



INTPA-NEAR Environment & Climate Week

27-31 March 2023
Brussels, Belgium



WORKSHOP ENERGY EFFICIENCY



ENERGY EFFICIENCY POLICIES IN BUILDINGS

Discussion

(25 min)



CLEAN COOKING – STANDARDS AND LABELS

Discussion

(15 min)



ENERGY EFFICIENCY BUSINESS MODELS SUCH AS DSM / SUPER ESCO

Discussion

(15 min)

Introduction

Energy efficiency is vital

Energy efficiency first!

Energy efficiency = “Do more with less energy”

Less energy = Less emissions, less pollution

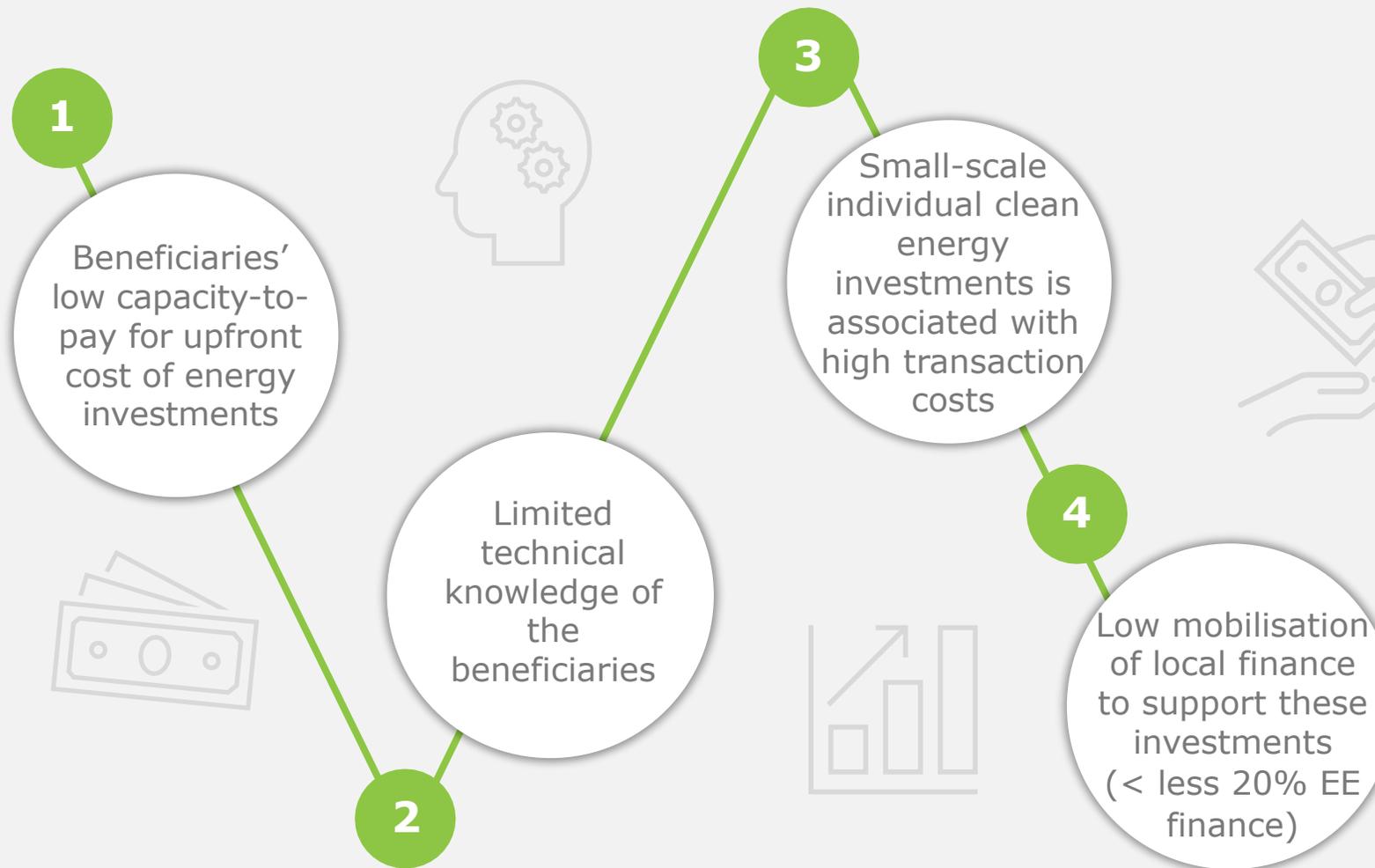
Energy efficiency = offers opportunities for synergies with other policy fields

- Market policies, trade facilitation, jobs and skills, circular economy, climate adaptation, just transition, etc.

Energy efficiency = tool and pre-condition for success of clean energy transition

- Help renewables reach their full decarbonisation potential
- Moderate energy demand (e.g. cooling)
- "Energy efficiency first" principle

Energy Efficiency Limitations



Energy Efficiency

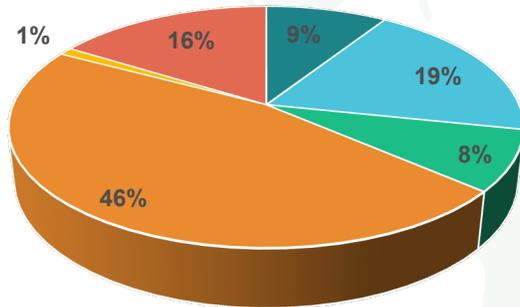
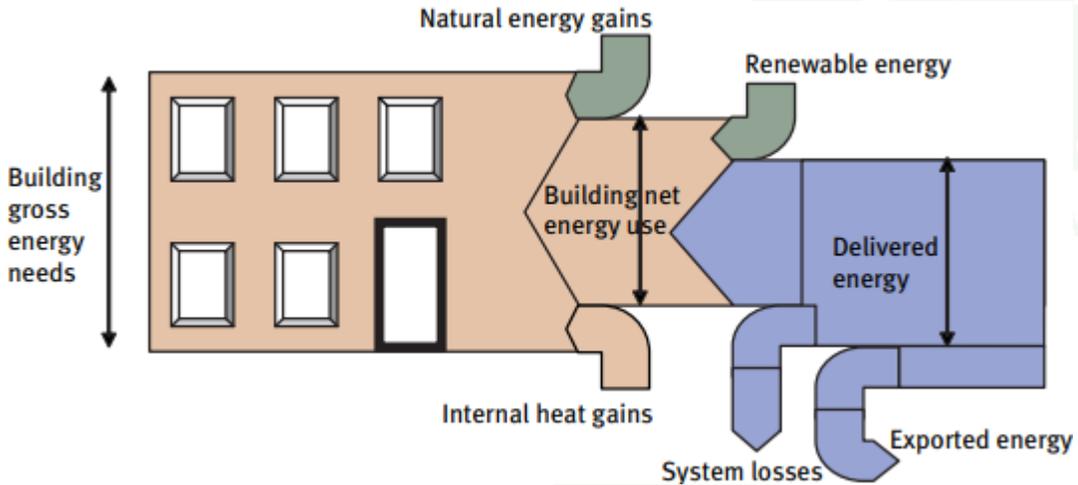
Topic 1. Energy efficiency policies for buildings (25 min)

