

CLOSING THE ENERGY EFFICIENCY KNOWLEDGE GAP THE KENYAN SITUATION

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Energy efficiency sector in Kenya

- **Energy efficiency efforts started in the early 2000s**
- **The Energy Act, 2019**
- **Energy sector regulator - Energy and Petroleum Regulatory Authority (EPRA)**
- **Two regulatory instruments:**
 1. **The Energy (Energy Management) Regulations, 2012**
 2. **Energy (Appliances Energy Performance and Labelling) Regulations, 2016**
- **Kenya National Energy Efficiency and Conservation Strategy launched in 2020**
 - ❖ **Targets households, buildings, agriculture and industry, transport, and power utilities to be accomplished within a 5-year timeline up to 2025**
 - ❖ **Recognises training and capacity-building in EE and conservation central to meeting the targets**

Energy efficiency sector in Kenya cont'd

The Energy (Energy Management) Regulations, 2012

- ❖ **Targets industrial, commercial, and institutional facilities consuming more than 180,000 kWh annually**
- ❖ **Designated facilities are required to:**
 - i. Develop an energy management policy**
 - ii. Designate an energy officer**
 - iii. Conduct an energy audit once every 3 years**
 - iv. Develop an energy management implementation plan**
 - v. Implement ECMs to achieve at least 50% of the recommended energy savings**
 - vi. Monitor performance of EE projects, prepare implementation reports and submit them to EPRA**
 - vii. Keep a record of production and energy consumption data.**
- ❖ **Audits are conducted by licensed energy auditors - 87**

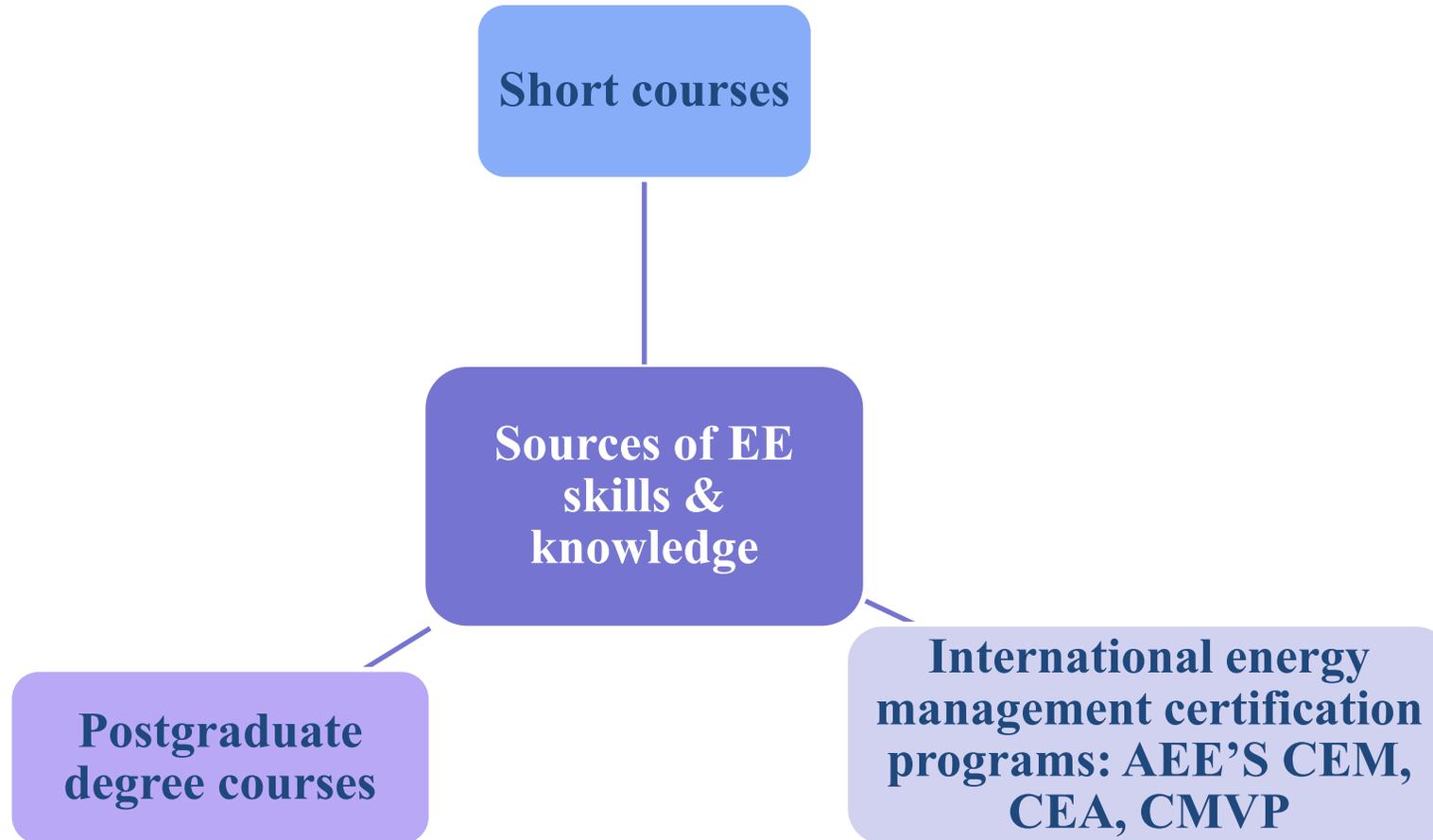
Energy efficiency sector in Kenya cont'd

