REPORT

Developing Model ESCO Performance Contracts (EPCs) for Industrial Projects

Alliance for an Energy Efficient Economy™

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Guide to Performance Contracting in India

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MODIFYING THE MODEL CONTRACT

The model EPC can be used in its current form for executing most energy performance contract projects. However due to the unique nature of each project, the contract must be fully negotiated between the parties and that these negotiations may lead to modification of the contract. AEEE recommends that while negotiated changes are being made to the document, it is to be done in reference to the schedule attached to the contract. Some common issues that might be the subject of negotiation include: Third party financing; Performance guarantee; Baseline adjustment; and Measurement and Verification (M&V)

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Alliance for an Energy Efficient Economy
New Delhi

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ABBREVIATIONS

AEA - Accredited Energy Auditor

AEEE - Alliance for an Energy Efficient Economy

BEE - Bureau of Energy Efficiency

CRISIL - Credit Rating Information Services of India Limited

DC - Designated Consumers

DPR – Detailed Project Report

EA – Energy Auditor

EC Act - Energy Conservation Act, 2001

EE - Energy Efficiency

EESL - Energy Efficiency Services Limited

EOI – Expression of Interest

EPC – Energy Performance Contract

FEED - Framework for Energy Efficient Economic Development

ICRA - Investment Information and Credit Rating Agency

IREDA- Indian Renewable Energy Development Agency Ltd

M&V - Measurement and Verification

MOP – Ministry of Power

MW - Mega Watts

O&M - Operations and Maintenance

PRGF - Partial Risk Guarantee Fund

PAT - Perform Achieve Trade

RFP – Request for Proposal

SDAs - State Designated Agencies

SMEs - Small and Medium Enterprises

SSEF - Shakti Sustainable Energy Foundation

VCFEE- Venture Capital Fund for Energy Efficiency

EXECUTIVE SUMMARY

In an urge to embark upon the sustainable development and pursue the plans for climate change mitigation, India has identified energy efficiency (EE) as a key component of the strategy. Energy Service Companies (ESCOs) provide attractive options for companies willing to undertake EE projects. However, in the Indian context, ESCOs have not been able to tap into this potential and deliver savings to the companies. Several reports have examined the issues. The absence of credible experiences in success stories for large scale replications, lack of credible M&V tools which build confidence in client relationships, lack of credibility in existing mechanisms for dispute resolution, and demonstration of technology expertise are identified as key constraints.[1] Furthermore, the absence of policy support, favourable legal framework, limited financing have constituted major barriers and could have defeated young and emerging ESCO companies.[2]

Based on the findings of these reports and to foster the development of the ESCO Industry, AEEE has developed a set of documents – a standard Energy Performance Contract (EPC) document and a Measurement & Verification template. The aim of this standard performance contract is to provide a consistent basis to negotiate an energy performance contract between the customer and the ESCO. The document provides a mechanism intended to cover the rights and obligations of both parties for implementing an energy performance contract. The M&V planning template has been developed to assist M&V planners incorporate the various design elements.

EPC being a relatively new methodology in India, developing a standard set of documents will help customers work through the contracting process with the least amount of difficulty. The document can be suitably negotiated and modified to adapt to the needs and requirements of the individual projects.

AEEE has worked on some key areas by assisting ESCOs through capacity building, preparation of agreements and assisting in third party financing, as per the requirements of the project. The report builds on and summarizes the first results of ESCO projects, both ongoing and completed. It gives a step-wise methodology for developing performance contracts, highlighting key challenges and barriers for EPC contracting and how these issues can be addressed; by running through the project development process, and showcasing examples and tips in the preparation of successful performance contract documents. Based on the review and the analysis, areas of activity are identified and indication is given as to what action is likely to foster the further development of ESCOs in India. The typical challenges faced and reasons for non execution or delay in executing these projects have been mentioned in detail as part of the *Key Learnings* of this report.

[1] India manual for the development of municipal Energy Efficiency Projects" (2008) and "India Energy Efficiency Indicator 2010."
[2] International Finance Corporation- IFC Energy Service Company Market Analysis

AEEE's study of the ESCO market scenario in India indicates that the following recommendations can help support the successful growth of ESCOs in the use of EPCs for energy efficiency improvements:[3]

1. Project Level:

A. Focus of building technology specific expertise for the various services.
B. Document and follow a M&V plan in consultation with the client to eliminate ambiguities during the course of the project
C. Prompt decision making for an EPC - as soon as the audit report is shared as baselines may vary beyond a period of six months
D. Encourage execution of performance contracts after obtaining energy audit reports.

2. Finance Level:

A. Introduce project based financing packages for small value EPC projects
B. Undertake capacity building of employees for better understanding of EE projects and develop a project evaluation criteria for provision of loans for EE projects
C. Use of Performance risk guarantees for leveraging EE funds
D. Extend use of Venture Capital Funds for investments in the private sector

3. Policy Level

A. Use State Energy Conservation Funds (SECF) for partial investments in ESCO projects with time-bound payment terms
B. Create incentives for EPCs:
   - ESCOs should be exempted from the payment of tax for the revenue generated from EPC projects until the market matures.
   - Introduce third-party EE validators for EPC projects.
   - Exemptions in income tax for EPC projects
   - Develop standardized M&V plans for various types of projects
C. Create incentives for Negawatts production at par with incentives for power generation
D. Strengthen the process of accreditation of ESCOs

[3] These recommendations are based on AEEE's learning's through the project and valuable inputs received from Dr Satish Kumar, Dr Bhaskar Natarajan, and various practising ESCOs.

1. INTRODUCTION

1.1. Energy Service Companies (ESCO's) and Performance Contracts

Definitions for Energy Service Companies (ESCOs) vary from country to country. An ESCO is a professional services business providing a broad range of comprehensive energy efficient solutions, including design and implementation of energy savings projects, energy infrastructure outsourcing and risk management. ESCOs perform in-depth analyses of physical properties, design energy efficient solutions, install proper equipments, and maintain the systems to ensure energy savings.

The Bureau of Energy Efficiency (BEE), Ministry of Power (MOP), India defines ESCOs as an organization engaged in a performance based contract with a client firm to implement measures which reduce energy consumption and costs in a technically and financially viable manner[4].The Bureau of Energy Efficiency has taken certain necessary steps to encourage the supply of performance-contract based energy-efficiency enhancement services through Energy Service Companies (ESCOs) in India. An accreditation exercise of ESCOs, in terms of success in implementation of energy efficiency projects, ability of technical man-power, and financial strength to invest in such projects, was carried out by CRISIL and ICRA[5], with technical and financial support of BEE[6]

Organizations wishing to improve their energy efficiency and reduce energy related costs usually engage energy consultants to conduct an energy survey to identify energy saving opportunities. ESCOs are usually differentiated from other firms that offer energy efficiency improvement or energy services, such as consulting firms and equipment suppliers, by the concept of performance-based contracting, this means that the ESCO's payment is directly linked to the amount of energy saved (in physical/material or monetary terms).

The two commonly observed classifications of ESCOs are vendor-driven ESCOs, who use their own technology/products for implementation of energy improvement measures, and general ESCOs, who are product-neutral. As commonly observed in other countries, the Indian ESCO industry is also dominated by vendor-based ESCOs.

Energy Service Companies (ESCOs): A for Profit Commercial Entity

ESCOs are profitable commercial entities and provide a range of services and look to derive profits from the amount of energy saved. Although the **ESCO business** is **profitable**, it also involves high amounts of risks and demands technical and financial competency.

[4] As per the announcement made from organizations for enlisting as Energy Service Company - The Bureau of Energy Efficiency

[5] CRISIL , ICRA - Credit rating agencies

[6] Available at : http://bee-dsm.in/DSM_Service_Providers.aspx

Before arriving at the concept of “Performance Contracting” ; the common understanding of "energy services" by energy service companies, is that they offer a range of services to the customer, such as an energy auditing, project identification and design, equipment procurement, installation and commissioning, measurement and verification(M&V), training, and operations and maintenance (O&M).

Standard Services offered by ESCOs

The methodology of Energy Performance Contracting differs from traditional contracting, which is invariably price-driven. Performance contracting is results-driven: ensuring quality of performance. In practice, under a performance contract, an ESCO provides a comprehensive retrofit, which can include the replacement of boilers, insulation, cooling systems; lighting etc i.e. the ESCO takes complete “turn-key” responsibility for the project, from start to finish. The provision of this total package of services from a single company (i.e. an ESCO) is the key difference between performance contracting and more conventional project implementation and funding.

EPC contracting creates incentives for the ESCO to provide quality products and services over the lifetime of a project, which in turn allows facility owners and managers to upgrade ageing and inefficient assets while recovering capital required for the upgrade directly from the energy savings guaranteed by the ESCO.

EPC: In short

The principle of an Energy Performance Contract is that the energy efficiency investments are paid over time by the value of energy savings.
ESCO – undertakes to improve energy efficiency of facility;
Contract – is structured such that payments are made as per demonstrated savings;
M&V- a methodology for verifying savings is agreed by both parties;
Client- agrees to make payments to ESCO as per terms set in agreement

1.2. Advantage of Energy Performance Contracting

Risk Transfer
An ESCO's main job is managing technical risk—the EPC shifts that risk from the organisation, where it would normally lie in a traditional approach where the organization goes for a process up gradation on its own. The ESCO assumes the risk that the project will perform as designed; will remain within budget regardless of technical difficulties; and equipment will be maintained properly after installation.

Time Effective
Energy and cost savings are delivered quickly and for the long term- although there is a relatively long procurement period, once an EPC in place the ESCO can generally deliver energy savings more quickly & effectively.

Project financing
Most energy savings projects are funded like capital work upgradations, ESCOs can demonstrate how an energy savings project can be funded out of cash flow rather than capital expenditure.

Reduced Management time and guaranteed savings
EPCs involve a guarantee by the ESCO that the savings will be achieved. The facility management can focus on the desired outcomes without having to manage how they are achieved.

Expertise
ESCO brings expertise to a project as energy efficiency is its core business. Using a performance contracting arrangement enables you to streamline and deal with only one company.

The point of distinction between engineering or equipment supplier companies, and ESCOs, is that the latter (in most cases) engages in a performance contract and thus assumes the risk for the results. When the remuneration is proportional to energy savings, then the term Energy Savings Performance Contracting is used.

Cases when an Energy Performance Contract (EPC) may not be the best choice?

- × Client's unwilling to try something new and innovative, given the potential benefits that could be realised
- × Variations in the energy usage patterns are very high, adding to complications of the project

1.3. ESCOs and Energy Performance Contracting in India

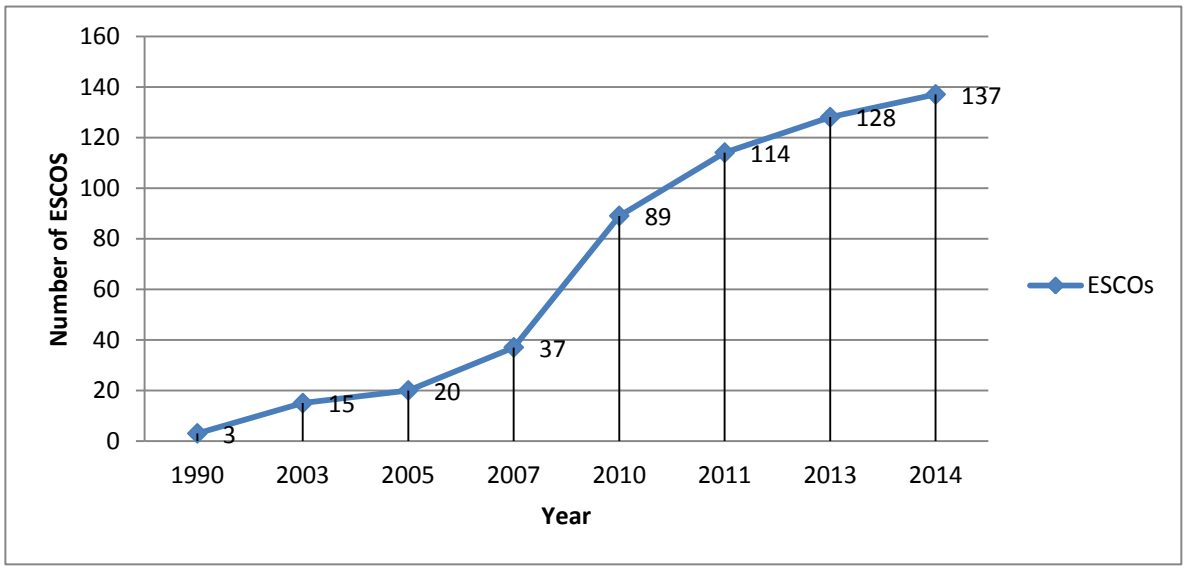
Inspite of its early start, the Indian ESCO industry is still at an evolutionary stage. The overall energy efficiency investment market size under ESCO system of performance contract in India has been estimated at Rs. 14,000 crores with the potential to save about 54 billion units of electricity annually.[7]

The Indian ESCO industry can be broadly segmented into Industrial, Commercial, Agricultural and Government customers. The main growth drivers for the ESCO industry are rising energy costs, prompting the enterprises to improve their cost-effectiveness. While most of the ESCOs have been accredited, the number of energy service companies working in the Industrial energy efficiency is only a handful.

Growth of ESCOs in India

The first three ESCOs in India were established in the early 1990s, initiated in large part by funding from the U.S. Agency for International Development (USAID) which included training workshops held by energy specialists from the United States along with an ESCO feasibility study [8].

In 2003 there were 10 to 15 ESCOs operating in India (Roy, 2003). By 2005, the number of ESCOs had grown to twenty companies, many of them former energy auditors or engineering consultants that started with a small asset base and a few of the emerging vendor ESCOs. Projects have been implemented in India to retrofit municipal lighting, improve the energy efficiency of hotels, and DSM for industrial operations. As of 2007 there were 38 projects in the public sector in India (Hansen, Langlois & Bertoldi, 2009). The typical



[7] Estimated by ADB Study project team (2005)
[8] WRI – ESCO Report India

size of a project in India is small (US$0.1 to $1.1 million) and payback is usually within two years (Sridharen, 2005). Most projects have been financed by the client and are undertaken in accordance with the guaranteed savings scheme; however there are many shared savings projects (Roy, 2003).[9] From the year 2008 onwards the number of ESCOs accredited in India has increased from 89 to 114 in the year 2011. For the year 2014, the number of accreditied ESCOs has risen to 137 ESCOs, an increase of 9 from the previous year.[10]

The evolution of the industry has mainly been from energy auditors and energy management consultants. The growth is expected to continue due to immense untapped investment potential and several new entrants making their way into the industry.