Building Sector Overview for Africa (focus SSA)

- **60% of population living in slums - informal settlements.**
- **Floor area is expected to double between now and 2050**
- **\$770 billion USD current investment opportunity in buildings** (commercial: \$260bn, residential: \$510bn)
- **Over 90 MtCO₂ emissions savings possible in the building sector through energy efficiency.**



Energy Efficiency Potential in Buildings



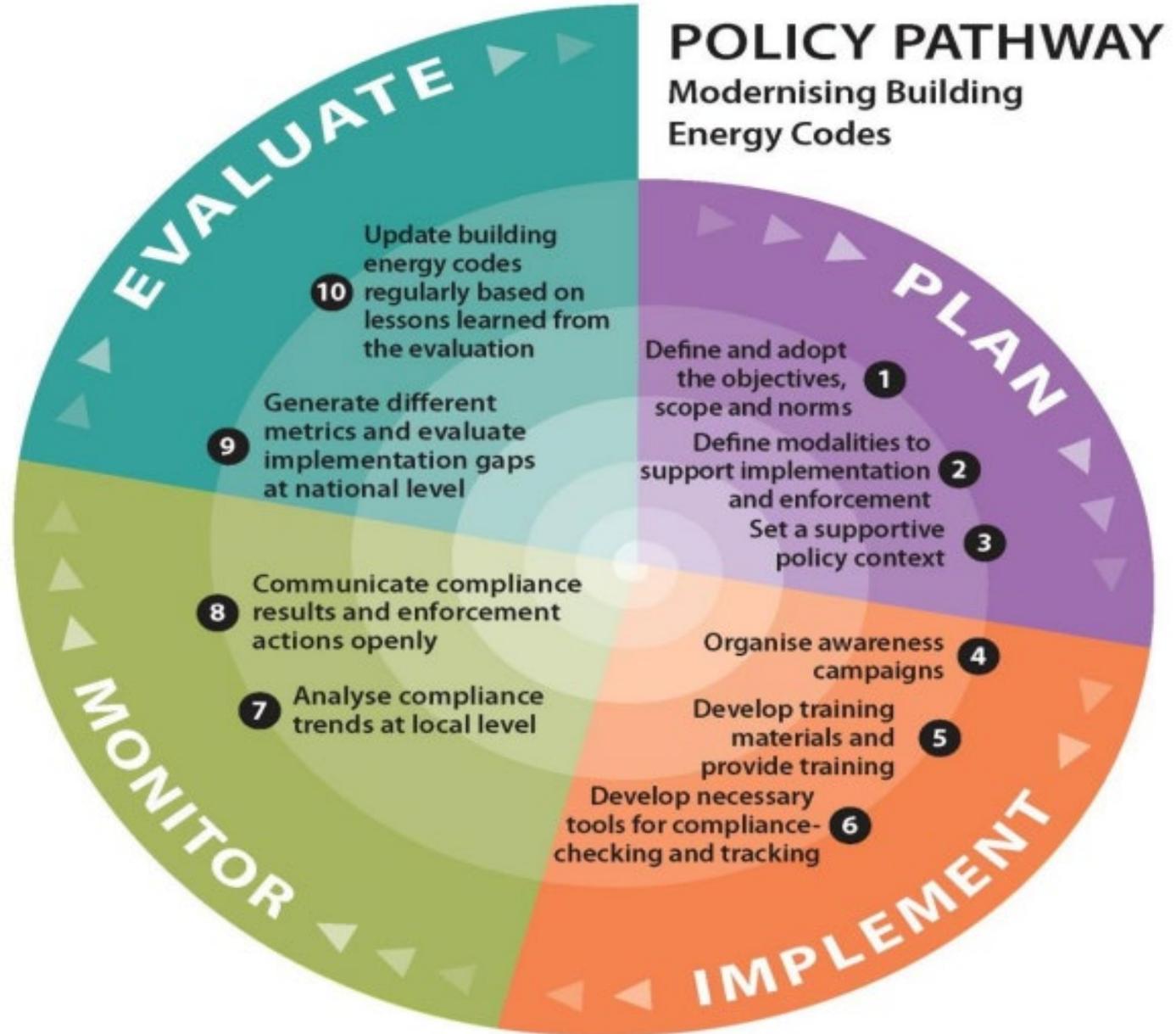
- Permanent loads
- Appliances
- Water pumps
- Air conditioning
- Ventilation
- Lighting

