ESMAP
Energy Sector Management Assistance Program

Briefing Note 09/10

Public Procurement of Energy Efficiency Services

Getting Started

ENERGY EFFICIENT CITIES INITIATIVE

HELPING CITIES MEET THEIR ENERGY CHALLENGES OF THE NEW CENTURY

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Procuring Energy Efficiency Services

The world's primary energy needs are expected to grow rapidly over the next two decades, with the largest incremental increase coming from developing countries. This will require over US$25 trillion in energy supply infrastructure investment by 2030. Meeting the growth in energy demand through traditional energy development models is unsustainable from both environmental and energy security perspectives. Finding new ways to meet energy needs sustainably while maintaining robust socioeconomic development is imperative.

Energy efficiency (EE) can be one of the most cost-effective and critical instruments to help meet the global growth in energy demand. Improvements in EE contribute to enhanced energy security, increased competitiveness, employment generation, load reductions on often overstressed utilities, higher reliability of energy systems, reduced vulnerability to high and volatile energy prices, and lower environmental impacts including greenhouse gas (GHG) emissions. For national governments, EE is seen as a win-win-win option, providing positive returns to the government, energy consumers, and the environment. EE measures are generally viewed as "no regrets" policies, since their net financial cost can be negative—the measures are justified purely based on high financial returns. Unfortunately, despite these promising benefits, achieving significant and sustained efficiency gains has proved daunting in both developed and developing countries. Broad and timely deployment of EE measures in the coming decades will also help buy time for more technologically advanced GHG mitigation initiatives that will emerge over the longer term. The International Energy Agency (IEA) estimates that EE could contribute about 58% of GHG reductions potential through 2050 (Figure 1).

The public sector[1] holds significant potential for improved EE globally and represents a large and important market in all countries. The public sector typically represents 10–20% of a country's gross domestic product (GDP). Public procurement, alone, can also be substantial. In Europe, for example, public procurement represented some €1,500 billion in 2008 (16% of GDP). Although public energy use as a percent of total energy use is relatively small (about 2–5% in many countries, higher in those with district heating sys-

[1] The "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.

BOX 1 **GETTING STARTED**

In 2010, ESMAP completed and published a comprehensive report detailing how governments around the world can bundle, finance, and implement energy efficiency measure using energy savings performance contracts (ESPCs). The book, entitled *Public Procurement of Energy Efficiency Services: Lessons from International Experience,* offers policy advice about ways to overcome some of the more vexing barriers to achieving real energy savings in government-owned facilities. *Public Procurement of Energy Efficiency Services* was based on an international review of country experiences that have used the ESPC approach in the public sector, along with more in-depth country case studies. Developed country studies included Canada, France, Germany, Japan, and United States. The review also identified project and program examples in Brazil, Bulgaria, China, Croatia, Czech Republic, Egypt, Hungary, India, Poland, and South Africa.

This note offers more operational guidance on how to get started with such programs. It starts with a summary of the report's main findings and then delves into operational modalities of operationalizing these findings for World Bank (WB) operations, including issues of WB procurement and financing. Rather than seek to recommend changes in WB procedures, it presents some ideas and options under current WB processes to formulate operational approaches and strategies to deliver large-scale energy savings to public agencies, at both the national and local levels.

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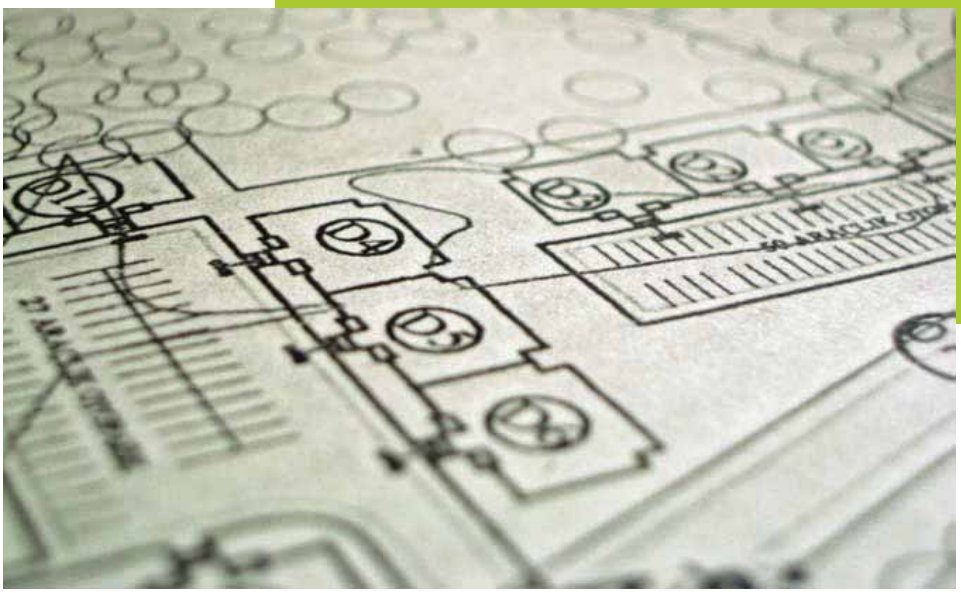
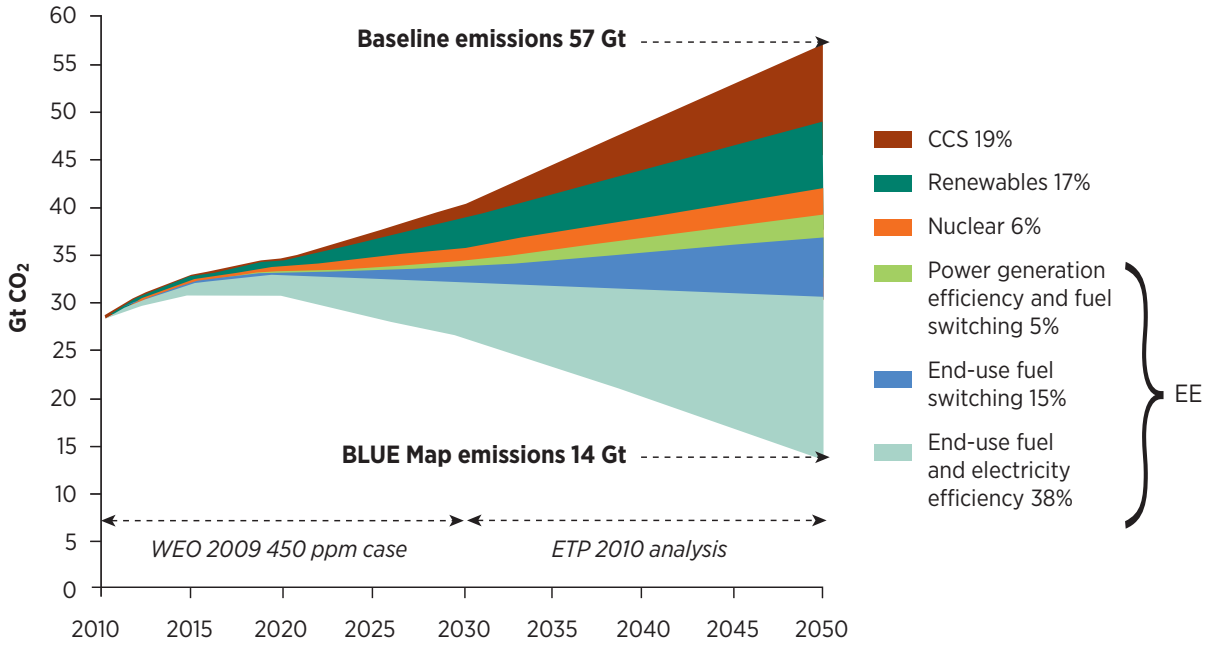


FIGURE 1 | GHG Mitigation from Energy Efficiency



Source: International Energy Agency (IEA). Energy Technology Perspectives. Paris: IEA, 2010.

tems), the government is often the largest single user of energy in a given country. In the United States, federal agencies consumed 38 million tons of oil equivalent (Mtoe; 1.5% of primary energy in 2006) at a cost of US$17.7 billion, and generated 42.8 million tons of carbon dioxide equivalent (CO_2e) to operate government buildings, vehicles, and equipments.

Further, governments often have many 24-hour-load facilities, such as hospitals, universities, orphanages, etc. The common ownership and homogeneous nature of many of the facilities, particularly those with common functions (e.g., schools, hospitals), offer unique opportunities for bundling many projects together and allowing financing at a large scale. In this way, the public sector can have a catalytic effect on local markets by demonstrating good behavior to the private sector and general public, while stimulating nascent markets for EE goods and services. Additionally, programs to reduce energy use in public facilities can reduce public energy expenses, creating fiscal space to allow governments to expand social services and meet other critical infrastructure investment priorities. Energy efficiency investments in public facilities can also be an attractive economic stimulus, by creating local jobs to "green" existing infrastructure while upgrading facilities and lowering future operating costs.

The Opportunity

Although no conclusive estimates exist of EE potential in the public sector globally, anecdotal evidence suggests that it is substantial. Public facilities tend to have outdated equipment; many pay low energy prices or do not consistently pay their utility bills. In middle-income countries, in facilities where lighting is the primary energy use, EE savings can be as high as 50%. Many public office buildings in developing countries can easily achieve 20–40% energy savings through retrofits of existing equipment. Savings may not be as significant in many lower income countries, where access to and use of electricity may be relatively low. Key areas for saving include government office buildings, water utilities, public lighting, and institutional facilities (e.g., schools, hospitals).

Prevailing Challenges

Energy efficiency in the public sector has long been a challenge, even in developed countries. Despite the opportunities identified, implementation of EE measures is constrained by rigid public sector procurement practices that focus on first costs and a lack of discretionary budgets to make investments in energy efficient equipment. There is also a principal-agent or split-incentive issue, whereby a parent budgeting agency may determine capital budget needs while the subordinate agency is responsible for paying the monthly energy bills. Moreover, many facility managers are not aware of EE products or their performance, and the equipment they have is poorly maintained. Other constraints include:

- Government agencies are not typically responsive to price signals since they lack a commercial orientation.
- Public procedures for equipment and service procurement are not flexible.
- Constrained annual budgets make funding for capital upgrades difficult while restrictions on public financing and typical one-year budget appropriations make it difficult to amortize costs.

Although simple measures and universally applicable policies are lacking, experience from a number of countries shows that large-scale EE gains in the public sector are possible. Many governments have pursued a multipronged approach to encourage EE improvements in public facilities (Table 1).

Energy Savings Performance Contracts—A New Way?

Energy savings performance contracts (ESPCs) have been introduced in many countries to help address some of the more difficult issues associated with facilitating EE investments in the public sector. An ESPC involves an energy service provider (ESP; Box 2), providing an energy consumer or "host facility" a range of services related to the adoption of energy efficient products, technologies, and equipment. The services provided may also include the financing of the EE upgrades, so that the host facility has to supply little or no capital. In many cases, the compensation is contingent on demonstrated performance, in terms of EE improvement or some other measure, thereby creating a system where the services and equipment can be paid from the energy cost savings. There are several variations of ESP business models (Figure 2).

