

# Business Models and Capacity Development for Energy Efficient Cities in India



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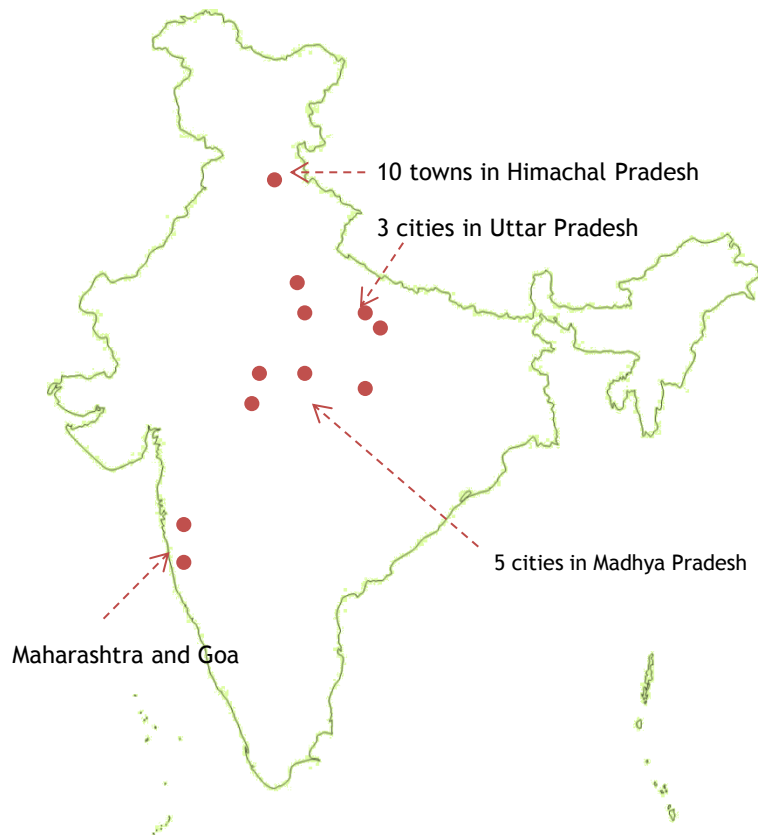


# Aligning of All Stakeholders/Departments for Concerted Planning and Design of EE Cities

Ministry of Urban Development	Smart cities mission	\$155 million
	Atal Mission for Rejuvenation and Urban Transport (AMRUT) over 5 years	\$7.5 billion
	Heritage City Development and Augmentation Yojana (HRIDAY) for development of 12 heritage cities over 2.5 years	\$75 million
Ministry of Power	National Smart Grid Mission - Development of Smart Grid in Smart Cities over 5 years	\$133.4 million
	National Smart Grid Mission - Establishing Smart Grid Knowledge Centres	\$1.2 million
	State Energy Conservation Fund - Matching contributions from BEE and States for energy efficiency project funding over 5 years	\$12.30 million
	Ujwal DISCOM Assurance Yojana (UDAY)	States will take over 75% of the DISCOM debt for 2 years
Ministry of New and Renewable Energy	<b>Solar Cities - MNRE Solar city Master plan - Prepared for 19 states and 36 cities. EE potential 33% over 5 years</b>	<b>\$3350 million</b>
	Solar Rooftop Grid Connected schemes	Central Financial Assistance of 15% of project cost



# Our Energy Efficiency Work in India in Urban Sector - Cities are at Different Stages of Development



DfID Madhya Pradesh Urban Infrastructure Investment Project (MPUIIP) in Bhopal, Indore, Jabalpur, Gwalior & Ujjain

Design and Implementation of Energy Efficiency Projects

UN Habitat & ICLEI South Asia

Urban low emission development strategies in emerging economies

Smart Cities Mission

Advisory for planning - Indore

Shakti Sustainable Energy Foundation

Advisory support to Uttar Pradesh New & Renewable Energy Development Agency

PE Global Pvt Ltd and DfID

Sustainable Hill Town Development through PPPs in 10 towns in Himachal Pradesh

This experience has helped us create a business case to work further on:

- Capacity building and institutional development
- Attracting investment for municipal energy efficiency

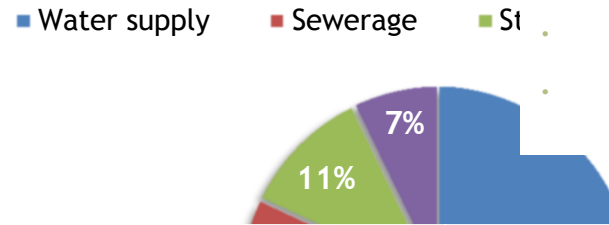


# Energy savings of 162 MW and Investment potential of \$180 millions in 20 large cities

Municipal Services contributes to 2-5% of GHG emission of city. Target initiatives include -