- ❖ **Energy auditors licensing requirements:**
 - ❑ **Minimum academic qualification; higher national diploma (HND), bachelors or postgraduate degree and;**
 - ❑ **Passed an energy management certification exam or postgraduate diploma or MSc in Energy Management and;**
 - ❑ **Have conducted at least five energy audits**

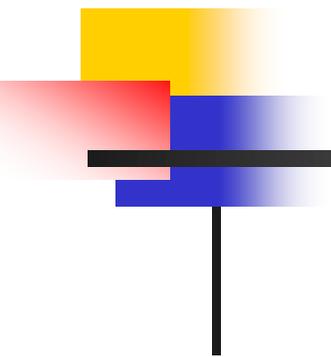
Energy (Appliances Energy Performance and Labelling) Regulations, 2016

- **Test appliances for energy performance - MEP**
- **Register appliances with EPRA**
- **Affix appliance with appropriate energy star label**
- **Appliances - Refrigerators, 3-Phase induction motors, non-ducted air conditioners, lamps, ballasts for lamps**

Sources of acquired skills and knowledge



Methodology



**Review of audit
reports submitted to
EPRA**

Field visits to facilities

**EE professionals'
interviews**

**Interviewed local
universities offering
EE training programs**

**Interviewed
government and non-
government agencies
involved in energy
management**

Requisite skills and knowledge for energy auditors

Energy management

Fundamentals

Tariffs

Data collection & analysis

Establishing EnPI

Technical knowledge

Electrical power systems analysis

Thermodynamics and heat transfer

Combined heat and power

Systems optimization

Commissioning principles

O&M practices

New & existing technologies

M&V techniques and protocols

Analytical skills

Statistical analysis

Whole-system analysis

Problem-solving abilities

Requisite skills and knowledge for energy auditors cont'd

Financial & accounting skills

Economics of energy management

Life cycle cost analysis

Financial decision-making processes

Economic assessment indicators

Financing options

Cost control & budgeting

Risk management

Regulations, standards, and best practices

National and county laws, rules, regulations, standards, policies

Global and sector best practices

Other areas

