2.3.2.1.	Generated from non-renewable fuel (MWh/year)	Electricity	5	12	3	
TRUE	2.3.2.2.	Solar PV generated (MWh/year)	Electricity	0	0	0	
TRUE	2.3.2.3.	Wind generated (MWh/year)	Electricity	0	0	0	
TRUE	2.3.2.4.	Biomass generated (MWh/year)	Electricity	0	0	0	
TRUE		Total sold or transferred energy:		8,8	19,5	10,5	
TRUE							

Check:

- Facility-level energy balance
- Facility-level material balance
- Energy balance for each energy carrier

Provide the measures:

Table 13. PROPOSALS FOR IMPROVEMENT MEASURES

Validation	Row no.	Group	Energy saving measure nam (with short description)	Life time duration, year	Investment costs kGEL	Type of energy saved	T s M
TRUE	1	B	Heat exchanger	20	20	Heat	
TRUE	2	B	Frequency changer	14	40,5	Electricity	
TRUE	3	C	Combution chamber	5	65	Direct fuel use	
TRUE							
TRUE							

Overview:

Table 9. ENERGY PERFORMANCE INDICATORS

1. Enterprise level energy performance indicators						
No.	**Energy performance indicator (EnPI)**		**Unit**	**2020**	**2021**	**2022**
1.1.	Total annual **final energy consumption**		MWh	764,8	801,1	777,1
1.2.	Total annual **primary energy consumption**		MWh	1109,4	1219,2	1109,4
1.3.	Total annual energy **costs**		thousand GEL	10,15	11,06	10,29
1.4.	Total green house gas **emisions**		tons CO2	225,0	231,8	217,6
1.5.	Total **auxiliary** energy consumption		MWh	15,3	64,1	38,9
1.6.	Percentage of energy consumed for **Auxiliary process**		%	2,0%	8,0%	5,0%
1.7.	Relative transport **energy consumption per tkm**		kWh/tkm			
1.8.	Relative transport **energy consumption per pkm**		kWh/pkm			

2. Product or service level energy performance indicators						
				2020	**2021**	**2022**
No.	Energy performance indicator (EnPI)	product ID	Unit	kWh/Unit	kWh/Unit	kWh/Unit
2.1.	Energy intensity per product unit	1	kg	16626,0	10013,4	6475,6
2.2.	Energy intensity per product unit	2	m3	30591,9	8411,3	23312,3

Group	Link	Validation aspect	Validity
Auditor(-s)	Details about auditor(-s)	Full data provided	TRUE
Inputs for energy audit	Company data	Full data provided	TRUE
		Operation data accepted	TRUE
	Consumption	Full data provided	TRUE
		Energy input do not exceed output	TRUE
		Provided consistent input	TRUE
	Energy cost'	Full data provided	TRUE
		Costs provided from each energy type	TRUE
	Raw materials'	Full data provided	TRUE
	Material cost'	Full data provided	TRUE
	Production	Tables filled	TRUE
		Correct allocation factors	TRUE
		Accepted auxilary	TRUE
		Auxilary energy factor correct	TRUE
	Equipment inv.'	Tables filled	TRUE
		Energy balance aligned	TRUE
Transport	Transport inv'	Full data provided	FALSE
	Transport consumption'	Full data provided	TRUE
Outputs	Measures	Full data provided	TRUE

The sheets are filled appropriately: FALSE <

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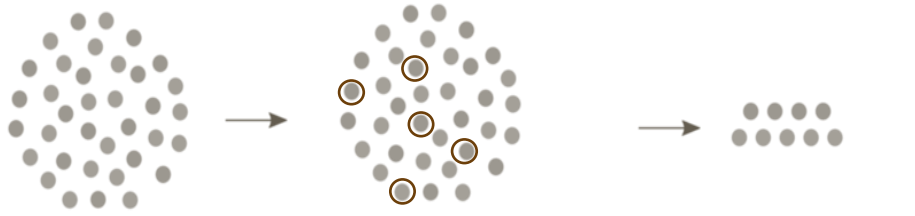
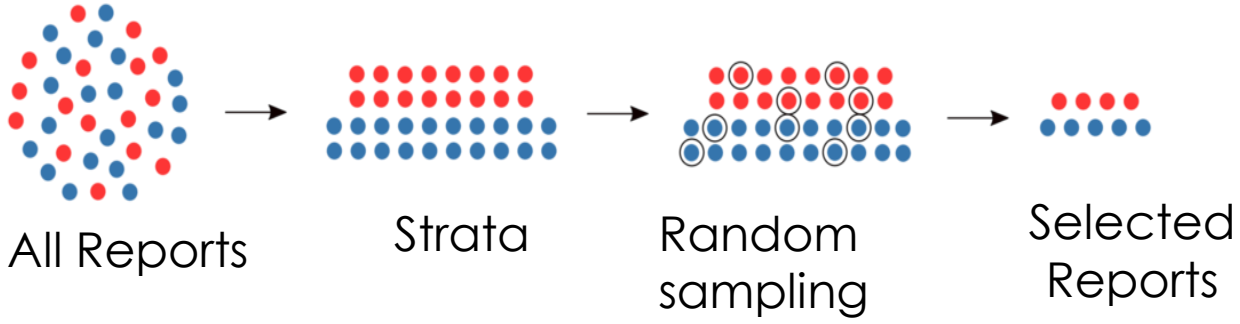
Stage 1 | Stage 2 | Stage 3 | Stage 4 | Stage 5 | Updated QS