A Success story: EPC in China

EMCo (Energy Management Company), a specialized, profit-oriented energy service company in China that operates based on the "energy performance contracting" mechanism has been developing rapidly.

According to State Grid ESCO-figures, 5,000 ESCOs were established in China in 2013, generating around 500,000 jobs. In total, ESCO industrial output reached CNY# 200 billion in the same year in comparison, according to official statistics by EMCA (EMCA, the industrial association of China's Energy Conservation Service Industry), there were only 160,000 employees working for 537 ESCOs in 2005.

Key Features:

- ESCO Business Model – Predominantly done on Energy Performance Contract
- Most common form of contract - the Shared Savings Contract
- Clients- Mainly corporate clients (industries, commercial buildings, heat service companies.)

What Worked?

- ✓ Strong Commitment from the community (Policy Measures, Financial Support, Co-operation with International donors)
- ✓ The Industry has received strong government support: taxation, subsidies, incentives
- ✓ Widespread Promotion of EPC model among others; increasing chances of replication and scalability

 # - (Chinese Yuan equivalent to ~ 9.6 Indian Rupee).

[9] Available at : http://www.iisd.org/pdf/2009/bali_2_copenhagen_escos.pdf

[10] List of 34 Energy Service Companies (ESCOs) accredited with BEE with validity till 30th October,2015 – available at http://www.beeindia.in/schemes/documents/ecbc/Listofesco.pdf

Barriers to ESCO development and Successful project implementation

Some of the project related barriers identified specific to the Industrial Sector for ESCO business is as follows:

1. Many companies do not allow ESCOs to check the core industrial processes because of the fears about trade secrets.
2. Inability to adopt and follow a standard mechanism for arriving at an energy efficiency project agreement with the client results in substantial delays and ultimately non execution of projects
3. In numerous companies, availability of qualified staff is insufficient and that the energy management infrastructure is limited.
4. The link between the technical staff and strategic management level is missing
5. Many companies prefer to modernize their outdated manufacturing process rather than invest their small revenues in energy efficiency

Some of the biggest barriers adversely affecting the growth of the ESCO market in India include low knowledge and experience in efficiency technologies and their implementation because of the technical risks that ESCOs assume. The limited revenue of the smaller and medium sized ESCOs has pushed them to rely on financing Institutes or Investors for covering the investment costs. The is also a high risk perception by the financing community for funding ESCO projects owing to the lack of confidence in the technical analysis and recommendations of an energy audit. This has lead to a vicious cycle of non execution of EE projects.

However, contrary to the general perception, ESCOs in India have executed a large number of meaningful projects in energy efficiency over the years; some of these energy efficiency projects have resulted in energy savings of as high as 30% over the original consumption level. Most of these projects have been undertaken by the private sector; the private sector's need to improve cost efficiencies in a competitive environment appears to fuel the need for such projects. Energy efficiency projects have also been undertaken by some urban local bodies.[11]

[11] Available at: http://bee-dsm.in/Docs%5CAccreditedESCOs.pdf

2. MODELS FOR ESCO PERFORMANCE CONTRACTS

Energy Performance Contracting (EPC) can be defined as 'a form of 'creative financing' for capital improvement which allows the funding of energy efficiency upgrades from cost reductions. Performance guarantees are given by the ESCO in terms of the level of energy service or the level of cost and/or energy savings. The savings are then split between the ESCO and the client who could potentially reinvest this into more improvements.

ESCOs develop, implement and provide or arrange financing for upfront EE investments for its clients. Repayments from savings allow clients to compensate ESCO's ongoing savings monitoring, Measurement & Verification (M&V) costs and assumption of risk through EPC or Third-Party Financing.

The two common types of Performance-based Contract structures used by ESCOs, called "**Guaranteed Savings**" and "**Shared Savings**", are widely adopted but there are a few more emerging models which have been described below:

a. Shared Savings

Under this model, the ESCO finances the project either through its own funds or by borrowing from a third party. The ESCO takes on the performance risk of the project. The cost savings are divided between the ESCO and customer at a prearranged percentage for an agreed length of time.

b. Guaranteed Savings

In this case, the customer finances the design and installation of the project by borrowing funds from a third party such as a bank or through leasing the equipment. The ESCO has no contractual arrangement with the bank but does assume the project risk and guarantees the energy savings made. If the savings do not reach agreed minimums the ESCO covers the difference; if they are exceeded then the customer agrees to share the savings with the ESCO.

c. Lease Rental Model

The supplier installs the equipment and may maintain it. The lease payments are financed by verified savings and the ownership is generally transferred at the end of a lease period. The client (lessee) makes payments of principal and interest; the frequency of payments depends on the contract. The stream of income from the cost savings covers the lease payment.

d. BOOT Model

A *BOOT (Build-Own-Operate-Transfer)* model may involve an ESCO designing, building, financing, owning and operating the equipment for a defined period of time and then transferring this ownership over to the client. This model resembles a special purpose enterprise created for a particular project. Clients enter into long term supply contracts with the BOOT operator and are charged according to the service delivered. The service

charge includes capital and operating cost recovery and project profit. BOOT models are becoming an increasingly popular means of ESCO business in India.

e. BOO Model

A new public-private partnership (PPP) project model for ESCO business named BOO (build, own, operate) has been emerging in which a private organization builds, owns and operates the energy efficiency of a facility. The government doesn't provide direct funding in this model, but it may offer other financial incentives such as tax-exempt status.[12]

In addition to the above, in a number of cases, the ESCO also provides a "No guaranteed savings contract" – in this type the ESCO (acting nearly as service providers) only provides the energy audit, design, construction management and commissioning. However, there is no guarantee of the energy savings or performance.

2.1. A Comparison of the Various Models

Contract Type [13]	Whose Balance Sheet	Who takes performance Risk	Project Specific Financing
Guarantee Savings	Client	ESCO	Yes
Shared Savings	ESCO	ESCO	No
Lease Rental	Client	ESCO	Yes
BOOT Model	ESCO	ESCO	Yes

From a customer's perspective the shared savings model is ideal since it involves no financial risks. From an ESCOs perspective; however this model tends to create barriers for small or start-up companies; as they are unable to contract further debt for subsequent projects. Since project based financing is largely unavailable in India, the ESCOs are not able to undertake on consecutive projects.

The guaranteed savings model is popularly adopted among vendor-driven ESCOs; and requires a creditworthy customer for it to succeed. However, this uses extensive measurement and verification for confirming the savings. One advantage of this model is that ESCOs can undertake a lot of projects. The other models such as lease rental, BOOT and BOT may have an element of shared savings in addition to the guaranteed savings element to provide incentive for the customer. For instance, all savings up to an agreed figure would

[12] Recently, an EOI was floated by a leading public sector telecom company for Implementation of recommendations of Energy Audit report on BOO basis by ESCOs in time bound manner by sharing the actual energy saving. The ESCO is to install all the equipments & provide all the services which results in to energy cost minimization at their own cost i.e. the Telecom Company was not to bear any expenditure or make any Investment on this project.

[13] International Finance Corporation(IFC)- Energy Service Company Market Analysis- June, 2011

go to the ESCO to repay project costs and return on capital; above this savings will be shared between the ESCO and the customer.

2.2. ESCO models in the Indian market

There are no fixed rules to opt for an ESCO performance contract model. All models are in practice in India; however, since the shared savings model involves the ESCO putting in the capital upfront, smaller ESCOs may not have sufficient capital to undertake many projects simultaneously. Wherever the ESCO perceives high risks, the ESCO may consider going for the guaranteed savings approach with the client investing for the project.

In the Indian perspective, the large industries can potentially work on Guaranteed Savings Models whereas the Shared Savings Model is generally suitable for smaller projects. The large industries, such as the Designated Consumers (as identified in the PAT scheme) do not necessarily approach ESCOs for EE projects owing to availability of in-house expertise and financial adequacy. While Shared Savings Model would be ideal for midsize industries, who may not necessarily have the finances for EE investments, these industries rely on their vendors for better technical reliability.

Ultimately, whosoever has access to market and delivers a whole-life cost saving solutions should be borrowing, to maximize the savings from the project[14]

Models used by ESCOs under this Project

The projects submitted under this project are mostly based on the guaranteed savings model, where the ESCO guarantees performance of the equipment as per the specifications mentioned and the client/ third party financer finances the equipment. Several ESCOs contemplate the use of 'shared saving' model – a model with high technical and financial risks; but is only used when the project costs are low and the credibility of client is high. There are variations and hybrids of this model in which the ESCO leases the equipment to the client for a fixed lease rent for the initial few years and the savings are shared between the ESCO and the client and the ESCO transfers the asset to the client once the cost of the equipment has been recovered.

The other popular models adopted by the ESCOs include the BOOT (Built Own Operate and Transfer Model), lease rental model and BOO (Build, Own, Operate Model) where the burden on investment by the client is at a minimum.

[14] IDFC Quarterly Research Note – Dec, 2011 - Can ESCOs drive energy efficiency in urban services? Available at: www.idfc.com_pdf_publications_Policy-Group-Quarterly-no-14Dec2011-ESCOs

3. THE ENERGY PERFORMANCE CONTRACTING PROCESS

3.1. Tasks involved in reaching award of EPC stage

Stage 1: Walk through Energy Audit and Business Proposal
Timeframe: 1-2 Weeks

To conduct a 'walk-through' audit and to prepare a proposal to the facility owner accurately the ESCOs will require access to the facility. For developing a business proposal, there will be two key phases to the overall EPC process. First, the responding ESCO will enter into an audit contract and then, post-audit, will enter into the full EPC. Both phases should be clearly articulated in the proposal.

Stage 2: Contract ESCO for Investment Grade/Detailed Energy Audit
Timeframe: 6-7 Weeks

Once proposals are received, the next step is to review the proposal, negotiate and contract the ESCO for the detailed energy audit, and for the ESCO to then conduct the investment grade audit. The Facility Owner will be responsible for providing utility bills and facility information. Note- In some cases, the Facility owner may include the services in terms of a detailed/ investment grade energy audit in the final energy performance contract.

Stage 3: Development of a Detailed Project Report (DPR)
Timeframe: 5- 6 Weeks

Based on the findings of the detailed/investment grade energy audit, the ESCO will develop a list of ECMs for implementation. Accompanying this will be energy savings estimates, project costs, implementation details and financing plans which will form a comprehensive detailed project report (DPR). This DPR is then submitted to the Facility Owner.

Stage 4: Finalize the EPC Contract with ESCO and Coordinate Financing
Timeframe: 5- 6 Weeks

After reviewing the DPR and depending on the project viability, the performance contract is negotiated and finalized. The ESCO may also coordinate financing for the project with a Financial Institute

Step 5: ESCO Implements Energy Improvements
Timeframe: 5 - 6 Weeks

Once the EPC is finalized and signed, the ESCO can begin implementing the ECMs, training staff on proper operation and maintenance (O&M), and putting measurement and verification mechanisms in place.

Step 6: Measure and Verify

Measurement and verification (M&V) that ECMs have been installed according to plan and that energy savings are being achieved to the levels estimated is critical to the success of an EPC. The M&V process is also essential for ensuring that the ESCO is fulfilling its responsibilities and that any shortfall in energy savings will be covered by the ESCO.

3.2. Milestones in an EPC

A. Walkthrough Energy audit and Business Proposal

The first step of an ESCO project is an initial discussion, or a "kick-off" meeting, during which the Facility owner and the energy service company exchange information to help prepare the ESCO for its preliminary site survey. The key personnel of the facility such as the Technical Head, Engineers, and operators can participate in this discussion. During the kick-off meeting, the client and ESCO clarify project expectations, establish communication protocols, and develop a schedule for municipalities and ESCO tasks listed in IGA.

Site visits

The ESCO should visit all facilities involved in the project to ascertain the availability of data and system complexity, formulate a data collection strategy, and address other issues. This process will assist the consultant in identifying the proper personnel at different facilities to coordinate the audit. Submitting a report to the facility after the site visits will ensure that the participants are informed and better able to assist as needed.

Preliminary data collection and Base-lining

The ESCO then designs "data format sheets" for recording monthly energy consumption and operating data for the last three years. Historical data is generally accepted as the previous three years of energy bills for a given facility. Analysis of the data helps the ESCO to identify systems for detailed measurement and monitoring. There is also a preliminary walk-through audit of the facilities to identify those areas where detailed measurements have to be taken during the complete audit.

B. Detailed Energy Audit and Development of a DPR

The detailed energy audit is conducted after the preliminary energy audit. A detailed audit includes data collection, measurements of the systems, analysis of the historical and measured data, and detailed energy savings calculations for suggested projects. The detailed audit goes beyond quantitative estimates of costs and savings. The ESCO evaluates the complete system and the electrical distribution system, in order to obtain a comprehensive efficiency solution that captures all energy efficiency opportunities, not just the more obvious ones.

Detailed Project Report (DPR)[15]

The detailed energy audit is followed by a detailed project report (DPR) and shared with the client and financial institutes. While there are many ways in which as a detailed project report (DPR) can be described, a DPR essential will cover the entire project with schedules and project execution plan. This would normally investigate all opportunities that will deliver a project within the required return on investment or the overall capital budget or both. This can also include facilities and/or equipment upgrades and/or maintenance-driven issues.

Suggested Contents of a DPR: Annexure I

C. Development of an M&V Plan

The preparation of an M&V Plan is the single most important M&V activity in an energy savings project. It is central to proper savings determination, and is the basis of verification. A plan is essential to assure the transparency of processes and the quality and credibility of achieved outcomes. Once an energy conservation measure has been implemented, the original system will often have been altered to such an extent that it is unfeasible (if not impossible) to undertake M&V retroactively. Hence, M&V must be initiated at the planning and feasibility stages of a project.

