A Best Practice Guide to Energy Performance Contracts

reducing operating costs through guaranteed outcomes

Produced by:
The Australasian Energy Performance Contracting Association for the Energy Efficiency Best Practice Program in the Australian Department of Industry Science and Resources

AEPCA

energy efficiency best practice

INDUSTRY SCIENCE RESOURCES

Disclaimer

The Australasian Energy Performance Contracting Association prepared this publication for the Energy Efficiency Best Practice Program. It was created by Robert Turner Consulting Pty Ltd, with contributions from Yves Lemoine Consulting and Conway Leather Shaw.

This guide is one of three separate documents prepared by the AEPCA that form the following suite of materials, which should be read together:

- Standard Detailed Facility Study Agreement;
- Standard Energy Performance Contract; and
- Best practice guide to Energy Performance Contracts (this guide).

The information, opinions and advice presented in this guide are intended for information purposes only, and are not intended to be definitive or complete. You should not rely solely on the contents of the guide, but should consult your own professional advisers before taking any action in relation to the matters set out in the guide. AEPCA, its related and member organisations and all of the authors of the guide hereby exclude all liability of any kind (to the extent that such liability can be excluded) for the contents of the guide or for any consequences arising from its use or from any reliance placed upon it.

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ENERGY EFFICIENCY BEST PRACTICE PROGRAM (EEBPP)

The EEBPP:

- works with industry sectors to reduce their greenhouse gas emissions, while also reducing costs and increasing competitiveness through improved energy efficiency;
- focuses on benchmarking and encourages innovation and best practice;
- develops practical products and services, such as information guides, training modules, case studies, databases and recognition schemes;
- works closely with industry associations, companies and other government agencies delivering energy-related programs; and
- targets industry sectors and processes with the greatest potential for achieving cost-effective energy savings and greenhouse gas emission reductions.

The Best practice guide to Energy Performance Contracts is one of a number of EEBPP cross-sectoral programs. More information on the EEBPP and other initiatives of the Department of Industry, Science and Resources (DISR) is available from the Department's web site: www.isr.gov.au/.

THE AUSTRALASIAN ENERGY PERFORMANCE CONTRACTING ASSOCIATION INC. (AEPCA)

The AEPCA, formed in 1998, is the peak body representing the Energy Performance Contracting industry in Australia. Members include the major firms operating in the industry. The AEPCA's mission is to act as the peak body to support the commercial growth of the industry, its members and their market through education, industry promotion, self-regulation and industry standards. A number of government bodies are welcome members of AEPCA.

AEPCA has initiated, and will continue to develop, links with other key industry bodies that share its objectives for energy efficiency and greenhouse abatement, such as the Sustainable Energy Industry Association (SEIA), the Institution of Engineers Australia (IE Aust.), the Australian Building Energy Council (ABEC), and the Property Council of Australia (PCA). AEPCA has also established international relationships with similar bodies such as National Association of Energy Services Companies (NAESCO) in the United States, the Canadian Association of Energy Services Companies (CAESCO), the Japanese Association of Energy Service Companies (JAESCO), and industry contacts in Thailand and other South East Asian nations.

To date, the Energy Performance Contracting industry in Australia has invested millions of dollars in initial market development activities conducted nationally over the past few years. AEPCA representatives have taken part in a number of presentations and have worked diligently to explain the benefits of EPCs to a wide range of government bodies. More details are available on the AEPCA web site at www.aepca.asn.au.

CONTENTS

ABBREVIATIONS

The following abbreviations are used throughout this guide and accompanying documents.

AEPCA	Australasian Energy Performance Contracting Association
AGO	Australian Greenhouse Office
ASHRAE	The American Society for Heating, Refrigeration and Air-conditioning Engineers
CFL	compact fluorescent lamps
DFS	Detailed Facility Study
DPWS	New South Wales Department of Public Works and Services
ECM	energy conservation measure
EE	energy efficiency
EEBPP	Energy Efficiency Best Practice Program
EOI	Expression of Interest
EPC	Energy Performance Contract or Contracting
ESCO	energy services company
GHG	greenhouse gas
HVAC	heating, ventilation and air conditioning
IAQ	indoor air quality
IPMVP	International Performance Measurement and Verification Protocol
IRR	Internal Rate of Return
M&V	measurement and verification
MVP	measurement and verification plan
NPV	Net Present Value
O&M	operations and maintenance
RFP	Request for Proposal
SEDA	New South Wales Sustainable Energy Development Authority
TPF	third party financier
VSD	variable speed drive

You can also refer to Appendix 9, which includes definitions of terms used both in the Standard Energy Performance Contract and this guide.

EXECUTIVE SUMMARY

To foster the development of the Energy Performance Contracting industry, AEPCA has developed a set of standard contractual agreements:

- *Standard Detailed Facility Study Agreement;* and
- *Standard Energy Performance Contract.*

The aim of these 'standard' contracts is to provide a consistent basis from which to negotiate an energy performance contract between you (the Customer) and your energy service company (ESCO). These documents have been reviewed and have received widespread endorsement by many stakeholders, including the ESCO industry, relevant Commonwealth Government departments and State Government departments, and private and public sector facility owners and operators. They are intended as standard templates for negotiating and implementing successful EPCs. Although it is expected that these documents can be used without significant change, it is up to the parties negotiating the agreements to decide if the circumstances of their project dictate a need to modify or adapt the agreements.

The primary aim of this guide is to provide guidance to you, and to building and facilities' owners and managers, on the interpretation and implications of key clauses in the *Standard Energy Performance Contract and Standard Detailed Facility Study Agreement.* Although the guide discusses many aspects of Energy Performance Contracting in general, it is intended primarily to be a guide to the actual standard contracts. For more information on Energy Performance Contracting, please refer to the AEPCA web site at www.aepca.asn.au.

Chapter 1 provides a useful overview of Energy Performance Contracting and its advantages, and discusses whether or not it may be the best choice for you in dealing with your energy efficiency requirements. It identifies the steps the AEPCA is taking to enhance the growth and strength of the industry through market development activities. This chapter also examines the four steps involved in reaching a decision to implement an EPC, explains funding options, and shows how independent assistance can be useful for Customers who want to access independent technical and commercial expertise.

Chapter 2 sets out the Energy Performance Contracting process recommended by the AEPCA—from selecting your ESCO and defining the scope of the project through to negotiating, signing and then implementing your project. It provides a detailed step-by-step process which, depending on your organisation's needs, can be adopted as suggested or modified to suit the specifics of your situation.

Chapter 3 is the commentary on the *Standard Detailed Facility Study Agreement.* This chapter describes what a *Detailed Facility Study Agreement* should deal with, and how to set conditions for payment. In brief, the objectives of this agreement are to provide a mechanism under which the ESCO can properly define the scope of a proposed EPC and project, and to obtain your commitment and intent to proceed with signing an EPC if the project appears financially and technically viable. This chapter provides guidance on these objectives and discusses issues related to various clauses in the standard agreement.

Chapter 4 is the commentary on the *National Standard Energy Performance Contract*—the heart of this guide. The clauses of the standard contract which are explained in detail in the commentary deal with a range of issues from design and installation of energy conservation measures, commissioning procedures, equipment maintenance, performance guarantee, and baseline adjustments, to intellectual property rights, and insurance and dispute resolution. Each key clause is explained in plain English and, in some cases, illustrated with an example.

Also included in the guide, as part of the Appendices, are tools and documents to help you through the process. They include: a risk assessment table; a check list on whether Energy Performance Contracting is right for your facility; sample Expression of Interest documentation; a check list of a Detailed Facility Study report deliverables; standard contract definitions, and other useful pro-forma documents.

CHAPTER 1: INTRODUCTION

About this guide

This guide is a supporting commentary on, and should be read in conjunction with, the *Standard Energy Performance Contract* and the *Standard Detailed Facility Study Agreement*. It was produced with the support of the Energy Efficiency Best Practice Program (EEBPP), which is managed by the Department of Industry, Science and Resources. The guide is also intended to help you by introducing performance contracting and the processes involved, and by providing practical advice on how to set up a performance contract, and what to look for in doing so.

Energy Performance Contracting is a way of implementing energy efficiency projects (and equipment/plant/maintenance upgrades in all types of facilities and buildings). It provides a transparent way to manage risks, while guaranteeing outcomes and results. Being a relatively new methodology in Australia, a national standard suite of documents was needed to help Customers work through the process with the least amount of difficulty. The Australasian Energy Performance Contracting Association Inc. (AEPCA), supported by relevant Commonwealth Government and State Government departments, has developed a set of standard contract documents that can be used by Customers from the public and private sectors. These documents are available on the AEPCA web site at www.aepca.asn.au.

Who should use this guide?

This guide is useful to anyone responsible for the operating costs of their business, related to energy and other resource inputs such as water. This includes management professionals such as facility managers, building owners and managers, plant and process engineers, financial controllers and procurement officers. The guide has been written for the facility owner, operator or person responsible for managing the negotiation and implementation of an EPC.

What is Energy Performance Contracting?

General explanation

Facility owners and operators know that energy costs are significant, and that these costs could be reduced by investing in proven and cost effective energy-saving technologies, systems and procedures. Yet they face a formidable number of barriers before investing in energy conservation. Some lack technical knowledge; others lack adequate finances, or are unable to raise sufficient finances; while others have reservations about the ability of energy-saving equipment to perform as promised.

Energy Performance Contracting is an innovative form of contracting, developed to overcome the major barriers to delivering cost-effective energy efficiency. Energy Performance Contracting can be used in any facility in which energy is used, including all types of buildings and industrial processes.

Energy Performance Contracting is when an energy service company (ESCO) is engaged to improve the energy efficiency of a facility, with the guaranteed energy savings paying for the capital investment required to implement improvements. Under a performance contract for energy saving, the ESCO examines a facility, evaluates the level of energy savings that could be achieved, and then offers to implement the project and guarantee those savings over an agreed term.

Energy Performance Contracting 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. The ESCO takes the technical risk and guarantees the savings. The ESCO is usually paid a management fee out of these savings (if there are no savings, there is no payment) and is usually obligated to repay savings shortfalls over the life of the contract. At the end of the specific contract period the full benefits of the cost savings revert to the facility owner.

The methodology of Energy Performance Contracting differs from traditional contracting, which is invariably price-driven. Performance contracting is results-driven: ensuring quality of performance. ESCOs search for efficiencies and performance reliability to deliver contractual guarantees.

An ESCO's services typically include:

1. performing an energy audit, known as a Detailed Facility Study (DFS);
2. establishing baseline energy use for specific equipment, systems, or the facility as a whole;
3. designing the project in consultation with the Customer;

4. undertaking turnkey supply, installation and commissioning of equipment;
5. training or briefing Customer personnel;
6. operating and maintaining the equipment for the life of the contract;
7. conducting measurement and verification (M&V) to determine the actual savings; and
8. providing savings and equipment performance guarantees.

The provision of this total package of services from a single company is the key difference between performance contracting and more conventional project implementation and funding. Different contractors may use different technologies and often provide divergent solutions. Energy Performance Contracting creates incentives for the ESCO to provide quality products and services over the lifetime of a project.

Other factors differentiate performance contracting, including:

- the Customer may not be required to make an up-front capital investment (if the contract is structured as an operating lease or if the ESCO provides direct financing);
- if you are required to borrow funds, the loan agreement can be structured such that the guaranteed savings stream will exceed the loan repayment obligations, producing a positive cash flow and resulting in immediate and real benefits from a project;
- the payments to the ESCO are contingent, to varying degrees, upon the level of energy savings achieved; and
- since the outcomes are guaranteed by the ESCO, technical and financial risks are shifted from the Customer to the ESCO. (See the sample risk allocation table at Appendix 1 as one way of describing how risk is shared between the Customer and the ESCO.)

Once the project is complete, the ESCO, or a third party auditor, continues to measure or monitor energy use and costs of the project. The ESCO then compares actual energy costs with the baseline cost to determine total savings. Without adequate M&V, there is no basis for determining the amount of energy saved. Typical contract terms are between four and 10 years—a relatively long period, but necessary to be able to structure the contract so the guaranteed savings cover the capital repayment and all ongoing costs to ensure a positive cash flow to the Customer.

A typical guaranteed savings project would normally be structured as in Figure 1 below. Note that there are separate agreements required between you (the Customer) and the ESCO, and you and the bank or financier (assuming you are not using your own available capital). The relationship between the bank and the ESCO is indirect, and primarily for the benefit of the bank to assess the stream of the guaranteed savings. The term 'bank' here is generic and intended to imply any financial institution providing capital funds for a project.

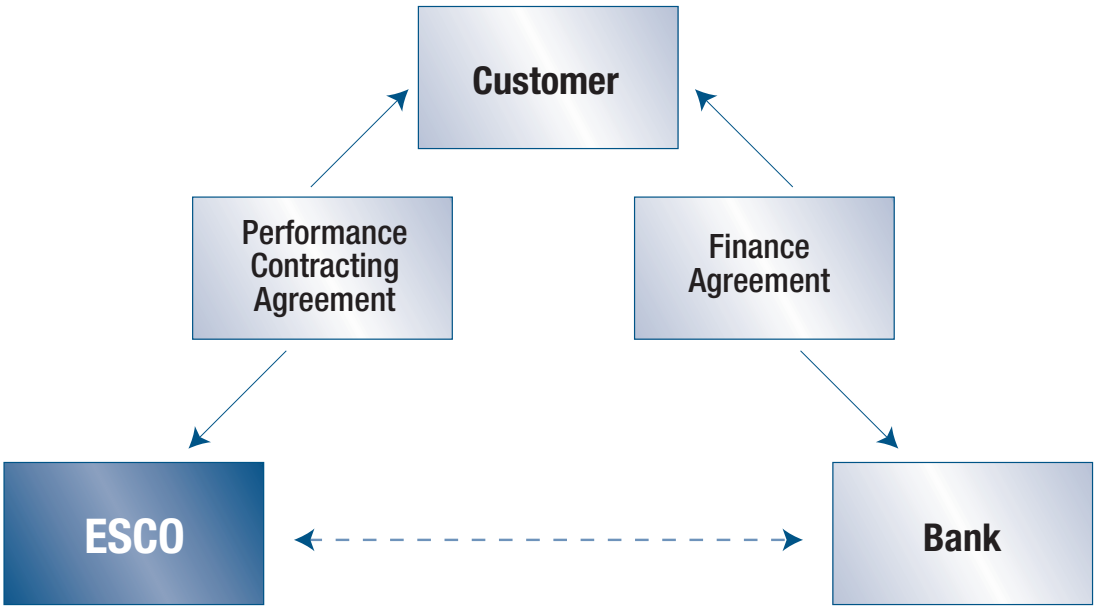

Figure 1: Relationship between Customer, ESCO and bank

Advantages of Energy Performance Contracting

EPCs have many benefits. Some reasons to choose an EPC for your project include:

- reduction of operating costs;
- facility improvement;
- outsourcing of non-core activities to focus on mission;
- simplicity of having a single source provider;
- dissatisfaction with traditional construction process results;
- alternative source of facilities funding—budget relief;
- access to systems experts and partnership with ESCO;
- potential to focus on improving the quality of the indoor environment—indoor air quality (IAQ);
- code compliance;
- risk management;
- potential access to capital;
- solution to a specific need;
- guaranteed performance;
- value-based solution;
- competitive advantage in your industry from lower operating costs;
- accountability over the term of the contract; and
- environmental benefits.

Although some of these benefits are inherent in the EPC process, others will need to be expressly discussed with your ESCO. Like all objectives, you will need to discuss these openly with your ESCO to ensure they are met.

There are five principal reasons why you may wish to consider Energy Performance Contracting, described below.

Technical risk

An ESCO's main job is managing technical risk—the EPC shifts that risk from your organisation (where it would normally lie in a traditional tendering approach) to the ESCO. The ESCO assumes the risk that:

- the project will perform as designed;
- the project will remain within budget regardless of technical difficulties; and
- the equipment will not be maintained or operate properly after installation.

Project financing

The intrinsic value to energy savings projects is demonstrated most clearly by cash flow. While most energy savings projects are funded like capital works upgrades, ESCOs can demonstrate how an energy savings project can be funded out of cash flow rather than capital expenditure. If the funding is structured as an operating lease, the project becomes fully self-funded rather than a debt on your balance sheet. Although not all EPC Customers will be able to take advantage of this, you should discuss this as an option with your ESCO, as well as with your finance department.

Guaranteed savings

EPCs involve a guarantee by the ESCO that the savings will be achieved. This is normally structured so the loan repayment is less than, or equal to, the savings guarantee amount. In this way, you are assured of being able to meet your loan or lease payment obligations from the savings generated by the project. This may also be important if you are sceptical about the ability of identified improvements to achieve the energy savings claimed under a traditional tendered approach.

Expertise

Since energy efficiency is its core business, the ESCO brings expertise to a project. While consulting engineers can offer similar expertise, and indeed are frequently employed by ESCOs, using a performance contracting arrangement enables you to streamline and deal with only one company. Also, because the ESCO is interested in a partnership with you and is always looking to improve the performance of the project, it can bring a level of continuous improvement that would ordinarily not happen.

Environment

Environmental benefits achieved by reduced energy consumption include a reduction in greenhouse gas emissions (either directly from burning fossil fuels on-site or indirectly from electricity that is generated from fossil fuel power stations), reduced water consumption, reduced chemical use and reduced solid waste. With performance contracting, these benefits can be easily measured and reported in your annual reports, as important corporate contributions to global environmental needs.

Note: Performance contracting offers management more time savings than carrying out the project in-house. However, because of the relatively new nature of Energy Performance Contracting in Australia, it may appear to be a more difficult and drawn out process than you are accustomed to. Using an independent and experienced facilitator to help you through the unfamiliar aspects of negotiating an EPC and entering into a true 'partnership' with your ESCO can greatly reduce the timeframes involved.

Some advantages of EPCs are found in Figure 2 opposite. This Figure shows the speed advantage of a well-

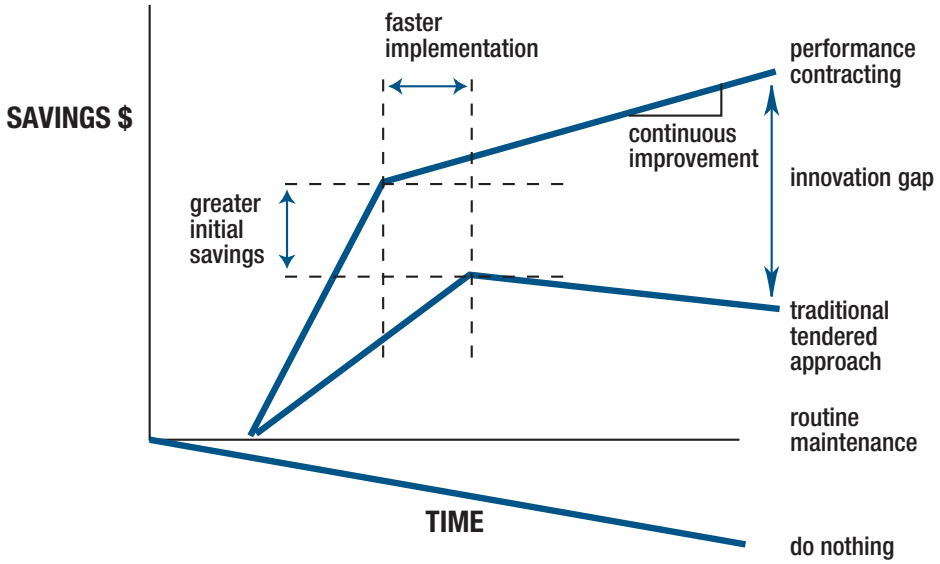

Figure 2: advantages of EPC over traditional tendered approach

managed EPC, the potential for greater savings, and the driver for continuous improvement and more incremental savings.

When an EPC may not be the best choice

While energy performance contracting has numerous benefits, it may not be the best option in all situations. You can consider the following when deciding whether an EPC is the best option for your facility.

1. Ensure you are comfortable with a long-term relationship and the benefits this will provide before proceeding with an EPC. One possible drawback is the loss of flexibility associated with signing a contract with a single contractor for a lengthy time period—this is an obvious corollary of the benefits of using a single source contractor for the entire project.
2. It is important to ask if the potential size of the EPC carries the overhead costs of developing a project by an ESCO. Performance contracts are turnkey arrangements that involve not only the capital investment cost, but also engineering audits, the implementation and corresponding project management time, and ongoing monitoring and maintenance. Thus, the threshold of economic viability for energy service companies may exclude smaller opportunities. The simple check list at Appendix 2 may help you decide if your facility will be suitable for an EPC.
3. It is also important to ask if you are willing to try something new and innovative, given the potential benefits that could be realised. Whilst performance contracting can provide the capital to both public and private sector Customers to fund energy saving improvements, these arrangements may not fit neatly into your existing procurement rules. Customers should check their internal procedures before a performance contract can be signed, and a considerable amount of education may be required to overcome possible reservation of this unconventional approach. Chapter 2 of this guide sets out the procurement procedures recommended by AEPCA, which could be used or adapted to alleviate difficulties in this regard.

Experience to date

International

Energy performance contracting has been used successfully in government and private sector operations in the United States, Canada and Europe for 20 years, but is relatively new in Australia.

In the United States, the Federal Government alone has in place US$5 billion worth of upgrade contracts that are predicted to deliver over US$1 billion in energy savings per year. This is achieved without any impact on the Federal budget, as these projects are funded through third parties. These loans are paid for using the guaranteed savings negotiated with the energy performance contractor. More information is available at

http://eren.doe.gov/femp/femp.html. Another US$750 million has been invested in private sector EPCs—covering schools, hospitals, airports, manufacturing and petrochemicals.

In Canada, the Federal Buildings Initiative has resulted in energy upgrades to 5 500 buildings resulting in a 16 per cent reduction in energy use and an 18 per cent reduction in greenhouse gas emissions. More information is available at http://oee.nrcan.gc.ca.

EPCs are now also being used in other countries around the world, including Japan and Thailand.

In the public sector, energy performance contracting is applicable to federal, state and local government facilities, as well as institutions such as hospitals, schools and universities. The attraction of equipment upgrades—often replacing old, expensive to maintain equipment—paid for through the guaranteed savings, is persuasive. It applies equally well to the private sector, where the offer of guaranteed savings overcomes the risk aversion of many business managers wary of efficiency claims; this is true both of the property industry and most industrial companies. In the United States, EPCs have also been applied to mobile equipment, allowing for the upgrade of federally owned aircraft, ships and trucks.

Australia

In Australia, there is a growing capability to provide this service. New South Wales has taken a lead by facilitating the efforts of the Sustainable Energy Development Authority (SEDA). The New South Wales Government has already contracted more than A$9 million worth of upgrades in facilities such as regional hospitals, the Australian Museum and the New South Wales State Library. These projects will return over A$1 million in savings per year, and reduce greenhouse gas emissions by 7 115 tonnes per year. Other Australian examples of EPCs include hospitals, prisons and some of Australia's leading universities.

Energy Performance Contracting is a major opportunity for many Greenhouse Challenge partners to deliver their committed emission reductions.

Typical projects undertaken in the private sector to date in Australia have included air conditioning upgrades, boiler and chiller replacements, and lighting system upgrades. Under one State Government performance contract, annual energy and operating cost savings were sufficient to pay back the cost of new equipment and installation in less than five years. Some Commonwealth Government departments have already signed contracts or are in the evaluation phase.