TABLE 1 | Typical Barriers & Actions Taken to Improve EE in the Public Sector

BARRIERS	INDICATIVE ACTION AND COUNTRY EXAMPLES
Lack of awareness and information, including costs, benefits, risks, products	Initiate awareness campaigns, case studies, procurement guidelines, product catalogs/specifications, information dissemination, demonstrations (Brazil, Canada, China, France, Germany, Japan, Mexico, Sweden, U.S., Vietnam)
Lack of technical capacity for audits, project design, procurement, implementation, monitoring; trust of EE potential	Create nodal agencies to provide TA for EE projects; appoint energy managers; develop training/educational programs for facility operators/energy mangers/ESPs, EE analytical tools, ESPC audit and procurement/contracting guidelines, prequalification of ESPs, M&V protocols (Brazil, Canada, China, Germany, India, Japan, Mexico, Philippines, South Korea, Thailand, U.S., Ukraine, Vietnam)
Limited incentives to implement EE (potential loss of budget), try new approaches, take on risks	Revise budgeting to allow retention of energy savings; issue awards for agencies/staff; include EE in management performance reviews; risk sharing/financing programs; EE targets (Brazil, Canada, China, France, India, Mexico, U.S.)
Lack of agency accountability for energy savings	Create public sector/agency targets with reporting/monitoring, penalties for nonperformance, energy performance labeling of buildings (China, Germany, Japan, Mexico, Sweden, U.K., U.S., Ukraine)
Restrictive procurement, contracting, and financing rules	Revise public policies for EE products (e.g., labeled only, life-cycle costing) and ESPCs; develop local ESPC models; create public EE funds (Brazil, Canada, China, France, Germany, Thailand, U.K., U.S.)
Lack of funding for upfront energy audits and project funding	Earmark public EE budgets; create dedicated grant/subsidy programs, public revolving funds, DSM surcharge or "wire charge"; free energy audits (Brazil, China, Denmark, France, Germany, Japan, Mexico, Sweden, South Korea, Thailand, U.K., U.S., Vietnam)
Small size and high transaction costs of EE projects	Bundle public EE projects; generate model documents/templates to streamline projects; prequalify ESPs; bulk procurement of EE products (Austria, Canada, Germany, Hungary, India, Philippines, South Africa, Sweden, U.S.)

ESPCs have a number of inherent advantages for addressing the specific difficulties that public agencies face. Outsourcing an EE project in its entirety—from development to financing to monitoring—allows agencies to reap the gains without the hassles of completing each step of the project on their own, often with multiple procurements taking months, if not years. The ability of ESPCs to allow for off-budget financing and to pay for themselves from the savings makes the mechanism even more attractive to public agencies that have small discretionary budgets, or none at all, and a very low tolerance for risk. And ESPCs can leverage expertise from commercial ESPs. Several countries have been able to realize significant ESPC markets in the public sector (Table 2).

Although ESPCs may be well suited to address many of the challenges to improving public sector EE, rigid public procurement and budgeting guidelines and procedures are quite poorly suited to making ESPC procurement simple, particularly if full project costs and technical parameters have yet to be determined. Furthermore, the complex nature of ESPCs requires significant capacity building throughout the public sector to ensure their successful use.

BOX 2 **ESCOs versus ESPs**

Commercial entities that have implemented projects using the ESPC approach have traditionally been referred to as "energy service companies" or ESCOs. Many governments and donor programs have focused on developing local ESCO companies in order to help tap EE potentials. However, since ESPC projects are simply a bundle of goods and services under one contract, ESPC projects can be implemented by a variety of businesses, including energy suppliers, equipment manufacturers, engineering and installation contractors, construction management firms, etc., that may not be commonly recognized as ESCOs. By issuing public tenders to ESPs, public ESPC projects can bring existing companies into the EE business, building upon existing business models and market precedents. Therefore, the term ESP, rather than ESCO, is used.

FIGURE 2 | ESP Business Models

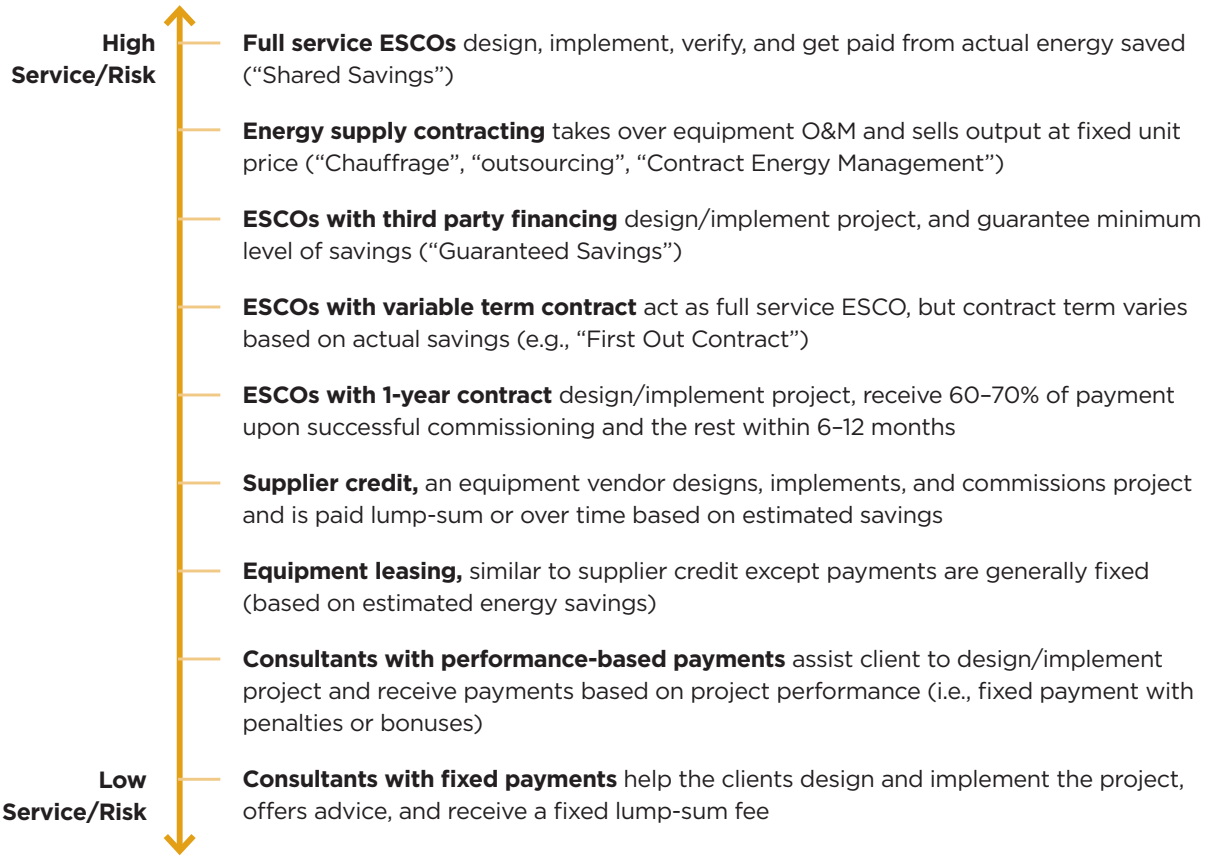


TABLE 2 | Public Sector ESPC Markets and Results from Selected Countries

COUNTRY	MARKET SIZE	RESULTS	PROJECTS
Canada (FBI)	Can$320 million (~US$300 million)	• 20% reduction in energy intensity • Can $40 million in energy cost savings • 285 kt of CO_2 reduction	85 EPC projects (7,500+ buildings)
Germany	€200 million (~US$260 million)	• 20-30% reduction in energy costs • €30–45 million in energy cost savings/yr	2,000 properties
Japan	10 billion yen (~US$115 million)	• 12% reduction in energy intensity • 265kt of CO_2 reduction	50 ESPC projects in FY06
South Korea	~223 billion Won (US$185 million)	n/a	~1,400 public ESPC projects
United States (FEMP)	US$3.8 billion	• ~30 trillion BTU/yr • US$11.7 billion in energy cost savings	500+ ESPC projects

BARRIERS AND EMERGING MODELS FOR ESPCS

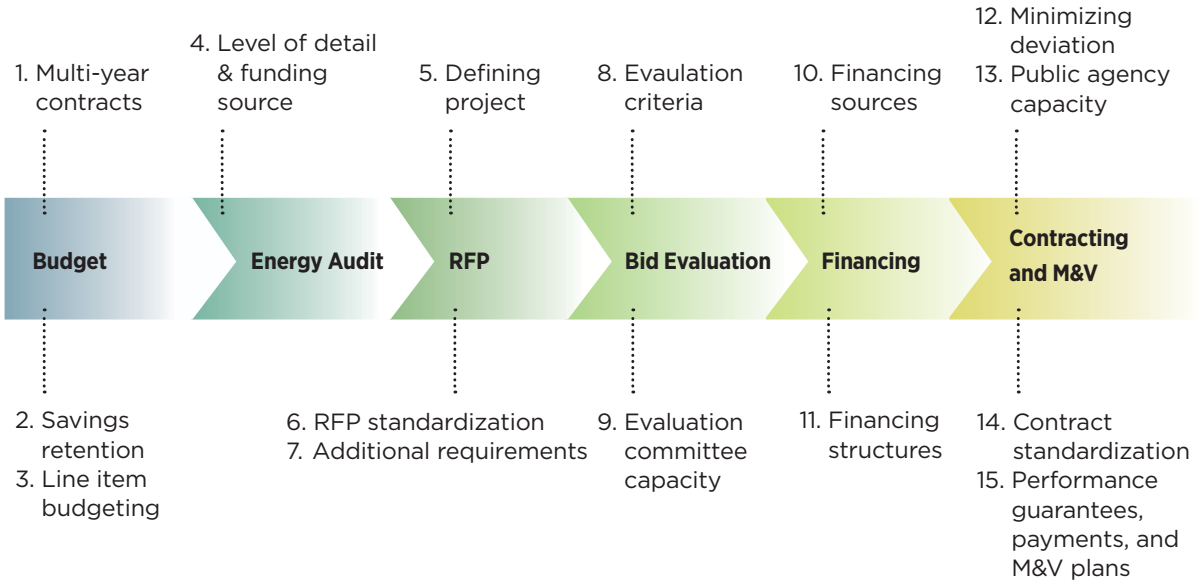
When it comes to the specific steps in the procurement process, a number of key issues must be overcome to successfully implement EE projects using ESPCs. Six main steps in the EPSC procurement process, along with key issues and decision points within each step, are presented in Figure 3.

