8. Financing and Implementing Municipal EE projects

John Dulac

Paris, 23 May 2019

IEA #energyefficientworld

8. Financing and Implementing Municipal EE projects

Trainer(s): John Dulac

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

20 mins

1. **Generate interest**

2. **Build capacity**
   - Learning Energy efficiency networks

30 mins

3. **Unlock financing options**
   - Revenue-base raising, financing and execution models, creditworthiness

5 mins

Better EE policymaking by integrating finance and investment

Activity

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

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 execution of energy efficiency in your municipality?

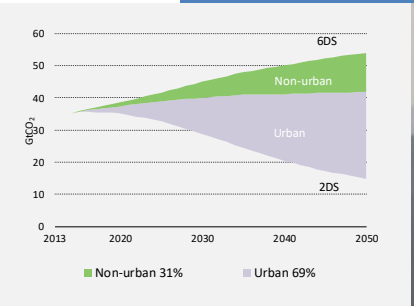
A	B	C
Lack of awareness and incentives	Insufficient capacity to implement	Limited access to financing
1. Generate interest	2. Build capacity	3. Unlock financing options

1. Generate interest

1. Generate interest

1

Communicate Benefits of Energy Efficiency



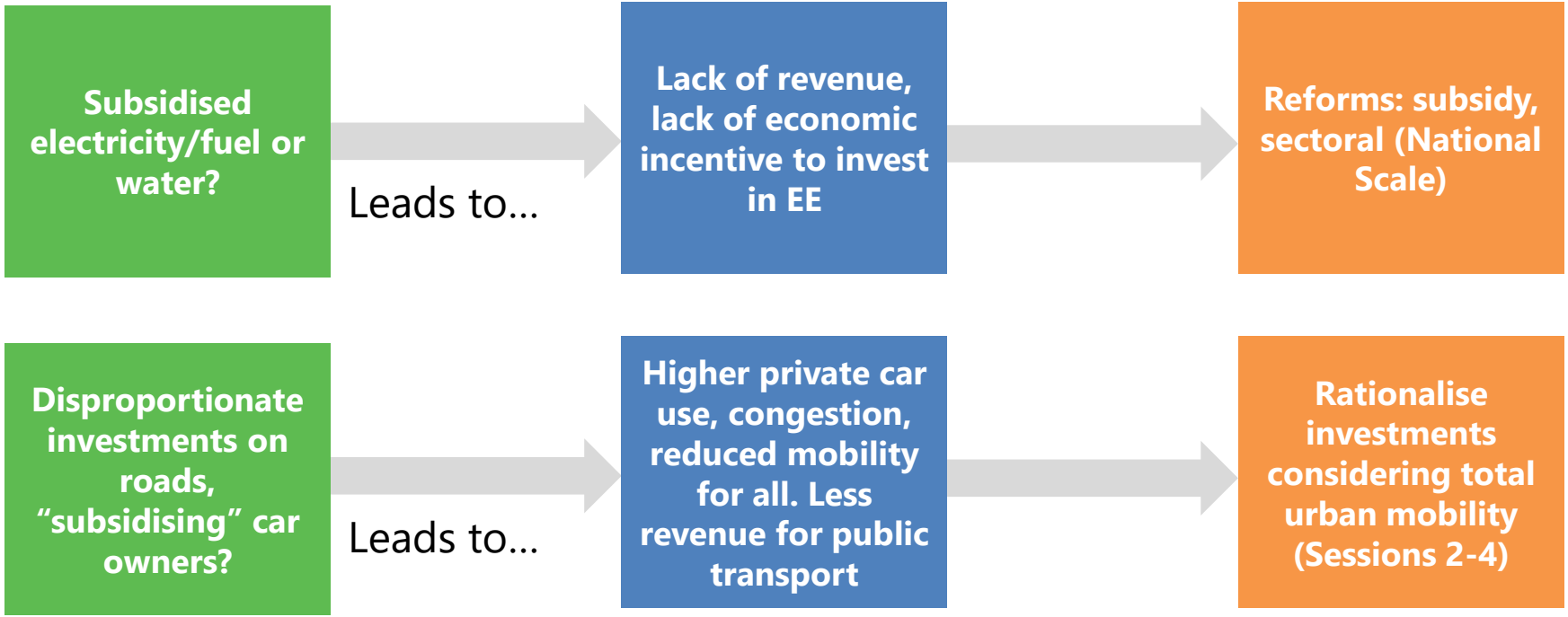
2

Examine possible hidden split incentives

Subsidised electricity/fuel or water?

Disproportionate investments on roads, "subsidising" car owners?

1. Generate interest
Examine split incentives



2. Build capacity

2. How to build capacity?

Train

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

Outsource

- **Use** Energy Savings Performance Contracting

2. How to build capacity?
Train and then build networks

World Bank's City Energy Efficiency Online Course

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

IEA Energy Efficiency Training Weeks

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

And then? How to scale up the knowledge from these trainings?

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

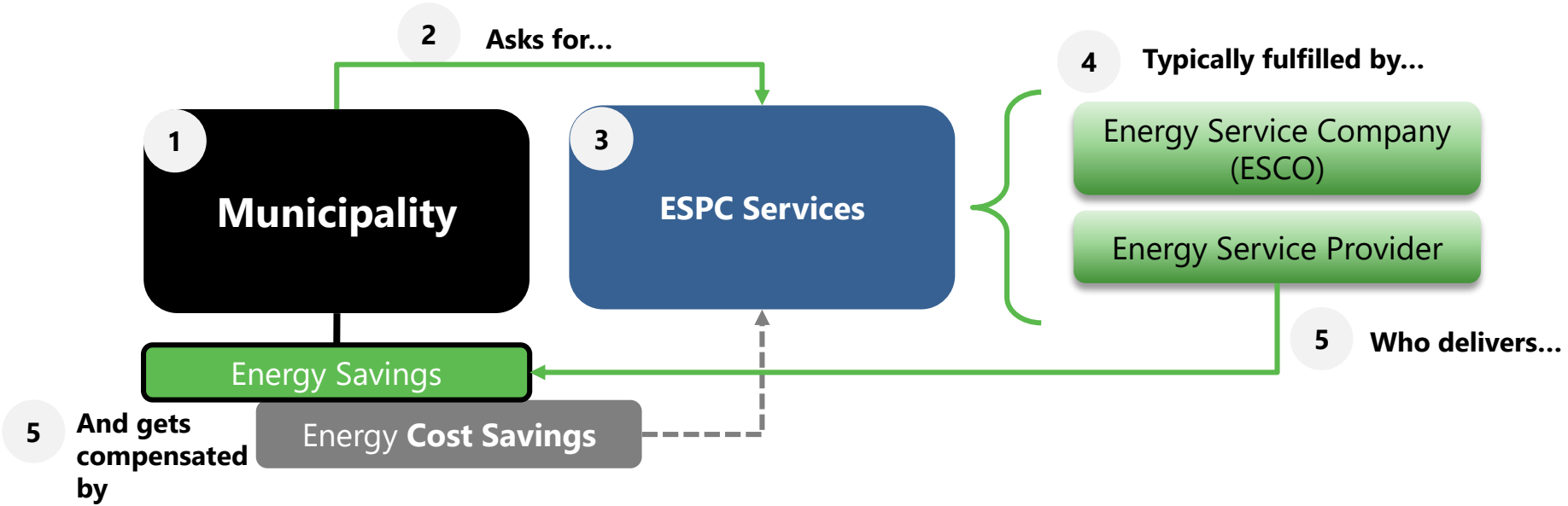
LESSONS LEARNED

- 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#.XMB5uugzaUI

- 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 Energy Efficiency

AKOLA ENERGY EFFICIENCY STREET LIGHTING

Undertaken: 2007
Champion: Akola Municipal Corporation

CHALLENGE

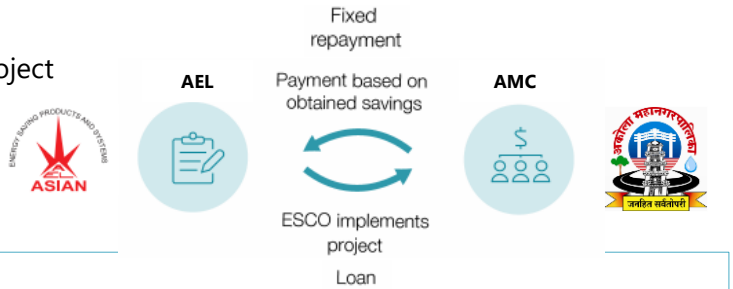
Rising electricity bills for street lighting, water and sewage pumping, and public buildings, with priority of investment in roads, health and education infrastructure over EE projects