Australian efforts for market development

Australian business experience to date has highlighted issues restricting the rapid uptake of energy performance contracting. This includes:

- the lack of consistent national industry standards/standard documentation for process and contract and training resources;
- lack of awareness and understanding of the EPC process by potential Customers;
- risk aversion of Australian business to something that sounds 'too good to be true';
- inability of some governments to handle third party loan arrangements because of legislative barriers;
- lack of desire by businesses to act on non-core activities such as energy efficiency/greenhouse abatement despite proven economic benefits;
- low energy costs which have a negative impact on the financial return from energy efficiency/greenhouse gas projects;
- the 'split incentive' between property owner and tenant as identified in the recent Productivity Commission report*;
- the early stage of the industry's development and consequent lack of resources, especially in relation to the development of the functions of the association;
- distrust of the process; and
- the novelty of the EPC approach, which works against the process in many organisations. Performance contracting does not fit neatly into any of the categories defined by tradition or by regulations.

AEPCA has considered these issues carefully and has developed the following three-pronged strategy to address them.

Stage 1—establish the foundations of national industry representation

This requires a national association office that can coordinate the activities of the Association in the development and delivery of the strategies.

Stage 1 is complete. The EPC industry has invested cash (membership fees and voluntary cash contributions) and hundreds of person-hours to establish theAEPCA as a professionally run association with a Board that is

*Productivity Commission Submission to the House of Representatives Standing Committee on Environment and Heritage: August 2000, available at www.pc.gov.au/research/subs/environment/index.html

recognised as the single voice of the industry. The AEPCA has conducted ministerial briefings, workshops with interested stakeholders, and public meetings.

Stage 2—build industry capability and the necessary Customer resources

This requires:

1. standard national procurement process, contract, and monitoring and verification documentation;
2. AEPCA accreditation to recognise pre-qualified energy performance contractors;
3. AEPCA accreditation to recognise EPC Program Support Managers; and
4. AEPCA accreditation to recognise pre-qualified M&V auditors.

The first element of Stage 2 is well under way, with the Commonwealth Government-funded development of the Standard Energy Performance Contract and Standard Detailed Facility Study Agreement, and the publication of this best practice guide. The remaining tasks are scheduled to be implemented progressively as funds become available.

Stage 3—build Customer confidence

This requires:

1. an AEPCA best practice web site;
2. awareness raising through training courses, seminars and direct marketing to end users;
3. development of case study information;
4. training and education; and
5. facilitation through Commonwealth Government programs such as Energy Efficiency Best Practice and Greenhouse Challenge, and State-based programs.

AEPCA has developed a three-year EPC Industry Action Plan to implement Stage 2 and Stage 3 strategies, pending available funding.

Should you use external assistance and where can you get help?

The EPC process is new to most Customers. Experience has shown that an independent facilitator or project manager directly experienced with EPCs can help guide you through the unfamiliar process. The procedure described in this guide may appear complex, but it is quite logical. Once the process is understood, Customers should find it relatively straightforward to manage it themselves, provided they have the time and resources.

Independent consultants with experience negotiating EPCs, can identify the technical and commercial areas you should be aware of before the EPC is signed. They can also provide a review of the plans and details prepared by the ESCO and facilitate the negotiation process, to arrive at a final plan agreed to by both parties.

You may wish to use independent consultants to assist you throughout the process or for specific tasks, such as:

- defining the general scope of works;
- performing a preliminary audit to identify potential for savings and estimating costs;
- preparing documents for procurement such as the EOI, the RFP and evaluation procedures;
- assisting in the evaluation of proposals;
- reviewing the DFS;
- reviewing the proposed maintenance and verification plans (MVPs)*;
- reviewing the proposed works specification including fit-for-use analysis of proposed energy conservation measures (ECMs);
- review of the final EPC;
- independent assessment of the M&V audits and reports which may, if required or requested, include a full independent determination of the actual savings achieved;
- dispute resolution; and
- promoting partnering between the Customer and the ESCO.

In some cases, an ESCO may also engage the services of consultants to help with some of the above, or recommend their use to clients where the consultant's independence from the ESCO is beneficial to successfully negotiating an EPC.

The AEPCA recommends using these consultants, and provides contact details on its web site.

*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.

Who makes the decisions?

The Customer

When dealing with any large contract, a number of decision-makers will normally be involved before the final approval is given to implement the project. This is even more relevant if your organisation is large.

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:

1. your management (at the level required to approve the necessary investment) must be fully supportive of the initiative, understand the economic and business impacts of the project on their business, and provide leadership;
2 your Facilities Operations Manager must be involved in the technical development and provide endorsement to whoever will sign the final approval, ensuring that all technical and operations risks are appropriately managed;
3. your Financial Manager must assess the economic outcomes of the project to the business and provide the required support to obtain final approvals from management, ensuring that all financial risks are managed, the economic benefits outweigh costs, and the financial priority of the project can be assessed against other business options; and
4. there is proper integration with existing maintenance arrangements.

An ESCO may be working with many different levels of management simultaneously. This means that it is important to assign a 'sponsor' for the overall coordination of the project. The sponsor would assume the responsibility to ensure that all company procedures for project approval are followed and that all the right people at the appropriate levels are involved as required. It is common for ESCOs to ask the sponsor for meetings with senior management and financial controllers, to ensure that this type of coordination is in place, as the ESCO accepts a large amount of risk during the project development phase. The ESCO will normally want to assist, wherever possible, with the development of material to support the sponsor's activities to obtain internal commitment and approval.

The ESCO

A number of people from the ESCO will be involved in the development of the project. Normally, the ESCO will assign a Sales or Customer Service Manager (the actual titles described here may differ from those of any specific ESCO) to take overall responsibility for Customer contact and managing the Customer's expectations. This person is usually your first point of contact and the one you would turn to for answers to issues raised during the contract. He or she will normally liaise with professionals within their ESCO who carry out the development and then implementation of the project. These may include the following:

Engineering Manager
Responsible for the project development audits including the DFS.

Legal Manager
Responsible for the language and intent of the EPC.

Project Manager
Responsible for the construction and commissioning.

Operations Manager
Responsible for the guaranteed energy savings.

The Engineering, Project, and Operations Managers may be the same person depending on the organisation of the ESCO and resourcing for the specific project.

Other key ESCO people may be involved, and some will be required to interact with your staff. The requirements for this will depend on the specifics of the project.

Funding options

Funding is a critical part of any EPC and Customers generally understand that the energy savings are used to pay for the equipment and services provided by the ESCO. However, you may not be aware of the finer points. It is important to understand that 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 your needs. Obviously this will be done in consultation with you, and if your organisation is providing the capital, may require additional work on your part.

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

1. direct financing provided from the balance sheet of the ESCO (rarely done);
2. third party financing: leveraged by the ESCO, equipment suppliers, or leasing firms; or
3. direct financing by the Customer using traditional sources of project funds (most common type of EPC financing in Australia).

The source of funds depends on a number of factors, including:

- the type of EPC being entered into (guaranteed or shared savings);
  1. under a guaranteed savings contract the Customer is typically the borrower and has the financing repayment obligation. The creditworthiness of the Customer will be a major determining factor on the terms of any financing;
  2. under a shared savings contract, the ESCO is typically the borrower and accepts technical and financial project risks. In this case the creditworthiness of the ESCO will establish the terms of financing;
- available terms from the different sources;
- tax implications; and
- availability of funding from the source.

Customer financing

This is the most frequently used method of financing. It is typically the cheapest (lowest interest rate) and easiest to negotiate (because the financier typically already knows your business well). By relieving the ESCO of most financial risks, this method allows the ESCO to focus on the technical delivery of the project.

Issues may include the need to educate your financier about the technical aspects of the project and the EPC concept; and the difficulty often encountered in securing the necessary extended repayment terms.

Third party financing

This type of financing involves an intermediary such as a bank or finance company. In many cases, the third party financier (TPF) is a long-standing partner in ESCO services contracts. As such, it may offer some particular advantages over the financial services available through the Customer's normal channels. Most third party financiers are aligned as strategic partners with ESCOs and, together with the ESCO, are frequently subsidiary or member firms within a larger business group. In other cases TPFs, such as leasing companies, have focused on providing lease options for turnkey projects. 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.

ESCO financing

ESCO financing, where it is available, may provide several advantages to the Customer such as:

- offering a full one-stop-shop for project implementation (i.e. no need to deal with a separate financial institution or educate them on the merits of the project);
- vesting ownership of the equipment in the ESCO until the contract is fully paid out; and
- offering flexible terms 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 should not be considered a risk to the Customer, or give rise to a negative perception about the technical capabilities or financial soundness of the ESCO. Many ESCOs have simply chosen not to provide direct financing for projects due to the restrictive impact such debt would place on their corporate balance sheets over time. Such 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.

Four steps to a decision to implement an EPC

As outlined in Figure 3, the major steps towards implementing an EPC involve deciding whether or not to use energy performance contracting; determining whether there are energy saving opportunities worth pursuing and selecting a preferred supplier; developing and agreeing on the final scope of the project; and negotiating and awarding a contract.

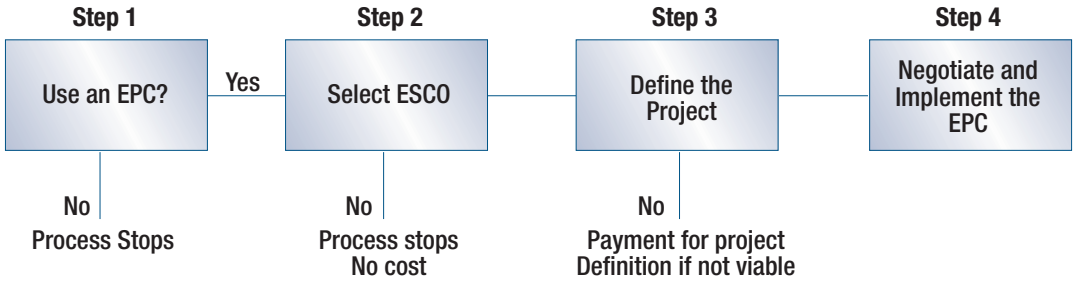

Figure 3: flow chart of major decision steps towards an EPC

1. Deciding whether to use an EPC

Energy performance contracting is not a universal panacea. Rather it is an approach to energy efficiency, greenhouse gas abatement and/or renewable energy supply that can be very beneficial to many facility owners.

However, EPCs are not a standard form of procurement tendering so it is extremely important that you have a clear understanding of what is involved from the outset.

Reading the standard contract that accompanies this guide is helpful. You can also familiarise yourself with performance contracting by attending seminars, or discussing the approach with other companies which have already entered into such contracts.

It is important that you are aware of any potential legal or institutional hurdles. For example, past experience with performance contracts, particularly in the public sector, shows that obtaining approval from decision-makers can be a long and slow process. It is vital that you secure the support of key decision-makers before any effort is made to progress beyond the initial exploratory stage. Lack of support from the party that must ultimately approve or reject a proposed contract greatly increases the risk that the project will never be realised.

Thoroughly reading and understanding this chapter and using the check list at Appendix 2 should help you to make a decision on whether an EPC is the right way forward. And, as outlined above, you may wish to hire an experienced EPC consultant—names can be found on the AEPCA web site at www.aepca.asn.au.

2. Selecting your ESCO

Once you have decided to proceed, you need to select your ESCO. For organisations that must follow strict corporate governance and procedures, the AEPCA recommends the procurement processes laid out in chapter 2. This chapter details the competitive process of requesting and evaluating proposals and finally selecting a preferred ESCO. The process is used to determine if there are opportunities worth pursuing with potential ESCO contractors. Normally work done on proposals by the ESCOs at this stage are produced without cost or obligation to the Customer, which means that if you decide 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. Again, the recommended procedure in chapter 2 lays out a detailed process including the development of a Detailed Facility Study (DFS) by your selected ESCO. If the DFS does not meet pre-determined criteria—Internal Rate of Return (IRR), Net Present Value (NPV), and minimum energy cost savings—then you are not obliged to pay anything. If the DFS meets these criteria, but you are unable to agree on a satisfactory contract, or you decide not to proceed, you are normally obliged to pay the contractor's costs in developing the DFS.

Although AEPCA strongly recommends the development of a DFS as a precursor to negotiating an EPC, private sector clients may choose to forgo this step in favour of a more general agreement as proposed by their ESCO. This is not an option for most public sector agencies in Australia.

Chapter 3 describes the details of the *Standard Detailed Facility Study Agreement* and can be used as reference during this process.

4. Negotiating and implementing an EPC

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

A standard EPC is provided by the AEPCA under license from the Australian Greenhouse Office (AGO), which retains full ownership and copyright of the document. The Standard EPC has been developed by the AEPCA, under contract to the AGO, by experts in the Australian energy performance contracting industry and with extensive input from AEPCA members, existing and potential customers, and government and private sector stakeholders.

The AEPCA and its members provide the Standard Energy Performance Contract as a fully endorsed document for use in implementing performance-based projects on a turnkey basis. The standard EPC document is intended to reduce the burden, on the Customer and the ESCO, of developing a unique contract each time a project is developed. The standard EPC document is also used by the performance contracting industry to ensure a national standard approach in the contract process. Chapter 4 of this guide takes you through the details of that contract.

Modifying the standard EPC

The standard EPC can be used in its current form for most guaranteed saving projects (where you, the Customer, are financing the measures). However, it is recognised that the unique nature of each project must be fully negotiated between the parties and that these negotiations may lead to the need to modify the contract. The AEPCA encourages these negotiations to ensure that the final EPC meets the needs of all parties. The AEPCA recommends that the standard contract remains whole and that negotiated changes be documented within a schedule attached to the contract. This preserves the intent of the standard contract, ensures that the EPC process remains consistent, and allows the unique aspects of each project to be easily identified and addressed within the schedule of contract amendments.

Some common issues that might be the subject of negotiation include:

- funding;
- maintenance;
- performance guarantee;
- baseline adjustment; and
- measurement and verification (M&V).

CHAPTER 2: THE EPC PROCESS

Reaching award of contract stage—the AEPCA recommended procurement process

The AEPCA, in conjunction with the Commonwealth Government and State Governments, has developed a methodology for the procurement of EPCs, which has proven successful in many negotiations and projects. The methodology meets all criteria for public service procurement and ensures that Customers obtain the benefit of competition through the procurement process. The Australian Greenhouse Office, New South Wales Department of Public Works and Services (DPWS), and the AEPCA have endorsed this methodology. Given the long-term and complex nature of the contract, the EPC procurement process is designed to minimise costs for both the Customer and the ESCO.

The methodology is highly focused on ensuring that all probity issues are covered, including transparency and equality of access (which means it is acceptable to governments). These issues are also important to many private sector businesses, where corporate governance requirements demand similar levels of attention. However, it is recognised that for many businesses in the private sector such a formal process for the selection of contractors is not required, and could be an unacceptably complex way of using energy performance contracting. In particular, tasks 1 to 8 in the table below could be replaced with a more casual method of selection, possibly based on existing relationships or reputation. This guide does not intend to specify how a business conducts its affairs. Rather, it describes the process that will achieve an outcome of the highest standards. This proven process is recommended where the highest levels of probity are required, and where this is not the case, the process can be simplified as the Customer sees fit.

An important part of the process is having the final contract developed in a partnership between you, as the Customer, and your ESCO. This partnering approach will ensure that your needs can be addressed as the scope of your project is being defined. It also enables the ESCO to inform you about special considerations and offer additional value throughout the contract development phase, while ensuring that you retain control of what you want out of the contract. With an EPC a number of issues will be raised during the term of the contract that may not have been considered at the time of issuing the tender. A good working relationship is therefore important. Through this type of open process, you can ensure you are getting the best value and best possible results.

The process involves the consecutive completion of the tasks identified in Table 1. Typically a period of at least six months should be allowed for this, unless the project is very simple, or you are dealing with a single ESCO.

Table 1: tasks involved in reaching award of EPC stage

Task	Party responsible	Timeframe
1. Issue public call for EOI	Customer	total timeframe for tasks 1, 2 and 3 is about three weeks
2. Prepare EOI documentation	Customer	
3. Issue EOI documentation to all qualifying respondents	Customer	
4. Prepare EOI responses/ prepare RFP documentation	ESCO/Customer	2 weeks
5. Complete EOI evaluation and select short list	Customer	total timeframe for tasks 5 and 6 is about one week
6. Issue RFP documentation to selected proponents, maximum of four	Customer	
7. Prepare RFP proposals/ prepare DFS documentation	ESCO/Customer	4 to 6 weeks
8. Complete RFP evaluation/ select Preferred Proponent	Customer	total timeframe for tasks 8 and 9 is about two weeks
9. Issue DFS documentation	Customer	
10. Prepare DFS proposal	Preferred Proponent	4 to 12 weeks
11. Contract negotiation	Customer/Preferred Proponent	varies
12. Award contract	Customer	

Figure 4 below is a graphic representation of this process.

As discussed in chapter 1, the broad steps towards an EPC can be broken down as follows:

Step 1: Deciding whether to use an EPC—this must be decided before beginning to work through the tasks in Table 1.

Step 2: Selecting your ESCO—this is accomplished through tasks 1 to 8.

Step 3: Defining the detailed scope of work—this is accomplished through tasks 9, 10 and 11.

Step 4: Negotiating and implementing an EPC—this is accomplished in task 12, and beyond as you manage implementation (described at the end of this chapter).

Note: This process is recommended for public and private sector Customers requiring high levels of transparency and impartiality in the selection process. Where this is not so important, any step up to and including the DFS may be omitted.

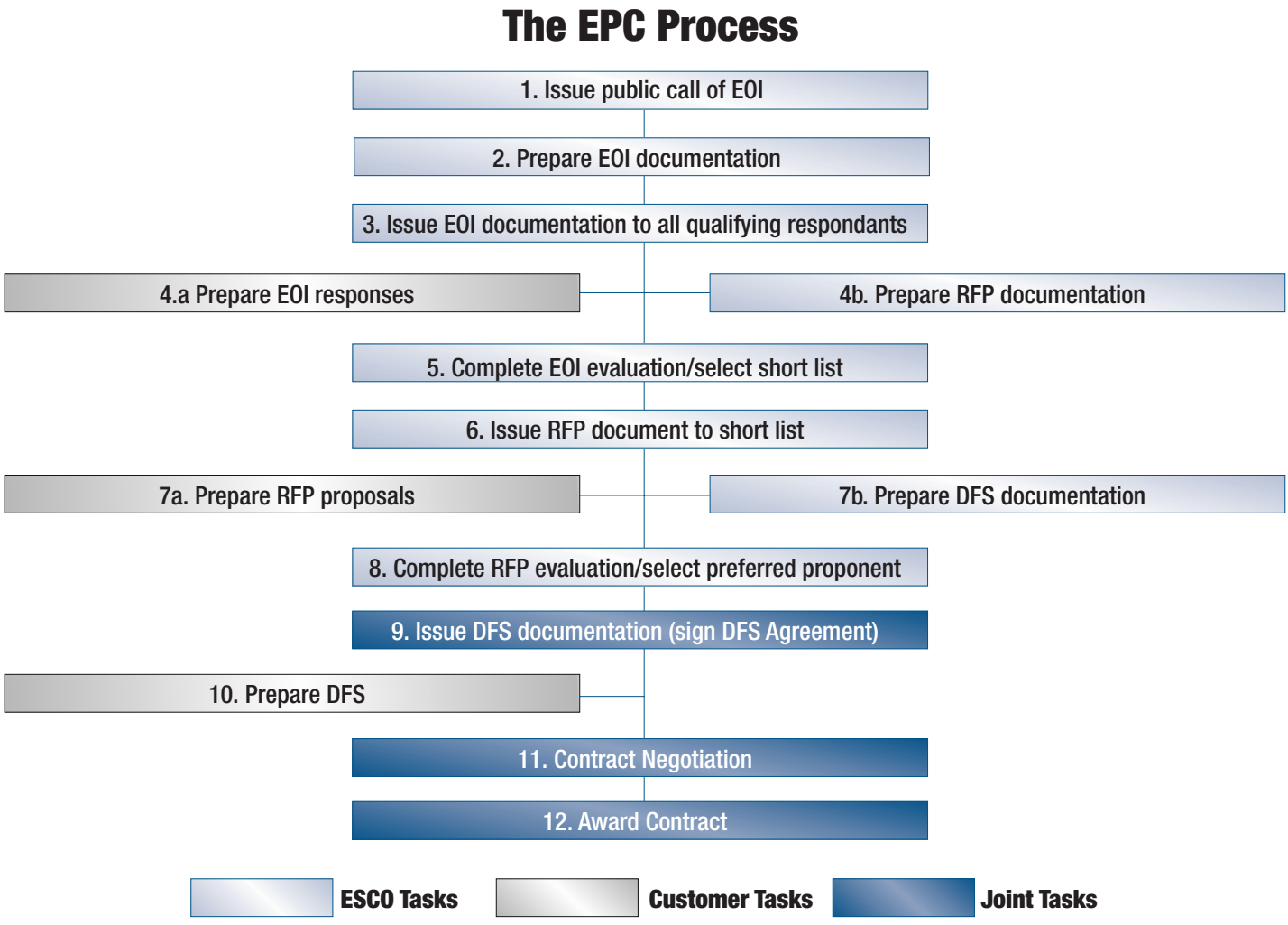

Figure 4: tasks involved in the EPC process

Task 1: issue public call for EOI

A public call for Expressions of Interest (EOI) is usually advertised in the local and/or national press. Typical wording for an EOI notice is included at Appendix 3. The purpose of the EOI is to identify all of the contractors able and willing to offer proposals for your project. There is an implied obligation to proceed to the RFP and DFS stages, and EOIs should not be seen as a 'free walk' through an audit (see details below).

Task 2: prepare EOI documentation

This documentation sets out the type of information required and the format in which it is to be presented by each respondent. The aim is to make evaluation as easy as possible. Only request as much information as necessary to allow the evaluation to be done for the project under consideration. (For example, if it is a lighting project, there is no value in asking for details of a respondent's experience in heating, ventilation, and air conditioning.)

The EOI should state the Customer's interest in entering into an EPC, with general details about the project scope and a request for respondents to describe how they would approach the work. As a minimum, the EOI should provide the following details.

On the Customer and scope:

1. overall objective for the project;
2. general statement of scope of work required;
3. requirement for third party financing (if any or known); and
4. requirements for pre-qualification (the AEPCA member, DPWS or Commonwealth pre-qualified).

On the respondent:

1. list of capabilities;
2. general methodologies on performance contracting;
3. approach on performance guarantees; and
4. financing options available.

A typical EOI document is included at Appendix 4 for guidance.

Task 3: issue EOI documentation to all qualifying respondents

The key word here is 'qualifying'. It is probable that some respondents will not be suitable for reasons such as:

- the respondent does not understand what an EPC is and does not offer that service;
- you may have had a previous poor experience with the respondent;
- the technical, geographic or other resources of the respondent may not match the requirements of the project; and
- the respondent may not meet pre-qualification criteria.

You have the right to eliminate any respondent at this stage without giving reasons. However, there is no advantage to randomly selecting a short list, since every respondent who might deliver a good proposal should be given the opportunity to do so.

Task 4: prepare EOI responses/prepare RFP documentation

EOI response (prepared by the ESCOs)

While the ESCOs are preparing their responses to the EOI, there should be little or no communication between them and you, the Customer, outside official briefing process, site inspections, etc. If you provide additional information to one respondent, it must be passed to all.

RFP documentation (prepared concurrently by you, the Customer)

While the ESCOs are preparing their responses to the EOI, you should be preparing the Request for Proposal (RFP) document.

The RFP is the mechanism for selecting the 'Preferred Proponent' with whom you then negotiate an EPC. The RFP defines the general scope of work, along with specific requirements that must be addressed by a performance contract. This information is much more detailed than what was included in the EOI. Typically, the RFP will include information on:

1. list of facilities under investigation;
2. asset management issues for the facilities in question;
3. projects already identified;
4. funding restrictions/requirements;
5. proposed phases of work;
6. maximum contract duration (if applicable);
7. maintenance and operational requirements; and
8. selection criteria and financial targets.

