

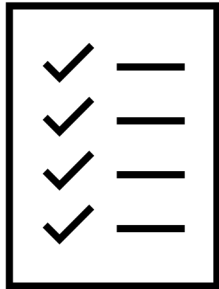
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ENERGY EFFICIENCY IN BUILDINGS AND INDUSTRY: THE ROLE OF ENERGY AUDITS

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Georgian Energy Sector Reform Programme” (GESRP)**

PRESENTATION OUTLINE



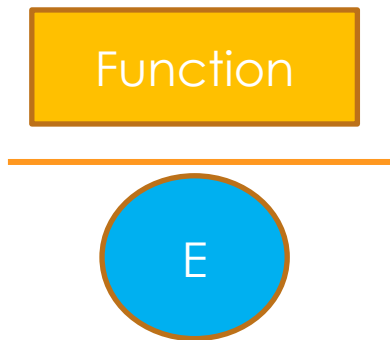
1. What is the right way to understand energy efficiency?
2. What do we gain from energy efficiency measures?
3. What is an energy audit?
4. What is the appropriate way to perform an energy audit?
5. How energy audit integrates into the building life cycle?
6. What is the place of an energy audit in enterprise development?
7. What is needed to have an energy audit system?
8. What are the key elements of a quality assurance system?
9. How to know the level of quality?
10. Who should lead the process and ensure quality improvement?
11. How may the Energy audit system help to plan the energy sector?

WHAT IS ENERGY EFFICIENCY & WHAT IS NOT?

Energy efficiency should be understood as getting the same with less energy, not just using less energy by sacrificing comfort or profit.

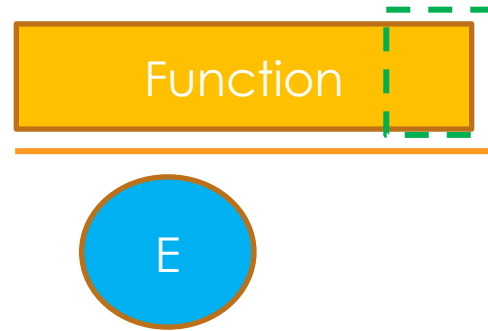
Energy efficiency:

It is the amount of energy needed to perform specific function

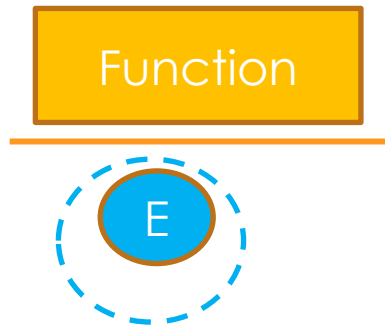


Efficiency improvement:

A) Have "more" with less energy



B) Have the same with "less" energy consumed



BUT if we sacrifice the function (as a comfort or productivity) – **it is not an improvement!**