In terms of the ESP market, many countries lack the legal and financial infrastructure to adapt to and support such complex business models. New ESPs generally either lack the technical and operational expertise to carry out all the functions typically associated with ESPCs or lack the balance sheets to mobilize the requisite financing such business models require. Local ESPs often have no track record in the market to carry out such sophisticated projects while international ESPs, which could bring better expertise and access to capital, are usually not very keen to invest in these emerging markets due to a host of risks (e.g., perceived small markets/projects, unclear legal/regulatory regimes, perceived client creditworthiness concerns, lack of access to appropriate local project financing, etc.). Developing countries also have limited equity markets and few investors willing to test new business types.

Emerging ESPC models

A review of select international experiences reveals a number of different programmatic approaches by governments to deal with the promotion and procurement of ESPCs in the public sector. Whereas some countries, such as Canada and the United States, have initially addressed these issues at the federal level, others, including Germany, focused on developing more local experience first. Some countries, such as South Korea and Belgium, have relied on strong government interventions to support ESPCs, while others, including the Czech Republic and South Africa, have not. The various emerging models for dealing with ESPC procurement, along with some pros and cons, are summarized in Table 3.

FIGURE 3 | Schematic of Typical ESPC—Steps and Issues



Assisting public agencies through the process of ESPC procurement is complex. The multidisciplinary nature of the various issues posed in each step of the process, from budget regulations to energy auditing to public contracting to project financing, makes navigating the process very challenging. And, many of the procurement and budgeting practices vary from country to country, so solutions must be carefully designed and adapted to fit local situations. Many countries have developed various solutions to deal with these issues, which can serve as valuable references for others. Some general recommendations for dealing with the main steps in the procurement process are summarized in Table 4.

For each of the issues in the ESPC procurement process, review of international experiences reveal a continuum of options for countries to consider. By looking at the range of options, a country may be able to find an appropriate and feasible solution based on what has been done elsewhere. Alternatively, a local government or public agency could mix and match, combine, or develop new solutions based on the many approaches presented. As shown in Figure 4, countries may be able to design suitable procurement processes by calibrating the options for each issue. Of course, in reality, the process is not so simple. Many of the steps are inextricably linked to one another, making the process more complex as a solution to one issue may limit the possible solutions to another. For example, if agency or local procurement regulations require more prescriptive technical details in the bidding documents, then a more detailed initial audit may be required.

BOX 3 **Project Bundling**

One of the major advantages of using ESPCs in the public sector is the opportunity to bundle many facilities together, creating projects large enough to capture significant economies-of-scale while speeding up implementation and attracting the private sector. Some examples of such project bundling, include:

- **Hungary |** In 2006, the Ministry of Education issued a tender for ESCOs to renovate *all* schools in the country; OTP Bank and local ESCO (Caminus) signed 20-year agreement with US$250m IFC guarantee; about US$22m implemented as of Aug 2008.
- **India |** The State of Tamil Nadu's urban development fund bundled street lighting and water pumping in 29 municipalities under a few tenders (30% energy savings requirement, first ESPC with 7 urban local bodies signed in 2008); State of Gujarat recently issued tender for up to 159 local urban bodies (2 phases).
- **South Africa |** City of Johannesburg issued a tender in 2008 for about 50 municipal buildings with support from the Clinton Climate Initiative.
- **Austria, Belgium, Czech Republic, Germany, South Korea, Israel, and U.S.** | All of these countries have have successfully bundled public EE projects using ESPCs.

TABLE 3 | Emerging Models for Public ESP Contracting

NO.	MODEL	DESCRIPTION	CASES
1.	Indefinite Contracting	Umbrella government agency competitively procures one or more ESPs (typically based on general qualifications) and then allows public agencies to enter into direct contracts with selected ESPs without further competition	US (USDOE/FEMP), Hungary (MOE)
2.	Public ESP	ESP is publicly owned, so there is no requirement for a competitive procurement process	Ukraine (Rivne City)
2a.	Super ESP	A variation of the public ESP model, a publicly owned ESP contracts directly with a public entity and then subcontracts with smaller ESPs/ contractors on a competitive basis	US (NYPA), Belgium (Fedesco), Philippines (EC2), India (EESL)
2b.	Utility ESP	A public entity contracts directly with their utility for EE services without additional procurement (since they are already existing supplier)	US (UESC), Croatia (HEP ESCO), Uruguay (USCO UTE)
2c.	Utility Demand-Side Management ESP	A publicly owned ESP uses funds from a DSM surcharge to invest in target public agencies at no cost to the agency (so no procurement since there is no contract/ payment)	Brazil
2d.	Internal ESP (PICO)	A unit within a public agency acts as ESP, providing technical and financial services, and receives payments through internal budget transfers	Germany (Stuttgart)
3.	Energy Supply Contracting (Chauffage)	Public agency contracts out delivery of an energy service, such as lighting or heating, and selects a service provider based simply on cost per unit of service	France, Germany, Austria
4.	Procurement Agent	A quasi-public entity or NGO helps government agencies, often on a fee-for-service basis, develop RFPs and assists them through contract award	Germany, US (NYSERDA), Czech Republic (SEVEn), Austria, Slovakia (CEVO)
5.	Project Bundling	Umbrella government agency bids out a group of buildings or facilities for a large ESPC	Austria, Germany, S. Africa (Johannesburg), India (CPWD, TNUDF, GUDC), U.S. (California)
6.	Nodal Agencies	A dedicated EE agency is appointed to facilitate procurement (prepare model documents, share experiences, training, facilitate financing)	U.S. (USDOE), S. Korea (KEMCO), India (BEE), Japan (ECCJ)
7.	Ad Hoc	No explicit program or mechanism to support public ESPCs, but no policy to prevent them; therefore, projects are developed one at a time	Brazil, South Africa, China, Mexico, Egypt, Poland

Acronyms: BEE—Bureau of Energy Efficiency (India); CEVO - Centrum pre Verejné Osvetlenie (Slovakia); CPWD—Central Public Works Department (India); ECCJ—Energy Conservation Center, Japan; EESL—Energy Efficiency Services Ltd. (India); FEMP - Federal Energy Management Program (U.S.); GUDC—Gujarat Urban Development Company (India); HEP ESCO—Hrvatska Elektroprivreda Energy Service Company (Croatia); KEMCO—Korea Energy Management Corporation; MOE—Ministry of Education (Hungary); NYPA—New York Power Authority (U.S.); NYSERDA—New York State Energy Research and Development Authority (U.S.); TNUDF—Tamil Nadu Urban Development Fund (India); UESC—Utility Energy Service Contract (U.S.); USDOE—United States Department of Energy; USCO UTE—Administración de Usinas y Transmisiones Eléctricas Service Company (Uruguay)

	PROS	CONS
	Allows much easier contracting between smaller public agencies and ESPs, with lower risks for upfront audits and project design costs	Upfront contracting can create barrier to market entry during contract period; nontransparent direct contracting approaches; provides less leverage for public entities to negotiate on price
	Can reduce transaction costs for procurement, provide greater access to concessional international financing (through sovereign loans) while raising comfort level of public agencies that know little about EPCs	Can become monopolistic and may not provide services as efficiently and cost-effectively as private ESPs; may not lead to a sustainable, vibrant ESP market; needs viable exit strategy
	Same advantages of a public ESP while still allowing more private ESP participation and competition	Creates an artificial barrier between the contractor and customer; has very limited track record in developing countries; allocation of risk to contractors is tricky
	Allows bundling of energy and EE services with existing utility, public or private, and easier repayment through utility billing; utilities can access cheaper financing	Can create monopolistic utility ESP; may be some conflict between EE and energy supply services
	Can address the procurement and financing barrier together	Using DSM surcharges for public agencies can create perceived unfairness; ESP may not be service-oriented without contractual relationship; often there is no performance guarantee
	No procurement and the transaction is internal to the public administration	As with other public options, efficiency relative to commercial ESP is not clear
	Well demonstrated and has a very simple procurement and contracting approach (no performance contract)	Often require long terms (20-30 years) to be viable; focus on supply-side gains only; better suited for central systems (heating, cooling)
	More market-based and allows agent to evolve approaches as the market develops	Can lead to monopolistic behavior as agent has no incentive to share approaches; agent may not have ability to change public policies; developing countries may not have logical agent candidates
	Favors competition while expanding project sizes and reducing transaction costs	Public agencies have less control in how their projects are bundled; large project sizes may inhibit market entry of new (or local) ESPs
	Provides a strategic review of procurement programs and sharing of experiences and model documents	Nodal agencies may have limited ability to influence procurement, budgeting policies; assistance is general and often excludes detailed transaction support
	Allows for full innovation and development of demonstrable approaches before developing guidelines and model documents	Transaction costs for the first project(s) are very high and some reinventing the wheel for early projects is likely

