



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA

8. Financing

Mel Slade, IEA

Pretoria, 16 October 2019



IEA #energyefficientworld

Training Overview

8. Financing and Implementing Municipal EE projects

Scenario: There are ambitious targets but seemingly little funding available to realise energy efficiency projects.

Question: What are the financing options that you can take?

Training Overview

Activity: Barriers

1. Generate interest

2. Build capacity

- Learning Energy efficiency networks

3. Unlock financing options

- Revenue-base raising, financing and execution models, creditworthiness

Better EE policymaking by integrating finance and investment

20 mins

30 mins

5 mins

Activity: Barriers

Activity: Barriers in financing and implementation

What is the biggest barrier in financing and implementation of energy efficiency in your municipality?

A

**Lack of
awareness and
incentives**

B

**Insufficient
capacity to
implement**

C

**Limited access to
financing**

Raise hands

Activity: Barriers in financing and implementation

What is the biggest barrier in financing and implementation of energy efficiency in your municipality?

A

**Lack of
awareness and
incentives**

1. Generate interest

B

**Insufficient
capacity to
implement**

2. Build capacity

C

**Limited access to
financing**

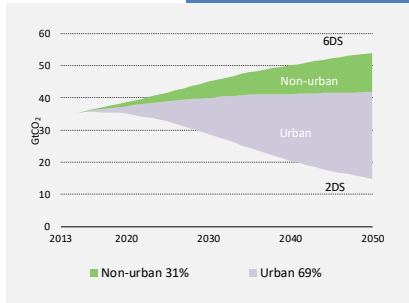
**3. Unlock financing
options**

1. Generate interest

1. Generate interest

1

**Communicate
Benefits of
Energy Efficiency**



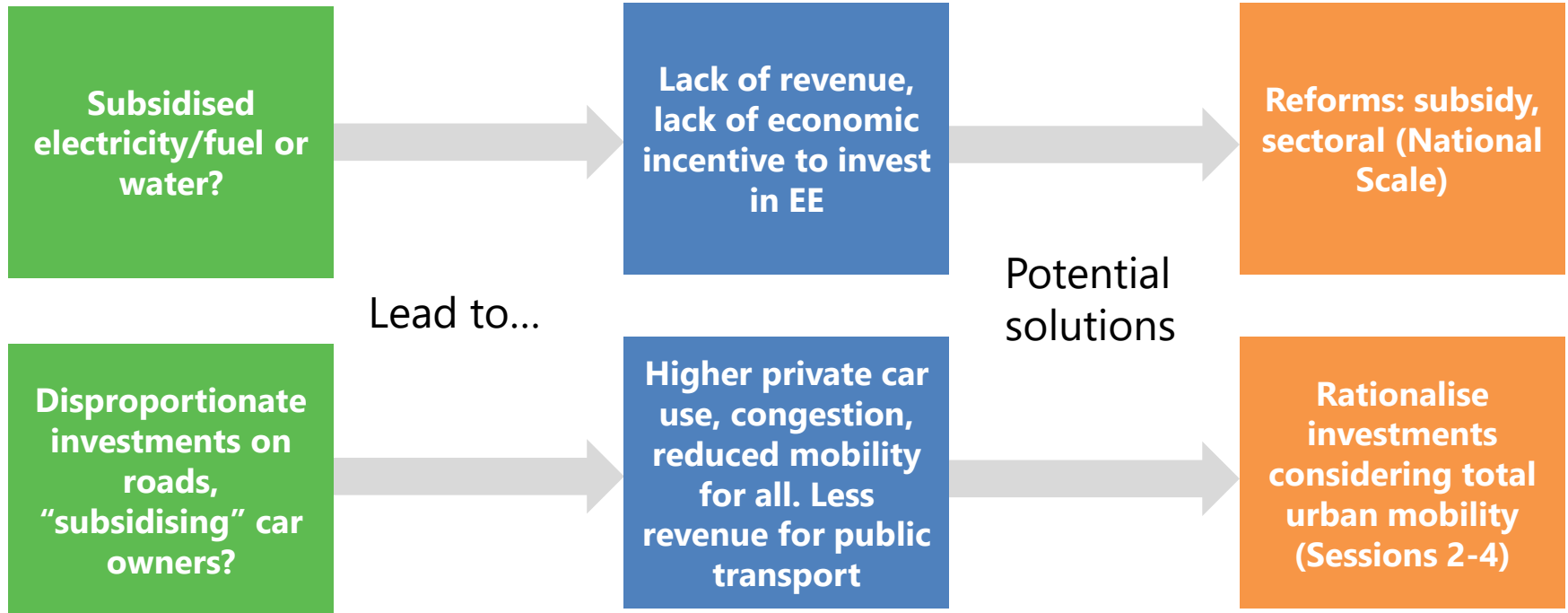
2

**Examine possible
hidden split
incentives**

**Subsidised
electricity/fuel or
water?**

**Disproportionate
investments on
roads,
“subsidising” car
owners?**

1. Generate interest: split incentives



2. Build capacity

How to build capacity?

Train

- **Find and fund training** opportunities
- **Establish** learning networks

Outsource

- **Use** Energy Savings Performance Contracting

How to build capacity: Train and then build networks

 **WORLD BANK GROUP**

Open Learning Campus  IN PARTNERSHIP WITH REPUBLIC OF KOREA
MINISTRY OF ECONOMY AND FINANCE

ACCELERATING SOLUTIONS THROUGH LEARNING

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 **Energy Efficiency in Cities (Self-paced)**
★★★★★ (1) | 12 Discussions
[SIGN-IN TO ENROLL](#)

The e-learning program has been developed under the City Energy Efficiency Transformation Initiative (CEETI) managed by the Energy Sector Management Assistance Program (ESMAP) and has benefitted from a collaboration between ESMAP, the World Bank Climate Change Group and the Online Learning Center. The production of the e-learning program has also benefitted from financial support from the Korea Green Growth Trust Fund.

World Bank's City Energy Efficiency Online Course

<https://olc.worldbank.org/content/energy-efficiency-cities-self-paced>

Training weeks

The IEA Energy Efficiency in Emerging Economies Training Week is a five-day training event dedicated to sharing experience with planning, implementing and evaluating energy efficiency policies in emerging economies. Launched in 2015, these events have now brought together over 1,000 next generation energy efficiency professionals from more than 90 countries, primarily from government institutions and their supporting organisations in emerging economies.