- Water Supply - Energy Efficiency
- Street lighting - Energy Efficiency
- Energy Efficient Municipal Buildings
- Energy Efficient & CFC free air conditioning
- Waste to Energy
- Renewable Energy

Emmissions from Mun



Our experience of implementation	Raw water pumping and clean water distribution	Sewage water pumping	Street lights	Municipal Buildings	Total
Baseline energy Consumption	553 MU	332 MU	118 MU	77 MU	4037 MU's (790 MW)
Energy Savings	48 MU (12 % p.a.)	45 MU (12% p.a.)	55 MU (40-50% p.a.)	31 MU (40% p.a.)	579 MU's (162 MW)
Monetary savings	\$6.2 million	\$4 million	\$5 million	\$2.6 million	\$63.3 million
Investment Potential	\$13 million	\$8 million	\$18.5 million	\$13 million	\$179 million
Simple payback	2 years	2 years	3.6 years	4.5 years	-



# Challenges in Realization of Energy Efficiency Potential

## Strategic myopia

- Growth and development of new infrastructure is given priority
- Existing infrastructure O&M is neglected

## Way forward

- Reduction in waste of energy and stopping revenue leakage should be made the first priority

### Limited Municipal Corporation Funds

- Expenditure exceeds income
- Insufficient fiscal flexibility

### Existing infrastructure neglected

- New development attracts more investment
- No focus on reducing wastages, establishing benchmarks
- Abysmal operation and maintenance efficiency

### Delay in approval and cost overruns

- Intangible costs are not factored into project design
- Project not bankable, commercially sustainable

### Lack of institutional framework

- Insufficient skilled manpower
- Recruitment, training, and capacity building
- Salary, bonus, and promotions linked to performance

### Weak project governance

- Political agenda precedes planning
- Weak legal framework for contract enforcement
- Unrealistic EE targets or obligations
- Risk perceptions and low trust



# Approach Towards Implementation

3

Structure PPP models for implementation

2

Design

## Preparation of inventory

- To ascertain the total connected load and tentative energy consumption expected
- To ascertain and compare the O&M costs
- To maintain proper history sheet

## Metering

- Establishing actual energy consumption
- Rationalization of electricity bills
- Ascertain the theft and loses in system

Technological interventions and preparation of Detail project reports

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Stakeholder Consultation - inputs from engineers/citizens and their representatives, media, research institutes etc.

*Things which cannot be measured cannot be monitored!*



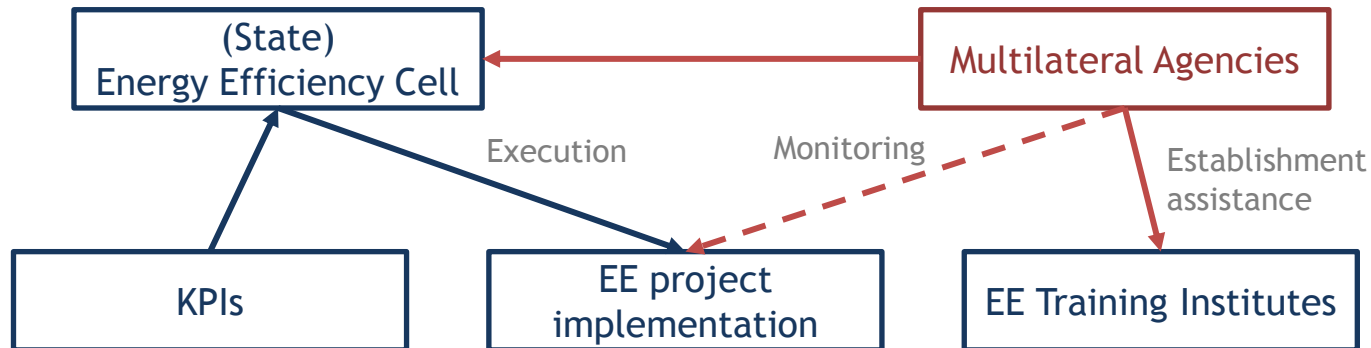
# Proposed Strategy for Capacity Building

## Capacity building

- Training institutes for Energy Efficiency project implementation
- Dedicated resources under an Energy Efficiency cell - recruit skilled personnel, provide access to technology and funds
- Linking salaries and incentives of the staff to Key Performance Indicators

