

Department of Minerals and Energy, Pretoria

**Capacity Building in Energy  
Efficiency & Renewable Energy**

**Report No. 3.1 Agreements & Financing**

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## **Abbreviations and Acronyms**

<b>BEE</b>	Black Economic Empowerment
<b>CaBEERE</b>	Capacity Building in Energy Efficiency and Renewable Energy
<b>CB</b>	Capacity Building
<b>CEF</b>	Central Energy Fund
<b>DANIDA</b>	Danish International Development Assistance
<b>DDG</b>	Deputy Director-General
<b>DEAT</b>	Department of Environmental Affairs and Tourism
<b>DK</b>	Kingdom of Denmark
<b>DKK</b>	Danish Kroner
<b>DME</b>	Department of Minerals and Energy
<b>DPW</b>	Department of Public Works
<b>DTI</b>	Department of Trade and Industry
<b>EE</b>	Energy Efficiency
<b>EMO</b>	Energy Management Opportunity
<b>ESCO</b>	Energy Service Company
<b>ESETA</b>	Energy Sector Education Training Authority
<b>FIDIC</b>	Industrial Federation of Consulting Engineers
<b>IDC</b>	International Development Corporation of South Africa
<b>NT</b>	National Treasury
<b>NER</b>	National Energy Regulator
<b>NGO</b>	Non-Governmental Organisation
<b>PDI</b>	Previously Disadvantaged Individual
<b>PM</b>	Project Manager
<b>PQ</b>	Pre-Qualification
<b>PSC</b>	Project Steering Committee
<b>PTT</b>	Project Task Team
<b>QA</b>	Quality Assurance
<b>RE</b>	Renewable Energy
<b>RSA</b>	Republic of South Africa
<b>SA</b>	South Africa / South African
<b>SALGA</b>	South African Local Government Association
<b>SANGOCO</b>	South African Non-Governmental Organisations' Committee
<b>SARS</b>	South African Revenue Service
<b>SMME</b>	Small, Medium and Micro Enterprises
<b>SP</b>	Service Provider
<b>ST</b>	Short Term Adviser
<b>TA</b>	Technical Assistance
<b>TOR</b>	Terms of Reference
<b>VAT</b>	Value Added Tax
<b>ZAR</b>	South African Rand

## 1 Introduction

Energy efficiency reduces operating costs and frees up funds for capital improvements. It purchases textbooks, buys new medical equipment, hires new staff. It lowers costs for consumers, enables enhanced industrial competition, and has the potential to reduce energy-related pollution significantly.

Energy efficiency can very likely save more money more quickly than any other measures to reduce pollution. Even if you do not have money to invest, now more than ever, the opportunity to have a more efficient operation is great.

An entire industry designed to find the money hidden in your “warm water system”, to reduce the 25% of your utility cost that goes to lighting, and find the resources willing to invest in those improvements, is here to serve your needs.

The concept is simple. It is called energy performance contracting, a contract with payments based on performance. Historically, it has been based on guaranteed future energy savings. Performance contracting allows the customer to use future energy savings to upgrade facilities and cut operating costs now.

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

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. Another US\$750 million has been invested in private sector contracts 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 percent reduction in energy use and 18 percent reduction in greenhouse gas emissions. Energy performance contracts are now also being used in other countries around the world, including Japan and Thailand.

In Australia, there is a growing capacity to provide this service. The New South Wales Government 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.

The Department of Commerce and Treasury are also now actively supporting energy savings by means of Energy Performance Contracting by offering a grant of A\$ 20 million to the Government Departments.

In South Africa the Department of Public Works has taken the lead and awarded four Shared savings contracts for the regions: Western Cape, South Gauteng, Pretoria and Bloemfontein. The Western Cape and South Gauteng contracts have already resulted in energy cost savings of more than R40 million since 1998. However, this is a very small percentage of the total energy savings potential still remaining in South Africa's Government buildings (Other 8 DPW regions, buildings under provincial and local government).

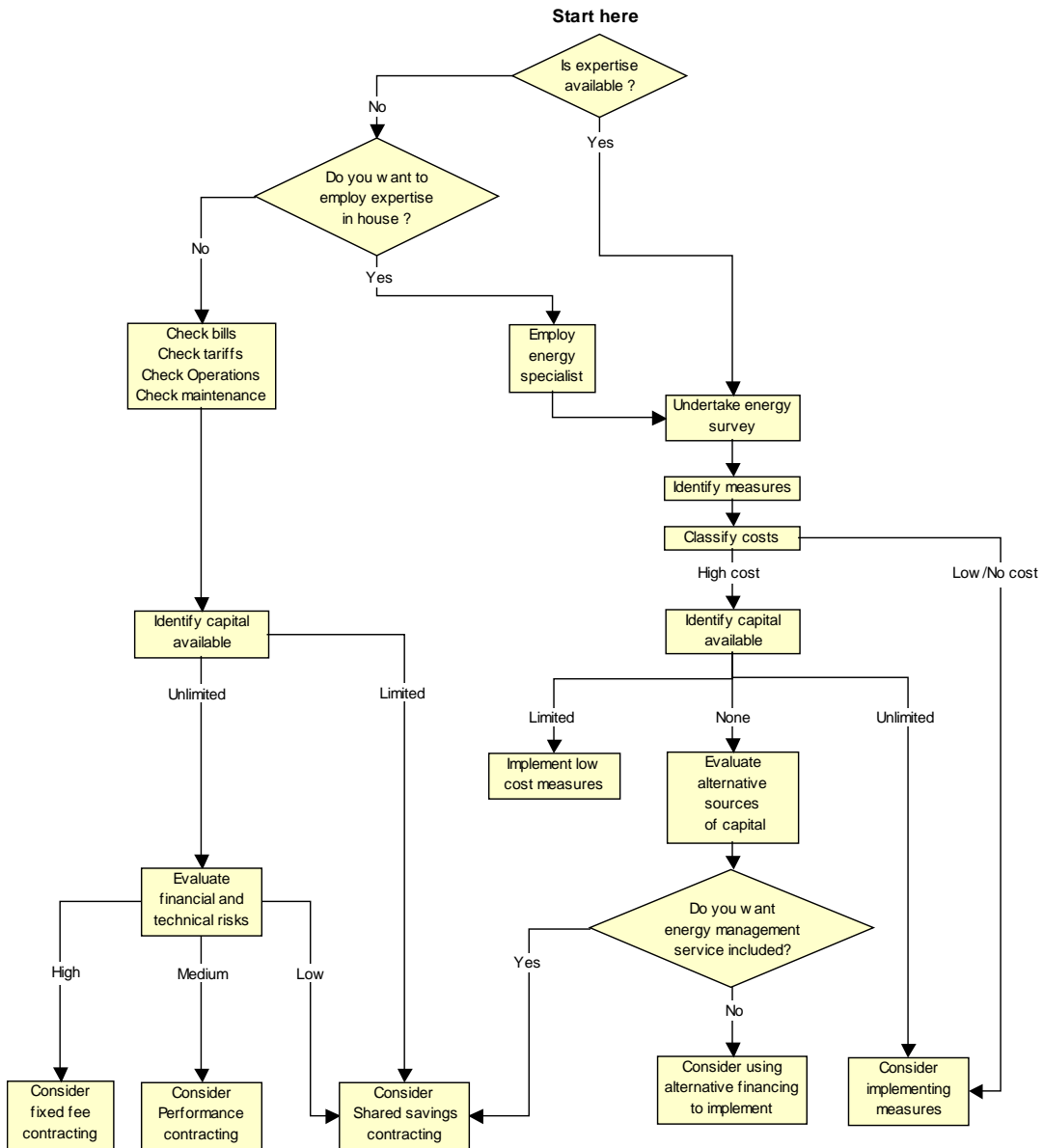
The total estimated energy cost savings potential in buildings under the control of the National Government in South Africa is approximately R 275 million per annum. This saving is based on the asset register of the National DPW and typical energy indices for similar building types in South Africa. The methodology and assumptions made to

calculate this saving are described in more detail in DME CaBEERE Volume 5: General Document.

This document describes several proposed energy contracting mechanisms to unleash the remaining energy savings potential still existing in the Government buildings of South Africa. The objective of this document is to assist the Government departments to engage in sustainable energy efficiency programmes.

## 2 Routes to Energy Efficiency

The following flow chart is a simplified decision tree outlining the process by which a route to energy efficiency may be chosen:



The sections that follow describe three energy contracting options, each with its respective risks and rewards, to achieve and sustain energy savings. Selecting one of these options depends mainly on the following:

- The amount of capital available.
- The level of expertise and resources available in house.
- The amount of financial risk the client is prepared to take.