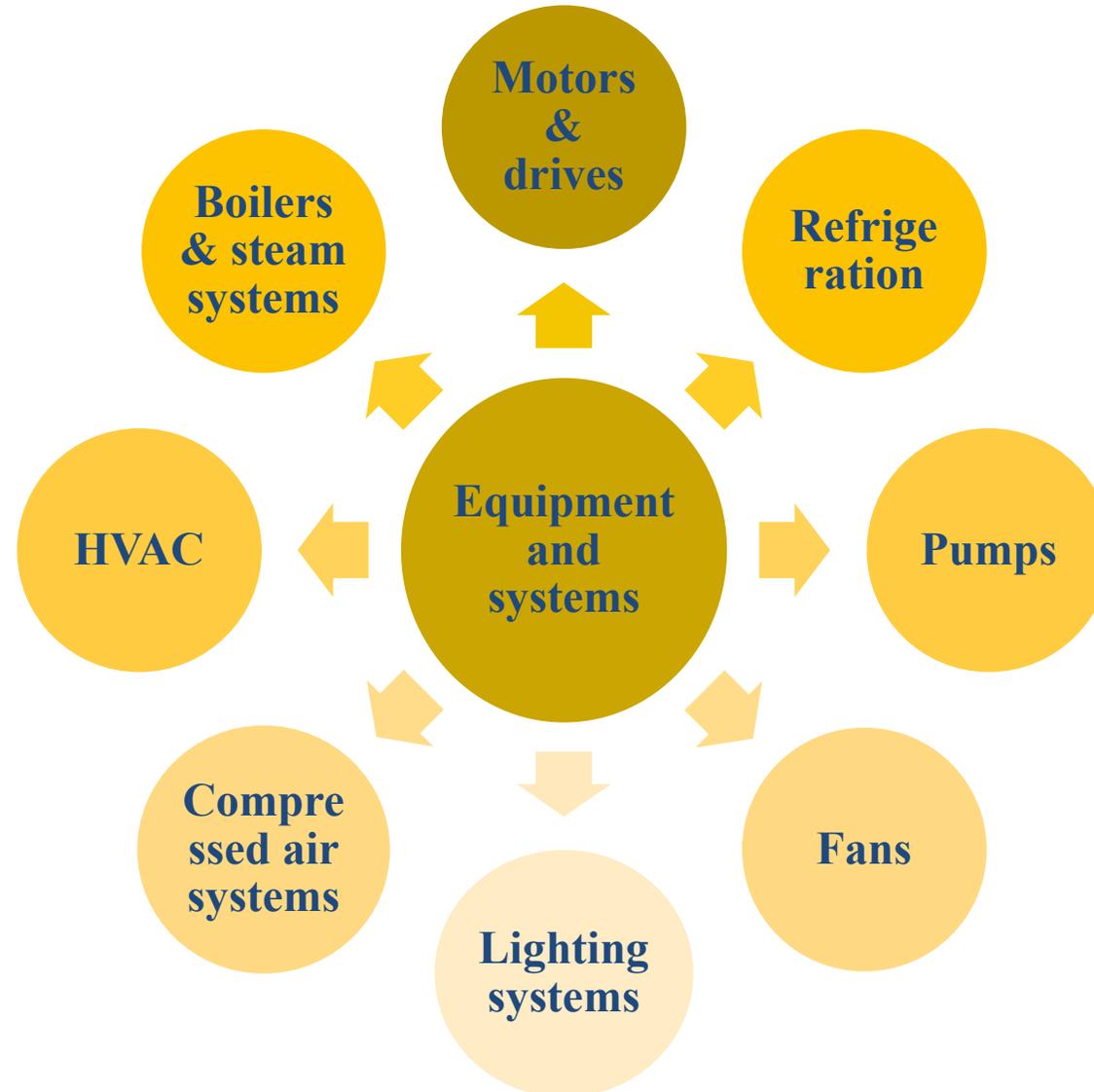
Communication and interpersonal skills

Performance contracting

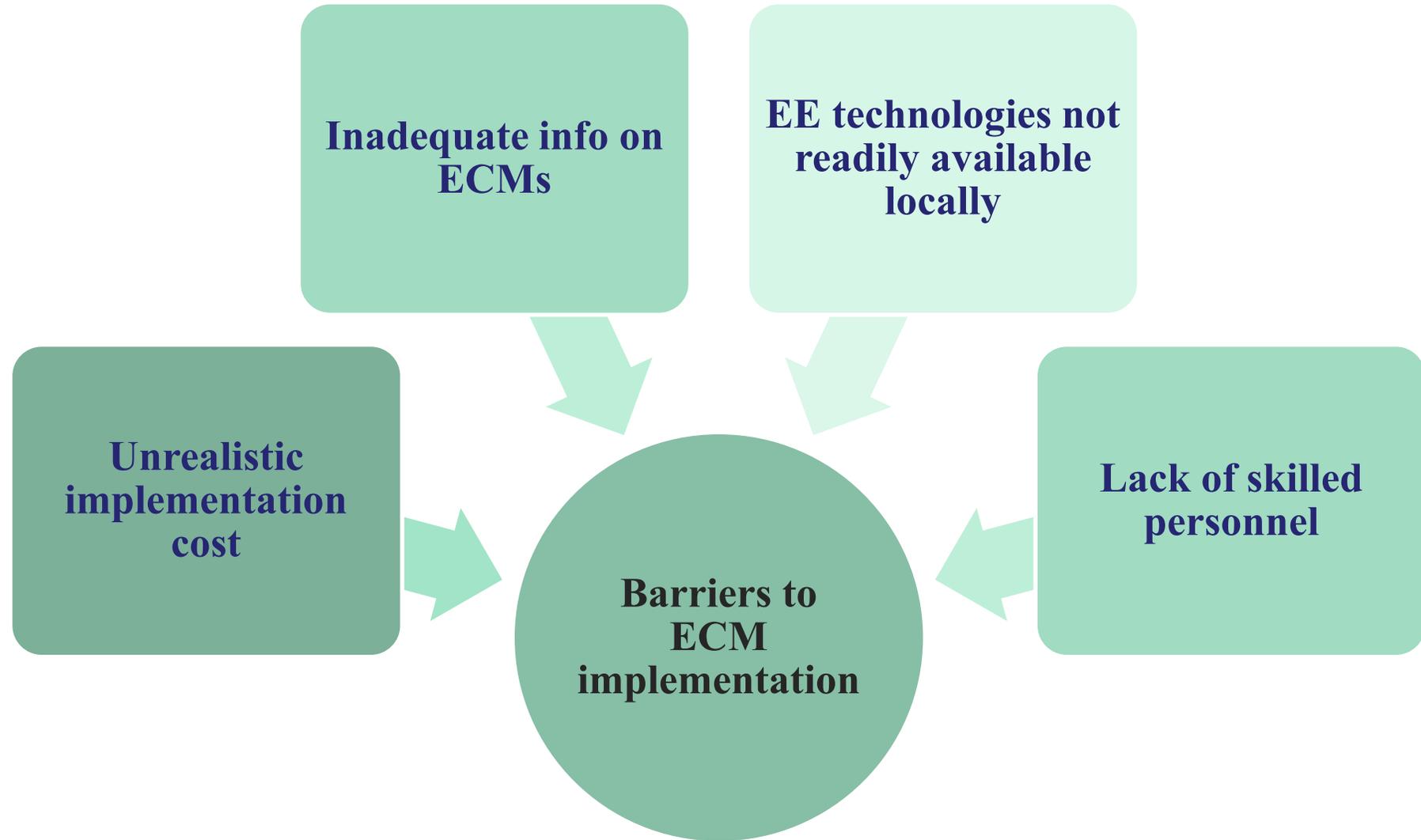
Judgment and decision making

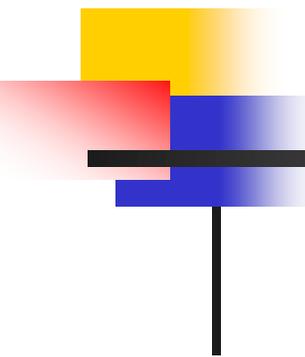
Report writing

Main applications and processes that require EE intervention



Challenges encountered during implementation of ECMs





EE skills among energy auditors

Understanding energy use

Establishing energy baseline

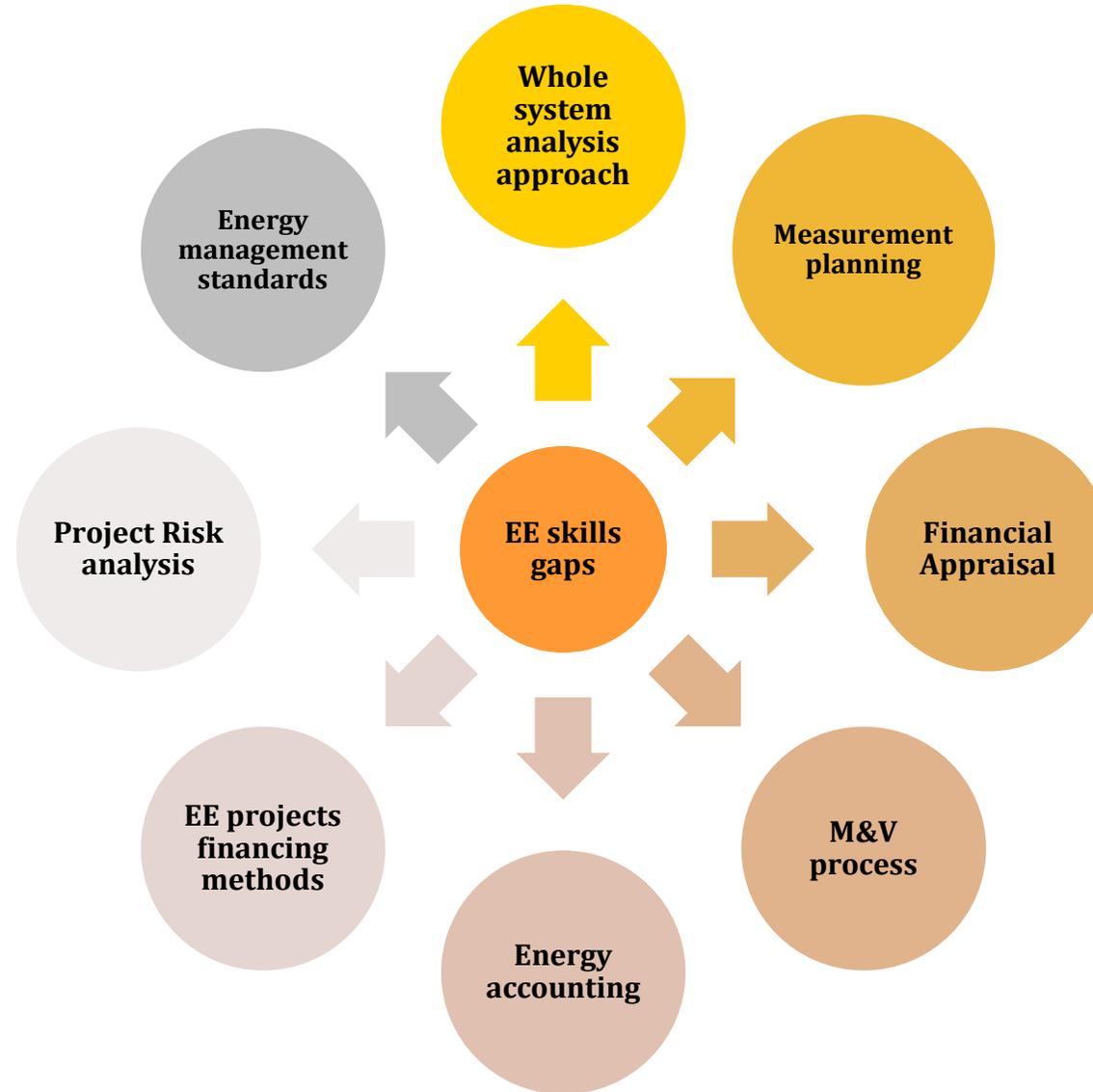
Data collection and analysis

Understanding energy pricing & tariffs

Identifying appropriate EnPI

Identification and evaluation of potential EE opportunities

Gaps in EE skills



Bridging the EE skills gap

EE professionals	Short course area/topic
	<ul style="list-style-type: none">◆ Energy systems optimisation◆ Energy measurement techniques and monitoring◆ Energy accounting & metering◆ Financial analysis of energy savings◆ Energy efficiency project financing: mechanisms & resources to fund EE projects
Energy auditors	<ul style="list-style-type: none">◆ Risk assessment and management for EE projects◆ Energy economics, financing energy projects, and performance contracting◆ Introduction to measurement and verification◆ Energy management regulations and standards◆ Energy audit report writing

Topics for postgraduate programs

Energy management

- ❖ Energy management and auditing:
- ❖ Instrumentation and control for energy systems
- ❖ Energy measurement techniques
- ❖ Energy modelling and optimization
- ❖ Energy use and resource management
- ❖ Material and energy balance
- ❖ Solar thermal energy
- ❖ Energy and water efficiency
- ❖ Energy efficiency in buildings
- ❖ Measurement and verification
- ❖ Energy management and transport
- ❖ Codes and standards

Economic analysis

- Energy economics and planning
- Energy, climate change and carbon trade
- Financial and project management
- Project economics and evaluation