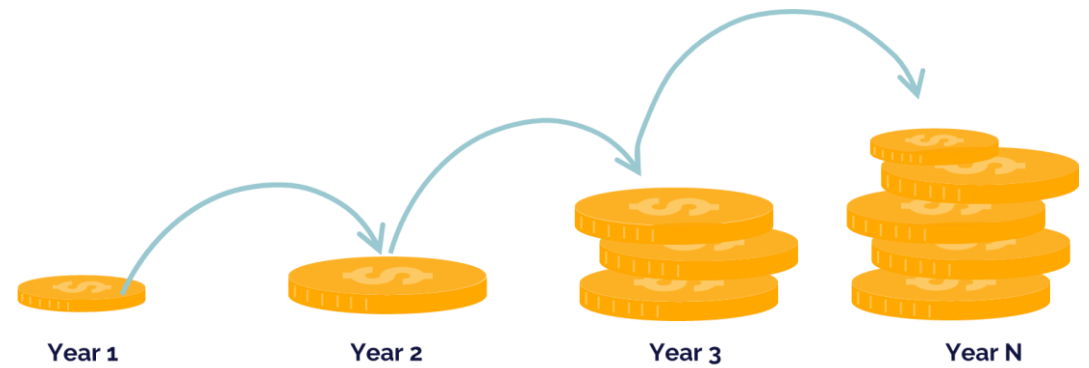




# Leveraging Energy Efficiency with Revolving Funds

Key Lesson Learned and Practical Case Studies  
from experience

**Tamara Babayan**  
**Senior Energy Specialist**  
**World Bank**



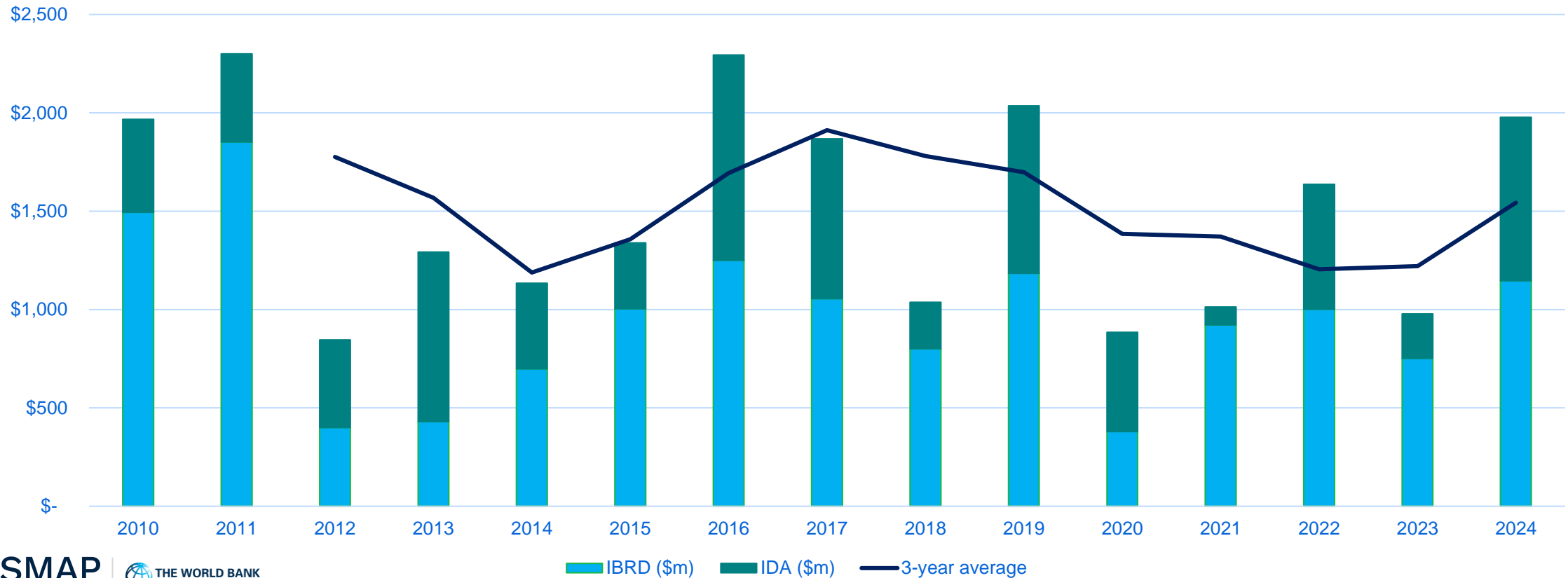
# Context

Energy efficiency refers to using less energy to achieve the same level of output or service. This can be accomplished