### 3 Fixed Fee Contracting

#### 3.1 Principles

This conventional type of contracting is a high risk, great reward option designed to enable the client to evaluate the immediate, direct benefits of the contract scheme without the need for a complicated savings analysis. This method of energy contracting was commonly used during the 1970s and 1980s. The client decides on the level of service required and pays a single fixed fee based on the scope of work. The client in this document will be referred to as the party responsible for paying the energy and maintenance accounts of the respective facilities. The principles of the contract are summarised as follows:

- This conventional process to purchase energy efficiency improvements often requires four separate solicitation and contract awards.
- First the client solicits engineering services (consultant) for an energy study.
- After reviewing the complete study, the client selects the improvements to be implemented and solicits proposals for engineering design services.
- Once the designer completes the plan and specifications, the client issues one or more invitations to bid to selected contractors who will install the improvements.
- Finally, the client invites bids to request preventive maintenance services for any energy related equipment the facility is not maintaining with in-house staff.
- The facility owner is responsible for financing all four contracts and maintaining operation to ensure sustainable energy savings. All the financial and technical risks are therefore with the client.
- All the savings achieved as a result of the improvements are retained by the client.

A schematic layout of the scheme is displayed in Figure 1.

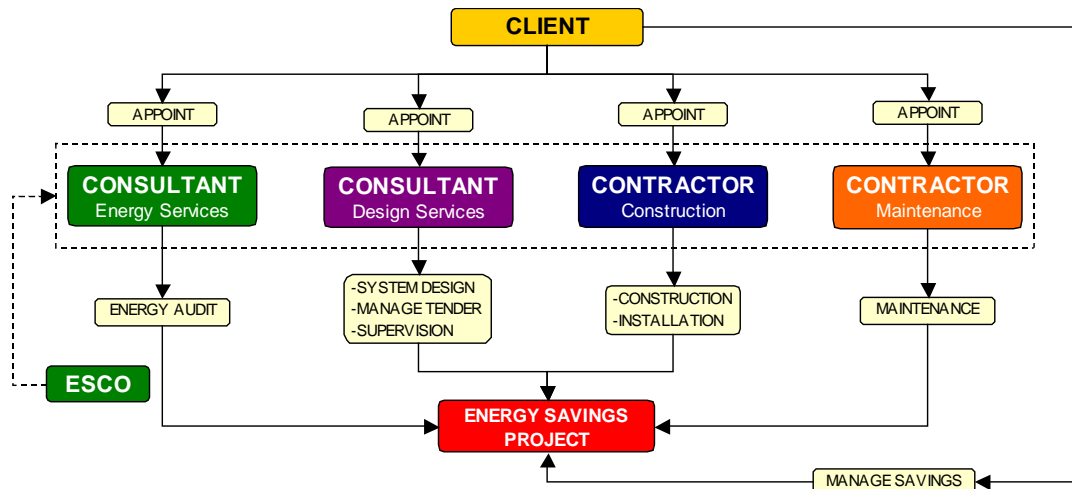


Figure 1: Fixed fee contracting responsibilities

##### 3.1.1 Client

- The client is defined as the Government department responsible for paying the energy bills of the facility. In the case of the South African Government the client is currently the regional DPWs and will be the Line Departments in the near future.

- The client will select and appoint an engineering consultant (rotated from a consultant roster) to perform a preliminary and detailed energy audit to quantify the potential for energy cost savings. The engineering consultant will be a professional engineer registered with ECSA or SAACE with experience in Energy Contracting.
- The client will select and appoint an engineering consultant (rotated from a consultant roster) to develop energy savings installation specifications and tender documentation. The engineering consultant will be a professional engineer registered with ECSA or SAACE with experience in design services.
- With the assistance of the consultant the client will appoint a qualified contractor through a thorough tender process, to construct and install the energy savings equipment. The contractor will be a registered company with expertise and experience in building system construction.
- The client will appoint a qualified maintenance contractor (tender process), if required, to maintain the energy savings equipment. The contractor will be a registered company with expertise and experience in building service maintenance.
- The client will be responsible for managing energy cost savings on a daily basis.

### 3.1.2 Energy Services

The appointed consultant will perform preliminary and detailed energy audits to quantify the potential for energy savings in the selected facilities. All viable options will be presented to the client for implementation.

### 3.1.3 Design Services

The consultant will design and draw up all required specifications to implement the approved energy savings strategies in the facilities. The consultant will further be responsible for construction supervision and quality assurance during the installation phase.

The consultant will assist the client in appointing the contractor and will manage the contractor throughout the installation phase.

### 3.1.4 Construction Services

The contractor appointed will install and construct, to specification, all the required systems to improve energy efficiency in the selected facilities. The contractor will guarantee the operation of the installed equipment for at least one year.

### 3.1.5 Maintenance Services

The maintenance contractor appointed, if required, will maintain all the installed energy savings equipment, as specified, for the duration of the contract term.

### 3.1.6 ESCO

Energy Service Companies have the expertise and infrastructure to supply all four services required to implement and sustain energy cost savings. The client can therefore deal with one party to achieve energy cost savings. The process will, however, still consist of four separate contracts.

## 3.2 Financing

A number of funding mechanisms will have to be in place to finance the four fixed fee contracts required to achieve and sustain energy cost savings. The proposed fixed fee

contracting funding mechanism to acquire energy efficiency in South Africa's Government buildings is displayed in Figure 2.

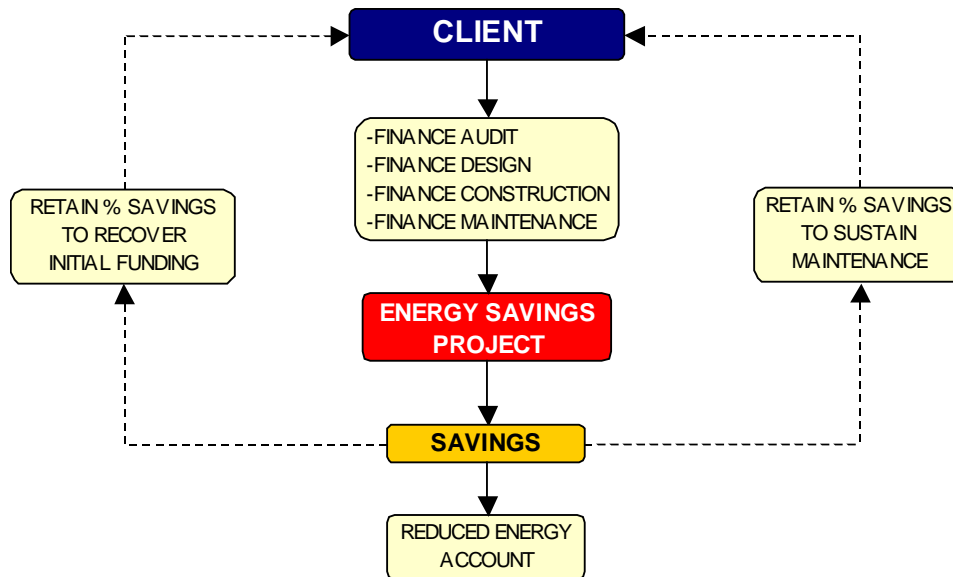


Figure 2: Fixed fee contracting funding mechanisms

### 3.2.1 Client

The Client will be responsible for financing all the project costs as well as the required maintenance costs to maintain the newly installed energy savings equipment. The client will retain a percentage of the savings achieved to recover the initial capital investment and maintenance costs required in the future. Surplus savings will result in reduced energy accounts in the future.

### 3.3 Agreements

Four agreements for this scheme will have to be negotiated and put into place before the installation of any energy savings measures. A schematic layout of the agreement structure is displayed in Figure 3.

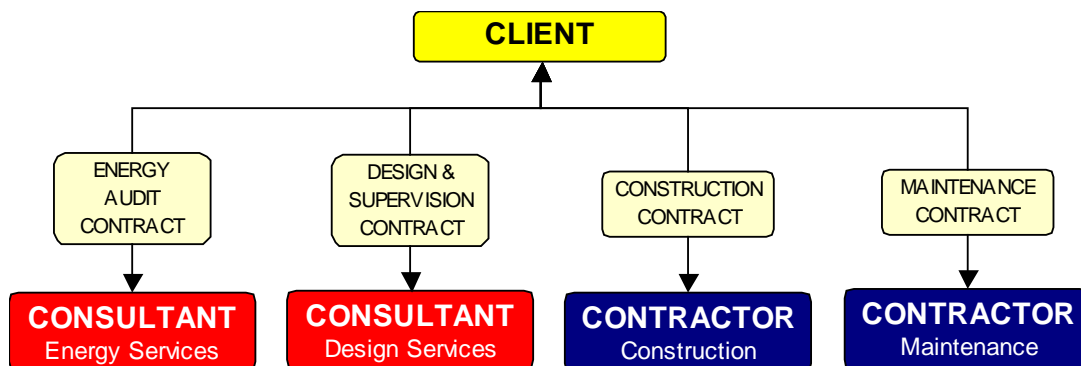


Figure 3: Fixed fee contracting agreements

### 3.3.1 Energy Audit Contract

The energy audit agreement between the client and the consultant will be based on the standard SAACE agreement principles as stipulated in the Form of Agreements of Consulting Services February 2002. The consultant will receive fixed payments for his services as specified in the contract. The consulting fees will be calculated as stipulated by SAACE ([www.saace.co.za](http://www.saace.co.za)).