## Role of Multilateral Agencies

- Assist in setting up training institutes - financial and technical support
- Bring in experts from different countries to share knowledge
- Monitor Energy Efficiency project implementation and guide progress



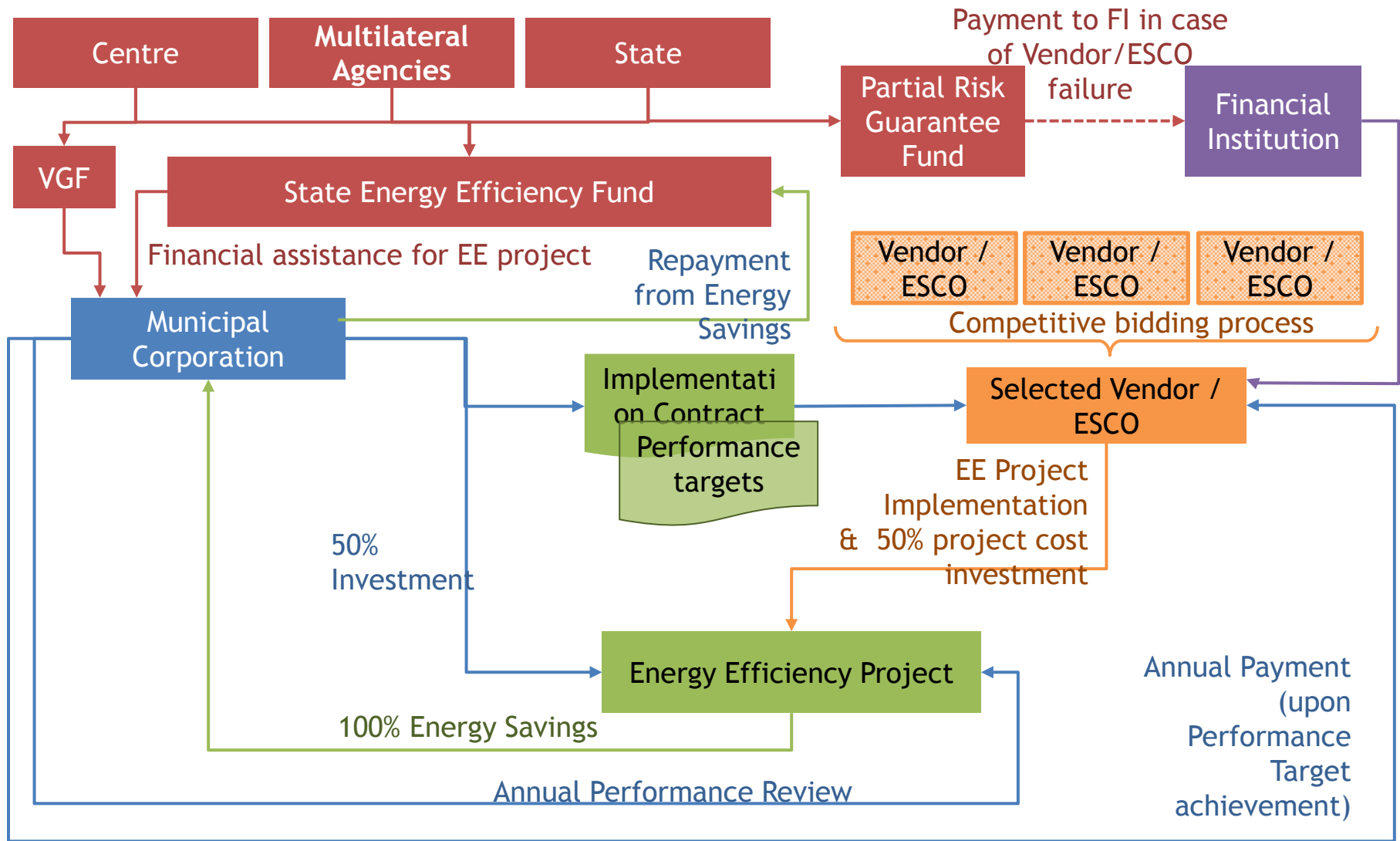


# Implementation Structures

Particulars	Shared Savings	Guaranteed Savings	Deemed Savings
<b>Financing</b>	Vendor/ESCO	Customer	Vendor/ESCO
<b>Operation and Maintenance</b>	Vendor/ESCO	Vendor/ESCO	Vendor/ESCO
<b>Ownership</b>	Vendor/ESCO	Customer	Vendor/ESCO
<b>Baseline Energy Consumption</b>	Required	Required	Not required
<b>Payment to Vendor/ESCO linked to</b>	Equivalent to the value of a portion of energy savings achieved	Pre-determined fee for achieving guaranteed energy savings (with incentives for achieving more energy savings)	Pre-determined based on estimated quantum of energy savings
<b>Guarantee for Energy Savings from Vendor/ESCO</b>	Typically No. (some variants of this model may include a min. guaranteed level of energy savings)	Energy savings are guaranteed by Vendor/ ESCO. Penalty to be paid by Vendor/ESCO for shortfall in energy savings.	No
<b>Requirement for M&amp;V</b>	Required	Required	Not required
<b>Payment type</b>	Spread over project duration and is funded from saving from energy expenditure		Spread over project duration and is not dependent on actual energy savings achieved