D. Contract – Negotiations and Awarding

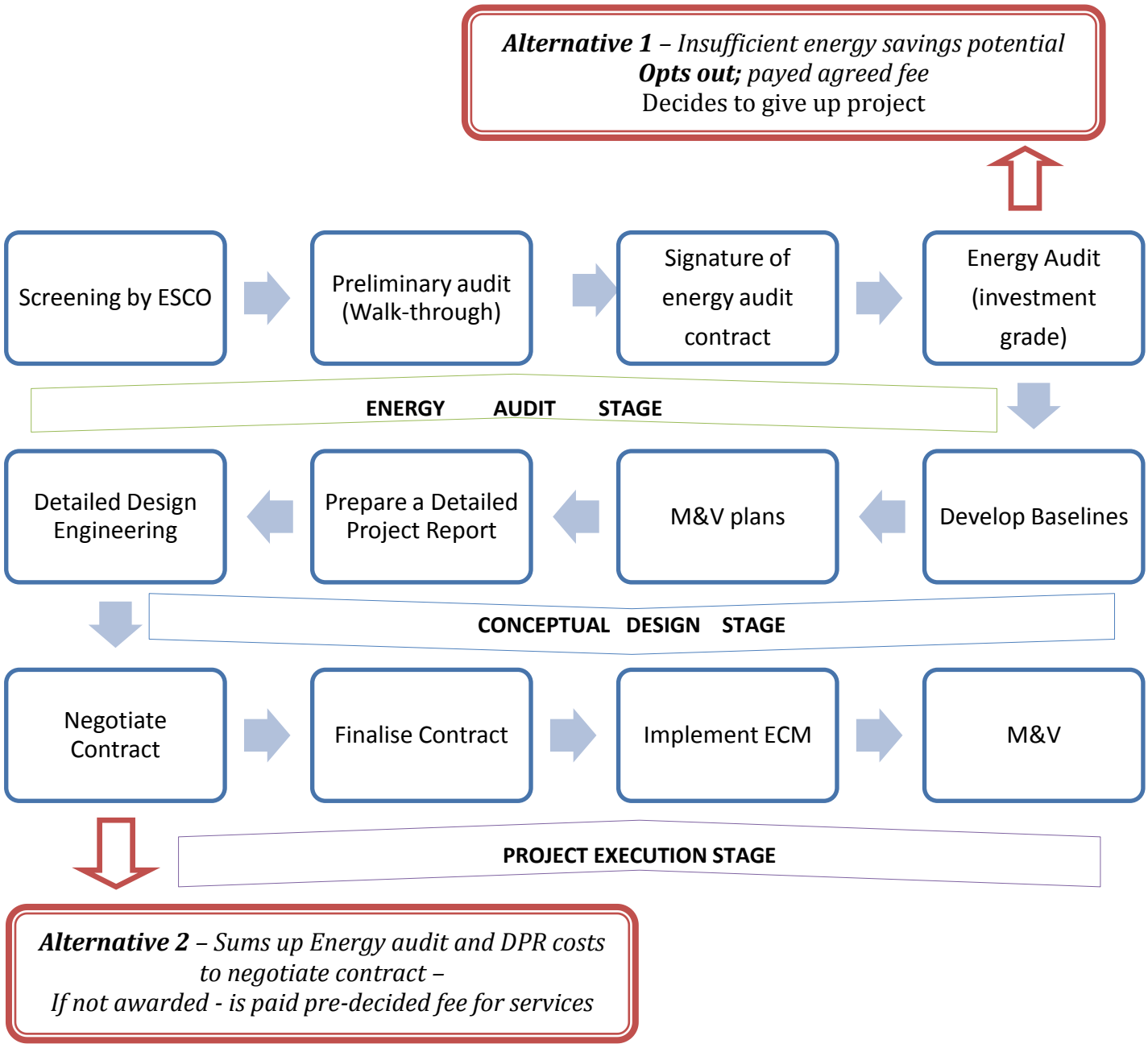
The final negotiations establish the project scope, the guaranteed savings, project timetable, and exact costs associated with the entire project. The method for monitoring energy savings and the financing arrangements (if required) are also finalised at this stage.

If final negotiations do not result in a signed EPC, the Facility owner is required to pay for the DPR. This should be clarified with the ESCO prior to signing the DPR agreement.

[15] Example of a DPR can be accessed from: Energy efficient motors (15 kW EEF 1) Howrah Cluster: http://sameeeksha.org/pdf/Howrah_galvinising/DPR_on_Energy_Efficient_Motor_15_kW.pdf

Steps in developing an effective EPC

The following process is followed where the highest levels of fairness is required, and can be suitably simplified as the customer sees fit. It is recognised that for many businesses in the private sector a formal process for the selection of ESCO by issuing of EOI/RFP may not be required. In particular, tasks below could be replaced with a more casual method of selection, possibly based on existing relationships or reputation.



While the procedure remains same for all types of businesses, smaller ESCOs or project with smaller capital investments may afford to skip a few steps to reduce the project development cycle, making the project financially viable; therefore changes in the recommended timeframe may also be expected.

4. DEVELOPING ENERGY PERFORMANCE CONTRACTS FOR INDUSTRIAL PROJECTS

Under this project, AEEE organized consultations with accredited ESCOs to identify potential business opportunities in the EE market in India. The discussions primarily focussed on gathering inputs from various participating ESCOs and stakeholders on the barriers and challenges faced in developing Energy Performance Contracts (EPCs). A large number of ESCO's submitted their project details and discussed their common issues in the stakeholder consultation.

Key Highlights of the Discussions

- Though the energy performance contract model has been successful internationally, ESCO has not been diffused in India.
- The key barriers for ESCO implementation are lack of trust, lack of robust performance contracts, absence of proper M&V techniques, not having well established, lack of dispute/ conflict resolution mechanism among others.
- BEE has specifically constituted a committee to work on template preparation. The committee is working on preparation of 2 part contracts. The first one being the legal aspect while the second one focussing on M&V.
- M&V is critical component for performance contracting and there is need to develop customised protocols suitable to the market.

The feedback obtained from the stakeholder consultations and dialogues with ESCOs threw light on the typical challenges faced and constraints for the projects to move into implementation stage. The project details received by AEEE from the ESCO's was analysed to identify the implementation potential on a case to case basis.

Additional details was sought from the ESCOs shortlisted, in terms of short summary of the project status including a possible start period, so that technical assistance can be provided with respect to performance contracts, Measurement & Verification, Interaction with Financial Institutes with time lines for each stage.

The major concerns raised by the ESCOs were (i) how the investments can be recovered in a time bound manner and (ii) how can the issues be resolved in case of any disputes.

Based on the data submitted by the ESCOs; AEEE provided assistance to these ESCOs in developing standard contracts that would help with reference to:

- Ensuring timely payments to the ESCO
- Establishing savings to the client
- Dispute Resolution Mechanism: In case a dispute arises, what remedies can help in settlement of case
- Termination and Exit Clause: In case both parties wish to terminate the contract, what will be the possible exit clause.

4.1.Project and Contracts developed

The type of projects submitted under the technical assistance were diverse in nature (retrofit of coolers, reduction in lighting load, boiler conversions, chiller optimization) and the value of projects costs ranged from 25 lakhs to upto 30 crores. The performance contract model used are the guaranteed savings model, shared savings mode, lease rental and the BOOT model; as described in the previous sections of the report.

Sno.	Project Description	Annual Savings in Electricity, and Fuel	ESCO Business Model	Status of contract Development	Status of Project
1	Cooler Retrofit	6700 MTOE	Guaranteed Savings	Contract Developed and Shared	Delays in contract closure
2	Optimization of voltage to the lighting feeder and changing the lighting system	529200 kWh	Lease Rental	Contract Developed and Shared	Delay in contract closure
3	Reduction in heat load, lighting, implementing tariff related measures	225,412 kWh	BOOT Model	Existing Contract document reviewed	Project executed
4	Retrofits on Chiller, motors working at partial loads, etc.	250000 kWh	Shared Savings	Contract Developed and Shared	Contract negotiations ongoing, to be executed
5	Conversion of fuel fired boiler to Briquette fired boiler	3,76,200.00 (Net Cost Savings per annum)	Lease Rental	Contract Development stage not reached	Project Terminated

Based on the information provided by the ESCO, performance contracts with dispute resolution and exit clause for these projects were developed. The document language was made compact, simplified, additionally; it also included a Measurement & Verification (M&V) plan for the various projects for verifying savings to the customer.

Project 1

Project Description: Retrofit of industrial cooler based on the guaranteed savings model with a potential to save 1.5 to 2 kWh/t of clinker and 10-30 Kcal/kg of clinker on fuel. These energy savings corresponds up to 0.65 Million MTOE (considering production of 200 million tons per year clinker production)

Outcomes: The Contract was developed and shared with the ESCO; however there is a significant delay in negotiating and closing the contract with the client. Though customers are aware that the payback is less than 2 to 3 years, the Management is not able to allocate funds to this kind of energy improvement projects. Financing Institutes are willing to provide financing but would require a bank guarantee or any kind of security for availing this loan which neither the client nor the ESCO is in a position to provide.

FI's view: Major hurdle in EE financing is the unavailability of good bankable contract between the service provider (ESCO) and facility owner. Further, a corporate guarantee by the facility owner would give additional comfort to the lenders. Guarantee by large equipment supplier manufacturing energy efficient equipment (Vendor ESCO) would go long way in giving comfort to the lenders.[16]

AEEE view: The project development cycle has gone beyond eleven months and such timeframes are too long for any project to go forward. The decision to go ahead with the project or to call it off should be taken promptly.

Project 2

ESCO Grade: 3

Project Description: Improvements in the lighting load (that involves luminaries range of tube lights, metal halide, sodium vapour, etc) with a saving potential in the range of 20% to 50%. The loads are in the range of few 100 kW to 7-8MW. Energy saving in the lighting system is to be achieved through a combination of optimizing voltage to the lighting feeder and changing the lighting system to LED's.

Outcomes: The project has been put on hold by the client due to projects related to production improvement. Another significant reason for delay in the advancement is the refusal of the client to cover the detailed energy costs for the EE improvement in the facility.

AEEE view: The ESCOs and client's inability to take quick decisions is causing a delay in the project. While the detailed energy audit costs can be covered as a separate contract, often these costs are added to the final EPC contract.

[16] Project related discussions with Mr. KP Philip, IREDA

Project 3

ESCO Grade: 2

Project Description: The project involved procurement, implementation and commissioning of all energy efficiency measures (Reduction in heat load, lighting, implementing tariff related measures) with an online metering to provide measurement and verification plan.

Outcome: The contract was developed and shared with the client. AEEE reviewed the contract document and provided suggestions towards further strengthening the energy performance contract in terms of dispute resolution and schedules and timelines for the project.

AEEE view: The ESCOs previous experience in dealing with such projects has helped in the successful execution of the project

Project 4:

ESCO Grade: 4

Project Description: Energy saving performance contract in shared savings model. The ECMs included retrofits on Chiller, improvements in motors working at partial loads and lighting loads.

Outcomes: The negotiations are ongoing between the client and the ESCO**.** The EPC contract has been developed for the project with support from AEEE and the contract is being negotiated with the client.

AEEE view: Prompt decision making by the ESCO in moving forward with contract negotiations has greatly reduced the project development cycle. The ESCO now has to negotiate the terms and conditions of the project and convince the client of the benefits.

Project 5:

ESCO Grade: 3

Project Description: Conversion of fuel fired boiler to Briquette fired boiler

Outcomes: Project has been terminated. The Client's inability to negotiate and arrive at a model for availing services from the ESCO has resulted in the project being called off. The ESCO is highly experienced and has successfully executed several projects in the past.

AEEE view: It is important for new entrants in the EPC to fully understand the process of arriving at an EPC. Negotiations form an important part of the EPC process and cannot be avoided.

- **Reasons for successful execution of projects**

In the cases where project was executed successfully, the key factor for success was the buy in and keenness shown by the management in delivering the project in partnership with the ESCO. Efforts were made by the ESCO to ensure the client fully understands the scope of the project and perceived benefits from it.

Both parties performed their roles and responsibilities with utmost care. In cases where parties show willingness to proceed with the project, the performance contract is negotiated within 2-3 months of the proposal submission.

- **Reasons for delay in the execution of projects**

The reason for delay in the execution of projects is the lack of commitment from the client to go ahead with the project. The various reasons cited for this are – unwillingness for temporary stoppage of production in the facility, unavailability of finance for the project, low production cycles, among others. As told during a project related discussion *"Time is the name of the Game*"; what the client fails to understand is that for the time taken by the management for arriving at a decision takes so long - had the decision been taken earlier; the results would have started to show by that time which would eventually benefit the client only.[17]

In some cases, the ESCO's delays in responding to a proposal made by the client have also resulted in delay in the execution of projects.

- **Reasons for termination of projects.**

Energy performance contracting; being a relatively new concept in India is practised by only a few ESCOs. The performance contracting involves a lot of risks, technical and financial and there are no fixed rules for executing successful performance contracts.

The unwillingness to discuss or even put efforts to negotiate a contract has lead to the termination of projects. "Energy Performance Contracting has its own starting troubles; it is successfully executed only when an ESCO has some previous experience in dealing with such projects."[18]It is a challenge when there are new entrants both on the ESCO side and client side. Emphasis should be laid on service delivery rather than the approach to the project.

The typical challenges faced and reasons for non execution or delays in executing projects have been mentioned in detail in *Section 12- Key Learning's* of this report. AEEE will continue to monitor the projects and obtain feedback from the ESCOs on the timelines of implementation for these projects.

[17] Discussions with Dr Gharpure, Yajna Fuels, Mumbai, India.
[18] Discussions with Mr. Milind Chittawar, CEO of SEETECH Solutions

4.2. Standard Energy Performance Contract

This section provides a discussion and review of the objective, implementation and major clauses of the Standard Agreement. Legal terminology is used in this contract quite extensively. This document is intended to cover the rights and obligations of parties in an industry which has not come in to the realms of litigation.

Energy Performance Contracting is a way of implementing energy efficiency projects i.e. Equipment, Plant/maintenance upgrades in all types of facilities and buildings. It provides a transparent way to manage risks, while guaranteeing outcomes and results.

There is no commitment until the time of a contract closure. Up until that time, the customer may walk away without obligation apart from covering the costs of the energy audit & design activities completed to date. Following contract closure (order acceptance) with agreement of the measurement & verification plan and financing, installation and commissioning proceeds, as soon as the project installation is completed, then begins the duration of the EPC.

EPC being a relatively new methodology in India, developing a standard set of documents will help customers work through the contracting process with the least amount of difficulty. The document can be suitably negotiated and modified to adapt to the needs and requirements of the individual projects.
The developed standard contract has been made with reference to:

- **Dispute Resolution Mechanism**: In case a dispute arises, what remedies can help in settlement of case.
- **Termination and Exit Clause:** In case both parties wish to terminate the contract, what will be the possible exit clause.
- **Relevance of sections – on a case to case basis**

Wherever possible the document language – has been made more simplified, rather than the legal wording that is in place.