through various measures, such as upgrading to more efficient appliances, improving insulation in buildings, or utilizing smarter technologies.

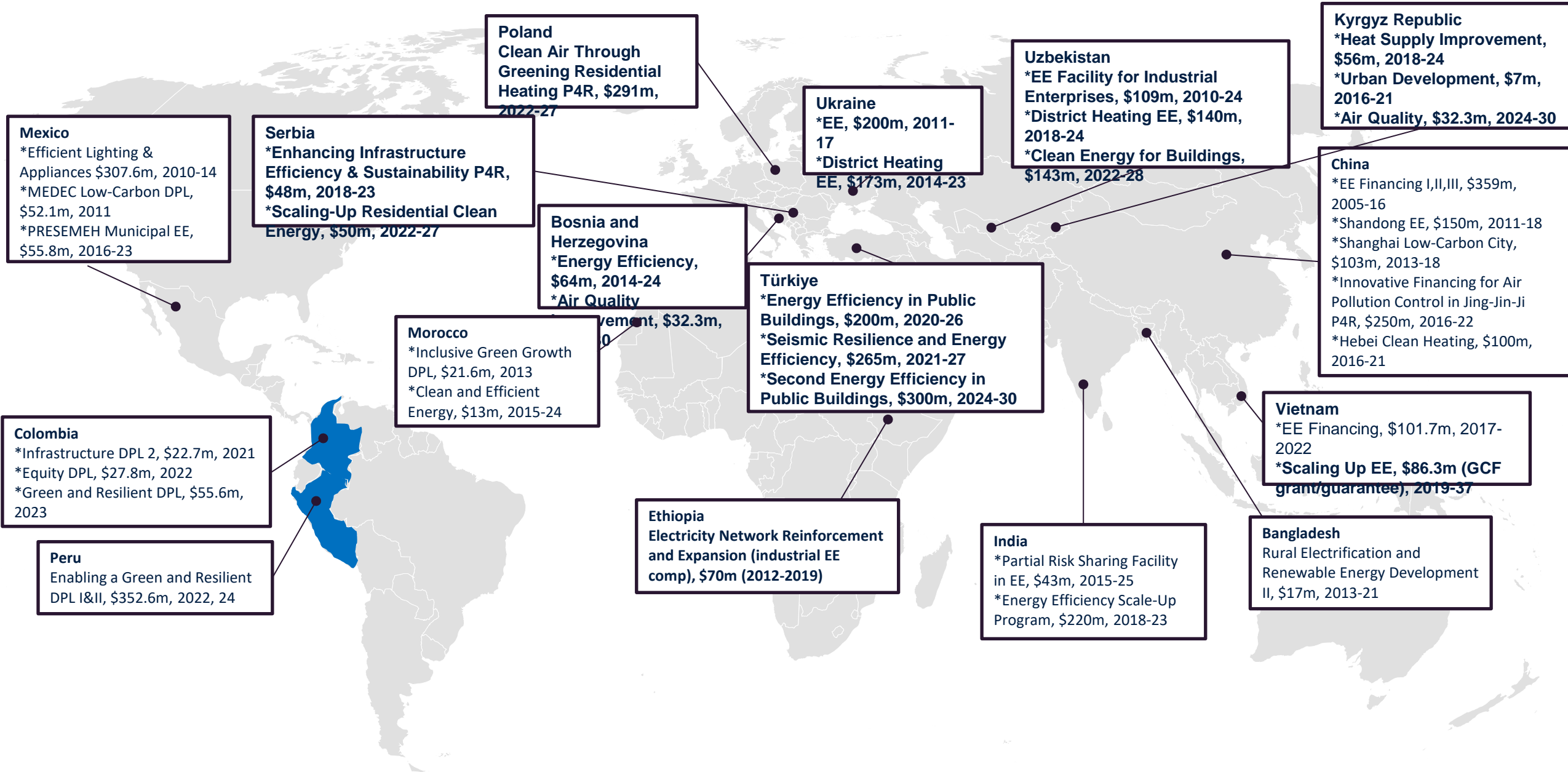
A revolving fund is a financial mechanism that allows for the continuous funding of projects. In the context of energy efficiency, a revolving fund can be set up to finance energy-efficient upgrades using the energy savings.

