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Training workshop "Studying international practices in implementation of innovative energy efficiency technologies in the electric power industry. Methodology, goal and objectives of electricity and heat consumers energy survey"

SEIT building, 62 Bayram Khan st, Mary, 13-19 March 2024

Review of international experience in setting up regulatory framework for introduction of innovative energy efficiency technologies in residential and public buildings

Ilze Purina, Key Expert, SECCA

Stantec | intec MEMBER OF GOPA CONSULTING GROUP | ACTED | European University Institute | Robert Schuman Centre for Advanced Studies | FSR ENERGY Florence School of Regulation

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Обучающий семинар «Изучение международного опыта по внедрению инновационных технологий по энергоэффективности в электроэнергетической отрасли. Методика, цель и задачи проведения энергетического обследования потребителей электрической и тепловой энергии»

Здание ГЭИТ, г. Мары, ул. Байрам-хана 62, 13–18 марта 2024 года

Обзор международного опыта по созданию законодательной базы для внедрения инновационных технологий по энергоэффективности в жилых и общественных зданиях

Илзе Пурина, Ключевой эксперт, SECCA

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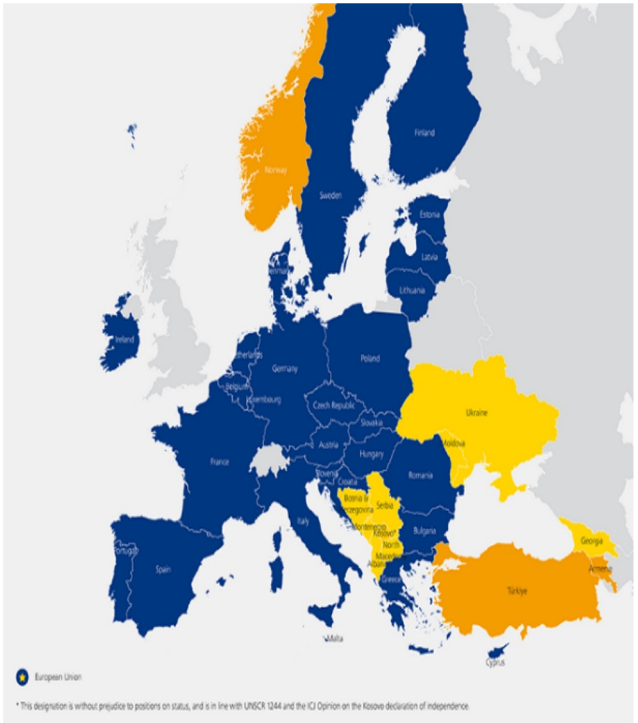
Legal and regulatory framework for promotion of EE in buildings

- Legal and regulatory framework
  depends largely on the country –
  status of existing legal/ regulatory framework,
  including standards, application practice of norms, etc.,
  and institutional set-up

- Examples presented are based
  on experience/ practice in EU countries
  and also
  Energy Community Contracting Parties
  (namely Georgia and Moldova)



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Building stock

- **Public buildings, incl. Central Government Buildings**
- Commercial sector buildings (offices, etc.)
- Industrial Buildings
- **Residential buildings**
  - ✓ **Multi-apartment buildings**
  - ✓ **Family houses**

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Key elements for promotion of EE in buildings

- **Minimum energy performance requirements**
- Energy performance certification of buildings
- Inspection of heating and cooling systems in buildings
- Energy audits of buildings

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Key tools for promotion of EE improvement in Building life cycle

Building refurbishment (renovation) OR Upgrade

Building design

Building construction

Building use (operation and maintenance)

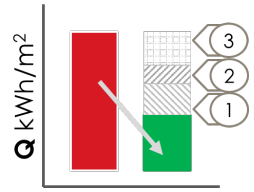
Building demolition (End-of-Life)

Tools:

① Project __EPC

② Energy performance certificate

③ H&C Inspection



④ Energy audit for building

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Minimum Performance Energy Requirements (MEPRs)

- **MEPRs** have been introduced into the national legislation of EU countries since the 90s **to reduce the energy consumption** in new and existing buildings, first as stricter energy parameters in the **building components**, then on the **building's overall energy consumption**
- To reduce the non-uniformity among EU countries, the EU Commission was asked to develop a **standard method** to verify if the governments were applying **the most energy-efficient values being still cost-effective**