### 3.3.2 Design and Supervision Contract

The design and supervision agreement between the client and consultant will be based on the standard SAACE agreement principles as stipulated in Form of Agreements of Consulting Services February 2002. The consultant will receive one fixed payment for his services as specified in the contract. The consulting fees will be calculated as stipulated by SAACE ([www.saace.co.za](http://www.saace.co.za)).

### 3.3.3 Construction Contract

The construction agreement and tender documentation will be based on the standards of the Joint Building Contracts Committee of South Africa as stipulated in the JBCC Contract Document Manual of 2000 ([www.jbcc.co.za](http://www.jbcc.co.za)). The contractor will be paid the fixed amount quoted to supply the service as specified in the tender contract.

### 3.3.4 Maintenance Contract

There will be a maintenance agreement between the client and the contractor that stipulates all the required maintenance procedures and schedules. The contractor will be paid a fixed agreed monthly fee or lump sum for maintenance supplied as stated in the contract.

## 3.4 Advantages

The main advantages of this contract scheme are as follows:

- There is a single, fixed payment for each contract depending on the level of services and the extent of work.
- All the energy savings achieved are retained by the client. This eliminates the need for complicated savings analyses.
- Contract lengths are generally shorter (one year) than performance contracts (7-10 years).

## 3.5 Disadvantages

The main disadvantages of this contract scheme are as follows:

- There is no incentive for the facility managers, consulting engineers and contractors to maximise the performance of the project.
- The client has to negotiate 4 contracts.
- The entire project is financed by the client.
- Energy savings are not guaranteed and are the responsibility of the client.
- Most of the time the energy savings are not measured and it is not possible to give savings figures.
- All the financial and technical risks are with the client.

### 3.6 Implementation Process

The implementation process of a typical fixed fee contracting scheme is displayed in Figure 4.

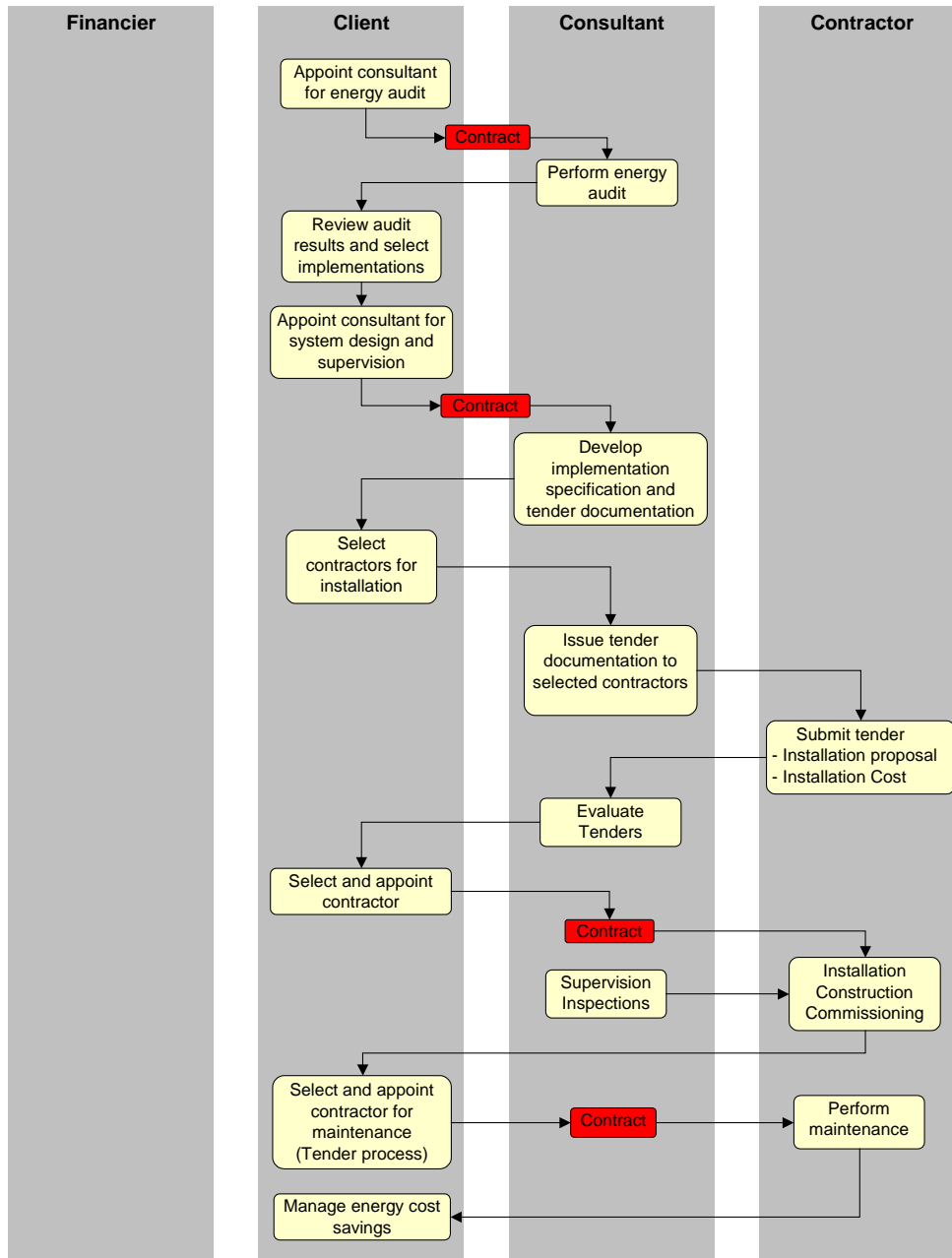


Figure 4: Fixed fee implementation process

## 4 Shared Savings Contracting

### 4.1 Principles

This performance type of contracting is a low risk, good reward option designed to enable the client to implement energy efficiency improvements with limited capital available. The savings achieved are shared between the ESCO and the client. The entire project is financed by the ESCO and the invested capital is recovered from the ESCO's portion of the savings resulting from the improvements. This method was popular during the 1990s in the Australian public and private building sectors. The principles of the contract are summarised as follows:

- Shared savings contracts replace the conventional collection of solicitations and contracts with a single proposal covering all aspects of the project and one contract with the selected proposer.
- The client/consultant prepares a Request for Qualifications (RFQ). The purpose of the RFQ is to select at least two Energy Service Companies (ESCOs) to prepare proposals for the provision of energy efficiency equipment and services to the client in response to a Request for Proposal (RFP).
- After receipt of a favourable proposal, the client directs the winning ESCO to develop a comprehensive energy study of energy efficiency opportunities at the facility. The proposal becomes the basis for the contract between the client and the ESCO. The contract specifically addresses compensation, liability, the accountability of services, and an estimation of savings at the facility.
- After receiving the notice to proceed, the ESCO furnishes, installs, and commissions the efficiency improvements and begins performing maintenance and repairs that continue for the duration of the contract term.
- The ESCO is responsible for financing the entire project, including maintenance, and maintaining operation to ensure sustainable energy savings. The ESCO acquires a share of the savings to recover all the provided capital (no savings, no payment). All the financial and technical risks are now shifted back to the ESCO.
- The client receives therefore a percentage of the savings without taking any financial or technical risks. Shared savings contracting is the perfect vehicle for any government with limited funds to reduce their energy bills and upgrade their facilities.

A schematic layout of the scheme is displayed in Figure 5.

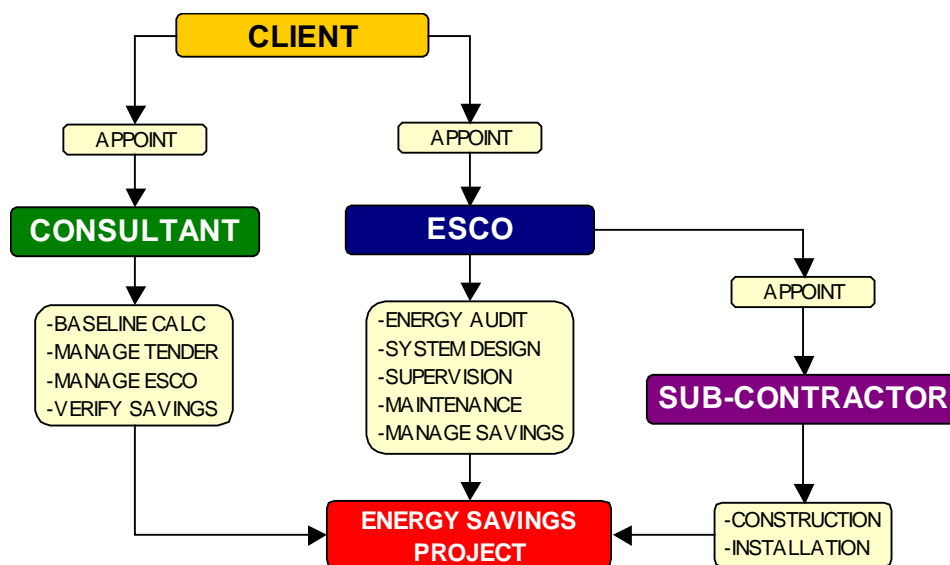


Figure 5: Shared savings contracting responsibilities

#### 4.1.1 Client

- The client is defined as the Government Department responsible for paying the energy bills of the facility. In the case of the South African Government the client is currently the regional DPWs and will be the Line Departments in the near future.
- The client will select and appoint an engineering consultant (rotated from a consultant roster) to manage the tender process, manage the appointed ESCO and verify the monthly savings. The engineering consultant will be a professional engineer registered with SAACE or ECSA with experience in Energy Service Contracting.
- With the assistance of the consultant, the client will select and appoint a qualified ESCO through a thorough tender process, to supply and manage energy efficiency in the selected facilities. The ESCO will be a registered company with expertise and experience in Energy Contracting.
- The Client will provide monthly energy accounts to the consultant and ESCO to calculate the savings achieved.