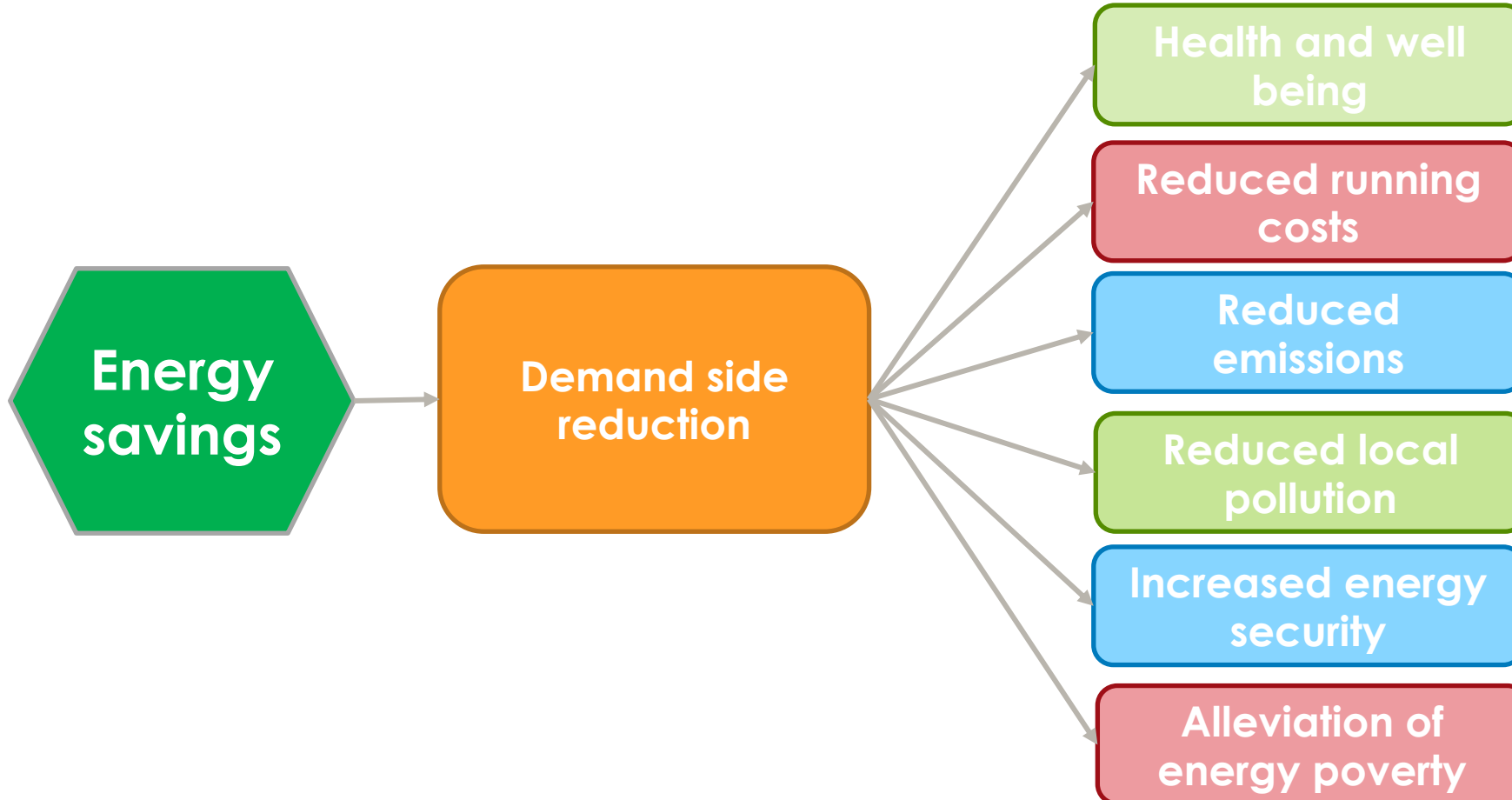
No efficiency improvement!

Sample functions:

- Maintain thermal comfort in the building
- Run manufacturing process
- Transport goods from A to B

WHAT WE CAN GAIN FROM ENERGY EFFICIENCY?

Energy efficiency will bring lower energy consumption, lower costs, reduced emissions and other benefits. That's why the EU focuses on "Energy efficiency first".



But how to find measures that delivers cost efficient energy savings?

WHAT IS ENERGY AUDIT?