The 2018 Energy Efficiency Training Week held in Paris (Photo: IEA)

IEA Energy Efficiency Training Weeks

<https://www.iea.org/topics/energyefficiency/e4/trainingweeks/>

How to scale up the knowledge from training?

Build Learning Energy Efficiency Networks (LEEN)

Spotlight: Learning Energy Efficiency Networks in Mexico



LEEN FOR WATER OPERATORS

Undertaken: 2015

Champion: State of Coahuila, Mexico

CHALLENGE

Rising electricity bills leading to 40% of operation costs of water operators.

OBJECTIVES

To develop capacity to identify EE measures and implement them effectively

HOW DID IT WORK?

- Network of different operators was established aided by BECC and GIZ, based on experiences in Germany and Switzerland
- Identification of common problems such as old equipment and lack of good management schemes
- Systematic energy audits and piloting, regular meeting and studies, leading to widespread adoption of EnMS in water sector



RESULTS

- 40% reduction of costs
- Less than one year payback periods

LESSONS LEARNED

- Baseline data sharing and transparency among network participants allow better understanding of common challenges
- Non-competitive nature of municipalities help in maximum uptake of information and subsequent solutions

Source: <http://www.becc.org/news/videos/energy-efficiency-learning-network-in-the-state-of-coahuila-spanish-only/>

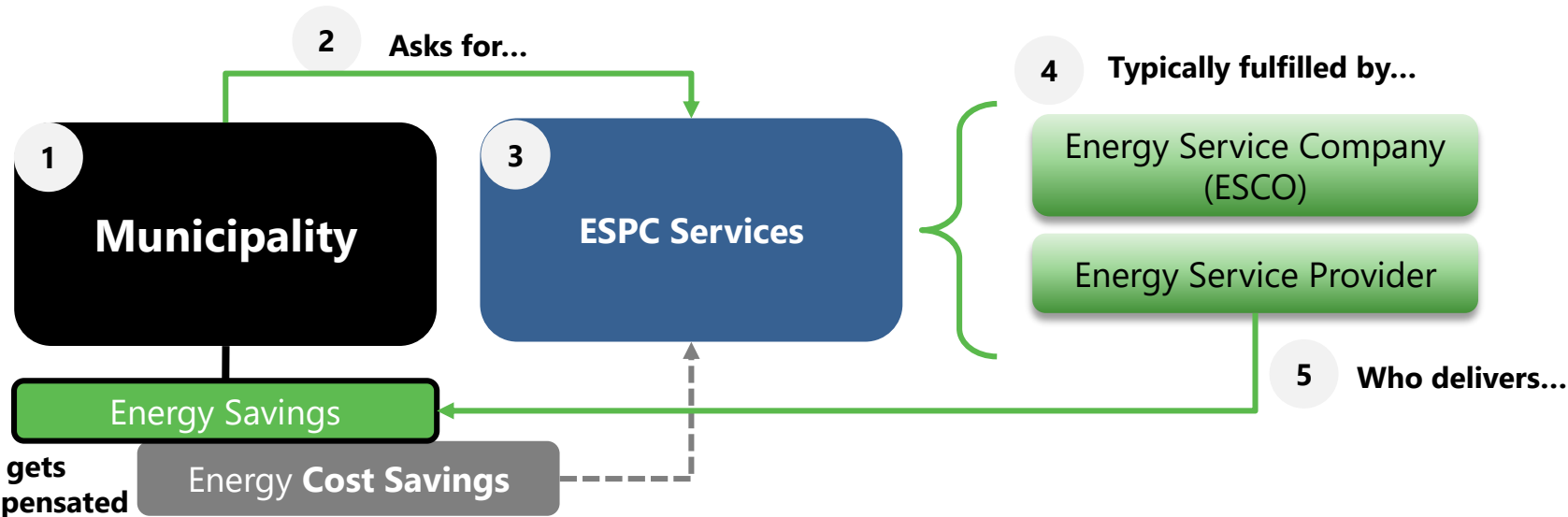


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How to build capacity: outsourcing

- We could also **outsource energy efficiency** works to **specialists** through Energy Savings Performance Contracts
- **ESPC acts as** implementation/financing mechanism to deliver energy savings



Source: www.iea.org/media/training/presentations/latinamerica2014/8A_Energy_Service_Companies_and_Financing.pdf

Spotlight: Performance Contracting for Street Lighting EE



AKOLA ENERGY EFFICIENCY STREET LIGHTING

Undertaken: 2007

Champion: Akola Municipal Corporation

CHALLENGE

Rising electricity bills for street lighting, water and sewage pumping, and public buildings, with priority of investment in roads, health and education infrastructure over EE projects

OBJECTIVES

To secure investments for street lighting retrofits using an Energy Savings Performance Contract (ESPC) approach

HOW DID IT WORK?

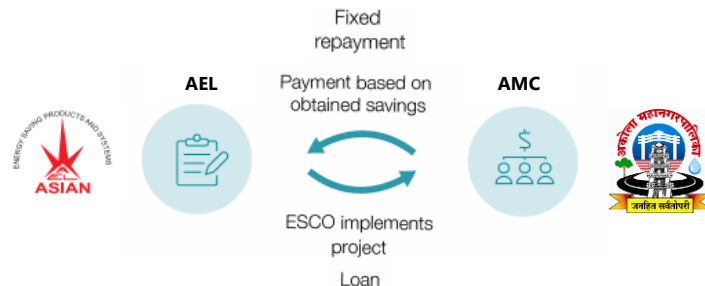
- Through a competitive bid process, AEL were selected as ESCO to implement the project
- AEL financed the project, replacing 11,518 street lamps within a 3-month period
- AEL also carried out the O&M and M&V processes over the 6-year duration of the contract
- As per the contract, AEL accrued 95% of the energy savings

RESULTS

- Annual **energy savings of 2.13 million kWh** (55.7% reduction)
- Financial **savings of USD 133,000** per year
- GHG emission **reduction of 1,830 metric tons of CO2** per year

LESSONS LEARNED

- Leadership by Akola Municipal Corporation to implement an ESPC was an important factor in the project's success
- The availability of energy efficiency products and presence of local ESCOs were also critical success factors
- In the absence of an independent M&V agency, AEL's undertaking of baseline energy measurements enabled energy savings calculations



Spotlight: Performance Contracting for Water Leak Management



EMFULENI WATER LEAK MANAGEMENT PROJECT

Undertaken: 2005

Champion: Municipality of Emfuleni

CHALLENGE

- In Emfuleni, the public water utility was experiencing leakage loss of 80% potable water through broken pipes and plumbing fixtures, due to deteriorating infrastructure.
- The municipality lacked the financial resources and technical expertise to carry out infrastructure and EE improvements.