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

Source: ESMAP EECI Good Practices in Cities

Spotlight:
Performance Contracting for Water Leak Management

EMFULENI WATER LEAK MANAGEMENT PROJECT

Undertaken: 2005
Champion: Municipality of Emfuleni

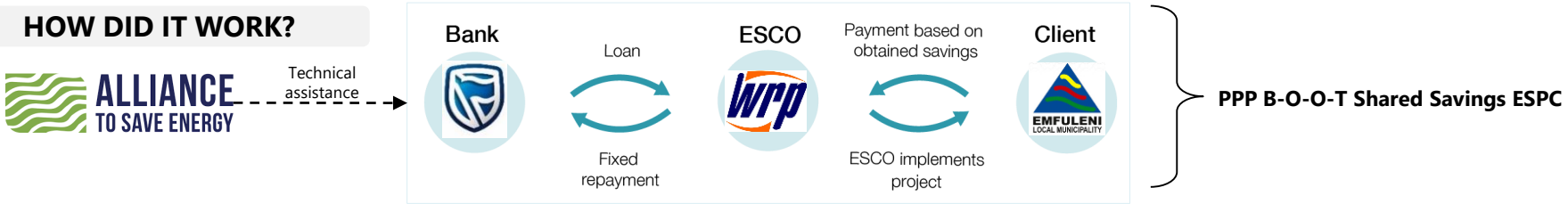
CHALLENGE

- 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?



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 (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

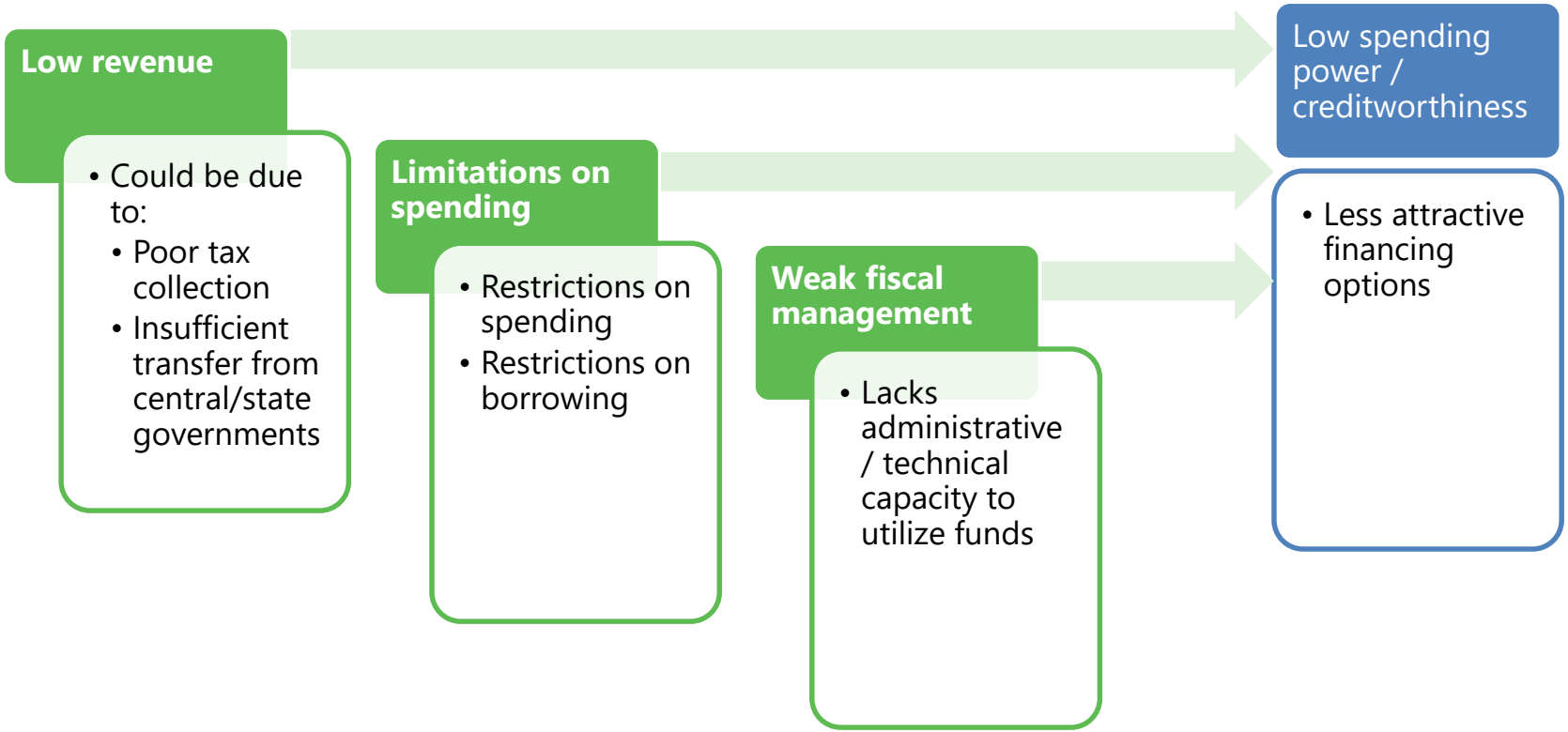
On March 6-8, 2019 the Alliance for an Energy Efficient Economy (AEEE) and Bureau of Energy Efficiency (BEE) jointly organised the International Energy Services Conclave 2019 – *Energy Efficiency for Business Competitiveness* in New Delhi. The Conclave was a flagship event that brought together key decision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

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

3. Unlock financing options

3. Unlock financing options

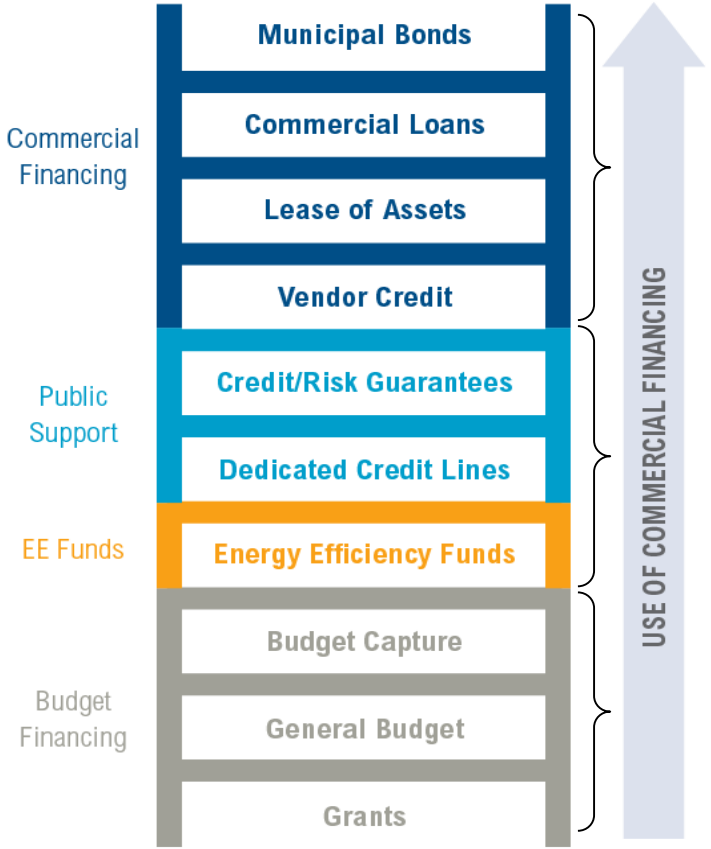
First, what are the financing challenges of municipalities?