# World Bank financing for EE (FY10-24)

- Cumulative Bank EE financing reached US\$23.5 billion with total project costs for EE components reaching \$41.5B, achieving almost 1:1 leverage over 331 projects.
- Annual lending averaged \$1.56B but remained volatile with a considerable dip during the COVID-19 pandemic (FY20-21).
- IBRD lending was about \$14.37B (61%), IDA about \$8.23B (35%) and the rest (\$880m) from CTF, GCF, GEF, TFs.



# EE Portfolio: Snapshot of demand-side EE projects



# Revolving Fund General Features

## Initial Capital:

A pool of funds is established, often through government grants, loans, or private investments.

## Repayment:

Once the project is completed, the energy savings can be used to repay the fund. This could involve using a portion of the savings to replenish the fund.



This approach can help stimulate investment in EE measures while ensuring that funds are available for future projects, ultimately leading to reduced energy consumption and lower greenhouse gas emissions.

## Project Financing:

Entities can apply for funding to implement EE projects

## Sustainability:

As repayments are made, the fund can be reused to finance additional projects, creating a sustainable cycle of investment in energy efficiency.

# Variety of Revolving Mechanisms:

## Key features of the revolving fund

- Repayment-based mechanism
- Multiple cycles of usage of the funds
- Multiple number of beneficiaries
- Exponentially increased investments
- May be public, private, commercial

## Funding

- State or municipal budgets
- Commercial banks
- Development banks
- IFIs financing facilities
- Utilities funds
- Private ESCO funding

### 1 Commercial lending

- Lending product of FI. Multiple lending cycles.
- Utility on-bill financing. Gradual enhancement of EE investments
- ESCO model. Increased number of the clients for EE projects

### 2 Institutional revolving fund

- Energy Efficiency Agency, government institution that provides long-term affordable funding.
- EE Fund, independent or quasi-governmental institution dedicated to perform EE revolving mechanisms.
- EE PIU, created for implementation of IFI project

### 3 Budget capture

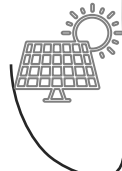
- Special budget funding line for revolving of EE funds for the public buildings EE retrofitting
- Replacement of operational expenses (energy bill) to EE capital investments

# WB Projects Case Studies



## Budget Capture Mechanism

Montenegro Second Energy Efficiency Project (MEEP2)



## Commercial Revolving Mechanism

Kyrgyz Republic Air Quality Improvement Project (AQIP)