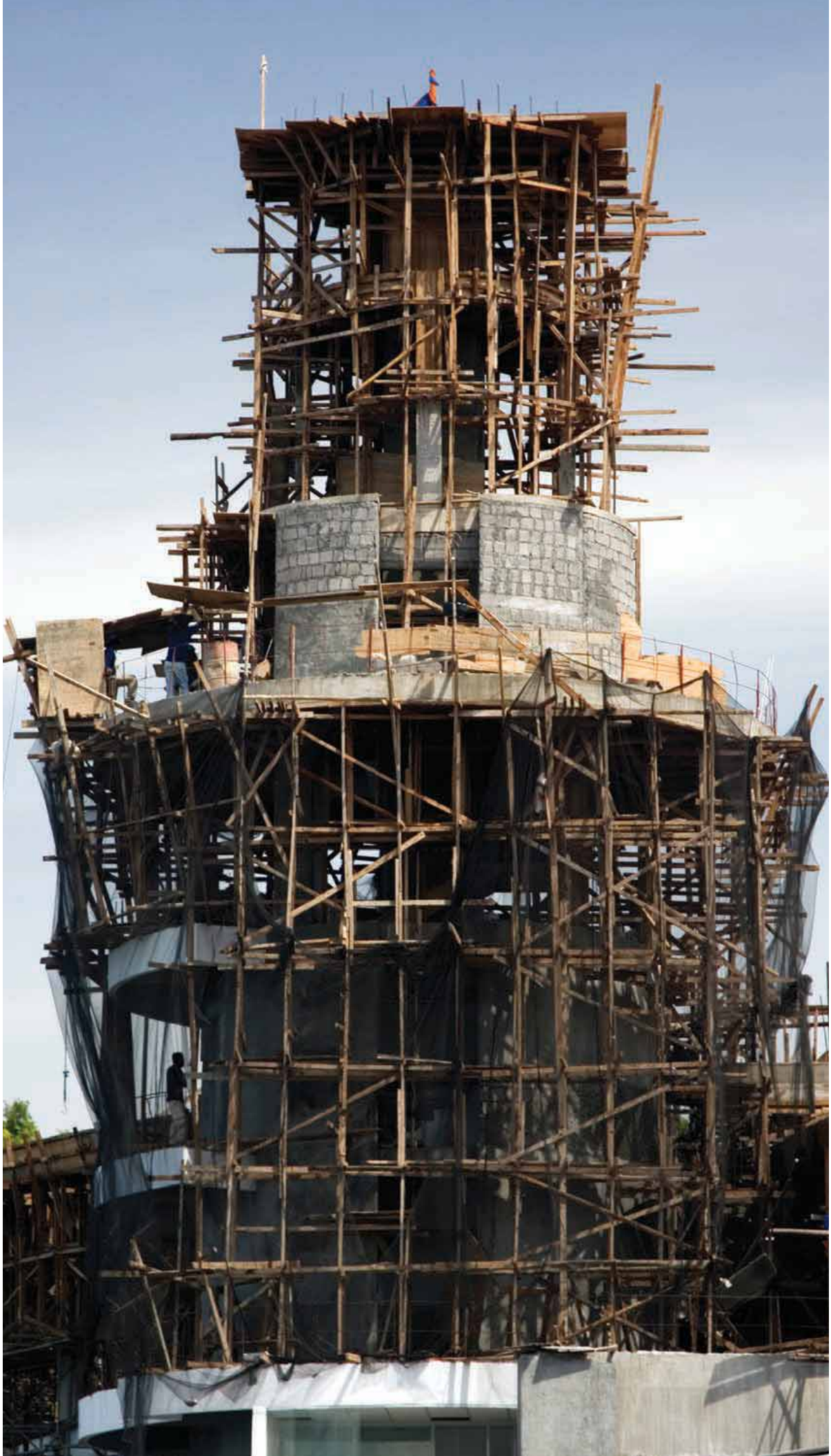


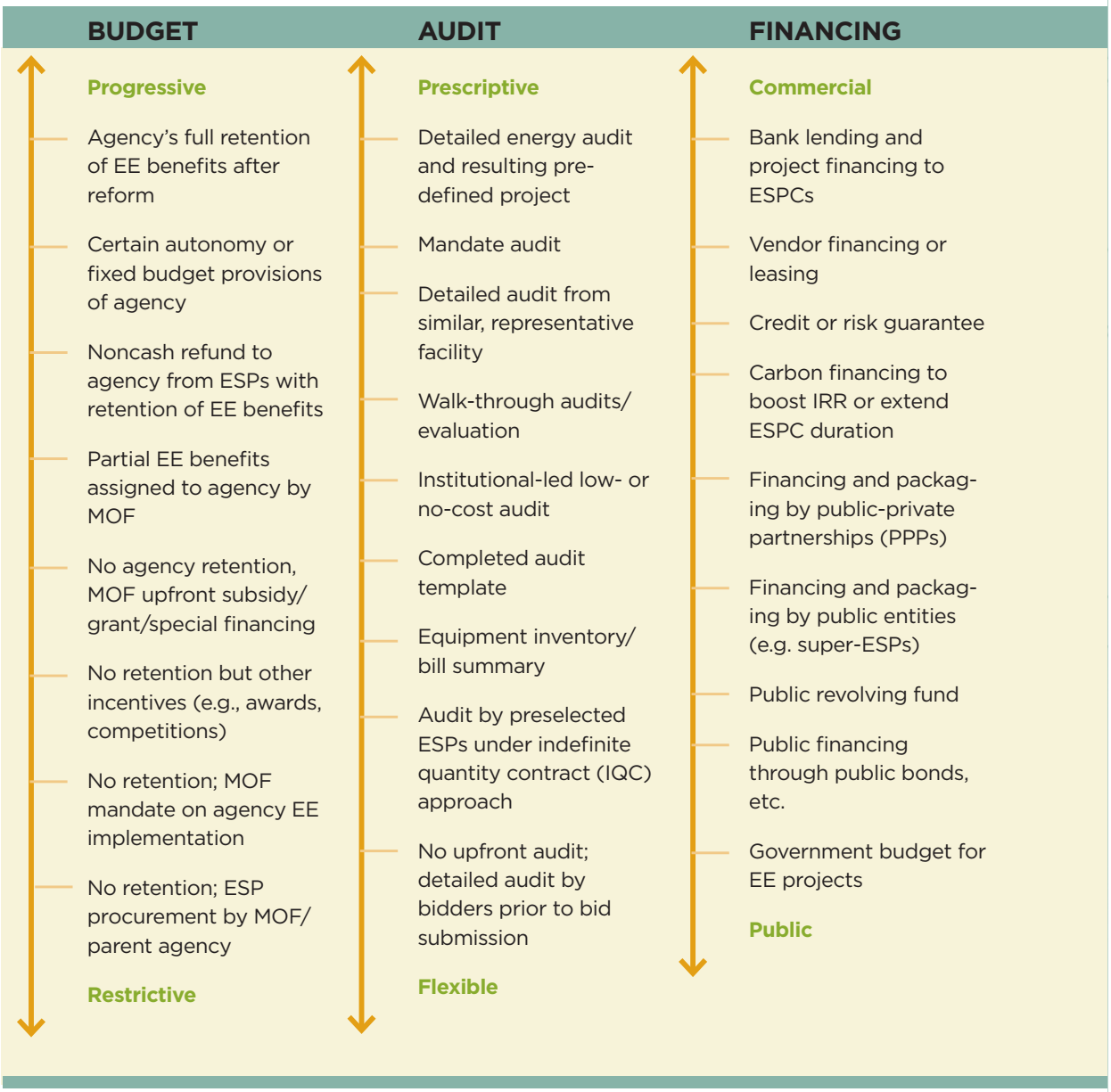
TABLE 4 | Recommendations for Main Public ESPC Procurement Steps

MAIN STEPS	RECOMMENDATIONS
Budgeting	• Start public ESPC procurement schemes with more autonomous public entities first. • Gain support from and work with parent budgeting agencies. • After implementing a few ESPCs, develop public financing programs to help address budgeting, incentive, and financing issues. • In the longer term, consider changes to the budgeting laws and regulations as needed.
Energy Audit	• Consider level of technical information required by prospective bidders to properly define project. • In lieu of an audit, provide only basic technical data (facility description, equipment inventory, energy bills, etc.).
Bidding Documents	• Define the project carefully to ensure it meets local procurement rules and regulations. • Consider broader parameters, such as minimum energy savings or target systems, and avoid prescriptive requirements. • Avoid standardizing the procurement documents too early. Once a critical mass of projects has been implemented, standardization can facilitate scale-up and reduce transaction costs. • Consider additional steps in the bidding process (e.g., prequalification, detailed audits, prebidding conference, oral presentations) based on local needs and capabilities.
Evaluation Process	• Adopt a two-stage evaluation process, where technical bids are scored first and bids meeting technical qualifications proceed to the financial evaluation stage. • Use NPV or equivalent single, comprehensive indicator in the financial evaluation to allow for simple, transparent assessments while also limiting "cream skimming."
Financing	• In mature capital markets, attract commercial financing for ESPCs with information and TA. • Where perceived risks are high, use credit/risk guarantees to facilitate commercial ESPC financing. • In immature markets, particularly where liquidity is an issue, create dedicated EE funds or similar mechanisms to support ESPCs. • Ensure flexibility of financing programs to allow for maximum market development.
Contracting	• Given the inherent complexities, designate institutions (e.g., nodal agencies, agents, public ESPs) to facilitate public ESPC projects. • Once initial ESPCs have performed successfully, develop standardized contracts to further facilitate public energy savings projects. • Define performance parameters based on the measure being implemented and include a M&P plan in the contract. • Address O&M and client training in the ESPC to ensure savings persist.

Is Project Bundling Really Possible?

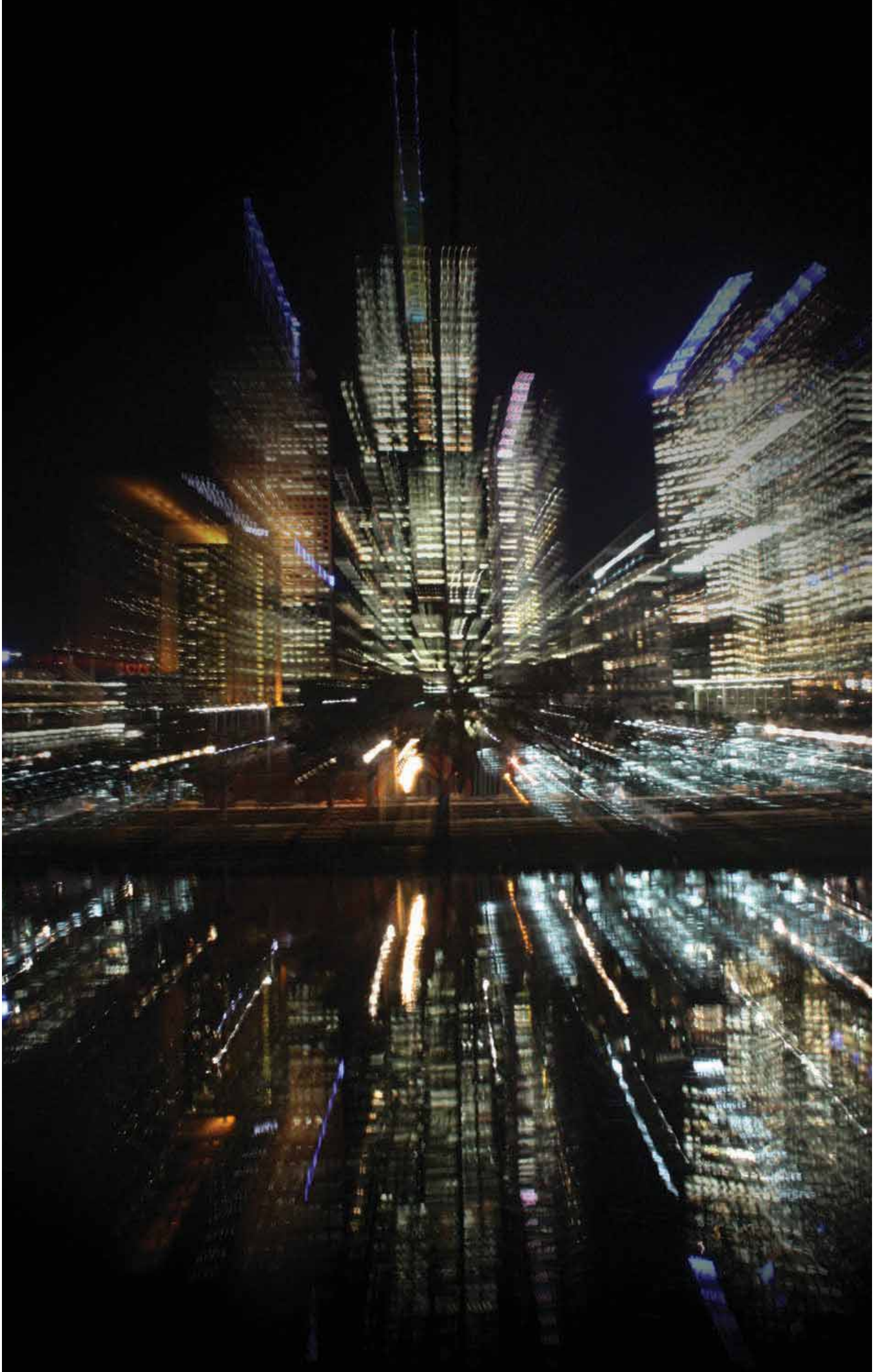
Many countries, regardless of the specific approach they use, have found that common ownership allows the bundling of many smaller public projects together into a single procurement. Typically, this is done through a parent or an umbrella agency, although it has also been done in many countries with multiple municipalities or even agencies within different departments (Box 3). Such an approach increases the aggregate size of projects, which is usually more attractive to ESPs, and lowers the transaction costs for each facility. In developing countries, bundling can send a powerful signal to private firms that there are large opportunities in the public sector ESPC business, which may help encourage more international and local firms to enter the market. However, larg-

FIGURE 4 | Recommendations for Main Public ESPC Procurement Steps



er transactions can be more complex and each individual agency will have less control of the overall contract. In developing countries, very large contracts may also prevent smaller firms from participating, particularly local firms with a limited capital base. One approach considered to address this issue is to bundle public sector projects under a super or public ESPC, which can reduce transaction costs while still allowing for smaller ESPs to implement projects in smaller bundles.