OBJECTIVES

To engage an energy service provider to implement a project for water loss reduction and accrue energy savings

HOW DID IT WORK?



Technical assistance



Bank

Loan



Fixed repayment



ESCO

Payment based on obtained savings



ESCO implements project



Client

PPP B-O-O-T Shared Savings ESPC

RESULTS

- Water savings: **7-8 million cubic metres per year** (30% of former supply saved)
- Energy savings: **US\$ 3.8 million per year**
- Financial savings: **14,250 MWh per year**
- GHG emission reduction: **12,000 tonnes per year**
- Payback period of initial investment: **1 year**

Check out IEA's webpage on ESCOs

Energy Service Companies

At the heart of innovative financing models for efficiency

Energy service companies (ESCOs) deliver energy efficiency projects that are financed based on energy savings. Given the need to rapidly and significantly increase financing for energy efficiency, interest in ESCO business models is growing.

[ESCOs Home](#)

[ESCO contracts](#)

[Country profiles](#)

[Resources](#)



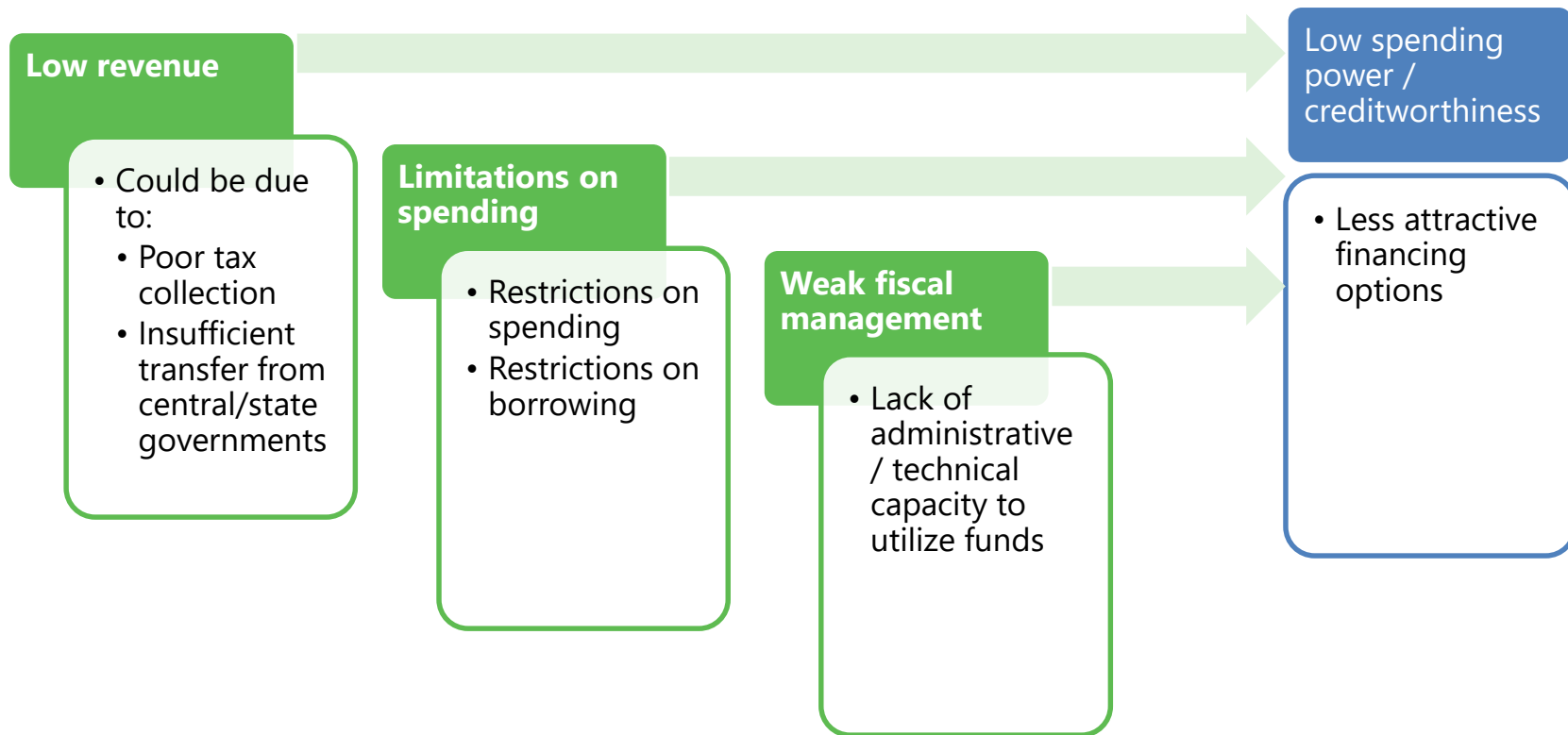
International Energy Services Conclave 2019

On March 6-8, 2019 the Alliance for an Energy Efficient Economy (AEEE) and Bureau of Energy Efficiency (BEE) jointly organised the International Energy Services Conclave 2019 – *Energy Efficiency for Business Competitiveness* in New Delhi. The Conclave was a flagship event that brought together key decision makers to discuss scaling up energy savings through digitalisation, policy and innovative business models.

