



Options for Financing Energy Efficiency in Public Buildings Kosovo, Georgia and Turkey

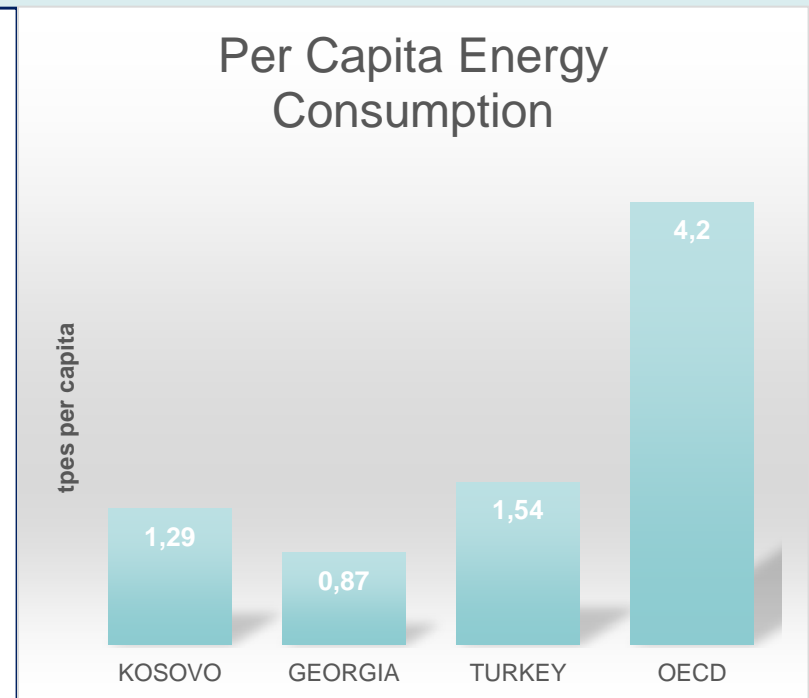
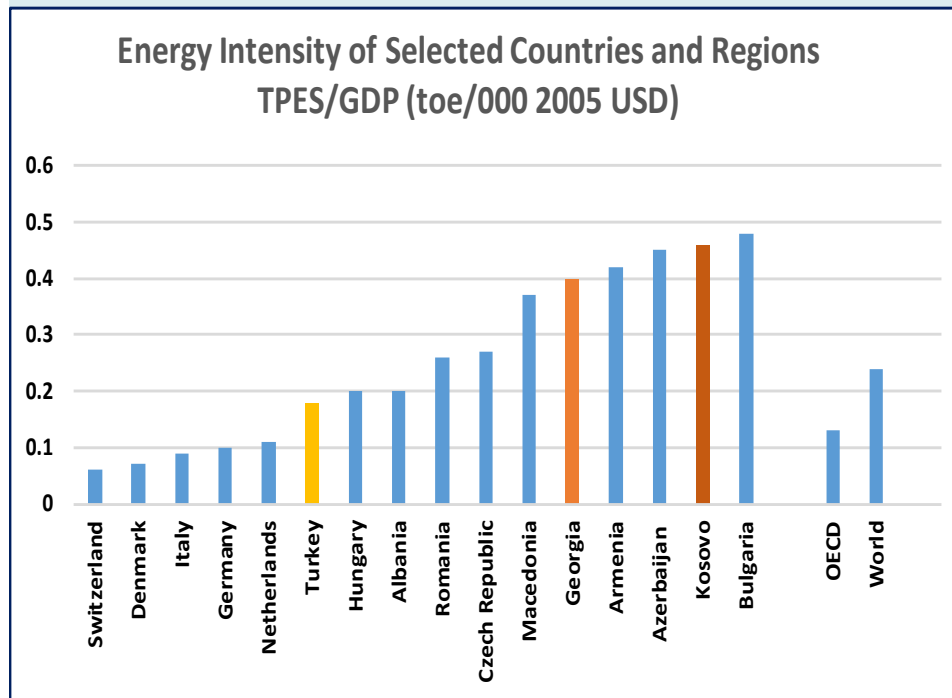


Importance of Energy Efficiency in the Public Sector

- Continued economic growth will lead to increased energy needs
- Public sector is a very high consumer of energy
- Public buildings have large potential for improving energy efficiency (EE) with reasonable paybacks
- Improved EE in public buildings can:
 - Reduce budgetary costs for energy
 - Reduce energy imports
 - Renovate aging buildings
 - Contribute to climate change mitigation
 - Enable government to “lead by example”
 - Help stimulate EE and ESCO markets