SECCA Sustainable Energy Connectivity in Central Asia

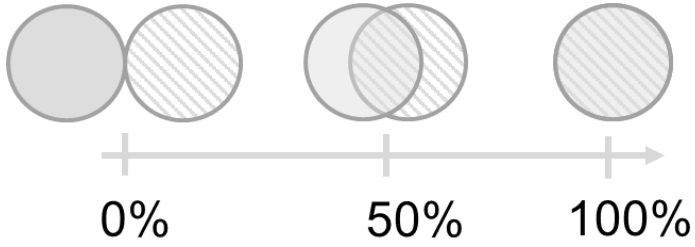
PROPOSAL: CLEAR SELECTION AND STANDARDIZED SCREENING PROCEDURE

Selection Procedure for Quality Screening





Quality Screening of Energy Audits



$$QSI = \frac{\Sigma[Valid\ criteria] + \Sigma[Partialy\ valid * 0{,}5]}{Total\ number\ of\ criteria}$$

PROPOSAL: TO FOCUS ON RISKS AND MAIN OUTCOMES OF THE ENERGY AUDIT

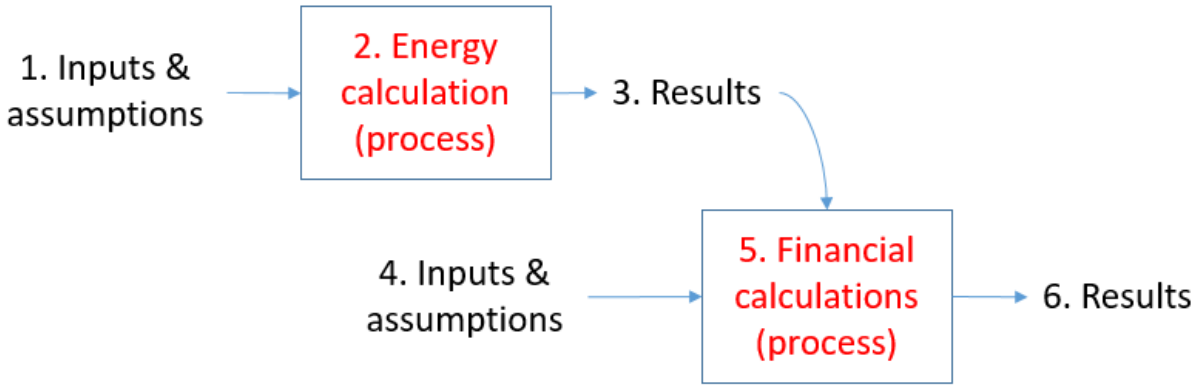
Selection for In-Depth Quality Checking

- **Energy Saving Potential**
- **Energy Use Intensity**
- **Auditor Impact on Market Quality**
- **Number of Proposed Energy-Saving Measures**
- **Investment in Energy-Saving Measures**
- **Auditor's History of Warnings/Penalties:**
- **First-Time Reports by New Auditors**

$$n_x = \frac{\max(\Delta X_i) - \Delta X}{\max(\Delta X_i) - \min(\Delta X_i)}$$

$$n_{tot} = \frac{\Sigma([\text{Weight factor}] * [\text{Parameter value}])}{\Sigma(\text{Weight factors})}$$

In-Depth Quality Checking of Energy Audits



1. **Quality of Energy-Saving Estimates**
2. **Quality of Financial Parameter Estimates**
3. **General Audit Effectiveness**