Example of EnC CP - Georgia

- The Law on EE of Buildings states that the investments in energy efficiency to be applied to existing buildings are obligatory if demonstrated as cost-effective in the lifetime of the building, considering investment, maintenance and energy consumption costs
- The calculation made to identify the MEPRs has to be compliant with cost-effectiveness criteria
- A study is being conducted to verify the cost "optimality" of MEPRs, using a European methodology

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Obligations impacting the public sector (1)

- The buildings owned by the public sector, like schools, offices, health facilities, etc., need refurbishment plans, which include many aspects, like
  - ✓ structural strength
  - ✓ hygienic services
  - ✓ safety of users, *and*
  - ✓ energy efficiency

- For energy efficiency, the **refurbishment must comply with the Minimum Performance Energy Requirements** (MEPRs)

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Obligations impacting the public sector (2)

Complying with MEPRs means achieving specific values for the parameters defining the energy quality of building components, for example:

- ✓ improving the deteriorated facades adding **external insulation**
- ✓ replacing old inefficient boilers with **condensing boilers in colder climatic zones, or heat pumps in milder climatic zones**
- ✓ replacing single-glazed and draughty windows with **double-glazed, low emittance, airtight windows**

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How the MEPRs are enforced?

- Enforcement usually is ensured by issuing Resolution of the Government

Example of EnC CP - Georgia

✓ This Resolution on enforcement of MEPRs stipulates that "the architectural project and the construction scheme/project shall be accompanied by an expert opinion on the compliance of the architectural project and the construction scheme with the MEPRs"

✓ It concerns buildings, parts of buildings or building elements

✓ The Resolution applies also in case of the major refurbishment of the existing building *(the reconstruction of more than 25% of the surface of a building envelope & the upgrade of a building envelope or technical systems, the value of which exceeds 25% of the value of the building)*

Therefore, plans for the refurbishment works will need to show that the refurbishment will achieve the MEPR standard/s in order to obtain the construction permit

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Energy Performance Certification of Buildings (1)

Example of EnC CP - Georgia

- Energy performance certification (EPC) is compulsory for **new buildings** when the building is sold or rented out, and for **all public buildings** whose surface area exceeds 500 m^2 (250 m^2 after June 2026) and are frequented by citizens
- A copy of the EPC shall be shown to the prospective new tenant or buyer and handed over to him
- According to the Georgian secondary legislation - a building complying with the levels set by the law (MEPRs) is classified in Class D, while buildings having better levels will be classified from A to C, and existing buildings, below the legal levels, will be classified from G to E
- Class A building represents a so-called nearly zero energy building, where very low energy demand is further reduced using renewable energy, like solar thermal and solar photovoltaic

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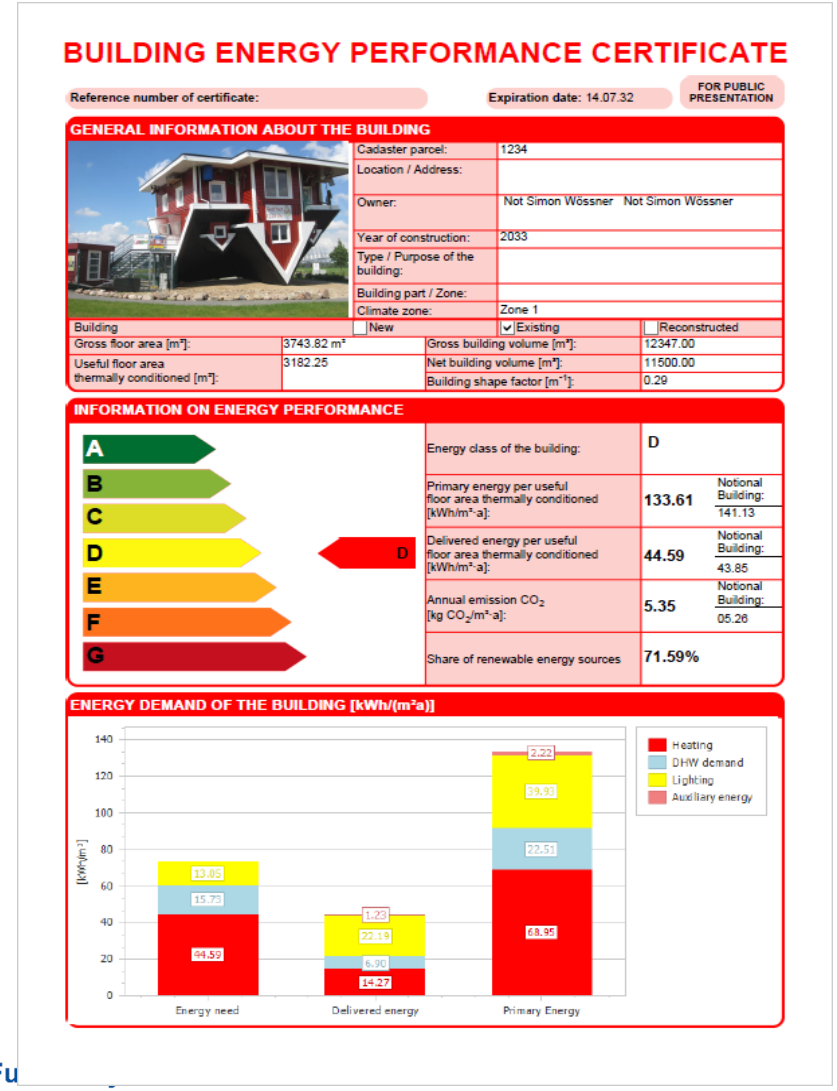
Energy Performance Certification of Buildings (2)