MODEL
High ESP risk
Full service—shared savings
Energy supply contracting—chauffage, outsourcing, contract energy management
ESPs with third-party financing—guaranteed savings
ESPs with variable-term contract—first out contract
Supplier credit
Equipment leasing
Consultation with performance-based payments
Consultant with fixed payments
Low ESP Risk
CONTRACT
Performance based
Multiyear contract and periodic payments based on M&V assessment
Multiyear, flexible term contract until ESP's agreed return met
Partial payment upon commissioning and balance paid 3–6 months
Multiyear contract and fixed payments with periodic M&V, equipment warranty, and bonus provisions
Full payment upon commissioning with some recourse for outer years
Full payment upon commissioning
Traditional



WORLD BANK PROCUREMENT

ESPCs and World Bank Procurement Guidelines

Energy savings performance contracts have been promoted in World Bank (WB) investment operations for more than a decade.[2] Until now, the procurement aspects of such projects have not been an issue since the ESPC clients have mostly been in the private sector. As such, most of the operations have been classified as financial intermediation projects—where WB administered funds (IBRD, IDA, GEF, CTF) are placed in a financial institution, usually a local commercial or development bank, and on-lent for many smaller EE projects. There have also been a limited number of operations that established publicly owned ESCOs that the WB provided financing to directly. Under this approach, WB procurement was limited to the equipment purchased by the public ESCO and not the contracting between the ESCO and client.

Recognizing that many ESCO markets in developed countries (e.g., Canada, Germany, U.S.) were largely developed within the public sector market, combined with renewed government interest in EE due to energy security and climate change concerns, interest in public sector ESPC projects in developing countries is rising. Further, new commitments by the WB to increase EE lending, along with its comparative advantage for providing financing in the public sector, have increased demand for such programs. These drivers have led to questions about suitable options to contract ESCOs for public clients following WB procurement guidelines and procedures.

Why is ESPC Procurement Different?

Unlike goods, works, or services, ESPC procurement is more complex. Key differences include:

- ESPCs use ***output-based rather than input-based models.*** Unlike typical bidding documents, ESPCs are bid out without specifying the precise inputs the bidders have to provide. This is needed to avoid costly upfront studies and to encourage innovation by the bidders.
- ESPCs involve a ***blend of goods, works, services, and financing.*** ESPCs require procurement of goods (e.g., appliances, windows, insulation); works, such as revamping existing systems, constructing stand-by power and cogeneration units, etc.; and services include energy audits, project design, measurement and verification (M&V), operations and maintenance (O&M), training, etc. ESPCs may also require the bidders to present a financing plan as part of their bids.
- ***Payments are based on performance*** rather than time-based or delivery-based contracts. Because contracts are based on outputs and not inputs, compensation must be linked to verification of outputs rather than the typical delivery-based schemes. This requires contracts to include clear project baselines, pre-agreed performance indicators and measuring methodologies, contract terms long enough for the outputs to accrue (which can affect typical five-year WB project durations), procedures for payment disputes, etc.

[2] Some of these include: Bulgaria Energy Efficiency (2005), China Energy Conservation I & II (1998, 2002), Croatia Energy Efficiency (2003), India Renewable Energy II (1998), India Tamil Nadu Urban Development II (1999), Poland Krakow Energy Efficiency (2001), Romania Energy Efficiency (2002), Tunisia Energy Efficiency (2009), Turkey Private Sector Renewable Energy and Energy Efficiency (2009), Uruguay Energy Efficiency (2004), and Vietnam Demand-Side Management and Energy Efficiency (2004).

- ***Relatively small contract sizes*** for ESPCs make complex WB procurement options cumbersome. Many existing bidding documents that utilize output-based, performance-based provisions are for large, multimillion dollar contracts. Therefore, even though the bid preparation costs are high, the relative transaction costs are manageable. However, most ESPCs for public facilities can be in the US$ 50,000–$100,000 range and few would be over US$ 500,000. Although some bundling is possible, many WB projects also have developmental goals related to local ESP market development, and smaller, local ESPs are often unable to bid on very large, bundled packages.

- ESPCs require ***credible, upfront technical information.*** Since ESPCs are designed to solicit bids from ESPs to improve operations of an existing facility or system, the need for reliable baseline data is critical. This can be done through prefeasibility studies, audits, baseline surveys, or similar schemes—conducted by credible professionals.

- ESPCs are often ***finalized after contract signing.*** In order to reduce bidding costs for ESPCs, detailed energy audits or project designs are generally not required as part of the initial bids; rather bidders are asked to propose their best estimate based on the available information and their past experience. Once selected, an ESP then performs a detailed or investment grade energy audit (IGA), which establishes the detailed project baseline and determines the precise scope and investment of the project. Such a process, however, creates a risk that bidders may overpromise at the bidding stage and then reduce the level of energy savings at the IGA stage. It also may present opportunities for bidders to inflate project costs after the IGA stage.

Procurement Precedents

Although ESPCs possess unique characteristics, dealing with these issues under WB procurement can be done. In fact, the WB has been moving towards output-based procurement schemes over the past several years and piloting a number of performance contracts. In addition, there has been growing recognition that new procurement approaches may be needed to foster public-private partnerships (PPPs), such as ESPCs, which do not fit traditional contracting. A few existing models that create strong precedents for ESPCs include:

- **Management services contracts.** Although management services contracts are typically for private firms to take over operations of utilities, the mechanics are similar to ESPCs: (i) both blend goods, works, and services; (ii) both use output-based rather than input-based requirements; (iii) both use financial bid evaluation methods other than lowest cost; (iv) both make payments based on performance; and (v) both require firms to bring in some of their own financing. However, such bidding procedures are complex and typically only used for high value contracts.

- **Output-based or performance-based contracts.** Output-based contracts have been used for a variety of infrastructure projects, but tend to be deployed mostly for improving access to infrastructure services, such as water and electricity. Thus, payments are based on measurable service provisions (e.g., number of new connections, kilometers of road construction/maintenance, volume of wastewater treated). Contracts may include payment reductions for lower quality levels of outputs and, in certain cases, premiums for exceeding the minimum quality requirements. Some infrastructure con-

tracts also have used a "design-build" variation, which allows for design to be included in the overall contract.

- **Cost-plus contracts.** Where the precise project size is not known, the WB has used cost-plus contracts, which work like open book ESPCs. Rather than providing a specific financial bid, bidders offer costs per hour for required services, agreed mark-ups for equipment and subcontracts, and use bills of quantities to itemize their expenses.

- **Two-stage bidding.** Where the technical approach is not known, unpriced technical bids may be requested first to see what solutions bidders propose. Precautions can be taken to ensure proprietary technical solutions are kept fully confidential. Issues related to minimum energy savings, ESP financing abilities, etc., can be explored in the first stage before refining requirements of the bidding documents for the second stage. However, such a process increases the costs to the bidders.

Based on the existing precedents, some preliminary ideas and options for implementing EE projects using WB procurement are discussed below.

Split Design and Construction Contracts

Currently, most EE projects are done in two phases. Under the first phase, a consulting contract is used for an energy audit and project design. This generally involves: (i) assessing the current energy consumption within the facility, documenting key energy-using equipment, facility age and function, floor space, review of 12–24 months of energy bills, etc.; (ii) assessing EE potential and cost-effectiveness of various measures; and (iii) proposal of a project design. Often this also involves having the consultant prepare the technical specifications and bidding documents for the equipment. Under the second phase, a construction firm is hired to procure and install the equipment. (Several projects in the past used two contracts for the second phase, first purchasing the equipment and then hiring a firm to construct or install, but a growing number of WB projects found combining the equipment and installation under a single supply and install contract was more efficient.)

Such an approach is commonly used and, thus, all parties understand it. However, this method creates split accountability between the two contractors. In the event the project does not perform as expected, neither contractor will accept fault and are likely to blame the other. Further, this split does not allow design firms to develop hands-on experience with actual project performance. Similarly, construction firms are generally not allowed to propose adjustments to the design (based on their past experience), creating a suboptimal project. Nevertheless, where combining design and construction are not feasible, this may be the only way forward in the near term (Table 5A).

Combined Design and Construction Contracts

There has been strong interest for a number of years to combine the design and construction contracts in order to reduce the number of procurements, create clearer lines of accountability, encourage more innovation at the design stage, and better link payments to performance. Such precedents have been used in other sectors, most notably in output-based aid contracts for infrastructure service access. However, this creates some challenges for the procurement process, namely: (i) defining the parameters of the project is

tricky, since the design has not yet taken place; (ii) developing binding cost proposals for bidders is difficult without knowing the exact level of investment, equipment needs, etc.; (iii) fairly and transparently evaluating vastly different financial bids can be complicated; and (iv) defining and measuring the outputs for determining payments becomes more challenging.

Countries that have used ESPCs have, of course, developed strategies and solutions to each of these issues. However, there is no one-size-fits-all solution. The first decision point may be to agree on the method of procurement to use, from which the other aspects will follow (Table 5B). While some of the approaches proposed can be done with existing bidding document templates, others may require some adjustments.

Additional Contractual Challenges

- **Defining the project.** A basic issue in the procurement of EE services relates to what is actually being procured. As noted earlier, ESPCs are a combination of goods, works, and services, so bidding documents need to be developed to allow for this. Additionally, the definition should be based on desired outputs, rather than prescriptive inputs, and include verifiable outputs on which payments would be based. WB guidelines require the establishment of key parameters that define the project in the bidding documents to ensure transparency in the subsequent evaluation of the bids. Bidding documents must, therefore, provide clear project objectives from which various approaches will be measured against, as well as outline a clear methodology for evaluating dissimilar bids. Some countries have relied on their upfront energy audit to prescribe the specific EE measures to be installed (most restrictive; Options 1–3, Table 5A). Others prescribe the systems to be retrofitted but not the technical solutions to be used. Some simply set a minimum set of mandatory EE measures while allowing bidders to propose additional measures. Still others specify a minimum level of energy savings and then allowing bidders to develop alternative ways to achieve the target level at the lowest cost (most flexible; Options 4–8, Table 5B).