An EPC implies a long-term financial relationship between you and the ESCO. The financial stability of the ESCO is, therefore, a major consideration in evaluating proposals. This is one major issue that will be included in the AEPCA endorsed pre-qualification of contractors. In the meantime, when requesting proposals the Customer may wish to request information that demonstrates the financial condition of the ESCO and its ability to support its performance guarantees.

The ESCOs will almost certainly require access to the facilities in question, to conduct a 'walk-through' audit and to prepare their proposals accurately. This is one reason to limit the number of proponents.

Much of the detail of the project will only be concluded after the DFS has been carried out. However, based on the background information supplied by you, and on the simple walk-through audit, the ESCOs should be able to provide at least the following information to allow an informed judgement on the Preferred Proponent:

Technical aspects of the proposal:

1. fixed cost of the DFS;
2. estimated annual energy savings, plus or minus 20 per cent;
3. broad guideline of recommended energy saving measures;
4. proposals for operations and maintenance and training;
5. latent site conditions;
6. greenhouse gas abatement, etc.;
7. minimum savings, Net Present Value (NPV) or Internal Rate of Return (IRR) criteria; and
8. maintenance and/or upgrade issues.

Financial aspects of the proposal:

1. method of measuring savings;
2. method of determining payments and term of payments;
3. length of contract;
4. ownership of equipment;
5. estimated cost of energy saving measures, plus or minus 20 per cent;
6. purchase options; and
7. insurances.

Background and qualifications:

1. description of the ESCO and its capabilities;
2. relevant experience;
3. references; and
4. financial information.

This list is not exhaustive—you should request as much information as needed to properly evaluate and choose between proposals.

The evaluation criteria includes the specific requirements above and may also ask for information on:

1. EPC methodology and philosophy (performance guarantee, monitoring, time requirements, training and project management);
2. financing options; and
3. additional opportunities beyond those identified in the tender documents.

The RFP is not a detailed specification of works. It does not request a fixed price for work that is defined in detail. It requests a proposal on how the ESCOs would carry out the outlined work, how they would structure fees for that work, and estimates of the likely values of costs and savings. The main focus of the proposal is to state the basic methodology for guaranteeing savings, the general EPC details, how the scope identified in the RFP would be approached, and other opportunities the ESCOs feel offers value to you.

The evaluation process should also be described, so the ESCOs can ensure they provide all necessary information. This typically involves deciding on the essential requirements of the contract, giving each a weighted score, and compiling results into a table (as described below). The evaluation table should be included in the RFP document without the weighted scores.

Task 5: complete EOI evaluation and select short list

Once all responses to the EOI are received, evaluation should proceed without delay. The evaluation methodology described in the EOI document is the tool used by a small group, which normally includes the person responsible for the project, a technical manager, and a commercial manager.

In general, each response is scored according to the evaluation table previously developed, and then the scores are totalled, with the highest scoring three or four ESCOs being short-listed. The main reason for the limit is to minimise the work—and difficulty—involved in selecting the preferred ESCO (Preferred Proponent) for the DFS.

It is important that this process be as impartial and transparent as possible, for reasons of probity and accountability.

A typical evaluation table is included at Appendix 5.

Task 6: issue RFP documentation to selected proponents

The document, prepared as described in task 4 above, is issued to the selected three or four ESCOs who scored best in the evaluation process.

Task 7: prepare RFP proposals/ prepare DFS documentation

RFP Proposals (prepared by the ESCOs)

The ESCOs preparing responses to the RFP will require access to the facilities as well as time with staff. They need reasonable access since the quality of responses is directly related to how well respondents understand your facilities, the opportunities available, and any restrictions on how they can implement them.

It is normal, but not essential, for all ESCOs, to attend site visits together; this ensures none has an advantage over another. It also minimises the time you and your staff have to devote to the process. As far as practical, questions by any ESCO should be answered and circulated to all.

Prepare DFS agreement (prepared concurrently by you, the Customer)

While this is happening, you should also be preparing the DFS agreement, preferably following the standard one developed by the AEPCA and available from the AEPCA web site.

The DFS investigates all opportunities based on your minimum requirements as set out in the RFP. The Preferred Proponent normally investigates all opportunities that will deliver a project within the required return on investment or the overall capital budget, or both. The strength of an EPC is that ESCOs identify all potential opportunities, not only those within the pre-defined scope of work. While you still have the final say, a more complete picture of opportunities can now be evaluated.

A checklist of the most important issues to cover in the DFS is included in Appendix 7. You can also refer to the DFS agreement commentary in chapter 3 for further insights into this critical component of the process.

Task 8: complete RFP evaluation and select Preferred Proponent

This stage involves selecting the Preferred Proponent by carrying out an assessment against the proposal evaluation criteria. The evaluation criteria should place considerable weight on the originality, creativity and technical soundness of the approach.

The same people who evaluated the EOI responses should evaluate the RFPs. A system is set up to evaluate each proposal based on your requirements. The 'best fit' is given the opportunity to negotiate an EPC with you. As the proposals vary in approach considerably, the use of a conventional weighted scoring method at this stage can bias the result significantly and should be avoided. Rather the creation of a 'best case' scenario by you, and the choice of the closest fit to this scenario will produce more reliable results.

Financing, if requested or desirable, should be assessed as part of the proposal with the weighting of the option defined in the evaluation criteria. If financing is not part of the works (i.e. self-financed) then this does not form part of the evaluation.

Cost (or lowest cost) is not the main driver for the selection of the Preferred Proponent since detailed project costing cannot be carried out until the DFS is conducted (task 10). Consequently, originality, understanding, and approach are given significantly more weight.

It may be possible to do the paper evaluation without meeting each of the ESCOs face-to-face, although normally some clarification is necessary and interviews are highly desirable. However, even if this cannot be done for all, the selection of the preferred ESCO must be followed by an interview.

The reason is that an EPC is a long-term contractual relationship and it is therefore important to get a 'feel' for the preferred proposal and the people behind it. Regardless of the outcome of any objective evaluation, if the Customer and the ESCO do not get along at this stage, the chances of a successful future relationship are poor. There must be some common understanding, shared beliefs and values over and above normal commercial and legal commitment.

Note that all proposals are to be treated as confidential as they may contain commercial-in-confidence material.

Task 9: issue DFS documentation to the Preferred Proponent

The DFS agreement is a contract between your organisation and your Preferred Proponent, to carry out a detailed study of the facilities in question. This study forms the technical basis for implementing the EPC.

As the Customer, you can set the conditions of the DFS agreement, and you may wish to allow the ESCO to also nominate its own conditions—in this event it becomes another evaluation criterion. These conditions must be clarified with the Preferred Proponent before signing the DFS agreement. Example conditions might be:

1. if you do not sign a final contract for any reason, then you will be required to pay for the costs of the DFS (conditions of costs are laid out in the DFS agreement—see list of possible financial criteria below);
2. if the Preferred Proponent does not find significant savings, or does not find savings that meet the minimum level specified in the RFP, then you are not liable for the costs of the DFS; and
3. if the study identifies opportunities that lead to a contract being signed, then the costs of the study may be rolled over into the capital cost of the project.

Financial criteria might, for example, include any of the following:

1. the project must return a minimum IRR (e.g. 15 per cent over a specified number of years) or meet a NPV greater than a set value;
2. the project must be below a pre-set maximum capital limit;
3. the contract cannot be extended beyond a maximum number of years;
4. minimum savings versus maximum cost etc.;
5. the contract must be structured with a neutral or positive annual cash flow; and
6. savings must be guaranteed.

Note that the scope of the study can either be strictly controlled, or you can offer the Preferred Proponent the opportunity to identify further benefits and present them as options. These additional options would be offered at no obligation to you other than the costs to study them as laid out in the DFS agreement.

Task 10: prepare DFS proposal

The detailed study of the facilities by the Preferred Proponent investigates all opportunities based on your minimum requirements as included in the DFS agreement. The Preferred Proponent 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.

To reiterate, the strength of an EPC is the incentive for ESCOs to identify all potential opportunities, not only those within the pre-defined scope of work. While you still have the final say, a more complete picture of opportunities can now be evaluated.

Tasks 10 and 11 are somewhat iterative, since the study is refined as the contract negotiations are undertaken. It is critical that you and the ESCO act as partners, each responding to the other's needs and requirements. The creation of the DFS is not a 'one-off' process. You should be prepared for a continual dialogue with your preferred ESCO.

This is essential as it helps foster understanding between the parties. Formulating proposals and negotiating the contract should be seen more as a continuum than as a series of discrete steps. In this way, the best possible result, and contract, can be obtained.

Task 11: contract negotiation

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. The AEPCA National Standard Energy Performance Contract should be used as the basis for these negotiations for the following reasons:

1. it is familiar to the EPC industry and accepted by all AEPCA members;
2. it presents the normal contractual position on all major issues; and
3. it avoids the high legal cost of Customers developing their own contract.

If final negotiations do not result in a signed EPC, you may be required to pay for the DFS. This should be clarified with the ESCO prior to signing the DFS agreement.

Task 12: award contract

With all negotiations completed, the EPC is awarded, and work commences.

Implementing and managing the contract

Once you have signed the EPC, it is time to manage its implementation. The steps in this process include:

1. the ESCO finalising its designs, procuring equipment and managing the construction process;
2. commissioning of the project (and project components) by the ESCO;
3. managing the savings period, including:
   - measurement, verification and reporting;
   - maintenance; and
   - continuous improvement.

Step 1: the ESCO finalising its designs

Most ESCOs will not have completed all final engineering designs at the conclusion of the DFS, and prior to signing the EPC. This is to avoid unnecessary up-front cost and reduce commercial risk should the project not proceed. Once the EPC is signed, the ESCO progresses in earnest to finalise design details and confirm the scope of works specification so the equipment list can be prepared and procurement started.

At this stage, a detailed program works chart should be prepared and the final components of the EPC complied (see chapter 4 for further details).

With the detailed works specification and schedule in place, the ESCO proceeds with hiring sub-contractors as necessary and organising the site for work on the project. All these activities must be coordinated with you, to ensure your special requirements or restrictions are taken into account (planned shutdowns, critical periods of operation, holidays, vacations etc.).

Step 2: commissioning of the project

This task is typically performed by the ESCO, but it is strongly recommended that your operations staff participate also, to learn more about the performance aspects of the project. Commissioning is typically not a static process, particularly when several energy conservation measures (ECMs) are involved. Also, with EPCs you may find that the commissioning process is one of 'fine-tuning' until the ECMs deliver on the expected energy savings proposed by the ESCO. As in the construction phase, the commissioning process should be well documented and scheduled according to your requirements as well as the ESCO's. And, lastly, the commissioning process is an ideal opportunity for training your operations staff on the details of each of the ECMs—it is advised that you discuss this opportunity with the ESCO and incorporate if appropriate.

Step 3: managing the savings period

Once the project is fully constructed the 'savings period' begins. During this period, three basic tasks are performed.

Measurement, verification and reporting of the savings

This is typically performed by the ESCO according to the terms laid out in the contract, but may also be performed by a contractor or, if you require, independent verification by an independent firm. Savings reconciliation will typically be performed at a minimum of once per year.

Often during the first year or two of the contract, the ESCO will undertake more frequent measurement and verification (M&V) for its own purposes of fine-tuning savings from the ECMs. However, while this is occurring, you will not normally receive more frequent reports from the ESCO than those agreed under the EPC.

The savings reconciliation in the reporting process will identify if any payment should be made to you (e.g. if savings have fallen below the minimum guaranteed amount) or to the ESCO (e.g. if there are excess savings in subsequent years, see chapter 4). Such payments typically happen on an annual basis.

Maintenance of the equipment

As laid out in the EPC, both you and the ESCO will be required to fulfil your maintenance obligations. In most cases both of you will have maintenance tasks to complete, and these should be fully described in the contract. In addition to carrying out the maintenance, both parties are normally required to report on what maintenance has been undertaken. This is done to assure the other party that all maintenance requirements are being complied with, and to ensure that maintenance issues do not cause lower than expected savings.

Continuous improvement

As the M&V and maintenance tasks are being performed, the ESCO will be constantly fine-tuning the savings from the ECMs to reduce its risks, and if appropriate, maximise savings. This task may also include identifying ECMs that are not performing as planned, and introducing new ECMs to make up the loss in savings. This continuous improvement will also frequently identify new savings opportunities in your facilities and, from time-to-time, your ESCO may present you with these opportunities. This last point is one of the main advantages over a traditional tender process.

Once the contract has been signed, you must now ensure that the ESCO is meeting the terms of the agreement—both the services provided and the energy savings achieved. EPCs typically run for five to 10 years and you and/or others in your organisation will need to be involved at some level throughout the term of the contract.

Timing

You should have defined in the ESCO's proposal your needs regarding the timing of installation—for example, whether the improvements need to be installed during a maintenance shutdown. During implementation it is your job to ensure that the timing quoted in the proposal is

adhered to, including the actual installation of equipment and the submission of documents and reports.

It is recommended that Gantt charts, or a similar programming tool, be produced as part of the scope of works.

However, you should also be aware that the project might be delayed through no fault of the ESCO's. In such circumstances, you will need to determine whether the ESCO is doing all it can to solve such problems.

Technical aspects

You should ensure that any equipment delivered and installed does in fact match the specifications set out in the ESCO's proposal.

Another aspect of the technical performance of the equipment is the standard of service that the ESCO is obliged to provide, such as temperature levels within the building, and hours of service.

These can be matters of contention between you and the ESCO where one of the parties has entered into the contract under false assumptions.

Maintenance and service

The maintenance obligations of both parties should be stated in the contract. Normally the ESCO is responsible for the maintenance and servicing of new equipment installed. Frequently the maintenance of existing energy-using equipment is also taken on by the ESCO. You should have two concerns regarding maintenance: is the ESCO fulfilling its maintenance obligations?; and are you fulfilling your obligations?

You should ensure that the agreed maintenance schedules are being fulfilled, both in terms of frequency and of what is actually done. However, you also need to ensure that your maintenance staff:

1. are properly trained to operate and/or maintain the installation; and
2. carry out the operation and maintenance as required in the agreement.

The training and attitude of your own staff is crucial to the success of the EPC. Even if all maintenance is carried out by the ESCO, the equipment installed, together with the existing energy-using equipment, will normally be operated by existing in-house staff. Both parties must ensure that staff are fully informed as the project progresses, to avoid alienation, and that they are adequately trained to enable the predicted energy savings to be achieved.

The responses to the original RFP should have examined this point, and included, if necessary, training of existing staff by the ESCO. You and the ESCO have an equal interest in ensuring that adequate training is carried out.

Financial aspects

You should monitor the actual levels of energy saving achieved and compare these with the forecast levels set out in the proposals. In addition to monitoring the actual level of savings, you should examine the method of calculating those savings to ensure it complies with that agreed to in the contract. In particular, you should ensure that changes in tariff structures are fairly treated and included in any calculation of monetary savings.

Guaranteed savings

An essential part of an EPC is the guarantee of savings. Sometimes projected savings fall short of initial estimates. To enable the ESCO to maintain its guarantee, it must have the right to implement additional ECMs to those originally covered by the scope of works. These will normally be at the ESCO's cost, and will be discussed with you in advance. However, agreement must not be arbitrarily withheld unless there is good reason. This issue is discussed in greater detail in chapter 4.

CHAPTER 3: COMMENTARY ON DFS AGREEMENT

Background

This chapter provides a discussion and review of the objective, implementation and major clauses of the *Standard Detailed Facility Agreement.* The critical areas regarding best practice implementation are dealt with in the context of the structure of the standard agreement, including specific clauses and energy performance contracting in general. Note however, that not all clauses are reviewed in this guide as some are considered to be standard legal issues, which any service contract would be required to address. As such, it is your responsibility as the Customer to satisfy yourself that all clauses within the agreement meet your needs and expectations.

Introduction

The detailed facility study (DFS) agreement is a contract between you (the Customer) and your selected energy service company (ESCO or Preferred Proponent) for the preparation and delivery of a DFS. The DFS agreement places conditions on the ESCO so you can plan for and control the scope of the project. The intent is to agree on certain conditions and arrive at a negotiated EPC*. This commentary on the standard DFS agreement will assist you and the ESCO through the process.

As described on page x of this guide, the four steps in the decision-making process to implement an EPC are:

1. deciding whether or not an EPC is the right choice;
2. selecting the ESCO;
3. negotiating and signing a DFS agreement and undertaking a DFS; and
4. negotiating the EPC based on the results of the DFS.

Negotiating and signing a DFS agreement and undertaking a DFS (step 3 above) involves:

1. negotiating the scope of the DFS;
2. establishing the minimum acceptable technical and financial criteria;
3. establishing the timeframe for the study;
4. signing the DFS agreement, and
5. undertaking the DFS.

Integration of the DFS and the EPC

The following sections describe:

1. aspects of the DFS and DFS agreement;
2. issues that should be carefully considered by the parties;
3. practical examples; and
4. detailed comments regarding specific clauses in the agreement.

This discussion is a summary of many of the issues more fully described in chapter 4 relating to the EPC. Because the DFS is a precursor to the EPC, it is important to review the proposed EPC to ensure that the technical and financial conditions of the DFS will achieve the desired outcomes. This is particularly important at the time of reviewing and accepting the final DFS because the volume of data, calculations, and information may be substantial.

In some cases, it may be advisable to consider professional independent assistance at this stage to ensure that the DFS has delivered everything required to properly negotiate a successful EPC. This may be particularly important where the following conditions exist:

1. a large number of energy conservation measures (ECMs);
2. complex technical ECMs and limited internal Customer experience;
3. a Measurement and Verification Plan (MVP) based on several different methods and/or based on utility bill analysis, regression or energy model simulation;
4. special options that modify the basic conditions of the AEPCA standard contract documents; and
5. any other areas where independent assistance may be seen as valuable to the Customer.

*It is important to note that no Customer should enter into a DFS agreement without a full commitment to negotiate an EPC. If the Customer is only interested in an energy study of their facility (and not the implementation and guaranteed performance of the identified measures) this objective would be better served through a traditional independent detailed energy audit. Using an ESCO to complete a detailed energy audit under a DFS agreement should not be viewed as a way of obtaining a detailed audit at no cost.

Information on independent sources of technical assistance is available on the AEPCA web site (www.aepca.asn.au).

The DFS agreement in practice

A DFS is required to:

- identify energy (and related) cost saving measures for implementation;
- define the scope of work to be undertaken to achieve the cost savings;
- identify the costs, to investment grade level, for implementation of the scope (i.e. develop the final costs in sufficient detail, subject to negotiation, for an EPC to be signed);
- identify performance levels (including estimated savings levels) and guarantees to be provided by the ESCO; and
- identify the measurement and verification procedures so that savings can be demonstrated over the life of the EPC.

To ensure these pre-requisites are met, and to ensure the DFS delivers, a DFS agreement should be negotiated and signed by both parties. The completed DFS becomes the tool used by you and your ESCO to negotiate an EPC and implement the project.

The points above identify specific outcomes that will be delivered within the DFS and which will be required before an EPC can be negotiated. To ensure these outcomes are acceptable to you, it is important that the work undertaken by the ESCO is structured according to a specified scope of works. While this scope should be detailed enough to achieve the outcomes and justify the DFS fee, it is also important to ensure sufficient flexibility to allow the ESCO to modify the final DFS to achieve your overall technical, operational and financial expectations. The DFS scope of work is usually based on your RFP and the selected ESCO's proposal, as modified during the DFS agreement negotiation.

Two significant potential barriers to negotiating an EPC are:

1. the potential up-front costs associated with defining the project when the outcomes are unknown or unconfirmed; and
2. obtaining a commitment to proceed from the project development phase (including the DFS) to contract negotiation and implementation.

The standard DFS agreement suggests that payment for DFS work be structured in such a way that removes as many barriers as possible to implementing the DFS and the ECP.

For example, it sets out conditions under which the ESCO will be paid for developing the proposed project, and identifies performance criteria that must be met. If these are not met, there is no obligation to pay the ESCO for its time or efforts. As an alternative, and by prior arrangement, payment of the DFS fee could be deferred by rolling this cost into total project implementation costs, which would be paid if and when the EPC is negotiated and signed. It is important to note that signing the DFS agreement represents a commitment by you to negotiate the ESCO proposal (i.e. the DFS) in good faith, and advance to signing an agreed EPC with the ESCO, provided the developed project meets the agreed technical and financial conditions.

Clause 5: fees

Conditions for payment of the DFS fee

The DFS fee is negotiated between you and your ESCO and is related to the level of effort required by the ESCO to complete the required work. There are no set rules for establishing the fee, but it is reasonable to expect that the ESCO be fairly compensated for the time, effort and materials required to prepare the DFS.

Criteria for payment of DFS costs by you are:

1. If the conditions of the DFS are met:
   - the ESCO is entitled to be paid the DFS fee; and
   - you and the ESCO have the option of rolling the cost of the DFS into the project cost to become part of the EPC cost (cost deferral option).
2. If the conditions of the DFS are not met, you have no obligation to pay the ESCO for the DFS.

The 'conditions' stipulated in the agreement are both financial and technical, and both must be achieved for the 'conditions' to be met. These financial and technical conditions are described in the following two sections.

DFS financial conditions

The most important aspect of the DFS agreement is establishing the necessary conditions to ensure flexibility and yet control the scope. This is achieved by defining the following in a schedule to the DFS agreement:

1. schedule item 3—maximum project costs for implementation of the proposed ECMs;

2. schedule item 4—minimum total identified projected energy savings; and
3. schedule item 5—minimum total Internal Rate of Return (IRR) in respect of all services provided over a defined number of years.

Item 3—maximum project costs for implementation

Item 3 defines the maximum project costs that should be applied to the entire project over the life of the proposed term of the EPC, discounted at an agreed factor. The main purpose of defining the maximum project cost is to facilitate your budgeting and approvals, and speed up the EPC negotiation process.

It is intended that you obtain at least 'in principle' approval to proceed with the project to the maximum cost if:

1. the project appears favourable;
2. all other conditions are met; and
3. an EPC can be negotiated between the parties.

This maximum figure should include all project costs, including any additional costs you can be expected to bear independent of the EPC (such as maintenance required for new equipment and carried out by the Customer), and any ongoing costs that will be paid to the ESCO (such as the MVP, ESCO maintenance and guarantees).

Item 4—minimum identified energy savings

Item 4 defines the minimum projected energy savings from the proposed project over the term of the proposed EPC. This value is typically established through preliminary discussions with ESCOs, or the preliminary proposal of the selected ESCO. The primary purpose of specifying this value is to ensure the ESCO delivers on the expectations established during the proposal phase. This places pressure on the ESCO to 'live up to the promises' in its preliminary proposal, which are the likely reasons the ESCO was selected. Although you will not be required to pay for the DFS if the ESCO fails to achieve the minimum projected energy savings, it may still be possible for the parties to negotiate an EPC, if other conditions are acceptable. Whether this is possible depends on the viability of the proposed ECMs and the remaining interest of both parties in pursuing their implementation.

Item 5—minimum total IRR

Item 5 defines the minimum IRR for the overall project. This value is intended to represent the minimum criteria for financial viability from your perspective. This is typically the minimum 'hurdle rate' for your organisation's prospective investment in any new project and for which Customer approval should be obtained without difficulty (assuming all other conditions are met). It is intended that this value be applied to the total project and not to individual ECMs or options.

It is a mistake to use the values of items 3 and 4 to set the IRR for item 5. The IRR should be set independently. The IRR for item 5 should be the absolute minimum reasonable IRR required by you as the Customer for a proposed investment plan. If this is lower than the IRR based on items 3 and 4, it could indicate either item 3 is set too low, or item 4 is set too high. If your minimum total IRR is higher than the IRR based on items 3 and 4, it provides a clear indication that lower costs and/or higher savings are expected from the project. Given that the ESCO has prepared only preliminary estimates of costs and savings at this stage, it is reasonable to expect improvements in cost effectiveness following further detailed study and costing of the final project, within the DFS.