High Energy Intensity

- Energy intensity of these countries is 40% to 200% higher than the average of OECD countries and two to four times higher than some EU countries
- Energy intensity is likely to rise further as per capita energy consumption increases with continued economic growth



Source: IEA World Energy Statistics

Energy Use in Public Buildings and Facilities

- Limited data on public sector buildings and facilities (central government and municipal) and their energy consumption
- Efficiency improvement and renovation of public buildings and facilities has been identified as a priority in the NEEAPs
- Recent studies and audits have pointed out
 - Potential energy savings of 30 to 50+%
 - Paybacks of 5 to 10 years
 - Investment needs of € 50 to 80 per m²

Objectives of World Bank Options Papers

- Review existing information of energy consumption in public sector (municipal and central government buildings and facilities) and assess energy savings opportunities
- Document the existing legislative and regulatory framework for facilitating EE projects in the public sector
- Identify the major barriers to EE financing in the public sector
- Review international experience with financing options for public sector EE implementation
- Identify suitable financing options
- Conduct a comparative assessment of the advantages and limitations of the options
- Recommend option and outline implementation roadmap

Barriers to Financing Public Sector EE

Policy / Regulatory

- Energy pricing and collections
- Public procurement and budgeting policies
- Limitations on public financing, borrowing capacity
- Limited and poor data
- Import duties on EE equipment
- Unclear or under-developed EE institutional framework
- Lack of appliance standards and building EE codes, lack of testing, poor enforcement

Equipment/ Service Provider

- High project development costs
- Perceived risk of late/non-payment of public sector
- Limited demand for EE goods/services
- Diffuse/diverse markets
- Limited experience with new contract mechanisms (e.g., ESCOs)
- Limited technical, business, risk mgmt. skills
- Limited access to financing/equity

