

Public Procurement of Energy Efficiency Services

Jas Singh, Senior Energy Specialist, ESMAP – Project TTL Dilip Limaye, Senior EE Consultant Brian Henderson, Senior EE Procurement Consultant Xiaoyu Shi, Operations Analyst, ESMAP

Why EE in the public sector?

- Public sector energy use est. ~2-5% of total primary energy use in many countries (more in countries with DH)
- Represents a large, homogenous, common-owner market
- Public sector can "lead by example" and influence markets
 - Public sector typically represents 10-20% of GDP
 - Public procurement alone in EU is €200B or 3% of GDP
 - U.S. federal sales (2-3%) helped achieve high penetration rates for ENERGY STAR equipment (many at 90% or more)
- Energy is major public sector expense; reducing energy costs creates fiscal space for other socioeconomic priorities
- Natural comparative advantage for WB we can guide procurement process, bundle and finance
- Suitable target for fiscal stimulus and "greening" infrastructure efforts



Why have results been so low?

Policy / Regulatory

- Low energy pricing and collections
- Rigid procurement and budgeting policies
- Limitations on public financing
- Ad hoc planning
- Limited and poor data

Public End Users

- Limited incentives to save energy/try new approaches
- No discretionary budgets for special projects/upgrades
- Unclear ownership of cost/energy savings
- Limited availability of financing
- Lack of awareness and technical expertise
- Behavioral biases

Equipment/ Service Providers

- Higher transaction costs for public sector projects
- Perceived risk of late/non-payment of public sector
- High project development costs
- Limited technical, business and risk management skills
- Limited access to equity and financing

Financiers

- High perceived public credit risks
- New technologies and contractual mechanisms
- Small sizes/high transaction costs
- Behavioral biases



What have other countries done?

Policy measures

- Energy pricing (TOU, feed-in tariffs, demand charges)
- EE product procurement (public sector MEPS/labeling, life-cycle costing, bulk purchase)
- Setting and monitoring of EE targets in public facilities
- Allowance for use of energy savings performance contracts (ESPCs)
- Building codes and certification

Procedural changes

- Changes in budgeting to allow retention of energy savings
- Designation of energy managers, periodic energy audits to identify EE measures
- O&M changes, such as automatic shut-off during evening/weekend hours

Informational programs

- Standard bidding documents and templates, analytical tools
- Establishment of benchmarks, guidelines and good practices for buildings/systems
- Public sector EE case studies and newsletters
- Training of public sector staff, facility managers, procurement officers

Incentive mechanisms

- Funding for energy audits
- Public financing for EE retrofits/upgrades
- Awards for high performing public facility managers, agencies, cities
- Publishing agency performance, ranking and rating of agencies



World Bank Public EE Portfolio

- From FY00-FY09, the WB has supported 22 projects with explicit public EE components, excluding supply-side (power, DH) investments
- 17 of these (77%) have been in the ECA Region
- 8 included focus on public (office) buildings, 5 on municipal water supply, 7 on schools/hospitals, 3 on housing and 2 on street lighting
- Only 2 projects had ESCOs mentioned as an instrument for project identification, packing and implementation
- 3 CF projects under advanced preparation (all in India, 2 municipal water supply, 1 street lighting)



Non-WB Public EE Portfolio

- Over same period, 27 other donor projects and programs identified involving public EE (including IFC)
- 18 of these (67%) have been in the ECA Region
- 10 of them (37%) involved the creation of a fund or financing facility
- EBRD, USAID and UNDP have been more active than others in this area, although GTZ, REEEP and Clinton Foundation have entered the sector
- 14 included focus on general public facilities, 7 on public (office) buildings, 4 on municipal water supply, 6 on schools/hospitals, 4 on housing and 5 on street lighting
- 15 of them (56%) had ESCOs mentioned as an instrument for project identification, packing and implementation



The Report

 Objective. Summarize international experiences in using EE performance contracting in the public sector

