ESCO Development
Around the World

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What is an ESPC?

• An energy savings performance contract (ESPC) is a contracting mechanism to implement EE projects on turn-key basis – i.e., design, equipment procurement, construction/installation, and savings verification.

• Optional services include financing, operations and maintenance (O&M), training, etc.

• Usually, compensation is tied to actual energy savings from the client or ‘host facility’.

• Allows host facilities with limited capital to pay for EE upgrades from future energy savings, while mobilizing private capital and sharing of project performance risks.

• ESPCs are generally carried out by energy service companies (ESCOs), or energy service providers (ESPs).
Barriers to Energy Efficiency Investments

Policy/Regulatory
- Energy pricing and collections
- Procurement policies favor lowest cost
- Import duties on EE equipment
- Unclear or underdeveloped institutional framework for EE
- Lack of appliance standards and building EE codes, lack of testing, poor enforcement

Equipment/Service Providers
- High project development costs
- Limited demand for EE goods/svcs
- Diffuse/diverse markets
- New contractual mechanisms (ESCOs)
- Limited technical, business, risk mgmt skills
- Limited financing/equity

End User
- Lack of awareness of EE and high disc rates
- Higher project dev and upfront costs
- Ability/willingness to pay incremental cost
- Low EE benefits relative to other costs
- Perceived risks of new tech/systems
- Concept of energy savings is “virtual” – can not “see”
- Mixed incentives
- Behavioral biases
- Lack of credible data

Financiers
- New technologies and contractual mechanisms
- Small sizes/dispersed widely→high transaction costs
- High perceived risks as these are not traditional, asset-based proj
- Other higher return, low risk projects are more attractive
- Behavioral biases
# How ESPCs can help

<table>
<thead>
<tr>
<th>Barriers</th>
<th>ESPCs can…</th>
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<tr>
<td>High perceived risks</td>
<td>better define the benefits/costs upfront, assign some project risks away from the client and financier</td>
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<td>Low interest in energy savings</td>
<td>allow for equipment renewal and plant modernization, increasing competitiveness and output quality, often under simplified turn-key arrangement</td>
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<td>Limited budget for capital upgrades</td>
<td>facilitate project financing, usually with repayments derived from project savings allowing positive cashflow throughout</td>
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<td>Small projects with high project development/transaction costs</td>
<td>allow smaller projects to be bundled, streamline audits/M&amp;V for similar types of facilities, reduces hassle factor for clients</td>
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<td>Inadequate information and technical know-how</td>
<td>solicit technically competent private sector firms to compete based on their qualifications, experience and best project ideas</td>
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Energy savings from ESPCs

Investment in Energy Saving Project

Baseline Energy Bill

Customer Savings
Payments to ESP
Financing Payments

Reduced Energy Bill

Customer Savings
Reduced Energy Bill

Before During After
## Results of ESPCs in select countries

**[Public Sector only]**

<table>
<thead>
<tr>
<th>Country</th>
<th>Market Size</th>
<th>Results</th>
<th>Projects</th>
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<tr>
<td>United States</td>
<td>US$3.8 billion</td>
<td>- 18 trillion BTU/yr (2006)</td>
<td>460 ESPC projects</td>
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<tr>
<td>(FEMP)</td>
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<td>- US$7.1 billion energy cost savings</td>
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<tr>
<td>Canada</td>
<td>Can$320 million</td>
<td>- 20% energy intensity reduction</td>
<td>85 EPC projects (7,500+ buildings)</td>
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<tr>
<td>(FBI)</td>
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<td>- Can$40 million energy cost savings</td>
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<tr>
<td></td>
<td></td>
<td>- 285 kt CO$_2$ reduction</td>
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<tr>
<td>Germany</td>
<td>~€200 million</td>
<td>- 20-30% energy cost reduction</td>
<td>2,000 properties</td>
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<td></td>
<td></td>
<td>- €30-45 million energy cost savings</td>
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<tr>
<td>Japan</td>
<td>~10 billion yen</td>
<td>- 12% reduction energy intensity</td>
<td>50 ESPC projects in FY06</td>
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<td>- 265kt of CO$_2$ reduction</td>
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<tr>
<td>South Korea</td>
<td>US$185 million</td>
<td>n/a</td>
<td>~1,400 public ESCO projects</td>
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**Source:** ESMAP, Public Procurement of Energy Efficiency Services – Getting Started. 2010.
# ESPCs in selected developing countries

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>Initiation</th>
<th>No. of ESPs</th>
<th>Characteristics</th>
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</table>
| China            | 1998       | > 500       | - World Bank support  
                              - Mostly Guaranteed Savings  
                              - Focus on industry          |
| India            | 1995       | > 120       | - Strong accreditation scheme  
                              - High growth in recent years  
                              - Focus on buildings and industry |
| Thailand         | 1999       | 45          | - Government funding support  
                              - Focus on both industry & buildings  
                              - Guaranteed and Shared Savings |
| South Africa     | 2004       | > 100       | - Financing from Eskom  
                              - Focus on both industry & buildings  
                              - Standard Offers/Standard Products |
| Czech Republic   | 1994       | 15          | - Government and donor funds  
                              - Focus on public sector  
                              - Guaranteed savings most common |