3. Unlock financing options

See how these challenges affect ability to access other options

The Financing Ladder



- Commercial banks
- Asset lessors
- Equipment suppliers

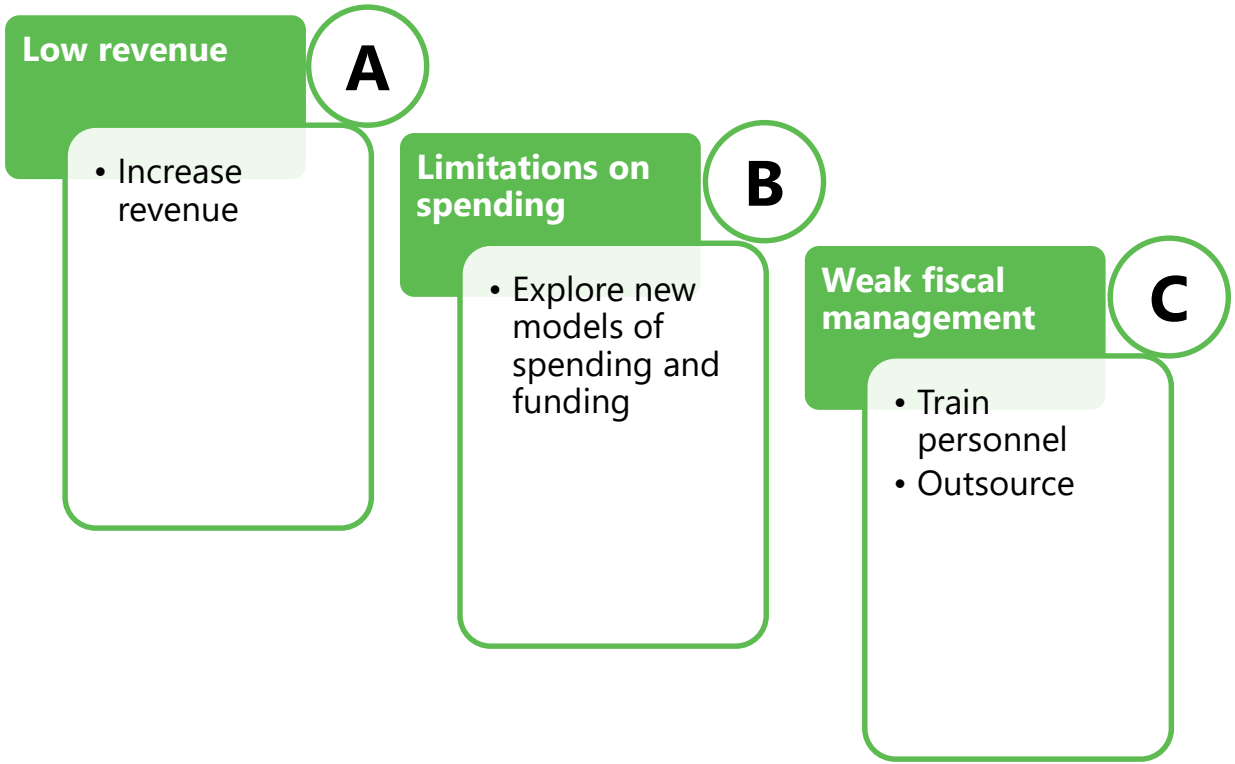
- Development Finance Institutions

- Energy efficiency funds (which can becoming revolving funds)

- Government
- External donors

Source: Adapted from ESMAP Financing Municipal Energy Efficiency Projects

3. Unlock financing options
So what can we do?



3. Unlock financing options
A. Low revenue: are things charged, are prices 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)

Source: Adapted from UN Habitat: Financing for City Leaders – Improving municipal finance to deliver better services

Spotlight:
Increasing 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

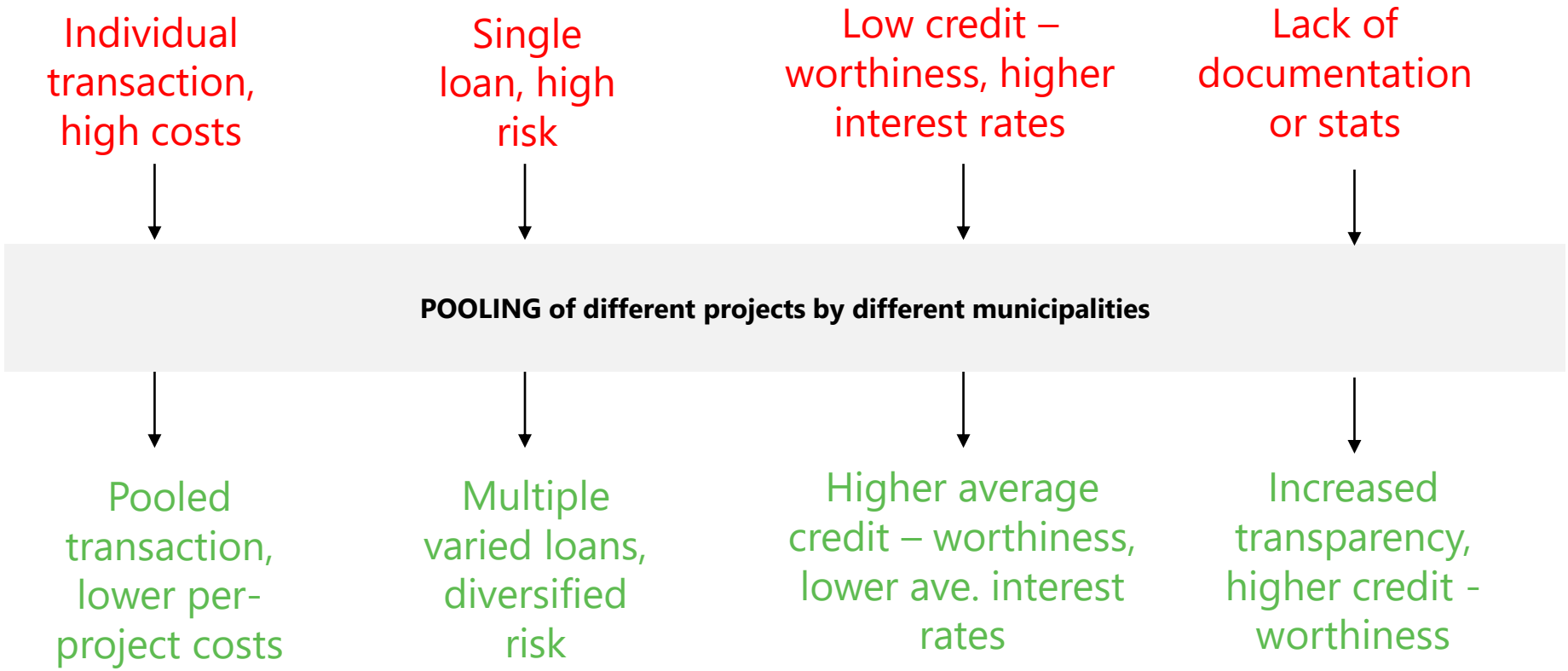
- Awarded BBB+ investment-grade credit rating by Bloomfield Investment in 2013
- Enabled the structuring of a municipal bond for the City of Dakar*