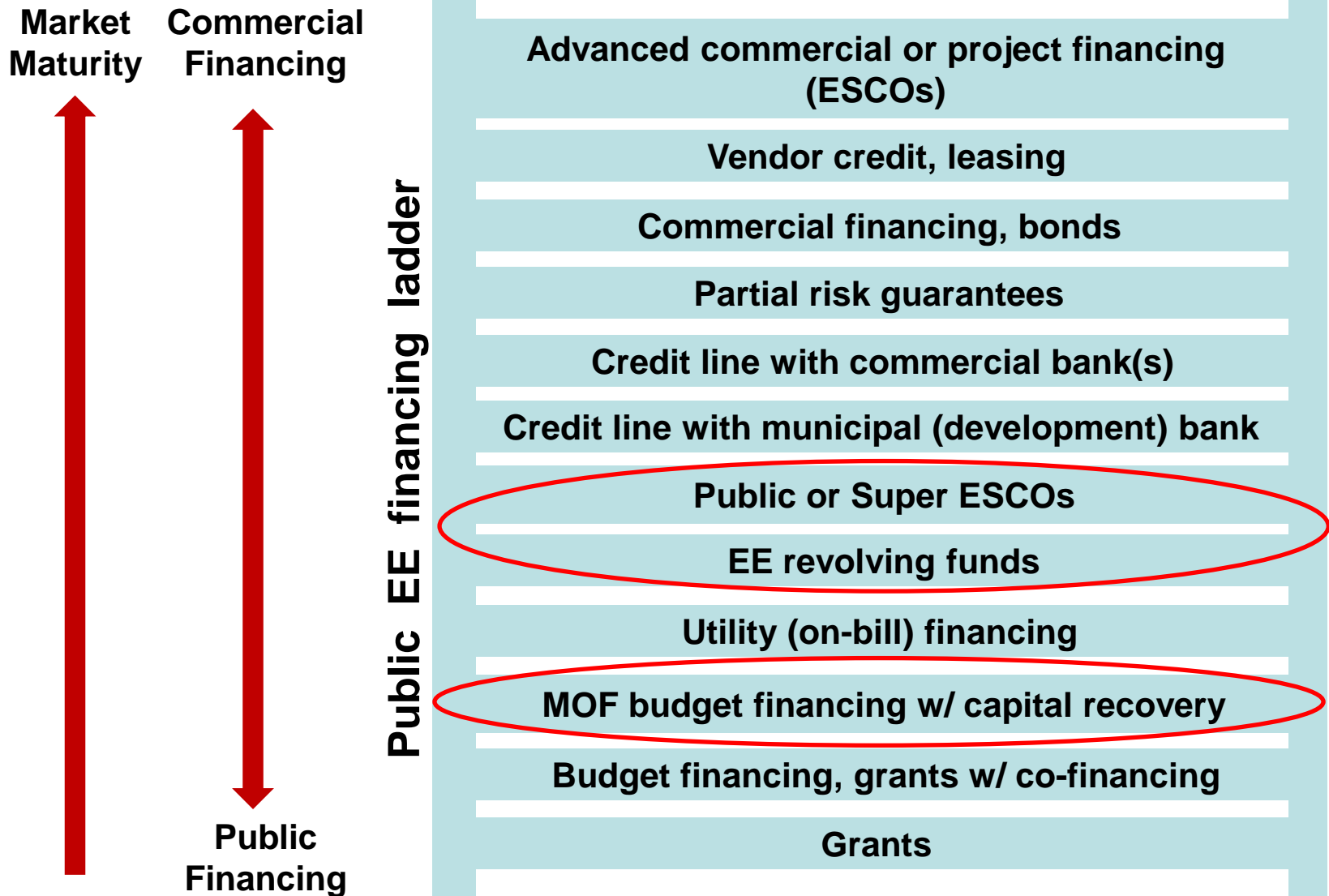
End User

- Lack of credible data
- Lack of awareness of EE opportunities
- High upfront and project development costs
- No discretionary budgets for special projects/ upgrades and limited ability to borrow
- Poor structural condition of public buildings/facilities
- Ability/willingness to pay
- Perceived risks of new technologies/ systems
- Mixed/lack of incentives
- Inability to collateralize public assets

Financiers

- New technologies and contractual mechanisms
- Small sizes/widely dispersed → high transaction costs
- High perceived risks, incl. public credit risks – not traditional asset-based financing
- Other higher return, lower risk projects
- Over-collateralization and restrictions on public assets as collaterals
- Behavioral biases