- **Developing binding cost bids.** Ensuring that bidders can adequately develop binding cost bids before the project design has taken place is critical to a project's success. Under separate design and construction contracts, agencies can conduct in-depth upfront energy audits and then prescribe the project, making preparation of financial bids straightforward (Options 1–3, Table 5A). For combined design and construction schemes, bidding documents can either require bidders to offer full project designs during the bidding process (Options 5, 6, 8, Table 5B), request a best estimate to be confirmed after the IGA (Option 4, Table 5B), or develop unit costing with the exact design to be defined at the IGA stage (Option 7, Table 5B). Where basic facility information can be provided—such as facility function, age, energy use profile, equipment inventory, 18 to 24 months of billing data, etc.—it can greatly help bidders prepare bids within minimal upfront cost, allowing for innovation at the bidding stage, and better establish baselines from which the project outputs would be determined. Providing case studies of similar types of facilities, and their investment costs and energy savings, can also help bidders develop project cost estimates.

- **Bid evaluation.** Evaluating bids requires special attention to prevent bidders from "gaming the system" in order to maximize their scores. Picking the best overall bid must consider the evaluation of dissimilar bids, energy cost savings, and project investments. For technical evaluations, WB recommends a pass-fail criteria-based evaluation. In terms of the financial evaluation, use of a single indicator, such as net present value (NPV)[3], may be the most appropriate since it allows for various financial factors to be aggregated into one clear indicator. Use of NPV also helps to prevent "cream skimming" and can enhance transparency in bid evaluation.

- **Defining and measuring outputs.** Under an ESPC, payment to the ESP is based on the project performance. For "shared savings" ESPCs, where the ESP finances the project, the host facility is entitled to reduce the ESP payments when the savings fall below the agreed levels. For "guaranteed savings" contracts, where financing is provided from the host or third party, the ESP is required to reimburse the agency for any shortfall in the guaranteed savings. For WB-financed contracts, neither model can be used as defined. For example, it is difficult to finance long-term contracts given the relatively short WB project disbursement periods. Similarly, it is difficult to require ESPs to reimburse the host or WB for payments made under the "guaranteed savings" approach. For these reasons, the procurement options presented generally involve paying the ESP in full within one to two years, before the full energy savings have accrued. Some countries have considered using performance bonds or escrow accounts (for about 10% of the contract amount) to allow for some enforceable recourse should project performance deteriorate in outer years. Project M&V is also critical, as it forms the basis for making payments. Where project EE measures are relatively simple and the level of expertise limited, simpler methods, such as deemed savings[4] may be suitable. Where simpler approaches are not desirable or practical, developing proper baseline energy uses, developing clear measurement frequencies and methodologies, agreeing on factors that would change the baseline (e.g., changes in operating conditions, occupancy, addition of new equipment, etc.), deciding who measures and who pays for measurement, and outlining how disputes are handled should also be included in the M&V plan.

Because this represents a markedly new approach, a number of these options will have to be tested and tailored to individual countries/programs before successful precedents can be established. And, as noted earlier, the procurement options may be constrained by the project flow of funds and WB financing program designs (see "ESPC Financing"). Ongoing innovations in alternative procurement strategies for other types of PPPs may also lead to additional viable procurement methods applicable for ESPCs. A first generation of WB operations using various forms of ESPCs is now under development and results will be available and disseminated in the months ahead.[5]

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[3] WB procurement allows NPV as a criterion for goods but generally not for works.

[4] Deemed savings is a predetermined, validated estimate of energy savings attributable to an EE measure instead of through additional M&V activities. Under the deemed savings approach, the public agency and the ESP agree to a simplified savings calculation procedure and the savings are then "deemed" or calculated using this procedure. For less developed markets, use of deemed savings can greatly reduce M&V costs, although it shifts some of the actual project performance risk back to the public client.

[5] See, for example, the Armenia Electricity Supply Reliability and Energy Efficiency Project (concept note approved March 2010).

TABLE 5A | Preliminary Procurement Options for Public Sector EE Projects—Split Design & Construction Contracts

NO.	MODEL	DESCRIPTION
1.	Standard design & civil works (CW) contracts	Agency hires consultant to conduct an audit/project design, including technical specifications and bidding documents. Then procures a firm to supply and construct project. Payments are based on completion of project per design.
2.	Standard design w/ output-based CW contract and fixed payments	As with Option 1, an audit is completed. Then, bidding documents are developed based on EE output (e.g., minimum savings), allowing bidders to offer alternate designs. Evaluation would be based on (a) meeting minimum savings targets with technically feasible measures, and (b) lowest cost to achieve these savings. Payments would be based on delivery of project.
3.	Standard design w/ output-based CW contract and performance-based payments	As with Option 2, an audit is conducted and bidding documents developed based on EE outputs. Evaluation is based on lowest cost to feasibly achieve target. The bidding document must provide an M&V plan for how savings would be measured. Payments can be fully or partially based on verified savings, but would be done soon after commissioning (e.g., 60–80% at commissioning and the balance over 12–24 months).

TABLE 5B | Preliminary Procurement Options for Public Sector EE Projects—Combined Design & Construction Contracts

NO.	MODEL	DESCRIPTION
4.	Combined design and output-based CW contract w/ fixed payments	Unlike Options 1–3, there is no upfront design, only basic facility technical information is provided (e.g., building age, area/drawings, 12–24 months of energy bills, equipment inventory). Agency issues bidding documents to design and implement EE retrofits w/ output-based requirements. Bidders submit combined technical and financial bids, which are evaluated based on technical feasibility and lowest cost to achieve the savings target. First task is design, which must be approved by client before construction. Payments are based on verification of the project based on the approved design.
5.	Combined design and output-based CW contract w/ performance-based payments	Similar to Option 4, except financial evaluation is based on the highest project NPV and bidding documents include an M&V plan for how savings would be verified. Payments could be fully or partially performance-based, with the bulk soon after commissioning and the balance 12–24 months later.
6.	Two-Stage bidding w/ output-based CW and performance-based payments	Similar to Options 4 and 5, there is no upfront audit but basic facility technical information provided in the bidding documents, which require a minimum of energy savings. This allows bidders to submit unpriced technical level proposals first, after which the bidding documents can be refined before requesting final technical and financial bids. Final bids are evaluated based on their technical feasibility to meet the minimum savings, and lowest cost or NPV. Payments could be partially or fully based on project performance with suitable M&V plan.
7.	Cost-plus CW	Agency issues bidding documents with basic facility information and request bidders to provide their technical approach and unit costs/mark-ups for cost comparisons based on minimum level of energy savings. Evaluation would be lowest cost structures of technically qualified proposals. After detailed audit, the project costs are determined based on the bid unit costs. Payments would largely be based on delivery of the project with possible bonus/penalty for significant variations from minimum savings.
8.	Management services contract	As with Options 4 and 5, there is no audit but basic facility technical information provided in bidding documents, which specify desired outputs. Evaluation is based on minimum technical threshold; financial bids would be assessed based on highest NPV. Contract would have two phases: (i) IGA and (ii) project implementation and verification. Contract value could be amended after first phase. Payments would be based on the proposed payment schedule, but the principle defined in the biding documents would be from energy savings based on agreed M&V plan.

PROS	CONS
Simplest approach, which public agencies and bidders understand. Good competition for bid packages can be expected.	Split accountability means public agency assumes full project performance risk. Agencies have to do two procurements.
Allows for some innovation by the bidders while better linking contract awards with energy savings.	More complex bidding documents and evaluation process. Upfront audit can be redundant. Output-based bidding documents with input-based payments can create incentives for bidders to overpromise. No incentive for bidders to exceed minimum savings target. Agencies have to do two procurements.
Allows for innovation by bidders. Includes performance-based payments to shift risk to contractor and hold them accountable for their designs. Payments can shift from mostly fixed to performance-based over time, as bidders' experience improves and markets become more sophisticated.	Requires two procurements and no incentives for bidders to exceed minimum savings target. Bidders have to base their bid (and payments) in part on third party designs. Bid evaluation and M&V is more complex. Public agency assumes project performance risk in outer years.

PROS	CONS
Approach combines the design and construction tasks which improves accountability of project performance and allows bidders more ability to innovate. Involves single procurement.	No incentives for bidders to exceed minimum savings target. Bid evaluation is complex since there is no standard design upfront. Output-based bidding documents with input-based payments can lead bidders to overpromise.
Approach combines the design and construction tasks which improves accountability. Use of NPV allows bidders to innovate and provides incentive to maximize cost-effective savings. Involves single procurement.	Evaluation is complex. High bid preparation costs by bidders since there is no upfront project design. High risk to bidders to develop binding cost bids without detailed audit. Performance-based payments may make access to working capital more difficult. These may result in fewer qualified bids.
Approach combines the design and construction tasks which improves accountability and ability to innovate. First stage may lead to additional opportunities for energy savings not initially identified by the public agency. Involves single procurement.	Evaluation is complex and bidders have no incentive to exceed minimum savings. High bid preparation costs (since there is no upfront project design) and high risk to bidders to develop binding cost proposals without detailed audit; these may result in fewer responsive bids. Can take long time and may not be suitable for small projects.
Approach takes away much of the bidding risk from the firms by not requiring them to provide full project costs before the project has been designed. This can encourage firms to participate and result in lower risk premiums and lower overall project costs. Evaluation is more straightforward.	Cost structure comparisons may not yield lowest cost project since quantities of inputs is not known during evaluation. Payments are less performance-based which creates risk to agency and limits incentive for firms to exceed energy savings target.
Approach promotes maximum innovation, maximizes benefits to the public agency, shifts performance risk to the private sector, mobilizes commercial financing, etc. Involves single procurement.	Complex and requires long lead times to develop suitable bidding documents and process, train agency staff and prospective bidders. Transaction costs will be high. Not suited for small projects. Few bidders may qualify/participate.

ESPC FINANCING

Financing Models and Options

A critical aspect of ESPCs is the nature of project financing, which will have implications on the procurement type and method. Some governments may prefer to finance such projects on their own, especially if they are able to access lower cost financing than a commercial ESP. Examples include municipalities that can sometimes access low-cost (or tax-exempt) bonds, governments that can access long-term multilateral development bank or concessional donor loans, public revolving funds, DSM programs, etc. In other cases, governments may view ESPCs as an attractive mechanism precisely because they represent an alternate way for governments to finance EE projects off-budget. Despite the attractiveness of the latter option, the ability for ESPs, particularly local firms in developing countries, to actually mobilize financing on their own balance sheets can be limited. A range of financing options should be carefully assessed and the one(s) most likely to succeed in a given market developed should be further developed. The selected financing scheme then must be clearly presented in the bidding documents.

For WB-financed projects, there are a number of plausible options for ESPC financing (Table 6 and Figure 6). A brief discussion of these alternatives is presented below.