For these reasons it is important to establish these criteria carefully, so enough flexibility remains for the ESCO to properly define the scope of the project and allow for variations in cost estimates and cost savings projections.

The above conditions provide sufficient flexibility for the ESCO, while holding the ESCO to its original projections and commitments. The conditions also provide assurance to the ESCO that you have obtained the necessary internal clearances for the project to develop within the financial criteria. These approvals are important to avoid extended delays to project commencement. Such delays can add significantly to project costs resulting in changes to overall project financial requirements.

Note for New South Wales Government agencies: criteria for setting the IRR for projects is provided in a directive titled Memorandum to Department Heads, Investing in Energy Efficiency—Guidelines, signed jointly by Treasurer, Michael Egan and Minister for Energy, Bob Debus. This memorandum states that in assessing projects agencies should consider the following:

- 'Immediate investigation of projects that have rates of return in excess of 20%. Where capital is a constraint, Energy Performance Contracting and the fund provided by Treasury may be used.
- Projects that have rates of return of >> 12% should also be investigated immediately where the savings are guaranteed (as in Energy Performance Contracts).

Example: establishing the right conditions to control the scope and guarantee flexibility

The Customer has selected an ESCO to undertake a DFS and negotiate an EPC based on the ESCO's (preliminary) proposal that they can save approximately $110 000 per annum, with a project investment of $420 000. The calculated IRR of the project is 25.3 per cent (over a 15-year life analysis, assuming that all costs are in year 0 and that projected savings are not escalated). The ESCO calculated the project estimates on the basis of a brief prepared by the Customer, and a walk-through audit of the facilities. The ESCO states that it believes the costs and estimates to be within 20 per cent error, barring unforeseen events.

The Customer and ESCO agree to proceed on the following conditions for the DFS agreement::

- maximum project costs for implementation of the proposed ECMs (item 3 of the schedule) will be set at $500 000. This increase from the initial estimate of $420 000 reflects uncertainty about the initial cost estimates at this early stage of the project, and allows sufficient flexibility for the ESCO to identify additional measures that may have been overlooked during the walk-through audit. The Customer has acknowledged that as long as the other financial criteria are met, this increase in the estimate for the project would be acceptable. The Customer obtains internal 'in principle' approval for this level of expenditure and sets the funds aside pending final approval;
- the minimum total identified projected energy savings are set at $100 000. Although slightly lower than estimated, the level reflects the uncertainty of the ESCO's projection at this early stage of project development. It also provides a clear benchmark for the ESCO and identifies the minimum savings required for the Customer to proceed with the project; and
- the minimum IRR is set at 20 per cent. This is lower than the ESCO's projection, but reflects the Customer's internal hurdle rate for project investment. This value is slightly higher than the IRR that would be obtained if the ESCO delivered a DFS that only just met the other two conditions above—at a cost of $500 000 and annual savings of $100 000 per year, the IRR = 18.4 per cent (over 15 years). By establishing an IRR of 20 per cent and obtaining internal 'in principle' approval, both the Customer and the ESCO will be able to proceed more quickly to establish the final EPC. This hurdle rate also provides a benchmark against which to review individual ECMs. However, it is important to remember that most agreements set out to maximise the benefits of the total project and not those of individual ECMs. Technical benefits of ECMs and ECM interactions need to be included in the evaluation process before the final scope of services is agreed.

- Projects that have a rate of return of > 7% (T Corp + 2%) should also be seriously considered where the savings are guaranteed by an Energy Performance Contract.'

For more information on this memorandum and Treasury's EPC Fund, contact the New South Wales Sustainable Energy Development Authority (SEDA) Project Manager for the Energy Smart Government Program on (02) 9249 6100.

Clause 3.1: ESCO to provide services

DFS technical criteria

DFS technical criteria are defined in clause 3: ESCO's obligations. This section includes a general description of the services to be provided by the ESCO, and the specifics for the DFS to be technically compliant. The scope of work (including the facilities, area, end-uses, and equipment to be studied) will typically be according to your specifications and/or the ESCO's preliminary proposal.

The DFS agreement uses these documents as a reference for the DFS scope of works.

The technical requirements are provided in a general way to allow for flexibility in the final scope of works proposed by the ESCO, and to guarantee that financial criteria are met.

Clause 3.1 requires that the DFS provides and documents the results and outcomes of the following:

(a) A detailed description of the equipment and energy systems in place at the premises, their condition at the time of the DFS, and methods of operation.
This information will be used to establish a clear understanding of the current situation and a baseline for comparison with the proposed ECMs. The information provided should be collected only where it is relevant to the ECMs being proposed. It is not intended that this become a fully detailed audit of all of the premises' equipment and systems, but only of the systems and equipment that will be affected by the ECMs, or where baseline data is required to properly assess the impact of the proposed ECMs. Collecting and analysing information at this stage is a function of the proposed ECMs and the proposed MVP (see item k). Although the premises' total energy consumption and cost may not be required for ECM assessment, or for the project as a whole, it may still be important for project assessment purposes as it provides a basis for total cost comparison by you, the Customer. It is suggested that specific agreement be made between the parties if this is not to be provided as part of the DFS.

(b) The energy consumption and demand profile and the space conditions of the facilities on the premises.
As in (a), this information will be used to establish the baseline energy performance data of the premises. Again, only the data necessary to demonstrate the proposed and estimated impacts should be collected, analysed and reported. The level of detail and format of the data is a direct function of the proposed MVP (item k). Data that is not required to verify savings typically will not be required as part of the DFS.

(c) A description of the ECMs and improvements proposed by the ESCO, the cost of the installation of the ECMs and improvements, the projected IRR for each site on the premises and the impact of the proposed ECMs and improvements on the energy consumption and demand profile of each site and on the space conditions of the facilities on the premises.
This is the component of the DFS where most of the ESCO's work will be focused. The ESCO's proposal should state clearly all costs, savings, guarantees, performance, etc. You should break down the data on an ECM-by-ECM basis for easier assessment. Note however, that the project should be assessed as a total package when considering whether the financial conditions for payment have been achieved.

(d) A brief description of the intended purpose of each of the modifications proposed by the ESCO to the equipment or systems and/or to the operating methods of the equipment or systems.
This section should provide a brief, easily understood narrative of each of the proposed ECMs, drawing a comparison between the current (baseline) practice and the proposed new practice. It should focus on items other than costs and savings such as improved comfort, air quality, tighter temperature control, peak demand control, reduced emissions, heat transfer, reduced operating hours, improved load factor, equipment rejuvenation, and enhanced operating life.

(e) A projection as to any changes in capacity of the existing equipment due to the modifications, or improvements contemplated.
You need to consider the impact some ECMs may have on future equipment capacity requirements. For example, an ECM may propose that an existing oversized motor be replaced with an appropriately sized, high efficiency motor to achieve significant energy savings. However, in reducing the size of the motor, the use of the motor may be limited to its current application and you may need to plan for this impact. If motor capacity is based on current production rates, which are expected to increase in the future, you need to plan accordingly. If you feel that the limitations imposed by the proposed size of the new motor were unacceptable, given planned increased production levels, the ECM would either be deleted or possibly replaced with an alternative (for example a Variable Speed Drive to match motor speed with production output requirements).

(f) An outline of training programs or instruction required for the Customer's facilities managers and operators, and a summary of the involvement of facilities managers and operators likely to be necessary to effect the improvements.
A successful ESCO project requires proper training and instruction, particularly if the savings achieved are to be sustainable beyond the term of the EPC. Training should be detailed in line with your staff responsibilities (management, operations, finance,

maintenance, etc.) and performance expectations. For example, if the objective of training operations staff is to allow your organisation to manage the day-to-day operations of the ECMs, the training should be comprehensive enough to ensure that staff are able to achieve the required performance level. Because EPCs span many years (typically three to seven) there may be a need to deal with ongoing training needs, staff turnover, outsourcing, etc.

(g) *Estimated figures projected as the annual energy savings, which will result from the modifications or improvements, together with an indication of how these figures are arrived at, with performance criteria defined in terms of lumen, litres/sec of air temp etc.*
These are the technical design calculations for arriving at the pre- and post-performance data of each of the ECMs, against which operating performance requirements will be measured. For example, a new lighting system for energy savings should only be proposed where lighting levels can be maintained at or above minimum requirements for the current application. Calculations should be provided to demonstrate how these requirements are achieved, and how they will be maintained and verified.

(h) *A summary of the intended schedule for implementing the modifications and improvements, including the timing and estimated duration of on-site work in respect of each distinct location or facility.*
This is the proposed construction schedule, including all preparatory, final design, and equipment procurement work. It should include as much detail as possible regarding your restrictions, but it is important to note that based on final EPC negotiations, this schedule will almost always require revision. For planning purposes, the schedule should be sufficiently detailed to show the impact of each of the ECM's installation on your premises, and to highlight your special requirements. In this way, the schedule proposed in the DFS provides a clear basis for establishing the final implementation schedule.

(i) *An indication of any altered or new operating or maintenance requirements that will apply due to implementation of the improvements, and an estimate of the cost of any upgrading or maintenance work that the ESCO recommends be undertaken prior to, or during, the implementation of the modifications/improvements to maximise their effect.*
The ESCO should produce a detailed maintenance schedule to ensure that equipment is maintained according to manufacturer's specifications and according to the requirements established by the ESCO for the sustainability of energy savings and guarantees. This schedule should highlight all maintenance tasks required for each ECM, and state who is responsible (you or the ESCO) for each. Parts or materials required as part of this service should also be identified, including cost recovery (i.e. included as an EPC cost or as a direct cost to your organisation). Where you take responsibility for maintenance, the ESCO should provide you with a reporting format and audit procedure with sufficient detail to enable the ESCO to verify that you are complying with maintenance requirements. This reporting allows the ESCO to determine whether a shortfall in savings has been caused by lack of maintenance. For major equipment such as boilers or chillers, and where the ESCO has maintenance responsibility, it may be prudent for you to request similar maintenance reporting to ensure duty of care by the ESCO.

(j) *A full description of all new equipment to be installed to effect the improvements together with an estimate of the expected lifetime of that new equipment, including engineering summaries and detailed equipment data sheets, as well as the effect its installation may have on the expected lifetime of the existing equipment, and a full description of the warranty and servicing arrangements that will apply to the existing equipment and to the new equipment installed.*
This is a detailed equipment procurement and supply list with full equipment specifications and suppliers' minimum warranties. To save DFS costs, some ESCOs may not complete the final design of all ECMs until the EPC has been negotiated and signed. It may not be possible, therefore, to provide final equipment lists until the EPC has been finalised. In this case, a draft list can be provided and full details supplied when available. The full details and their effects on existing and new equipment are provided for your asset planning purposes. It is your responsibility to review these details to ensure that impacts on the continued operations of the facilities are acceptable.

(k) *An MVP which is acceptable to both parties for monitoring, verifying and guaranteeing savings from the implementation of the ECMs, based on the International Performance Measurement and Verification Protocol (IPMVP).*
This is a comprehensive action plan of how the ESCO will demonstrate the savings and performance guarantees over the term of the EPC. It should show the means of determining the baseline, the ongoing ECM consumption, and the resulting energy savings. It should detail what, if any, adjustment factors may or will be applied and specifically how they will be

applied. It should identify what monitoring equipment will be used and the frequency of data collection. It should also provide a 'confidence interval' for the accuracy of the result. A data collection procedure should be fully described if you are to collect the data. The reference to the IPMVP is intended to provide an independent source and reference of measurement and verification, and provide assurance to Customers that the ESCO is following recognised international practice with respect to M&V. (See further discussion on M&V in chapter 4).

Clause 3: ESCO's obligations

As noted above in relation to the EPC procurement process, the provision of a DFS is effectively the third stage in the process, following your evaluation of EOIs and the RFP responses. The ESCO's obligations regarding the provision of services that will result in the production of the DFS are set out in clause 3.

One purpose of the DFS is to give you an indication of the possible extent of savings that can be achieved under an EPC, and what level of savings the ESCO is prepared to guarantee. You must be satisfied that you understand and agree with the nature of the services the ESCO is to provide in its study of your premises.

In addition to these services, there are provisions contained in the clause that govern how the ESCO must perform the services, including the following:

- the services must be performed diligently (clause 3.3), in accordance with agreed time limits (clause 3.4) and with relevant legislative requirements (clause 3.7);
- the ESCO must observe certain requirements in relation to the subcontracting of any part of its performance of the services (clause 3.6) and in relation to the existence of any conflict of interest that may affect its ability to provide the services (clause 3.8); and
- it must provide the Customer with reasonable access to ensure you can keep abreast of the ESCO's performance of the services (clause 3.9).

The substantive provisions deal with the following issues:

- the nature of the information to be set out in the DFS (clause 3.1) described in detail above;
- the minimum standards that must be met by the changes to the premises that the ESCO proposes (Clause 3.2); and
- security of documentation provided to the ESCO by the Customer (clause 3.5).

The obligation to provide certain information in the DFS is the key requirement that helps determine the aims of the EPC. The ESCO must provide sufficient information to allow you to make an informed decision on whether to proceed beyond the DFS.

The DFS provides a diagnostic comparison between current energy consumption related to equipment and services in use at the premises and forecast energy consumption, using the recommended ECMs to achieve guaranteed savings—ultimately qualifying the savings and costs that will become a point for negotiating an EPC. The DFS should also itemise proposed installations and the estimated cost of maintaining the ECMs.

The starting point is a complete list of your equipment and systems that may impact on the performance of ECMs to be installed. This is important as it gives you an indication of your current mechanisms and their impact. Even more important is the impact the installation will have on your future operations. For example, the ESCO must supply a summary of the intended schedule for implementing the proposed modifications, and proposed training programs and instructions required for the maintenance of the ECMs.

Clause 4: Customer's obligations

To ensure the ESCO has every opportunity to deliver on its commitment and achieve the successful outcome expected by both parties, it is imperative that you meet certain obligations under the agreement. These include the following:

1. the Customer shall fully cooperate with the ESCO in connection with the conduct and completion of the DFS;
2. the premises and equipment under study must be owned or leased by the Customer; the Customer must demonstrate evidence of this if required by the ESCO conducting the DFS;
3. the Customer shall provide any and all reasonable information requested by the ESCO for the purposes of conducting and completing the DFS, and shall ensure that this information is accurate; and
4. the ESCO shall not be liable for inaccuracies, errors or misleading descriptions in its projections or other information contained in the DFS, that arise wholly or principally as a result of deficiencies or omissions from the Customer.

Without this level of support from you, it is unlikely that the ESCO will be able to develop and implement a successful project. While the ESCO can control its input

into the project and attempt to obtain the necessary information from you, the ultimate success of the EPC will depend on the development of a 'partnership' approach.

Clause 4.4: errors and misleading descriptions

It is the ESCO's responsibility to provide as much information as possible so you can make informed decisions. However, the provision of information should not be one-sided since the value of the study conducted by the ESCO is largely dependent on the accuracy of information you provide.

The DFS submitted by the ESCO is based not only on its own investigations but also on the information you provide. Pursuant to clause 4.3, you must provide the ESCO with all reasonable assistance by providing documentation requested. If there are errors or inaccuracies in the documentation, clause 4.4 operates to excuse the ESCO from liability for resultant errors contained in the DFS.

You are obliged to provide information so the ESCO can forecast expected energy savings. It is therefore in your best interest to accurately describe the current state of the premises. The ESCO cannot be held accountable for errors in its predictions if they can be attributed to an error or omission in the information you or your organisation provide.

The type of information that may be required from you is set out in clause 4.3 and includes:

- contracts the Customer may have with third parties relating to facilities management and maintenance—whether of the premises generally or of existing plant and equipment on the premises—energy supply or other contracts that may impact on the provision of the services;
- all energy bills, tariff sheets and rate schedules, or other documentation that may assist the ESCO in calculating the costs of current levels of energy consumption on the premises; and
- details of the operation of the premises, including hours of operation, floor areas, number of occupants and usage patterns.

This last category of information is important in assisting with the formulation and design of relevant ECMs and will augment the analysis of the premises conducted by the ESCO.

Clause 6: variations

The most important aspect of the DFS is establishing control of the scope of the project while retaining flexibility.

Clause 6 of the DFS agreement provides a mechanism through which you can request a variation to the scope of the DFS, provided that it does not substantially affect the objectives originally agreed to by the parties (clause 6.1(b)). This proviso relates back to clause 2.2, which sets out the objectives of the DFS, and to the parameters you originally established in your RFP.

The reason for this is: if you request a variation to the scope of the DFS that will make it impossible (or substantially less likely) to achieve the IRR, the ESCO may advise that, in its opinion, the variation will substantially affect the original objectives agreed to by the parties and should not be incorporated into the DFS. In this case, if the variation was agreed to without further consideration, it could possibly jeopardise the viability of the whole project by needlessly diminishing the outcome of the DFS in relation to the rest of the project.

Clause 6.2 deals with fees related to variations and provides for you or your ESCO to renegotiate the DFS fee if a requested variation will:

- extend or markedly reduce the objectives set out in clause 2.2 of the DFS agreement; or
- substantially broaden or narrow the scope of services to be performed by the ESCO as required under clause 3.1.

Because a variation may significantly compromise the efficacy of the DFS, clause 6.3 provides that you may not terminate the agreement simply because the ESCO does not agree to the value of such a variation, but rather the parties must refer the matter to arbitration under the dispute resolution procedures set out in clause 14 of the agreement.

Clause 7: entitlement to use data contained in the DFS

Clause 7 is designed to prevent the use of the information contained in the DFS without the ESCO's permission if for any reason the parties do not progress from the DFS to the EPC.

If you do not wish to proceed to an EPC, the information contained in the DFS may only be used subject to the intellectual property rights of the ESCO, as outlined in the clause 7.2 (for example, the information contained in the

DFS may be used internally by your organisation but you may not implement the recommended systems without the prior consent of the ESCO).

Reference is made to this prohibition in clause 7.2(b) in relation to the terms of the RFP. Unless you have stated in your RFP that you intend to use the information contained in the DFS on sites other than the premises being analysed by the ESCO, the licence that the ESCO grants to you for use of the information will be limited to the premises that are the subject of the DFS.

Clause 8: confidentiality

Confidentiality is an issue of vital importance to developing industries. This is why clause 8 protects the ESCO. The principle distinction between the confidentiality provisions in the DFS and the EPC is contained in clause 8(a)(vi) in the DFS agreement and covers the need to gather what may be confidential information to provide you with a baseline estimate of the forecast savings.

In providing the services outlined in clause 3, the ESCO will need information that you may consider to be commercially sensitive. Conversely, you should recognise that the information the ESCO must provide to you, regarding the ECMs to be installed, and the methods of modification to the existing systems and equipment on the premises, will be commercially sensitive to the ESCO.

For this reason, clause 8(c) imposes a sanction by way of liquidated damages that would payable to the ESCO if you breach this clause. You should be aware that confidential information could include all or any of the following:

> *All communications, documents, data, computer software, intellectual and industrial property created, together with each and every other agreement, deed, guarantee, instrument, arrangement or understanding, and any amendment, from time to time, existing now, or in the future, made between the Customer and the ESCO (either alone or jointly with another person) or between the Customer and any other person, which information is disclosed to the Customer pursuant to this Agreement.*

Clause 9: indemnity

Pursuant to this clause, the ESCO promises to protect you from harm (being damage, liability, loss, claim or expense) resulting from anything done (or not done but which should have been done) by the ESCO.

This indemnity is given subject to two provisos:

1. The indemnity will be diminished or extinguished to the extent that any action of the Customer (or its employees, agents, subcontractors or invitees) causes or contributes to the harm suffered by the Customer.
2. The indemnity is expressed subject to clause 4.4, being the clause discussed above regarding errors and misleading descriptions in the information provided to the ESCO by the Customer. If any harm is suffered by the Customer as a result of some action or omission of the ESCO's, which was in turn caused or contributed to by an error or misleading description in the documentation provided by the Customer, the ESCO's indemnity of the Customer will be diminished or extinguished to the extent that the error or misleading description has contributed to or caused the harm suffered by the Customer.

The indemnity given by you to the ESCO in clause 9.2 is cast in similar terms with the exception that it is not subject to clause 4.4.

Clause 10: insurance

The DFS requires the ESCO to provide proof that it maintains three types of insurance:

- professional indemnity;
- worker's compensation; and
- public liability.

The requirement for the ESCO to maintain these policies is to your advantage. For example, subject to the indemnity provisions in the DFS agreement, professional indemnity insurance protects your organisation against expenses related to a fault in implementing any ECM recommended by the ESCO.

Clause 12: termination

Either party may terminate the DFS agreement without affecting their other rights under the agreement, although you should note that you would remain liable to some degree to pay the DFS fee.

Pursuant to clause 12.2, you may terminate all or any part of the performance of the services but shall nevertheless pay to the ESCO half of the DFS fee, unless there has been some default or breach by the ESCO.

You should also note that, pursuant to clause 12.5, the ESCO would remain obliged to rectify any breach or non-performance of any obligation even though you have terminated the DFS agreement as a result of such a breach.

CHAPTER 4: COMMENTARY ON STANDARD CONTRACT

Background

This chapter provides a discussion and review of the major clauses of the *Standard Energy Performance Contract*. The critical areas regarding best practice implementation are dealt with in the context of the structure of the standard EPC, including specific clauses, and energy performance contracting in general. Note however, that not all clauses are reviewed in this guide as some are considered to be standard legal issues, which any construction or service contract would be required to address. As such, it is your responsibility, as the Customer, to satisfy yourself that all clauses within the agreement meet your needs and expectations.

Clause 1: definitions and interpretation

The definitions and interpretation section of any contract is designed to assist the parties to understand the context in which words and phrases are used.

In this contract, the definitions section appears at Appendix 9 principally because it is lengthy and deals with words and phrases specific to the EPC industry.

The interpretation section sets out basic rules for interpreting a contract, which are designed to avoid confusion.

Legal terminology is used in this contract quite extensively. While it is preferable to use plain English as far as possible in any contract, this document is intended to cover the rights and obligations of parties in an industry that is still very young in Australia and which remains largely unlitigated. As a result, it is difficult to use plain English as there is no law on the meaning of plain English phrases within the context of the energy performance contracting industry.

Clause 2: design and installation of energy conservation measures (ECMs)

The negotiation of the works specification is a key aspect of the EPC process. It must be handled carefully to ensure that the ESCO clearly understands what results it is required to produce and that the Customer clearly understands what it can expect to achieve from the process.

For you, the Customer, a key aspect of ensuring that the works specification fulfils your needs is to consider the equipment that is to be installed and ensure it is fit for the intended purpose.

The ESCO's principal consideration is to design ECMs that can achieve a guaranteed level of energy savings over the life of the contract. Within the parameters set by the Customer (on the basis of which the ESCO produces the DFS), the ESCO may produce a list of equipment to be installed that admirably achieves this aim, but that does not necessarily fulfil the 'fit-for-purpose' test.

It is your responsibility to assure yourself that the equipment the ESCO proposes to install meets your site requirements. For example a new lighting system that is set on a timer to save energy obviously will not meet the needs of—or be 'fit for purpose' for—an operating theatre in a hospital.

Once the parties have agreed to sign an EPC and the terms and conditions have been fully laid out, it is time for the ESCO to meet its first obligation under the contract—– preparing the works specification. The terms and conditions are based on the detailed facility study (DFS) developed by the ESCO under the scope you defined. You may choose to add additional conditions at this stage, but in practice these should have been dealt with prior to finalising the DFS. The negotiation of the works specification is one of the most important aspects of the EPC, and must be done carefully to ensure that you know what you will be getting and so the ESCO clearly understands what it will deliver. To the greatest degree possible, the scope should have been agreed to prior to finalising the DFS. In this way, the ESCO will be performing a straightforward function of documenting the details previously agreed. If the scope changes from the final DFS, there must be additional negotiation to agree on the revised scope. Then the work specification must clearly identify changes to the recommendations in the DFS, new work added, and work deleted. It is highly

recommended that the ESCO prepares details of new work or changes, to the same level of detail as the final DFS, plus what is required to comply with the works specification.