Commentary on EPC Standard Contract – Key Clauses and Definitions

Clause1. SCOPE OF WORK

This clause describes the scope of intervention for the energy efficiency project identified by the ESCO. All the ECMs are mentioned in the Detailed Energy Audit Report, approved and accepted by the client, has been appended as an annexure and made part of the contract document.

Clause 2. COMMENCEMENT DATE FOR ENERGY SAVING CALCULATIONS AND TERMS

The implementation of an ESCO project proceeds much like any standard construction project and the Commencement date of the energy efficiency project is the date by which the ESCO has completed installation and has commences operation of all energy saving

equipment specified in the scope of work/ part of the audit report. Compensation payments to ESCO are to begin after 30 days of the acceptance of the first M&V Report. The ESCO must nominate the date or dates it intends to use (as the performance guarantee commencement date) in writing prior to installation of equipment.

For Example –
An ESCO has been awarded a project for Chillier optimization, after obtaining the energy equipment; he commences the installation of the equipment and notifies the client about the completion of installation. The client after inspecting the equipment and surveying effect on other processes signs a certificate of acceptance.

Clause 3: EQUIPMENT WARRANTIES AND COMPATABILITY

The equipment warranty, or, manufacturer's warranty, is an instrument provided by the manufacturer, which indemnifies against loss of the equipment due to defects in materials and workmanship for a specified period.

This will normally cover repair or replacement of the equipment at the discretion of the manufacturer, if the equipment has mechanically or electrically failed while used for its intended purpose, and had been 'maintained according to manufacturer specifications

Note – The ESCO and the Client must take due diligence to ensure that the equipment is working as per the manufacturer's specification.

Clause 4: CONSTRUCTION SCHEDULE AND EQUIPMENT INSTALLATION: APPROVAL

Following installation of each ECM, the ESCO will undertake a 'commissioning process' to verify that the equipment has been installed according to specification and can achieve the performance requirements of the intended task. After this commissioning process, the ESCO provides an 'acceptance certificate', after inspecting the installation and operation of equipments certifying that the equipment has been installed according to the specification.

Clause 6: BASE YEAR ENERGY ADJUSTMENTS

Typically, the most difficult aspect of M&V for Customers is for understanding that the baseline energy consumption needs to be changed, updated or modified to reflect changes to the environment of the ECMs. The following example illustrates this.

Example –
The energy consumption, and hence savings, of a new energy efficient chiller is directly related to the amount of conditioned space the chiller is servicing. If the Customer has constructed an addition to its facility and has air-conditioned that space using the same systems serviced by the new chiller, it is reasonable to expect that the chiller will consume more energy. By understanding the relationship of conditioned space to cooling requirements, the baseline energy consumption can easily be adjusted and can easily be accommodated by modifying the baseline and guaranteed energy savings

Clause 7: OBLIGATIONS OF ESCO

This clause defines the obligation of the ESCO for the entire duration of the contract. This includes , repairs, and adjustments to the Equipment installed, responsibility for the professional and technical accuracy of all services performed.

Clause 8: OBLIGATIONS OF CLIENT

This clause defines the obligation of the ESCO for the entire duration of the contract. This includes reasonable steps to protect the Equipment from damage, notifying the ESCO within twenty-four hours after Client's actual knowledge and occurrence of any malfunction and alteration or modification in any energy-related equipment or its operation.

Clause 9: PAYMENTS TO ESCO

Payments due to ESCO are to be calculated in accordance with the provisions of mutually agreed predetermined payment schedule as set forth in *Schedule D of the contract,* and ESCO shall provide to the client an invoice of the total amount due.

Clause 11: EVENTS OF DEFAULTS

Any failure by either party i.e. ESCO or Client in exercising their obligations would result in an event of default in which case the termination or dispute resolution will follow

Clause 16: DISPUTE RESOLUTION

Dispute resolution procedures are particularly important in an EPC. An EPC creates a relationship in which parties must work closely together over a number of years. The parties should view any dispute that may arise as an issue to be resolved within the framework of the contract, rather than as an irreparable breakdown of the relationship.

Conflict Resolution

Contractual disputes are time-consuming, expensive and at times unpleasant. They can destroy client/ESCO relationships built up over a period of time and also add substantially to the cost of a contract. It is in everyone's interest to work at avoiding disputes in the first place and by improving relationships between the client and ESCO through teamwork and partnering. Inevitably, however, disputes do occur and when they do the importance of a fast, efficient and cost-effective dispute resolution procedure cannot be overstated.

Once the contract is in place good contract management is key. Contract management techniques should include monitoring for the early detection of any problems. Good dispute management involves selecting and using the most appropriate resolution procedures such as negotiations, mediation, arbitration and lastly litigation. The advantages of this include-speed, cost savings, confidentiality and preservation of relationships.

5. GETTING STARTED WITH AN EPC PROJECT – DEVELOPING A M&V PLAN

The preparation of an M&V Plan is the single most important M&V activity in an energy savings project. It is central to proper savings determination, and is the basis of verification. A plan is essential to assure the transparency of processes and the quality and credibility of achieved outcomes.

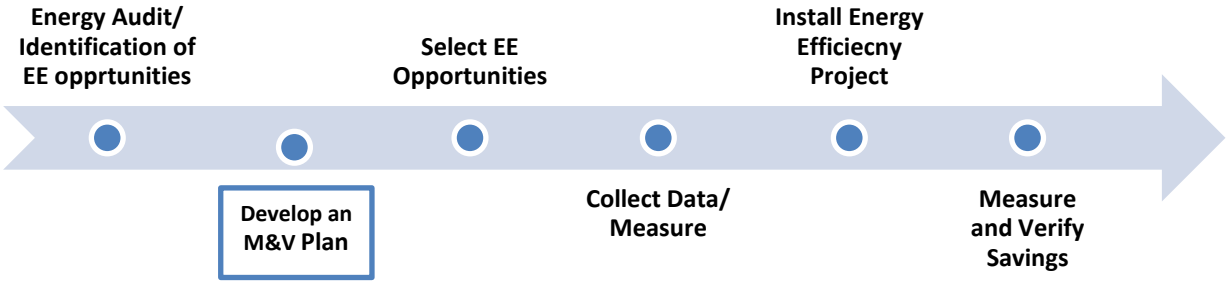
5.1. M&V for Industrial EE Projects

Measurement and verification of the energy savings is typically one of the most difficult issues for any Customer to deal with, due to the combination of technical and commercial issues involved. Most Customers will be implementing their first EPC and as a result will not have the experience to know what to expect or watch out for during the preparation of the contract. *Agreement of both parties for a methodology on M&V creates a risk management tool for either party. A good M&V plan is one that reduces the risk and makes the project viable.*

The central role of M&V in a performance contracting is as follows:

- Tool for defining and controlling risks of the project and
- Helps control for uncertainty about savings; and
- Is the basis for payments (shortfalls, excesses savings)[19]

Where does the M&V plan fit into an Energy Efficiency project?



The principal issue to tackle through M&V is this: once an energy conservation measure has been implemented, the original system will often have been altered to such an extent that it is unfeasible (if not impossible) to undertake M&V retroactively. *It is therefore important that M&V be initiated at the planning and feasibility stages of a project.*

Practical Advice
When creating an M&V Plan, one should be mindful of the project scope - expected level of savings and investment in the project.

[19] Best Practice to EPC – EEC

5.2. Components of an M&V plan:

The amount of detailing required for a M&V plan depends on the scale of the project and costs associated with it. The key factors for measurement requirement are mentioned later. For all practical purposes, the M &V Plan should stipulate the following in detail:

- baseline energy consumption of the existing systems (prior to introduction of ECMs);
- formulas and procedures for determining baseline energy consumption;
- Adjustment factors to be applied to the baseline energy consumption. These are factors that could reasonably be expected to increase or decrease energy usage and outside the control of the ESCO, such as changes in outdoor temperature for air-conditioning ECMs, increases in production for production-related ECMs or changes in occupancy;
- formulas and procedures for determining the post-ECM installation energy consumption;
- procedures for performing the statistical validation and level of anticipated accuracy of results;
- specification of equipment and procedures used to collect, measure or obtain results;
- method and format of reporting results to the Customer; and
- Schedule of reporting to the Customer.

How does standard M&V help attract investments for energy efficiency projects?

Financial institutions don't like uncertainty and standard M&V protocols provide open, transparent, and replicable methods of calculating energy savings for any type of energy conservation measure. In an industrial setting this can be a fundamentally difficult task since *independent variables* affecting a process's energy use (i.e. production levels) can vary significantly from the baseline period to the performance period. M&V helps in reducing uncertainties associated by using different M&V protocols for different projects thereby reducing the possibility of disagreements over the type of protocol used.[20]

Data collection, metering and analysis

M&V accuracy and costs is driven by the following factors:

- Measurement equipment accuracy
- Sampling frequency and sample size
- The amount of deviation between baseline data and the baseline model
- Validity of assumptions

Normally, the annual M&V budget should be approximately 3-5% of the predicted annual energy cost avoidance (with 10% being an upper threshold on what could be considered reasonable to spend). In cases where M&V also provides useful process control information, it may make sense to have a larger budget. Metering costs can be reduced by *estimating* effects rather than measuring them, but it's important to assess the sensitivity of the reported savings to the plausible range of the estimated value.

[20] Available at: www.eec.org.au_UserFiles_File_docs_Best practice guide to measurement and verification

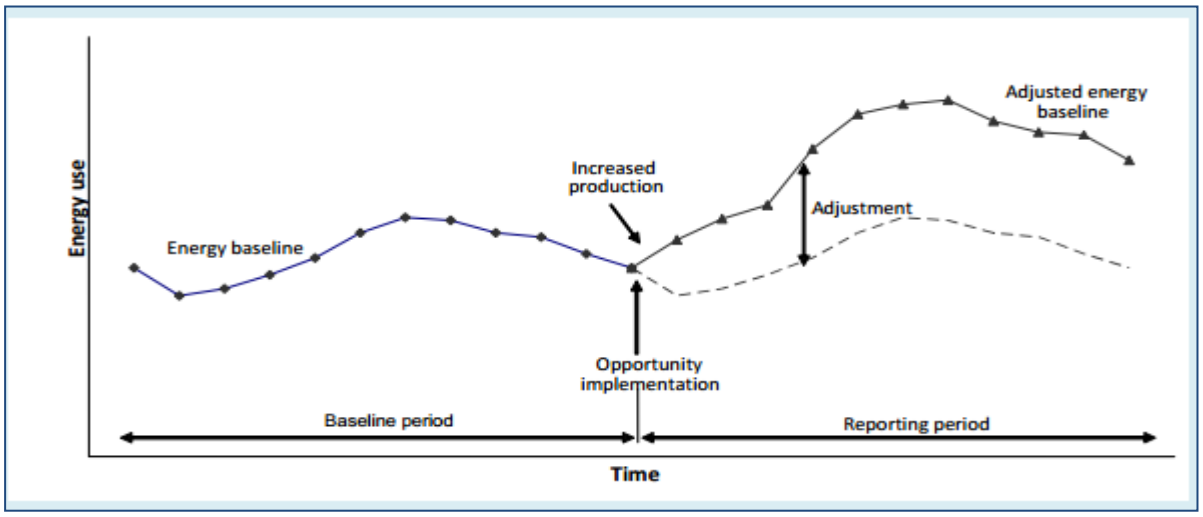
5.3. M&V Methodology *Calculating and reporting savings*

The energy savings are determined by calculating the difference between the energy measured in the pre-retrofit and post-retrofit periods after accounting for differences in non- ECM factors between the two periods
In general the savings equation is:

Savings = Baseline Energy Use – Post-Retrofit Energy Use ± Adjustments

Post Retrofit Energy Use = Energy consumption measured during the post- retrofit performance period
Baseline energy = Energy consumption measured during the baseline period
Routine Adjustments = Adjustments due to regular changes in independent variables (e.g. changing weather conditions, varying production levels)
Non Routine Adjustments = Once – off or infrequent changes in energy use or demand Occurring due to static factors (e.g. alterations to equipments, extremes weather changes)

The inclusion of adjustments is one of the critical elements of the M&V process. This is the step often overlooked or ignored by practitioners seeking a quick and low cost outcome.
The following example illustrates this:



The actual post-retrofit energy consumption (in equivalent kWh) of the manufacturing unit is found to be greater than the actual baseline energy consumption even after installing the ECMs. In other words, it appears that the retrofit project has FAILED to save energy!

However, since the annual energy consumption is dependent on its annual production volume, in order to compare apples to apples, the baseline energy consumption needs to be adjusted to post-retrofit operating conditions. To forecast the energy baseline, the current energy baseline was adjusted for the production increase. The dashed line shows the forecast energy baseline, had the production level not been adjusted for an increase (source: IPMVP 6).

5.4. Contents of a M&V plan

To develop an effective M&V approach, it is important to understand the nature of the project being implemented; basic approach and design for conducting M&V, desired outcomes and limitations (e.g. budget). The suggested M&V planning process listed below can be used as a basis for developing a M&V plan:[21]

M&V Contents	
ECM Intent	The desired outcome or benefit expected to be achieved by implementing the ECM
Measurement Boundary	1. The measurement boundary which best suits the size (in terms of expected savings) and complexity of the project: a) A narrow boundary simplifies data measurement, but variables driving energy use outside the boundary (Interactive Effects) will need to be accounted for. b) A wide boundary will minimize interactive effects and increases accuracy; however, M&V costs may also increase. 2. Static Factors (document important static factors in case conditions change)
Required Data for Energy Baseline Development	The data that will likely be required to substantiate the intended benefit: Energy data Performance Factor: Usage Factor: Static Factor: Interactive Effects: Independent Variables:
Measurement Tools	1. What measurement devices are required 2. Where to place these devices 3. Accuracy requirements 4. Measurement period/duration
Data collection	1. Software 2. Manual Data Collection – Metering/ Sub metering 3. Utility Bills
Analysis	1. Which independent variables will be used to create energy model (take data & create knowledge) 2. What software will be used (Metrics) 3. Validation of model w/ baseline data
Responsibility	1. Who will collect & record data 2. Who will provide oversight & ensure M&V Plan is followed

[21] For a glossary of M&V terminology, please refer to IPMVP Volume 1, 2012 (this document is available as a free download from the Efficiency Valuation Organization's (EVO) website: www.evo-world.org).