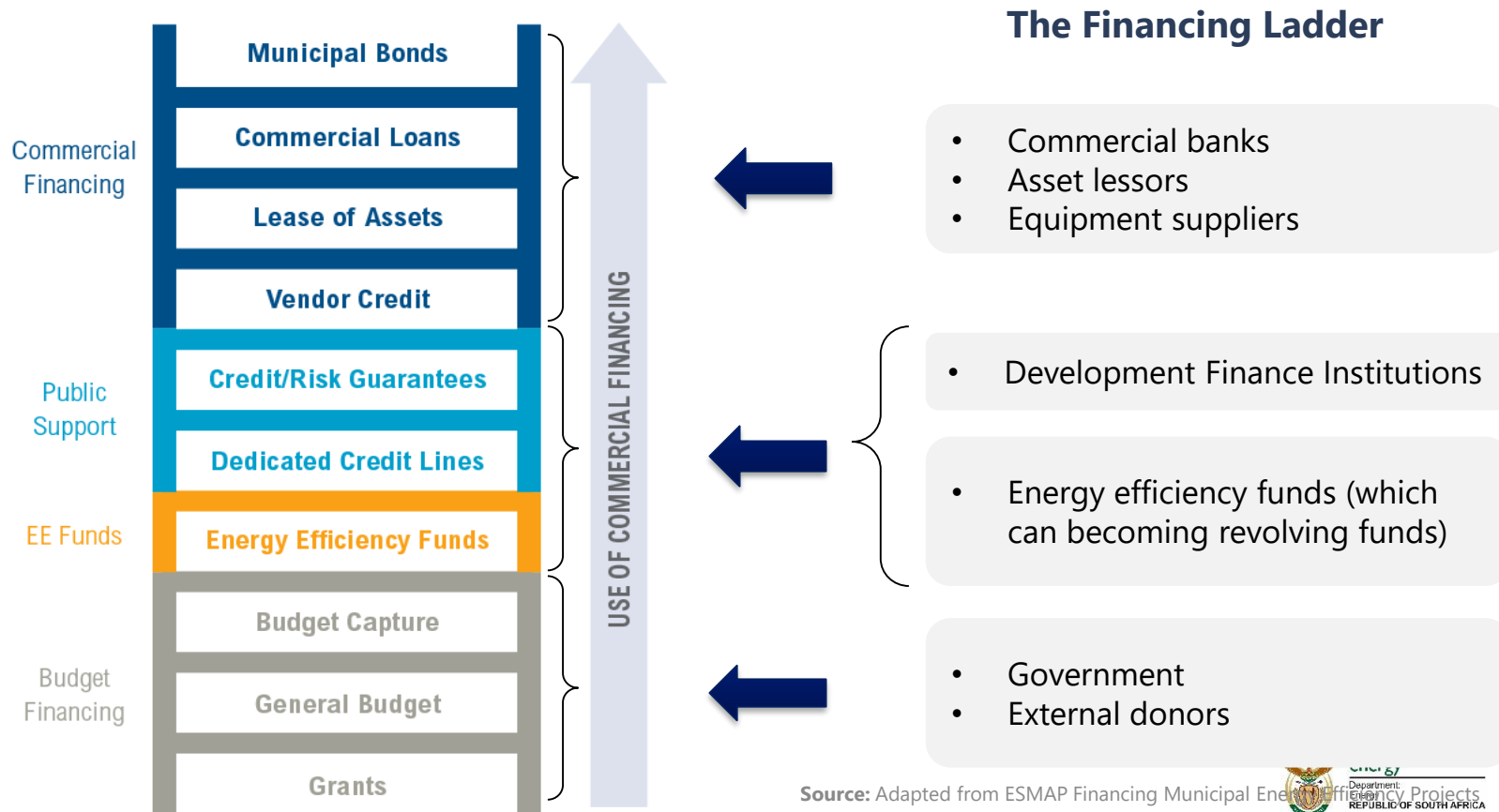
<https://www.iea.org/topics/energyefficiency/escos/>

3. Unlock financing options

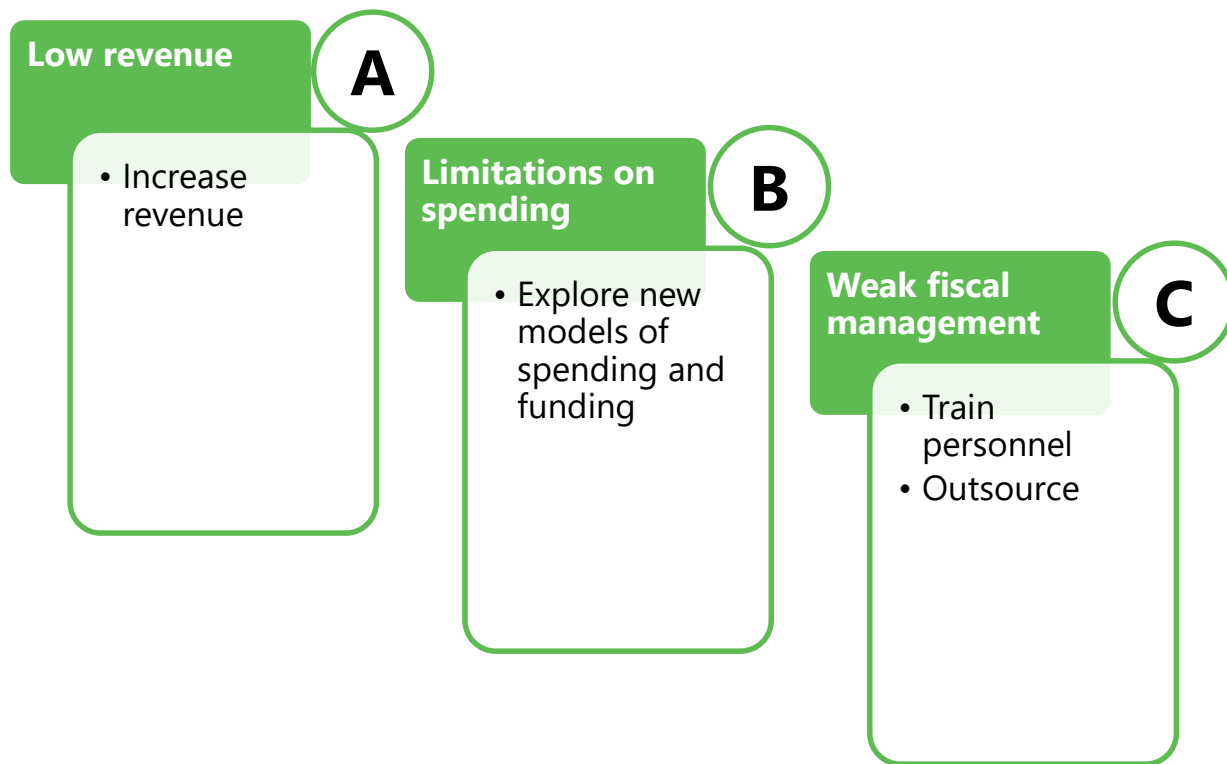
Unlock financing options: what are the challenges for Municipalities



Unlock financing options: how the challenges effect access



Unlock financing options: potential solutions



Unlock financing options: are fees fair and sustainable?

Internal revenue sources:

Land revenue

- Land fees
- Property tax

Non-land revenue

- License fees for businesses, etc.
- Taxes on households, vehicles, etc.