The works specification is not prepared as part of the DFS for two basic reasons:

1. to avoid costly work by the ESCO that may not be required if the ESCO and the Customer cannot agree to negotiate an EPC; and
2. to allow last minute considerations which will most likely have large impacts on the final works specification, such as final EPC negotiation details, EPC negotiation delays, choice of ECMs, availability of financing, contract commencement date, occupancy schedules, equipment delivery planning or availability of trades.

Clause 2.1 (submission of works specification) requires the ESCO to submit a works specification, which is defined within the standard EPC as the scope of works submitted to the Customer by the ESCO for the design and installation of ECMs. The works specification:

(a) Sets out the tasks involved (and a timetable for completing them) in relation to the design and installation of the ECMs.
This should be viewed as a master project management flowchart showing all installation milestones for each ECM. It will act as the road map for the ESCO in managing installation and for you to monitor progress. It should provide a listing of all major pieces of equipment and specify details of procurement that are important from you or your organisation's perspective.
An example of equipment specification for procurement could be if one of the ECMs involves replacing an existing chiller, and the new chiller must match the make of the others in the plant—then this must be specified.
Levels of quality and performance should also be specified.

(b) Specifies the ECM purchase price, broken down into a schedule of progress claims, corresponding to the task relating to installing the ECMs.
Mapped against the project management chart above, and according to appropriate milestones, this specification should provide a clear schedule of payments to the ESCO. It should also show all payments to the ESCO, according to the approval of 'acceptance certificates' for ECMs and any ongoing payments over the guarantee savings period.

(c) Specifies the works specification fee for additional ECMs.
Assuming you and the ESCO have negotiated additional ECMs, following the completion and submission of the final DFS, this provision allows the ESCO to recover costs that should have been included in the DFS had the original scope of work included the agreed additions.

(d) specifies the guaranteed energy savings for the ECMs, as identified in the DFS or pursuant to clause 3.1(a).
This provides primarily for increases in the guaranteed energy savings if additional ECMs are added during the preparation of the works specification. In other words, clause 3.1(a) protects you from additions effectively reducing the energy savings guarantee. Remember also that you and the ESCO must agree to additions, which means the ESCO can only add to the works specification with your agreement.

(e) Includes any other information the ESCO considers necessary, including plans, specifications, engineering designs and drawings relating to the proposed facility upgrade.
Different Customers will have different requirements of their ESCO in this regard. From the ESCO's perspective, it is being contracted to deliver the ECMs and achieve an agreed level of performance (guaranteed energy savings)—it is the ESCO's responsibility to achieve this guarantee. You, on the other hand, are primarily interested in the delivery of new equipment that is to be paid from with the promised savings. Although some ESCOs would like to ignore the issue of capital acquisition and sell the ESCO concept on a cash flow and net return basis, capital is being procured and Customers will want to ensure they are getting what they paid for—equipment, services, and performance.

(f) Includes a listing and description of the equipment that needs to be upgraded or replaced.
Normally clarified in the DFS, this list is of the equipment the ESCO will remove, modify or replace during installation of ECMs. As this equipment is owned by your organisation, disposal should also be specified.

(g) Includes a detailed listing of all maintenance programs, training programs and schedules for the equipment.
Full maintenance programs should be specified for all required equipment including whether you or the ESCO will take responsibility for that work. In practice, you and the ESCO will need to work together to define the appropriate method of maintenance, so any new

maintenance is appropriately integrated into your current practice. In many cases, professional maintenance is the key to the ESCO achieving sustained savings. So, where you choose to be responsible for maintenance, the ESCO will insist that it is carried out to specification and that you provide documentation as evidence that the maintenance has been carried out. The ESCO should carefully specify maintenance procedures for you (or your third party) to carry out, including providing forms and instructions on how maintenance will be verified. In cases where savings are lower than expected, the ESCO may investigate the maintenance practices to see if this has had an impact. See the discussion below on clause 5 (equipment maintenance) for further details.

Equipment schedules and operating practices must also be fully detailed and provided. These will also need to be updated by the ESCO if they change over the course of the contract. These details are critical for you to be able to operate the equipment effectively and as per original design during, and following termination of the contract.

And lastly, the ESCO should detail a comprehensive training program appropriate for your needs so you will be able to manage the continued operation of the ECMs beyond contract completion. Depending on whether you use your own internal operations staff or outsource these services, ensure that you are adequately prepared to manage everything as the EPC finishes. See the discussion below on clause 5.10 (training) for further information.

(h) Includes a detailed list of criteria prepared by you to control and define performance of the works by the ESCO, as specified in the Request for Proposals.

This list provides the ESCO with your performance requirements regarding the services provided by the equipment. This includes specifications such as the temperature of water leaving a chiller, room control temperatures, operational schedules, compressed air pressure and volume capacities, hot water temperature set points, and lumens per application for lighting. In most cases, the ESCO will provide recommendations for these values, which you will need to review and agree to. You and ESCO will use these performance details to determine that the equipment is saving energy and performing according to expectations.

Works specification meetings

The work specification as detailed above is a complex process that may result in a large number of documents, procedures and forms for parties to manage during the EPC. The best way to begin this first step is for you and your ESCO to hold a works specification meeting.

Using the DFS as the starting point, you and your ESCO should agree on:

1. what will be included, as described and analysed in the DFS;
2. what will be deleted, excluded, or not implemented in the DFS;
3. changes to work as described or analysed in the DFS;
4. if there is additional work not described or analysed in the DFS;
5. changes to the measurement and verification plan (MVP). Note: this should have been addressed during the review and finalisation of the DFS, but may require additional review at this point due to changes of scope as a result of points 1 to 4 above. The final MVP will form Appendix 1 to the contract;
6. maintenance issues (e.g. who will take responsibility, level of service, timing);
7. commissioning issues and performance criteria for ECM acceptance certificates;
8. training requirements and schedule; and
9. the estimated budget and installation timing implications of the above decisions.

Once this meeting is complete and the parties have agreed in principle on the scope of works, it is up to the ESCO to prepare the detailed works specification. Again, because this document may be long and contain a large amount of detail, it is recommended that you and your ESCO meet to review the details. This meeting should, for the most part, be a reconfirmation of previously agreed items. However, in the case of new or changed work, there may be a need for a more comprehensive and detailed review process (similar to what may have transpired towards the completion of the DFS).

You will need to carefully review the new documents produced, including:

- the full project milestones (carefully consider this in terms of planning requirements for your business or operation, to allow the project to be successfully implemented);
- ECM purchase price and disbursement plan;
- equipment specifications;
- equipment performance requirements;

- MVPs (carefully review baseline adjustment criteria and any data collection procedures that you will be required to undertake on behalf of the ESCO—e.g. providing utility bills, occupancy data, production data. The MVP should specify the baseline energy use and provide detailed descriptions of existing equipment. See clause 8 for further details on M&V and baseline adjustments);
- energy savings guarantee (to verify that this has not diminished and that the financial criteria of the project still hold);
- commissioning procedures (you should agree that the proposed commissioning procedures are sufficient to demonstrate that the equipment has been properly installed, is functioning according to its original intent and to the required performance specifications, and is achieving the desired energy savings); and
- maintenance, equipment operation and training schedules.

Increased scope/increased cost?

Typically, when new or additional work is included at the stage of preparing the works specification, it will mean additional costs that may include:

- the ESCO's cost to analyse, design and plan for the new work;
- incremental equipment and hence increased cost (there is also the possibility that changes could remove some redundant equipment and hence reduce costs);
- increased installation, commissioning, M&V, maintenance, and training; and
- increased project management cost.

The ESCO is responsible for identifying where costs will increase and why. You should be aware of potential cost reductions and request these where appropriate. Both parties must agree to the final increase or decrease in scope, before implementation.

Clause 2.1: submission of works specification

While it may seem obvious, it is important that, in assessing the adequacy of the works specification, you consider whether the equipment the ESCO proposes to install meets site requirements. That is, you must assure yourself that the equipment not only delivers energy savings as projected by the ESCO, but that it is fit for the purpose for which it was originally required.

Similarly, you must satisfy yourself that the proposed ECMs will not only deliver guaranteed energy savings and perform according to expectations, but that they will also meet the operational requirements of your business.

It is important to remember that the ESCO is guaranteeing savings and performance; it is up to you to ensure that the ECMs, and equipment installed to give effect to those ECMs, are adequate for your organisation's needs.

Clause 2.2(c): changes required to works specification

The ESCO will design the works specification with due regard for the nature of the site and your organisation's business and operational requirements, to ensure minimum impact on your normal operations. Nevertheless, a proposed installation timetable may interfere with your organisation's operations in a way you cannot accommodate. This is why provision is made in clause 2.2 for you to notify the ESCO of changes you require to the works specification.

However, it is important to understand that these changes may impact on the costs of installation, project management, and various other costs of the EPC.

As far as possible, you should carefully consider the proposed timing and estimated duration of installation works set out in the DFS. You should notify the ESCO of alterations you are likely to require to that schedule, before the ESCO drafts the works specification, to minimise the cost of the changes. Remember that a construction timetable can only allow a certain number of last minute changes.

Clause 2.5: installation of ECMs

At this point, implementation of an ESCO project proceeds much like any standard construction project. The ESCO must follow the works specification laid out in the contract, and you manage your participation according to the terms of the EPC. As with previous steps in the process, you should appoint a project manager to oversee and interact with the ESCO, its personnel and sub-contractors throughout installation. One important role the project manager must undertake is to ensure that your organisation's relevant policies and procedures are provided to the ESCO prior to commencing work, and that the ESCO is monitored to ensure these are followed.

The construction schedule is likely to be the most important issue to manage. As described above, the schedule should have been developed with careful consideration given to your facilities' operation schedule, to minimise disruption to your business during construction. Minimised disruption is a function of cost and convenience and you and the ESCO must work together on a compromise, agreeing on how best to

schedule the construction process. This is particularly critical in Customer businesses that operate 24-hours, seven-days-per-week (e.g. hospitals). Construction in a facility such as this requires careful coordination with the operations staff of each affected department and area of the building, to ensure that essential services are not disrupted and that other services and construction needs can be managed. Accommodation of difficult or unusual schedules will normally add to the cost of the installation of the ECMs, as trades people often charge higher rates to work evenings, weekends and public holidays.

If new work is required due to the ESCO's errors or omissions when preparing its works specification, then it is normally the ESCO's responsibility to rectify the situation at its own cost. If, however, additional work is required as a result of some action you have performed or not performed in carrying out your duties under the EPC, then your organisation will pay for these additional works. In no way is the intent of this clause to remove the responsibility of the ESCO of performing its duties under the preparation of the works specification.

Clause 2.5(c): safety procedures and identification of contractors on-site

It is also important that you provide the ESCO with details of policies or procedures on safety and identification of contractors on-site as early as possible. Ideally this should be done before the EPC begins, but at least before the ESCO begins drafting the works specification. Coordination of sub-contractors and delivery of materials and equipment is a cost-control exercise that is made much more difficult if crucial planning items are not available to the draftsperson at the beginning.

As well as safety and identification, you should ensure that the ESCO is made aware of other policies, procedures or requirements that contractors must comply with while on-site, such as non-smoking, confidentiality, security or background checks, health issues that may arise in hospitals, aged care facilities or other health care environments, or stipulations regarding working hours.

Clause 2.5(d): warranty and material changes to premises

The warranty you are asked to provide under this clause is of considerable importance.

Example: importance of the warranty under clause 2.5(d)

A university has a wing it has traditionally used infrequently as a conference facility, and advises the ESCO of this when the DFS is being prepared. After the DFS is completed, a decision is taken to set up the wing as seminar rooms that will be used 50 hours a week, 40 weeks a year.

The ESCO is to replace a boiler in the basement underneath this wing. The ESCO schedules most disruptive installation works during a vacation period. However, the installation timetable commences during the semester so that all works can be completed before the start of the next semester. Replacement of the old boiler must occur early in the works timetable, and this originally presented no problem since there were no conferences scheduled during this time and the wing was not expected to be in use. Now, however, the ESCO cannot access the wing until midway through the semester break, which means it cannot complete the works until a month into the new semester. This is not acceptable to the university.

As a result, implementation of the EPC must be postponed nine months (until the long summer vacation), the ESCO advises that the DFS must be re-done to account for the substantial variation in load factors and energy costs arising as a result of the delay and the university is faced with having to find funding for the new DFS for which there is no provision in its budget—because it failed to disclose a material change to the premises.

A list of changes to premises that should be considered 'material' is set out in clause 8.1 within the context of adjustments to the baseline for the purposes of calculating guaranteed savings. The list applies in this context as well.

Clause 2.6: latent conditions

Latent conditions are physical conditions on the premises or its near surroundings (including artificial things but excluding weather conditions or physical conditions occurring as a result of weather conditions) which differ materially from the physical conditions that could reasonably be anticipated by the ESCO at the time of its tender, and which would affect its ability to complete the installation.

If the ESCO becomes aware of a latent condition that will affect its ability to complete the installation of the ECMs, it must notify you as soon as possible and preferably before the latent condition is altered.

The notice that the ESCO provides must specify the nature of the problem, what work will be required to fix it, how long it will take, what it will cost, and other relevant details.

Delays experienced as a result of dealing with a latent condition may then justify a formal extension of the installation timetable.

If a latent condition is going to cause extra work/time/expense, which the ESCO could not reasonably have anticipated, you must pay the agreed additional amount or—in the absence of agreement—the actual, reasonable costs incurred by the ESCO.

However, if after receiving the notice referred to above, you do not want to proceed with rectifying the latent condition, you must notify the ESCO of that decision immediately.

If the parties cannot agree on an alternative method of solving the problem, the issue is treated as a dispute and becomes subject to the dispute resolution procedures set out in clause 17.

It is therefore important for Customers to understand that the ESCO will not be responsible for circumstances outside its control, that arise as a result of encountering a latent condition—provided that the ESCO could not reasonably have foreseen the situation and its impact on the performance of the EPC.

If, during installation, the ESCO encounters a latent condition not accounted for in the tender or DFS, and it constitutes an insurmountable problem (which means the EPC cannot proceed), the matter of costs must be addressed. Clause 16.3(b) covers the procedure for dealing with costs where you decide to abandon the EPC because of a latent condition, within the context of termination of the EPC for any reason.

As noted above, when a latent condition is encountered, the ESCO must notify you (clause 2.6(a)), outline details of the problem, what will be required to resolve it, how long it will take and what it will cost (clause 2.6(b)). Subject to alternative methods of dealing with the problem which you and the ESCO may agree on (clause 2.6(f)), you must then decide whether to proceed with, or terminate, the contract. If you agree to terminate, clause 16.3(b) applies, and you will be liable for costs incurred to that point, including the DFS fee, the works specification fee and as much of the ECM purchase price that has been incurred to the date of termination. You may also be liable for other costs.

If the ESCO is liable to pay any of your costs incurred to this point, you can recover them under clause 16.3(c).

Clause 2.8: sub-contracting

Sub-contracting is common in the EPC industry. Almost every contract has some level of sub-contracting; as ESCOs rarely have all the resources or skills to implement a full project themselves. Using sub-contractors does not relieve the ESCO from its obligations under the ECP. This is similar to the construction industry, where the main contractor must use numerous sub-contractors and suppliers to fulfil its obligations. It is common practice for an ESCO to put its suppliers or contractors under the same obligations. This allows the ESCO to manage its performance risk by sharing it, but does not relinquish its responsibility to the Customer. If necessary, the ESCO would have to pursue restitution from its suppliers or contractors independently.

The ESCO should disclose names and details of all sub-contractors.

Clause 2.9: approvals and consent

You may need to obtain some form of approval or consent from a third party before the ECMs can be installed. Examples include building approval or development consent from a local council, authorisation from a parent company or government department and consent of a mortgagee to the premises.

Clause 2.9(a) appoints the ESCO as your agent for the purpose of obtaining necessary approvals.

Canvass this issue as early as possible to avoid or minimise delays in obtaining approvals or consents.

Clause 3: additional ECMs

Although contractually the EPC (through the works specification) defines the equipment and ECMs to be installed, the ESCO's primary focus is delivering energy savings—with the equipment and ECMs a means to achieve that end. If savings are not being generated to the expected level, the ESCO can take certain actions to rectify the situation. This clause allows the ESCO to change, replace, remove, alter or add to any equipment or procedures introduced as part of the project, without reducing the guaranteed energy savings. The ESCO is required to fully clarify in writing the rationale for the change and obtain your acceptance before proceeding.

Some equipment that is installed may also meet other intrinsic needs related to the facility's operations. In this case, that equipment could be identified within the contract as excluded from this clause.

Example: an ESCO using clause 3

An ESCO recommends and implements a solar hot water heating system to supplement an electric water heating system in a recreation centre's 25-metre swimming pool. The energy savings have been estimated and set out as a guaranteed energy savings in the EPC. After four months, the net savings are well below the guaranteed savings. If no action is taken, this will result in the ESCO having to pay to the Customer the difference between guaranteed and actual savings. Several factors are found to have contributed to the shortfall, including:

1. over-estimation by the ESCO of the performance of the solar hot water heater;
2. under-estimation of the usage of the pool; and
3. over-estimation by the ESCO of the temperature of replacement pool water (to keep the pool at the required level).

If the ESCO took no action, it would be required to make an annual shortfall payment to the Customer of approximately 25 per cent of the guaranteed energy savings.

To avoid this loss, the ESCO looks for other options. It decides to apply a pool cover when the pool is not in use, which provides the following benefits:

1. it acts as a passive solar heater during daylight hours;
2. it reduces evaporation (and consequently latent heat loss);
3. it reduces convective heat loss; and
4. it reduces pool cleaning costs.

Through analysis, the ESCO has determined that the pool cover will more than compensate for the net shortfall in guaranteed energy savings from the solar water heater. Further analysis shows that the added investment (which must be borne by the ESCO) will be less than the savings shortfall the ESCO would otherwise have to pay to the Customer. The ESCO approaches the Customer with the problem and the solution and asks for approval to implement the change. The Customer is assured that the cover is easily managed by pool staff and will not present any significant barrier or inconvenience to use of the pool. The Customer gives approval to proceed.

Following installation, staff are trained in how to apply, remove and maintain the cover. Because the savings from the cover are directly related to the cover being used regularly, the ESCO monitors its use carefully. After monitoring for three months, the ESCO estimates that the energy savings on the pool heating costs will now exceed the guarantee level in the EPC. Because the pool cover does not in itself consume energy, the energy saving calculation procedures in the MVP did not require modification. However, because energy savings are now directly dependent on the use of the pool cover, careful monitoring of its use and the pool's use must be correlated. The Customer monitors the pool's use with its standard pool scheduling forms, while the cover's use is monitored by a simple and inexpensive electronic timer on the underside of the cover, which is activated when placed under water. By verifying that the pool cover is used when the pool is not in use or closed, the ESCO can verify compliance with operations procedures. In this instance, the Customer has agreed to follow the prescribed operations procedures as set out by the ESCO.

Example: a Customer wishing to protect itself against clause 3 being used

An ESCO recommends and implements changes to a food processing plant, which will increase production output and result in significant energy savings. The ESCO, unable to control the Customer's production, only offers guaranteed energy savings based on a particular unit of production, and allows the Customer to solely benefit from the increased production.

The ESCO experiences a number of technical difficulties, including feedback and control issues when fine-tuning the equipment—resulting in lower than expected energy savings. However, despite the reduced energy savings, production increase expectations are being met and the Customer is benefiting from this aspect of the project.

The ESCO has assessed its options and identified a change to the system at a modest cost that will allow it to achieve the guaranteed energy savings. However, if implemented, the Customer will loose the benefit of increased production capacity.

Because the ESCO and Customer have identified production capacity as a performance requirement under the EPC, the ESCO must discard this option and search for an alternative. Had this not been written specifically into the works specification, the ESCO would have had the right to implement this change and the Customer would have lost an intrinsic benefit, which may have been a key factor in the decision to proceed with the EPC.

The essence of this clause is to allow the ESCO to continually evaluate the financial impact of the EPC, and take action that will result in the best financial position while still achieving the guarantees. If the ESCO is losing money because the project is not achieving the guaranteed energy savings target, the ESCO will evaluate what minimum investment is required to reduce its losses. If the ESCO is paid a performance bonus for exceeding the guaranteed energy savings, then this is a continuous process by the ESCO to see how it can maximise its returns.

Because equipment installed by the ESCO is the property of the Customer under the standard EPC, the ESCO must seek approval to remove, modify, change or dispose of any property.

Clause 4: commissioning procedure

Following installation of each ECM, the ESCO will undertake a 'commissioning process' (according to the works specification) to verify that:

1. the equipment has been installed according to specification and can achieve the performance requirements of the intended task; and
2. the equipment (or ECM) is performing to expectations in the sense of being able to achieve the expected level of guaranteed energy savings.

After this commissioning process, the ESCO provides you with an 'acceptance certificate', certifying that the equipment has been installed according to the works specification and is reasonably expected to achieve the guaranteed energy savings. You are required to sign off on this certificate within the timeframe nominated in the EPC, or reply in writing to the ESCO about deficiencies in the installation.

In practice, you should be directly involved in the commissioning process of each ECM to better assess that the ECM and equipment complies with the works specification and certify the acceptance certificate with little, if any, delay. You need to ensure that everything has been supplied as required before signing off.

It is in your best interest to sign off on the acceptance certificate so that the performance guarantee commencement date is as soon as possible and you can realise the benefits of the energy savings as quickly as possible.

Depending on the MVP in the EPC, sign off of acceptance certificates may not constitute a commencement date until a group of certificates has been signed off. This would apply in the case of MVPs based on the methodologies of option C or D under the *International Performance Measurement and Verification Protocol (IPMVP)**. This should be clearly identified within the MVP (of the ESCO project and ECMs) as part of the works specification.

Where individual ECM installation and commissioning completion dates are scattered over the construction period of the entire ESCO project, it may be easiest—for energy and financial accounting purposes—to agree on a final acceptance certificate for all ECMs and have one common performance guarantee commencement date. This avoids annual reporting of each ECM's savings on the anniversary of individual ECM performance guarantee commencement dates. Under a common commencement date, you are usually provided the benefit of energy savings from ECMs that were operating prior to the commencement date being accepted—without any benefit to the ESCO. However, this approach could lead to project delays in finalising all ECMs, as it may be to the ESCO's benefit to fine-tune ECM energy savings in lieu of issuing the final acceptance certificate. The aspect of the project that guards against this delay is final payment for the equipment (by the Customer), which cannot occur until the final acceptance certificate can be issued. As a result, the disbursement plan and method of managing holdbacks should be carefully considered.

When you accept and sign off the certificate, you take ownership of the equipment and further responsibility for it, including any agreed maintenance requirements (see clause 5 below). If you are agreeing to take responsibility for maintenance, ensure you are fully prepared to meet your operations and maintenance obligation (see clauses 5.9 and 5.10) by coordinating any required training with the ESCO.

The ESCO also has the option of specifying a performance guarantee commencement date that precedes completion of the installation of all ECMs, or a staged performance guarantee commencement date that nominates a series of dates during the installation.

In either case, the ESCO must nominate the date or dates it intends to use (as the performance guarantee commencement date) in writing prior to installation beginning. This issue should be clarified in the works specification.