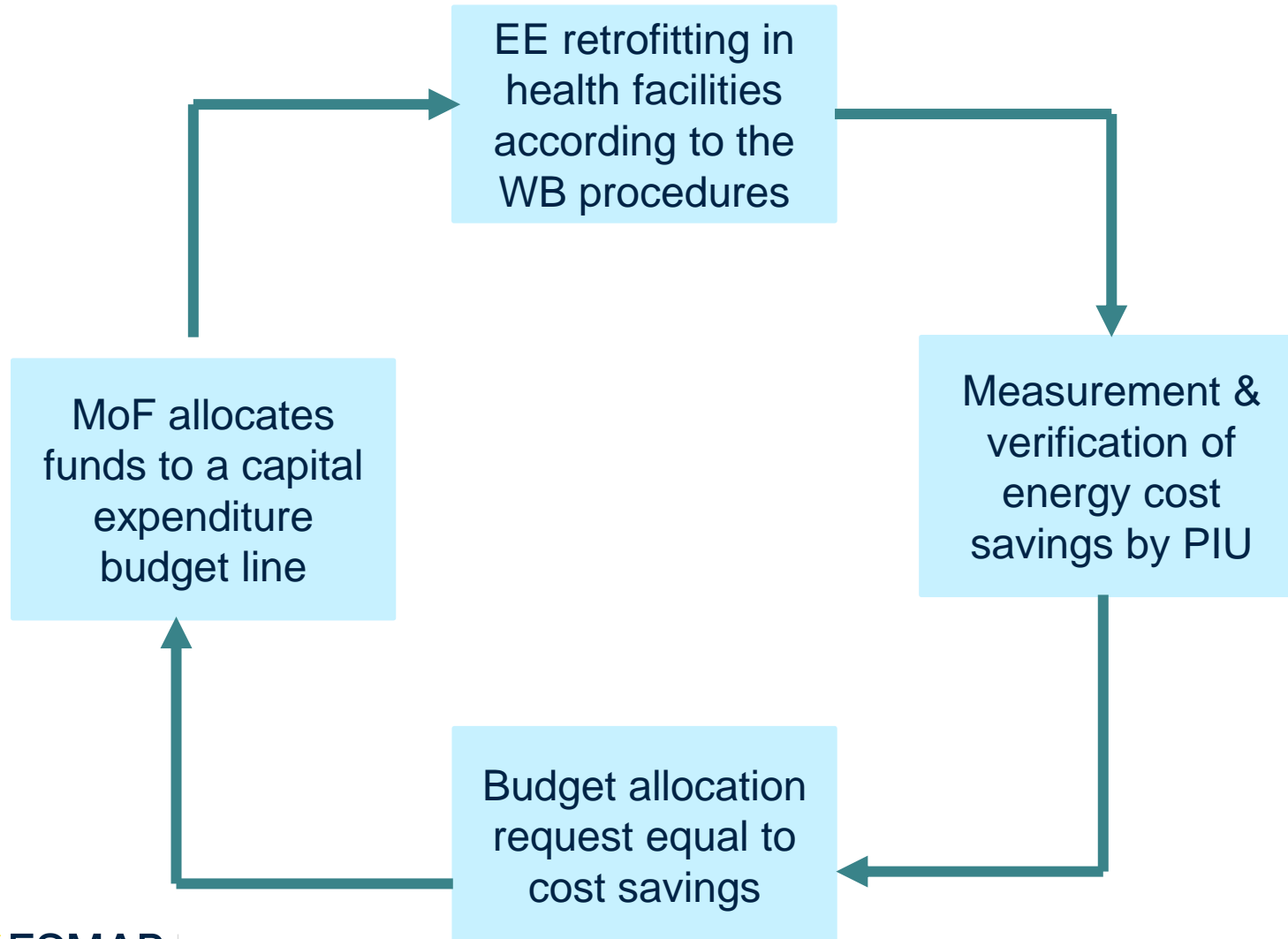


## Institutional Revolving Fund

Clean Energy for Building in Uzbekistan Project (CEBU)