PROPOSAL: INVESTIGATE ON-SITE WHEN NEEDED AND RESONABLE

Selection for Site Visit

The selection criteria for site visits strike a balance between identifying potential risks and maintaining an unbiased approach through random sampling:

***Risk-Based Selection**: Audits showing potential risks or notable discussable aspects in earlier quality checks are prioritised for site visits.*

- Low QSI score
- Low score of In-depth quality checking
- Large number of flagged issues

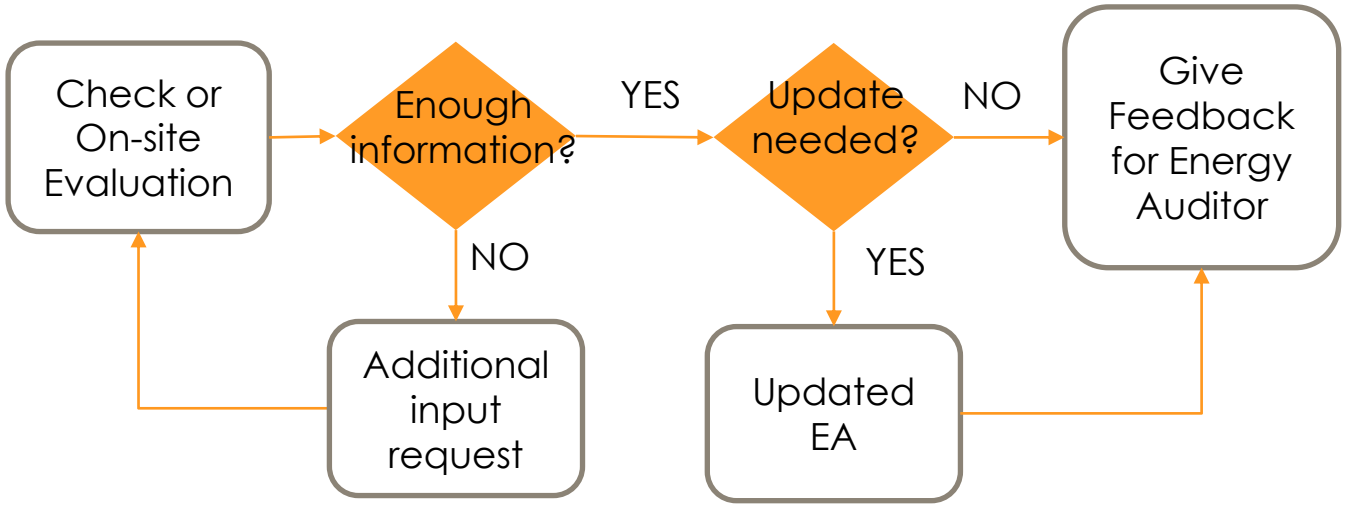
***Random Sampling**: In the absence of specific risks, a random sampling approach is employed to ensure a comprehensive quality assurance process.*

Quality Evaluation During the On-Site Visit

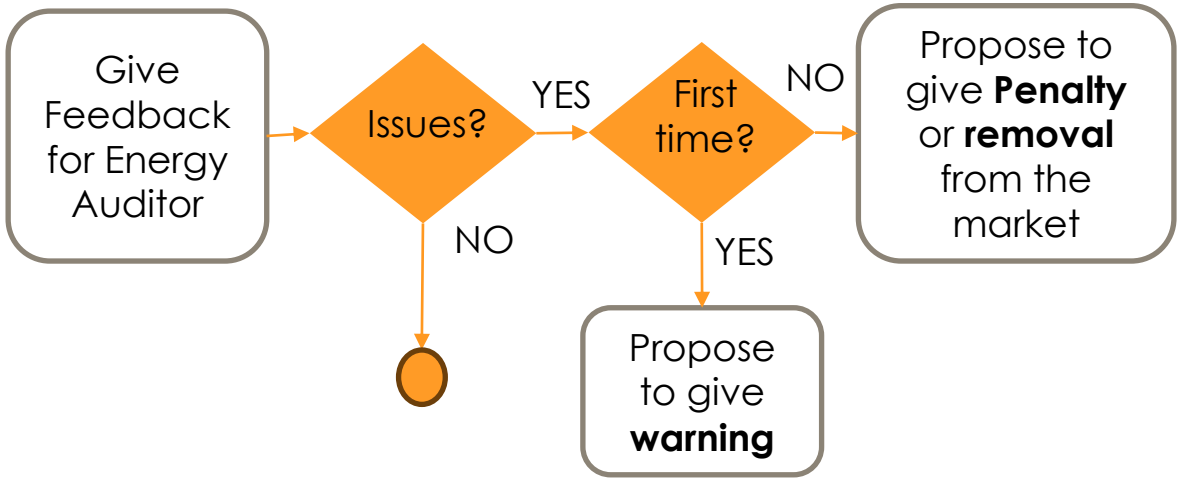
- **Basic Data Collection Checks:** Verifying the accuracy and completeness of the data collected during the audit.
- **Examination of Flagged Issues:** Addressing specific issues flagged during the initial screening and in-depth quality checks necessitating on-site physical verification.