- **Credit lines.** By far the most common option, used extensively by the WB, is to establish a credit line either through a development or commercial bank. The bank then uses the loan proceeds to provide many subloans to eligible borrowers for EE projects, which can be in the public or private sectors. Credit lines may offer a range of products, such as on-balance sheet financing, working capital loans to ESPs, project financing (against future energy savings cash flow), or project refinancing—that is, the purchase of ESP project receivables from completed projects (also known as factoring or forfeiting). Where the sub-borrower is private—either a private client or ESP—the WB requires that acceptable commercial practices (CP) be used for the procurement of goods and services. For public sub-borrowers, local public procurement rules typically apply.

- **Credit Guarantees.** Where sufficient liquidity in the market exists, the WB has sought to leverage commercial financing for EE projects, including ESPCs, using partial credit or risk guarantees—often using GEF grants. Such an approach has been used where the perceived risks for EE and ESPC projects are high, the target market has greater credit risks (e.g., small and medium enterprises or SMEs, housing cooperatives), or the credit market terms (loan tenors, collateral requirements) make EE projects unattractive. These are usually administered by commercial banks, but in some cases were done through a development bank, guarantee company, or other qualified institution. Since WB funds are used to cover defaults or other losses, and not finance projects directly, WB procurement has not applied.

- **Public ESPs.** Another option is to lend directly to a public ESP for financing a portfolio of subprojects. The public ESP or public ESCO model has been more commonly used in recent years, with some form of public ESP now in about a dozen countries (Table 3). As noted in "Procuring Energy Efficiency Services," because public sector clients and the ESP are both publicly owned, no competitive procurement is usually required.

FIGURE 6 | Decision Tree for Public EE Financing Options

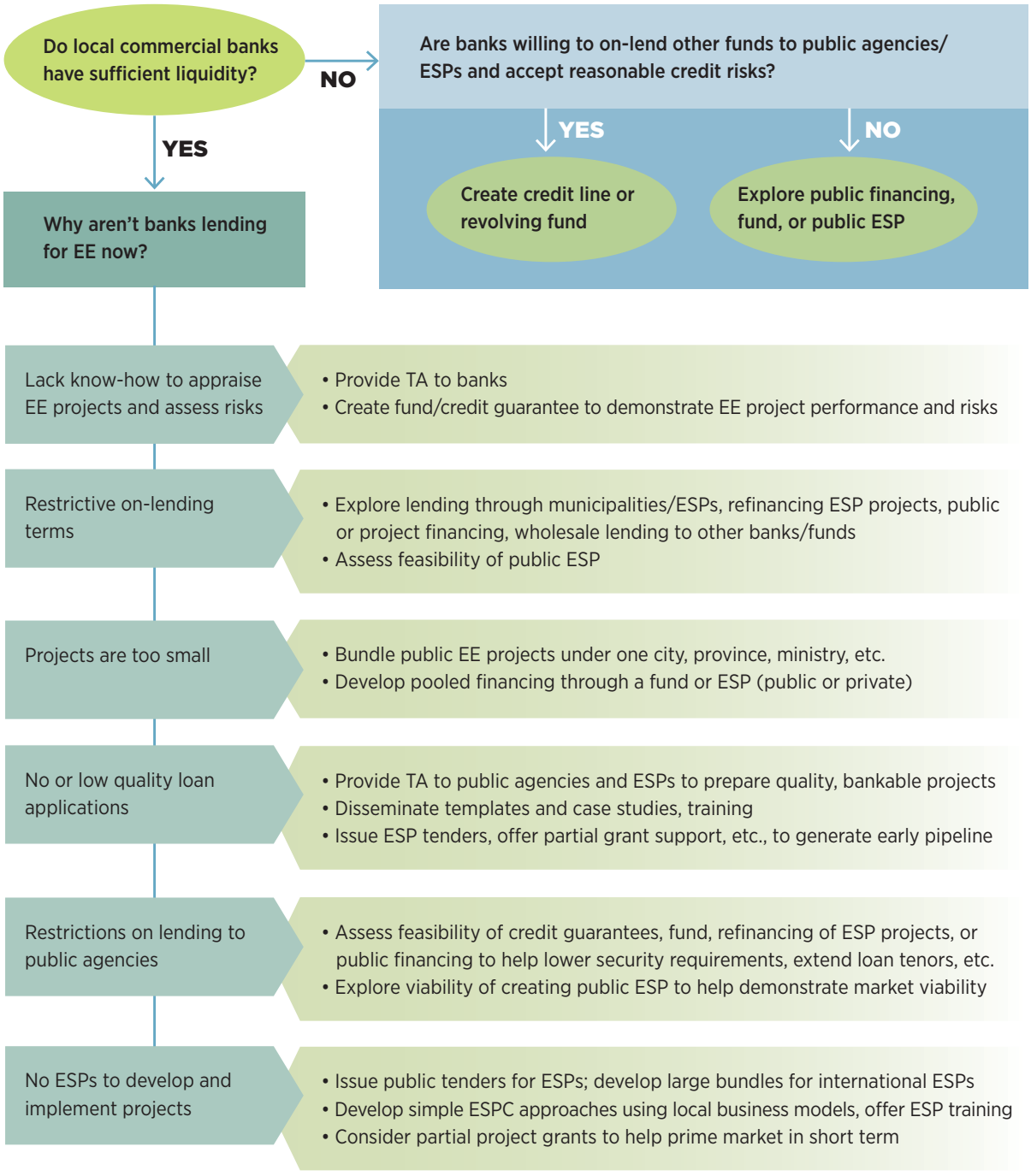


TABLE 6 | Financing Options for ESPC Projects under WB Projects

FINANCING MECHANISM	MARKET CONDITIONS	EXAMPLES
Credit lines	• Many small subprojects in the public and private sectors • Good banking partners willing to lend and assume risks • ESPs exist in market to provide basic services • Liquidity is an issue	India Renewable Energy II (1998) China EE Financing I & II (2006, 2010) Turkey Private Sector RE & EE (2009) Tunisia EE (2009)
Credit guarantees	• Many small subprojects in the public and private sectors • Good banking partners willing to lend and share risks • ESPs exist in market to provide basic services • Liquidity is not an issue	China Energy Conservation II (2002) Philippines Electric Cooperative System Loss Reduction (2004) Tunisia EE Program/Industrial Sector (2004) ***Other projects*** IFC Hungary Commercial EE Financing (1997) IFC CEEF (2002) IFC China Utility-based EE Finance (2006)
Public ESPs	• No local ESPs willing or able to serve public sector clients or finance • Traditional on-balance sheet financing insufficient to develop EE market • Public procurement rules make hiring of ESP problematic • Credible public entity exists with demonstrated capacity to service public sector, take on debt, and capacity to subcontract and manage subprojects	China Energy Conservation (1998) Croatia EE (2003) Poland EE (2004) China Shandong EE (2011)—proposed ***Other projects*** EBRD Ukraine ESCO Financing (1998) ADB Philippines EE—EC2 (2009)
Funds	• Many small subprojects • Local commercial banks unable or unwilling to enter into EE market • ESPs exist in market and willing to provide basic services • Some subproject cofinancing is available • Credible and proactive fund managers can be recruited	Bulgaria EE (2005) India Tamil Nadu Urban Development II (1999) Romania EE (2002) Uruguay EE (2004) Armenia Electricity Supply Reliability and EE (2011)—proposed
Public financing	• Target market is public sector only • Credible ESPs willing and able to bid on bundled packages and access working capital • Public budgeting and financing allow for such project financing and repayments	Ukraine Kiev Public Buildings EE (1999)
Project financing	• Large, credible local and/or international ESPs able and willing to bid on bundled package • Strong central public entity able to bundle and organize subprojects • Relatively homogeneous bundles of facilities exist and willing to undertake project	WB projects (none) ***Other projects*** IFC Hungary OTP Sub-Sovereign Schools EE (2006)

	PROS	CONS
	Relatively straightforward to prepare and only a small portion of projects need to be identified upfront; allows for flexibility of financing structures and procurement methods.	Relies on banking partners and existing market to identify and prepare projects, which may not be enough to catalyze market; ESPs take time to develop; developing ongoing robust pipeline has been difficult; partnering with one bank can inhibit competition; banks prefer on-balance sheet loans to creditworthy customers making development of new markets more difficult.
	Relatively straightforward to prepare and only a small portion of projects need to be identified upfront; allows for maximum flexibility of financing structures and procurement methods; leverages local commercial financing; can result in more sustainable, competitive	Guarantees to cover nonpayment of public entities can create moral hazard; requires proper risk sharing that some banks may not be willing to accept; ESPs take time to develop; developing ongoing robust pipeline has been difficult.
	Can eliminate public procurement issues and reduce transactions costs; more easily channel WB/public financing ESPC projects, potentially allow for more bundling of projects and equipment procurement; can proactively drive market; can help foster commercial ESPs through subcontracting.	Public ESCO can be monopolistic and may be subject to public sector bureaucracies (procurement, staffing, budgeting); some appropriate exit strategy for the public ESCO may be needed if private ESPs wish to enter the market.
	Can provide more flexibility than credit line if guarantees, mezzanine financing are allowed; can piggy back on existing development fund; fund may be able to bundle public projects and procure ESPs directly; can incentivize fund manager to target underdeveloped markets.	Creation of new fund requires governance structure, staffing, business plan, etc., which can take time; relies on fund manager/ partners to identify and prepare projects, which may not be enough to catalyze market; developing ongoing robust pipeline has been difficult; fund can act monopolistic.
	Scheme overcomes the critical hurdle of ESPs inability to take on large debt with public third party financing; WB-backed contracts can help reduce perceived contractual risks by international ESPs.	Value-added of WB financing of ESPC directly may be limited; under alternate schemes, ESP is required to use WB procurement rules, which can discourage equipment suppliers from bidding, or offering full performance guarantees; enforcement of guaranteed savings contract would be more problematic.
	No need for business and investment plans, pipeline development, ongoing TA, etc., as there is only one transaction; transaction costs will be low given the large project size; options for bulk equipment procurement, sampling of audits/ M&V, etc., exist to further reduce project costs.	Project size must be large, which makes transaction more risky; few ESPs may have capacity and ability to bid; requires coordination across many agencies to work; WB processing more complex with risks of delays (from appraisal to effectiveness) once procurement is completed.

In these cases, however, goods and services (e.g., equipment, engineering and audit services, installation subcontracts) procured by the public ESP receiving the WB loan are subject to WB procurement rules. Typically, this has meant use of international competitive bidding (ICB) for larger procurements; national competitive bidding (NCB); international and national shopping for medium-sized procurements; and CP for small procurements.[6]

- **Funds.** Where banks are not desirable or feasible, another option is to channel WB financing through special funds, which can include special purpose funds (Bulgaria, Romania, Uruguay), municipal development funds (Tamil Nadu, West Bank), public revolving funds (Armenia), etc. This is more common when the primary beneficiaries are public or seek to serve a market underserved by traditional commercial financial institutions (e.g., schools, municipalities, SMEs). Funds can be publicly or privately managed, often with performance-based fee structures, and sometimes have both public and private capital sources. When they target private borrowers, CP generally applies. However, for public sub-borrowers, WB procurement rules apply. Use of some of the procurement and contracting options presented in "World Bank Procurement" may be required.