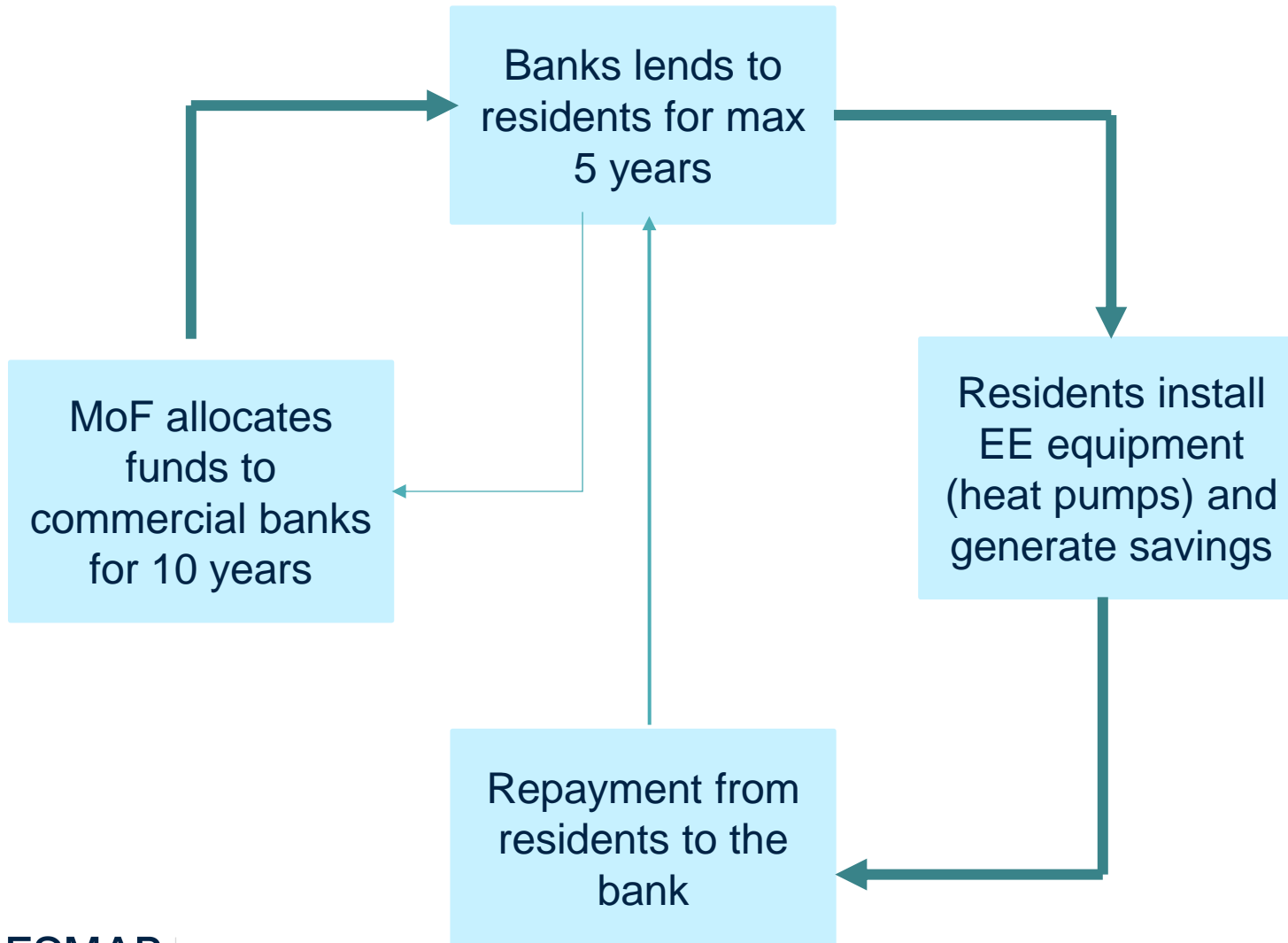
# MEEP2: Budget Capture



**IBRD Loan \$&.4 million**  
**Financing from revolving: \$3.1 million**  
**Beneficiaries: Public health facilities**  
**Duration: 2018-2025**  
**Average savings: 35%**  
**Simple payback: 7 years**



