

THE CLIMATE GROUP WORKSHOP

WORLD BANK GROUP

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Modernization of Street Lighting Systems

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Presentation Outline

I. Background

II. Implementation models and financing sources



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BACKGROUND



Background

- Why is World Bank Group (IBRD, IFC, MIGA, IDA) interested?
 - Nice convergence between our Climate and Cities agenda
 - We believe that there are significant efficiency gains (O&M and energy savings) for municipalities
 - Despite being technology agnostic, we believe in the potential of LEDs
- Examples of our engagement in sector
 - Developed PPPs, which have pioneered the effort
 - In the last 12-18 months, enhanced our understanding of technologies, economics, business models, financing, risk allocation
 - Identified the potential of EE savings in 20+ cities (TRACE tool)
 - Carried out a pre-feasibility study for Rio and BH for street lighting
 - Signed MOU with EESL in India – potentially a JV
 - ILEF – LED dedicated lending facility to munis (in preparation)
 - Exploring investments in multiple countries (Colombia, Russia, Vietnam, India, South Africa, etc.)

Background – in the case of Brazil

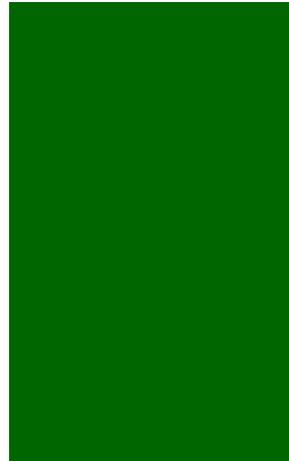
- **Phase I: Pre-feasibility studies for Rio and BH (completed)**
 - Summarized our best knowledge to date in those reports
 - Discussed the business models and financing sources with multiple stakeholders
 - Explored to what extent the knowledge acquired for those two cities may be applicable to other cities in Brazil, particularly in light of the ongoing institutional transformation
 - Presented the products that the WBG can offer:
 - Lending
 - Equity
 - Guarantees
 - Structuring PPPs
 - Technical Assistance
 - Other financial instruments

Background – in the case of Brazil

- **Phase II: Expand the dialogue with other cities (ongoing)**
 - Identify other business models that can be applicable to other, smaller cities (steep ABC curve – 90% < 50,000 inhabitants)
 - Provide technical support to the development of the street lighting sector as a whole (technical, institutional, regulatory)
 - Identify potential partners with whom to join forces
 - Host national level workshop for public and private stakeholders to build capacity and exchange best practices (early 2015)
 - Offer our menu of potential products & services



IMPLEMENTATION MODELS AND SOURCES OF FINANCING



Business Models – from public to private – and everything in between

Different Business Models for the Provision of Street Lighting	Who Owns Assets	Who Pays the Electricity Bill	Who is Responsible for O&M
Services with Muni, partly outsourced or not	Muni	Muni	Mostly Muni
Services with Muni, mostly outstourced	Muni	Muni	Mostly Outsourced
Separate SOE (SPV) in charge of SL (Rioluz, RosAvtorDor)	SOE	Muni (s) or SOE	SOE
Services provided by Distribution Utility, not owning the assets	Muni	Muni	Disco
Services provided by Distribution Utility, owning the assets, but muni paying the bill	Disco	Muni	Disco
PPP with private sector via SPV, but muni holds > 50%	SPV	Muni	SPV
ESCO investing in modernization (e.g. leasing), but Muni doing O&M	Muni old ones, SPV new ones	Muni	Muni
PPP with private sector (via SPV and concession), muni holds < 50% or nothing at all	Concessionaire	Concessionaire	Concessionaire

Business options explored in the Rio study:

I - Direct Contracting of LED equipment only

Description	Pros	Cons
<p>Procurement of LED equipment only under Law 8.666/93.</p> <p><i>Installation, maintenance and smart system integration remain cities' responsibility.</i></p>	<ol style="list-style-type: none">1. Routine process of competitively tendering the LED project under law 8,666.2. City could tender without need to involve other governmental entities.3. Existing business model may not be affected.	<ol style="list-style-type: none">1. Upfront municipal funding needed to cover the investment. Budget transfers or municipal debt needed - reduces fiscal space in city budget.2. LED supplier likely not be willing to provide lifetime warranty if they are not responsible for installation, maintenance and smart system integration.3. Public sector bears most of responsibility for project performance.4. Need to train city staff for new technology.5. Tender needs to be reissued any time LED expansion or replacement is required.

- **Key messages:**

- *Potential* for quickest implementation (few months)
- City must have technical and operational capacity to roll out program
- Requires additional upfront financing from municipality
- Performance warranty likely to be inferior to other options

II - Direct Contracting of LED equipment & services

Description

Procurement of LED equipment and services under Law 8.666/93.

*Direct Contracting of LEDs + installation & maintenance.
Tender would be for "Efficient Energy Services"*

Pros

1. **Transfers some commercial, operational, technical risk to private sector.**
2. **Manufacturer warranty likely to be stronger** than with procurement of LED equipment only.
3. **Routine process** under law 8,666/93.
4. **Improve efficiency** of smart system integration.

Cons

1. **Upfront municipal funding needed** to cover the investment. Budget transfers or municipal debt needed - **reduces fiscal space in city budget.**
2. **LED performance guarantee likely limited to 5 years**, as Law 8,666/93 does not allow contracting term beyond 5 years (half the economic life of LED asset).
3. Limited contractual incentives available to maximize efficiency.

- **Key messages:**

- Brings economies of scope by bundling provision of equipment and services.
- Performance warranty stronger than if only LED equipment is procured, but still likely to be limited to 5 years (limitation of Law 8,666/93).
- Requires additional upfront financing from municipality

III - Public Private Partnership (PPP)

Description

PPP model

Establishment of SPE, which will undertake procurement, installation, maintenance, and smart system integration.