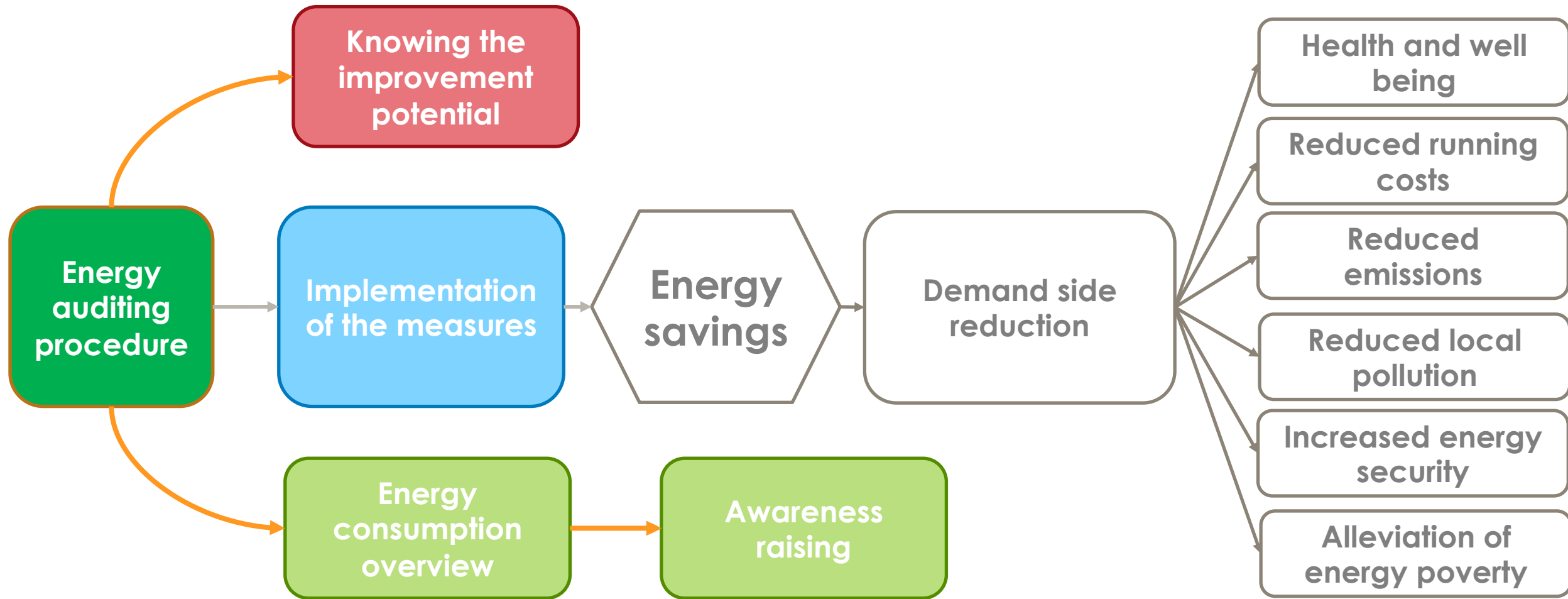
ENERGY AUDIT - systematic procedure with the purpose of obtaining adequate knowledge of the energy consumption profile of a facility, identifying and quantifying cost-effective energy saving opportunities, and reporting the findings.

In other words – a procedure which aims to document **energy flows and losses** and then **identifies ways to reduce or eliminate those losses** by proposing cost-effective measures.

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**

Energy audit is a tool that helps unlock cost-effectively energy efficiency improvements. The quality has to be ensured to deliver significant benefits

WHAT BENEFITS COULD BE GAINED FROM ENERGY AUDITS?

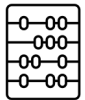


WHAT IS APPROPRIATE WAY TO DO ENERGY AUDIT?