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

3. Unlock financing options

B. Limitations on spending: creative ways to fund projects by pooling small municipalities



Spotlight: Pooled Municipal Financing

MUNICIPAL FINANCE AUTHORITY OF BRITISH COLUMBIA

Established: 1970
Champion: regional municipalities of British Columbia, Canada

MFABC
Municipal Finance Authority of BC

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

*MFA's activities have expanded to include short-term investment opportunities, interim financing, and leasing

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

BHUBANESWAR STREET LIGHTING PPP PROJECT

Established: 2011 (officially launched 2012)
Champion: Bhubaneswar Municipal Corporation

CHALLENGE

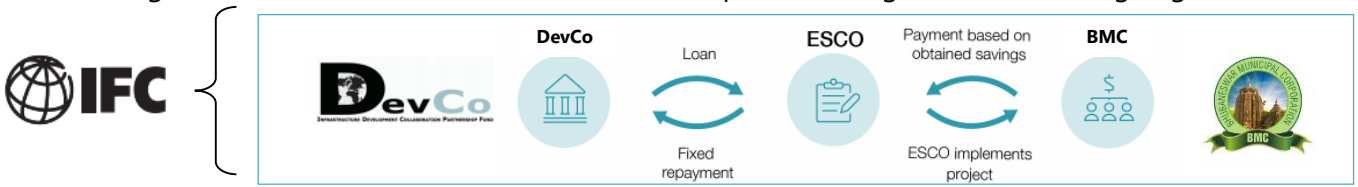
Streetlights on the city's small and residential streets were dimly lit or not lit at all in certain areas, raising continuous complaints from the public regarding their poor condition. Bhubaneswar Municipal Corporation (BMC) at the same time recognised that it did not have sufficient financial or technical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

OBJECTIVES

To upgrade and manage it's 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

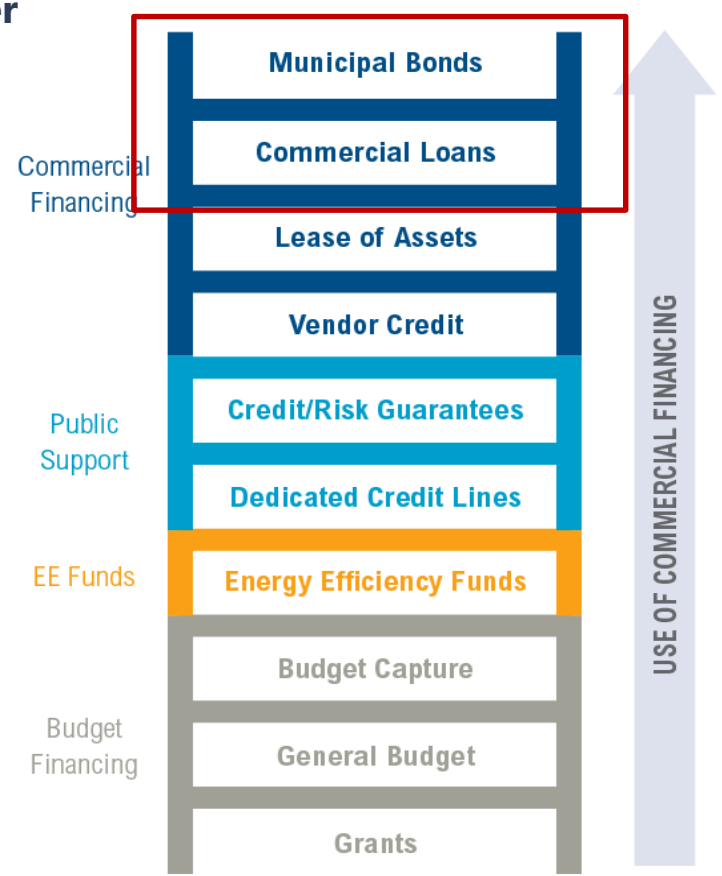
- Expected to generate **USD 100,000** in annual savings
- Mobilised **USD 4.8 million** in private sector investment
- Expected to reduce GHG emissions by approximately **10,500 tonnes** per year

Source: International Finance Corporation

3. Unlock financing options

When creditworthiness is established, bigger loans for bigger projects can be made available

The Financing Ladder



Source: Adapted from ESMAP Financing Municipal Energy Efficiency Projects

Spotlight: Municipal bonds

GREEN MUNICIPAL BONDS IN JOHANNESBURG

Established: June 2014
Champion: City of Johannesburg

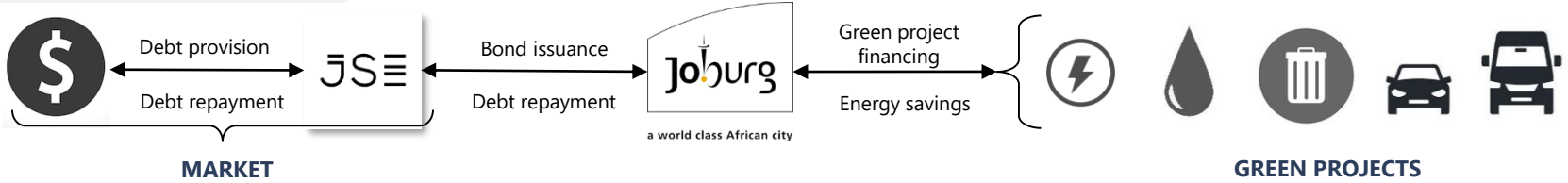
PRECONDITIONS

- 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

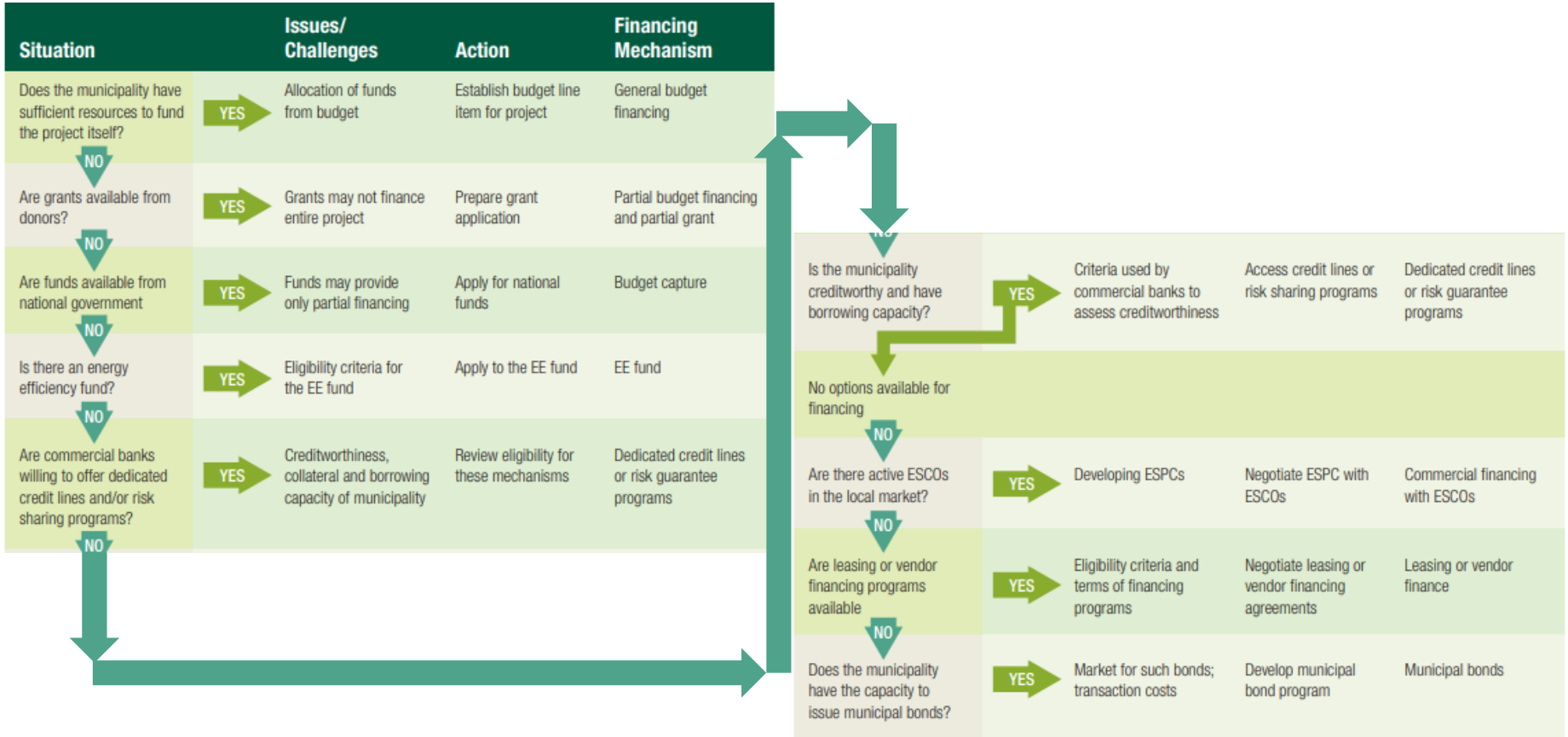
HOW DID IT WORK?