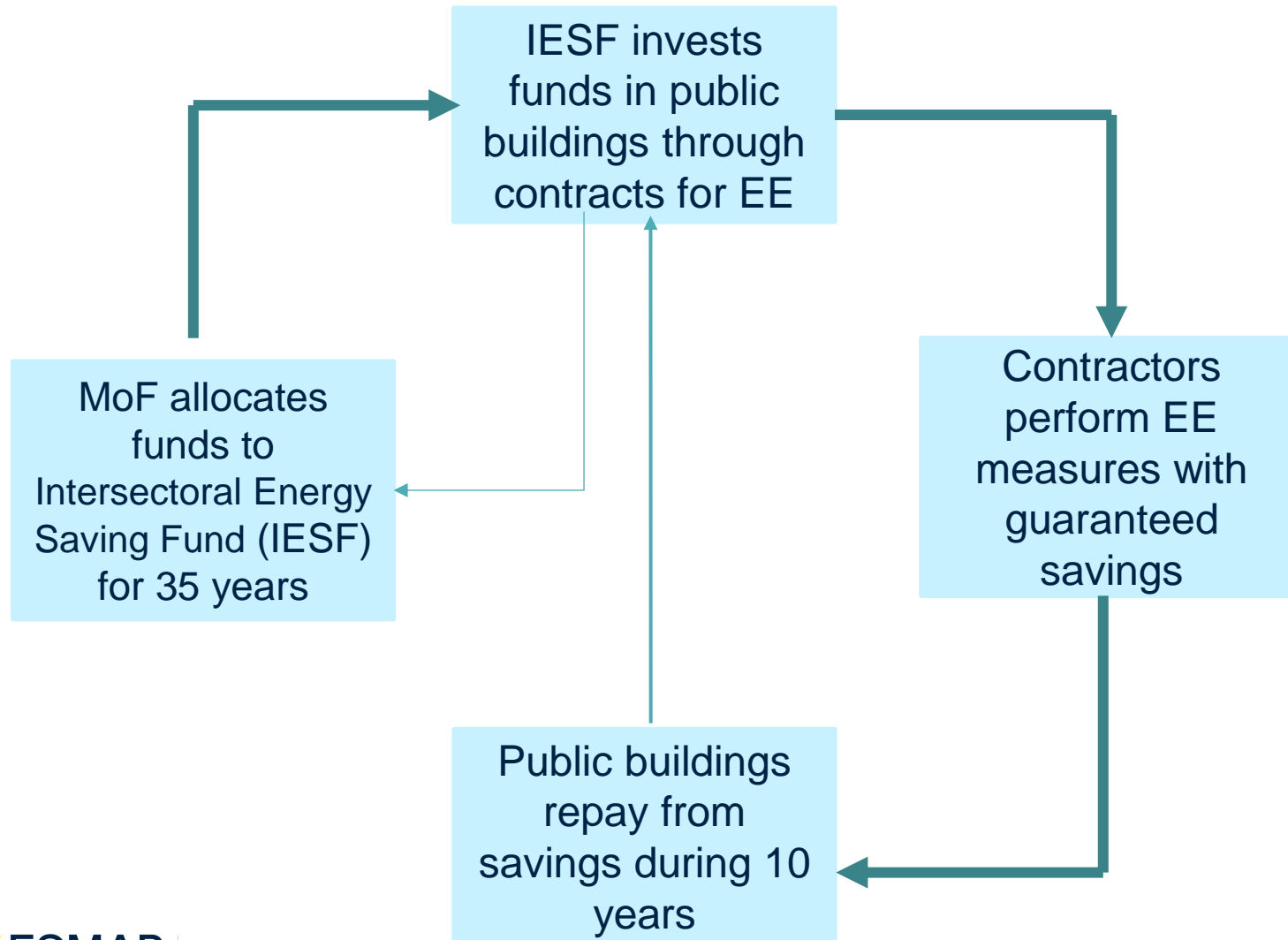
# AQIP: Commercial Revolving Mechanism



**IDA Loan \$30.6 million**  
**Financing from revolving: \$26.6 million**  
**Beneficiaries: Residents of SFHs**  
**Duration: 2023-2028**  
**Average energy savings: 40%**  
**Simple payback: 10 years / 4 years**

	Million USD		
Year	Investment	Reinvestment	Total
1	1.7		1.7
2	4.1	0.2	4.3
3	8.3	0.6	8.9
4	16.6	1.5	18.0
5	1.6	3.3	3.3
6		3.5	3.5
7		3.8	3.8
8		4.2	4.2
9		4.6	4.6
10		5.0	5.0
	<b>30.6</b>	<b>26.6</b>	<b>57.2</b>

# CEBU: Institutional Revolving Mechanism



**IBRD Loan \$143 million**  
**Financing from revolving: \$98 million**  
**Beneficiaries: Schools, hospitals, kindergartens**  
**Duration: 2023-2029**  
**Average energy savings: 50%**  
**Simple payback: 10 years / 7 years**