M&V professionals require additional specialist knowledge, skills and experience beyond the scope of this section. For more details visit http://www.ipmvp.org/services.html#CMVP

5.5. M&V Excel planning template

An M&V planning template has been developed to help M&V practitioners, business energy savings project managers, translate M&V theory into successful M&V projects[22]. The template will assist M&V planners incorporate the various design elements. The template is presented in a spreadsheet for ease of calculations with the following contents:

Project Summary: This would provide a summary of the various ECMS and budgets associated teams for the projects.

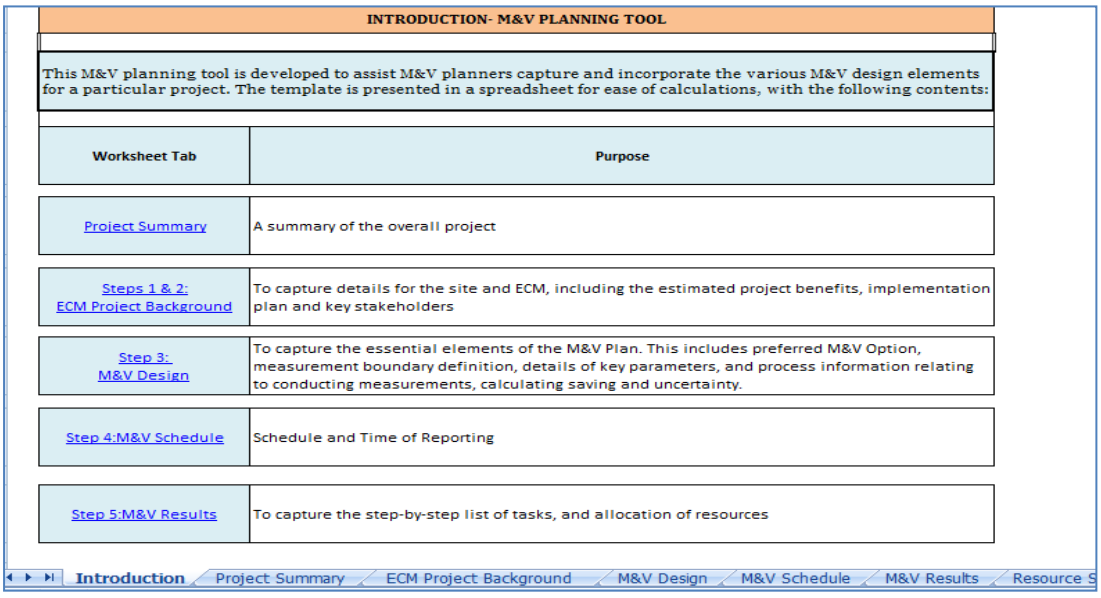
ECM Background: This would comprise of the present site description and implementation strategy

M&V Design: This includes preferred M&V Option, measurement boundary definition, details of key parameters, and process information relating to conducting measurements, calculating saving and uncertainty.

M&V Schedule: This would capture the schedule and time of reporting M&V

M&V Results: A step by step list of tasks accomplished and savings achieved

The full template can be downloaded from www.aeee.in



INTRODUCTION- M&V PLANNING TOOL

This M&V planning tool is developed to assist M&V planners capture and incorporate the various M&V design elements for a particular project. The template is presented in a spreadsheet for ease of calculations, with the following contents:

Worksheet Tab	Purpose
Project Summary	A summary of the overall project
Steps 1 & 2: ECM Project Background	To capture details for the site and ECM, including the estimated project benefits, implementation plan and key stakeholders
Step 3: M&V Design	To capture the essential elements of the M&V Plan. This includes preferred M&V Option, measurement boundary definition, details of key parameters, and process information relating to conducting measurements, calculating saving and uncertainty.
Step 4:M&V Schedule	Schedule and Time of Reporting
Step 5:M&V Results	To capture the step-by-step list of tasks, and allocation of resources

Introduction | Project Summary | ECM Project Background | M&V Design | M&V Schedule | M&V Results | Resource S

Snapshot of the M&V Excel Template

[22] This template is adapted from the International Performance Measurement & Verification Protocol (IPMVP) and the U.S. Department of Energy's Federal Energy Management Program (FEMP) M&V Guidelines

5.6. Reporting M&V of the EPC Project

An M&V report is a document that summarises the M&V project and the outcomes achieved. M&V savings reports typically include:

- overview of the site and the ECMs
- list of installed equipment and/or technology
- the M&V Option that has been used - with reference to the IPMVP edition
- list of project team members
- performance period savings
- process for calculating savings
- expected savings for in current year
- savings uncertainty

Savings reports may take several forms, including presentations, case studies, as well as formal and informal written reports. The submission of report for the initial years says, year 1 of the project implementation, the ESCO may submit quarterly reports to the client and bi- annual reports after the 1st year.

It is important to note that the release of payments as agreed in the performance contract to ESCOs is linked to the delivery of the status report

The following tips may assist when preparing M&V savings reports:

Reporting tips

The following tips may assist when preparing M&V savings reports:

1. Use appropriate language and provide background details and references wherever possible
2. Develop a summary page for the top management demonstrating the energy savings
3. Use the details within the documented M&V plan to shape the report, including goals, expected outcomes and measures for success
4. Describe step-by-step the data analysis and savings calculations. Add equations for explanations if they are unfamiliar to the audience.
5. Report any uncertainties in savings arriving during the period along with suitable reasons

6. FINANCING AN ENERGY PERFORMANCE CONTRACT PROJECT

Funding is a critical part of any EPC and paying for the investment from savings is a function of the total investment costs, the terms of the contract, financing, and the savings generated. If the cost of the ECMs installed under the contract is to be paid from savings, the accumulated savings over the life of the contract need to be equal to, or be greater than, the total cost of the project, including financing costs.

Once the project costs have been determined, and the level of savings agreed, the ESCO needs to establish the source, determine the applicable terms, and establish whether project financing can be structured to meet the needs of both parties (ESCO & Client).[23]

In any EPC project, there are basically three sources that can be used to fund an ESCO project:

- direct financing provided from the balance sheet of the ESCO ;
- third party financing: leveraged by the ESCO, equipment suppliers, or leasing firms; or
- direct financing by the Customer using traditional sources of project funds

6.1. ESCO Financing

ESCO financing, where it is available, may provide several advantages to the Customer such as:
• offering a complete one-stop-shop for project – technical risks as well as the financial risks
• transferring ownership of the equipment to the client once the contract is fully paid out;
• offering flexible models of payments to meet the needs of the project.

Not all ESCOs have the capacity to offer direct financing for their projects. ESCO financing depends on its corporate financial viability, and whether it has a strategy in place to offer a combination of financial and technical services to simplify project delivery mechanisms.

An ESCO's inability to provide direct financing is not be considered a risk to the Customer, or give rise to a negative perception about the technical capabilities or financial soundness as ESCOs are primarily technical and project oriented solutions providers, and a high level of project debt would quickly limit their operations, as their ability to access new sources of capital would become severely restricted.[24]

It is important to note that the implementation phase of an EE project (the actual construction of the EE installation) is a critical phase of EPC in terms of financing.

[23] Best Practice to EEC
[24] Tom Dreesen

6.2. Third Party Financing

This type of financing involves an intermediary such as a bank or finance company. Most third party financiers are aligned as strategic partners with ESCOs. While funds offered by TPFs may involve higher interest rates than the direct financing by the Customer, other terms may be more attractive, such as being able to provide a sufficiently long period for repayment according to the savings generated. In other cases such as leasing companies, have focused on providing lease options for turnkey projects.

Every project proposal irrespective of Industry is assessed by Financial Institutions (FIs) on the basis of the financial viability of the project. The Bankers are generally unwilling to finance ESCO projects, based on cash-flow. The concept of *Trust-and-Retention* or *Escrow* account is neither fully understood nor widely accepted. In India, the FI's look purely at asset-based collaterals, even if the ESCO is dealing with a bank for several years without default.

ESCO's concerns:

Financing must be project cash-flow based and not based on Balance Sheet, Mortgage, Guarantees or Collaterals. It is understood that if these aspects decide sanctioning of loan then it is not considered to be part of EPC financing.

FI's concerns:

Difficult to understand how energy savings (which are measured through parameters, such as meter readings and electricity bills), can be captured as money savings, and how payment security can be ensured.

FI's are also concerned as to how they can stake a claim on the security of the equipment installed by ESCOs in the client's premises, and how these can be liquidated in the event of a default.

6.3. Direct financing by the Customer

In some cases, especially in large facilities, the management may consider a technological upgradation in the present system using its own finances or as a component of its working capital loan.

Such cases are also found in few Small and Medium Enterprises (SMEs), where the interest charged by an FI is high and the management feels that there is considerable return on investments arising out of a project if done on a self-funding basis.

6.4. India: Limitation in EE Financing

Often customers wish to base debt service on the project cash flow, which requires adequate understanding of EE projects by FIs. The limitation of this financing model is the low value of collateral in an EE project: once EE equipment is installed at the end user's facilities, it is often difficult and uneconomic to remove and use elsewhere (e.g. lighting or motors). Thus, often EE equipment has a low collateral asset value while representing a sizeable share of total project cost with high portions of engineering, development and installation costs. This is why often EE project lending is frequently not based on the equipment asset value solely, but on the creditworthiness of the borrower or additional securitisation is required.[25]

Preparing a Financial Plan/Proposal for Bankers

For any Organization, attaining funding is an important activity. It is essential that a company arrange its project report in a lucid manner that makes it easy for the bank officials to understand. The most important document that the bank needs is an information memorandum. It details the entire history of the company with details like the activities of the company, details of promoters, financial numbers, existing banking and loan facilities.

The following points serve as a snapshot of the company seeking funding[26]:

- **Audited financial statements and Income Tax returns**
- **Profile of promoters**
- **Financial statements**
- **Project report**
- **Existing banking and loan facilities**
- **Collateral offered**

Collaterals are one of the most important things that a bank looks into for a funding proposal. Banks also fund companies and SME's without a collateral obligation. There are schemes like CGTMSE (Credit Guarantee Fund Trust for Small and Medium Enterprises), that are specifically introduced by the Indian Government to help the growth of such companies.

[25] FINANCING ENERGY EFFICIENCY: FORGING THE LINK BETWEEN FINANCING AND PROJECT IMPLEMENTATION

[26] Available at : http://smallb.in/%20/plan-new-entrepreneurship%20/guidelines-preparing-detailed-project-report

7. KEY SUCCESS DRIVERS FOR A EPC CONTRACT

Some of the key drivers of a successful energy performance contract as identified through the project are as follows:

7.1. Understanding Roles, Responsibilities

It is the joint responsibility of the ESCO and Customer to agree on the approach used in each case. This can include, for example, the requirements to operate the equipment installed by under the contract according to specified standards or to maintain certain parameters of the system operation. The best way to ensure the EPC is implemented is to make sure all roles, responsibilities, requirements, and assumptions are clearly articulated within the resulting contract documents

Client	ESCO
Selects Auditor/ESCO	Audit – analysis of potential energy savings
Awards EPC	Prepares conceptual design of project
Approves detailed engineering design	Delivers and installs equipment
Inspects and approves delivery	
Operates plant, Measures savings, pays proportionally	Assist in operation, training, verification and maintenance

Customer - *Roles and Responsibilities*

A number of decision-makers will normally be involved before the final approval is given to implement the project when a customer is dealing with a contract. For the project to develop and be implemented smoothly with minimum delays, it is important to secure corporate buy-in at all levels. In general, this means that the management must be supportive of the initiative, understand the economic and business impacts of the energy saving project, and provide leadership. The Facility Manager must be involved in the technical development and provide endorsement to whoever will sign the final approval, ensuring all technical and operations risks are appropriately managed; and that there is proper integration with existing maintenance arrangement. [27]

ESCO- *Roles and Responsibilities*

The ESCOs main responsibilities include: Tracking and monitoring of energy consumption, Energy plan and engineering design and present the project to the customer; Supply installation and maintenance equipment, overall project management, audit and evaluation of saving and guarantee the savings

[27] A best practice guide to energy performance contracts reducing operating costs through guaranteed outcomes

7.2. Adherence to Timelines

Adhering to timelines is critical as interest levels of both parties are dependent on it. The Framing of Agreements /Contract take the maximum time since it's a lengthy process and involves multiple parties and rounds of negotiations. This takes about 90-120 days or more depending on the client and comfort levels. For most of the contracts, the duration of 5 years, out of which the payback for investment is 2 years.

Closure of Agreement/ Contract	
Chances of Success	**Time Duration**
High	3-4 Weeks
Medium	8-10 Weeks
Low	6 months and more

Chances of success of a ESCO project – Low, High

The contract has various elements associated with it - Business Laws, Finance, Legal Definitions etc and all the employees associated with the project from the client's side and the ESCO side are required to be convinced which requires multiple iterations to finally arrive at a configuration for the energy performance improvement actions to be implemented under a Performance Contract.

Suggestions for improving timelines:

Ideally, the framing of contracts should not take more than 3-4 months to keep interest of both parties. Six months is too long a time for the contract closure as baselines may vary significantly. A few suggestions for improving timelines are as follows:

- To quicken the process of EE implementation – the faster approach is to focus on energy intensive areas rather than the entire plant.
- The project needs to be understood at the Institutional Level rather than at the Individual level. Not depending on Individuals but on the Team for execution of projects would eliminate most of the issues.
- Transparency needs to improve when the ESCO in the consultation stage and customer should ask the right questions in the kick off meeting stage – Payback and Timelines; instead of waiting till the contract is awarded.
- Development of IT based Measurement &Verification (M&V) and usage of controlled model of M &V

Example: The ESCO submitted a project proposal to the client for a cooler retrofit project in the cement sector; the client was not in a position to commit on the proposal for more than 6 months inspite of agreeing on the energy savings. Ultimately, the project was called off due to the delay in decision making. Interestingly, the client again showed interest after a period of 8 months- and the ESCO did not want to take the proposal forward.

7.3. Market Credibility

For considering an EPC project, market credibility of the ESCO and Client are important factors. An established ESCO looks to do business with a client having a good reputation and market credibility as an EPC usually involves high financial risks, and that the payments are not delayed for unforeseen reasons; similarly the client looks at working with a well established ESCO –having successfully executed projects in the past.

Even in terms of financing a project by a third party financier, the FI would also want to know the profits generated by the client/ ESCO to asses financial lending and payback.