- Building Codes and Bioclimatic design
- Ecodesign (MEPS) and Energy Labels

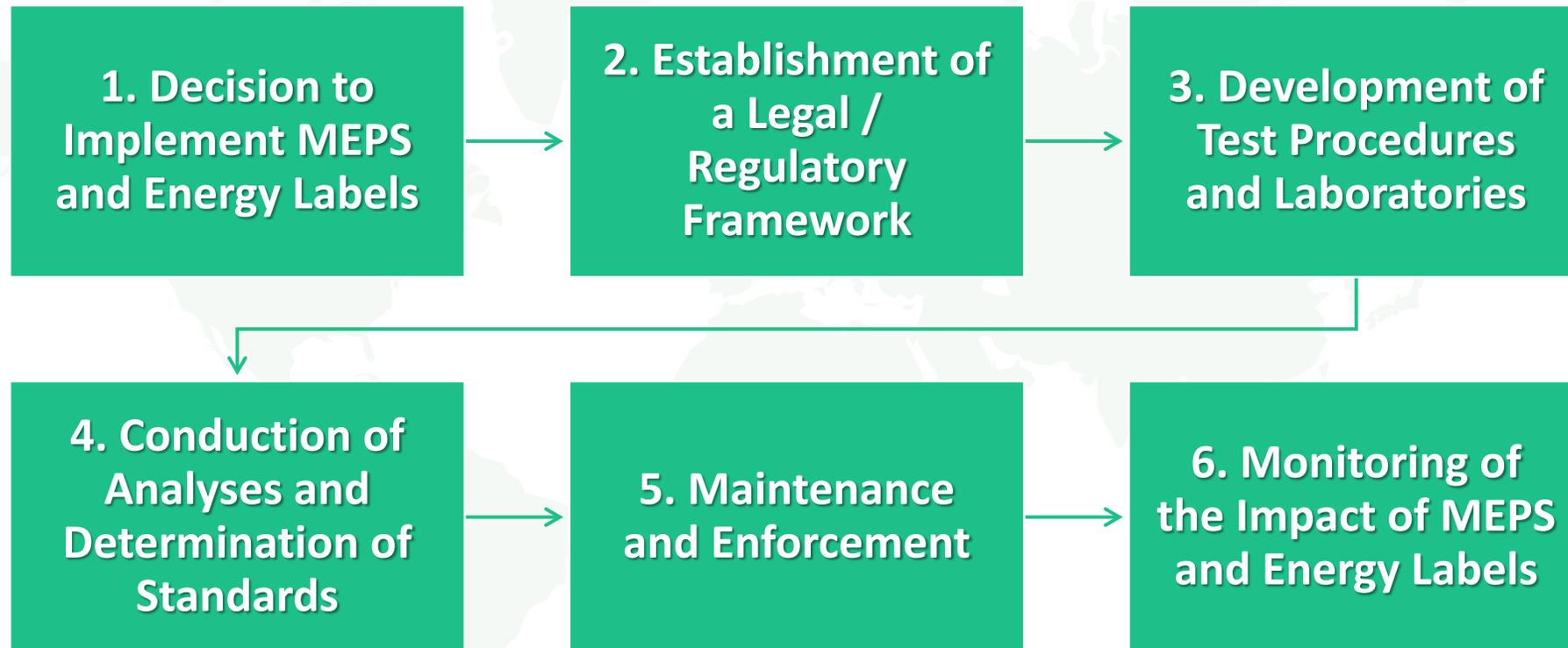
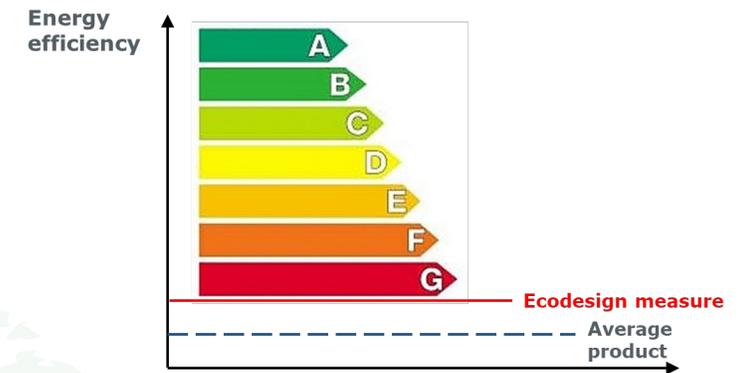
Annual Energy Savings Impact Measures	Office	Apt.
Smart lighting management	18%	-
Solar shading – walls isolation	17%	8%
Glass performance	15%	11%
Efficient Chillers (higher COP)	11.4%	9%

Building Codes

1. Prescriptive Codes
2. Simple Trade-Off Codes
3. Performance Codes
4. Outcome-based Codes



Ecodesign (MEPS) and Energy Labels



Energy Buildings Performance Certification in Tanzania

Case study

Building Codes Energy Buildings Performance Certification in Tanzania

Support Energy Performance in Building (EPB) in Tanzania:

- a. Building stock & climatologic data analysis
- b. Energy audits in large public buildings
- c. Energy Performance Certificate.
- d. Integration EPB in building permitting process
- e. Development guidelines for the regulatory framework including Roadmap.



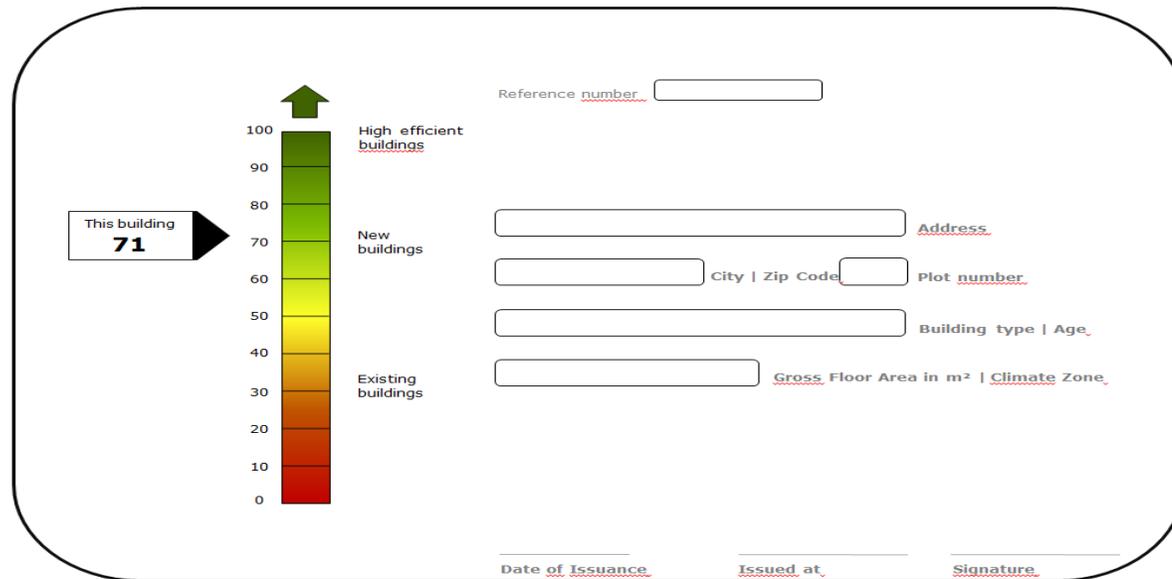
EPB regulatory framework Development

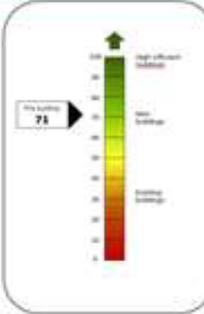
- **Fixing targets with stakeholder**
- **Establish common understanding**
- **Develop Principle and methods of EPB for new and existing buildings.**
- **Measures, steps for establishment EPB**
- **Organisational set-up for energy certification system**
- **Regulatory framework on Energy Performance Certification (EPC) of buildings and enforcement**