User charges

- Services (water, sewerage, parking, etc.
- Administrative fees (building permits, business registration, market fees)

External revenue sources:

Intergovernmental transfers

- Conditional grants
- Unconditional grants or shared transfers

Borrowing

- Governmental
- Private sector borrowing

Development assistance

- International development assistance
- Domestic assistance (e.g. disaster relief)



Spotlight: Creditworthiness by first increasing own-source revenues



DAKAR MUNICIPAL FINANCE PROGRAM

Established: 2011 (officially launched 2012)

Champion: City of Dakar

CHALLENGE

Insufficient funding to meet local needs; limited technical capacity; perception of low creditworthiness

OBJECTIVES

Position itself as a creditworthy issuer that could attract funding from investors in regional capital markets

HOW DID IT WORK?

- Increased own-source revenues by almost 40%
- Established Dept. of Planning and Sustainable development
- Partnered with several development finance institutions to boost technical capacity
- Institutionalised a participatory process for citizens



RESULTS

- Awarded BBB+ investment-grade credit rating by Bloomfield Investment in 2013
- Enabled the structuring of a municipal bond for the City of Dakar*

LESSONS LEARNED

- Dakar showed an active, innovative approach to its funding requirements
- It demonstrated the importance of addressing institutional & structural issues that impact revenues & municipal fiscal health
- It demonstrated the importance of developing technical capacity programs to position cities to leverage their revenue base & to use financial instruments

Unlock financing options: aggregating projects

Individual
transaction,
high costs



Single
loan, high
risk



Low credit –
worthiness, higher
interest rates



Lack of
documentation
or stats



Aggregation of different projects from different municipalities



Aggregated
transaction,
lower per-
project costs



Multiple
varied loans,
diversified
risk



Higher average
credit – worthiness,
lower ave. interest
rates



Increased
transparency,
higher credit –
worthiness

Spotlight: Aggregated Municipal Financing



MUNICIPAL FINANCE AUTHORITY OF BRITISH COLUMBIA

Established: 1970

Champion: regional municipalities of British Columbia, Canada



OBJECTIVE

To provide financing to regional districts and local governments of British Columbia through collective long-term debt*

STRUCTURE

- Is 100% owned by BC local government. Governance is assured by members representing regional districts
- Oversight is provided by 39 representative members appointed from each of 28 regional districts in BC
- A Board of 10 Trustees is elected annually from the Members to exercise executive and administrative powers, including policy, strategy, and business plans

HOW IT WORKS

- All local governments, except the City of Vancouver, must borrow long-term debt through the MFA
- Long-term financing is met through the placement of debentures in the capital markets through issuing 5- and 10-year bonds
- Debt issued is backed, as a guarantee, by the revenues and assets of regional districts and municipalities
- Interest rates on debenture issues to the MFA are lower than those available to individual municipal borrowers
- MFA has a Aaa/AAA/AAA ratings from Moody's, S&P, and Fitch, respectively

RESULTS

- At the end of 2015, MFA's outstanding loans reached US\$ 3.5 billion
- During 2018 alone, roughly US\$1.3 billion was raised in long-term debt for municipal and regional projects

Unlock financing options: Weak fiscal management; train or outsource

Train

- **Requires funds** to train personnel
- **Establish** knowledge networks among different municipalities

Outsource (via PPP)

- **Efficient procurement and project delivery** in a defined timeframe
- **Better risk allocation** of projects between public and private sectors
- **Reduced costs** to the public sector for energy efficiency

Spotlight: Public Private Partnership for Street Lighting



BHUBANESWAR STREET LIGHTING PPP PROJECT

Established: 2011 (officially launched 2012)

Champion: Bhubaneswar Municipal Corporation

CHALLENGE

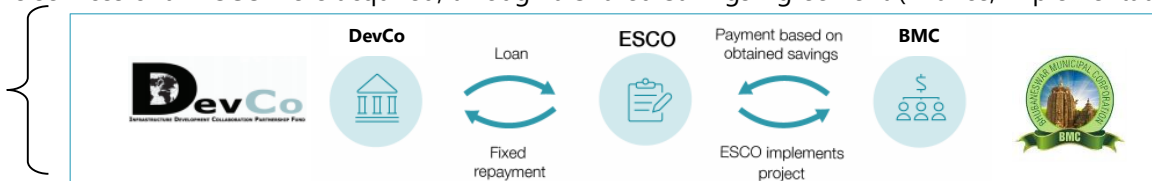
Streetlights on the city's small and residential streets were dimly lit or not lit at all in certain areas, raising continuous complaints from the public regarding their poor condition. Bhubaneswar Municipal Corporation (BMC) at the same time recognised that it did not have sufficient financial or technical capacity to see through the upgrade of its streetlights.

OBJECTIVES

To upgrade and manage its street lighting system through a public-private partnership transaction

HOW DID IT WORK?

- IFC was approached by BMC to design, structure and manage a public private partnership
- Through the PPP, the services of an ESCO were acquired, through a Shared Savings Agreement (finance; implementation, mgt)



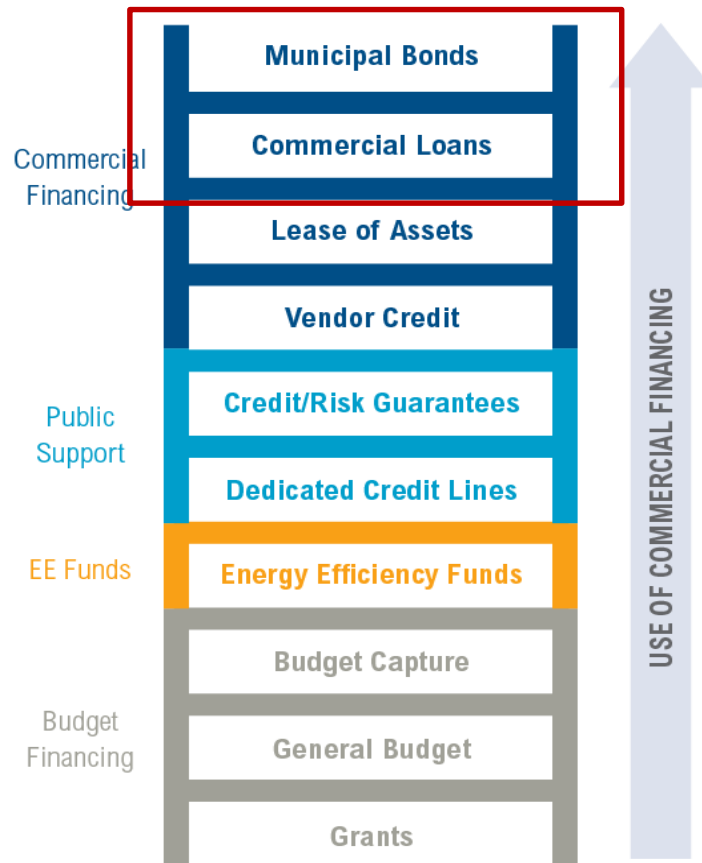
EXPECTED RESULTS

- Expected to generate **USD 100,000** in annual savings
- Mobilised **USD 4.8 million** in private sector investment
- Expected to reduce GHG emissions by approximately **10,500 tonnes** per year