Approach:

- Commissioned case studies from 5 developed countries Canada,
 France, Germany, Japan, U.S. and 2 states (New York, Quebec)
- Commissioned 5 country case studies from developing countries –
 Brazil, China, the Czech Republic, India, Poland
- Collected several other developing country project examples from Bulgaria, the Philippines, Egypt, Hungary, South Africa
- Review of international literature, collected and reviewed 10-15 RFPs, interviewed about 60 experts/practitioners



Definitions

- Public Sector refers to publicly-owned institutions subject to public procurement rules and regulations, including federal/municipal buildings, universities/schools, hospitals/clinics, public lighting, water utilities, public transportation stations, community centers, fire stations, libraries, orphanages, etc.
- ESP refers to an Energy Service Provider (broader than typical ESCO definition)
- ESPC refers to Energy Saving Performance Contracts for the report, an ESPC must:
 - tie at least part of ESP payment to project performance
 - must be involved in project implementation (not just audit, equipment sale or O&M)



ESCO Models

High service/risk

Full service ESCOs designs, implements, verifies and gets paid from actual energy saved (aka "Shared Savings")

Energy supply contracting, takes over equipment O&M and sells output at fixed unit price (aka "Chauffage", "Outsourcing", "Contract Energy Management")

ESCOs w/third party financing, designs/implements project, and guarantees minimum level of savings (aka "Guaranteed Savings")

ESCO w/variable term contract, act as full service ESCO, but contract term varies based on actual savings (aka "First Out Contract")

Supplier credit, equipment vendor designs, implements and commissions project and is paid lump-sum or over time based on estimated savings

Equipment leasing, similar to supplier credit except payments are generally fixed (based on est. energy savings)

Consultant w/performance-based payments, agent assists client to design/implement project and receives payments based on project performance (fixed payment w/penalties or bonuses)

Low service/risk Consultant w/fixed payments, where consultant helps the client design and implement the project, offers advice and receives a fixed lump-sum fee

Source: World Bank 2005

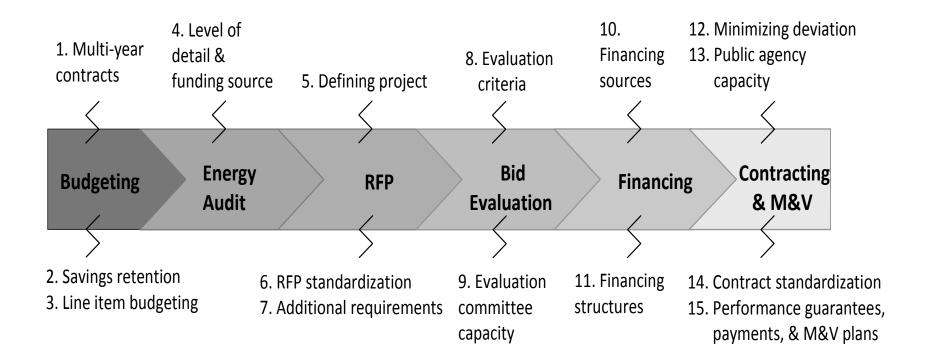


How ESPCs Can Help

| Public Sector Barriers | ESPCs Can |
|---|--|
| Lack of commercial incentives to reduce operating costs | Not deal with incentives, but can help reduce transaction costs/risks, by offering package of services & project performance risk. |
| No incentive to save energy (no retention of savings) | Not address the principal-agent issue, but better define the benefits/costs upfront, so agencies can negotiate and apportion them. |
| High perceived risks from new technologies and mechanisms | Involve performance guarantees to assign many project risks away from the public agency and financier. |
| Inflexible procurement procedures | Allow for high IRR projects to be done by evaluating the best value to the agency, bypassing procurement for each measure, equipment or service. |
| Constrained annual budgets for capital upgrades | Often facilitate project financing, with repayments derived from project savings. |
| Small projects with high project development/ transaction costs | Allow smaller projects to be bundled, often with notional audit/ baseline information, thus helping to address development/ transaction costs. |
| Inadequate information and technical know-how | Invite technically competent private sector firms to compete based on their qualifications, experience and best project ideas. |