#### 4.1.2 Consultant

- The consultant will have the task to prepare all tender documentation, issue tender documentation, manage tender process and assist the client in appointing the ESCO.
- The consultant will obtain the energy accounts of all the selected facilities and calculate baselines for energy savings calculations. The baselines of each facility will be verified by the appointed ESCO and approved by the client.
- The consultant will verify the monthly energy savings (issue payment certificates) before any payments are made to the ESCO.
- The consultant will manage the ESCO throughout the duration of the contract through regular progress meetings and site inspections.
- The consultant will review all the proposed energy savings strategies and approve them before implementation.

#### 4.1.3 ESCO

- The ESCO appointed will perform preliminary and detailed audits to quantify the potential for energy savings in the selected facilities. All viable options will be presented to the client for implementation.
- The ESCO will design and draw up all required specifications to implement the approved energy savings strategies in the facilities. The ESCO will further be responsible for construction supervision and quality assurance during the installation phase.
- The ESCO will present all the energy savings strategies to the facility personnel prior to implementation.
- The ESCO will appoint and manage all sub contractors required to implement energy savings strategies.
- Maintenance and management of all the installed strategies will be the responsibility of the ESCO for the duration of the contract term.
- Every month the ESCO will invoice the client, including a comprehensible calculation of the achieved savings.

#### 4.1.4 Sub-Contractor

If the ESCO does not have the in-house ability to implement the strategies, registered sub-contractors will be appointed to install and construct the required systems to improve energy efficiency in the selected facilities. The sub-contractor will guarantee the operation of the installed equipment for at least one year.

## 4.2 Financing

Funding mechanisms will have to be in place to finance the two contracts required to achieve and sustain energy cost savings. The proposed shared savings contracting funding mechanisms to acquire energy efficiency in South Africa's Government buildings are displayed in Figure 6.

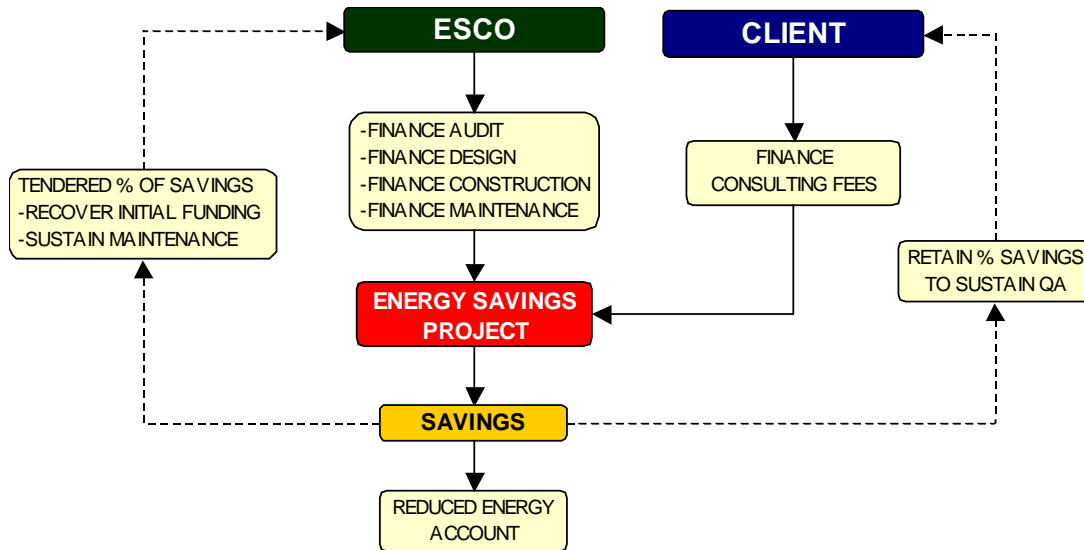


Figure 6: Shared savings contracting funding mechanisms

### 4.2.1 ESCO

The ESCO will be responsible for financing the energy audits, the development of implementation specifications, installation of equipment and maintenance for the duration of the contract term. The ESCO will recover the provided capital from their portion of the tendered savings resulting from energy efficiency improvements.

### 4.2.2 Client

The client will only be responsible for financing the consulting fees to initiate the project, Quality Assurance (tender process) and to verify the monthly savings. This small amount will be recovered from the client's share of the tendered savings split resulting from the energy efficiency improvements.

### 4.3 Agreements

Two agreements for this scheme will have to be negotiated and put into place before the installation of any energy savings measures. A schematic layout of the agreement structure is displayed in Figure 7.

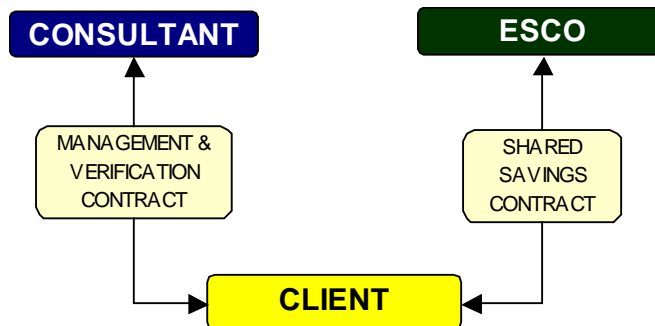


Figure 7: Shared savings contracting agreements

#### 4.3.1 Shared Savings Contract

The contract is based on the following main principles:

- The Client and ESCO share the savings achieved over the contract term. The ESCO will offer the client a savings split in the tender document.
- The contract award will be based on the combination of the savings split between the client and the ESCO, and a savings target offered by the ESCO.
- The ESCO will finance and provide all the services to realise the savings target for the duration of the contract term. The services will include energy audits, design, installation and maintenance of all energy savings equipment.
- Both parties will have the right to terminate the contract if the savings target is not achieved over time. This evaluation will occur at the end of each contract year.
- All the equipment installed will belong to the ESCO for the duration of the contract. The client will become the owner of the equipment after the completion of the contract term.

#### 4.3.2 Consultant Contract

The agreement between the client and consultant will be based on the standard SAACE agreement principles as stipulated in the Form of Agreements of Consulting Services February 2002. The consultant will be paid a fixed hourly fee for his/her services as stipulated by SAACE ([www.saace.co.za](http://www.saace.co.za)).

### 4.4 Advantages

The main advantages of this contract scheme are as follows:

- The entire project is financed by the ESCO.
- The ESCO receives a percentage of the savings as payment.
- The savings are the responsibility of the ESCO (no savings, no payment).
- Maintenance and operation of energy savings equipment are the responsibility of the ESCO.
- Both parties have the option to terminate the project if the savings target is not achieved.
- All the financial and technical risks are with the ESCO.

#### **4.5 Disadvantages**

The main disadvantages of this contract scheme are as follows:

- Monthly savings calculation and verification are required.
- The energy savings are not known in advance.
- The energy savings are not guaranteed.
- The client only receives a percentage of the savings for the duration of the contract term, even when the ESCO's costs are recovered.

## 4.6 Implementation Process

The implementation process of a typical shared savings contracting scheme is displayed in Figure 8.