# Proposed Business Model for Upscaling



# Conclusion

- Role of multilaterals - Development of conducive Policy, regulatory and institutional mechanisms, guidelines for project structuring, setting EE targets/obligation, training and capacity building
- Central Government to nominate a single ministry to aggregate all schemes and provide single window national level incentive disbursement mechanisms
- ESCO rating should carry more weightage for past experience and performance delivered by the ESCO projects
- Establish energy conservation funds at state level to assist financing of ESCO projects
- Build awareness on the PRGF, Venture Capital finance and viability gap funding
- Vendor development - competition and creating viable market
- State must involve financial institutions for Low interest financing for PPP/ESCO projects and energy efficiency sector



**Be the Change you want to  
see in the world.**

**Energy is Life.**

Conserve it for Benefit of Self, Nation and Environment.

**THANK YOU!**

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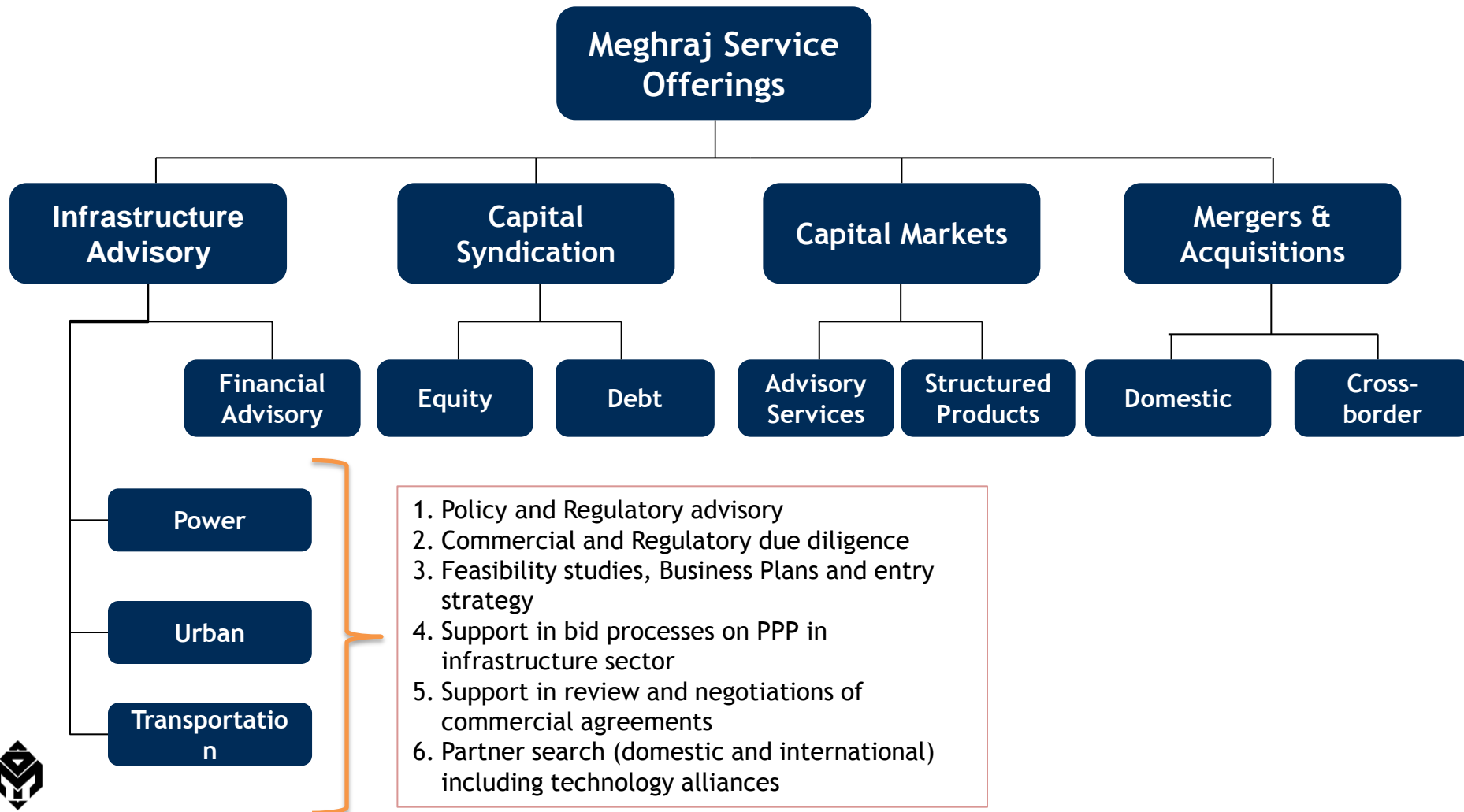