Public Sector EE Financing Schemes



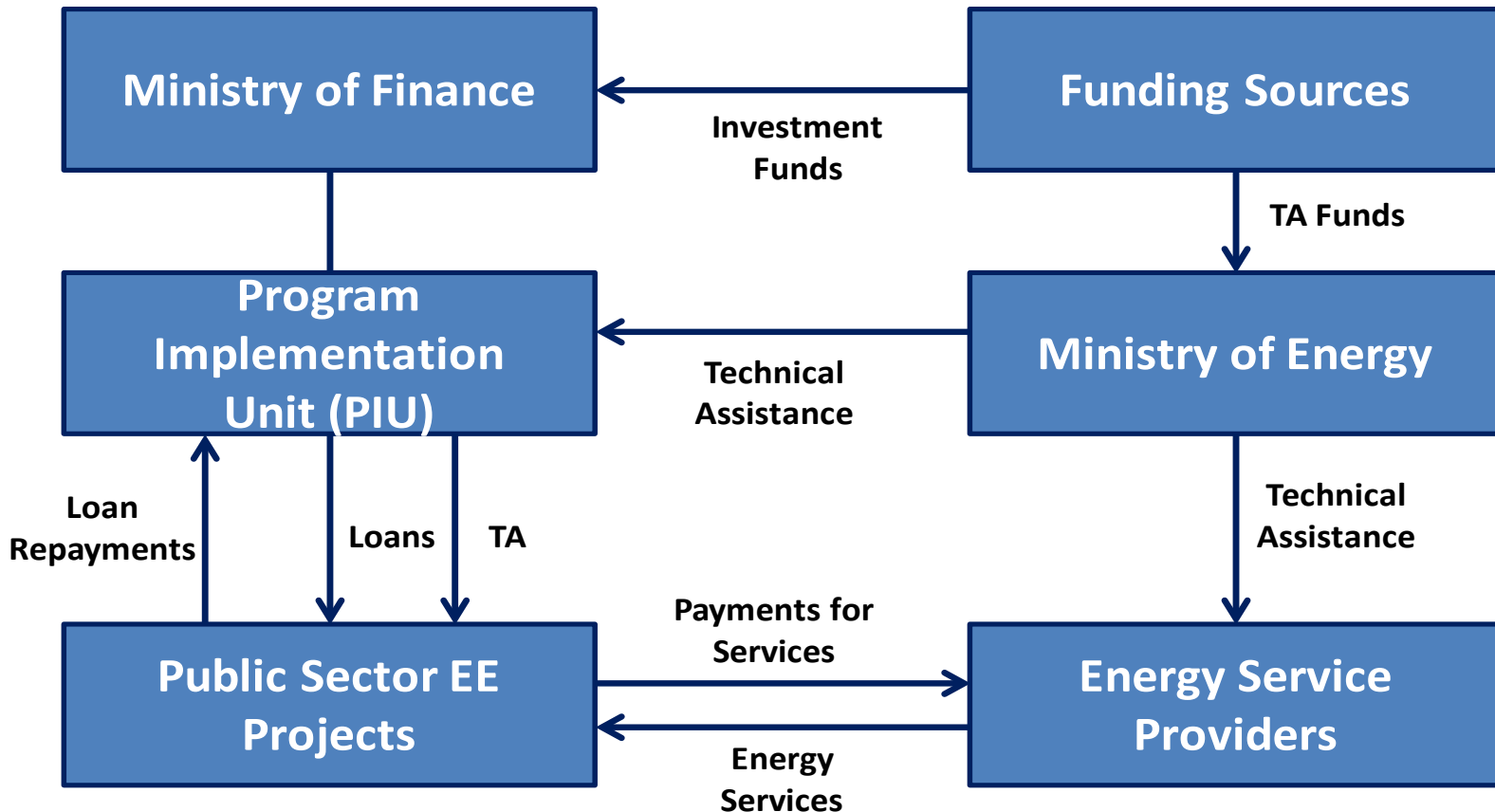


Budget Financing with Capital Recovery

Budget Financing with Capital Recovery – Characteristics

- Funds provided by MOF to public agencies – may include on-lending of IFI/donor funds
- Project management by project implementation unit (PIU) located in MOF or other suitable government agency
- Products/Services:
 - Loans to creditworthy municipalities with implementation capacity
 - Budget financing for central government agencies and highway lighting
 - Support for project preparation, implementation and monitoring could be provided by PIU (and/or Ministry of Energy)
- “Repayment” from energy savings (through budget reduction)

Structure



Case Study – Municipal Services Improvement Project (Macedonia)

- Funding provided to MOF by World Bank
- On-lending by MOF to creditworthy municipalities and public sector entities for municipal services projects (including energy efficiency)
- Implemented by a PIU within MOF
- Eligible projects have to be revenue-generating or cost-reducing
- Borrowers pay back the loans from the revenues or cost savings of the implemented projects
- Some municipalities lack capacity to do project design and procurement - PIU can provide some support with TA funds
- Repayments through “budget capture” - in the form of lowered outlays to the borrowers in future years.