Unlock financing options: creditworthiness increases access to finance

The Financing Ladder



Spotlight: Municipal bonds



GREEN MUNICIPAL BONDS IN JOHANNESBURG

Established: June 2014

Champion: City of Johannesburg

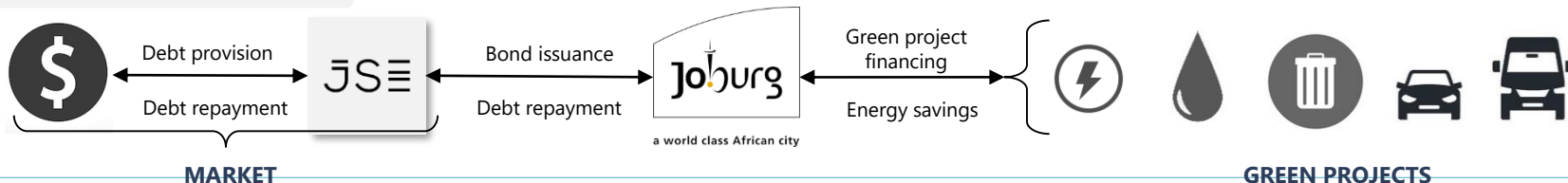
PRECONDITIONS

- Supportive political leadership of the city's pursuit of innovative finance mechanisms
- Established creditworthiness - investment-grade rating helped the city take the bond to market & receive a positive response
- Benefited from international guidance in pursuing green bonds, such as support from C40

OBJECTIVES

To reduce the city's emissions through financing green infrastructure projects across the energy, water, waste & transport sectors

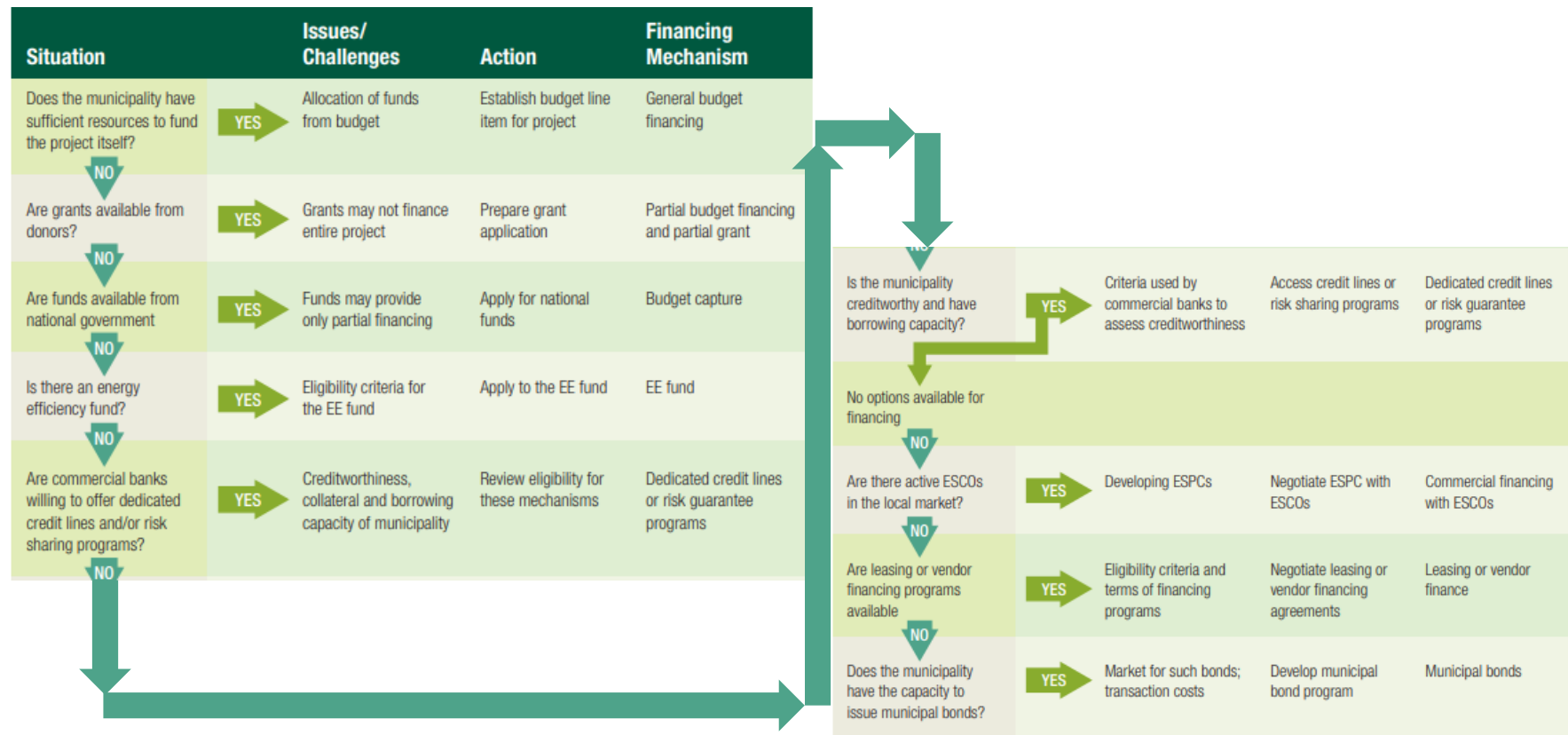
HOW DID IT WORK?