BUILDING ENERGY PERFORMANCE CERTIFICATE

Reference number of certificate:

Expiration date: 14.07.32

FOR PUBLIC PRESENTATION

GENERAL INFORMATION ABOUT THE BUILDING

Cadaster parcel:	1234
Location / Address:	
Owner:	Not Simon Wössner Not Simon Wössner
Year of construction:	2033
Type / Purpose of the building:	
Building part / Zone:	
Climate zone:	Zone 1

Building	☐ New	☑ Existing	☐ Reconstructed
Gross floor area [m²]:	3743.82 m²	Gross building volume [m³]:	12347.00
Useful floor area thermally conditioned [m²]:	3182.25	Net building volume [m³]:	11500.00
		Building shape factor [m⁻¹]:	0.29

INFORMATION ON ENERGY PERFORMANCE

A B C D E F G (D)

Energy class of the building:	D	
Primary energy per useful floor area thermally conditioned [kWh/m²·a]:	133.61	Notional Building: 141.13
Delivered energy per useful floor area thermally conditioned [kWh/m²·a]:	44.59	Notional Building: 43.85
Annual emission CO_2 [kg CO_2/m²·a]:	5.35	Notional Building: 05.26
Share of renewable energy sources	71.59%	

ENERGY DEMAND OF THE BUILDING [kWh/(m²a)]

The energy performance certificate shall be displayed in a prominent place, clearly visible to the public in buildings where

- a total useful floor area of over 500 m² of a building for which an energy performance certificate has been issued is occupied by public authorities and frequently visited by the public. On June 30, 2026, this threshold shall be lowered to 250 m²;

- a total useful floor area of over 500 m² of a building for which an energy performance certificate has been issued and is frequently visited by the public.

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Regulatory and enabling environment for EPCs

DATABASE
Centralized national registry for reports and experts.

NATIONAL CALCULATION SOFTWARE:
A free software tool simplifying the calculation and the processing of EPCs.

EXPERT CERTIFICATION:
Defined process for certifying and registering EPC experts.

QUALITY ASSURANCE:
Oversight of report quality and impartiality of experts.

GUIDELINES & DOCUMENTATION:
Providing templates and guidelines for performance certification

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Inspection of heating and cooling systems in buildings

- The heating and cooling systems of significant size **often lack suitable maintenance and have defects in their design or installation** which produce a loss of energy efficiency
- The inspection concerns only heating and cooling systems having a rated output larger than a certain threshold, practically excluding all single-family boilers and AC systems, therefore obliging mostly public buildings, health and educational facilities, large commercial establishments, centralized residential systems, and similar.
- The obligation to inspect falls on the building owner; when the system serves a multiplicity of buildings or building units, the inspection cost will be shared among the system users, in the same way as for system maintenance cost.
- **The larger public buildings will be required to have a system inspection**
- The inspector will assess the energy performance of the heating and AC systems and will recommend measures to improve energy efficiency, in the direction of approaching the level of performance fixed in the MEPRs.
- The building owners are not obliged to implement the recommendations, but these suggestions will be the basis for future energy refurbishment initiatives