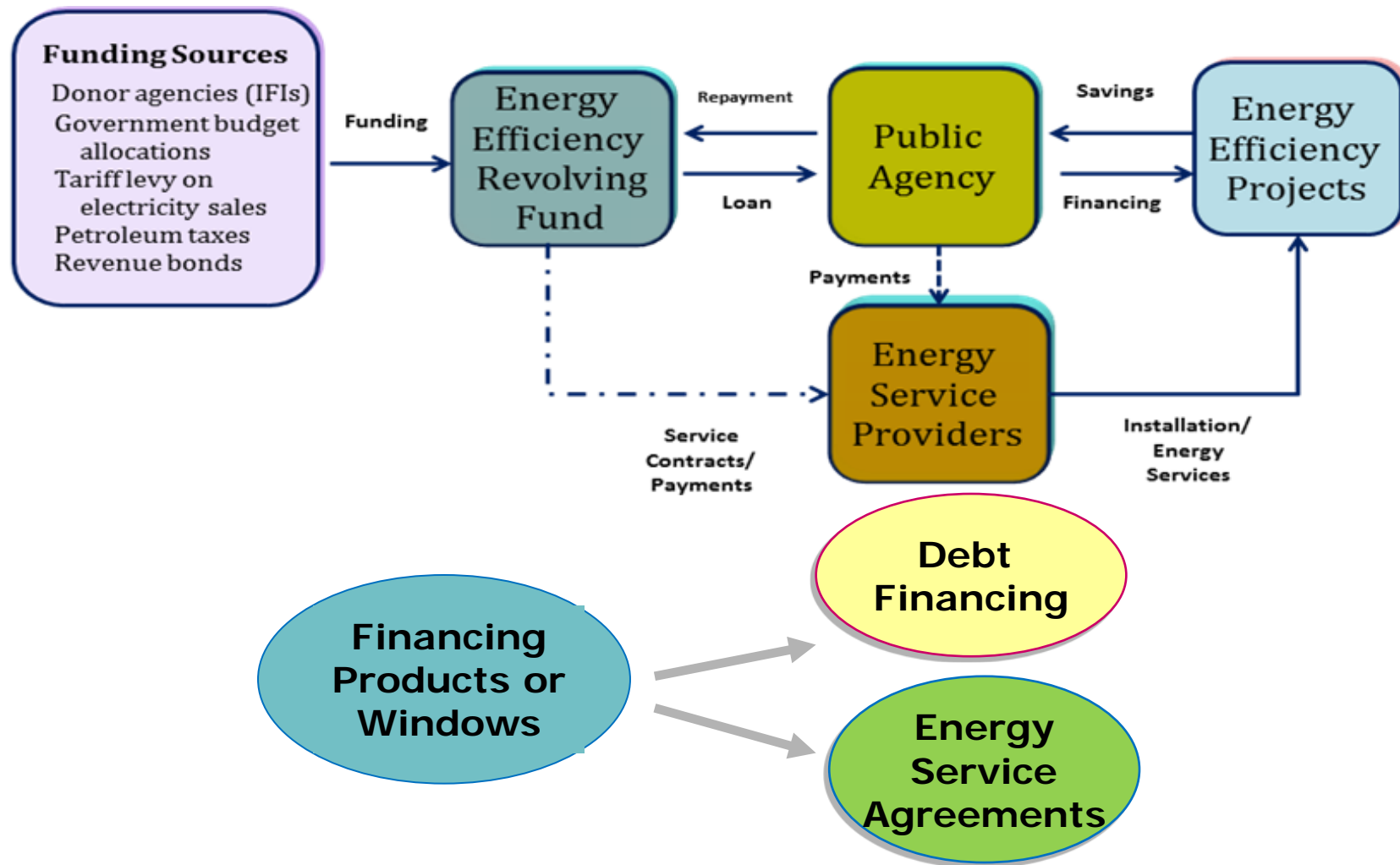
Energy Efficiency Revolving Fund



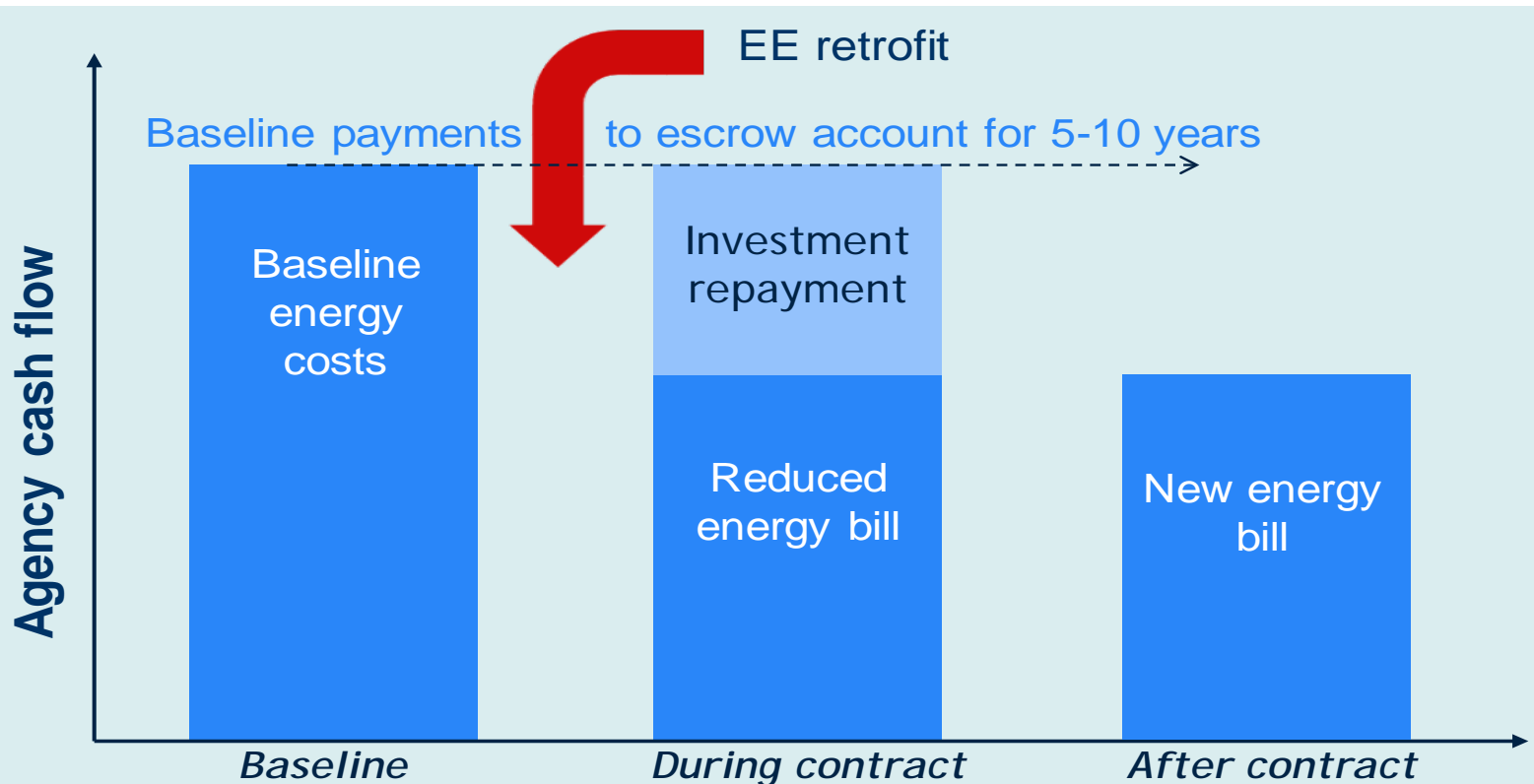
EE Revolving Fund - Characteristics

- Capitalized from IFI/donor funds
- Management by Fund Manager (company or organization), overseen by Board of Directors
- Full service: Financing plus project preparation, implementation and monitoring services
- Two windows:
 - Loans to creditworthy public agencies able to borrow, collateral/own contribution required (Model 1)
 - Energy services to other entities (non-creditworthy, without own budget, unable to borrow) (Model 2)
- Payback from energy savings
- Repayment risk with Fund Manager
- Revolving nature of Fund
- Pricing of services depends on funding sources, condition of client

EE Revolving Fund (EERF) - Structure



EERF – Energy Service Agreements



Baseline payments need to be adjusted for:

- Changes in energy prices
- Changes in operations and comfort levels
- Severe weather impacting energy use

Management and Governance

Two Options –

1. Establish EERF within a suitable existing agency (such as a development bank)
2. Create a new, independent organization (e.g., public enterprise)
 - The EERF should have a separate Board of Directors and Management Team
 - Board should have representation from key stakeholders including various ministries and the private sector
 - Fund management should not be subject to government procurement rules and regulations
 - Compensation of fund management team should be more flexible than typical government salaries

How the EERF Can Address Financing Barriers

Barrier Type	Barrier	How Addressed
Legal/ Regulatory	Limited number of creditworthy municipalities and borrowing capacity	Finance projects directly with creditworthy municipalities with borrowing capacity and engage in ESAs with others
	Restrictive budgeting and procurement regulations and procedures	Enter into loan agreements or ESAs with public agencies without facing the restrictive regulations/procedures