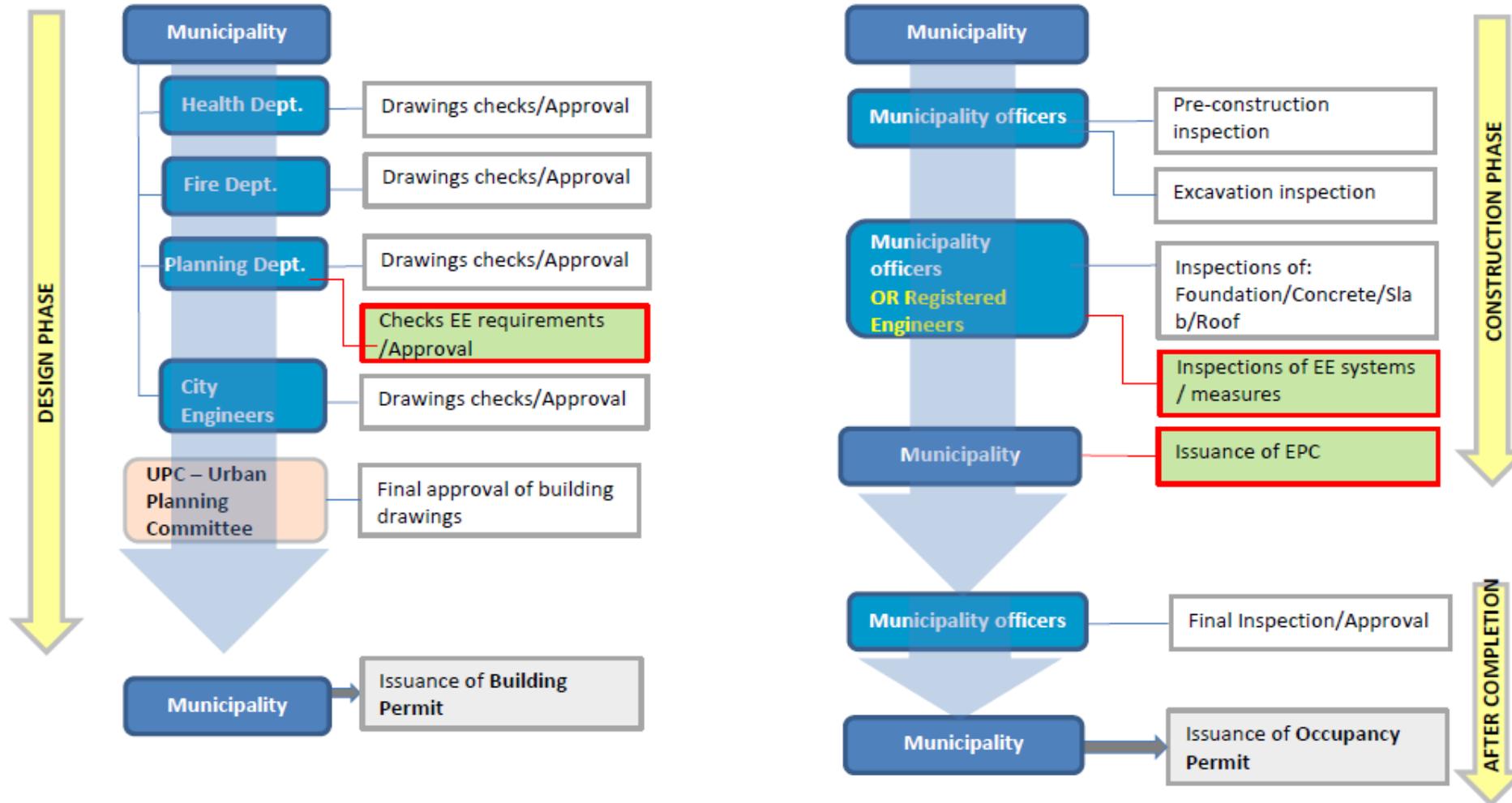
Energy Performance Certification

- EPC classification scale and template developed for Tanzania



ENERGY PERFORMANCE CERTIFICATE	
Reference No. or Registration No.: ...E1-2017-000001.....	
Address:	Umjaja House, Hamboug Avenue
City /Zip Code:	Dar es Salaam / 21000.....
Plot number:	214.....
Building type:	Non - Residential Building Existing Building
Year of construction:
Gross Floor Area (m ²):	4553.31.....
Climate Zone:	4 - Coastal Area
	
Building Energy Class	
	
Recommendations	
1.
2.
3.
4.
5.
Date of issuance:	Municipality of
Name of energy auditor:	Name of person in charge:
Registration No of Energy Auditor:	Signature of person in charge:
Signature:	Stamp of Municipal authority

Integration in building permitting process





THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF ENERGY AND MINERALS

Report on

"Building stock assessment and classification of buildings"

(Working Document to be revised after stakeholder consultation meeting on 10th August 2016 - 24/08/2017)



This project is funded by
the European Union



THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF ENERGY AND MINERALS

Report on

"PRINCIPLES AND METHODS OF ENERGY PERFORMANCE IN BUILDING REGULATORY FRAMEWORK INCLUDING ENERGY PERFORMANCE CERTIFICATE"

(Revised document after stakeholder consultation meeting on 9th February 2017) – 22 March 2017



This project is funded by
the European Union



THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF ENERGY AND MINERALS

Report on

"Building inventory report for Tanzania"

(Working Document to be revised after stakeholder consultation meeting on 10th August 2016 - 24/08/2017)



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the European Union

meetMED II

Mitigation Enabling Energy Transition in the Mediterranean Region

Case study

meetMED II: Mitigation Enabling Energy Transition in the Mediterranean Region

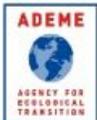
- meetMED II in figures : €5 million, over 42 months (2021- 2024)
- Covering the Southern Neighbourhood: Algeria, Egypt, Jordan, Lebanon, Lybia, Morocco, Palestine, Tunisia



MEDENER is an international no-profit organization gathering agencies from North and South of the Mediterranean region in charge of implementing public policies on energy efficiency and promotion of renewable energy sources

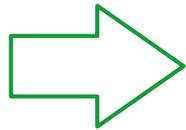


RCREEE is an intergovernmental organization aiming to enable and increase the adoption of renewable energy and energy efficiency practices in the Arab region.

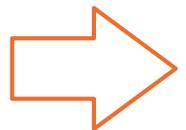


Objectives of meetMED II

- Building on previous phase of meetMED I and on the established meetMED Regional Expert Network (REN) of more than **140 experts** from national agencies of 13 Mediterranean countries
- Goals: enhancing energy security, fostering the transition to low carbon economy, helping countries achieve their NDCs, contributing to climate change mitigation.



The deployment of **RE and EE measures** in the Buildings and the Appliances' sectors in the SN region to accelerate the clean energy transition



Increasing **public awareness** on energy's major stakes and challenges and fostering **public and private sectors' involvement and investments** towards EE in Buildings and Appliances.