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 offers the opportunity for creditworthy cities to access large-scale, debt finance to introduce or promote energy efficient services within their cities**

3. Unlock financing options
Financing based on situation (Reference from ESMAP)



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

Better EE policymaking with Investment-grade EE policy

What is it?
Why is it important?
Why better financing matters

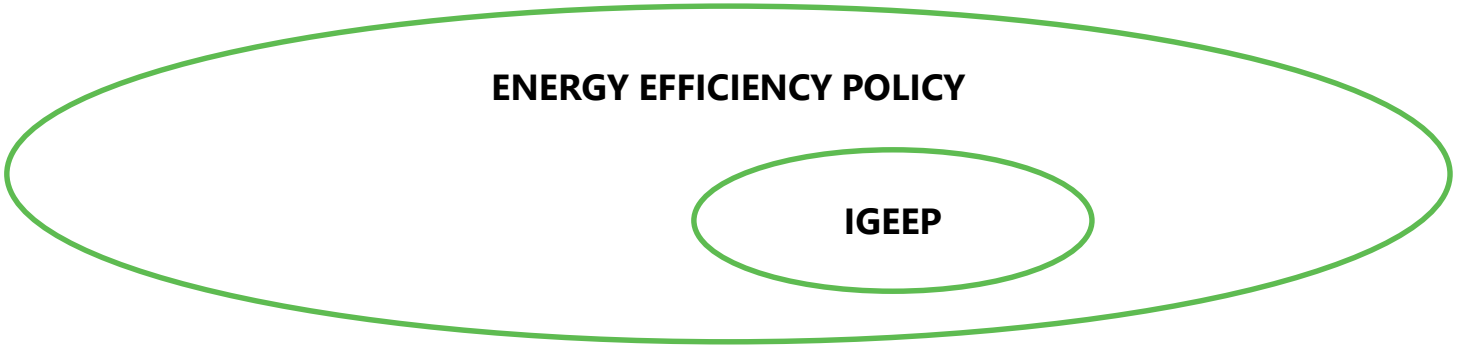
Better EE policymaking with Investment-grade EE policy

Now that we established the hurdles in financing and implementation. How can we make EE easier for municipalities?

Investment Grade EE Policy: What is it?

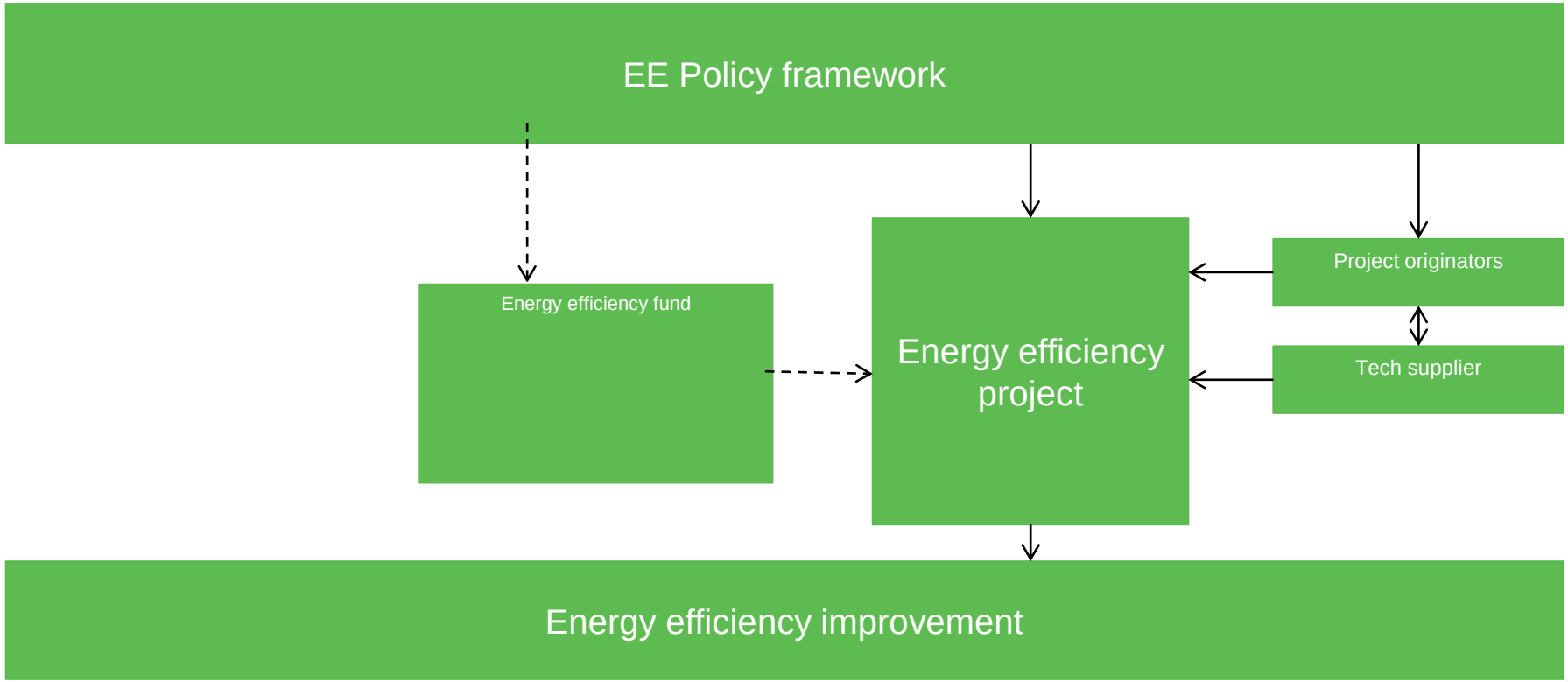
- What is **energy efficiency policy**?
  - A set of strategies, legislation, regulations, measures, programmes that together stimulate energy efficiency improvement