Access to Financing	Lack of internal budgets	Provide financing from EERF or offer ESAs
	Relatively high interest rates and short tenors from commercial banks	Provide lower interest rates and longer tenors than commercial banks and engage in ESAs
	Small project sizes, leading to high project development and transaction costs	Standardize agreements and procedures; aggregate similar projects across public agencies
Institutional	Lack of information on EE technologies	Provide TA; Offer ESAs
Implementation Capacity	Limited technical an implementation capacity	Provide TA; Offer ESAs
	Lack of development of energy service providers and performance-based contracting	Engage energy service providers in project implementation and develop their capacity for performance-based contracting

Case Study - Armenia R2E2 Fund

- Renewable Resources & Energy Efficiency (R2E2) Fund established in 2005, started revolving mechanism in 2012 for public EE projects using ESAs
- Project targeted US\$9 million (about 100 municipal street lighting and building retrofit projects) over 3 years
- To date, the R2E2 Fund has signed 55 ESAs totaling US\$8.7 million
 - Average project size is about US\$150,000 (one US\$1.2 million project with a university)
 - All ESAs are being repaid on time (or early)
 - All projects are subcontracted to local construction firms under simplified performance contracts; to date, all have met or exceeded savings estimates
 - Many new technologies have been introduced, since procurement is based on highest NPV rather than lowest cost
- Some key lessons/remaining issues include:
 - High % of application rejection (55/307 applications accepted) creates higher admin costs than expected
 - Need to develop robust project pipeline to meet investment target
 - Increased bundling in procurement to lower transaction costs
 - Fund sustainability after project closure is unclear