# Annex: Repayment example from Armenia EE Project

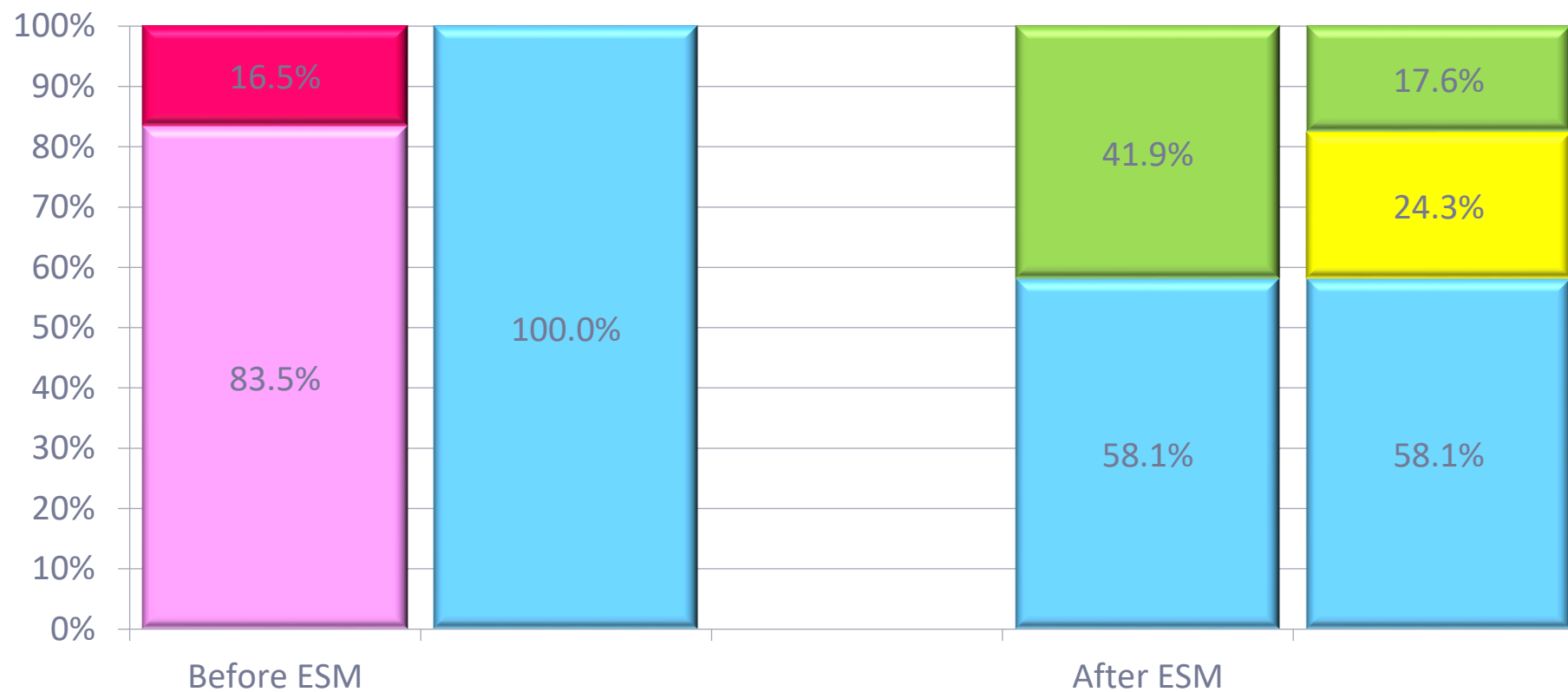
Repayment schedule				
Amount of Investment	12,000,000			
Month, Year	EE investment balance	EE investment monthly payment	EE service fee	Total amount payable
October 2015	12,000,000	166,667	25,000	191,667
November 2015	11,833,333	166,667	25,000	191,667
December 2015	11,666,667	166,667	25,000	191,667
-----				
August				
Septemb				
October				