Algeria



Libya



Egypt



Morocco



Jordan



Palestine



Lebanon



Tunisia

EE in Buildings in the Med Region

- **Growing energy demand** due to growing population and behavioral patterns (fossil fuel to respond to their needs).
- **The building sector** is one of the largest energy consuming sectors of the meetMED target countries, which makes it a main target for NEEAPs.
- **Egypt & Lebanon** have the largest share of energy consumption in the building sector.
- Most of the meetMED countries have developed **NEEAPs**, except Libya.
- Level of implementation is still difficult to assess and **enforcement** remains a key challenge

- **National energy efficiency action plans (NEEAPs)**: promote stakeholders engagement and contribute to the development of the energy sector legal framework. NEEAPs establish indicative **energy savings targets** for each country
- **Energy performance labelling systems**: work in progress. Some successful examples in Morocco and Tunisia.
- **Enforcement challenge**: the minimum conditions for a higher level of enforcement of NEEAPs and EEBCs are:
 - Strong institutional commitment
 - Enforcement should follow a testing & improvement approach
 - Public buildings should take the lead in demonstrating this approach.

Table 4: Energy consumption in the building sector in the meetMED partner countries

	Unit	Algeria	Egypt	Jordan	Lebanon	Libya	Morocco	Palestine	Tunisia
Year of data:	Year	2017	2017	2017	2015	2016	2013	2017	2017
Share in total Final energy consumption	%	33.60%	50.5%	28.70%	40.20%	39.00%	33.00%	38.40%	27.00%
Share in total Primary energy consumption	%	-	-	20.10%	29.30%	-	-	34.00%	-

Focus on EEBCs

Table 7: EEBC Status

EEBC	Algeria	Egypt	Jordan	Lebanon	Libya	Morocco	Pales-tine	Tunisia
Technical Requirements								
Legal Framework								
Institutional set-up (clarity regarding responsibilities)								
Implementation								
Enforcement procedures								
Monitoring & Evaluation procedures								
							Existing	
							Planned	
							Not Existing	

Table 8: EEBC policy requirement level

EECB policy requirement level	Algeria	Egypt	Jordan	Lebanon	Libya	Morocco	Pales-tine	Tunisia
Mandatory	-	X	X	-	Not applicable	X	-	X
Voluntary	-	-	-	X	Not applicable	-	X	-
Mixed	X	-	-	-	Not applicable	-	-	-

Table 10: EEBC implemented in the meetMED target countries

Type of building code	Algeria	Egypt	Jordan	Lebanon	Libya	Morocco	Pales-tine	Tunisia
Prescriptive					Not applicable			
Performance based					Not applicable			
							Existing	
							Planned	
							Not Existing	

- EEBCs (EE Buildings Codes): developed in most countries, but **not enforced**. Lebanon is finalizing its requirements.
- Established legal frameworks = **Algeria, Egypt, Jordan, Morocco, Palestine, Tunisia**
- Defined entities responsible for their implementation = **Jordan, Morocco, Tunisia**
- Mandatory implementation of EEBCs: **Egypt, Jordan, Morocco, Tunisia**.
Success factors = correlation between best performing EEBCs and strong institutional set-up with political commitment and support by agencies.
- Other countries : voluntary, due to structural and/or institutional challenges:
Algeria: Construction is heavily subsidized and incentives are skewed towards less EE options.
Lebanon: faces a severe crisis (economic & political, exacerbated by the Beirut explosion and COVID).
Libya: Tradition of heavy dependence on fossil fuels (historically at very low price) + cheap and reliable electricity supply, hampering action on EE.

Success stories

Morocco: from development criteria to operationalization of mandatory EEBC from 2020 onwards:

- **meetMED I:** recommendations on enforcement & monitoring of EEBC based on the RtCM (*Réglementation Thermique de Construction au Maroc*).
- **meetMED II:** implementation of recommendations and interlink between regulation, EEBC, and compliance tool (BINAYATE = “Green Toolbox” for sustainable construction & efficiency for public buildings + platform for training on EE in buildings for all types of stakeholders).
- Eco-Binayate – First national energy performance label.
- **Demo projects per climate zone** to assess the benefits of the regulation (comfort, EE, decreasing costs and increasing value).
- These developments are used as an inspiration for the Concerted Actions -Buildings ongoing during meetMED II.

Tunisia: coupling the mandatory RTBN with “pre-sale” audits and the implementation of a voluntary label (to promote EEB and anticipate the evolution of the regulation)

- Objective = anticipate the evolution of the RTBN (*Réglementation Thermique des Bâtiments Neufs*) to create incentives to go beyond the mandatory framework.
- “ecoBAT” voluntary energy performance label covering collective residential (existing and new) and tertiary buildings.
- The label is awarded according to the overall score obtained by the building based on a detailed rating framework (targeting the envelop, the equipment, and the energy/water/waste resource management) and corresponding indicators.
- The “ecoBAT label” can be used as a commercial vector for sale or rental of labelled buildings.

Challenges & Actions taken

Challenges of implementation:

- **Governmental:** non-mandatory measures, low enforcement, lack of institutional coordination, lack of monitoring procedures, lack of financing solutions.
- **Technical:** low capacity in manufacturing efficient equipment, low capacity to implement efficient solutions.
- **Information:** low awareness (of population and investors), low dissemination of EE benefits, lack of data.
- **Level of action:** need for more north-south and south-south cooperation to exchange good practices to fill-in the capacity gap, especially at the local level.



meetMED recommendations and actions:

- **Measurement & Monitoring:** implementation of a common regional energy observatory on EE indicators (Med'ObservEEER) to ensure the monitoring of NEEAPs.
- **Capacity-building:** development on an online Self-Certification & training platform (GRASSMED), and training modules for project owners, and for banks.
- **Awareness-raising & Access to Finance:** organization of 3 National SEI Roundtables (Jordan, Morocco, Egypt) bringing together relevant stakeholders (IFIs, banks, national authorities, private sector) and creation of networks to activate investments and replicate best practices. More roundtables to come (Tunisia, Algeria).
- **Regional & Local cooperation:** Twinning agreements between cities and selection of tools to implement and/or finance (launching in May 2023).