Pros

1. **Transfer significant amount of technical, commercial, operational and investment risk to the private sector.**
2. **LED performance guarantee should extend to 10 years**, since installation, maintenance and smart system are jointly managed over LED lifetime.
3. **City can retain an important role:** strategic priorities, technical standards, contract administration, revenue regulation, possibly some installation services.
4. **Upfront costs financed by private sector** via SPE. COSIP/CIP used to repay SPE over time.
5. **Maximize incentives for project performance** when all parties to consortium **invest** in SPE.

Cons

1. **Project preparation cost is higher** and requires hiring of external consultants – **may take time** depending on challenges to bidding process.
2. **Requires more coordination** among various stakeholders and governmental agencies.
3. **City may need to adjust its business model** – more focus on administration and strategy than on operational aspects of public street lighting.

- **Key messages:**

- Minimizes risk to the public sector.
- Maximizes performance warranty– city should be able to receive warranty for fully life cycle of the technology (10 years).
- Potential to maximize project efficiency – financial incentives for consortium.
- Time to prepare a PPP substantially longer than other two options.

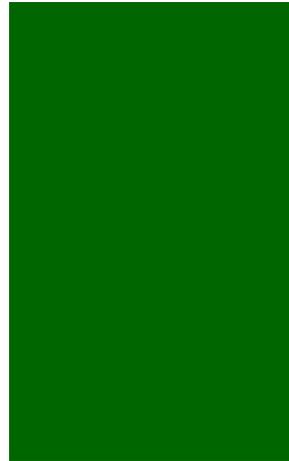
Potential financial instruments

Financing Instrument	Description	PROS	CONS
Municipal sources of funding			
MUNICIPAL BUDGET (COSIP)	Using COSIP surpluses over time to invest in LEDs	Earmarked funds that can only be used for investments in public lighting. Simpler financial execution. Potential to set pace of investment according to expected decline in unit cost of LED prices.	Time to implement project extended. Every year project is delayed, city incurring additional electricity expenditures (opportunity cost of waiting).
MUNICIPAL BORROWING	Debt from national or international development and/or commercial banks.	Commonly used tool to finance infrastructure projects. Could potentially access some concessional financing for energy efficiency.	Debt will be on municipalities balance sheet, taking up fiscal space. City may face limits under Fiscal Responsibility Law. Potential delays in loan approval. Sovereign guarantees often needed.
MUNICIPAL DEBENTURES (BONDS)	A municipal bond is issued by the City of Rio de Janeiro to finance EE Projects	Cost of capital may be attractive given strong credit rating of city of Rio de Janeiro (BBB). Opportunity to innovate in municipal bond market.	Debt will be on municipalities balance sheet, taking up fiscal space. City may face limits under Fiscal Responsibility Law. Little historic experience of municipalities issuing debentures.
Private sources of funding			
PPP structure: DEBENTURES (BONDS) issued by SPE or loans	Debt issued by the project SPE primarily owned by private sector. Debt repaid with COSIP surplus over time.	Potentially can be treated as off-balance sheet for the municipality. May attract a larger pool of investors compared to municipal debenture issuance.	More complicated financial structuring. Larger number of intermediaries may lead to higher transaction costs.
PPP structure: PRIVATE EQUITY invested in SPE	Private sector investors place equity directly into the project SPE	Private sector takes risk of successful implementation of project. Increases potential leverage of project.	Typically a more expensive source of funding.



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Potentially interesting models in LAC

	Who owns and operates the assets?	Concessions to Private Sector?	Who regulates the sector?	Charged via Electricity Bill?	Any Energy Efficiency Programs?
BRAZIL 17,000,000 lamps	The Municipality in 19 States, utilities in 8 States	Allowed by Legislation, but so far no concessions granted Large cities (e.g. Sao Paulo) are considering Concessions via PPPs	ANEEL regulates utility assets and prucent costs passed through tariffs Municipalities in charge of economic and technical regulations - economic regulation	Yes, utililty charges a service fee and transfers COSIP proceeds to municipality	RE-LUZ from Procel/Eletrabras. Currently, a large percentage (70%-80%) is HPS. LEDs not yet certified
	As of Dec 31, 2014 only Municipalities to be in charge		Municipalites not yet prepared do regulate PPPs or private concessions		
MEXICO 7,000,000 lamps	Municipalities		Municipality, subject to Federal Norms	Yes, "Derecho a Alumbrado Publico", charged by most municipalities	SENER and CONHEE launched a national EE program in 2011
	Some concessions being granted (Puerto Vallarta, Acapulco); in other cases, ESCO models have been introduced (e.g. Optima)	Yes	Regulation by Contract		Concessions have specified efficient lighting (e.g. 30% in Puerto Vallarta)
COLOMBIA 1,400,000 lamps	Municipalities (1021)		Power Sector Regulator	Yes, if Concessionaire agrees to set tariffs on a cost plus basis	Program launched 15 year ago to replace mercury lamps, but not fully implemented due to lack of funding
	Concessions (119, or 47% of total lamps) and 23 Concessionaires	Yes			Modernization happening under Concessions regime
PERU 1,200,000 lamps	Utility company (before service was provided by Municipalities)	Under the General Law of Concesiones, utilities are responsible for provision of public lighting. This is a requirement both for private utilities (working in the Lima region) and public utililties (working in the rest of the country).	OSINERGMIN, Power sector regulator sets prices and quality standards.	Yes. Municipalities pay bills for "Alumbrado Publico Complementario" for public lighting of recreational areas (parks, stadiums). These facilities are metered and are under a special tariff.	In Lima, 87% of lamps are HPS