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Supporting infrastructure for EE policy implementation

Energy efficiency targets could not be achieved without **supporting infrastructure needed for policy implementation**

Energy Professionals

Tools and methods supporting preparation of energy audit

Quality assurance framework for energy auditing

Reporting procedures (need for international recognition of efforts to improve energy efficiency)

Monitoring and verification procedures

The supporting infrastructure is needed as a background process
to ensure that energy efficiency measures will ensure energy savings

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Actions and outcomes from different professions (1)

Profession:	Action:	Outcome:
ENERGY PERFORMANCE CERTIFICATION EXPERTS	Issue **Energy Performance Certificate** for existing building	1. Assigned energy performance rating (class) 2. Recommendations for improvement at the elements where it is not compliant with MEPR's
HEATING & AIR CONDITIONING SYSTEM INSPECTOR	Perform an **inspection of the heating and/or air conditioning system**	Prepare an inspection report with recommendations for improvement (together with a brief description)

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Actions and outcomes from different professions (2)

Profession:	Action:	Outcome:
ENERGY AUDITOR IN BUILDINGS	Perform **energy auditing procedures in the building**	Energy audit report, providing recommended improvement measures based on detailed evaluation, with financial feasibility for buildings
ENERGY AUDITOR IN INDUSTRY	Perform **energy auditing procedures in the industrial process**	Energy audit report, providing recommended improvement measures based on detailed evaluation, with financial feasibility for industry
ENERGY AUDITOR IN TRANSPORT	Perform **energy auditing procedures in the transport process**	Energy audit report, providing recommended improvement measures based on detailed evaluation, with financial feasibility for transport

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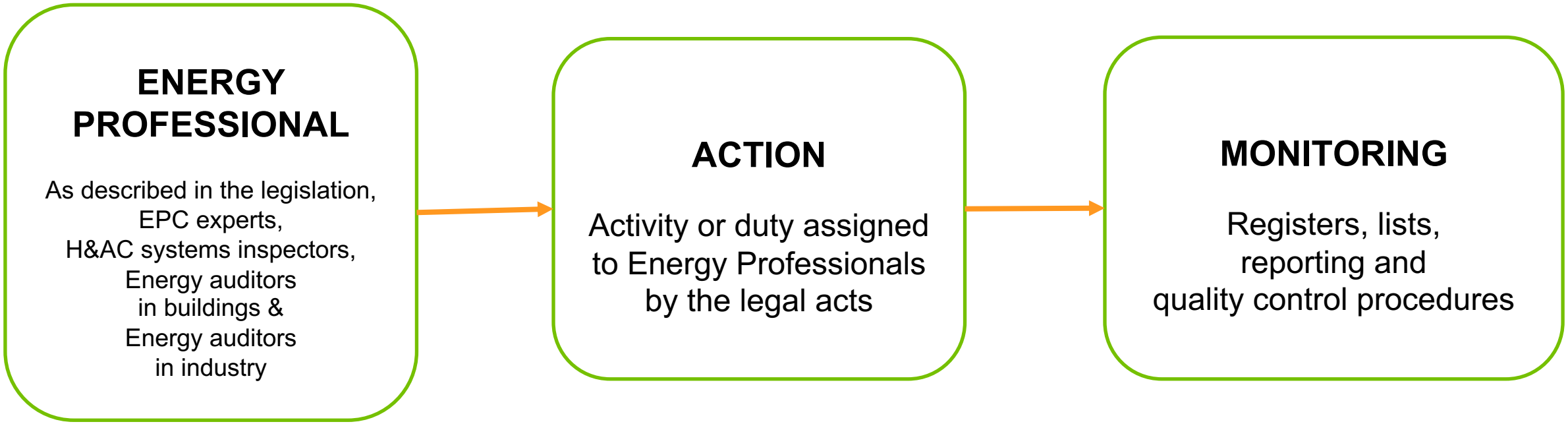
Monitoring procedures of Energy Professionals