Energy audit process



Performing energy audit and preparing the report



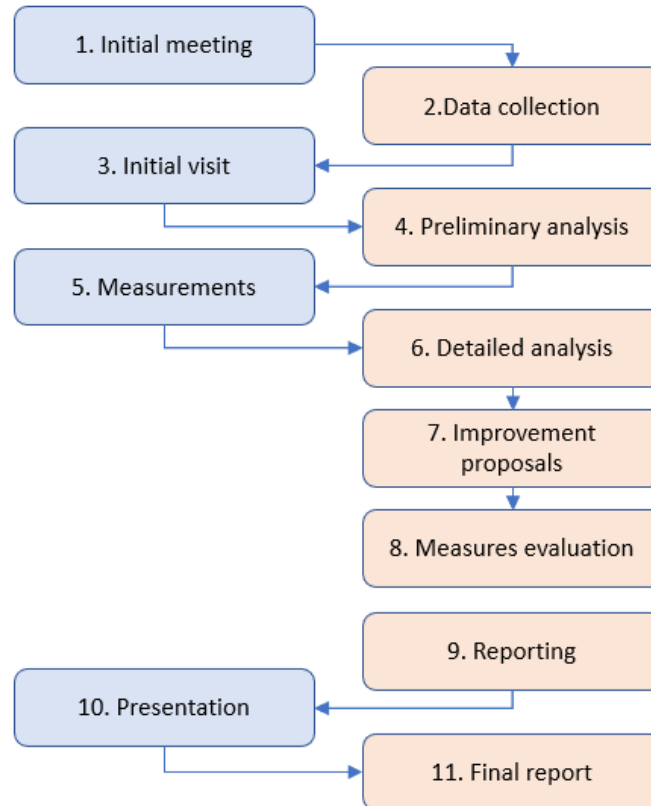
Tools



Templates



Checklists



Need for mutual understanding

Importance for collaboration

Need to provide general picture

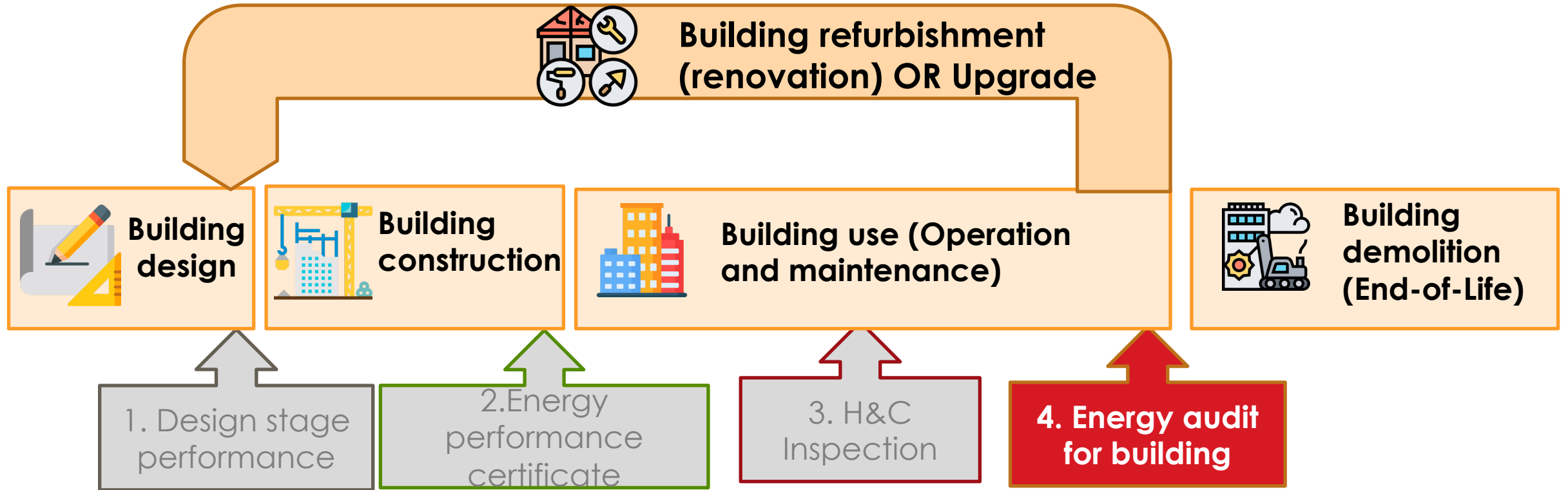
Pin-point the important details

Identify the most reliable measures

Ensure that the analysis and proposals are well understood and will be implemented

.Energy audits should be done in a standardized way but individualized for every case. Good results are often achieved when an energy professional end client collaborates

HOW ENERGY AUDIT INTEGRATES TO BUILDING LIFE CYCLE?



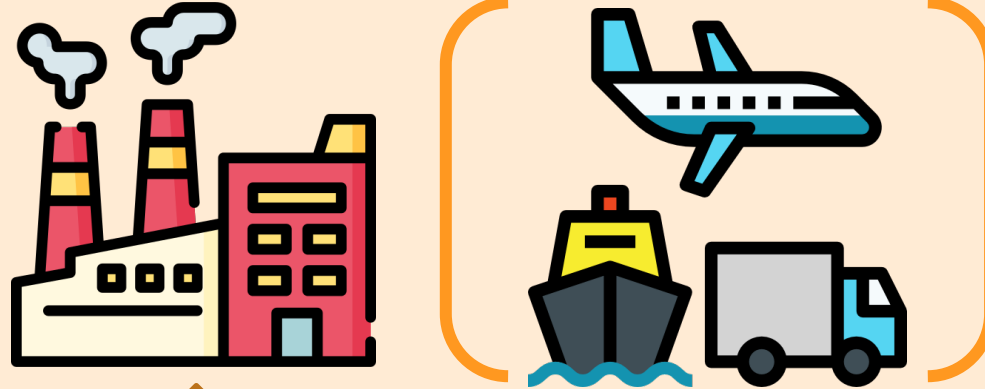
Energy audit plays an important role in managing the energy consumption of a building during its life cycle.

WHAT IS THE PLACE OF ENERGY AUDIT IN THE DEVELOPMENT OF ENTERPRISE?