# *Back-up Slides*



# Meghraj Group and Service Offerings

- Meghraj Group established in the year 1919 and specialize in international financial services, infrastructure consulting, fiduciary services and real estate business.

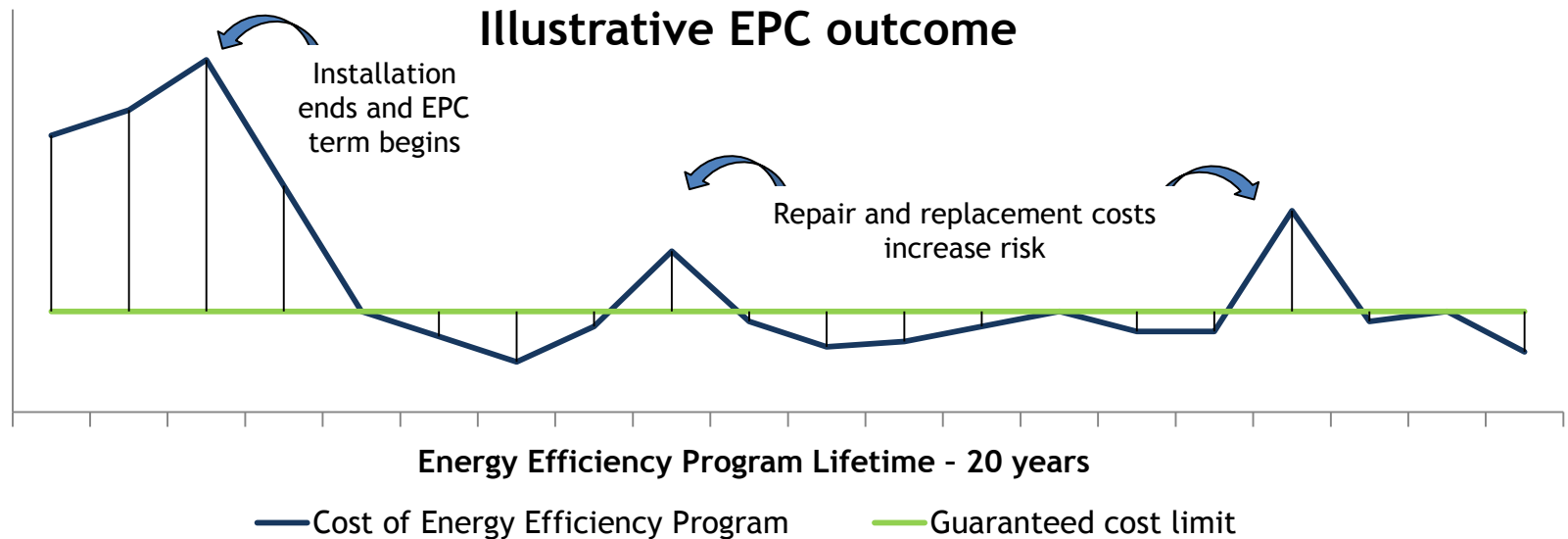


# Our Presence



# Energy Performance Contracts

- An alternative to paying Contractors for installation and maintenance of energy efficient technology - energy savings guarantee given by the Energy Services Company (ESCO)
- High risk of not recouping installation and retrofitting costs. Financial savings from energy efficiency are shared between Municipal Corporation and Vendor/ESCO.



- Vendor/ESCO absorbs the cost if guaranteed savings are not created. Municipal Corporation pays Vendor/ESCO a share of the benefits if costs are below the guaranteed level.





# Implementation Risks & Benefits



## Risks

Expected energy savings may not be realised

Cost of finance higher than self-finance

Loss of control over physical asset; stringent monitoring mechanism required to maintain standards of service

## Benefits

Flexibility in technology selection and upgradation schedule

Lower initial capital requirement

Technical and performance risk transferred to Lessor through operating lease

Spreads financial risk over lease period (10+ years)