Steps and Issues





Emerging Public ESPC Models

| Model | Examples | | |
|--|--|--|--|
| Indefinite Quantity Contract (IQC) | U.S. (FEMP), Hungary | | |
| Public ESP | Ukraine (Rivne City) | | |
| Super ESP | J.S. (NYPA), Belgium (Fedesco), Philippines (EC ²) | | |
| Utility ESP | ESP U.S. (FEMP – UESC), Croatia (HEP ESCO) | | |
| Utility DSM ESP Brazil | | | |
| Internal ESP (PICO) | Germany (Stuttgart) | | |
| Energy Supply Contracting | Germany, Austria, France | | |
| Procurement Agent | Germany, Austria, U.S., Czech Republic, Slovakia | | |
| Project Bundling | Austria, Germany, India, S. Africa, U.S. | | |
| Nodal Agencies U.S. (US DOE), S. Korea (KEMCO), India (BEE), Jap | | | |
| Ad Hoc Brazil, China, Egypt, Mexico, Poland, S. Africa | | | |



Public ESPC Procurement Issues

Budget provisions for ESPCs

- 1. Multi-year contracts
- 2. Retention of energy savings
- 3. Line item budgeting

Initial energy audits

4. Level of detail and source of funds for initial audit

Development of the RFP

- 5. Defining the project
- 6. Standardization of the RFP
- 7. Additional steps in the bidding process

Evaluation of bids

- 8. Evaluation criteria for multiple technical and financial parameters
- 9. Technical capacity of agency evaluating committees

Financing

- 10. Sources of financing
- 11. Financing structuring

Contracting and M&V

- 12. Minimizing deviation from the proposal
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Budget: Issue 1 (Multi-Year Contracts)

- Medium Term Expenditure Framework (MTEF) is approach promoted by WB to help reconcile multi-year obligations with annual budget envelopes
- MTEF helps ensure that public commitments are consistent with its medium-term fiscal outlook
- Many WB clients have adopted MTEF, so do not face this issue
- Many other countries have precedents for multi-year contracting, which should be explored
- But, if this is a key issue, consider one-year ESPCs (e.g., Mexico)



Budget: Issue 2 (Retention of Savings)

Full ownership Tof savings

MOF/parent agency assigns full project benefits to agency for discretionary spending – may require regulatory changes

Focus on autonomous agencies or ones with fixed budget provisions

ESP retains all energy savings but then provides a non-cash refund to the agency at the end of the project period

MOF assigns partial project benefits (e.g., duration of ESPC) to agency to allow ESP payments to be made

MOF provides upfront subsidy/grant for investment or special financing but retains benefits

Gov't does not allow energy savings but offers institutional awards, interagency competitions, employee recognition for proactive energy efficiency measures

No ownership of savings

MOF issues mandate to implement cost-effective EE measures MOF/parent agency procures ESP directly for public facility retrofits and retains all energy savings



Budget: Issue 3 (Line Item Budgeting)

- With separation of capital & operating budgets, many public agencies have difficulties using savings from one category to pay for another – spirit of ESPCs
- The U.S. (24 years) and Germany (17 years) have addressed ESPC budgeting issues through series of legislative and regulatory amendments, yet both still face substantial state differences and recurring reviews
- India has dealt with it on a project-by-project basis with the issuance of Government Orders, until sufficient experience has been gained



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Audit: Issue 4 (Level of Detail/Cost)

Detailed energy audit resulting in predefined project/evaluate based on lowest cost for services/equipment

Gov't mandates energy audits for public facilities

Detailed energy audit from similar, representative facility

Walk-through audit/evaluation based on representative project with allowance for bidders to suggest project enhancements