Establishment



Operation (economic activity)



Liquidation,
reorganization
(End-of-Life)



**Energy audit
for Industry**

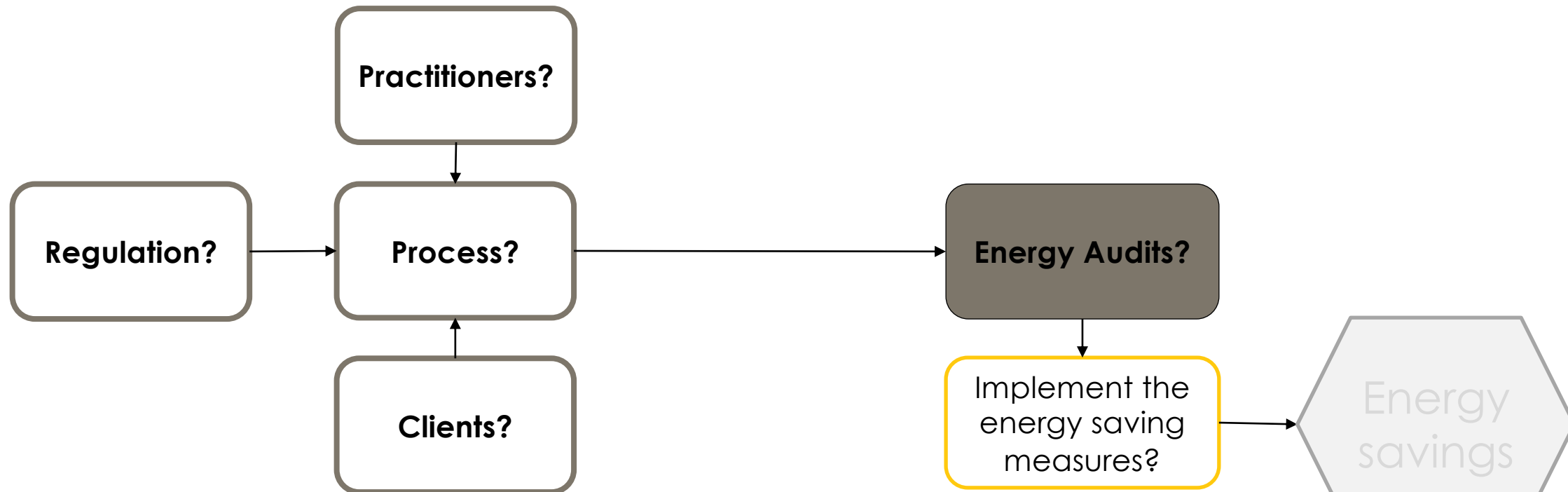
Who should do energy audits?

- Mandatory for Large enterprises
- Mandatory for enterprises that enjoys state support
- Voluntary for others