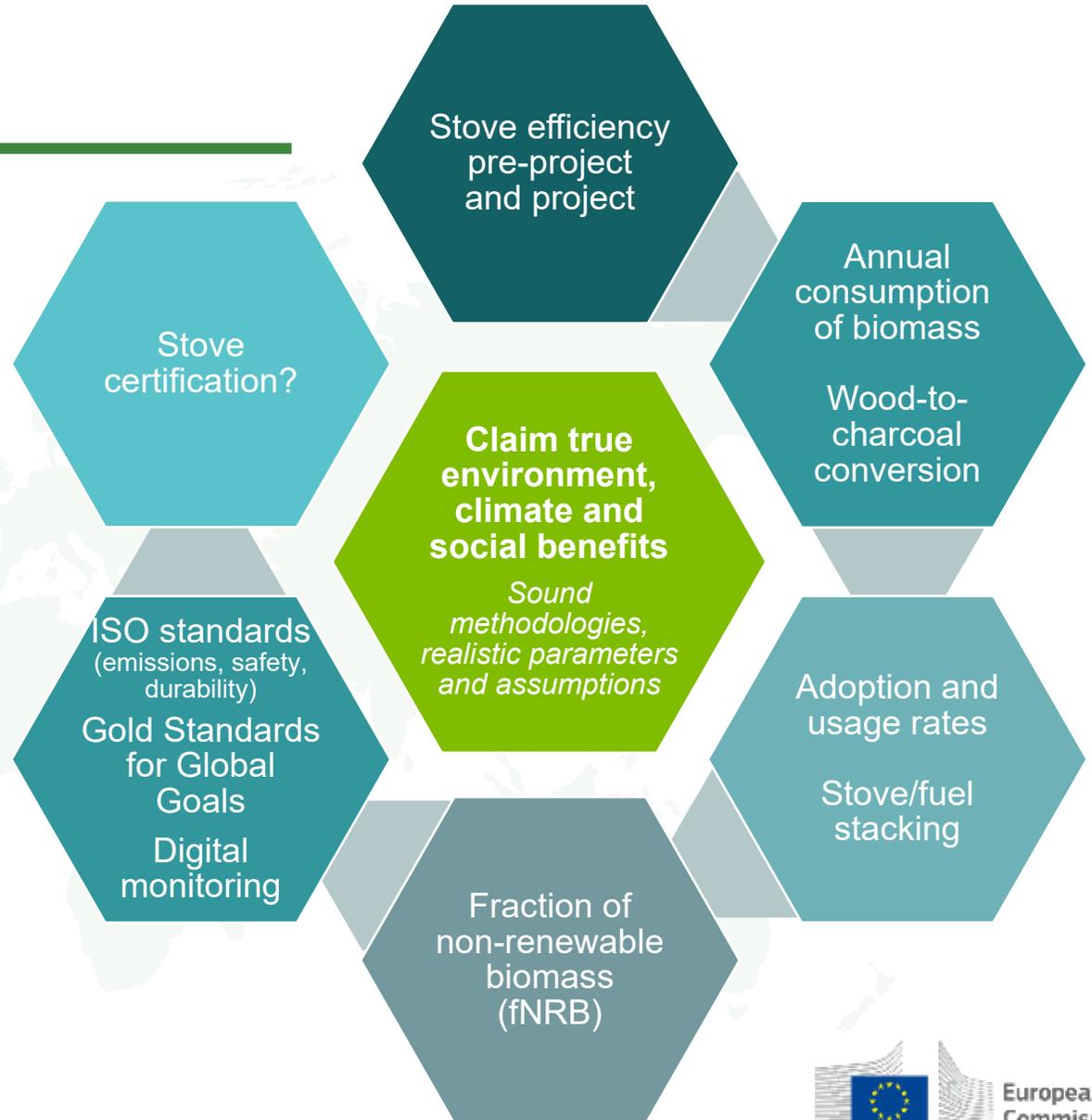
Discussion

Topic 1. Energy efficiency policies for buildings

Energy Efficiency

Topic 2. Clean cooking strategies – focus on standards and labels
(15 min)

Not all stoves and not all projects are equal



Planning and Implementing Clean Cooking Solutions in Kenya

Case study

SETA, Sustainable Energy Technical Assistance

4-year programme of the Ministry of Energy and Petroleum financed by the EUD-Kenya

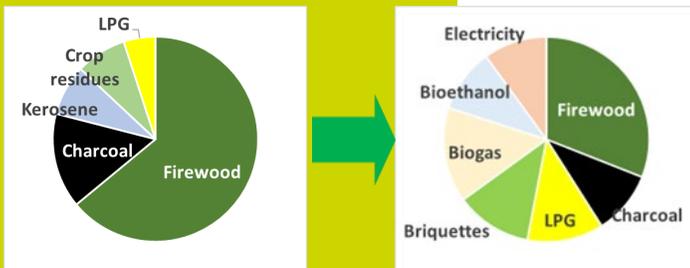
Starting in September 2020, SETA is providing TA to the MoEP, the Utilities, and the Council of Governors.

Nurturing the engagement and the commitment of the Private Sector and the Civil Society organisations to the national energy policies and the **ongoing national integrated energy planning**.

SETA is presently working with 12 county governments on the development of their county energy plans with the main pillars of the SEforALL agenda as focuses: **sustainable energy, access to clean lighting and cooking services, energy efficiency and conservation**. Energy as an enabler will contribute to the economic and social welfare of the population.

Among the national strategies, SETA is particularly supporting the elaboration of the **Kenya Clean Cooking Energy Strategy**, developing planning tools at the counties level to secure the transformation of the cooking energy markets and the transition to cleaner fuels and technologies.

<https://www.seta-kenya.org/>



Cookstoves Standards and Labelling (S&L) in Kenya

WHY DO WE NEED S&L IN THE SECTOR?

Increasingly growing demand for improved cook stoves (ICS) leading to more products in the market selling as "ICS".

The public, especially in the rural areas, has insufficient knowledge and guidance on making an informed ICS purchasing decision.

IMPACTS OF LABELLING

- Improved product efficiency
- Reduced spending on fuel
- Enhanced consumer welfare
- Strengthened and competitive markets
- National pollution is reduced, and climate change goals achieved

KEY CONSIDERATIONS FOR COOKSTOVE S&L

- Durability requirements
- Safety requirements
- Thermal performance
- Emissions
- Workmanship and finish
- Marking, packaging, storage and usage

The Pilot Voluntary Label types

Symbol



Label



Poster/Flyer



Discussion

Topic 2. Clean cooking strategies – focus on standards and labels

Energy Efficiency

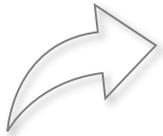
Topic 3. Energy efficiency business models such as Super ESCO / DSM (15 min)

Objectives

- The **main objective** of the programme is to foster sustainable and inclusive socio-economic growth in selected partner countries and **develop sustainable business models for the provision of clean, climate-friendly and energy efficient solutions.**