RESULTS

- The bond has provided the city with a new funding source to improve and expedite the implementation of its climate change mitigation strategy and move Johannesburg towards low carbon infrastructure
- The investment supports wider benefits such as the provision of energy efficiency lighting and solar heating to low income households in the City
- **Municipal bonds offer the opportunity for creditworthy cities to access large-scale, debt finance to introduce or promote energy efficient services**

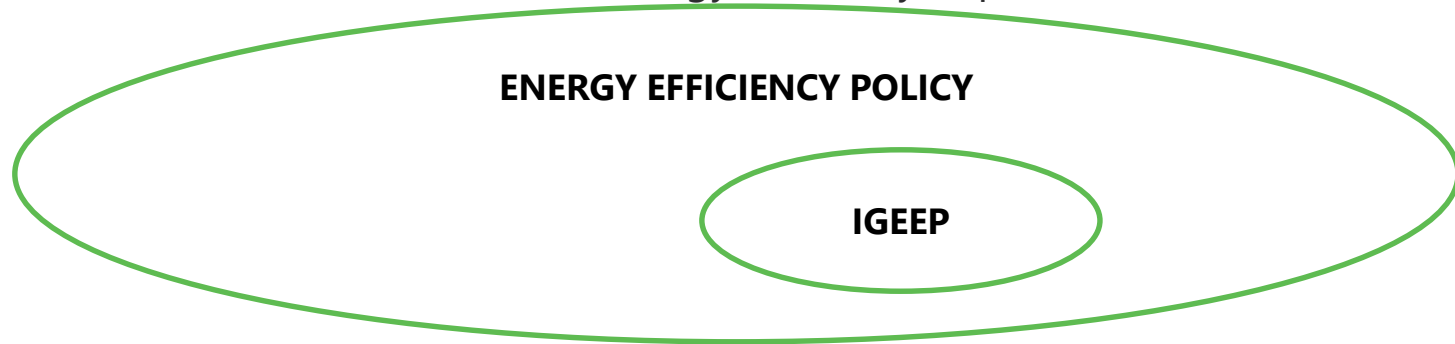
Unlock financing options: summary



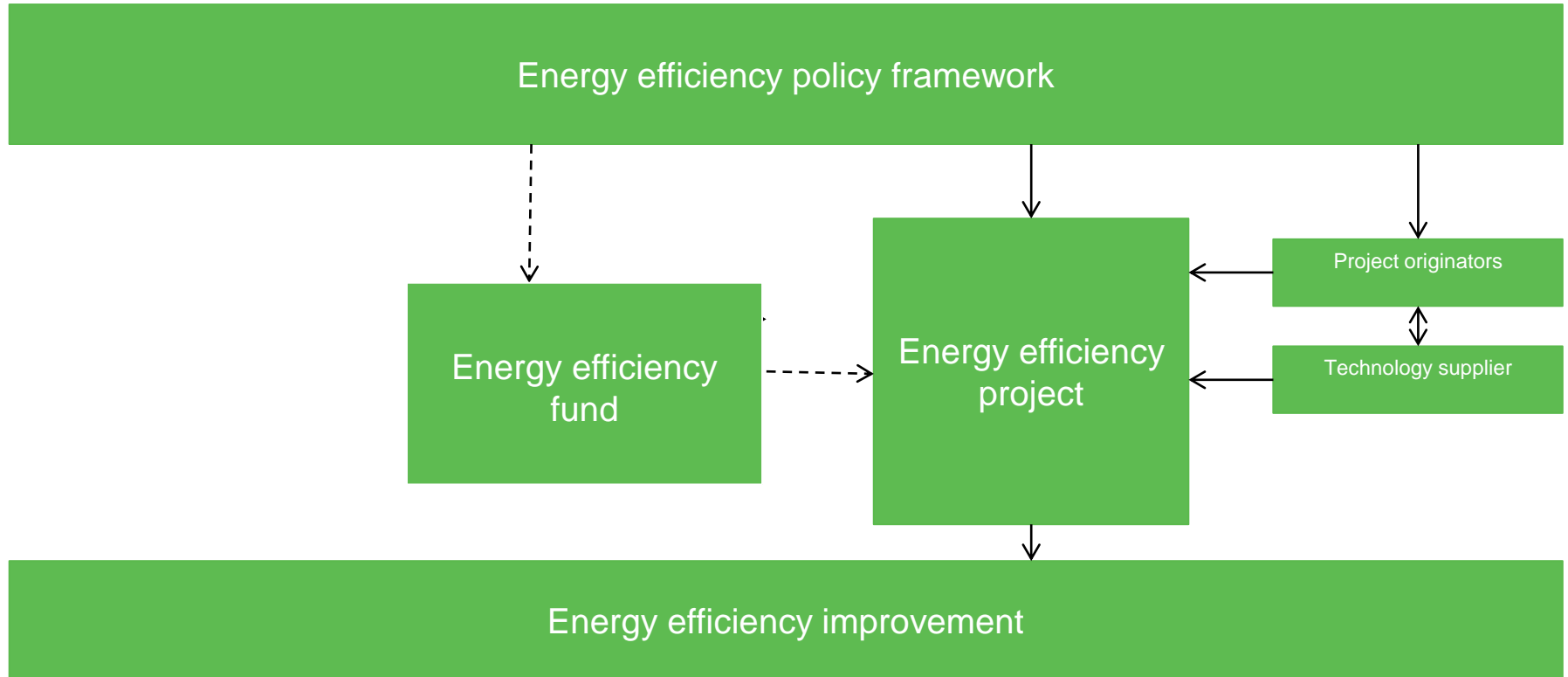
Better policymaking with Investment-grade energy efficiency policy

Investment Grade EE Policy: What is it?