- **Public Financing.** Another option involves WB lending to a public entity, such as the Ministry of Finance (MOF) or a municipality directly.[7] Under this scenario, the ESP can either be required to mobilize financing or not. In the former case, the ESP would mobilize its own financing and implement the project. The public client could then use the WB loan proceeds to cover the ESPC payments. The ESP would still be required to conduct M&V to justify payments.[8] Since the host facility's energy savings would not be used to pay the ESP, these funds could be held back by the MOF to eventually repay the WB loan or used to create a revolving fund to finance additional public sector ESPC projects. Another option is to use the WB loan to make accelerated payments to the ESP (perhaps a 60-80% payment upon commissioning and the rest over 12–24 months), and then use the energy savings stream to repay MOF (Option 5, Table 5B).

  If ESP financing is not deemed necessary or feasible, then the proceeds of the WB loan can be used to actually finance the project with the ESP providing a savings guarantee, where they assure the client that the savings will be sufficient to service debt repayment obligations. However, as noted earlier, in practice this can be difficult to enforce since most public contracts (including those of the WB) do not include provisions for contractors to reimburse public clients for poor performance (although some form of bank guarantees, trust/escrow accounts, performance bonds, etc., may help address

[6] Thresholds for these vary. For China Energy Conservation, ICB was required for contracts over US$ 2 million, NCB for contracts under US$ 1 million, and shopping for the rest (with aggregate thresholds). Under Poland and Croatia EE Projects, ICB was required for contracts over US$ 350k and CP for smaller contracts (with an aggregate threshold). However, this was revised for the Croatia project during supervision to allow for CP under US$ 750k with the aggregate threshold removed.

[7] One approach now being considered in Macedonia involves "budget capture," where MOF borrows funds, provides funding for EE improvements through annual municipal budget provisions, and then captures the repayments (from energy cost savings) in future budget allocations.

[8] Such a scheme does raise questions about the value-added of the WB loan, since the creation of an energy savings stream would allow the agency to make payments to the ESPC. However, many ESPs, particularly international ones, may be more willing to enter into medium-term contracts with WB backing (alleviating concerns over contractual, political, or other risks). Further, many public entities may not be capable of entering into such complex contracts on their own or local procurement rules may not allow for such contracting options.

such issues). In such cases, a few options exist: (i) the ESP designs the project and serves as a procurement agent on behalf of the municipality using the WB loan; (ii) the municipality uses a cost-plus arrangement where the ESP is reimbursed for their expenses (Option 7, Table 5B); (iii) the ESP is hired under a guaranteed savings contract, where the client has the ability to assess penalties for underperformance; or (iv) the ESP is hired under a management services contract with the ability to be reimbursed periodically for procurements from the proceeds of the WB loan (Option 8, Table 5B). In these cases, any procurement requirements for the selected ESP must be noted clearly in the bidding documents.

- **Project Financing.** Another approach is to finance a large ESPC project directly. For example, if a municipality planned to retrofit a large bundle of buildings, say 100 to 200, then the entire project could be bid out under a single tender using ICB, and the WB proceeds used to finance the contract. Such a transaction would only be appropriate for large contracts, but may be attractive for smaller countries where no local ESP markets exist. Under such a scheme, the borrower may be the national or municipal government.

The choice of financing mechanism, of course, depends on many factors, including the country context, state of the ESP and credit markets, institutional capabilities, subproject needs, business models, procurement restrictions, etc. Deciding on the most suitable mechanism should be based on a holistic market analysis, identification of key barriers, and stakeholder

dialogue. Where possible, partner financial institutions should be selected competitively to ensure strong commitment and suitable terms. Such programs should also be flexible to allow a greater variety of financing schemes (i.e., loans to ESPs, clients, project finance, leases, etc.). And, project bundling can greatly help lower transaction costs while ensuring strong disbursement and utilization rates.

GETTING STARTED

Before one becomes too involved in the details of the procurement or financing schemes, it is advised to get a solid understanding of the market and its failures, assess institutional capabilities and needs, and identify other opportunities and constraints. Identifying viable business and contractual models for ESPs to operate in a particular country or region should be done before any complex financing and procurement schemes are contemplated. Early consultations with procurement staff, both WB and local staff, is also important to help formulate coherent strategies. It is advisable to begin with simpler models first and develop more complex transactions as the market develops. Familiarity with ESPC models developed in OECD countries can be important in understanding the range of options but those models need to be carefully adapted to work in developing countries. Where local ESPC experience exists, it may be prudent to build on successful transactions and institutionalize those aspects that have worked well. It may also be worth considering efforts to bundle projects to reduce transactions costs and make such projects more attractive to larger ESPs.

In addition, assessing the relative capacities of the ESP industry and public agency staff is critical to ensure success. The level of sophistication of ESPCs, the ability of local firms to access and provide financing, and the willingness of local firms to assume project risks and other factors must be evaluated. Efforts should be devoted to developing incremental adjustments to existing procedures and practices, rather than seeking broad changes to local laws and regulations. Some key steps to consider include:

1. Conduct an ***upfront market survey*** of ESPs to gauge their level of interest in serving the public sector market, their capacity to offer various services (e.g., design and construction, financing, performance guarantees), and their technical capabilities. Also assess public agency needs and abilities for complex contracting and accessing financing (i.e., creditworthiness).

2. Hold ***stakeholder consultations*** to analyze barriers, assess the types of constraints expected in public procurement of ESPCs, and define the nature and relative priority of the main barriers. Stakeholders should include public officers (budgeting, procurement, technical, legal), prospective ESPs, financiers, etc.

3. Formulate a ***list of options*** for surmounting each of the main barriers, as an approach to developing possible road maps to navigate the procurement process. Consider simple approaches first, such as one-year contracts, fixed payments with bonuses, simpler technical systems (e.g., lighting), etc.

4. Once procurement plans are developed, ***test small procurements,*** documenting all the challenges faced, and work collectively to refine the procurement process. Projects may need to allow for alternate procurement options to be tested in order to assess which

ones are most effective at meeting the project objectives.

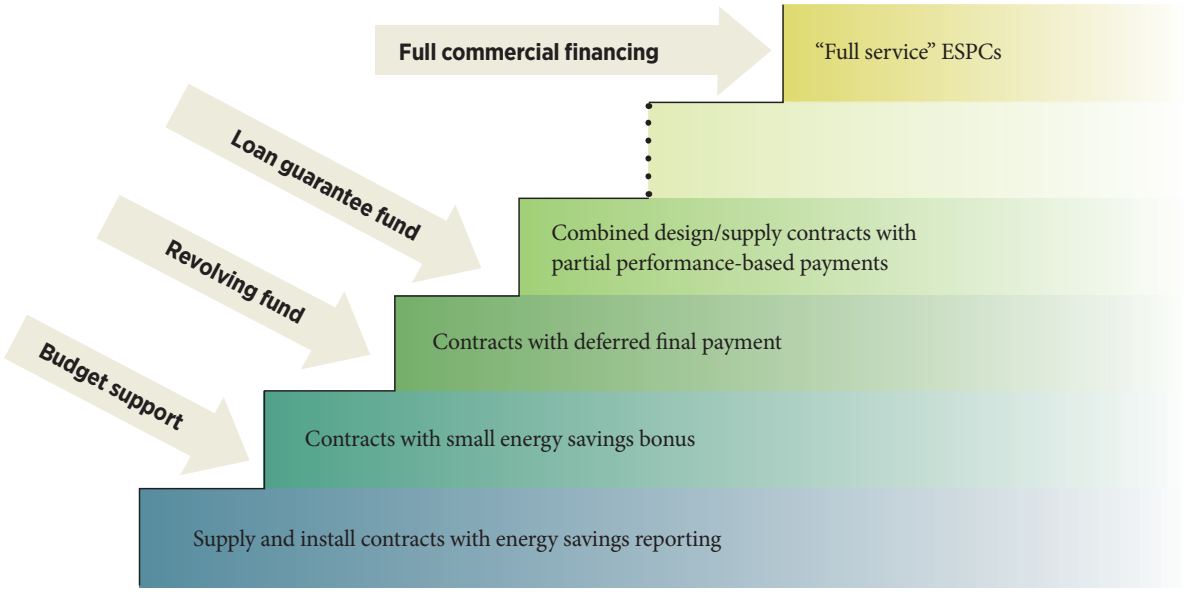
5. Efforts should then be made to ***expand and replicate*** successful schemes, seeking options to scale up by broadening the range of target systems and bundling of facilities together.

6. As successful models are validated, ***institutionalize systems*** by developing model templates and documents, aggressively disseminating results, seeking longer term changes to public procurement and budgeting systems, creating incentive schemes and financing programs, instituting ESP prequalification/certification, and setting targets and outlining M&V frameworks.

As simple schemes are implemented and yield results, the program can develop a systematic approach to market evolution—moving to more sophisticated models, larger bundles, increasing commercial leverage, etc. In such a way, the market can be developed through a series of incremental enhancements (Figure 7).

As the public sector market thrives, ESPC models developed and promoted in the public sector are likely to have significant ripple effects in the private sector, as private firms observe what the public sector is doing, and participating ESPs enhance their capabilities and begin to market their services to other sectors. While private sector models may ultimately determine their own paths, the precedents and expertise established in the public sector will be critical to help foster a sustainable ESP industry that is capable of serving the entire market and delivering scalable EE gains in the years ahead.

FIGURE 7 | Building the Market—Step by Step



ACRONYMS AND ABBREVIATIONS

€	Euro
BTU	British thermal unit
CCS	carbon capture and storage
CO_2e	carbon dioxide equivalent
CP	commercial practices
CTF	Clean Technology Fund
CW	civil works
DSM	demand-side management
EE	energy efficiency
ESP	energy service provider
ESPC	energy savings performance contract
ETP	*Energy Technology Perspectives* (IEA publication)
FBI	Federal Building Initiative (Canada)
FEMP	Federal Energy Management Program (United States)
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
Gt	gigatonne
IBRD	International Bank for Reconstruction and Development
ICB	international competitive bidding
IDA	International Development Association
IEA	International Energy Agency
IFC	International Finance Corporation
IGA	investment grade audit
IQC	inadequate quantity contract
IRR	internal rate of return
Kt	kilotonnes
M&V	measurement and verification
MOF	Ministry of Finance
Mt	million tonnes
Mtoe	million tonnes of oil equivalent
NCB	national competitive bidding
NPV	net present value
OECD	Organisation for Economic Co-operation and Development
O&M	operations and maintenance
OTP	Országos Takarékpénztár Bank (Hungary)
PICO	public internal performance contracting
ppm	parts per million
PPP	public-private partnership
RFP	request for proposal
SME	small and medium enterprise
TA	technical assistance
US$	United States dollar
WB	World Bank
WEO	*World Energy Outlook* (IEA publication)

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ESMAP
Energy Sector Management Assistance Program
The World Bank
1818 H Street, NW
Washington, DC 20433 USA
email: esmap@worldbank.org
web: www.esmap.org