Institution-led low-/no- cost audits (e.g., gov't agency, utility, university)

Host facility completes audit template

Host facility provides equipment inventory/bill summary

Use of IQC approach, where ESPs are competitively preselected and then undertake audits and contracts directly with public agencies

Flexible \(\brace \) No upfront audit; RFP requires bidders to perform detailed audit during bid phase, possible remuneration for unsuccessful bidders



Audit: Issue 4 (Level of Detail/Cost)

Minimum information (buildings) required:

- Age of building
- Inventory of equipment
- Square footage by function (e.g., office space, cafeteria, training centers, etc.)
- Operating conditions (operating times, functions)
- 1+ year of energy billing data, including tariff information
- Past EE measures implemented to date
- If bundle of projects, only need data on representative sample

Conclusion: Technical information can be prepared at a very low cost!



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RFP: Issue 5 (Project Definition)

- 3 aspects to consider:
 - Type of procurement
 - Project parameters
 - Services to be provided

| Country/Institution | Type of Procurement | | |
|---------------------|--|--|--|
| India (Tamil Nadu) | Goods and Services | | |
| India (Gujarat) | Works and Services | | |
| Germany | Works or Services | | |
| USA (NYPA) | Services | | |
| USA (FEMP) | New Law/Procedures | | |
| France | New PPP Law/Procedures | | |
| World Bank | Management Contract (Goods & Services) | | |



RFP: Issue 5 (Project Definition)

- Project parameters can include: pre-specified type and quantity of equipment to be replaced (*Egypt*), target end-uses or systems (e.g., lighting, HVAC), required & optional target systems (*Germany*), minimum level of energy savings (*India*), minimum share of energy savings
- Package of services can include detailed energy audit, engineering & project design, equipment procurement, financing, installation & construction, commissioning, performance guarantee, M&V, O&M



RFP: Issue 6 (Standard RFPs)

- There are substantial differences in standard RFPs for ESPCs among those available and reviewed
- Developed markets have many (federal, state, association, program)
- Need to consider opportunities for early innovation and testing of different approaches, customization for specific agency needs, high typical procurement transaction costs, avoid "reinventing the wheel"



RFP: Issue 7 (Additional Steps)

- Various countries have added additional steps to the typical bidding process including:
 - Pre-qualification or short-listing of ESPCs
 - Conducting of an investment grade audit (IGA) (France)
 - Draft RFP and pre-bidding meetings
 - Site visits
 - Oral presentations (*Japan*)
- Additional steps should be driven by client needs, level of project complexity, need for consultations, experience of bidders and agencies, etc.



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Evaluation: Issue 8 (Many Parameters)

- Most countries use two-stage evaluation process (technical and financial)
- Technical evaluation similar to typical services: firm experience, technical approach, personnel, etc.
- Financial evaluation more complex due to multiple cost-related parameters (e.g., energy savings, IRR, total project cost)
 - Some countries use weighted average of financial criteria (Japan, Czech Republic, Canada, U.S. – NYSERDA, India)
 - Others use single calculation or value to determine best value (i.e., NPV) (Austria, Germany)
 - Still others rely on direct negotiations (*U.S. FEMP/NYPA*, *France*)
- Evaluation procedures must fit local regulations and agency needs, yet also be clear, transparent and simple



Evaluation: Issue 9 (Agency Capacity)

- Many country programs have some public agency or commercial agents that can assist in procurement, including evaluation of proposals
- Umbrella IQCs, pre-qualification of ESP bidders, standardized RFPs, pre-bidding conferences, training of ESPs and agency staff, etc. all can help



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Financing: Issues 10 (Sources)

Full commercial financing

Large-scale, mainstreamed bank lending and project financing for ESPCs Development of specialized banking instruments, such as factoring or trust accounts, to help promote ESPCs