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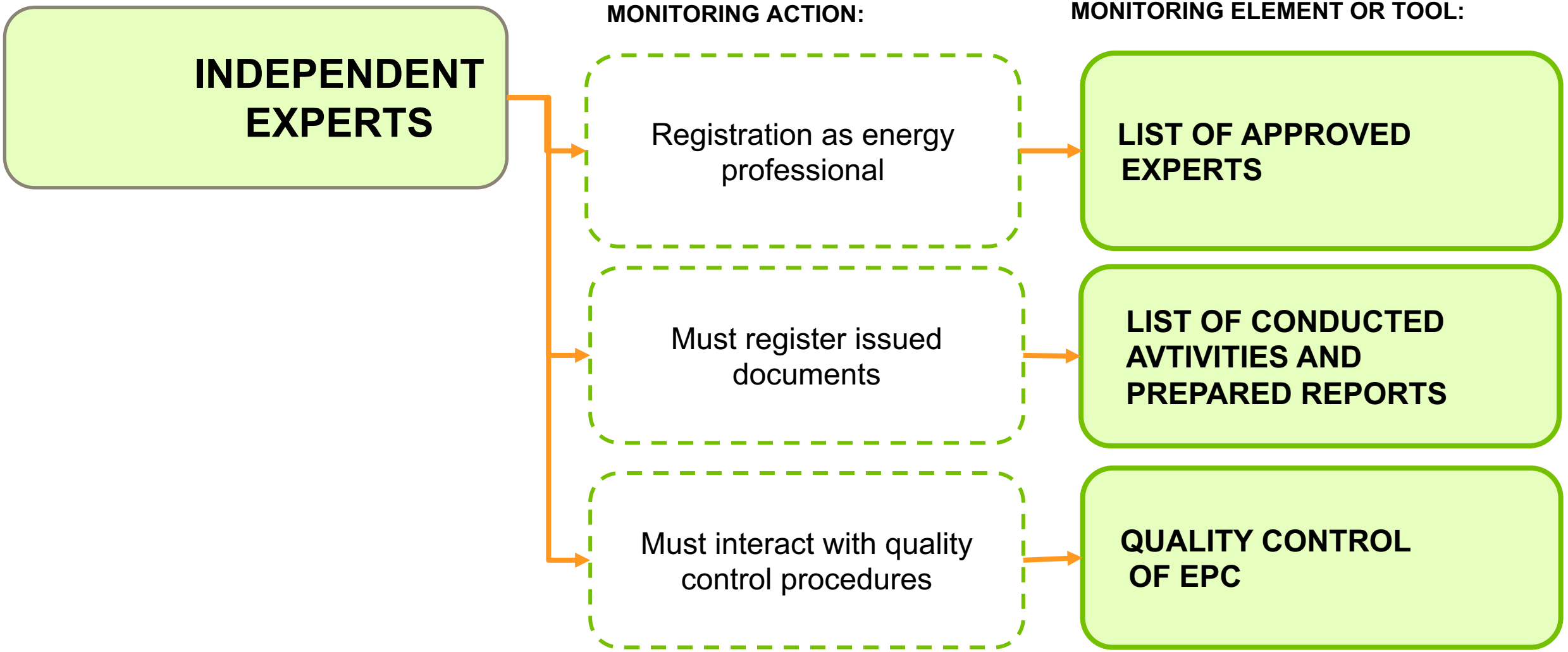
Procedure for keeping registers and monitoring work quality



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Legal framework for EE and EEiB in Georgia

Law on EE and 19 bylaws, incl. ones related to supporting infrastructure

- ✓ Bylaw on Energy professionals
- ✓ Bylaw on Energy audit procedure
- ✓ Bylaw on Training program

Law on EEoB and 11 bylaws, incl.

- ✓ Bylaw of energy performance certification of buildings
- ✓ Bylaw on regular inspection of heating and air-conditioning systems in buildings

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Key elements of the Bylaw on Independent experts - Georgia

IMPORTANT PRE-REQUISITES

- DEFINITIONS
- RESPONSIBILITIES OF STAKEHOLDERS
- GENERAL PRINCIPLES

PATHWAY OF ENERGY PROFESSIONAL

- QUALIFICATION REQUIREMENTS
- REGISTRATION AND CONTINUOS TRAINING
- RULES OF CONDUCT
- QUALITY SUPERVISION
- SUSPENDING, REVOKING AND REMOVAL

IMPLEMENTATION ASPECTS

- REGISTRIES AND LISTS
- ADDITIONAL TOOLS
- IMPLEMENTATION BODY
- TEMPORARY REGISTRATION
- ENTRY TO FORCE

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