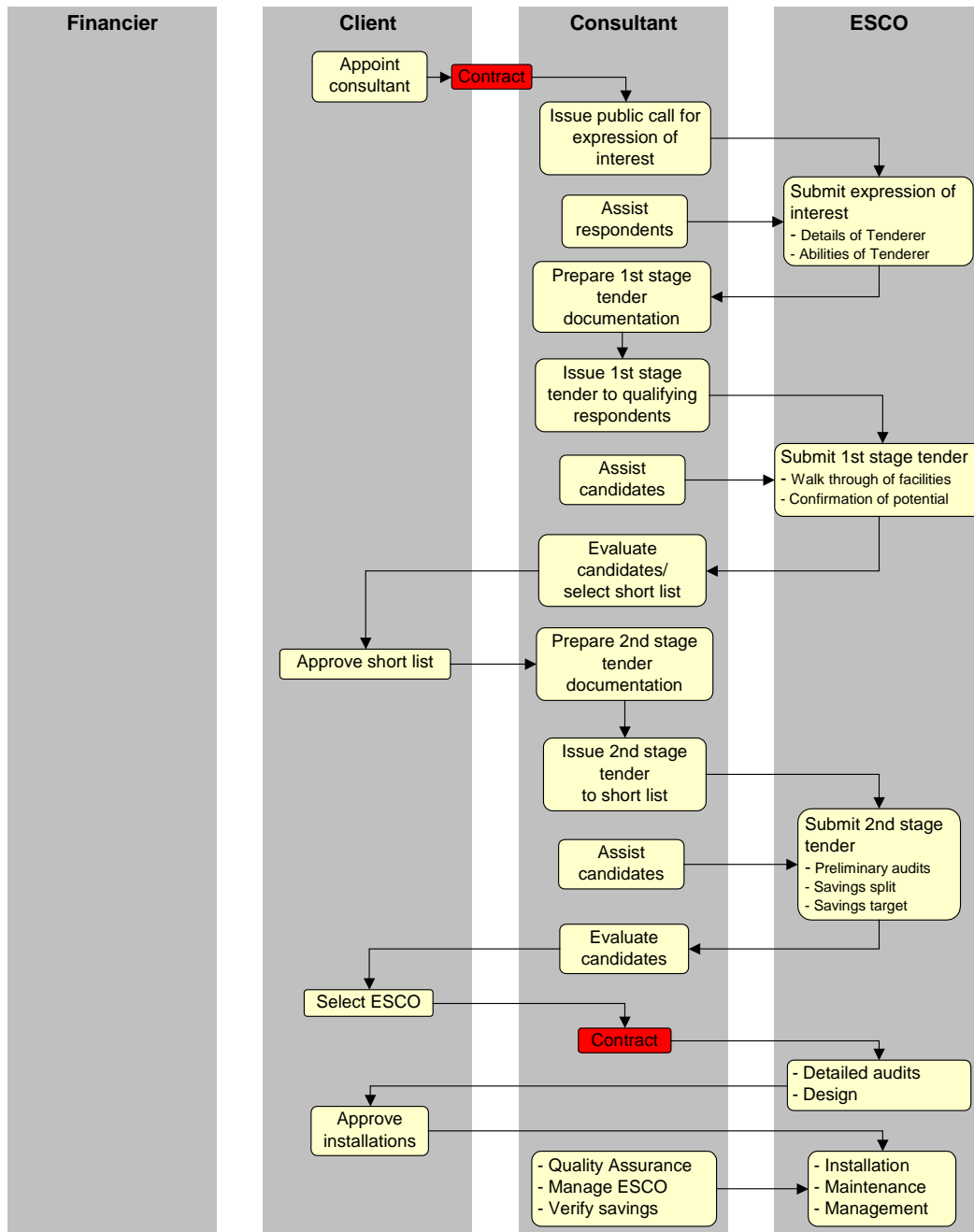


Figure 8: Shared savings implementation process

## 5 Performance Contracting

### 5.1 Principles

Performance contracting is a medium risk, good reward option where an 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. This scheme is based on fixed fee contracting with the addition of a savings guarantee. This method of contracting is currently very popular in the USA and Australia. The principles of the contract are summarised as follows:

- Energy performance contracts replace the conventional collection of solicitations and contracts with a single proposal covering all aspects of the project and two contracts with the selected proposer.
- The client invests all the capital to realise energy savings and retains 100% of the guaranteed savings.
- The client prepares a Request for Qualifications (RFQ). The purpose of the RFQ is to select a number of Energy Service Companies (ESCOs) to prepare proposals for the provision of energy efficiency equipment and services to the client in response to a Request for Proposal (RFP).
- After receipt of a favourable proposal, the client directs 2 or 3 ESCOs to develop a comprehensive energy study of energy efficiency opportunities at the facility. These proposals become the basis for the contract between the client and the ESCO. The contract specifically addresses compensation, liability, the accountability of services, and the ESCO guarantee of savings at the facility.
- After receiving the notice to proceed, the ESCO furnishes, installs, and commissions the efficiency improvements and begins performing maintenance and repairs that continue for the duration of the contract term.
- The ESCO is responsible for maintaining operation to ensure sustainable energy savings. The contractor will pay in the difference if the guaranteed savings are not obtained for the duration of the contract term. All the financial and technical risks are therefore with the ESCO.

A schematic layout of the scheme is displayed in the Figure 9.

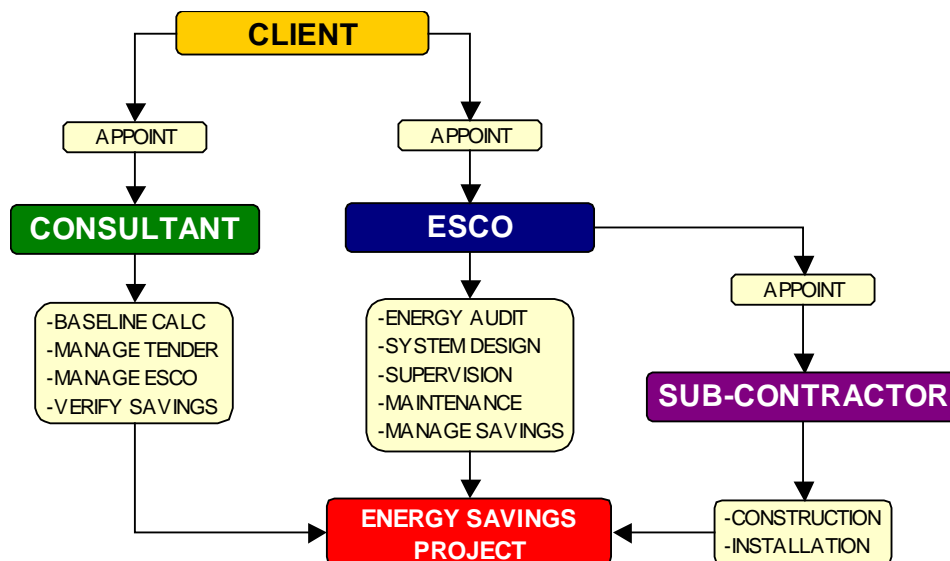


Figure 9: Performance contracting responsibilities

#### 5.1.1 Client

- The client is defined as the Government Department responsible for paying the energy bills of the facility. In the case of the South African Government the client is currently the regional DPWs and will be the Line Departments in the near future.
- The client (Government Departments) will select and appoint an engineering consultant (rotated from a consultant roster) to manage the tender process, manage the appointed ESCO and verify the monthly savings. The engineering consultant will be a professional engineer registered with SAACE or ECSA with experience in Energy Service Contracting.
- With the assistance of the consultant, the client will select and appoint a qualified ESCO through a thorough tender process to supply and manage energy efficiency in the selected facilities. The ESCO will be a registered company with expertise and experience in Energy Contracting.
- The Client will provide monthly energy accounts to the consultant and ESCO for calculating the savings achieved.

#### 5.1.2 Consultant

- The consultant will have the task to prepare all tender documentation, issue tender documentation, manage tender process and assist the client in appointing the ESCO.
- The consultant will obtain the energy accounts of all the selected facilities and calculate baselines for energy savings calculations. The baselines of each facility will be verified and accepted by the appointed ESCO.
- The consultant will verify the yearly energy savings and invoice the ESCO if the savings guarantee is not achieved (ESCO pays in the difference between savings guarantee and actual savings on an annual basis).
- The consultant will manage the ESCO throughout the duration of the energy performance contract through regular progress meetings and site inspections.
- The consultant will review all the proposed energy savings strategies and approve them before implementation.

#### 5.1.3 ESCO

- The ESCO appointed will perform preliminary and detailed audits to quantify the potential for energy savings in the selected facilities. All viable options will be presented to the client for implementation.
- The ESCO will design and draw up all required specifications to implement the approved energy savings strategies in the facilities. The ESCO will further be responsible for construction supervision and quality assurance during the installation phase.
- The ESCO will present all the energy savings strategies to the facility personnel prior to implementation.
- The ESCO will appoint and manage all sub contractors required to implement energy savings strategies.
- Maintenance and management of all the installed strategies will be the responsibility of the ESCO for the duration of the contract term.

#### 5.1.4 Sub-Contractor

If the ESCO does not have the in-house ability to implement the strategies, registered sub-contractors will be appointed to install and construct the required systems to improve energy efficiency in the selected facilities. The sub-contractor will guarantee the operation of the installed equipment for at least one year.

## 5.2 Financing

Funding mechanisms will have to be in place to finance the two contracts required to achieve and sustain energy cost savings. The proposed performance contracting funding mechanisms to acquire energy efficiency in South Africa's Government buildings are displayed in Figure 10.