7.4. Relationship with Client

The relationship that the ESCO enjoys with the client is a key criteria for the project to move forward. Relationships with energy end-users is a key element for the trust needed for the end-users and ESCOs to be willing to enter into a new type of long-term contract that may have legal precedence.

7.5. Financial Capacity

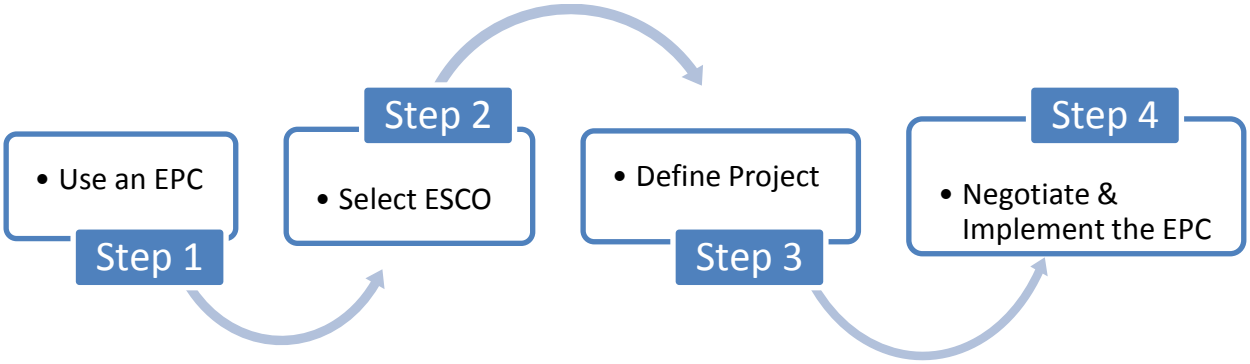
Project financing is fundamental to the ESCO's business model and availability of a long-term reliable source for financing its EE projects. The added financing intricacies of an EE projects, which use the savings measured from the project and creditworthiness of energy end-users as collateral versus traditional contracts make financing more relevant to the project and its success. The project financing barrier is difficult to overcome for ESCOs when their financial capacity is limited. In most cases, the local banking industry is unfamiliar and uncomfortable with providing project-based lending to energy savings projects on a medium- to long-term basis and very few banks accept energy savings from EE projects as collateral.

7.6. Risk Identification and Management

Risk identification is one of the critical first steps in a risk management process. Since an energy saving project has several technical and financial risks, it is important to have a risk management plan for the project documented and shared with the client. This helps in identification of any major issues at an early stage and also helps in course correction wherever necessary. For risk identification, the project team should review the project scope, cost estimates, schedules, key performance parameters, performance challenges, stakeholder expectation vs. current pans and implementation challenges among others.

8. STEPS TO ENSURING A SUCCESFUL ENERGY PERFORMANCE CONTRACT

Energy performance contracting is an approach to energy efficiency, if used in the right manner can prove to be very beneficial to many facility owners. There is no standard procedure to an EPC; however, it is extremely important that to have a clear understanding of what is involved from the outset and be aware of any potential legal or institutional hurdles. By reading and understanding this chapter and contents of this report; it should help an ESCO/Client to make a decision on whether an EPC is the right way forward.



1. Deciding whether to use an EPC

It is vital that the ESCO secure the support of key decision-makers before any effort is made to progress beyond the initial exploratory stage i.e. walkthrough energy audit stage .Past experience with performance contracts, particularly in the public sector, shows that obtaining approval from decision-makers can be a long and slow process. Lack of support from the party that must ultimately approve or reject a proposed contract greatly increases the risk of the project not getting executed.

2. Selecting an ESCO

Once the management has decided to proceed, the facility owner needs to identify an ESCO for doing a preliminary study based on the expertise of the ESCO. Normally work done on proposals by the ESCOs at this stage is produced without cost or obligation to the Customer, which means that if the client decides not to proceed, there is no requirement to pay.

3. Defining the detailed scope of the project

The next step is to develop and agree on the detailed scope of the project. If the DPR does not meet pre-determined criteria— Return on Investments (ROI), Investment costs and minimum energy cost savings—then there is no obligation to pay anything. If the DPR meets these criteria, but the client is unable to agree on a satisfactory contract, or decides not to proceed, the client is normally obliged to pay the ESCOs costs in developing the DPR.

4. Negotiating and implementing an EPC

Once both parties reach this stage, the decision-making process is almost complete, and a contract can be negotiated and awarded so implementation can begin.

Suggested Steps for ensuring a successful performance contract:

STEP 1: INTRODUCTORY STAGE

Make sure that performance contracting serves the purpose.

The first step is to consider how an energy performance contract would work for the facility by looking at the facility size and needs, energy bills, and the potential for improvements through a walkthrough Audit.

Client will: Select/or competitively select **(if required) an** accredited **energy service company (ESCO)**

ESCO will: Conduct a consultation to help the client understand the energy performance contracting process and analyze the feasibility of performance contracting for the facilities and prepare a recommendation.

Client will: Help establish specific requirements for the project and help communicate the needs and wishes to prospective ESCOs. Provide information about the facility using the data sheet/ format submitted by the ESCO.

Get the "Go" Decision

ESCO will: Give a presentation to the Board or decision-making group to explain the recommendations of the walkthrough audit and benefits of using Energy Performance Contracting as a way to fund energy efficiency and capital improvements.

Client will: Meet with the ESCO to begin to develop the project to get a clear agreement on intent, ESCO's proposed service and **Use a Technical Energy Audit and Project Proposal Contract to ensure an investment grade audit;** ensuing that all terms and expectations are incorporated in the contract.

STEP 2: TECHNICAL ENERGY AUDIT STAGE

ESCO will: Enter into Technical Energy Audit and Project Proposal Contract with the Client.

Get ongoing independent reviews during the audit process

ESCO will: Audit the facility and ensure that the process set forth in the Audit Contract is followed accurately and that the technical, financial, and legal terms are fulfilled throughout the audit phase; Review all energy and cost calculations for reasonableness;

Client will: Provide ongoing support for finalization of ESCO's audit report.

ESCO will: Develop **a quality monitoring and verification plan to establish how savings will be determined**

Client will: Review the Technical Energy Audi and the monitoring and verification plan; final acceptance of report to be provided.

STEP 3: PERFORMANCE CONTRACTING STAGE

Develop a contract that will stand the test of time

ESCO will: Draft a project Energy Performance Contract. Ensure the Performance Contract meets all terms set forth in the Audit and meets all technical, financial, and legal requirements of the state or local government.

Client will: Meet with the ESCO team to review the overall contract.

Negotiating a contract

ESCO will: Assist in negotiating a contract that meets the needs; Ensure thorough documentation to clearly address future "what-if" questions.

Develop a final measurement & verification plan

ESCO will: Develop a mutually acceptable final savings Measurement and Verification plan and ensure it is incorporated into the Performance Contract.

Client will: Sign the project Energy Performance Contract.

ESCO will implement installation of all equipment

Client will: Provide on-going support during the construction phase as necessary. Provide a certificate of acceptance.

STEP 4: MONITORING AND VERIFICATION STAGE

ESCO will: Provide monthly and annual review of energy savings reports.

Client will: Ensure timely payments to ESCO as per terms and conditions set forth in the contract.

9. FAQs ABOUT ESCO PERFORMANCE CONTRACTS

Warranty vs. Performance Guarantee

There is often confusion about the difference between a performance guarantee and an equipment warranty. A warranty is standard with all equipment purchases and covers workmanship, typically lasting for one or two years for most machinery suppliers.

For Example- If one buys a car and the door handle falls off that is covered by the warranty. If it had been written into the contract that the car will go from 0 to 60 in under eight seconds that is a performance guarantee. It describes how the machine will actually perform, and while it may have a time component attached (the performance levels must be reached within 60 days, or be continuous over six months, for example), it typically expires once the criteria are met.

While a warranty is a standard clause in an equipment contract, a performance guarantee is is negotiated as an integral part of the energy performance equipment contract.

Performance Contracts have to be lengthy

While making sure all the essential terms are in the contract, the length of contract if kept at minimum ensures that the contract is negotiated and closed with minimum delays.

If during an EPC, there is an increase in tariff, the ESCO may lose out on opportunities for cost savings

Savings proportionately increases when unit rate goes up. However these savings have not increased due to ESCO's inputs.

An Example:

	Electricity Savings	Cost/ Unit	Total Energy Cost Savings
(Baseline)	1000 kWh/ Year	6	6000 Rs/Year
(Post ECM Installation)	1000 kWh/ Year	7 (Increase by 1 Rs/Unit)	7000 Rs/Year (Goes Up)

The tariff can be kept fixed or floating as per actual depending upon the ESCO and their client agrees to. The best practice is to fix the unit rate which can be the rate applicable at the time of signing the performance guarantee contract

10. KEY LEARNINGS

While the key objective of the project was to develop a legal framework compatible with energy efficiency investments; a number of barriers/ challenges have been observed through this project. These are as follows:

1) Low awareness, and Lack of information on energy performance contracting

Though energy performance contracting has been around for a long time, the modalities of this business in understood and practised by only a handful of ESCOs. Clients are unaware of the value addition in terms of an Energy Performance Contract. Also, there is a low confidence in the ESCO mechanism by the Industry due to short track record or poor performance. Other challenges include low understanding of criteria evaluation for project financing, limited understanding of energy use patterns and load profiles, as well as unavailability of historical data or process data for establishing a baseline; even top industries do not have historical data and this increase the risk perception in case of an energy performance contract.

2) Lack of Procedure on following a M&V plan

While it is known that M&V is the crux of an EPC to establish saving to the client, there is a very low understanding and usage of M&V as a means to successful project implementation. *Measurement and verification protocols for assuring performance guarantees are not fully understood and neither practised.*

3) Availability of Project Financing

The business models submitted by ESCOs are diverse, and not all based on shared savings and non-financing factors also on need to be accounted for. Financial Institutes have their own criteria to evaluate the various business models submitted by ESCOs. A framework for providing loans will make lending to ESCOs easier.

4) Small size of projects:

While Project Financing is critical for project to go forward – there as many factors which are important for financing a project. Many energy efficiency projects and ventures are too small to attract the attention of large multilateral financial institutions. Client agreement to the rate of interest charged by a third party financial Institute vs. doing the project on itself. Project bundling (pooling/aggregation) strategies can help overcome many of the key barriers.

5) Clients agreement to the terms and conditions and adherence to timelines

The delay in getting a buy in from the management of the client greatly deters the chances of executing a project. In many cases the clients delay in agreeing to the terms and conditions have resulted in non execution of projects.

6) Technical and Business risks

The conservative behaviour from both financial institutions and consumers are major barriers to EPC in Industries.EPC in Industries is considered to have high technical and business risk perception as the energy intensity of the facility greatly depends on various factors such as production, ambient conditions, fuel changes etc and undertaking an EPC would involve a rigorous M&V procedure to be adopted adding to the project costs.

CONCLUSIONS

The objective of the project was to (i) assist ESCOs through capacity building, preparation of agreements and assist in third party financing, if required and (ii) assist in developing the standard performance contract and dispute resolution mechanism.

AEEE, through this project has been able to interact with a large number of BEE accredited ESCOs to understand the key challenges faced by the ESCOs in executing contracts. The discussions with these ESCOs have brought to surface a number of practical difficulties when deciding to go for an EPC. However, the project proposals submitted by the ESCOs show the level of interest and keenness in taking up project in energy efficiency.

The agreements were developed but only a few were negotiated and executed due to variety of reasons related to financing and the inability to get a buy in from the client among other issues. This goes on to show that while services are made available for signing of contracts; there are still major hurdles at the project level, policy level and financing level that need to addressed and these will go a long way in developing an enabling environment to foster the growth of ESCOs in India.

AEEE's standard contract document seek to address some of these concerns at the project level by providing a framework for the ESCO performance contracting; and this can be modified suitably as per the needs and requirements of the project along with the M&V planning template will allow the ESCOs to work towards undertaking more energy performance contracts in the future.

Some of the issues that need to be addressed along with the appropriate action have been mentioned as part of recommendation in the next section. AEEE will closely monitor these projects and track the timelines for the projects for the various stages.

It is also important to note that Energy Efficiency Services Limited (EESL), working as a super ESCO, have shown keen interest to proactively facilitate the ESCO business in India, and conveyed significant flexibility in development of the ESCO market.

KEY RECOMMENDATIONS

AEEE's analysis indicates that the following actions will help the ESCO industry become more attractive to investors and realize its market potential:

Project Level: Targeted at the ESCOs and client for addressing issue at the project level

A. Focus of building technology specific expertise for the various services.

Energy Services Companies provide a variety of services and have its own set of technologies. Not all ESCOs have the necessary bandwidth and expertise to take on projects over various sectors and technologies – VFDs, Chillers, Lighting etc. The focus should be on building technology specific expertise for the various services. Sub-contracting work to local partners having field experience in different areas will help build a strong partnership in the execution of projects.

In situations where project values are small, bundling of technologies by an ESCO may be considered.

B. Document and follow a M&V plan in consultation with the client - eliminating ambiguities during the course of the project

M&V is fundamental to any energy efficiency project; however AEEE's experiences working with various ESCOs have indicated that very few ESCOs lay emphasis on documenting and following a good M&V plan. Emphasis should be laid on documenting a M&V plan as the topmost priority in the project. M&V does not only establish saving to the customer, it also helps detect issues during the project implementation period and scope for correction.

C. Prompt decision making for an EPC as soon as the audit report is shared - baselines may vary beyond a period of 6 months

This is fundamental to any Business, but is particularly important when it comes to an energy efficiency project since the baseline done during the audit process may vary significantly. The Client should secure an internal buy in from the management before negotiating a contract with the client. Delays in getting approvals increase the project development cycle and results in wastage of time. There should be quick decision making in either going ahead with the contract or not.

D. Encourage execution of performance contracts after obtaining audit reports.

Audit reports form a significant part of the EPC process. However, this is a start to an EPC and should not be considered the end. If the savings potential from the energy audit are found satisfactory. Efforts should be made to implement the energy efficiency measures as described in the audit report.

Finance Level: Targeted mainly at FIs, investors and donor agencies

A. Introduce project based financing packages for small value EPC projects.

The biggest concern raised by ESCOs is the lack of collateral free energy efficiency finance packages. Such packages are only available for projects with very high investments (above 1 crore) and most of the projects become instantly ineligible. This would allow ESCOs with good project but of smaller value to be undertaken.