Traditional ESCO financing

Shared Savings Model

Financial institution

Loan

Repayment from portion of savings share

Project development, financing, and implementation

End user

Payment based on savings share

Guaranteed Savings Model

Financial institution

Loan

Repayment with funds according to ESPC

Arrange financing

End user

Project development and implementation

Payment for services according to ESPC

Savings guarantee

Western ESPC models hard to replicate

• ESPCs are complex, requiring strong legal, financial, accounting, business infrastructure
• ESPs must be very technically competent, have strong financial expertise, developed risk management experience
• Typical ESPC models are problematic:
  – *Shared savings* is attractive to public entities but require ESCOs with large balance sheets able to take performance and credit risks (and it can be expensive)
  – *Guaranteed savings* rely on ESCO performance guarantees being credible with a balance sheet to back it up
• Except for public and utility-based ESCOs, few ESCOs have been able to use either model
What about performance guarantees?

• ESPCs are based on enforceable performance guarantee (PG) but…
  – Legal framework to enforce PGs are underdeveloped
  – Complex M&V make PG more difficult to enforce
  – Value of PG diminishes over contract period (highest before commissioning)

• Shared savings is desired by public entities since the PG is imbedded in repayment to ESP, but this requires ESP financing

• **Solution:** contractual model where partial payments are tied to performance, ESP does not have to finance, and M&V is simple (e.g., deemed savings)
Simpler options exist...

1. Leasing (or supplier credit)

**Commercial bank**

- Portfolio loan, factoring

**ESP**

- EE equipment lease

**Client**

- Lease payments made from energy savings

**Benefits:**

- Equipment leased without requirements for equity or additional collateral
- Client maintains positive cashflow throughout
- No changes in legal or financial frameworks required
Simpler options exist...

2. One-year ESPCs

Loan disbursements:
- 10% at contract signing
- 60-70% upon successful commissioning
- Balance after 6-12 months

Turn-key contract is performed

Commercial bank

Loan agreement

- Repayment from energy savings

Comments:
- Allows ESP to receive payment based on project performance
- Allows banks to finance projects with creditworthy clients
- Clients can request extended equipment warranties, performance bond for outer years
- Client maintains positive cashflow throughout project
ESCO business models

- **Full service ESCOs** design, implement, verify and get paid from actual energy saved (aka “Shared Savings”)
- **Energy supply contracting**, take over equipment O&M and sell output at fixed unit price (aka “Chauffage”, “Outsourcing”, “Contract Energy Management”)
- **ESCOs w/third party financing**, design/implement project, and guarantee minimum level of savings (aka “Guaranteed Savings”)
- **ESCOs w/variable term contract**, act as full service ESCO, but contract term varies based on actual savings (e.g., “First Out Contract”)
- **ESCOs w/1-year contract**, design/implement project, receives 60-70% of payment upon successful commissioning and the rest within 6-12 months
- **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)
- **Consultant w/fixed payments**, where consultant helps the client design and implement the project, offers advice and receives a fixed lump-sum fee

*Source: ESMAP, 2010*
Private sector financing of ESCOs

- Commercial bank financing, including credit lines (TurSEFF, AfD, Private Sector RE/EE, SME EE)
- Guarantee programs for small and medium size industries (SME EE)
- Vendor credit and leasing programs
- Facilitating energy service companies and ESPCs (SME EE, EU-IPA)
Public EE financing schemes

- Advanced commercial or project financing (ESCOs)
  - Vendor credit, leasing
  - Commercial financing, bonds
  - Partial risk guarantees
- Credit line with commercial bank(s)
- Credit line with municipal (development) bank
- Public ESCOs
- EE revolving funds
- Utility (on-bill) financing
- MOF financing w/ budget capture
- Budget financing, grants w/ co-financing
- Grants
Other strategies to foster ESPs

• Create small incentive schemes for using ESPCs (to help cover early transaction costs)
• Issue tenders from the public sector
• Performance-based pipeline development and partnerships with banks
• Creation of public/super ESCOs, ESCO agents
• DSM bidding through power regulators and utilities
• Creation of ESCO associations
• Standardized ESCO bidding documents, contracts, M&V protocols
• Government education of ESPC concept to clients
What have we learned?

- ESPC development require a *long-term, dedicated focus*
- Western models can be reference points, but must be *adapt to local markets* and evolve over time
- Holistic *market assessments* are critical to assess public agency needs and ESP capabilities
- Public regulatory/procedural barriers (procurement, budgeting, financing) require *substantial consultations* to be resolved
- Commercial financing may not be practical upfront; *public financing schemes* can develop foundation for banks later on
- Programs should be *flexible*; standardizing contracts and procedures too early may inhibit innovation
- *Develop and test* pilot schemes, *revise and adjust* as needed, *replicate and institutionalize* successful schemes
Building the ESPC market in Turkey

Small equipment supply contracts using leasing/supplier credit with bonus for meeting energy savings target

Combination of smaller shared savings and some guaranteed savings contracts

Contracts with some recourse in outer years, deferred final payment

One-year contracts with bulk of payment held until detailed commissioning

Small equipment supply contracts using leasing/supplier credit with bonus for meeting energy savings target

Full commercial financing

“Full service” ESPCs

Loan guarantee fund

Credit lines

Concessional loans
Thank you

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