Note that the date the acceptance certificate is issued is not necessarily the same as the performance guarantee commencement date. Also, issuing the acceptance certificate deals with completion of the EMCs' installation. It does not equate to a 'defects sign off', in that it does not affect expiry of a 'defects liability period' (see the warranty provisions in clause 10).

Clause 4.4: transfer of risk and insurance

Once the equipment is installed on site, the risk of loss or damage transfers to your organisation, notwithstanding the fact that title to the equipment does not pass to your organisation until the ECM purchase price has been paid in full. It is important that your existing insurance includes coverage for the newly installed equipment, or that you arrange a suitable extension of coverage.

The equipment is intrinsic to the ECMs, which are delivering the savings, and the savings are paying for the equipment. Adequate insurance coverage is likely to be a fundamental requirement of your financing arrangements.

Clause 5: equipment maintenance

Maintenance under an EPC is frequently a difficult issue for the ESCO and Customer to negotiate. It is often assumed that the ESCO obtains the largest benefit from undertaking this responsibility and, in some cases, this may be true. For the Customer this is often an issue of continuing with status quo (retaining responsibility for maintenance), which from an economic point of view may not be in your best interests.

Maintenance issues are complicated by a number of factors, including:

1. existing maintenance contracts with third parties;

*Option C provides for a utility billing analysis of energy savings of one or a combination of ECMs. A commencement date under this option would not apply until all ECMs have been fully installed and commissioned. Option D provides for a simulated approach to energy savings and also would not apply until all ECMs impacted by the simulation algorithms have been fully installed and commissioned. For further information see clause 8 and refer to the IPMVP.

2. the risk of the Customer's existing maintenance staff being made redundant or being retrained and relocated if the ESCO takes on maintenance; and
3. the Customer's existing maintenance staff being required to implement new procedures and undertake training if little incentive exists for additional workload.

The first issue is normally the easiest to resolve and is more of a perceived issue than a real one for Customers. Most existing maintenance contracts contain adjustment provisions based on changed operations and addition or deletion of equipment. In the same way that you would prepare a specification to modify an existing maintenance contract for any other change, you could negotiate a change to the existing contract due to an ESCO project. In practice, changes due to an ESCO project are easier than changes not related to ESCO projects, because the ESCO prepares a detailed maintenance schedule, which you can use to negotiate with your third party maintenance contractor.

The second and third issues are industrial relations matters that can be difficult to resolve depending on the situation, the proposed ECMs (i.e. maintenance workloads), and the Customer (i.e. whether staff are organised or not). Regardless of the existence of organised unions, internal labour issues must be considered carefully in the context of any successful ESCO project. If the project is implemented without this sensitivity, staff may undermine potential savings—this may result in disputes between you and your ESCO and perhaps even result in a failed project.

Despite most ESCOs being eager to take on maintenance responsibilities, they should nevertheless be sensitive to your issues and concerns and design a program that meets everyone's objectives.

An ESCO project can potentially be a significant boost to employee morale and skills development. ESCO projects involve new and, frequently, state-of-the-art equipment. This allows staff to enhance their experience and skills and be trained to use and operate this equipment. Often the attention provided by an ESCO to the project and to staff is more than they would have received under normal circumstances. This added attention can be a tremendous boost to morale and job satisfaction and can translate into higher productivity.

Maintenance specification

The first step in resolving who will be responsible for maintenance is to clearly define the maintenance requirements for all equipment in the works specification. Once complete, it becomes relatively simple, in conjunction with your operation and maintenance management, to determine alternatives and select an approach. In many cases, maintenance will be defined as a shared responsibility, where the Customer continues with practices you are already performing and the ESCO undertakes specialised and less frequent maintenance practices.

The result (best resolved in a maintenance specification meeting) should be a detailed maintenance schedule with a note defining who is responsible for each maintenance item.

The ESCO's maintenance objectives are to maintain energy savings for the life of the EPC, while not violating the manufacturer warranty requirements. From your perspective, the economics of maintenance are best evaluated on a life-cycle cost basis—where additional preventative measures are included in the maintenance program, when it can be shown that they have a cost-effective advantage over the life of the equipment (e.g. extending equipment life, reducing energy consumption, health and safety improvements and reduced noise). Each maintenance item should be justified and agreed to by both parties.

Where the ESCO takes responsibility for maintenance, this will normally be done for an additional ongoing cost. This cost is over and above the ECM purchase price and should be identified in schedule 1 of the EPC under 'maintenance services fee'.

Customers evaluating the impact of maintenance costs on EPCs should consider only the incremental maintenance costs in their financial evaluation. Maintenance being performed on existing equipment will be still required following the implementation of the ECMs and should not be added to the cost of the project. Where maintenance performed by the ESCO reduces your costs, these benefits should also be included in the financial evaluation of the project.

Maintenance versus warranty

There is an important interrelation between maintenance and equipment warranties. The equipment warranty, or more specifically, 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 indemnification 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'. This is why the ESCO and Customer must take care with maintenance. If the manufacturer finds that due diligence in the case of maintenance had not been followed, then the warranty may be voided and whoever was responsible for maintenance may be held partially or wholly liable for repairing or replacing the failed equipment.

Maintenance defined in the works specification should comply with the manufacturer's minimum specification requirements for warranties to remain in effect and to achieve the life expectancy of the equipment. You should verify this, or obtain a statement of compliance from the ESCO. It is then either your responsibility or the ESCO's responsibility as agreed in the EPC, to conduct maintenance as specified.

Enhanced maintenance

Enhanced maintenance (i.e. maintenance specified beyond the minimum required and suggested by manufacturers) may be specified by the ESCO to ensure energy savings performance is maintained or enhanced. Compensation for this may be included in the maintenance services fee, an enhanced maintenance fee, an ongoing guaranteed energy savings fee, part of the measurement and verification fees, or included up-front in the ECM purchase price. It is important for you and your ESCO to discuss and agree on the rationale and needs for enhanced maintenance and specifically how it will be paid for under the EPC.

Extended warranties

In some instances, the ESCO may have purchased extended warranties to the equipment, extending the period and/or conditions of warranty for further protection against equipment loss. This is normally done when you or your ESCO are interested in increased protection, particularly when the ESCO is responsible for maintenance, and up to a period (if available by the manufacturer) equal to the term of the EPC. If this is unavailable or too costly, the ESCO may provide an extended warranty for equipment through an insurance policy. Regardless of how extended warranties are provided, it is done at additional cost to the project and consequently, at a cost to you. This added cost should be weighed against the reduction in risk and additional benefits.

Maintenance compliance

Where you are responsible for all or a portion of the maintenance, it may be critical for the ESCO to know that maintenance procedures have taken place and what special actions (work performed by you not normally prescribed in the maintenance specification which may affect equipment performance, operation, or energy consumption) have taken place. For this reason, the ESCO will establish a reporting procedure and forms for the Customer to use. The ESCO will regularly seek copies of the forms and verify actions undertaken by the Customer. This is done as a risk protection measure for the ESCO against premature equipment failure due to a lack of regular maintenance and to ensure that a lack of maintenance does not contribute to reduced energy savings.

Clause 5.4: the Customer must notify the ESCO

The intent of this clause is twofold:

1. to determine whether any action on the premises, either by the Customer or an outside entity, will impact on energy savings from the ECMs; and
2. to give the ESCO adequate time, if possible, to take corrective action to ensure savings are maintained, given any such occurrences.

The notification period is intended to be short enough to manage lost energy savings potential which could significantly impact on the total guaranteed energy savings, yet long enough to give you reasonable time to respond. Changes should be noted to the ESCO regardless of whether that change would have a detrimental or beneficial impact on the energy savings. In this way, you can avoid future disputes over why energy savings are higher or lower than expected.

Areas that the ESCO knows may impact on energy savings should be fully defined in the MVP (included in Appendix 1 of the EPC—see clause 8 below for more information). As part of the MVP, you may be required to regularly collect and provide data to the ESCO, and this should be fully defined. In other instances, there may be implied areas that, if changed, could have an impact on energy savings, but where regular data collection is not taken. This clause is written primarily for those implied areas.

Example: notifying the ESCO about actions which impact on energy savings

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 the building addition easily accommodated by modifying the baseline and guaranteed energy savings. Without knowledge of this addition, it may have been assumed that energy consumption had risen for no apparent reason. Under this clause, the Customer is required to report the additional conditioned space serviced by the chiller to the ESCO in a timely manner.

The clause is primarily aimed at protecting the guaranteed energy savings from unforeseeable circumstances. So, while a temporary blackout is an entirely foreseeable occurrence, a power failure that lasts days or even weeks should be viewed as a significant interruption or alteration of an energy supply to the premises, that will effect energy savings. It should, therefore, be notified to the ESCO (see clause 5.4(c)).

Clause 5.6: equipment maintenance by ESCO

Where maintenance is provided by the ESCO, the EPC will need to define the maintenance specification in detail, including:

- the maintenance procedure specification over the term of the EPC;
- periods or frequency of procedures;
- access requirements, and notice of access, to Customer;
- consumables; and
- maintenance fee and any additional costs.

This should be part of the works specification as attached to the EPC.

Clause 5.9: training and clause 5.10: retraining/ongoing training

Training is integral to most EPCs for the following reasons:

1. most ESCOs will see training as an important part of the EPC. Your staff will be responsible for day-to-day operations of the ECMs and, as a result, have direct control over the ESCO's ability to achieve expected savings. Your staff therefore require adequate training to operate the equipment;
2. an ESCO acts as a turnkey service provider, so you will frequently not be involved in decisions and procedures you and your staff would have had to perform under a traditional construction project. You therefore may require training to take over operations at the conclusion of the EPC; and
3. all EPCs will eventually terminate, and you will be expected to take operational responsibility for the ECMs at this point. It is therefore important for the ESCO to provide operations and maintenance training on the whole project.

Without knowing what impact your decisions have, the ESCO is at risk. Although you wouldn't be at risk for these savings under a guaranteed savings scheme, it is in your best interest to help the ESCO achieve the maximum possible energy savings according to the operation specification of the ECMs.

Most ESCOs will establish a training schedule for operation and maintenance (O&M) coinciding with the commissioning of the ECMs. If possible, the ESCO should involve you in the commissioning process and use that as a valuable part of training. If you will be using third parties for maintenance, then discussion should centre on how those parties could participate in training. In addition to initial training, the ESCO will likely suggest periodic training updates. This is particularly important if staff turnover creates gaps in knowledge. In such cases, you can usually request training, or the ESCO may offer training to new staff. You would compensate this separately due to the unforeseen nature of this type of training. It is strongly recommended that the ESCO be given this latitude to charge for training, as it has no control over your human resources management practices, which can directly impact on ECM O&M and therefore on the ESCO's guaranteed energy savings obligation.

ESCOs will normally offer a regular training program as part of a continuous improvement processes. This is particularly evident when the ESCO is compensated for

enhanced or over-performance (i.e. paid a bonus for exceeding the annual guaranteed energy savings amount). Through training, the ESCO can keep staff focused on energy savings and can also use their day-to-day experience to fine tune systems for even more savings. This 'win-win' strategy is one of the biggest benefits of a well-run EPC and it helps to ensure the sustainability of the savings well after the EPC has terminated. The additional benefit of training during ESCO projects is staff exposure to new equipment, standards of practice and general improvement in skills that otherwise would not have occurred. This training usually improves morale and job satisfaction for the following types of reasons:

1. it shows interest by management in the O&M responsibilities and systems that may not have been evident before, demonstrating to staff that all areas are important to the success of the business;
2. it shows that you value your staff's ability to contribute;
3. it enhances your staff's skills and experience with new and state-of-the-art equipment; and
4. it demonstrates how changes can significantly impact on savings, which may lead to a more proactive approach to identifying operational changes in the future.

Clause 6: additional obligations of the Customer

Up to this point, the contract has been principally concerned with documenting the rights and obligations of the Customer and the ESCO in relation to installing and maintaining the ECMs and the equipment. Clause 6 is a transitional clause, in that it sets out additional obligations of the Customer not explicitly dealt with in the preceding sections of the contract, but which are nevertheless important to the installation and maintenance sections, as well as to the monitoring and verification provisions set out in clauses 7 and 8.

It is important for the implementation of each phase of the project that the ESCO is afforded full and complete access to the premises. However, the ESCO must accommodate the normal operations of your business, so the obligation to provide access is qualified by specifying that it be provided only at reasonable times. What constitutes reasonable access will depend on the nature of the premises and the business conducted on the premises.

For example, it would not be reasonable for an ESCO to insist on monitoring the ECMs in school classrooms during school hours or in a hospital operating theatre during surgery, unless this monitoring can be accomplished in a non-intrusive way.

It is recommended that you and your ESCO establish what kind of access is required and decide how it can be accommodated to the satisfaction of both parties.

Similarly, the level and type of cooperation (clause 6.2) and information (clause 6.3) that the ESCO requires, or is likely to require, should be established early to avoid conflict later in the project.

Clause 7: performance guarantee

Clause 7.2: monitoring and verification

The requirements and interactions between you and the ESCO should be fully stipulated within the MVP as part of the works specification. The MVP establishes the procedures to determine the energy savings and is generally based on the following simplified formula:

energy savings = baseline energy consumption x ƒ(adjustment factors) – post-ECM energy consumption.

In this formula ƒ(adjustment factors) represents a function of dependent and independent variables, applied in some function with correlated coefficients used to modify or determine the baseline energy consumption.

Although this formula represents the general process for establishing the energy savings, it is important to work with the ESCO to arrive at an agreement on the final MVP and calculation procedures for energy savings.

The MVP 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.

Depending on the M&V methodology used, the above MVP may identify procedures for each ECM, or the facility as a whole. In some cases, groups of ECMs may be serviced by one M&V. It is the joint responsibility of the ESCO and Customer to agree on the approach used in each case. However, in practice, the ESCO should propose MVPs for the project as a whole and work with you to arrive at an agreed approach. Because this is a relatively new area for most Customers, the ESCO will need to conduct basic training to assist you to appreciate the full scope of the issue.

The overall objective in finalising the MVP is to arrive at a balance between M&V cost and M&V accuracy. Because you must pay the cost for M&V, consider carefully the level of accuracy of the determined energy savings you can accept from your ESCO.

Another factor for you to consider is the simplicity of the process on which M&V and energy savings calculations will be based. If you cannot understand the process and calculations then you are unlikely to trust the results of the annual audit produced by the ESCO. The ESCO should work closely with you to ensure you are fully comfortable with the procedures and calculations. Because not all MVPs can be straightforward and simple, it may take extra time and effort on both sides to arrive at an agreement.

Clause 7.2(d): the Customer must assist

Although not directly stipulated in the EPC, you should discuss the option of the ESCO preparing detailed forms and procedures regarding data and assistance it needs from you to complete its energy savings audit report. This will ensure that you can plan properly for your involvement and avoid surprises when it is time for the ESCO to prepare the energy savings audit and report. This information should be stipulated in the MVP attached to Appendix 1 of the EPC.

Because the ESCO has designed the MVP, it will be relatively simple to prepare the information requirements you need to provide. In most cases, this will include data that you normally receive or collect in the course of your business. In some cases, the ESCO may require you to collect new data, which was not previously measured. Examples of data an ESCO might require include the following:

- monthly energy bills (either copies of bills or specific data from each bill);
- occupancy (weekly or monthly and could be in many forms such as: average daily admittance (ADA) or occupied beds (hospitals), occupied days (schools), occupied area or conditioned area (rented space);
- monthly or weekly production data (for industrial facilities that may include: number of widgets produced; kilograms of raw material used; number of occurrences of firing an oven; number of shifts etc. For commercial facilities it may include: number of meals served/prepared; kilograms of laundry cleaned etc.);
- changes in use (normally on a monthly basis, but usually as an exception to use prior to implementation of EPC. Therefore, the Customer only provides a notice when a change occurs and provides basic details of the change, such as: description of area affected, description of new use, m2 affected, energy services that may be affected (air-conditioning, heating and hot water use etc.); and
- reading from meters, gauges, thermostats etc. (this is commonly done by the Customer when the readings are part of existing systems and particularly if manual reading is performed).

The ESCO will use this information to assess whether there will be any impact on the guaranteed energy savings and should discuss this with you promptly.

As noted above, it is important for the ESCO to work closely with you to ensure you are fully comfortable with the procedures and calculations that contribute to compilation of the audit reports.

While you must assist in the preparation of the reports, by providing the information specified pursuant to clause 7.2(d), you may request explanation or clarification from the ESCO to assist in your interpretation of those reports pursuant to clause 7.2(e).

This latter clause limits the extent to which you can request assistance to interpret the audit reports, by specifying that it must be a ‘reasonable’ request. The purpose of the limitation is to avoid the potential for costs of teaching you to analyse the audit reports from becoming prohibitive. You need to consider what level of costs you are prepared to bear in relation to the M&V aspect of the EPC.

In this regard, you should be aware that you can retain the services of independent energy audit consultants to assist in the analysis of audit reports.

Baseline adjustments

Typically, the most difficult aspect of M&V for Customers is 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: baseline adjustment

An ESCO implements a variable speed drive (VSD) ECM on a material handling system in an electronics manufacturer's plant. The energy savings have been estimated at 50 per cent due to the variable nature of the loads on the motor. To arrive at this estimate, the ESCO has used the past 18 months of production data and monitored the past six weeks of the process. This monitoring has shown that there is a direct relation between the weekly production values (number of widgets produced per week) and the energy consumption of the motor. In discussions with the Customer, and through demonstration of the collected data, the ESCO and Customer agree on a formula, which will adjust the baseline energy consumption based on changes in production. In this way, the ESCO is not penalised for increased production (a benefit to the Customer) and the Customer is not penalised for reductions in production, which might show up as bigger energy savings.

In this case, it is agreed there will be no other 'direct' adjustment factors. However, if the Customer modifies the production line, or changes the production process, this may constitute the need to redefine the baseline, the energy savings calculations and possibly redefine the adjustment factors in the future. (As an aside, because the energy savings of this ECM are directly dependant on the level of production, the Customer should consider very carefully future production requirements, as significant increases will quickly erode savings. Because the ESCO and Customer have agreed on adjustment factors, the ESCO will not be held responsible for the original savings estimate and the VSD may not pay for itself within the expected timeframe if production is increased. An ECM like this should normally only be implemented if the production values within the payback period are within expectations.)

Clause 7.3: savings guarantee

As discussed above regarding clause 7.2 on adjustment factors, baseline energy consumption needs to be modified based on the impact those factors have on energy consumption. Because the baseline is being adjusted, the net result is also a change in guaranteed energy savings. Therefore, if there is a requirement to modify the baseline due to some adjustment factor (e.g. outdoor temperature, occupancy or production levels), there will almost certainly be a change in the guaranteed energy savings level.

Energy tariffs

If guaranteed energy savings are based on a value of money, that amount is almost always a tariff at a fixed moment of time and nominated in the EPC. If that tariff changes, the nominated tariff is used to determine energy cost savings. This is usually done by ESCOs as they have little or no control over future energy rates and will not typically accept this risk. By fixing the tariff in the EPC, the ESCO is in essence guaranteeing energy consumption savings, not energy cost savings. When other cost savings measures not related to energy are implemented, the guaranteed amount should be on the same basis.

For example, if maintenance savings are a feature of the guarantee, then the energy consumption savings would be converted based on the agreed tariff and this cost savings added to the calculated maintenance cost savings to arrive at the total cost savings. This total cost savings is then compared to the guaranteed amount to determine if the guarantee has been met, exceeded or if a shortfall must be paid to the Customer.

cost savings = energy consumption savings x energy tariff + maintenance cost savings.

The guaranteed energy savings is based on the baseline energy consumption less the predicted energy savings of the combined ECMs.

guaranteed energy savings = baseline energy consumption – estimated post-installation ECM energy consumption.

Clause 7.4: calculation of guaranteed energy savings

It is important to establish a clear MVP describing the methods, data collection, data use, calculations, etc. when

establishing the baseline energy consumption, post-retrofit energy consumption, and agreed adjustment factors. Without these clear procedures the savings audit (as stated in clause 7.2 (c)) submitted by the ESCO will be in doubt. Through a clear understanding of the documented adjustment factors, the methods of achieving energy savings will be equally clearly defined. This means the ESCO cannot claim additional energy savings achieved through events or operations unrelated to the ECMs. The MVP should be attached to Appendix 1 in the EPC.

The performance guarantee is the heart of the contract. At its simplest level, an EPC fulfils a dual purpose:

- it is a means of guaranteeing a reduction in energy consumption at a given site, delivering cost savings to the Customer; and
- because energy savings are guaranteed, it is a means of funding a capital works upgrade out of existing cash flow.

It is important that you understand the nature of the performance guarantee and particularly the manner in which the guaranteed energy savings are calculated.

And as discussed in relation to clause 7.2, you should ensure that you understand the nature and type of adjustment factors that may be used in calculating savings.

Within the context of the EPC, you and your ESCO should discuss the type of adjustment factors that will require a change in the baseline so you can fulfil your obligations under clause 8.1, and the ESCO can calculate the savings that are actually achieved in each guarantee year.

Note that guaranteed energy savings are considered to have been achieved if they are exceeded by the actual savings, regardless of how that occurs. The ESCO will have designed the ECMs with reference to the parameters specified by you in its response to the RFP. Provided that parameters are met, any factor that subsequently helps to achieve the guaranteed savings can also be taken into account.

In particular, as noted in clause 7.4(c), operations cost savings that the parties agreed on will contribute to the calculation of actual savings achieved, notwithstanding that they do not constitute a reduction in consumption.

Clause 7.5: savings shortfalls

The nature of the guarantee the ESCO provides should be carefully considered. This standard contract provides a bare contractual guarantee. If the ESCO establishes that savings are not achieved as projected at any stage during the performance guarantee period, it has a contractual obligation under clause 7.5 to pay you the amount of the shortfall identified in the audit report for the year or years in which the shortfall occurs.

While it is obviously in the ESCO's best interest to ensure that savings are achieved as projected, the contract does not provide explicit security for the guarantee. Generally speaking, if a shortfall payment is required, the ESCO will rely on the strength of its balance sheet to meet that requirement.

The ESCO does not obtain a guarantee from you that payment for design and installation of ECMs will occur. However, in practice, the contract is unlikely to be executed if you cannot confirm beforehand that you have either secured funding for the capital works program, or will use a third party financing package developed by the ESCO. Accordingly, if you have reservations about the capacity of the ESCO to meet its contractual guarantee

Example: adjustment factors

To use a loose analogy, most people understand that the difference in price of any given item, for example an increase in the price of a kilogram of apples, from one year to the next is described as 'inflation'. However, other factors, such as an increase in costs at the farm gate (poor harvest and therefore reduced supply), increases in transport costs (due to increases in fuel costs, a reduction in the diesel fuel rebate and wages pressures in the transport industry), and increases in retail operating costs (including wages, rent, and electricity), may also contribute to an increase in the price of apples.

obligations, you should consider negotiating security for that obligation in some form (for example insurance and bank guarantees). The type of guarantee you should seek from the ESCO is for an amount equivalent to some percentage (from say 50 to 100 per cent depending on circumstances) of the amount of savings to be achieved in any one year during the performance guarantee period. The guarantee should then be rolled over on each anniversary of the performance guarantee commencement date until the performance guarantee period expires or until your ESCO has earned your confidence and demonstrated its ability to pay and/or manage the project effectively.

If a shortfall payment is required and is then not made (as required under clause 7.5), you can call on the guarantee and should ensure that it remains in place against the possibility that it may be called on again during the remainder of the performance guarantee period.

Be aware that if you insist on this type of security for the performance guarantee, there may be an additional cost payable by you for this service.

Saving shortfalls and excesses in practice

On the anniversary of the performance guarantee commencement date, the ESCO will undertake to complete its M&V audit and savings report, which must be submitted to you within the period nominated in clause 7.2 (c). The objective of this report is to determine the energy savings obtained from the cumulative effect of the ECMs and compare that to the guaranteed energy savings. Three things can occur which may result in the following actions, depending on the nature and conditions of the EPC—these are listed below.