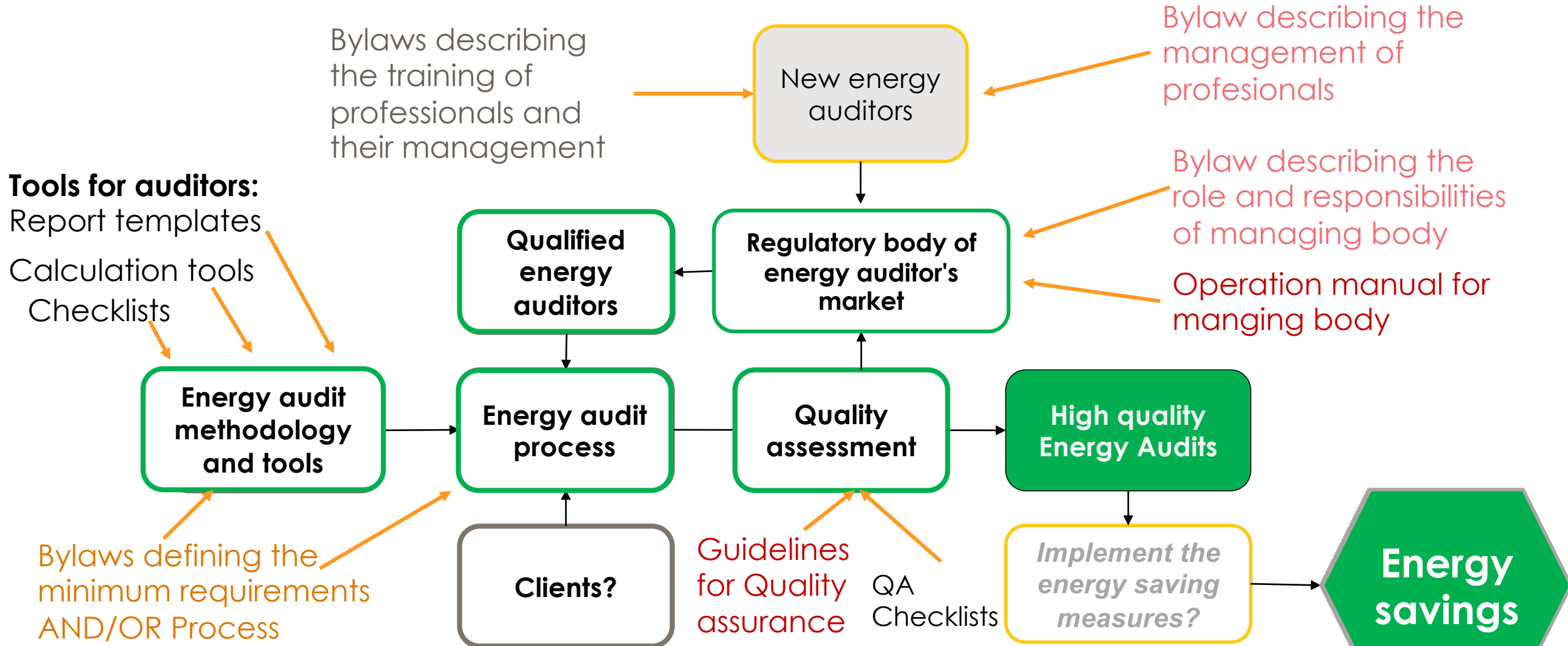
Enterprises may gain a competitive advantage by performing energy audits and implementing cost-efficient measures. It also enables raising awareness about energy use and demand reduction potential.

WHAT IS NEEDED TO HAVE ENERGY AUDIT SYSTEM?

In most of the countries there are already some elements of energy audit system, as it is a tool widely promoted by financial support donors:



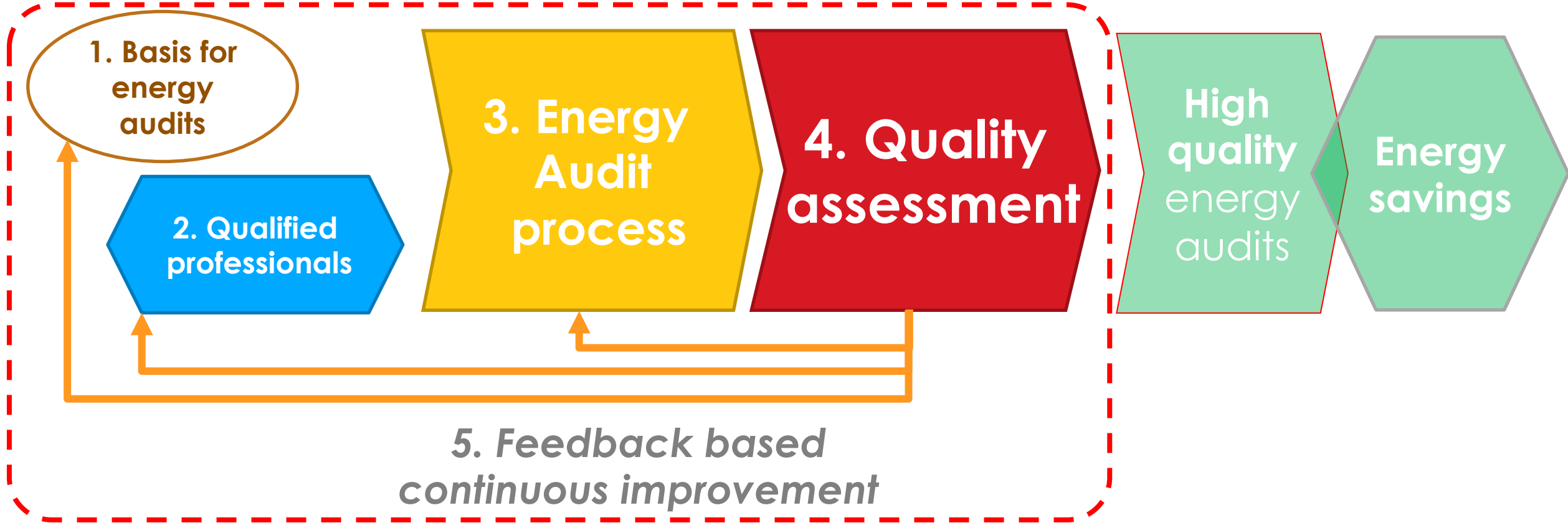
WHAT IS NEEDED TO HAVE ENERGY AUDIT SYSTEM?