- 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



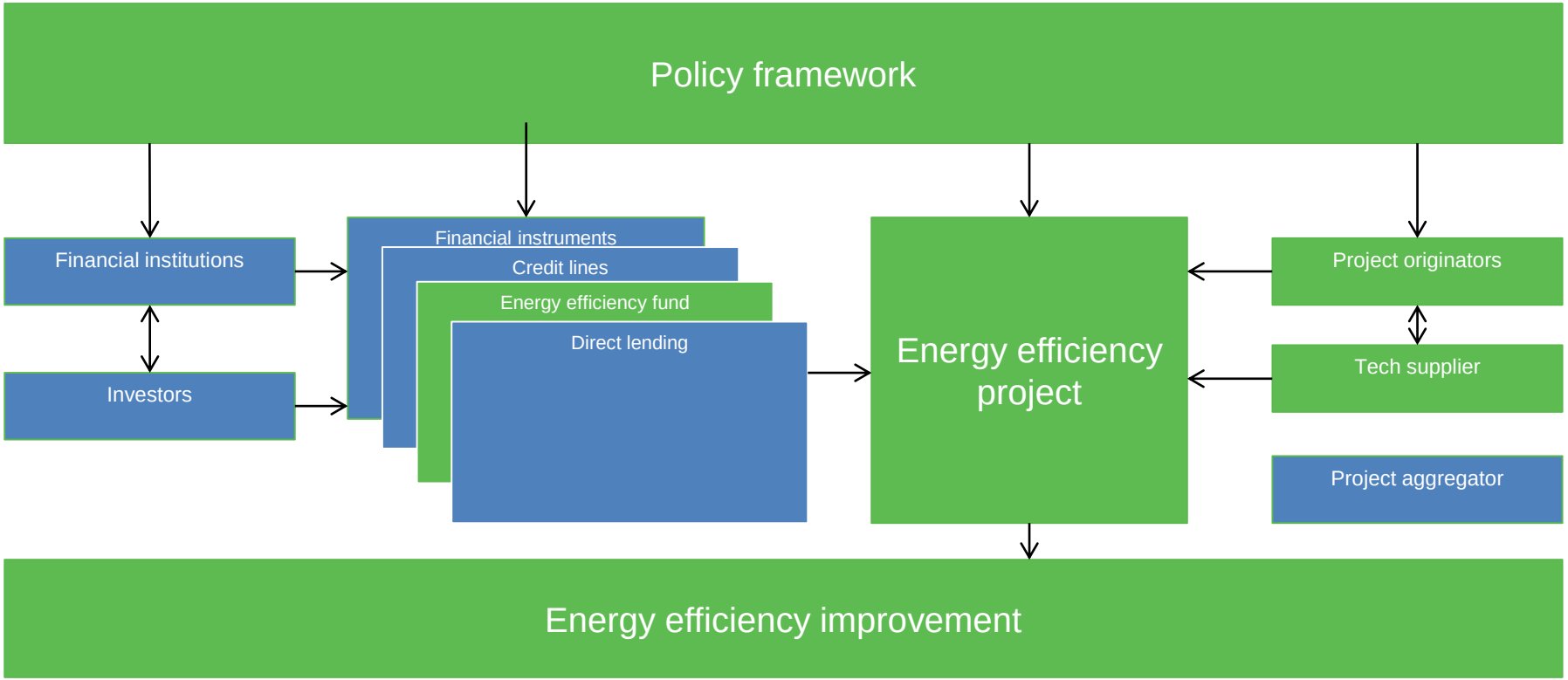
Source: EBRD

EE Policy: What it looks like



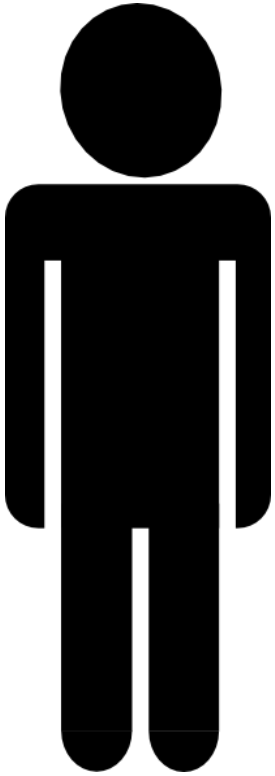
Source: EBRD

Investment-grade EE Policy: What it looks like



Source: EBRD

What problem does IGEEP tackle: policymaker vs banker



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

Source: EBRD

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

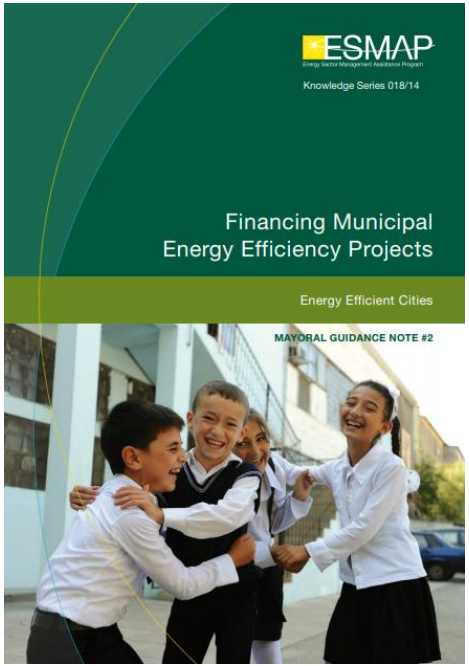
Setting **standards**

Applying market-based **incentives**

Designing tailored **financing mechanisms**

Source: EBRD

Key Resources



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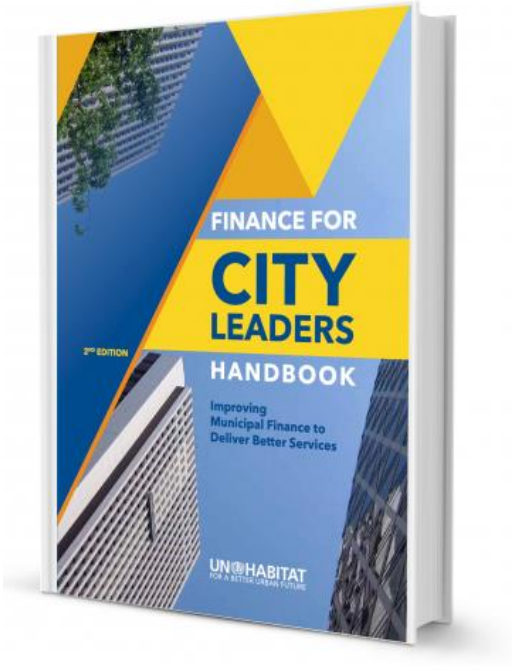


http://financeforcityleaders.unhabitat.org/

www.iea.org

IEA #energyefficientworld

Additional slides

Energy efficient and sustainable procurement

- **What?** The government purchasing efficient and sustainable products and services
- **Why?** Because governments spend more money and can influence the market for products and services
- **How?** Define minimum efficiency requirements into procurement specifications and enable purchases based on cost effectiveness and cost benefit analysis (and not first cost)
- **Result?** Efficient and sustainable product and service prices will go down, further improving the cost effectiveness of energy efficiency

Adapted from: OECD and Sustainable Procurement Platform.