In practice, the ESCO periodically reviews energy savings to ensure it does not have to pay a shortfall. This process is usually described in the MVPs attached to the EPC as Appendix 1. If the ESCO finds that the ECMs are under performing according to the guaranteed energy savings, it will normally take corrective action. In most cases, this action will focus on operational issues (such as control set points, other control functions, schedules) and will fine-tune the operation to achieve savings, but remain within the equipment performance requirements. In extreme situations, the ESCO may need to replace equipment that is not performing according to expectations, or modify or apply additional ECMs. In these cases the conditions of clause 3 (above) shall apply (i.e. there is no cost to the Customer). The following is an example of how clauses 7.5 and 7.6 would work.

	condition	action
1	Actual energy savings = guaranteed energy savings	ESCO has met its obligation and no payments are made.
2	Actual energy savings < guaranteed energy savings	ESCO has not met its obligation and is required to pay to the customer the difference between the guaranteed energy savings and actual energy savings.
3	Actual energy savings > guaranteed energy savings	ESCO has met its obligation and under the standard contract is not required to make any payment to the Customer. As an incentive, the Customer may agree to pay the ESCO a form of performance bonus for over achieving the guaranteed amount. This is normally based on a percentage of over achievement, but can take many forms subject to negotiation between the parties of the EPC.

Example: guaranteed savings shortfalls and excesses

The example in Table 2 below shows a five-year term EPC, with a guaranteed savings amount of $50 000 per year fixed in the contract over the term. The actual energy savings row in the table is determined by the ESCO through the M&V process defined in the MVP (also included in the contract). The savings credit (debit) row represents the annual and cumulative results of the net savings over the contract term. The payment to Customer (payment to ESCO) row represents the amount (if any) owed to either Customer (negative values) or ESCO (positive values). As a rule, the Customer will have been paid (cumulative up to any point during the term of the contract) the cumulative net savings debit. If this amount is positive (a credit), then the ESCO has achieved the guarantees up to that point and there would not be any default payments owing to the Customer. Also, if the Customer had received any default payments in the past, the Customer would have repaid these to the ESCO if a cumulative credit were achieved. See the progression in the table below.

Table 2: example of five-year term EPC indicating guaranteed savings, shortfalls and excesses

	Year 1		Year 2		Year 3		Year 4		Year 5	
(All $ in '000)	**Annual**	**Cumul.**	**Annual**	**Cumul.**	**Annual**	**Cumul.**	**Annual**	**Cumul.**	**Annual**	**Cumul**
Guaranteed savings	50	50	50	100	50	150	50	200	50	250
Actual energy savings	40	40	56	96	62	158	48	206	56	262
Net savings credit (debit)	(10)	(10)	6	(4)	12	8	(2)	6	6	12
Payment to customer (Payment to ESCO)	10	10	(6)	4	(4)	0	0	0	0	0

Cumul. = cumulative

- Year 1: actual savings are $10 000 lower than the guaranteed savings. Therefore, the ESCO is required to pay the Customer the shortfall of $10 000. Because this is the first year of savings, there are no accumulated savings to offset this loss.
- Year 2: the actual savings are $6 000 greater than the guaranteed savings. The cumulative savings are still in arrears to the cumulative guaranteed amount by $4 000. Because the ESCO has already paid a default to the Customer, some of that is due to be returned. The amount paid back to the ESCO is the difference between the cumulative shortfall and the cumulative debt. The Customer pays $6 000 back to the ESCO.
- Year 3: the actual savings are $12 000 greater than the guaranteed savings. Also, the cumulative savings are now $8 000 greater than the cumulative guaranteed savings. Because the ESCO in the first two years has cumulatively paid $4 000 in savings shortfall to the Customer and the cumulative savings is now greater than that amount, the Customer must repay the $4 000 to the ESCO (the remainder of the balance paid by the ESCO to the Customer).
- Year 4: although the actual savings are less than the guaranteed savings by $2 000, the cumulative actual savings are still greater than the cumulative guaranteed savings. No payments are due.
- Year 5: actual savings and cumulative actual savings are greater than guaranteed savings and cumulative actual savings respectively. No payments are due to either party.

The example opposite describes the approach in practice using language in the standard EPC. However, there are alternatives to this and you and your ESCO may wish to discuss and investigate whether these options suit the parties and conditions of the project. Variations could include the following cases:

1. guaranteed energy savings not accumulated—guaranteed energy savings are not cumulative and therefore shortfalls are reconciled annually. In this case, the ESCO pays you if the annual savings are less than the amount guaranteed in any year. Savings are not accumulated and therefore you never repay default payments by the ESCO regardless of excess savings later in the term;
2. guaranteed energy savings are accumulated for the first two years only—this option provides flexibility to the ESCO during the first year to fine-tune equipment. Depending on the nature of the ECMs, the first year's energy savings may require extensive commissioning. By allowing accumulation for the first two years, shortfalls can be offset by later gains, once equipment has established anticipated performance levels. This may be particularly important where large seasonal variations are expected; and
3. excess savings are shared—any excess savings (whether on an annual or cumulative basis as agreed by the parties in the Contract) are shared according to an agreed split. This would require that you agree to pay an agreed amount to the ESCO at the time of M&V reconciliation and on presentation of an invoice.

The above options are based on the assumption that the ESCO is guaranteeing an energy saving, and resulting cost, to you and that this savings is reconciled annually. It is possible that an ESCO may propose the guarantee be on a purely performance basis. In this case, the ESCO would demonstrate that the equipment installed meets all performance requirements, as when originally installed, and that it is still performing the services required, and to the conditions specified. Through inference, the ESCO can state that if all the performance requirements are still being met (i.e. the guarantee levels are achieved), then the resulting energy savings would also have been achieved. The benefit to this method is normally a greatly reduced cost in M&V. This is similar to Option A in the IPMVP.

Example: shared excess savings

Using the figures in Table 2 for Year 3, and assuming that the ESCO and Customer have agreed to share savings on a 60 (Customer): 40 (ESCO) basis, the Customer would pay $3 200 to the ESCO as a performance bonus (net savings after Customer repayment is $8 000 multiplied by 40 per cent = $3 200).

Example: performance is guaranteed

Consider the installation of electronic ballasts in a lighting system (assume it is the only equipment being installed). The ESCO measures the pre-retrofit lighting load using data loggers for two weeks normal operation, establishing the baseline lighting load. It then installs the energy efficient electronic ballasts and performs the same data logging to determine the post-retrofit lighting load. The difference is determined to be the guaranteed lighting load reduction. The energy savings can be determined from this value.

In some cases, the baseline hours of operation may be difficult to determine or agree to, and the ESCO may be uncomfortable with the risks associated with changes of use and operation by the Customer. In this example, the ESCO makes the case that by guaranteeing the maximum load of the new system and taking responsibility for maintaining the lighting system (ensuring lamps and faulty ballasts are replaced) the Customer will realise savings over the existing lighting system—this is a fact and can be guaranteed by the ESCO. The only question is the amount of energy savings. It is reasonable to assume the Customer will use its lights, but to establish consumption to within a 10 per cent margin may not always be possible. So the Customer agrees to accept the operations risk as long as the post-retrofit load is guaranteed and lighting levels are maintained (according to a performance specification).

Clause 7.6: excess savings

This provision deals with the procedure to be followed if savings exceed the amount the ESCO has guaranteed.

You will retain the benefit of excess savings achieved unless the ESCO has been obliged to make a shortfall payment at an earlier point in the performance guarantee period. In this case, you must pay to the ESCO a proportion of the excess savings, equivalent to the earlier shortfall amount.

However, if the ESCO consistently achieves or exceeds the level of savings it has guaranteed, you will retain the entire benefit of the excess savings, unless some form of performance bonus has been agreed to.

Clause 8: baseline adjustments

As has been described previously, the process of adjusting the baseline should be carefully and fully described within the MVP provided by the ESCO and attached to Appendix 1 as a part of the EPC. It is the ESCO's responsibility to draft the MVP/s and get your full agreement to the adjustment factors.

As a guide, the IPMVP 1997 provides a starting point for the methodologies and options for M&V. However, this document does not provide specific requirements for MVPs relevant to the ECMs being implemented by your specific contract.

While it is beyond the scope of this guide to provide a comprehensive description of MVPs and the specific issues related to adjustment factors, it does review and discuss the main issues.

Measurement and verification

To understand baseline adjustments you must first understand the rationale and basis for M&V. There are two perspectives from which to view M&V: as an engineering issue; and as a contract issue.

The engineering perspective normally relates to the mechanics of:

1. measuring energy use before and after ECM installation;
2. verifying that the ECMs continue to perform and generate savings;
3. quantifying the energy savings by comparing before and after energy use; and
4. using the data to identify potential for increasing savings either to reduce risk, or improve returns (improved returns in the case of a shared savings component to the excess savings, or a shared shaving contract).

The contracting perspective uses M&V as a:

1. tool for defining and controlling risk (ESCO's view);
2. control for uncertainty about savings (has the guaranteed savings amount been achieved?); and
3. basis for payments (shortfalls, excesses and shared savings).

The requirement to fully describe an MVP is based on the fact that energy savings cannot be directly measured. Energy savings are determined through an indirect process, by comparing pre-retrofit (or baseline) energy consumption with post-retrofit (or actual) energy consumption. The difficulty with this is that it is rare for all conditions to remain constant over the term of an EPC. Consequently, adjustment factors are introduced into calculation procedures. These factors are applied to the baseline (pre-retrofit) energy consumption to estimate what the energy consumption of the ECMs would have been had the same conditions been present throughout the full term of the EPC. This dynamic process is repeated (typically) on each anniversary of the M&V audit and report performed by the ESCO to demonstrate the savings.

In general terms, energy savings are determined through the following formula:

savings = baseline consumption – post-retrofit consumption.

In this formula, baseline consumption = f(pre-retrofit consumption, adjustments) and post-retrofit consumption = actual energy consumption of ECMs as determine using agreed process.

Under this approach, the baseline is rarely a static value (it would only be static if there were no adjustments, dependent or independent, defined). Therefore, it is represented as a function of those variables.

Example: energy savings formula

An ECM involves 200 x 100W incandescent lamps being replaced with 200 x 25W compact fluorescent lamps (CFL). The same lighting levels are maintained and no other changes are required. Prior to installation of the CFLs, the ESCO installed light loggers (measurement devices) for two weeks to determine the average usage of lamps over that time*. Using that sample of data, the ESCO estimated the annual hours of usage as 3 500 hours (adjusting for holidays, shutdowns, daylight savings, etc.).

- Pre-retrofit energy consumption = 200 lamps x 100W x 3500 hours of use / 1000 W/kW = 70 000 kWh.
- Estimated post-retrofit energy consumption = 200 lamps x 25W x 3500 hours of use / 1000 W/kW = 17 500 kWh.
- Estimated savings = pre-retrofit consumption – Post-retrofit consumption = 70 000 – 15 500 = 52 500 kWh.

Guaranteed energy savings are set to equal estimated savings.

It is agreed between the customer and ESCO that the only variables of change that could occur over the term of the contract are the hours of use, and the number of lamps. It is also agreed that these factors are outside the ESCO's control. In this case, the Customer manually controls the fixtures and it is not cost effective to modify that procedure. Also, the ESCO has no control if the Customer chooses to remove fixtures or discontinue use of some areas where CFLs are installed. Therefore, hours of use and number of lamps will be constituted as the adjustment factors to the baseline.

The baseline adjustment formula is then agreed to be:

baseline = 70 000 kWh x (# of actual lamps)/200 lamps x (actual hours of use)/3 500 hours of use.

Therefore, on the anniversary of the guaranteed savings period, the ESCO performs its energy savings audit and implements the MVP. The ESCO would survey the lamps to determine the number in active use areas and then install light loggers for the agreed sampling period. If we assume the ESCO determined that the number of lamps has not changed and the hours of use has been estimated at 3 400, then the baseline energy use would be calculated as follows:

- adjusted baseline = 70 000 x 200/200 x 3 400/3 500 = 68 000 kWh;
- because the load savings have not changed, the guaranteed energy savings must also be adjusted;
- adjusted guaranteed energy savings = 52 000 x 200/200 x 3 400/35 000 = 51 000 kWh; and
- actual energy consumption = 200 x 25 x 3400 /1000 = 17 000 kWh.

Therefore: energy savings = 68 000kWh – 17000kWh = 51 000 kWh = guaranteed energy savings.

*A light logger is a simple and inexpensive device that counts the number of cumulative hours of use of lighting by counting time when it senses the illumination of the fixture/s. They are typically installed inside the fixture, opposite the lamp. When the lamp is on, the logger counts time on its electronic circuit. When the light is off, it stops counting. The data is easily downloaded to a computer for later analysis. It is cheaper, but not as accurate, as a data logger.

In practice, this example could be simplified by relying on the determination of the load savings to establish the guarantee. The calculations of energy consumption would then only be required to establish the energy cost savings for economic evaluation purposes by applying the appropriate energy tariff.

Where loads and consumption are not constant, an engineering or statistical model of consumption must be developed.

The following figure tries to show how an ESCO has taken two years of energy consumption data from a building and, by applying adjustment factors to this data, has developed a statistical model which closely resembles the past energy consumption.

As the data required for this model is collected in the future, the model is used to estimate the baseline. The factors that constantly vary (weather is a prime example) are built directly into the baseline model. Other factors that may or may not change (such as use of facility or conditioned space) are dealt with as add-ons or multipliers to the model. The difference between the target line and the baseline represents the guaranteed energy savings, and is also modelled according to the same adjustment factors. This example uses a dynamic model that requires monthly data.

The benefit of this approach is that problems are quickly noted and identified early enough to take action so the guarantees can still be met. The disadvantage may be the complexity of the model, the number of dependent and independent variables, the uncertainty in correctly modelling unforeseen factors, or the cost to collect the required data.

The issues to be aware of here are:

1. the baseline is rarely a static value and must be modified by agreed adjustment factors; and
2. whatever adjustment factors are applied to the baseline will normally be applied to the target line, and affect the guaranteed energy savings.

The comprehensive MVP attached to the contract will deal with these issues and should provide:

1. a statement of the plan's methodology (e.g. IPMVP Option B with post-installation metering of operating hours). This is a recommended step, but not essential as it only provides a reference to the methods proposed by the ESCO, while the details required to verify the results will still be contained within the actual MVP as identified in steps 2 – 8 below;
2. an indication of who will be responsible for the components of the M&V process;
3. an explanation of how the following will be determined:

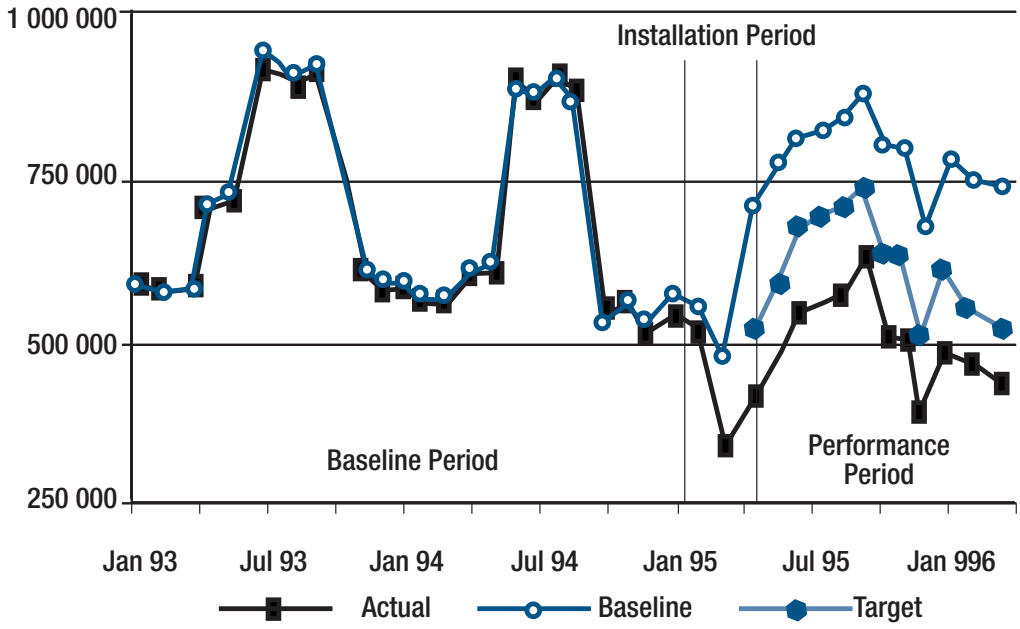

Figure 5: estimating the baseline

- baseline energy consumption;
- actual energy consumption;
- estimated energy savings;
- guaranteed energy savings; and
- adjustment factors and how they will be used;

4. specifications on data collection and (if required) metering procedures to be conducted, such as specification of the equipment, calibration, accuracy, location of measurements, periods of collection, sampling protocols etc. This should be provided for all data;
5. details of key assumptions to be made about significant variables and unknowns, including how these may be treated to adjust results if needed;
6. details of the level of accuracy to be achieved, if not for the entire analysis, at least for key components;
7. an indication of how quality assurance will be maintained and repeatability confirmed; and
8. specifications for reports, including contents, and when they will be provided.

The last item to remember about M&V is that standard techniques can be used and applied by your ESCO (e.g. IPMVP or the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) Guideline 14P*). However, it is impractical to develop and require ESCOs to use standard M&V templates, as the requirements of each ECM will be unique. Most ESCOs tend to standardise a series of ECMs and consequently develop their own templates for MVPs for each measure. The more experienced the ESCO is in developing these plans, the easier it will be to reach final agreement on the methodology and specifics of each plan.

Clause 8.1: customer to provide monthly report on changes affecting baseline

The specific provisions of this clause should be dealt with in detail in the MVP. A typical list is attached to Appendix 7, and described above. The items identified may seem onerous, but their specific requirements should be fully defined in the MVP. If a specific variable is not required, the MVP should not identify its need. Changes may occur that neither you nor the ESCO anticipate. In this case both parties should employ their best endeavours to provide or develop the required data.

The main issue in this clause is identifying unforeseen events you become aware of, which may affect ECM energy savings. By quickly identifying these, you enable the ESCO to take the corrective action required to continue to achieve the guaranteed energy savings.

Without this information, the ESCO may be exposed to unnecessary risks or the project may experience lower energy savings.

You have full responsibility for advising the ESCO as soon as you become aware of potential changes to these adjustment factors.

Clause 8.3: ESCO to determine effect on baseline and guaranteed energy savings and clause 8.4: energy saving procedures and methods of operation

The provisions of these clauses should be fully met if you and your ESCO have arrived at a consultative agreement on the MVP that should be attached to Appendix 1 of the contract. To understand the issues better, refer to the section above on M&V.

Clause 11: intellectual property

Intellectual property rights need to be considered carefully when negotiating an EPC. Generally speaking, the knowledge and experience the ESCO brings to the design of the ECMs it proposes to install has substantial value that usually remains unquantified in the EPC. The manifestation of that value is found in the equipment, materials, systems and software the ESCO uses to implement the EPC.

The standard contract provides for the Customer to use the ESCO's intellectual property in connection with the contract (clause 11.2). It also provides for the licensing of software associated with the ECMs, which generally relates to M&V software and to building management control systems software (clause 11.4).

Clause 11.3 is designed to deal with situations where you may intend to re-use designs for ECMs on sites other than those nominated in the EPC, without the ESCO being involved in implementation. This gives you the benefit of the ESCO's expertise but does not remunerate the ESCO for providing that benefit. This clause provides you with the opportunity to declare your intention and negotiate a suitable price for use of the ESCO's intellectual property.

*ASHRAE Guideline 14P—Measurement of Energy and Demand Savings: ASHRAE has developed comprehensive guidelines for M&V practices. This guide was issued for 1st Public Review between April – June 2000 and is expected for final publication early in 2001. The guide is intended to complement the IPMVP by providing much more practical information for the development of MVPs. (See www.ashrae.org for more information.)

Example: intellectual property

A chain of retail stores may recognise the intrinsic value of an EPC and commission a DFS as a pilot project for one of its outlets. The ESCO designs a number of ECMs, using high quality equipment that is relatively inexpensive. The Customer then implements these ECMs in all of its outlets, receiving the costs savings associated with the implementation of the ESCO's designs but foregoing the benefit of the guarantee that is provided under an EPC. It therefore avoids all ongoing costs associated with the provision of the guarantee. While this may make commercial sense, it is unethical and the ESCO is entitled to refuse to participate in such a scheme and to protect itself from the possibility of it occurring.

It is generally unlikely that the ESCO will obtain access to your intellectual property in preparing the DFS and implementing the EPC. However, you may seek similar assurances from the ESCO if it determines such an occurrence is likely.

Clause 12: insurance

For the purposes of the EPC, you are required to maintain public liability insurance—which should be in the joint names of your organisation and the ESCO. Typically you will need approximately $10 million of insurance cover although this figure should be determined on the basis of the replacement value of your site and the circumstances of each EPC. As noted above in relation to clause 4.4, you should insure equipment against loss or damage, once it has been installed.

The ESCO is required to carry substantially more insurance for the duration of the installation phase of the EPC, as specified in item 10 of schedule 1 of the standard contract. Customers should ensure that consequential loss cover is included, but note that the ESCO's liability in all circumstances is limited to the level of that cover. Consult with your professional advisers about the appropriate levels of insurance cover. Generally speaking, the ESCO's level of cover will be determined by the size of the project. Appropriate levels of insurance cover will need to be negotiated on a case-by-case basis.

Clause 17: 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.

Seeing an EPC through to its conclusion is a partnering process, as discussed in chapter 1. In a legal sense, the parties maintain absolute independence, but must work together towards a common goal over several years. For this reason, the dispute resolution provisions focus on expert determination of issues that arise, rather than the formal resort to the courts, or to alternative dispute resolution procedures such as arbitration.

Energy performance contracting is an industry in which most Customers will have little experience. It is therefore incumbent on ESCOs to educate Customers about what their expectations should be. Most disputes that arise will probably relate to interpretation of the rights and obligations of the parties, as discussed throughout this guide. The assistance of an independent expert to help interpret those rights and obligations, and the information produced under the contract, should also assist the parties to continue this partnering process through to completion of the EPC.

APPENDIX 1: TYPICAL RISK ASSESSMENT TABLE

The following is an example of issues that might be negotiated between the Customer and the ESCO on a case-by-case basis. It is intended as a tool to help clarify details contained in the contract. This not intended to be recommendations on the allocation of risks which might apply to a particular contract.