The key aspects of the energy audit system ensure that it will function and deliver promised benefits.

WHAT ARE KEY ELEMENTS OF QUALITY ASSURANCE SYSTEM?

Quality assurance system



The quality could only be ensured with regulations, qualified professionals, defined processes, quality assurance and continuous improvement.

HOW TO KNOW THE LEVEL OF QUALITY? (1/2)

 - Based on data provided by energy auditor with report

1. Are the required input data provided?

2. The validity against minimum requirements is fulfilled?

3. Correctness of calculations and used assumptions?

4. Correct/realistic data is provided?

Quality assessment



Automated Check



Quality screening



In-depth QC



Site visit

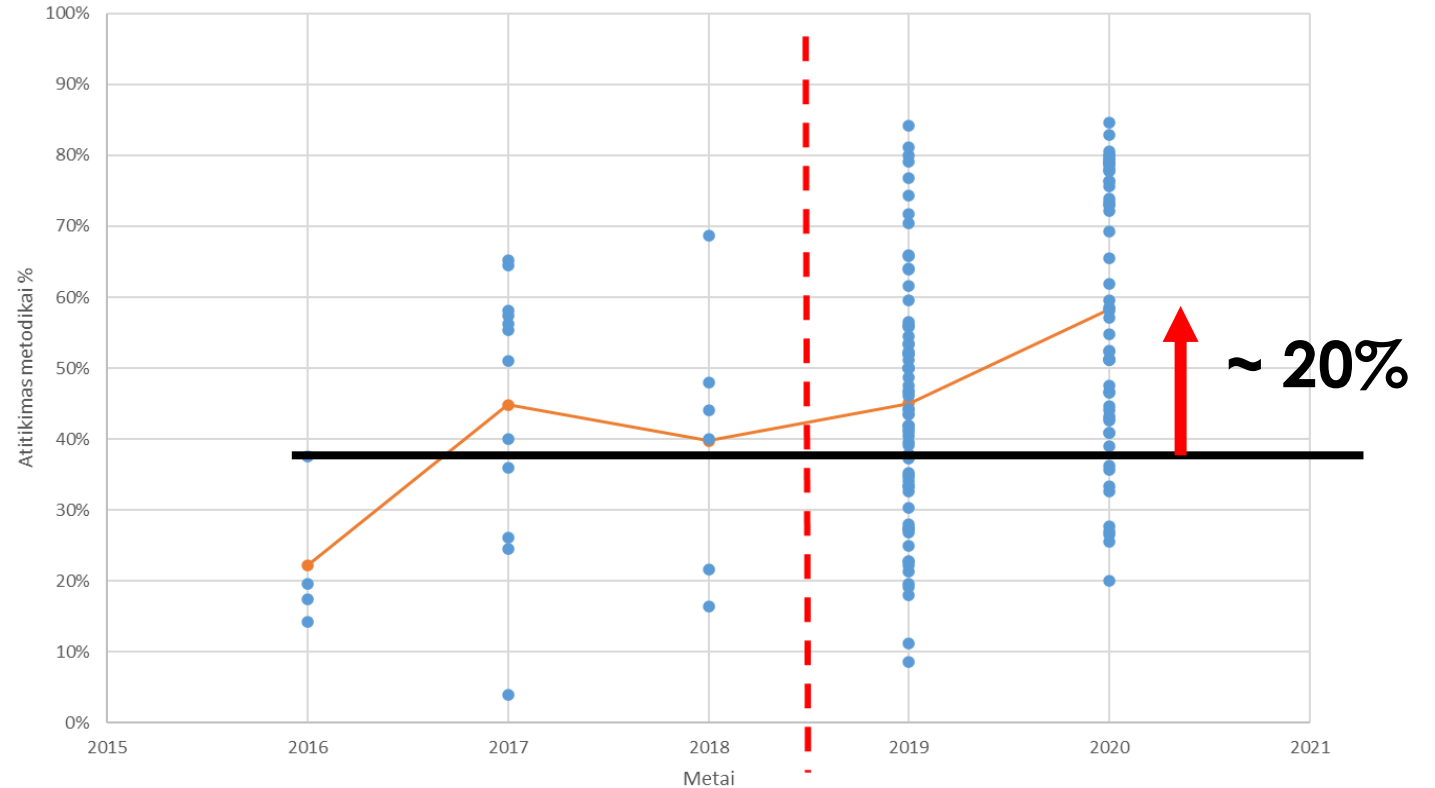
$$I_s = \frac{\text{Satisfied criteria}}{\text{Number of criteria}}$$