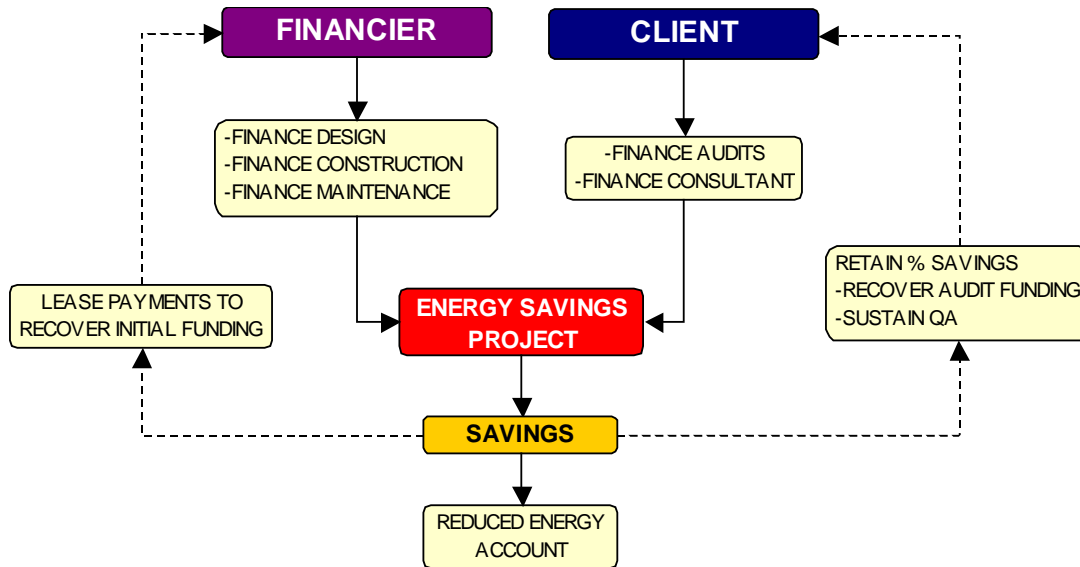


Figure 10: Performance contracting funding mechanisms

### 5.2.1 Financier

- The financier will recover the capital (fixed lease payments over a certain agreed period) from the savings achieved. One of the major advantages of performance contracting due to the savings guarantee is the number of financing options available. The financier can be any of the following parties:
- *Client*: The most cost effective means to finance performance contracting projects will be through the client, since there will be no interest rates involved. However, this can only be done if adequate funding is available.
- *National Treasury*: Treasury could establish a National Energy Efficiency Fund for Government buildings to finance energy efficient upgrades at a zero percent interest rate. Treasury will then actively support energy efficiency by offering a grant to the government departments to develop specifications, implement strategies and maintain the equipment to ensure sustainable energy savings.
- *ESKOM DSM*: They provide 100% funding for load shifting projects and 50% funding for energy efficiency projects. DSM funding could therefore be utilised to fund government performance contracts if the projects meet the DSM criteria.
- *ESCO/Financial institution*: Due to high interest rates this means of funding will be the most expensive. It should only be utilised if none of the above is available.

### 5.2.2 Client

The client will only be responsible for financing the project management fees, savings verification fees (consulting fees) and the fixed detailed audit costs. This small amount will be recovered from the guaranteed savings resulting from the energy efficiency improvements.

### 5.3 Agreements

Four agreements for this scheme will have to be negotiated and put into place before the installation of any measures. A schematic layout of the agreement structure is displayed in Figure 11.

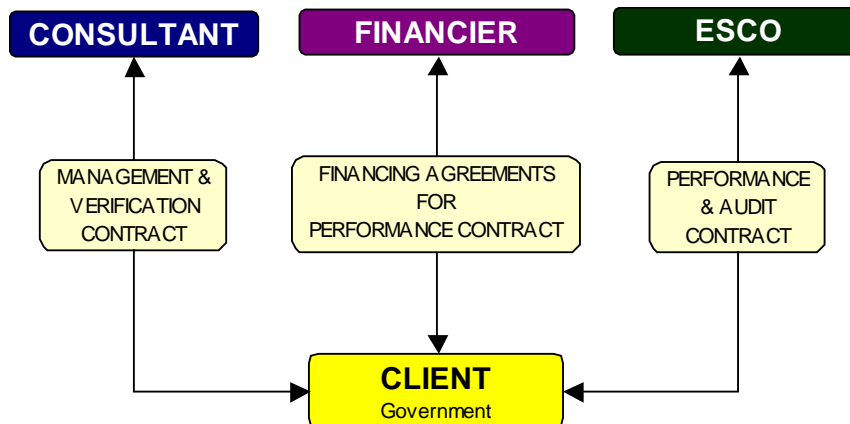


Figure 11: Performance contracting agreements

#### 5.3.1 Financing Agreement: Performance contract

The client will apply for funds from the financier to finance the performance contract of the selected ESCO. The award will be based on the proposed strategies, project costs and the savings guarantee of the ESCO. A lease agreement with fixed monthly payments will be negotiated between financier and the client. The loan term will be based on the savings guarantee of the ESCO. These loan payments will be made from the client's utility budget.

#### 5.3.2 Audit and Performance Contract

These contracts are based on the following main principles:

- The detailed audit contact award will be based on the contents of the ESCO's proposal and a quotation to perform a detailed audit.
- The ESCO will receive a fixed amount for the detailed audit as submitted in the tender proposal.
- The ESCO will provide all the services required to obtain the guaranteed savings as stated in the performance contract for the duration of the contract term. The services will include design, installation and maintenance of all energy savings equipment.
- The ESCO will receive a fixed amount for design, implementation and maintenance as stipulated in the performance contract.
- The ESCO will pay in the difference if the guaranteed savings are not obtained for the duration of the contract term.
- The additional savings (savings exceeding the guaranteed savings) achieved will go to the client.

#### 5.3.3 Management and Verification Contract

The management and verification agreement between the parties will be based on the standard SAACE agreement principles as stipulated in the Form of Agreements of Consulting Services February 2002. The consultant will receive monthly fixed payments for his services as specified in the contract. The consultant will be paid a fixed hourly fee as stipulated by SAACE ([www.saace.co.za](http://www.saace.co.za)).

#### **5.4 Advantages**

The main advantages of this contract scheme are as follows:

- The savings are guaranteed by the ESCO and are therefore known in advance.
- The client retains all the achieved savings.
- Maintenance and operation of energy savings equipment is the responsibility of the ESCO.
- All the financial and technical risks are with the ESCO.
- There are a number of financing options available due to the savings guarantee of the ESCO.

#### **5.5 Disadvantages**

The main disadvantages of this contract scheme are as follows:

- Monthly savings calculation and verification are required.
- The ESCOs will cover themselves by offering a low savings guarantee to minimise their financial risks.

## 5.6 Implementation Process

The implementation process of a typical performance contracting scheme is displayed in the Figure 12.

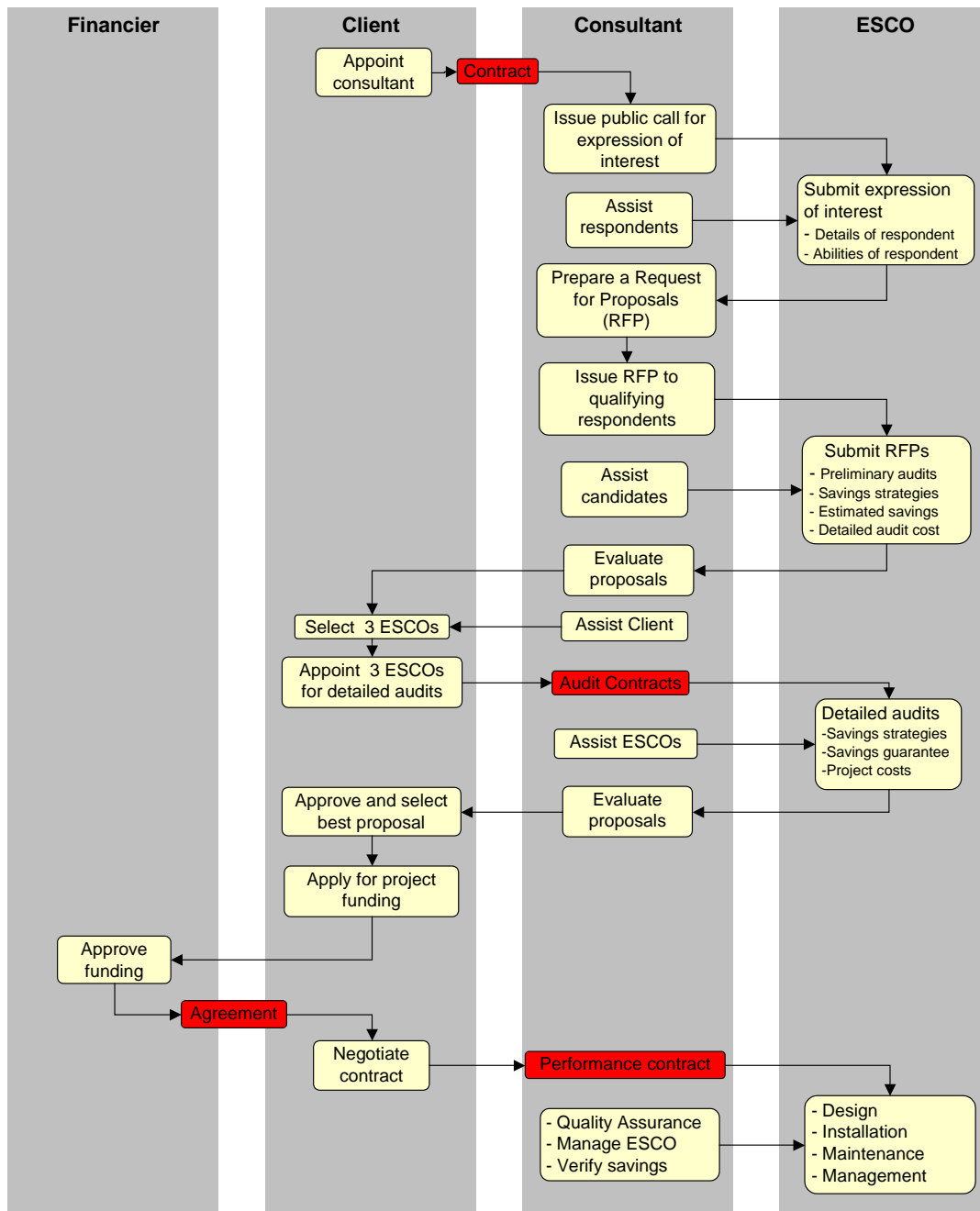


Figure 12: Performance contracting implementation process

## 6 Financial Analysis

This section analyses the financial estimates for the three energy service schemes of a typical theoretical case study. The following assumptions were made during the analysis:

Description	Assumption
Contract period	10 years
Savings per year	25%
Simple payback period	2 years
Yearly maintenance cost	2% of energy cost
Loan rate	14%
Inflation rate	7%

Table 1: Case study assumptions

### 6.1 Fixed fee contracting

Figure 13 displays the energy cost savings of a typical fixed fee contract based on the assumptions made in the Table 1. This option, if managed and maintained properly by the client, will result in total savings of 247% of the current cost over the 10-year period. This is a 349% return on the client's investment.

Fixed fee contracting is therefore a very attractive investment option with high rewards if the required funding is available and the improvements are maintained properly over a long period of time. It is however important to remember there is no savings guarantee and to actually achieve any savings is the responsibility of the client.

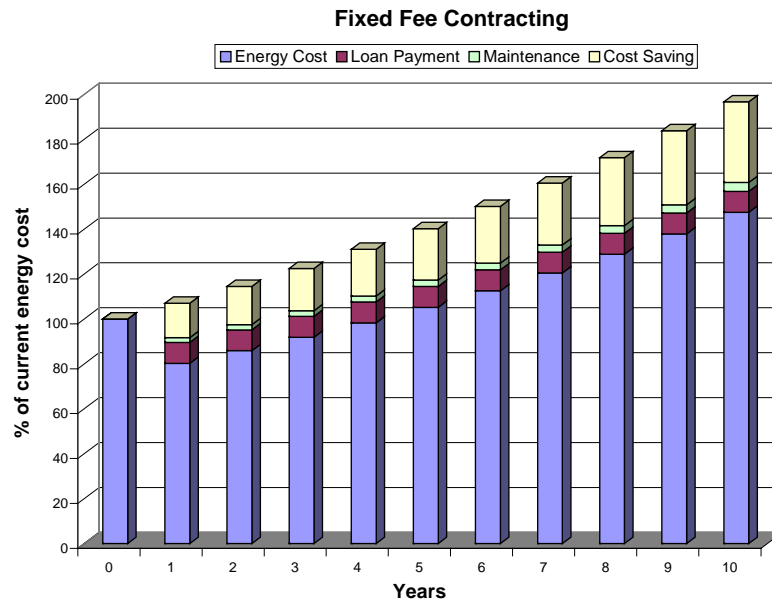


Figure 13: Fixed fee contracting cost savings

### 6.2 Shared savings contracting

Figure 14 displays the energy cost savings of a typical shared savings contract based on the assumptions made in the Table 1 and a 50/50 savings split between the client and the ESCO. This option, if managed and maintained properly by the ESCO, will result in total savings for the client of 185% of the current cost over the 10-year period. This saving is 25% less compared to the fixed fee option over the contract term of 10 years.

However, one must remember that this income was generated without any financial risk. Shared savings contracting is a very attractive option if limited funding is available and the client is not prepared to engage in a high risk investment.

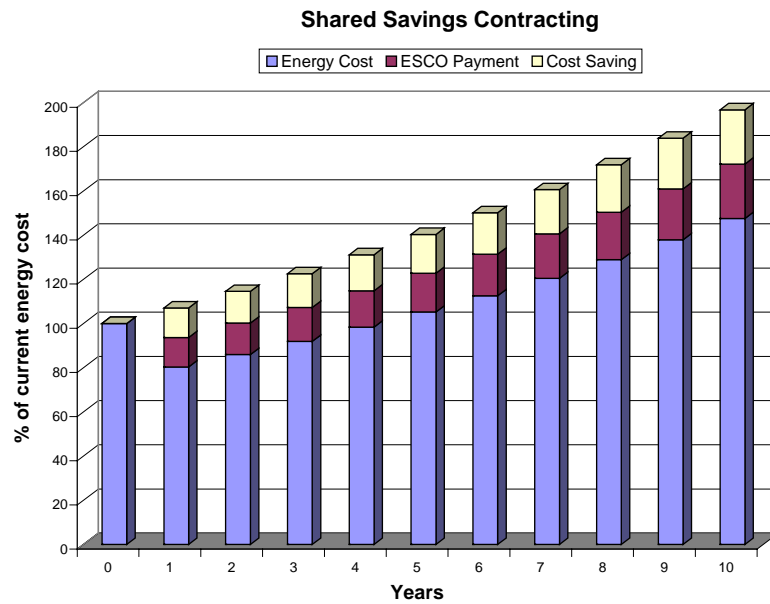


Figure 14: Shared savings contracting cost savings

### 6.3 Performance contracting

Figure 15 displays the energy cost savings of a typical performance contract based on the assumptions made in Table 1, a guarantee of 80% on the total savings. This option, if managed and maintained successfully by the ESCO, will result in total savings of 173% of the current cost over the 10-year period. This saving is 30% less compared to the fixed fee option over the contract term of 10 years.

This scheme results in a 246% return on the client's investment. Although this return is smaller compared to the fixed fee option, it remains very attractive since the return is guaranteed by the ESCO.

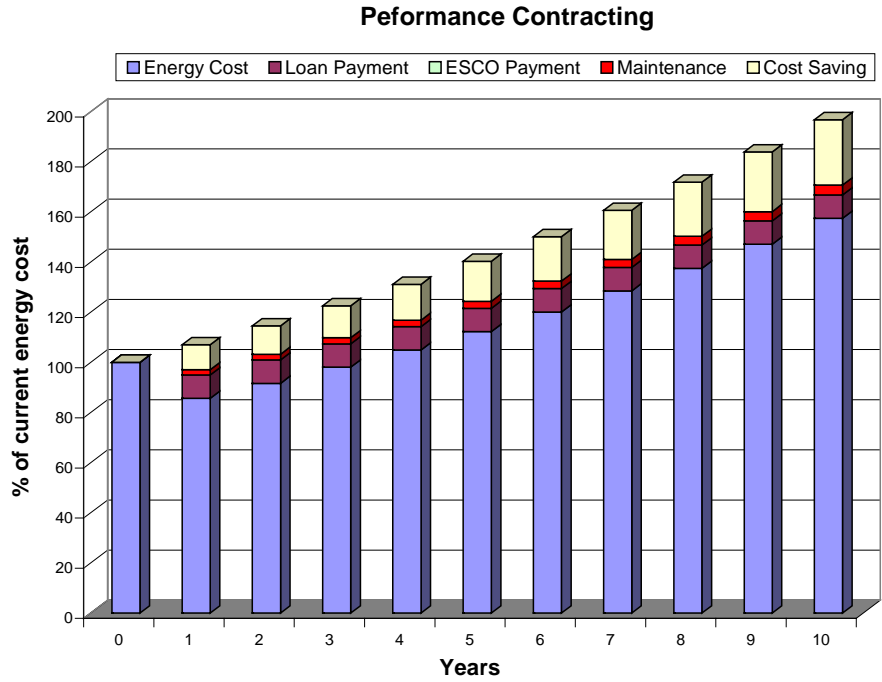


Figure 15: Performance contracting cost savings

#### 6.4 Savings comparison

Figure 16 below displays the theoretical cost savings for the client of the three contract schemes over the 10-year contract term.