Risk	Allocation	Comment
1. Design and construction	ESCO	Design and construction must be in accordance with the agreed requirements. ESCO will be liable for cost overruns and for costs of delay. Proponent will provide Customer with a bank guarantee as security for performance.
2. Site access	Customer	ESCO has right to access and use the site and any construction area for construction purposes. ESCO must cooperate with other contractors in relation to accessing the site. ESCO to manage interface with other contractors.
	ESCO	ESCO must not interfere with Customer occupancy, operations and services.
3. Services during construction	Customer	Customer will provide access to existing services for construction as agreed. Customer will not be liable for any delay or costs arising from any failure of any of the services.
4. Site conditions - latent defects	ESCO	Customer will make available to ESCO on an information-only basis geo-technical, contamination and environmental reports on the sites, if held by Customer. ESCO can carry out site inspections when nominated as preferred proponent and prior to the agreement being confirmed. ESCO will be liable for latent conditions including any delay costs.
5. Planning and other approvals	ESCO	ESCO will bear the risk of delays in obtaining, or failure to obtain, approvals and of conditions of approvals, which increase costs or cause delay. ESCO must carry out design, construction and maintenance in accordance with all applicable approvals.
6. Maintenance	ESCO/Customer	Agreement to clearly describe the respective maintenance responsibilities. ESCO will provide agreed maintenance services to pre-agreed standards. Customer will provide agreed maintenance services to pre-agreed standards.
7. Industrial relations	ESCO/Customer	ESCO will be responsible for industrial relations and will bear the risk of industrial unrest of own staff and sub-contractors. Customer will be responsible for industrial relations of own staff.
8. Force majeure	ESCO	ESCO will be entitled to extensions of time if specified force majeure events occur. ESCO will bear all financial consequences of a force majeure event.
9. Rates and taxes		
- increases in taxes - sales tax	ESCO	ESCO will be liable for all increases in State/Territory/Commonwealth taxes up to the date of completion.
- stamp duty	ESCO	The ESCO shall be responsible for sales tax if payable with a financing alternative.
	ESCO	ESCO will be liable for stamp duty which is payable.
10. Changes in law	ESCO/Customer	Changes in law will be considered on a case–by-case basis.
11. Inflation	ESCO	All risks of inflation during design, construction will be borne by ESCO. Maintenance contract will be subject to cost escalation labour only.
12. Insurance	ESCO	Proponent must effect and maintain appropriate insurance with reputable companies. Upon a casualty event, insurance proceeds must be applied to repair/reinstatement.
13. Financing	Customer/ESCO	Customer to take interest risk prior to signing agreement. ESCO is responsible for obtaining finance. The ESCO will be liable for costs or time implications due to changes in interest rates, financing costs, foreign exchange exposure and changes in law, which increase financing costs.

APPENDIX 2: IS EPC RIGHT FOR YOUR FACILITY?

A CHECK LIST

Is energy performance contracting a possible solution for you? This check list may help you to decide. Answer the following questions for the facilities you want to upgrade, circle the numbers below your answers, add them up and compare them with the notes at the end.

Are all the facilities in one location?

No	Yes
1	4

How many facilities are included?

60 or more	25 – 59	8 – 24	1 – 7
1	2	3	4

The average electricity price per KWh you pay is:

<$0.05	$0.05 – $0.07	$0.08 – $0.10	>$0.10
1	2	3	4

The facilities have an area of:

<5 000 m^2	5 000 – 10 000m^2	10 000 – 50 000m^2	>50 000m^2
1	2	3	4

The total annual energy bill (all fuels) is:

<$100 000	$100 000 – $500 000	$500 000 – $1 million	>$1 million
1	2	3	4

The average age of the facilities is:

<5 years	5 – 10 years	11 – 20 years	>20 years
1	2	3	4

Years since any significant upgrade:

<5	5 – 10	11 – 15	>15
1	2	3	4

Your score:

7 – 10: Your savings potential is low and your facility is probably not a good candidate for an EPC. However, there may be opportunities for savings which can be cost effectively implemented by more traditional methods, for example using an energy consultant to do an energy audit.

11 – 15: Your facilities may benefit from an EPC if you are strongly committed to energy efficiency.

16 – 22: Your facility is a good candidate for an EPC. The more commitment to energy efficiency, the more money can be saved.

23 – 28: Your facility is an excellent candidate for an EPC.

APPENDIX 3: TYPICAL NEWSPAPER ADVERTISEMENT

Expressions of Interest

Energy Performance Contract for [company]

As part of a commitment to saving energy, [company] is seeking Expressions of Interest from parties interested in supplying energy performance contract services to the facilities at the following sites:

- xxxx; and
- xxxx.

Interested parties should be capable of:

- carrying out detailed auditing of facilities;
- identifying energy saving opportunities;
- designing, procuring and installing proposed changes;
- guaranteeing energy savings;
- monitoring and reporting results; and
- providing ongoing technical service and support, including staff training at all levels on energy efficient practices.

[The company] will conduct a selective tender based on the responses to this Expression of Interest.

Submissions should include details of the tenderer's ability to provide the services listed above. Submissions should be received by 4 p.m. on [date].

Respondents should contact [name] on [phone/fax/email] for more information.

APPENDIX 4: TYPICAL EOI DOCUMENT

EXPRESSION OF INTEREST (EOI) FOR

THE SUPPLY OF ENERGY PERFORMANCE CONTRACT SERVICES

Preamble

As part of a commitment to saving energy, [company] is seeking expressions of interest from parties to supply energy performance contract services. Interested organisations are to provide the information requested in this document. Expressions of must be lodged by 10 a.m. on the closing date of [date/month/year].

Background

[The company] is planning to negotiate an energy performance contract (EPC) to [aim of the contract]. The purpose of this EOI is to find out who is capable of, and interested in, carrying out an EPC for this work. It is anticipated that a maximum of three registrants will be short-listed from this EOI to develop a proposal for an EPC for [company] (see Request for Proposal below).

Interested organisations should be capable of supplying the following as a 'turnkey' project across the facilities:

- carrying out detailed auditing;
- identifying energy saving opportunities;
- designing procuring and installing proposed changes;
- guaranteeing energy savings;
- monitoring and reporting results; and
- providing ongoing technical service and support, including staff training at all levels on energy efficient practices.

The work includes [details of work].

The major objective is to maintain or improve the existing functionality of the facility while reducing energy and other operating costs.

Request for Proposal (RFP)

Following the evaluation of EOIs, [company] intends to prepare an RFP document reflecting its requirements. Once the RFP is completed, [company] will invite proposals to be submitted for the services in accordance with the RFP. Organisations that respond to this EOI will be evaluated and the short listed organisations will be invited to submit an offer under the RFP.

Enquiries

All enquiries in relation to this Expression of Interest must be directed to [name and contact details].

Absence of legal obligation and confidentiality

In inviting or receiving EOIs, [company] makes no representations, nor does it intend to create any legal relationship with potential parties that choose to respond to the invitation. No part of the EOI shall be deemed to be confidential unless [company] and the potential registrant agree in writing. [Company] has no obligation of liability to selected registrants if it decides not to proceed with the proposal.

Evaluation criteria

All EOIs will be evaluated in accordance with the criteria set out below. The criteria are not listed in any special order and may not be accorded equal weight. Some criteria may be regarded as mandatory for the purpose of registration (as

suggested below). Evaluation and/or non-compliance with a mandatory requirement may result in the registration not being further evaluated.

The criteria are:

essential

- past experience with energy performance contracting;
- performance contracting ability of the staff involved;
- membership of AEPCA (Australasian Energy Performance Contracting Association);
- ability to identify running cost savings and efficiencies other than energy;

supporting factors

- method of monitoring energy savings;
- approach to a performance guarantee; and
- ability to provide ongoing support, service and training.

Registrants should note that [company] may engage the services of external organisations/experts to assist with the evaluation of responses.

Registrant's details

Company/trading name .....

ABN.....

of [address].....

Name of registrant's representative.....

Position.....

Address for service of notices.....

Phone.....

Facsimile.....

Email.....

Experience and capabilities

Previous projects

Registrants are invited to provide details of experience in similar projects within the past five (5) years.

Details should include:

- description and value of projects;
- name of client and contact person for enquiries, including telephone number;
- corporate occupational health and safety management system;
- quality management system;
- staffing details, including support services and training;
- ability to identify running costs, savings and efficiencies;
- proposed methodology for the monitoring of energy savings; and
- demonstrated ability to implement comprehensive energy saving opportunities across a range of services, if required.

Other relevant experience

Registrants are invited to provide details of any area in which they have particular experience and expertise that may be of special relevance to this EOI.

APPENDIX 5: EVALUATION SHEET

Evaluation will be based on the following criteria. Please tick each box if you can provide the service. Only tenderers that can satisfy all criteria will be considered. Items marked * can have up to one page of supporting documentation to demonstrate your ability/experience in these key areas.

1.	Member of AEPCA.	☐
2.	Able to carry out the detailed feasibility study of all sites in times nominated.	☐
3.	Ability to identify and implement comprehensive energy saving opportunities across both mechanical and electrical services.	☐
4.	Able to design, supply, install and project manage all energy efficiency projects.	☐*
5.	Will monitor energy savings from energy efficiency projects.	☐
6.	Will guarantee performance of all installed systems.	☐
7.	Can provide third-party financing if required.	
8.	Provide full commissioning and documentation of equipment.	☐
9.	Able to provide ongoing support, service and training.	☐*

In addition, registrants should include:

- if applicable, a one-page description of their approach to carrying out a performance contract when faced with implementation at distributed sites; and
- up to three pages outlining their specialities, particularly experience in energy management in sensitive environments and energy performance contracting.

These criteria are not necessarily in order of weight. The emphasis of the evaluation will be the firms that meet the needs of [company] and which have the background and experience to provide long-term service.

APPENDIX 6: TYPICAL EOI EVALUATION TABLE

Evaluation methodology for an EOI

The purpose of this document is to set out an evaluation method to pre-select three (or more) energy performance contractors for [company]. It is expected that a Request for Proposal for an energy performance contract (EPC) will be sent to each successful registrant. (This method is a subjective evaluation; each selection criteria should be identical to those described in the EOI document distributed to contractors.)

	Criteria	Max points	Actual points
	Complied with all items on the check list	Yes/No	
1	Performance contracting experience:		
	• stated capability to carry out an EPC;	5	
	• part of the team has implemented an EPC in Australia or overseas;	10	
	• carried out an EPC in Australia; and	5	
	• carried out an EPC in a group of facilities with similar issues to [company].	5	
		25	
2	Ability to carry out an EPC in:		
	• mechanical;	8	
	• electrical; and	10	
	• controls.	7	
		25	
3	Describes and shows ability to:		
	• identify projects;	5	
	• design solutions;	5	
	• procure required equipment;	5	
	• install energy efficiency projects; and	5	
	• project manage the whole job.	5	
		25	
4	Ability to provide:		
	• ongoing support;	5	
	• service; and	5	
	• training.	5	
		15	
5	Describes approach to carrying out an EPC in these facilities and shows an understanding of issues inherent with working on similar sites.	10	
	Total	100	

A minimum of three companies with the highest scores will have the opportunity to prepare a response to an RFP.

APPENDIX 7: CHECK LIST OF DFS REPORT DELIVERABLES

The following check list suggests some important issues to include in the DFS document issued to the Preferred Proponent.

Deliverables	Comments
A detailed description of the equipment and energy systems in place at the facility, their condition at the time of the DFS and their operating methods.	
The energy consumption, demand and space conditions at the facility.	
A description of the ECMs and improvements contemplated by the ESCO, the costs of the improvements, the projected Internal Rate of Return for the Customer and the impact of the contemplated improvements on the space conditions of the facilities.	
Description of the intended purpose of each modification proposed by the ESCO to the equipment or systems and/or to operating methods.	
A projection of changes in capacity of existing equipment due to modifications or improvements contemplated.	
An outline of training programs or instruction required for the Customer's facilities managers and operators and summary of the involvement of facilities managers and operators likely to be necessary to effect the improvements.	
Estimated figures projected as the annual energy savings, which will result from the modifications or improvements together with an indication of how these figures are calculated.	
A summary of the intended schedule for implementing modifications and improvements, including the timing and estimated duration of on-site work in respect of each distinct location or facility.	
An indication of altered or new operating or maintenance requirements which will apply due implementing improvements, and an estimate of the cost of upgrading or maintenance work the ESCO recommends be undertaken prior to or during the implementation of modifications/ improvements in order to maximise their effect.	
A full description of all new equipment to be installed to effect improvements; an estimate of the expected lifetime of any new equipment and the effect installation may have on the expected lifetime of existing equipment; a full description of the warranty and servicing arrangements which will apply to existing equipment and to new equipment installed.	
Establish an MVP for monitoring, verifying and for guaranteeing savings from the implementation of ECMs, which is mutually acceptable to both parties.	

APPENDIX 8: SAMPLE BASELINE ADJUSTMENT CHECK LIST

[name] school district

Critical factors that will influence ongoing savings (as compared to the baseline) to be advised to EPC contractor by the client.

Electrical

Extra (or less) electrical load

- lights
- heating
- fans
- operating equipment
- computers
- office equipment
- refrigeration
- canteen
- educational equipment
- computers
- home economics
- workshops
- metalwork
- woodwork etc.
- physics

Operating conditions

- number of students (say increase/decrease of over 10 per cent)
- number of student groups (i.e. number of groups for each grade)
- number of classes
- timetable
- night classes
- adult education
- community group usage
- sporting group usage
- weekend usage
- special nights (concerts, disco nights etc.)

External influences

- unseasonable weather
- summer/winter

Buildings

- extra buildings
- extra rooms
- consolidation of rooms
- change of use of rooms

Water

As above plus:

- additions or changes to school grounds
- higher concentration on quality of grasses on sports grounds
- additional toilet blocks
- additional drinking fountains and taps
- unreported water leaks

APPENDIX 9: DEFINITIONS EXTRACTED FROM STANDARD CONTRACT

In this agreement, unless the context requires otherwise:

Acceptance certificate means the certificate to be issued by the ESCO to the Customer upon completion of the installation of the ECMs, which itemises the completion of each task specified in a *works specification*.

Base energy rate/s means the energy rate/s set out in the detailed facility study (DFS), and in schedule 4, for each *energy source* used at the *premises* during the *baseline* period.

Baseline means the consumption over a twelve (12) month period (expressed in units such as kilowatt hours of electricity, megajoules of natural gas, pounds of steam and litres of oil) of each *energy source* used at the *premises*, as set out in the DFS, modified from time to time in accordance with clause 8.

Commencement date means the date specified in item 2 of schedule 1.

DFS fee means the fee payable by the Customer to the ESCO as set out in item 3 of schedule 1.

ECMs means the energy conservation measures specified in a *works specification*, the subject of an instruction under clause 2.2, or approval under clause 3.2, consisting of the installation of *equipment* and the development and implementation of *procedures*.

ECM purchase price means the fee charged by the Energy Services Company (ESCO) or the installation of the ECMs set out in item 4 of schedule 1 and in the *works specification*.

Energy savings means the reduction in *energy consumption* of each *energy source* used at the *premises* during the term of the performance guarantee. The reduction in *energy consumption* for each *energy source* during each *guarantee year* must be calculated as follows:

total *energy consumption* of that *energy source* during the *baseline* period less actual *energy consumption* of each *energy source* during that *guarantee year*.

Energy consumption means the consumption of an *energy source*.

Energy Source means electricity, natural gas propane, fuel oil, coal or water.

Equipment means all items of equipment specified in a *works specification*.

Guaranteed energy savings means the sum of the reduction in consumption of each *energy source* used at the *premises* during each *guarantee year* as specified in the DFS and a *works specification* over the entire *performance guarantee period*, or such sum as amended by the ESCO in accordance with clause 8 for each ECM.

Guarantee year means a period of one year beginning on the *performance guarantee commencement date* or on the anniversary of that date during the *performance guarantee period*.

Installation period means the period during which the ECMs are installed and commissioned by the ESCO at the *premises*.

Latent conditions are physical conditions on the *premises* or its near surroundings, including artificial things, but excluding weather conditions or physical conditions which are a consequence of weather conditions, which differ materially from the physical conditions that should reasonably have been anticipated by a competent ESCO at the time of the tender, and should have been disclosed by a physical inspection undertaken at that time, including:

- all information conveyed to the ESCO by the Customer, in writing, electronically or in verbal briefings, for the purpose of tendering; and
- all information relevant to the risks, contingencies and other circumstances having an effect on the tender and obtainable by the making of reasonable enquiries.

Maintenance services means, where clause 5.7 applies, those services to be provided by the ESCO (including provisions for emergency repairs) as set out in schedule 3.

Maintenance services fee means:

- the amount set out in item 7 of schedule 1; or
- an amount specified by the ESCO relating to the provision of *maintenance services* for additional ECMs.

Performance guarantee commencement date means the date/s on which the performance guarantee takes effect and the commencement date/s for providing *maintenance services*, where clause 5.7 applies either:

- the date of issue of the *acceptance certificate* referred to in clause 4.1; or
- any date during the *installation period* nominated by the ESCO in writing to the Customer, prior to commencement of installation of the ECMs, being a date on which a specific task identified in the installation timetable set out in the *works specification* is to be completed; or
- where there is to be a staged commencement of the performance guarantee, any series of dates during the *installation period* nominated by the ESCO in writing to the Customer, prior to commencement of installation of ECMs, being dates on which specific tasks identified in the installation timetable set out in the *works specification* are to be completed.

Performance guarantee period means the period of years set out in item 5 of schedule 1, commencing on the *performance guarantee commencement date*.

Premises mean real property occupied by the Customer including the existing equipment and systems in or on that property as set out in item 1(a) of schedule 1. Where more than one property is specified in item 1(a) of schedule 1, the terms and conditions of this agreement shall apply to each property jointly and severally.

Procedures means all systems and procedures to be implemented by the Customer at the *premises*, including energy efficient methods of operating *equipment* and other energy efficient operational procedures, as described in a *works specification*.

Project means the design, installation, implementation, operation and monitoring of the ECMs by the ESCO, in accordance with this agreement.

Statutory requirements means the laws relating to the ECMs, the *equipment*, the *premises*, or the work under the Contract (including without limitation the current Building Code of Australia, any relevant State or Territory Code of Practice for the construction industry, and any current relevant Australian standards), or the lawful requirements of any authority having jurisdiction over the ECMs, the *equipment*, the *premises* or the work under the Contract.

To specification means in accordance with the manufacturer's recommended maintenance procedures and the terms of any other operation or maintenance manuals or specifications provided by the ESCO to the Customer under clause 4.2(a).

Works specification means the scope of works submitted to the Customer by the ESCO for the design and installation of ECMs, which:

- sets out the tasks involved (and a timetable for completing them) in relation to the design and installation of the ECMs;
- specifies the *ECM purchase price*, broken down into a schedule of progress claims corresponding to the tasks relating to the installation of the ECMs;
- specifies the *works specification fee* for the additional ECMs;
- specifies the *guaranteed energy savings* for the ECMs, as identified in the DFS or pursuant to clause 3.1(a);
- includes any other information the ESCO considers necessary, including plans, specifications, engineering designs and drawings relating to the proposed facility upgrade;
- includes a listing and description of the *equipment* that needs to be upgraded or replaced;
- includes a detailed listing of all maintenance programs, training programs and schedules for the *equipment*; and
- includes a detailed list of criteria prepared by the Customer to control and define performance of the works by the ESCO, as specified in the Request for Proposals.

Works specification fee means the ESCO's fee for the preparation of a *works specification* for the installation of the ECMs, pursuant to clause 2 or additional ECMs pursuant to clause 3, provided that the fee shall be limited to 10 per cent of the project cost of any such additional ECMs.

APPENDIX 10: METHODOLOGY FOR ENERGY DATA VERIFICATION

The following is an extract from Table 3 in Section 3 of the International Performance Measurement and Verification Protocol (IPMVP). The IPMVP is online at http://www.ipmvp.org/info/download.html.

M&V option	How savings are calculated	Cost
Option A: Focuses on physical assessment of equipment changes to ensure the installation is to specification. Key performance factors (e.g. lighting wattage or chiller efficiency) are determined with spot or short-term measurements and operational factors (e.g. lighting operating hours or cooling ton-hours) are stipulated based on analysis of historical data or spot/short-term measurements. Performance factors and proper operation are measured or checked annually.	Engineering calculations using spot or short-term measurements, computer simulations, and/or historical data.	Dependent on no. of measurement points. Approx. 1 – 5% of project construction cost.
Option B: Savings are determined after project completion by short-term or continuous measurements taken throughout the term of the contract at the device or system level. Both performance and operations factors are monitored.	Engineering calculations using metered data.	Dependent on no. and type of systems measured and the term of analysis or metering. Typically 3 –10% of project construction cost.
Option C: After project completion, savings are determined at the 'whole-building' or facility level using current year and historical utility meter (gas or electricity) or sub-meter data.	Analysis of utility meter (or sub-meter) data using techniques from simple comparison to multivariate (hourly or monthly) regression analysis.	Dependent on no. and complexity of parameters in analysis. Typically 1 –10% of project construction cost.
Option D: Savings are determined through simulation of facility components and/or the whole facility. Calibrated energy simulation/modelling; calibrated with hourly or monthly utility billing data and/or end-use metering.	Calibrated energy simulation/modelling; calibrated with hourly or monthly utility billing data and/or end-use metering.	Dependent on no. and complexity of systems evaluated. Typically 3 –10% of project construction cost.

Specification of the IPMVP for projects

The proper use of the IPMVP and the specification of an M&V methodology require at least the following information to be specified:

- the document to be referenced (i.e. the IPMVP);
- which option and method from the document will be used (e.g. Option B with post-installation metering of operating hours);
- who will conduct the M&V;
- details of how calculations will be made;
- metering to be conducted including information on the equipment, calibration, location of measurements and metering period;
- key assumptions to be made about significant variables or unknowns;
- level of accuracy to be achieved, if not for the entire analysis, at least for key components;
- how quality assurance will be maintained and repeatability confirmed; and
- reports to be prepared, their contents and when they are to be provided.

APPENDIX 11: ENERGY EFFICIENCY BEST PRACTICE PROGRAM

Sectors

- vehicle fleet management
- beverage and containers
- manufacturing
- wine making
- bread baking and milling
- aluminium production
- diary processing
- hotel management

Cross-sectoral information and assistance

- motors systems
- energy management (monitoring and reporting, energy policy and financial reporting)

Tools and products available

- benchmarking databases and reports based on agreed key performance indicators
- best practice guidelines—sector-specific or generic
- staff training modules and workbooks—developed for operational staff and/or managers depending on industry demand
- sector-specific membership schemes
- workshops and seminars
- newsletters, articles and other publications
- energy efficient best practice web site (www.isr.gov.au/energybestpractice)
- motor systems selector software, case studies and other information (www.isr.gov.au/motors)

What EEBPP can offer

We work with companies on an industry sector basis so we can tailor our strategies—and provide practical tools—to meet your particular needs.

Where there are synergies, we deliver across sectors and focus on generic technologies and practices such as electric motor systems and Energy Performance Contracting.

- **Scoping studies**—as a starting point we conduct a scoping study to profile current energy use and likely energy efficiency gains in your sector. Implementation strategies are then developed in partnership with industry associations and participating companies.
- **Monitoring and benchmarking**—we can develop an ongoing benchmarking framework with your sector to measure and monitor your energy performance and practices over time. Ideally these can be integrated into your existing quality and energy and environmental management systems. You can use benchmarking to identify potential improvements in energy efficiency, to learn from others and to demonstrate company and industry performance against international best practice.
- **Best practice technologies and management systems**—we develop practical tools to help companies implement change, such as best practice guides, technology selector software, staff training modules and case studies.
- **Innovative solutions**—we can work with you to be at the cutting-edge of energy efficiency, especially when planning new facilities or installing new equipment. Through networking and focus groups, we work with companies who want to think outside the boundaries and adopt innovative energy solutions.

Benefits for your company

- increase productivity while reducing costs and your impact on the environment;
- increase shareholder value—improve your profits, image and performance;
- achieve attractive rates of return on your investment;
- minimise controllable costs—such as energy, waste, and equipment wear and tear;
- minimise peak load costs—understand and manage your peak/off peak energy profile;
- achieve process efficiency improvements right across the board;
- demonstrate the responsiveness of your industry sector and company to key environmental issues; and
- become an employer of choice.

Who EEBPP works with

We work with companies in industry sectors that are medium to large energy users. These industries want to build and maintain a competitive advantage but are also concerned about resource wastage and their impact on the environment. They recognise that improving their energy management practices can save energy and reduce costs. Typically, the companies in these sectors are learning organisations with potential to improve their energy performance: they are motivated to change and to deliver results.

The companies that participate in energy efficiency best practice agree to take action on energy. They trial and use the tools we deliver and provide valuable data and ideas to the program. They want to be leaders in their field.

For more information

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