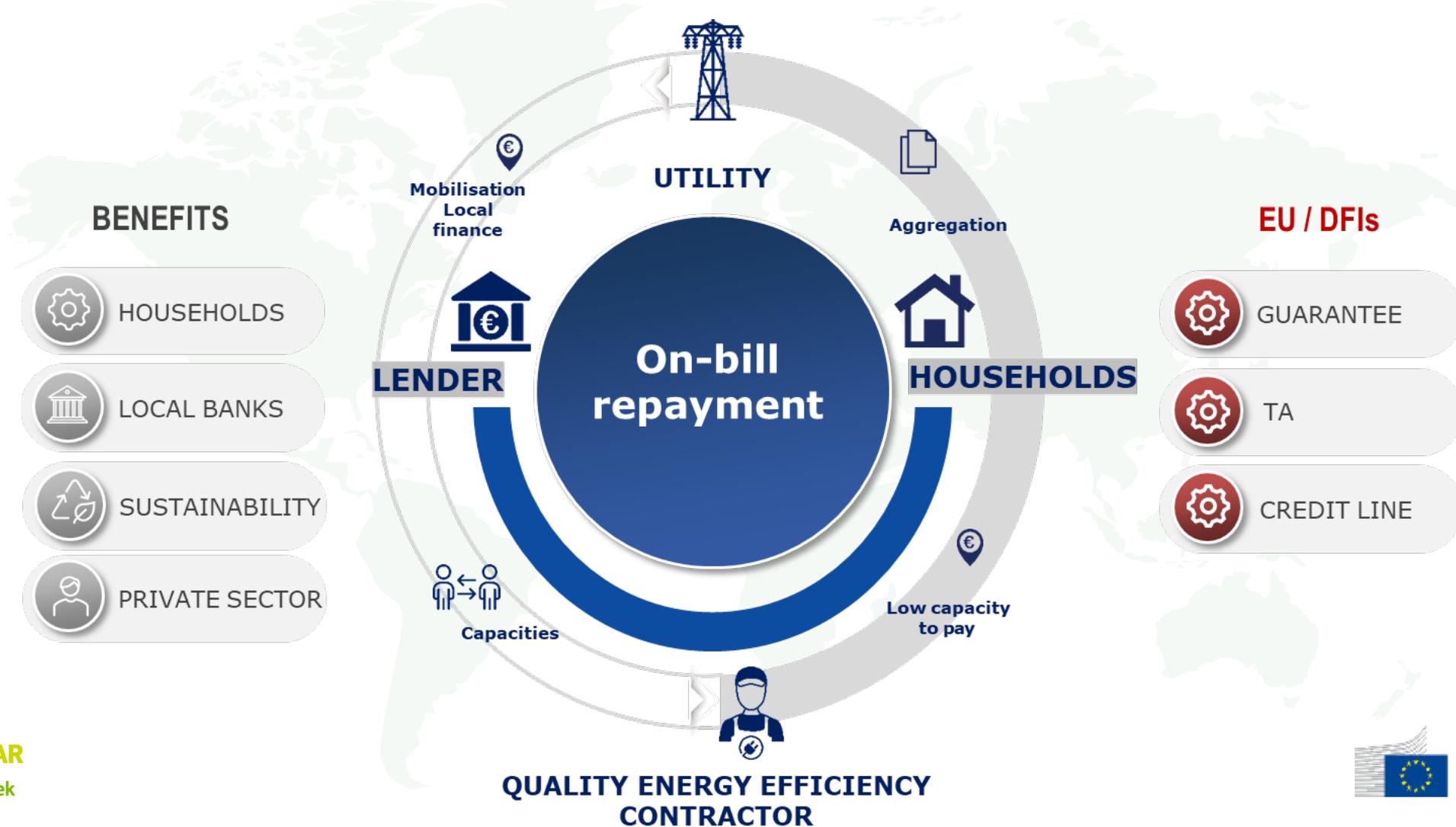
Expected results

- Support the establishment and operationalisation of super-energy service companies ('Super-ESCOs') to generate and manage energy efficiency investment programmes
- Implement demand side management (DSM) collaboration between power distribution utilities and local banks for clean and sustainable energy efficient investments
- De-risk approaches and scale-up private sector business models for the sustainable electrification of social infrastructure.

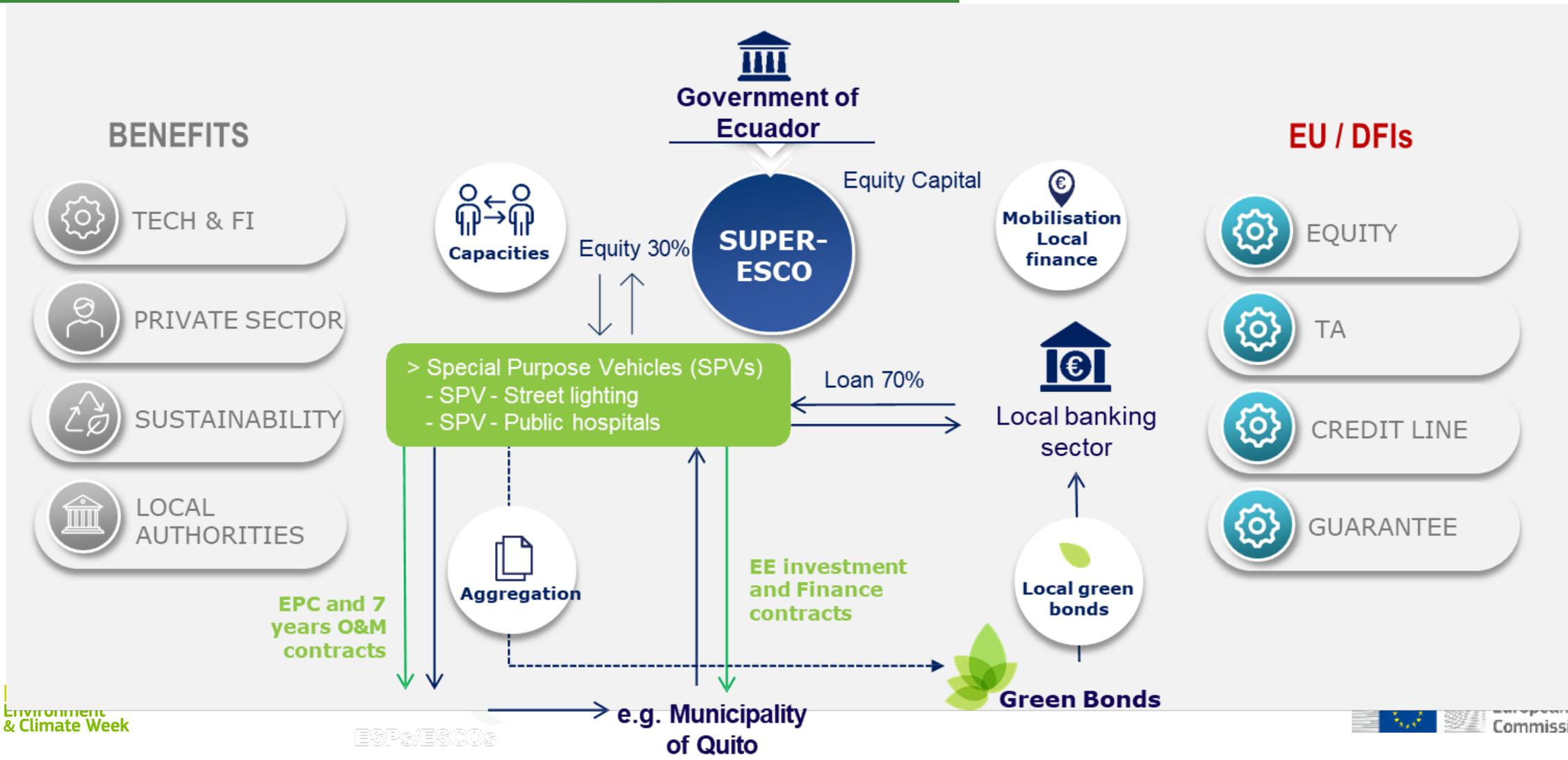


The programme intends to demonstrate innovative and sustainable approaches (« business models) in 5 Pilot lower-/ middle- income countries which can be scaled-up or replicated elsewhere