Vendor financing or leasing

Credit or risk guarantee instruments to help reduce high perceived risks from commercial financiers

Mobilizing carbon financing to help boost rates of return or extend ESPC durations

Promoting PPPs, including project agents, to help package and finance ESPC projects

Specialized public entities (e.g., super ESPs) to help package and finance ESPCs, sometimes blending public and commercial financing

Public revolving fund for financing of ESPC projects

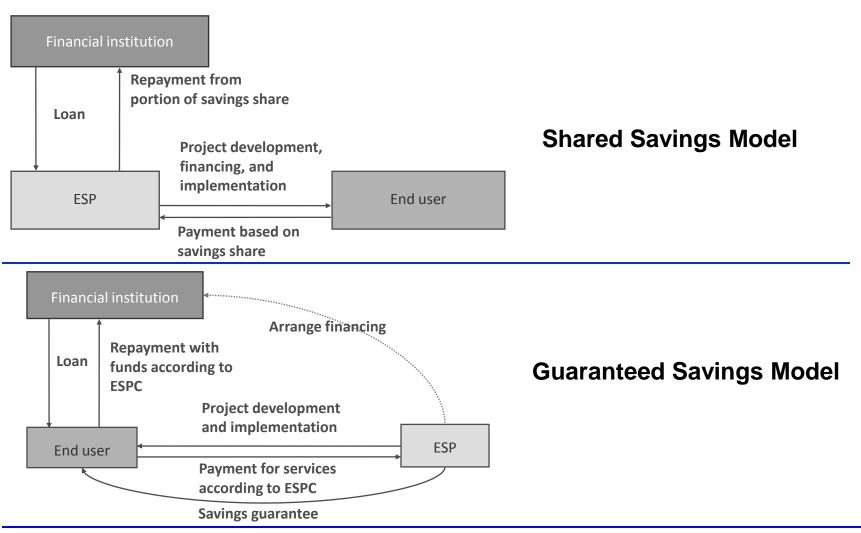
Public financing for project, through bonds or other mechanism

Provision of government budget for energy savings project

Public financing



Financing: Issue 11 (Structures)



Source: Taylor et al., 2008



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Contract: Issue 12 (Deviation)

- Direct contracting, requiring detailed energy audits or pre-specifying the project do not face this issue
- For the rest, need measures to ensure IGA project does not vary significantly from ESP proposal
- Options include:
 - Some contracts allow small (<20%) deviation of IGA from proposal or IGA is not reimbursed and contract is cancelled (*U.S., Brazil*)
 - Others use "open book" model, where ESP gets fixed service fees and agreed mark-up for equipment (Canada, Croatia)
 - Others agree on fixed unit price for various measures (*Hungary*)



Contract: Issue 13 (Agency Capacity)

- Many countries have some public agency or commercial agents to assist in procurement, including contract negotiations and supervision
- IQC master contracts, public/super ESPs, procurement agents, standardized ESPCs, training of ESPs and agency staff, bundling of public projects, etc. all can help



Contract: Issue 14 (Standard Docs)

| Countries | Approach | Status | |
|--|---|---|--|
| U.S., Japan, India, Canada - FBI | Nodal agencies developed standard contracts for use by government agencies | Standard contracts available and have been used in many cases | |
| Australia | Standard contract developed by ESP Association | Standard contract available and being use | |
| Czech Republic, Canada-Quebec, Germany | Assistance and guidance from NGOs/ associations/agents in contracting process | Standardization likely to occur with additional experience | |
| S. Africa, China, Mexico, Egypt | Little or no effort devoted to standard contracts | No standard contracts currently available | |
| France | Unique contracting process (PPP) - individually negotiated | No standard contracts currently available | |

- Need for standardized ESPCs is more important than RFPs
- Need to consider alternate provisions, customization for specific agency needs, high typical contracting transaction costs, creating legal precedents, avoid "reinventing the wheel"