B. Undertake capacity building of employees for better understanding of EE projects and develop a project evaluation criteria for provision of loans for EE projects

To understand the intricacies associated with energy efficiency project and risks involved with an EPC, the FIs must undertake capacity building of the professionals to evaluate viability of projects and to make project based financing available for the prospective ESCOs.

ESCOs face major hurdles in terms of access to loans, due to lack of financial credibility, even for viable projects. The project evaluation criteria should be standardized, making sure the good projects do not lose out on opportunities.

C. Use of Performance risk guarantees for leveraging EE funds

Performance risk guarantee programs have shown some success in recent years in energy efficiency programs across the world. In partial risk guarantees the contracts are between guarantor and investor/lender and between guarantor and host country government. Schemes initiated by BEE such as the Partial Risk Guarantee Fund (PRGF) and the proposed Partial Risk Sharing facility (PRSF) of the World Bank can greatly help FIs led to ESCOs, where the risk of lending is partially covered.

D. Extend use of Venture Capital Funds to private sector

One of key elements of the NMEEE is the establishment of a Framework for Energy Efficient Economic Development (FEEED) .The FEEED includes a Partial Risk Guarantee Fund (PRGF) and a Venture Capital Fund for Energy Efficiency (VCFEE)[28]. The support under VCFEE will be limited to Government Buildings and Municipalities in the first phase.[29] However, Funds allocated for venture capital, should be opened to private ESCOs wanting to take on EE projects as a means of support for the initial years

[28] Sushilkumar Shinde. Make Energy Conservation a Mass Movement: - NATIONAL MISSION ON ENHANCED ENERGY EFFICIENCY TO BE IMPLEMENTED FROM THE 1st OF APRIL, 2010: Available at http://www.energymanagertraining.com/NAPCC/main.htm

[29] Venture Capital Fund for Energy Efficiency, 2011 -RULES, Bureau of Energy Efficiency, Ministry of Power. Available at:
http://www.beeindia.in/schemes/documents/nmeee/feeed/Rules%20VCFEE%20clean%20mode.pdf

Policy Level: Targeted at Government, Policy Makers

A. Use SECF (State Energy Conservation Funds) for partial investments in ESCO projects with time bound payment terms.

The State Energy Conservation Funds (SECF) as mandated under the EC Act, 2001, have already been constituted in 22 states and funds have been released to 21 states during the 11th Plan to operationalize the SECF for various energy efficiency initiatives. In the 12th Plan, it is proposed to set up the SECF in all the states and

- Pursue with SDAs for constitution of SECF in the states and matching contribution by the state governments to the SECF.
- Coordinate with SDAs to implement various energy conservation activities and utilization of fund under SECF.

A contribution of **Rs. 70 Crores** to SECF is proposed under the 12th Plan.[30]

If utilised properly, the SECF can be disbursed by nodal agencies in the states to encourage energy efficiency projects through the ESCO route. The agencies can propose partial investment in such EE projects with time bound payment terms and conditions.

B. Create incentives for EPCs

Despite government support for the EPC process, the Indian ESCO industry remains immature compared to other emerging economies that are also engaging ESCOs to grow the building efficiency market. In China, in response to the challenges facing ESCOs, the central and local governments have recently issued various rules and policies.

Highlights of these legislation and policies are as follows:[31]

- Banks and other financial institutions are encouraged to develop new financial products to meet ESCOs' financial needs. The procedures for EPC financing applications are to be simplified. ESCOs shall be allowed to use the fixed assets of an EPC project as collateral to apply for a mortgage loan.
- ESCOs are exempted from the payment of business tax for revenue generated from EPC projects and from the payment of VAT on the free transfer of the EPC assets to customers.
- ESCOs are exempted from income tax for three years starting from the first revenue-generating year and are entitled to 50% percent of the standard income tax rate for the next three years.
- All reasonable fees paid by the customer to the ESCO shall be treated as tax-deductible and the EPC project assets transferred by the ESCO to the customers shall not be treated as the ESCO's revenue.

[30] National Power Training Institute: Chapter 5: Demand Side Management Energy Efficiency and Energy Conservation.

[31] Key Issues for the Implementation of Energy Performance Contracting in the PRC – Jade and Foundation

- The Standard Administration has set the standard for the measurement and verification of energy saving.
- The energy savings of an EPC project must be measured and verified by a qualified independent reviewer in order to receive financial subsidies from the government. Qualified independent reviewers must be approved by the relevant energy-saving regulatory authorities.

These legislations and policies reflect the Chinese government's continuing efforts to promote energy efficiency projects.

Drawing example from China, the following are recommended for India:

i. ESCOs should be exempted from the payment of tax for the revenue generated from EPC projects.
ii. Introduce third party EE validators for EE projects.
iii. Exemptions in income tax for a minimum number of projects undertaken in a year.
iv. Develop standardized M&V plans for various types of projects

C. Create incentives for Negawatts production at par with incentives for power generation.

Energy saved through ESCo projects offsets the need for setting up new power plants. Negawatts of power reduced via demand response, energy efficiency programmes must be paid on an equal footing with megawatts of generated. The incentives extended for generation of power must also be extended to energy efficiency projects.

D. Strengthen the process of accreditation of ESCOs

To ensure performing ESCOs are incentivised for taking up more projects, there is a need to strengthen the process of accreditation of ESCOs. ESCOs that have successfully implemented and demonstrated project saving should be recognized and incentives provided for. Likewise penalties for ESCO, who have accredited themselves as ESCOs, which are unable to take a minimum number of projects in a year.

Annexure I- Sample Contents of a DPR

I. INTRODUCTION

- Energy performance in existing system (Fuel consumption, Average annual production ,Specific energy consumption)
- Existing technology/equipment (Description of existing technology)
- Baseline establishment for existing technology (Design and operating parameters , Operating efficiency analysis)
- Barriers in adoption of proposed equipment (Technological barrier, Financial barrier, Skilled manpower)

II. PROPOSED EQUIPMENT FOR ENERGY EFFICENCY IMPROVEMENT

- Description of proposed equipment
  - Detailed of proposed equipment
  - Equipment/ technology specification
  - Integration with existing equipment
  - Superiority over existing system
  - Source of equipment
  - Availability of technology/equipment
  - Service providers
  - Terms and conditions in sales of equipment
- Life cycle assessment and risks analysis
- Suitable unit for Implementation of proposed technology

III. ECONOMIC BENEFITS FROM PROPOSED TECHNOLOGY

- Technical benefit (Fuel saving ,Electricity saving , Improvement in product quality , Reduction in raw material , Reduction in other losses)
- Monetary benefits
- Social benefits (Improvement in working environment ,workers skill)
- Environmental benefits (Reduction in effluent generation ,GHG emission other emissions)

IV. INSTALLATION OF PROPOSED EQUIPMENT

- Cost of project (Equipment cost , Erection, commissioning and other misc. cost
- Arrangements of funds)
  - Entrepreneur's contribution
  - Loan amount
  - Terms & conditions of loan
- Financial indicators
  - Cash flow analysis
  - Simple payback period
  - Net Present Value (NPV)
  - Internal rate of return (IRR)
  - Return on investment (ROI)
- Sensitivity analysis
- Procurement and implementation schedule

Annexure II- Model ESCO Performance Contract

ENERGY PERFORMANCE CONTRACT

This Energy Performance Contract ("Contract") is made and entered into as of [date], by and between (“ESCO"), having its principal offices at and [Name of the Client] ("Client").

RECITALS

- Client owns and operates facilities, and wishes to acquire equipment and services to reduce energy costs and related expenses in the facilities.
- ESCO has experience and technical management capabilities to identify and evaluate energy cost saving opportunities, and provide for engineering, packaging, procurement, installation, financing, maintenance and measurement of cost effective energy conservation measures (“ECMs”).
- The Client has selected ESCO to perform a technical energy audit and pursuant to the Technical Energy Audit and Project Development Plan Agreement, dated [date], has delivered Client a Technical Energy Audit Report and Project Development Plan (“Audit Report”) which includes an assessment of the energy consumption characteristics of Client’s facilities and the identification and evaluation of viable ECMs, as well as estimates of expected energy and operational savings and associated project costs for each recommended ECM.
- Client desires to contract with ESCO for the design, installation, financing, maintenance and measurement of the ECMs all as set forth herein.

ESCO, and Client all acknowledge and agree that the purpose of this Contract is to achieve the Energy Saving , leading to related Cost Savings contemplated by this Contract to the benefit of Client and all agree to cooperate to achieve the purpose of this Contract.

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, and intending to be legally bound herby, the Client and ESCO agree to the terms and conditions set forth hereinafter.

1. SCOPE OF WORK

1.1 ESCO has prepared the final Audit Report, dated [date] which is set forth in **Appendix A** and incorporated by reference. The Audit Report has been approved and accepted by Client. The Audit Report includes all identified ECMs.

1.2. ESCO has prepared and Client have approved and accepted the Schedules and Exhibits, copies of which are available with ESCO and Client and are made a part of this Contract by reference.

2. COMMENCEMENT DATE FOR ENERGY SAVING CALCULATIONS AND TERMS

Commencement date shall be the day of the month in which ESCO shall have delivered a notice to the client that it has installed and commenced operating all Energy Saving Equipment specified in **Schedule A**; and the client has inspected the installation and operation and has given the Certificate of Acceptance as set forth in **Exhibit I.**

2.1. The term of this contract shall be **8 years** from the signing of this contract. This contract shall be effective and binding upon the parties after its execution (the Effective Date).

2.2. Payments due to ESCO for service and maintenance under this Contract as set forth in **Schedule D** shall begin after 30 days from the commencement date of acceptance of the first M&V report as specified in **Schedule H** by the Client, whichever is earlier, beginning from the commencement date as defined herein.

3. EQUIPMENT WARRANTIES AND COMPATABILITY

3.1 ESCO covenants that:

(i) All equipment installed are new, in good and proper working condition and protected by appropriate written warranties covering all parts and equipment performance. The equipment warranty is to include replacement, repair, and any labour for the warranty period.

3.2 ESCO agrees to:
(i) Deliver to the Client for inspection and approval all written warranties
(ii) Transfer warranties to the Client ;
(iii) To pursue rights and remedies against the manufacturer of the equipment under the warranties in the event of equipment malfunction, and defects in parts, workmanship and performance;
(iv) Notify the Client whenever defects in equipment parts or performance occur or when warranty rights and remedies are exercised by ESCO.

4. CONSTRUCTION SCHEDULE AND EQUIPMENT INSTALLATION: APPROVAL
4.1 Construction and equipment installation shall proceed in accordance with the construction schedule as specified in **Schedule F.**
4.2. ESCO shall conduct systematic performance test in accordance with the procedures specified in **Schedule H** and prior to acceptance by Client.

5. UPGRADING OR ALTERING THE EQUIPMENT
All replacements of and alterations or additions to the Energy Saving Equipment shall become part the Equipment described in **Schedule A** .The Client shall not withhold the approval unjustly.

6. BASE YEAR ENERGY ADJUSTMENTS

6.1 Customer to provide a quarterly report on changes affecting base year energy
Subject to the requirements of the Measurement and Verification Plan at the end of each quarter during the post retrofit period, the Client must provide to the ESCO a report which details any significant change (and the date of any such change) in any factor which may result in a change in energy consumption or the timing of energy consumption at the facility.

6.2 To the extent that the cause of any such change is beyond the ESCO's reasonable control and not a foreseeable change, the ESCO shall be entitled to adjust the base year energy and/or the estimated energy savings to account for the change.

6.3 ESCO to determine effect on base year energy and minimum expected guaranteed energy savings
(i) The ESCO will acting in good faith and in accordance with this Contract determine the effect on the base year energy or the estimated energy savings of:
(a) any change notified by the Client under Clause 6.1; or
(b) any change required as a result of an additional works specification requested by the Client; or
(ii) any other similar matter coming to the attention of the ESCO and notified promptly in writing to the Client which may result in a variation in energy consumption or the timing of energy consumption at the premises
(iii) If the ESCO determines in accordance with 6.3(i) that the base year energy or the estimated energy savings should be changed, it shall notify the Client in writing and provide to the Client the detailed reasons and calculations upon which it bases its determination. Any such change to the base year energy shall be based on the Measurement & Verification Plan.
(iv) The ESCO must obtain the Client's consent in writing to the change before it can take effect. If the Client does not provide its consent in writing within thirty (30) days of its receipt of the said calculations, then a dispute will be taken to exist for the purposes of section 16.
(v) If the resolution of the dispute requires an adjustment to the base year energy or the **minimum expected guaranteed** energy savings as predetermined by the ESCO under Clause 6.3(b), then that adjustment together with any necessary reimbursements will be made with effect from the date of the ESCO's original determination.

6.4 Energy saving procedures and methods of operation
(i) The Client must develop the procedures relating to any EPC Solutions installed.
(ii) The ESCO acknowledges and agrees that the procedures shall not exceed the requirements set by manufacturers or relevant statutory requirements.

6.5 ESCO will not be liable to the Client for any failure to realise the minimum expected guaranteed energy savings on account of failure on part of the Client.

7. OBLIGATIONS OF ESCO

7.1. ESCO agrees to deliver the minimum expected guaranteed savings as specified in **Schedule A.**

7.1. ESCO shall provide all service, repairs, and adjustments to the Equipment installed without any cost to the Client, except as set forth in **Schedule D.**

7.2. ESCO may charge Client for the actual cost of the maintenance or repair insofar as such cost is not covered by any warranty or insurance proceeds when the need for maintenance or repairs arises due to the negligence or willful misconduct of Client or any employee or other agent of Client.

7.3. ESCO shall perform all tasks, and install the Equipment in such a manner so as not to harm the structural integrity of the buildings or their operating systems and so as to conformity to **Schedule G.**

7.4. ESCO shall repair and restore to its original condition any area of damage caused by ESCO's performance under this Contract and bear all costs associated with it.

7.5. ESCO shall remain responsible for the professional and technical accuracy of all services performed, whether by ESCO or its subcontractors or others on its behalf, throughout the term of this Contract.

8. OBLIGATIONS OF CLIENT

8.1. Client shall not move, remove, modify, alter, or change the Equipment or any part thereof without the prior written approval of ESCO except as set forth in **Schedule G.**

Notwithstanding sub-section (1), Client shall take reasonable steps to protect the Equipment from damage or injury and shall follow instructions for emergency action provided in advance by ESCO.