BUSINESS MODEL 1 - DEMAND-SIDE MANAGEMENT



BUSINESS MODEL 2: SUPER ESCO



ESCO experiences in Asia

Case study Thailand

Private sector (SME) ESCO business development

Case study Thailand

Type of barrier	Barrier
Financial	High up-front capital requirements for energy efficiency technologies
	Lack of access to capital: banks are cautious to lend to energy efficiency projects therefore have high collateral requirements and charge high interest rates for loans
	High transaction costs: proportionally when implementing smaller energy efficiency projects
	Competition for limited finance: finances are reserved for other core business activities
Technical	Lack of technical knowledge of energy efficiency projects at the bank
	Lack of technical competency at the ESCO
	Lack of knowledge/expertise in energy efficiency measures at the end-user
Market	Lack of trust between the customer and the ESCOs: in the ESCO to be able to deliver the savings they guarantee; in the customer that they will not implement the measures themselves that are put forward by the ESCO
	Government procurement procedures: not able to use ESCOs

Private sector (SME) ESCO business development

Case study Thailand



ESCO Facilitator/”One stop shop” to support client in identifying saving potential, choosing best ESCO and create a fair contract between client and ESCO

Private sector (SME) ESCO business development

Case study Thailand



Loan Guarantee: to improve access to capital for EPC projects; in collaboration with Thai Credit Guarantee Corporation



Grant Scheme: to enable ESCOs to carry out feasibility studies and identify projects



Training for banks: to improve their understanding of EE investments and EPCs

Collectively addressing the main financial barriers to the ESCO Energy Performance Contract (EPC) approach

Discussion

Topic 3. Energy efficiency business models such as Super ESCO
/ DSM

Thank you



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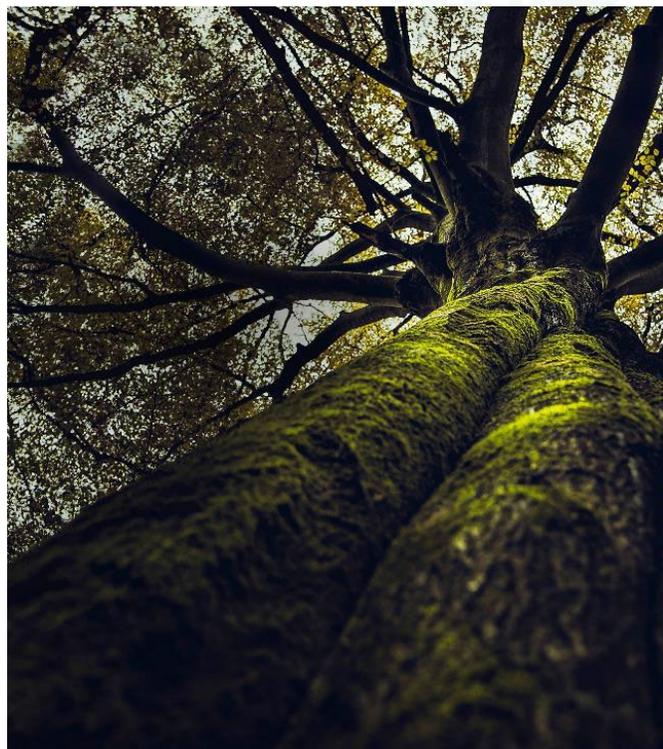
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ANNEXES

To learn more

To learn more fNRB



FRACTION OF NON-RENEWABLE BIOMASS (fNRB)

	fNRB
Africa	35 - 41%
Latin America and Caribbean	21 - 31%
Asia and Oceania	24 - 30%
India and China	41 - 43%
Uganda	0 - 89%
Mexico	0 - 96%
Kenya	42 - 64%

More details: Bailis et al. (2015). <https://www.nature.com/articles/nclimate2491>
and
UNFCCC (2022) https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20220713221018839/MP88_EA19_CN_Cookstove%20default%20values.pdf

To learn more Clean Cooking ISO standards

VOLUNTARY PERFORMANCE TARGETS (ISO TIERS)



Thermal efficiency
(%)



Carbon monoxide emissions
(gram/megajoule delivered)



Fine particle matter emissions
(milligram/megajoule delivered)



Safety
(score)



Durability
(score)

	Worst 			Best 		
	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Thermal efficiency (%)	<10	≥10	≥20	≥30	≥40	≥50
Carbon monoxide emissions (gram/megajoule delivered)	>18.3	≤18.3	≤11.5	≤7.2	≤4.4	≤3.0
Fine particle matter emissions (milligram/megajoule delivered)	>1031	≤1031	≤481	≤218	≤62	≤5
Safety (score)	<60	≥60	≥68	≥77	≥86	≥95
Durability (score)	>35	<35	<25	<20	<15	<10

World Health Organisation criteria
Polluting
Transition
Clean



To learn more

Gold Standards for Global Goals

A HIGHER STANDARD
for climate security and sustainable development

Gold Standard for the Global Goals is a standard that sets requirements to design projects for maximum positive impact in climate and development -- and to measure and report outcomes in the most credible and efficient way.



Gold Standard
for the Global Goals

<https://www.goldstandard.org/our-story/gold-standard-global-goals>

To learn more

Different types of fuels for cooking

Non-processed biomass



Firewood



Agricultural residues, Dung

Processed biomass



Briquettes, Chips, Pellets



Charcoal



Coal



Liquid (Kerosene, ethanol, methanol)



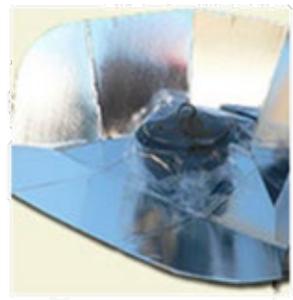
LPG, natural gas



Biogas



Electricity



Solar

To learn more

Different types of cooking solutions