Procurement: Energy Efficient Purchasing (EEP)

- Purchasing energy-using products that meet certain energy-efficient criteria

- Approaches and tools for EEPs:
  - EE Labelling
  - Technical Specification Catalogue
  - LLC, Best Value Award
  - EE Product Preference
  - Qualifying Product List

From left to right: US ENERGY STAR, EU Energy label, China EE Label, India Bureau of EE Label, Korean EE Label, Mexico Sello FIDE, Thailand EGAT EE Label, Brazil Selo Procel


TECHNICAL SPECIFICATIONS FOR ENERGY EFFICIENT TUBELIGHTS

A. Product Specification

Annexure I

Guarranteed Technical Particulars for 28W T-5 EETL with EB as a Composite Fixture

DAKSHIN HARYANA BIJLI VITRAN NIGAM LIMITED

SPECIFICATION NO. S-130/DD-177 (Version-II)

TECHNICAL SPECIFICATION FOR ENERGY EFFICIENT TUBELIGHTS

Issue Month : June, 2007

Source: ESMAP Driving Energy Efficiency Markets through Municipal Procurement

How Energy Efficient Purchasing addresses barriers

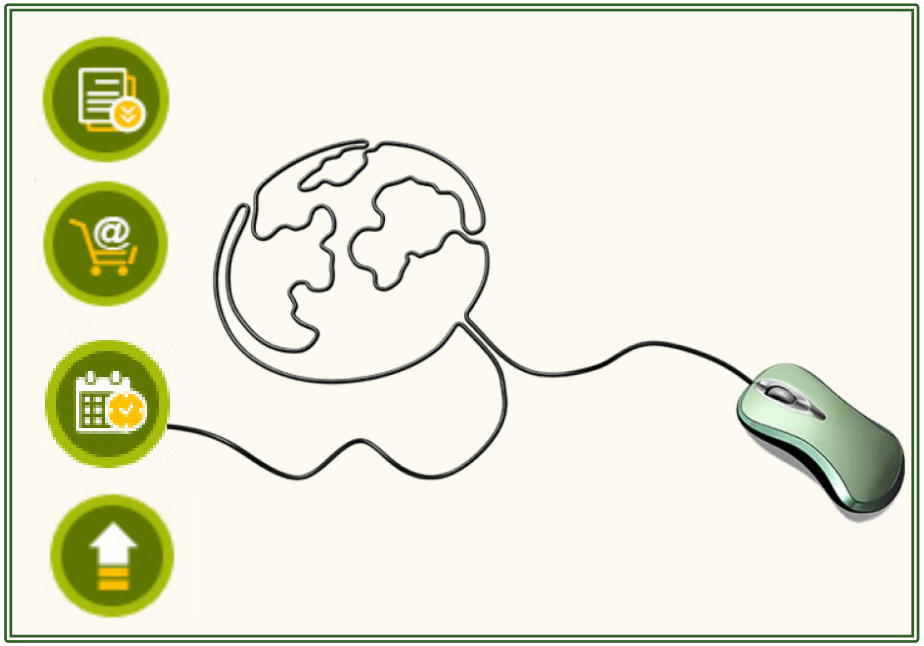
Enact EE procurement policies/programs…	To overcome restrictive policies and procedures
Create tools that can facilitate EEP efforts; provide training and dissemination plans…	To overcome poor or no access to information about EE opportunities
Develop incentives strategies	To counteract behavioural inertia
Ensure robustness of certification process through independent inspections; monitor compliance	To enable successful realisation of energy efficiency post-implementation

Source: ESMAP Driving Energy Efficiency Markets through Municipal Procurement

Source: IEA Energy Service Companies and Financing Presentation

Trends in Public Procurement

Harmonisation of public procurement policies

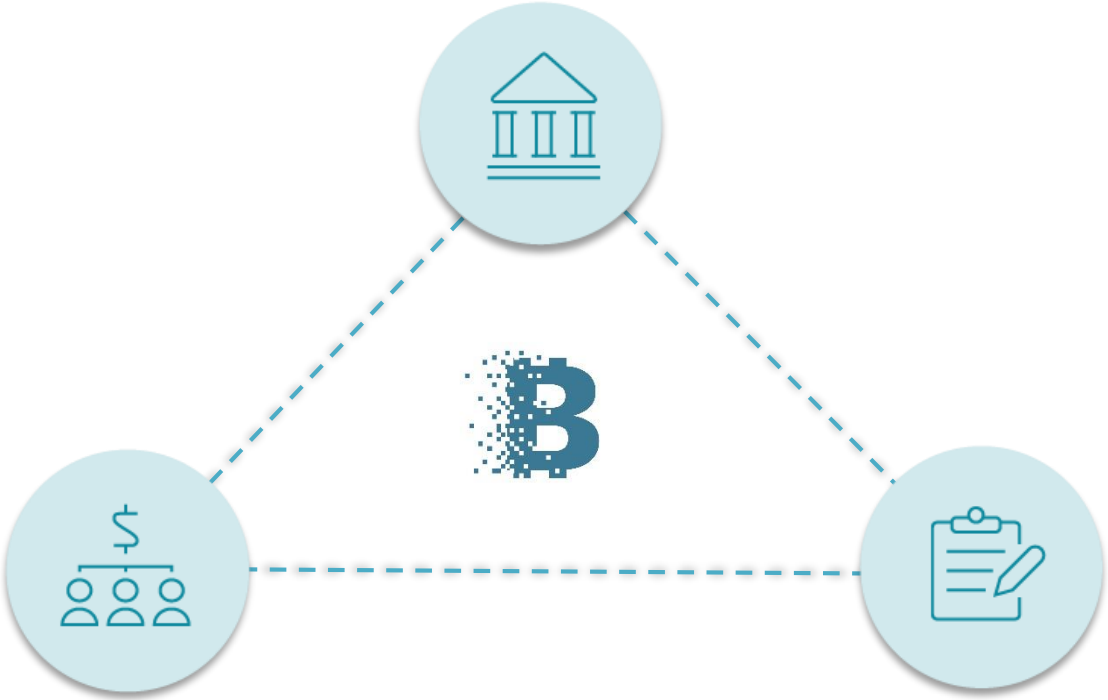


E-procurement

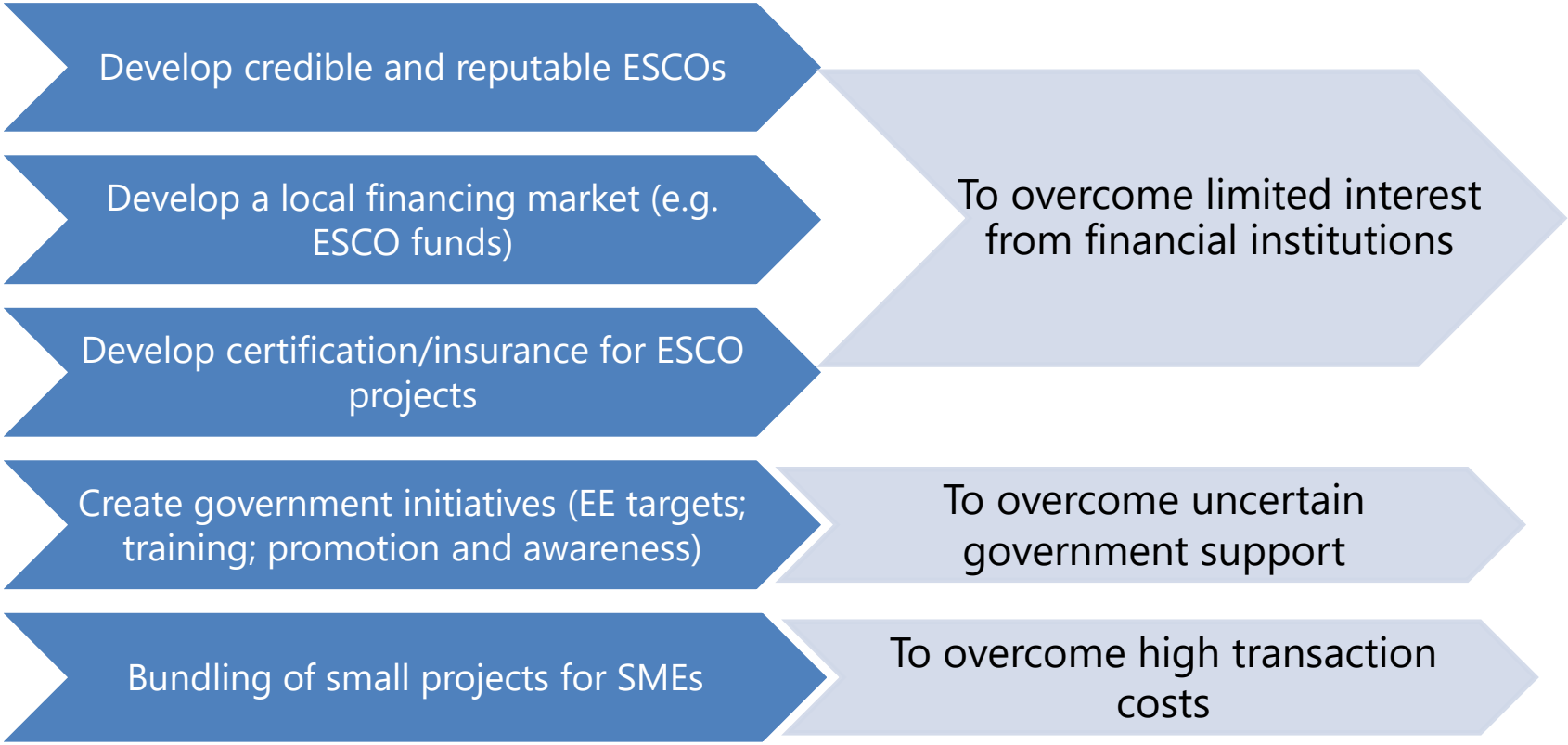
Adapted from: OECD and Sustainable Procurement Platform.