Contract: Issue 15 (Perf. Guarantees)

Fully Performancebased

Multi-year contract with payments fully based on periodic M&V assessments

Multi-year, flexible term contract with 100% of verified savings retained by ESP until ESP receives agreed return on investment

Partial payment upon successful commissioning and balance of payment within 3-6 months based on performance

Full payment upon successful project commissioning with some recourse if project performance waivers in outer years (e.g., performance bond, equipment warrantees)

Full payment upon successful project commissioning

Partially Performance-based

Multi-year contract (e.g., lease) with fixed payments, based on engineering estimates, with periodic M&V, strong equipment warrantee and small bonus provisions for exceeding targets



Summary

- The public sector represents a large, generally uniform untapped market for EE that can be bundled, financed and implemented on a fairly large-scale
- The promotion of ESPCs should be one tool for governments to consider in realizing this potential
- While using ESPCs in the public sector is complex, solutions from other countries can be used and adapted
- The WB should be proactive in making this happen



Designing the Right Process

| | Budget | Audit | Financing | Model | Contract |
|---|---|---|---|---|--|
| 1 | REFORMATIVE | PRESCRIPTIVE | COMMERCIAL | HIGH ESP RISK | PERFORMANCE BASED |
| _ | Agency's full retention of EE benefits after reform | Detailed energy audit & resulting predefined | Bank lending and project financing to ESPCs | - Full service – shared savings | Multi-year contract and periodic payments based |
| _ | Certain autonomy or fixed budget provisions of agency | project - Mandate audit - Detailed audit from | Vendor financing or leasing Credit or risk guarantee | Energy supply contracting – chauffage, outsourcing, contract energy | on M&V assessment - Multi-year, flexible term contract until ESP's |
| _ | Non-cash refund to agency from ESPs with retention of EE benefits | similar, representative facility | Carbon financing to boost IRR or extend ESPC | management - ESPs w/third party financing – guaranteed | agreed return met - Partial payment upon commissioning & balance |
| - | Partial EE benefits assigned to agency by MOF | - Walk-through audits/evaluation - Institution-led low-/no- | durationFinancing and packaging by PPPs | - ESPs w/variable term | paid 3-6 months - Multi-year contract and fixed payments with |
| _ | No agency retention, MOF upfront subsidy/grant/special | cost audit - Completed audit template | Financing and packaging by public entities (e.g. super ESPs) | contract - Supplier credit | periodic M&V, equipment warrantee and bonus provisions |
| - | financing No retention but other incentives (e.g. awards, | Equipment inventory/ bill summaryAudit by pre-selected | Public revolving fundPublic financing through public bonds, etc. | Equipment leasingConsultant w/performance based payments | - Full payment upon commissioning with some recourse for outer years |
| _ | competitions) No retention, MOF mandate on agency EE | ESPs under IQC approach No upfront audit; | - Government budget for EE projects | - Consultant w/fixed payments | - Full payment upon commissioning |
| - | implementation No retention, ESP procurement by | detailed audit by bidders prior to bid submission | PUBLIC | LOW ESP RISK | TRADITIONAL |
| 1 | MOF/parent agency RESTRICTIVE | FLEXIBLE | | | |



Conclusions and Recommendations

For countries interested in developing a process:

- Conduct an upfront market survey of potential ESPs
- Hold stakeholder consultations to analyze barriers and identify potential solutions
- Define multiple solutions for each barrier and options for each issue
- Develop and test small procurements
- Expand and replicate
- Institutionalize systems



Next Steps

- Finalize and issue report (Oct '09)
- Develop sample TOR and guidance note for using WB "Management Services" RFP template
- Support initial WB operations in Mexico, India, Latvia, Armenia, Egypt, China and elsewhere
- Disseminate operational experience and scaleup



Thank you!

For more information, please contact:

Jas Singh

E-mail: jsingh3@worldbank.org

Tel: (202) 458-0343