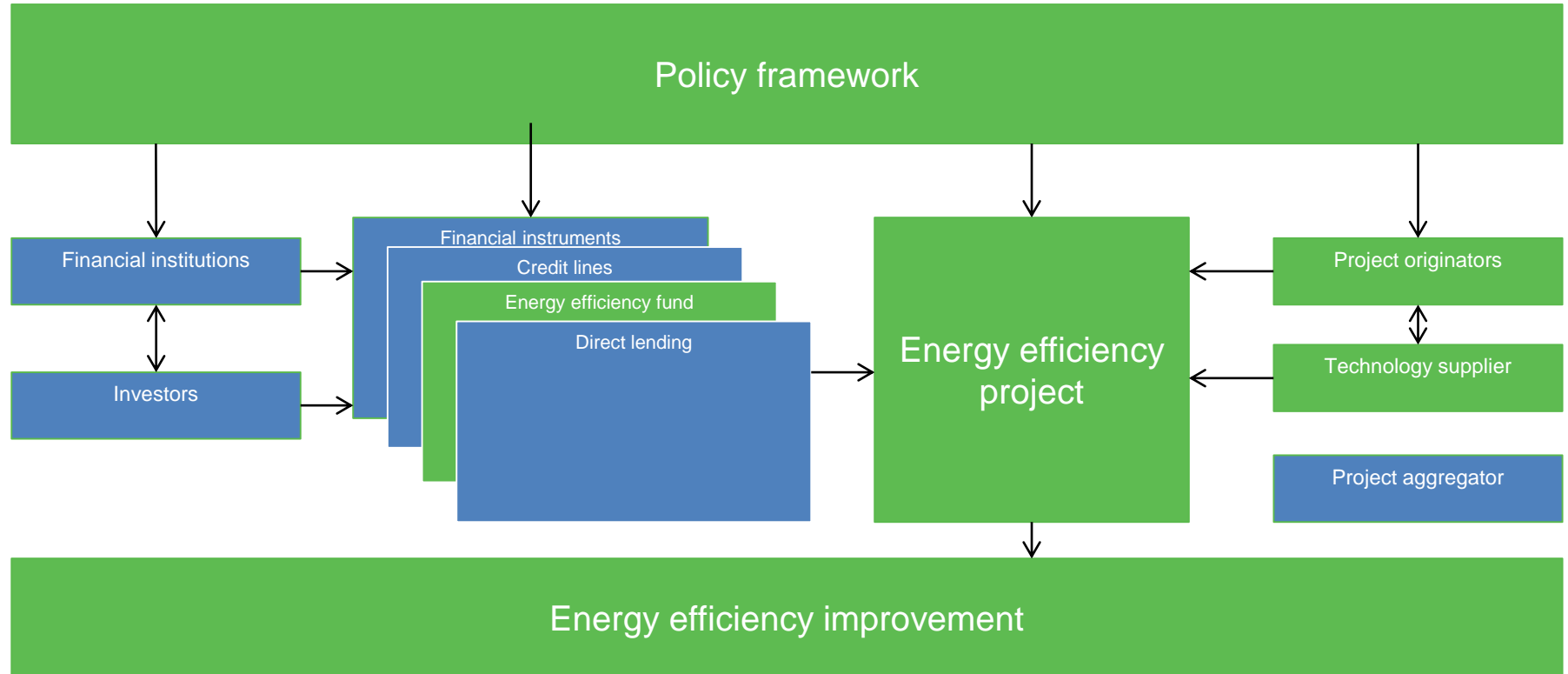
- What is **energy efficiency policy**?
 - A set of strategies, legislation, regulations, measures, programmes that together stimulate energy efficiency improvement
- What is **investment-grade energy efficiency policy**?
 - A set of strategies, legislation, regulations, measures and programmes that together **enable investments** that stimulate energy efficiency improvement



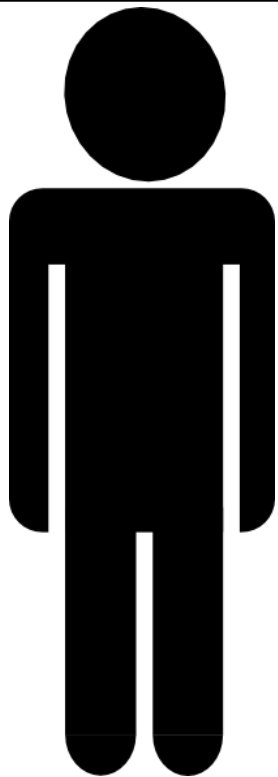
Energy Efficiency Policy: what it looks like



Investment-grade EE Policy: what it looks like



What problem does IGEEP tackle: alignment of interests



Policy maker

Long term	Time horizon	Short term
Public good	Motivation	Revenue target
Social cost-benefit analysis	Evaluation criteria	Internal rate of return (IRR)
Political	Relationship to risk	Legal
Economic impact / Political impact	Big concerns	Risk, bankability, creditworthiness



Banker

Investment grade policy: why is it important?

It provides **environmental certainty** in EE project investment that gives investors **greater confidence**:

- Focused **goal**
- Focus on specific set of **barriers**
- Focused group of **stakeholders**
- Specific **criteria**
- Specific **types of measures**

IGEEP

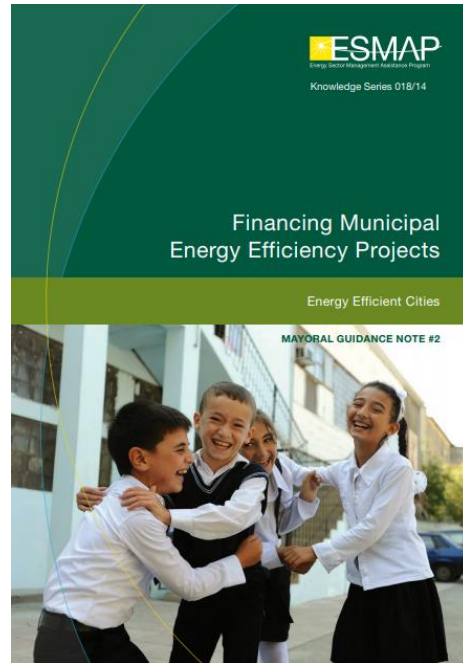
Setting **standards**

Applying market-based **incentives**

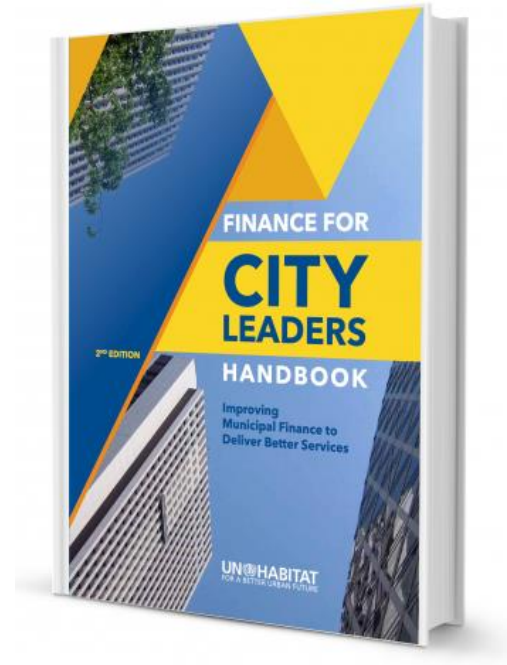
Designing tailored **financing mechanisms**

Resources

Key Resources



https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/FINAL_MGN1-Municipal%20Financing_KS18-14_web.pdf



<http://financeforcityleaders.unhabitat.org/>



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