Super ESCO

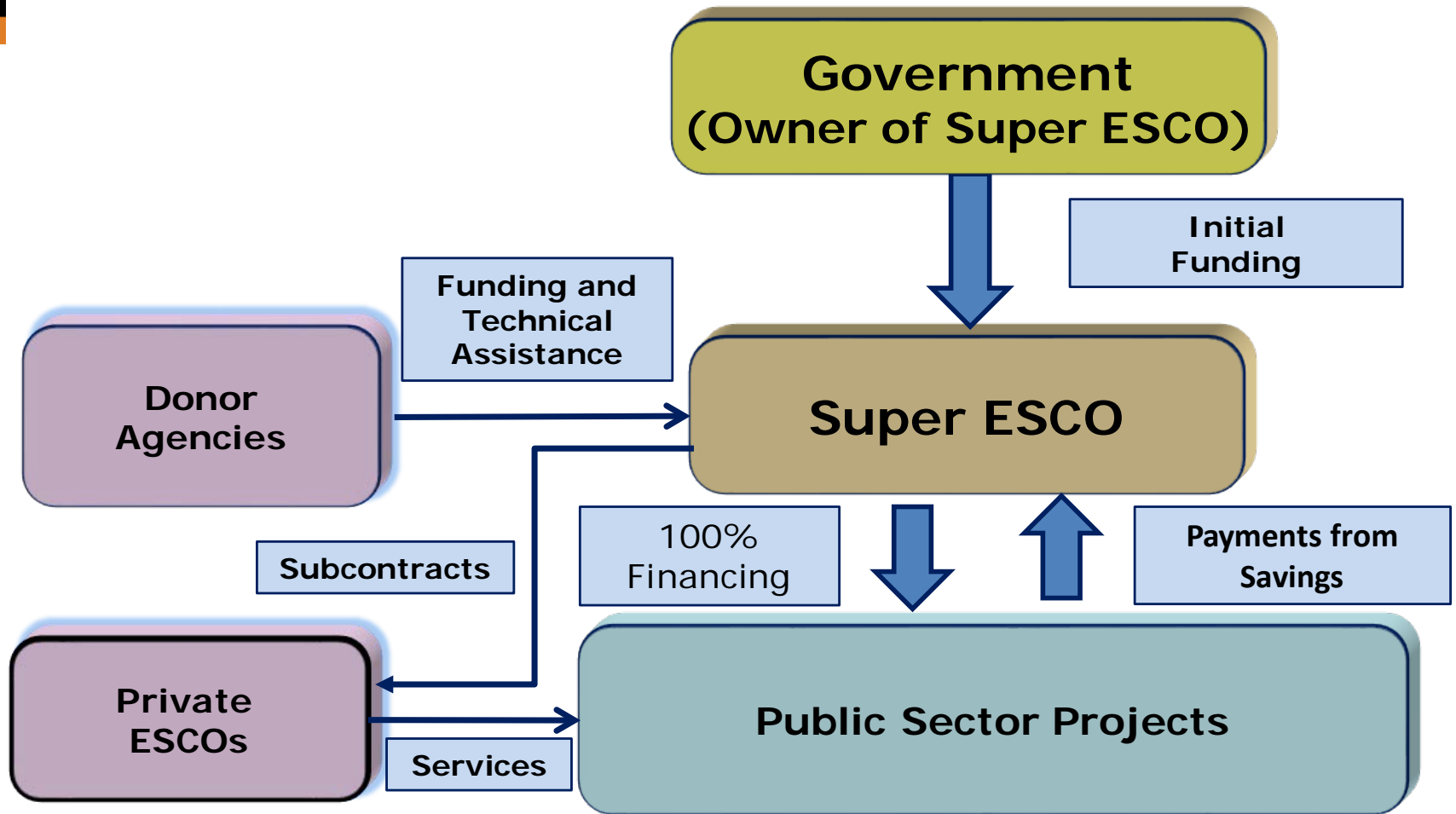


Super ESCO

- Independent corporation owned by the Government that has two major responsibilities:
 1. Implement projects in the public sector using ESPC approach
 2. Build the capacity of private sector energy service providers/ ESCOs by engaging them as subcontractors
- Capitalized by the Government with assistance from IFIs, donors
- Governance structure (Board of Directors established by Government) - includes public and private sector representatives
- Provides 100% financing for EE projects in public agencies with loan repayments from project cost savings
- Offers range of financing products to serve the needs of different public sector entities
- Develops partnerships with banks/FIs, equipment suppliers, leasing companies, etc.
- Provides training and capacity building to private ESCOs; TA may be provided by donor agencies