**Monthly payment = Total Investment/Number Years/12**  
 $166,667 = 12,000,000 / 6 / 12$

**EE service fee = EE Investment balance / 6**  
 $25,000 = 12,000,000 / 6$

**Total payable = Monthly amount of EE Investment + EE service fee**  
 $191,667 = 166,667 + 25,000$

# Annex: Armenia EE Project Energy Savings



■ Savings ■ ESA payment ■ Utility payments at baseline ■ Tariff increase ■ Paid according to old tariff

## Objectives

- ensure universal access to affordable, reliable, and modern energy services by 2030
- accelerate the transition towards a sustainable, just and decarbonized energy system
- ensure the resilience and adaptation of the energy sector to the growing impacts of climate change and other shocks

# *Since 2020: Clean Cooling Program in ESMAP*

## *Supports Scale up of Sustainable Cooling Solutions*

ESMAP CCP supports scaling up of access to affordable sustainable cooling solutions for multiple key cooling sectors: buildings and cities (space cooling), health (vaccine, blood, medication cold chains; maternal health) & agriculture, fisheries (food cold chains), and SMEs (productive cooling appliances), thus contributing to SDG 7 (energy), SDG 2 (hunger), SDG 3 (health), and SDG 13 (climate).

### Through:

- ✓ **Technical assistance: Provide expertise, strategic advice & TA to identify solutions, assess business & financial models, and design & implement sustainable and efficient investments in cooling.**
- ✓ **Generate & Share comprehensive global knowledge on space cooling, passive solutions, urban planning, less harmful refrigerants, sustainable vaccine & food cold chains, seawater cooling.**
- ✓ **Mobilize financing, including World Bank and IFC lending, investment, Green Climate Fund Cooling Facility**
- ✓ **Partnerships: Support WB teams on Paris Alignment, Montreal Protocol, Mission Efficiency, Mission Innovation; and works with other Partners (Cool Coalition, H4D, SEforAll, GlobalABC).**

- **Supporting 40+ TA activities**
- **30+ countries (+global and regional)**
- **Allocated \$10M+ grants (FY21-24)**
- **\$4.2b of WBG financing informed**
- **24 million tCO<sub>2</sub>e CO<sub>2</sub> savings (FY21-24) from informed operations**

# 2021: Sustainable Cooling Facility

To promote low-carbon and inclusive cooling solutions, the World Bank through ESMAP mobilizes US\$ 157 Million from the Green Climate Fund (GCF) and creates a Sustainable Cooling Facility to finance Sustainable Investment



- Objective: to scale up sustainable cooling solutions across multiple sectors that use cooling as a critical input.
- Financing mobilization: \$157 M GCF Climate finance to co-finance \$722.8 M IBRD/IDA
- Cross-sectoral: address key cooling areas such as space cooling (building) and refrigeration and cold chains for healthcare, agriculture and SMEs
- Programmatic: Support investments in cooling allocated across 9 countries in Africa, LAC, SAR and ECA regions.
- Expected lifetime tCO<sub>2</sub>e reduced/avoided: 16.2 Mt CO<sub>2</sub>e

# ESMAP Clean Cooling Program's Knowledge Sharing informs countries and development partners

## Primer for Cool Cities: Reducing Excessive Urban Heat with a Focus on Passive Measures:

This primer and its companion report, Cool City Case Studies: Reducing Urban

Heat, provide practical, actionable guidance and examples for implementers, policy makers, and planners tasked with mitigating urban heat impacts.



## Primer for Space Cooling

This publications introduces space cooling and its key considerations, and brings sustainable space cooling into policy discussions & investment considerations in developing countries. It presents the applicability of different space cooling options and key enabling factors for their

Implementation with potential trade-offs  
It provides an overview of available strategies and technologies & shares examples of effective regulatory, financial, & enabling mechanisms



## Sustainable Cooling-Grid Rural Areas | The Nexus between Access to Energy and Clean Cooling,

This report aims to increase awareness and start a discussion among stake-holders on the access to efficient and clean cooling in off-grid rural areas. It clarifies key cooling concepts, needs

and rural off-grid areas & the synergies between access to cooling and to electricity, identify key barriers and policy tools to address them, formulate recommendations & areas for further work.







# ESMAP

Energy Sector Management  
Assistance Program



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**Thank you**