8.2 Client shall use its best efforts to notify ESCO or its designee(s) within twenty-four hours after Client's actual knowledge and occurrence of:

(i) Any malfunction in the operation of the Equipment or any pre-existing energy related equipment that might materially impact upon the **minimum expected guaranteed** energy savings; or

(ii) Any interruption or alteration to the energy supply to the Premises; or

(i) Any alteration or modification in any energy-related equipment or its operation.

(ii) Where Client exercises due diligence in attempting to assess the existence of a malfunction, interruption, or alteration it shall be deemed not at fault in failing to correctly identify such conditions as having a material impact upon the **minimum expected guaranteed** energy savings.

9. PAYMENTS TO ESCO

9.1 ESCO guarantees to the client the annual energy and operations savings to be achieved after installation of Energy Saving Equipment and provision of services provided for in this contract as specified in **Schedule F** and **Schedule G**.

9.2 ESCO shall annually prepare and provide a report to the client documenting the performance of the ECMs.

9.3 ESCO shall maintain cost accounting records on authorised work performed under actual costs for labour and material, or other basis requiring records and shall afford to the client access to these records and preserve them for a period of one year after final payment.

9.4 The Client shall take all steps to pay to ESCO and to ensure that payments do not impact further payments.

9.5 Payments due to ESCO shall be calculated in accordance with the provisions of **Schedule D** and ESCO shall provide to the client an invoice of the total amount due.

Notwithstanding the above provisions in this Section, the client shall not be required to make any payments to ESCO under this contract unless all Energy Savings Equipment installation is completed by ESCO in accordance with Section 4 and **Schedule F** and accepted by the client.

9.6 The client shall give a certificate of acceptance as set forth in **Exhibit I.**

9.7 ESCO shall issue notice for temporary stoppage of activities where the client defaults for 2 or more invoices and re-schedule payments which may be reflected in **Schedule D**. This may include penalties and any other costs that ESCO may incur during this period.

10. EVENTS OF DEFAULTS

10.1 Each of the following events or conditions shall constitute an "Event of Default" by Client:
(i) any failure by Client to pay ESCO any sum due for a service and maintenance period of more than thirty (30) days after written notification by ESCO that Client is delinquent in making payment and provided that ESCO is not in default in its performance under the terms of this Contract;
(ii) any other material failure by Client to perform or comply with the terms and conditions of this Contract, including breach of any covenant contained herein, provided that such failure continues for thirty (30) days after notice to Client demanding that such failures to perform be cured or if such cure cannot be effected in thirty (30) days, Client shall be deemed to have cured default upon the commencement of a cure within thirty (30) days and diligent subsequent completion thereof; or
(iii) any representation or warranty furnished by Client in this Contract, which was false, or misleading in any material respect when made.
10.2 Each of the following events or conditions shall constitute an "Event of Default" by ESCO:
(i) any representation or warranty furnished by ESCO in this Contract is false or misleading in any material respect when made;
(ii) failure to furnish and install the Equipment and make it ready for use within the time specified by this Contract as set forth in **Schedule A** and **Schedule G**;
(iii) any lien or encumbrance is placed upon the Equipment by any subcontractor, labourer, supplier or lender of ESCO;
(iv) the filing of a bankruptcy petition whether by ESCO or its creditors against ESCO which proceeding shall not have been dismissed within ninety (90) days of its filing, or an involuntary assignment for the benefit of all creditors or the liquidation of ESCO;
(v) any change in ownership or control of ESCO without the prior approval of Client, which shall not be unreasonably withheld; or
(vi) failure by ESCO to pay any amount due Client or perform any obligation under the terms of this Contract.

11. REMEDIES UPON DEFAULTS

11.1 If an event of default by the Client occurs, ESCO may exercise all remedies available at law or in equity or other appropriate proceedings including bringing an action or actions from time to time for recovery of amounts due and unpaid by Client, and/or for damages which shall include all costs and expenses reasonably incurred in exercise of its remedy. Election of one (1) remedy is not a waiver of other available remedies.

11.2. If an event of default by ESCO, the Client may exercise and any all remedies at law or equity, or institute other proceedings, including, without limitation, bringing an action or actions from time to time for specific performance, and/or for the recovery of amounts due and unpaid and/or for damages, which shall include all costs and expenses reasonably incurred, including attorney's fees. Election of one (1) remedy is not a waiver of other available remedies.

12. TERMINATION OF CONTRCT PRIOR TO ENERGY SAVING CALCULATIONS

12.1. ESCO shall not be entitled to receive any payments from the Client where ESCO is unable to complete the construction and equipment installation in accordance with **Schedule F.**

12.1. Where the contract is terminated by the Client before the commencement of the Energy Saving Calculations or the first Monitoring and Valuation Report as specified in **Schedule H** whichever is earlier, ESCO shall be entitled to receive from the Client capital expenditure incurred on the construction and installation of the Energy Saving Equipment.

13. TERMINATION OF CONTRACT AFTER ENERGY SAVING CALCULATIONS

13.1. Where the contract is terminated due to ESCO's events of default, ESCO shall be entitled to receive from client termination payment equal to 90 per cent of the capital expenditure incurred on the installation of the Energy Saving Equipment.
13.2. Where the contract is terminated due to the Client's events of default, ESCO shall be entitled to receive from the client 120 per cent of the capital expenditure incurred on the installation of the Energy Saving Equipment.

14. TERMINATION BY MUTUAL CONSENT

Where the parties terminate this Contract by mutual consent, both parties shall be entitled to receive from each other the expenditure incurred or to be incurred by themselves towards the works done or in progress under this Contract after adjusting the depreciation of equipment.

15. FORCE MAJEURE

If any party is unable to perform any of its obligations under this Contract due to acts of God, Earthquake, war, insurrection or riots, or any other event beyond its control, this Contract shall at the other party's option:

(i) Remain in effect but said performing party's obligations shall be suspended until the said events shall have ended; or

(ii) Be terminated upon 10 days' notice to the performing party, in which even neither party shall have any further liability to the other.

16. DISPUTE RESOLUTION

16.1. Unless otherwise provided in this contract, if a party considers that there is a dispute in respect of any matters arising out of, or in connection with this contract, then that party shall immediately try to resolve the matter amicably.

16.2. Where the parties fail to resolve the dispute as provided in 18.1, the party which considers that there is a dispute shall give notice to the other party setting out details of the dispute. The parties will endeavor in good faith to resolve the dispute between themselves within five working days of the receipt of the notice, failing which the parties will within a further ten working days to appoint an independent mediator agreed upon by both parties, and resolve the dispute, time being of the essence.

16.3. If the parties fail to agree in mediation then the dispute shall be referred to the arbitration of a sole arbitrator.

16.4. Where the parties disagree to the arbitration of a sole arbitrator, the dispute shall be referred to the arbitration of three arbitrators.

16.5. The parties are free to agree on a procedure for appointing an arbitrator or arbitrators. Failing any agreement in arbitration with three arbitrators, each party shall appoint one arbitrator, and the two appointed arbitrators shall appoint the third arbitrator who shall act as the presiding arbitrator.

16.6. If the appointment procedure in sub-section 16.3, 16.4 or 16.5 applies and—

(i) A party fails to appoint an arbitrator within thirty days from the receipt of a request to do so from the other party; or

(ii) The parties fail to agree on the appointment of a sole arbitrator; or

(iii) The two appointed arbitrators fail to agree on the third arbitrator within thirty days from the date of their appointment,

16.7. The arbitration shall be referred to the Indian Council of Arbitration (the Council). The President of the Council shall appoint a sole arbitrator or three arbitrators in accordance with the Rules of Arbitration of the Council.

16.8. The decision of the Arbitrator(s) shall be final. No appeal shall lie against the decision of the Arbitrator(s).

16.9. The place of the arbitration shall be agreeable to both parties, and the language of the arbitration shall be English.

17. COORDINATION

The client will provide all necessary support to the ESCOs to ensure smooth coordination with the existing contractors of ESCO.

18. ASSIGNMENT

18.1. No party shall transfer or assign or sub-assign its rights, interests or obligations in whole or in part to any third party without the prior written approval of the other party in this contract.

19. PROPERTY/CASUALTY/INSURANCE: INDEMNIFICATION

ESCO shall save and hold harmless Client and their officers, agents and employees or any of them from any and all claims, demands, actions or liability of any nature based upon or arising out of any services performed by ESCO, its agents or employees under this Contract.

20. GENERAL PROVISIONS

The contract shall be governed by Indian Laws and the Courts at [Place] will have jurisdiction to entertain any dispute or claim arising on the contract.

20.1. ESCO shall be responsible for obtaining all permits, consents, and authorizations as may be required to perform its obligations hereunder. Failure in this Contract to specifically identify any applicable law does not affect its applicability.

20.2. ESCO is an independent contractor in the performance of each and every part of this Contract, and solely and personally liable for all labor, taxes, insurance, required bonding and other expenses, and for any and all damages in connection with the operation of this Contract, whether it may be for personal injuries or damages of any other kind.

20.3. This Contract, when executed, together with all Schedules attached hereto or to be attached hereto, as provided for by this Contract shall constitute the entire Contract between both parties and this Contract may not be amended, modified, or terminated except by a written amendment signed by the parties hereto.

20.4. This contract shall be construed in accordance with laws of the state. Any action to enforce the provisions of this contract shall be brought in the district court of [Name of City]. In the event any term of this contract is held to be invalid or unenforceable by a court, the remaining terms of this Agreement will remain in force.

20.5. Any notice required or permitted hereunder shall be deemed sufficient if given in writing and delivered personally or sent by registered or certified mail, return receipt requested, postage prepaid, or delivered to a nationally recognized express mail service, charges prepaid, receipt obtained, to the address shown below or to such other persons or addresses as are specified by similar notice.

TO [**ESCO Name and Address]**

TO **[Client Name and Address]**

IN WITNESS WHEREOF, and intending to be legally bound, the parties hereto subscribe their names to this Contract by their duly authorized officers on the date first above written.

[Name of ESCO]	**[Name of Client]**
By: _____	By: _____
(Signature)_____	(Signature) _____
(Name and Title)	(Name and Title)

ATTACHMENT I: Schedules, Exhibits, and Appendices

SCHEDULE A: EQUIPMENT TO BE INSTALLED BY ESCO

Sr. No.	Project Name	Annual Savings in Electricity, kWh	Annual Savings, Rs	Annual O&M Costs (Rs)	Annual M&V Costs (Rs)	Other project costs (Rs)	Payback Period, Months	Return on Investment %
1								

SCHEDULE B: BASELINE ENERGY CONSUMPTION

Baseline and post-installation energy is to be defined using metering, billing analysis and/or engineering calculations (including computer simulations) either individually or in combination. In addition, values for certain factors that affect energy use and savings that are beyond ESCO's control may be stipulated using historical data, analyses and/or results of spot or short-term metering

SCHEDULE C: SAVINGS MEASUREMENT & CALCULATION FORMULAE; METHODOLOGY TO ADJUST BASELINE

The energy savings are determined by calculating the difference between the energy measured in the pre-retrofit and post-retrofit periods after accounting for differences in non- ECM factors between the two periods.

In general the savings equation is:

Savings = Base year Energy Use – Post-Retrofit Energy Use ± Adjustments

SCHEDULE D: PAYMENTS TO ESCO

Year	Contract Payments {A}	Maintenance Services Fee {B}	Operations Monitoring Fee {C}	Other (Specify) {D}	Total Payments {E}={A}+{B}+{C}

SCHEDULE E: ENERGY SAVINGS ESTIMATE

Year	Annual Energy Saving (---UNIT)	Annual Energy Saving Contracted demand (KW)

Total over project concession period		

SCHEDULE F: CONSTRUCTION AND INSTALLATION SCHEDULE

SCHEDULE G: SYSTEMS START-UP AND COMMISSIONING; OPERATING PARAMETERS OF INSTALLED EQUIPMENT

SCHEDULE H: M&V PLAN SUMMARY (ATTACH FULL M&V IN A SEPARATE SHEET)

ECM	ECM Description	M&V Option*	Summary of M&V Plan

*OPTION A,B,C,D OF IPMVP

SCHEDULE I: ESCO'S, CLIENTS AND FACILITY MAINTENANCE RESPONSIBILITIES

A description of ESCO's specific operations and maintenance responsibilities should be included in this schedule along with the time intervals for their performance of the stated O&M activities.

SCHEDULE J: ESCO'S TRAINING RESPONSIBILITIES

Training Schedule	Time Period

EXHIBITS

EXHIBIT I CERTIFICATE OF ACCEPTANCE — INSTALLED EQUIPMENT

APPENDICES

APPENDIX A: TECHNICAL ENERGY AUDIT REPORT

EXHIBIT I CERTIFICATE OF ACCEPTANCE — INSTALLED EQUIPMENT

FORM OF CERTIFICATE OF ACCEPTANCE

FINAL CERTIFICATE OF ACCEPTANCE

Dated _____, 2014

In compliance with the terms, conditions and provisions of the **ENERGY PERFORMANCE CONTRACT** *dated _____, 2014 (the "Contract"), by and between the undersigned (the "Client") and (the "ESCO"), Client hereby:*

(a) certifies and warrants that all equipment described in the above-referenced Contract (the "Equipment") is delivered, inspected, fully installed and operational as of the Acceptance Date, as indicated and defined below;

(b) accepts all of the Equipment for all purposes under the contract and all attendant documents as of this _____ day of _____, 2014(the "Acceptance Date").

Client:

_____

By: _____

Title: _____

ABOUT AEEE

AEEE provides common platform for energy efficiency (EE) stakeholders to collaborate and address barriers to energy efficiency in India, through policy research, facilitating market transformation, fostering technology innovations, capacity building of energy professionals and stimulating financial investments. AEEE is promoted by EE industry leaders, distribution companies, academic and research institutes and national and international non-government organizations working in the energy conservation space. AEEE is active in energy efficiency policy research, capacity building and implementation advisory. AEEE is presently working on various initiatives that would ultimately result in energy consumers benefiting from EE activities.

For more information on AEEE, please visit www.aeee.in.

ABOUT SSEF

Shakti Sustainable Energy Foundation works to strengthen the energy security of the country by aiding the design and implementation of policies that encourage energy efficiency as well as renewable energy. Based on both energy savings and carbon mitigation potential, it focuses in four broad sectors: Power, Transport, Energy Efficiency and Climate Policy. Shakti acts as a systems integrator, bringing together key stakeholders including government, civil society and business in strategic ways, to enable clean energy policies in these sectors.

Shakti is part of an association of technical and policy experts called the ClimateWorks Network. For more information, please visit http://www.shaktifoundation.in