Super ESCO – Funds Flow



Energy Efficiency Services Limited (EESL) – India

- EESL was established by the Government of India as a publicly owned Super ESCO
- One of the key objectives is to implement energy efficiency projects in municipal functions, including public buildings and street lighting
- Provides turnkey performance-based implementation services to public agencies
- Partnerships with private ESCOs and EE equipment suppliers to mobilize private entrepreneurship and investment
- Substantial capacity building and training activities
- National EE Street Lighting Program – Installed 847,000 LED street lights (saving 28 MW and 308 MWh per day)
- Residential EE Lighting Program - distributed 110 million LEDs (saving 2,800 MW and 39,000 MWh per day)
- Projects in progress for improving EE in municipal water pumping and water treatment



Comparison of the Options



Comparison of the Options

Characteristics	Budget Financing	EERF	Super ESCO
Types of Financing	Loans and TA; may include some grants	Loans, TA, energy service agreements	Loans, TA, energy service agreements
Governance and Management	PIU	Board of Directors	Board of Directors
		Fund management team	Management team of Super ESCO
Project Development	PIU	Fund management team	Management team of Super ESCO
Project Implementation	Public Agencies	Public Agencies (for debt financing)	Management team of Super ESCO
		Fund Mgmt. Team (for ESAs)	
Sustainability	Based on government decisions	Assured by revolving fund & fees to cover operating costs	Commercial operation that can also leverage private financing
Repayment Risk	None	Assumed by EERF	Assumed by Super ESCO

Comparison of the Options (continued)

Characteristics	Budget Financing	EERF	Super ESCO
Advantages	Easy to implement	Addresses needs of all agencies	Can address needs of all agencies
	Analogous to some existing models	Multiple windows to address financing needs and evolving capacity of public agencies	Multiple windows to address financing needs and evolving capacity of munis
	Can address all public agencies	ESA model useful for smaller and weaker public agencies	Can provide ESA option
	Does not require any investments from the public entities	Helps build local ESCO industry and introduce performance based contracts	Uses performance based contracts Can help build capacity of private sector ESCOs
Limitations	Requires active participation of MOF	May need new legislation for implementation	Need the creation of new organization
	May need changes in budgeting procedures	Need a strong and capable Fund Management Team	Needs capable management team
	Requires capable PIU	Need to develop payment security mechanism to assure payments	Need to develop payment security mechanism to assure payments
	Sustainability not assured		
Can be Implemented under Current Legislation/Regulations?	Yes	No, requires new legislation; may require creation of new entity	No, requires new legislation and creation of new entity

Other recommended enabling steps

Program Component	Recommendations
Energy building databases	<ul style="list-style-type: none">• Develop national public buildings stock inventory• Initiate database with annual energy use, fuel type, floor area• Analyze data to determine benchmarks by sector, identify EE potential and high/low performers• Collect additional data on public EE projects/programs, costs
Incentives & recognition	<ul style="list-style-type: none">• Create mix of obligatory and voluntary measures• Fame and shame (e.g., recognize high/low performers)• Focus on long-term, sustained cultural changes• Require reporting and targets to help ensure participation
Appliance labeling & standards	<ul style="list-style-type: none">• Ensure building materials and appliances are properly tested and certified• Enforce standards and update over time• Accelerate building performance certificates in public buildings first• Develop ESCO certification scheme
Training	<ul style="list-style-type: none">• Conduct surveys on training needs, especially in auditing and M&V• Deliver regular training programs, in cooperation with local universities/institutes to ensure their sustainability, and include

Advantages of EERF

Fund governed by a government-appointed Board of Directors or Board of Trustees comprising of public and private sector members.

- Can represent the interests of all the relevant stakeholders (including various Ministries and private sector stakeholders)
- Fund management can be independent and thus avoid political influence.
- Can allow pooling of government and donor funds
- The Board can select a highly qualified management team
- Fund management staff would be long-term and could be compensated at market-based levels
- The Fund may not have to comply with government procurement rules and bureaucratic procedures.
- Can operate with more flexibility and faster decision-making than a government agency.

Concluding Remarks

- EERF can **reduce annual government energy spending** and help meet national EE targets
- **Significant co-benefits** include:
 - reduced energy imports
 - improved comfort levels
 - refurbished public building stock
 - creation of ESCO industry/jobs
 - reduced GHG emissions
- EERF will be **sustainable** - i.e., no recurring Government budget needed - and **operate on a revolving basis for 20+ years**
- EERF can provide **basis for extension or replication** to other public sectors (e.g., lighting, water)





Thank you

The World Bank

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