Digitalisation for Energy Efficiency Financing

- Blockchain and smart contracts for ESPCs
  - Automating transactions and repayments



Building ESCO capacity

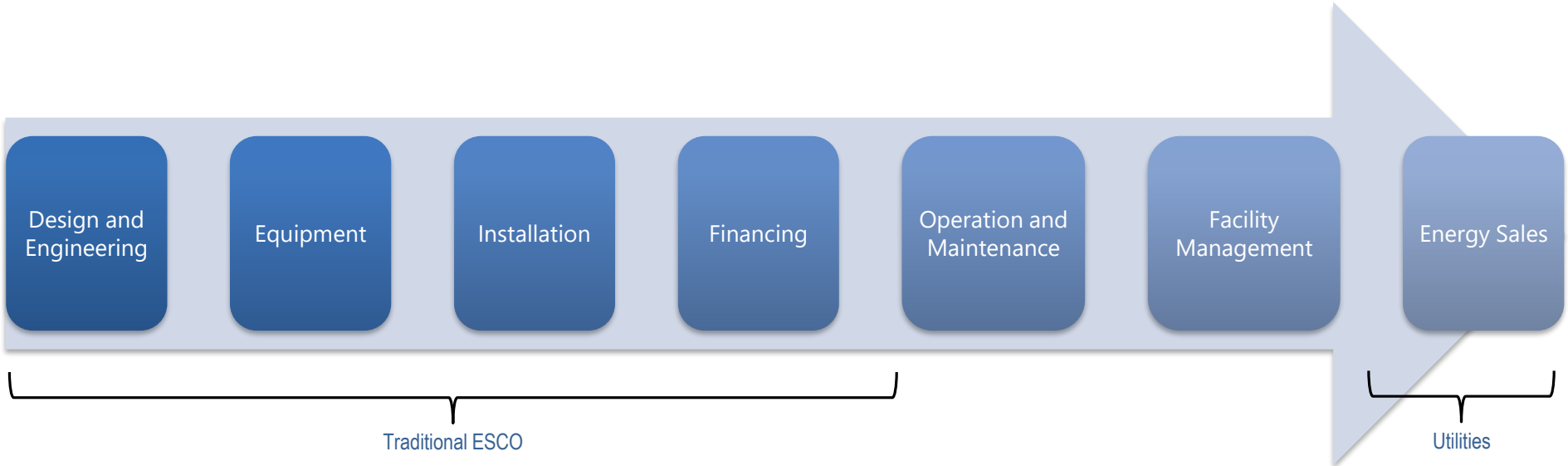


Source: ESMAP Driving Energy Efficiency Markets through Municipal Procurement

Source: IEA Energy Service Companies and Financing Presentation

ESCOs and Energy Service Providers

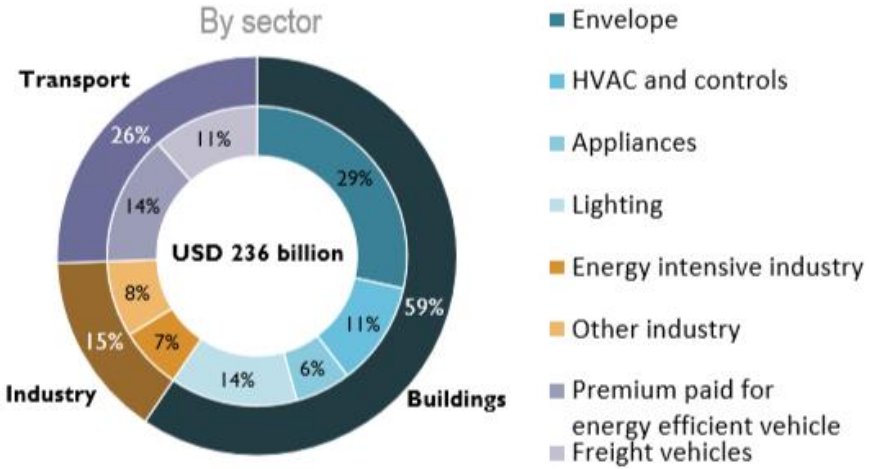
- Energy service companies (ESCOs) often deliver on ESPCs:
  - Can **provide services** for energy efficiency
  - Can **provide financing** for energy efficiency
  - Typically tasked with **delivering/guaranteeing energy savings**



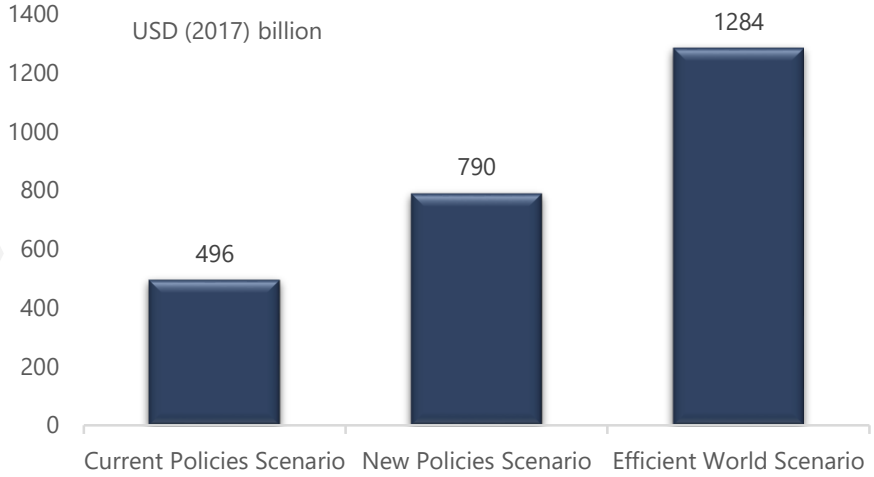
Source: www.iea.org/media/training/presentations/latinamerica2014/8A_Energy_Service_Companies_and_Financing.pdf

Investment-grade policy: why financing matters

Energy efficiency investment in 2017



Projected investment needed in 2040



Annual energy efficiency investment is expected to more than quadruple by 2040.
Policy will need to facilitate finance and business model innovation to stimulate this investment.

Source: IEA Energy Efficiency Market Report 2018