- Checked on-site

HOW TO KNOW THE LEVEL OF QUALITY? (2/2)

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



While in Lithuania (period of 2019- 2022) :

>500 energy audits in buildings | >0,308 mln. m² renovated public buildings | >540 GWh cumulative savings
 >600 energy audits in industry | >431 GWh annual energy savings potential (5% of sectors consumption)

WHO SHOULD LEAD THE PROCESS AND ENSURE QUALITY IMPROVEMENT?



Role of energy auditors:

1. Performs audits.
2. Does internal quality assurance.
3. Submits reports to the client.
4. Registers the report.
5. Interacts with quality checking procedure.
6. Provides feedback on legal framework and support tools, and shares client insights.

Role of implementation body:

1. Provides technical support for the commission.
2. Supervises training process.
3. Checks the quality and gives feedback.
4. Measures professional and market quality.
5. Aggregates and shares quality checking results.
6. Generates and collects insights.
7. Acts to improve quality.

The agency or other policy implementation body should act (and take leadership) on running the energy audit system.

HOW MAY THE ENERGY AUDIT SYSTEM HELP IN THE PLANNING OF ENERGY SECTOR?

DATA FOR ENERGY PLANNING AND SHAPING THE MEASURES

1. Helps to **benchmark actual energy consumption in buildings**
2. Helps to **identify specific consumption** of produced goods
3. Provides data for **comparing** the local consumption **with** int. **best practices** – enables to know **improvement potential**
4. Helps to **understand** what measures **need** for **financial support**

DATA FOR ENERGY CONSUMPTION MODELING AND FUTURE PREDICTIONS

1. Provides **data for** country and sector-level **energy modelling**
2. Helps **to** monitor the performance change and rely not only on financial data
3. **Quantify energy consumption** in the national energy balance
4. **Data-based estimations** of future energy savings

Energy audits system also delivers additional benefits for energy planning modelling and energy planning activities needed for policy making..

SUMMARY: KEY TAKE AWAYS (1/2)

1. Energy efficiency should be understood as getting the same with less energy, not just using less energy by sacrificing comfort or profit.
2. Energy efficiency will bring lower energy consumption, lower costs, reduced emissions and other benefits. That's why the EU focuses on "Energy efficiency first".
3. Energy audit is a tool that helps unlock cost-effectively energy efficiency improvements. The quality has to be ensured to deliver significant benefits.
4. Energy audits should be done in a standardized way but individualized for every case. Good results are often achieved when energy professional end client collaborates.
5. Energy audit plays an important role in managing the energy consumption of a building during its life cycle.
6. Enterprises may gain a competitive advantage by performing energy audits and implementing cost-efficient measures. It also enables raising awareness about energy use and demand reduction potential.

SUMMARY: KEY TAKE AWAYS (1/2)

6. Enterprises may gain a competitive advantage by performing energy audits and implementing cost-efficient measures. It also enables raising awareness about energy use and demand reduction potential.
7. The key aspects of the energy audit system ensure that it will function and deliver promised benefits.
8. The quality could not be ensured without regulations, qualified professionals, defined processes, quality assurance and continuous improvement.
9. The quality could be known and improved only when measured. The metric dynamics help to understand the need for additional actions for quality improvement.
10. The agency or other policy implementation body should act (and take leadership) on running the energy audit system.
11. Energy audits system also delivers additional benefits for energy planning modelling and energy planning activities needed for policy making.

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***THANK YOU FOR
YOUR ATTENTION !***



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



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