PROPOSAL: USE THE PROCESS DATA TO DRIVE IMPROVEMENT OF THE QUALITY

Feedback and Actions After Checking

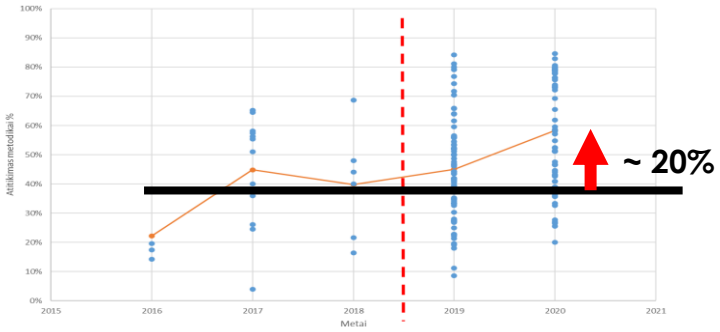


Warnings and Sanctions



Aggregation of Quality Control Process Generated Data

$$QSI = \frac{\text{Satisfied criteria}}{\text{Number of criteria}}$$



- **Measuring Market Quality Level**
- **Identifying Common Issues**
- **Identify Energy Auditor Knowledge Gaps**
- **Find recommendations for Improvement of methodology**

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PROPOSAL: AIM FOR ELEMENTS CREATING SINERGIES WITH QC SYSTEM

Additional Elements Contributing to the Quality of Energy Audits

EA Methodology Update: Prioritizes transparency, standardised processes, enhanced calculation procedures, and integration of advanced software tools to improve the accuracy and relevance of EAs.

Internal Procedures for Implementing Organizations: Advocates for standardised procedures aligned with international quality management systems, emphasising documentation, compliance monitoring, and quality control integration.

Qualification Scheme for Energy Auditors: A comprehensive training and certification program is recommended, emphasising continuous professional development and best practice sharing to elevate energy auditor standards.

Leveraging Data for Energy Efficiency: Highlights the importance of a centralised EA database for informed policymaking and targeted energy efficiency strategies, facilitating data-driven improvements in the sector.

DISCUSSION

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NEXT STEPS

WBS	Task	Who	When
1.1.1	**Assistance** on Mapping the current situation performing energy audits and ensuring their quality	EEDI to support the Lead Expert in EA	Beginning of August
1.1.2	**Assistance** for preparation for workshop	EEDI to support the Lead Expert in EA	Mid - August
1.2.1	**Preparation** for workshop to local stakeholders in Kazakhstan	Lead Expert in EA EEDI to support the Lead Expert in EA	Till 25 August
1.2.2.	**Workshop for local stakeholders in Kazakhstan**	Lead Expert in EA	6th September
1.3.1.	Inputs for a Road Map preparation	EEDI to support the Lead Expert in EA	Till Mid November
1.3.2	**Road Map (+Recommendations) for *the changes in quality control framework of Energy audits* in Kazakhstan**	Lead Expert in EA EEDI to support the Lead Expert in EA	December 2023
1.5	**Round table discussion** to **present and discuss the Road Map**	Lead Expert in EA	January 2024
M	***Preparation of final deliverables***	Lead Expert in EA EEDI to support the Lead Expert in EA	Latest March 2024

THE LIST OF DELIVERABLES

- **Technical Workshop** "QUALITY CONTROL OF ENERGY AUDITS FOR THE INDUSTRY" *(presentation)*
- The **Recommendations** for improvement of existing quality control *(document)*
- The **Roadmap** for how to implement proposed improvements *(document)*
- The **Round Table Discussion** "QUALITY CONTROL IMPROVEMENT OF MANDATORY ENERGY AUDITS IN INDUSTRY"*(presentation)*

That this information could be provided to **another institution**, to integrate into their quality control process.

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THANK YOU FOR YOUR ATTENTION !

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