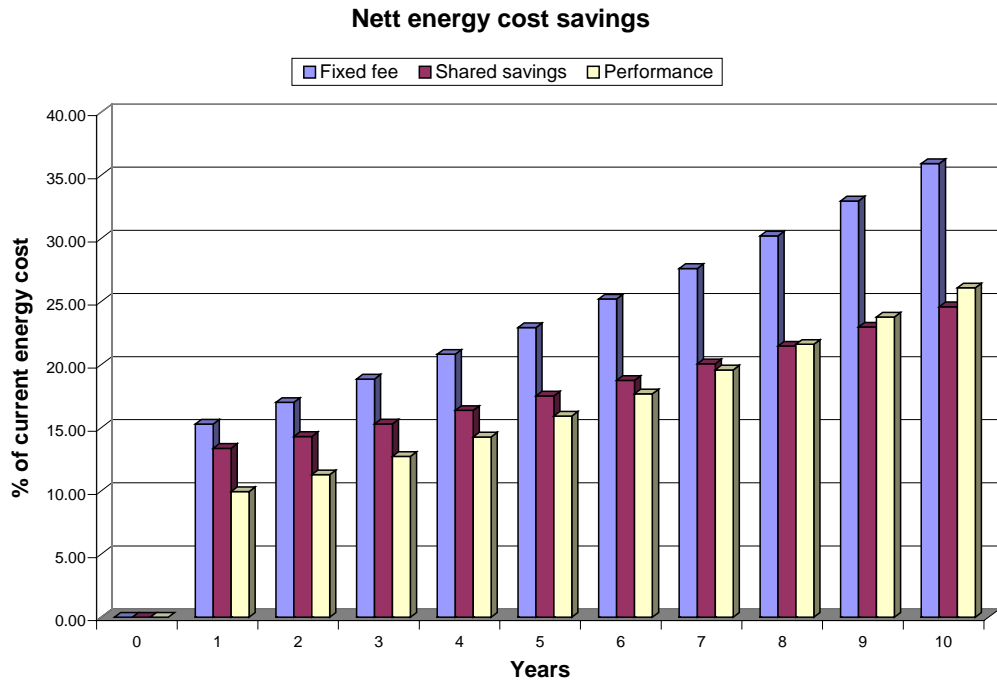


Figure 16: Cost savings comparison

Figure 17 displays the speed advantages of a well-managed EPC, the potential for greater savings, and the driver for continuous improvements and more incremental savings. Insufficient maintenance and management can result in a decrease of savings and even negative savings over time.

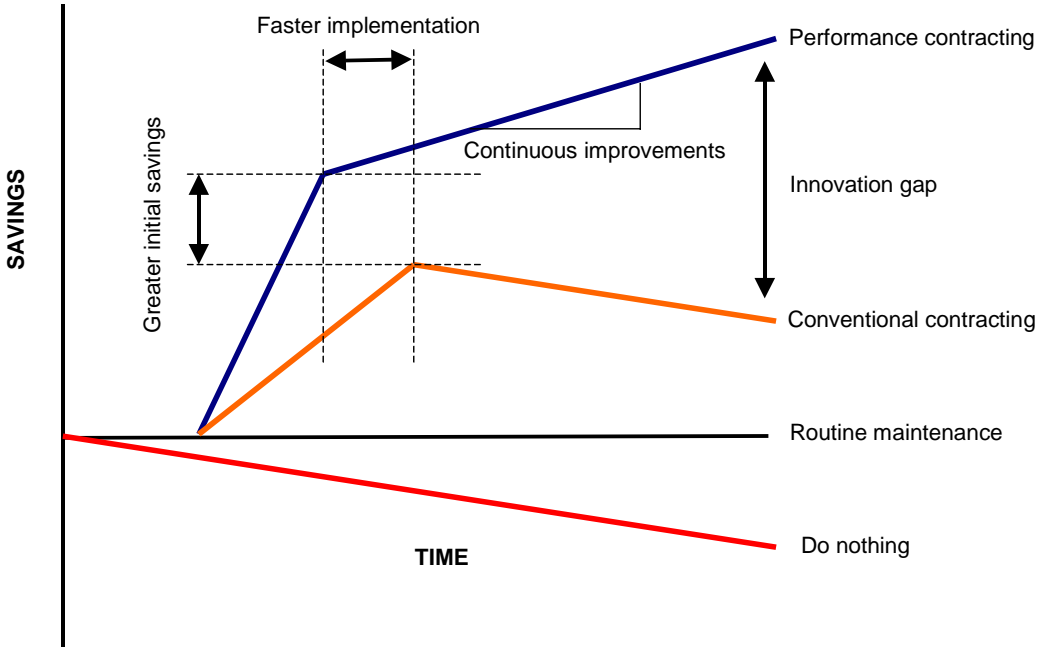


Figure 17: Actual cost savings comparison

## 7 Risk Analysis

Figure 18 displays the financial risk profiles of the client for the three energy contracting schemes. Where the client finances the project, the financial risk profile increases exponentially as more and larger payments are made to the completion of construction.

The fixed fee and performance contracting risk profiles peak after the completion of construction and commissioning, after the final large payments were made. The fixed fee contract will peak much higher since there is no guarantee that the investment will be recovered from the savings.

The risk profile for the performance contract will decrease much faster than the fixed fee contract due to the savings guarantee. Even if there are no immediate savings after commissioning, the ESCO will pay in the difference to maintain the loan payments.

The shared savings contract risk profile is very flat, since the ESCO finances the total project at own risk. The linear increase during the first three phases is due to the hourly consultant fees financed by the client, the only financial risk of the client. These costs will be recovered very fast during the operation phase of the project. The risk profile for the ESCO during shared savings and performance contracting will be the same as the client's fixed fee profile displayed in Figure 18.

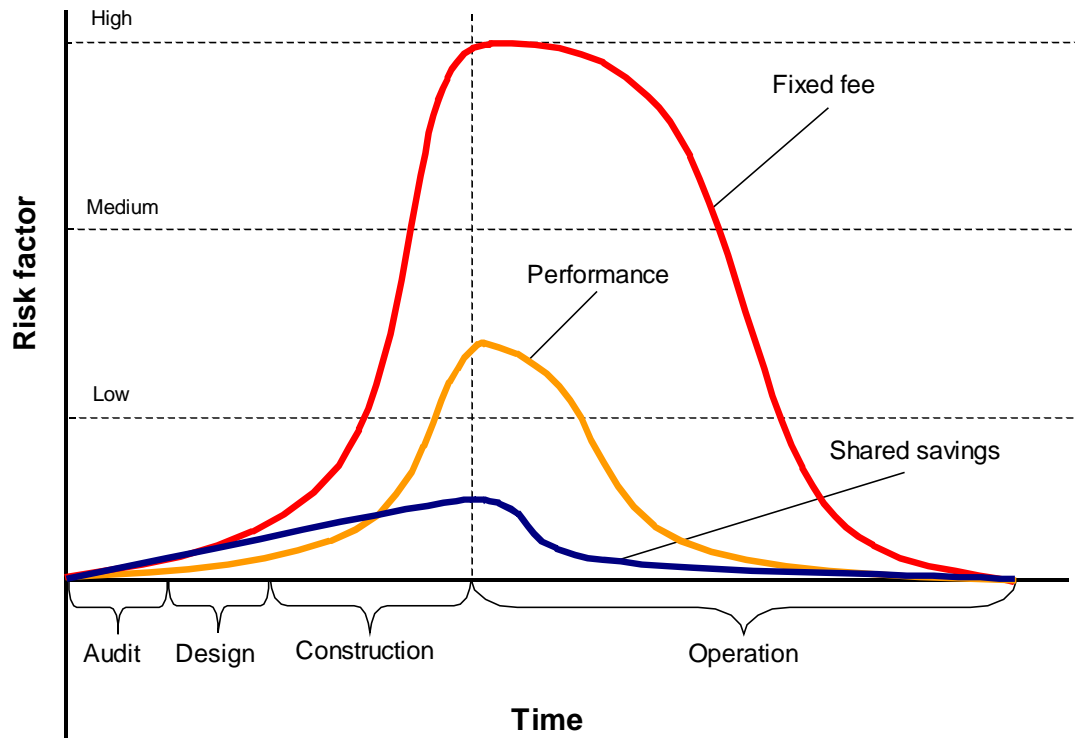


Figure 18: Financial risk analysis

## 8 Summary of Contracts

The three typical energy service contracting schemes discussed in the document are summarised in the Table 2.

<b>Description</b>	<b>Fixed Fee</b>	<b>Shared Saving</b>	<b>Performance</b>
<b>Contracts</b>	4 contracts	2 contracts	3 contracts
<b>Contract period</b>	1 year	7 –10 years	5- 7 years
<b>Complexity</b>	Low	Medium	High
<b>Financing</b>	Client	ESCO	Client/ESCO/Third party
<b>Savings</b>	Responsibility of client	Responsibility of ESCO	Guaranteed by ESCO
<b>Reward</b>	100% of savings (no savings guarantee)	Tendered % of savings (no savings guarantee)	100% of savings (savings guarantee)
<b>Return</b>	Excellent	Good	Good
<b>Risks</b>	High	Very low	Low

*Table 2: Summary of contracts*

## **9 Conclusions**

Performance contracting is recommended for the Government to upgrade ageing and inefficient assets while recovering capital required for the upgrades directly from the guaranteed energy savings achieved by the ESCO. The ESCO takes the technical and financial risks and guarantees the savings over the contract term.

All risks involved are shifted from the Government back to the ESCO. The Government has therefore basically nothing to lose when engaging in performance contracting. This form of contracting will be an excellent vehicle for the Government if initial capital is available to finance the energy savings implementations. A number of financing options are, however, available for performance contracting due to the savings guarantee.