Greener Government Buildings (GGB) is a Victorian Government program designed to improve the energy and water efficiency of existing Government buildings and infrastructure. The result will be a more efficient public asset portfolio that can be operated at lower cost, with a reduced impact on the environment.

<Project Name>

Project Plan



GGB improves the sustainability of Government finances by implementing sound investments in energy and water efficiency, such as upgrades to lighting, heating, ventilation and air-conditioning systems and the installation of building automation, rainwater harvesting, co-generation (or tri-generation) and solar photo-voltaic (PV) systems.

The program also supports Victoria’s energy efficiency industry, which means more jobs for Victorians, with Victoria fast becoming a hub for Energy Service Companies (ESCOs) and a centre of excellence for the delivery of energy efficiency projects.

Project approval

|  |  |  |  |
| --- | --- | --- | --- |
| Project Role | Sign Off | Signature | Date |
|  | Name: |  |  |
| Title: |
|  | Name: |  |  |
| Title: |
|  | Name: |  |  |
| Title: |

Table of Contents

[1 Project Brief 4](#_Toc339620601)

[1.1 Background 4](#_Toc339620602)

[1.2 Project Definition 5](#_Toc339620603)

[1.2.1 Project objectives 5](#_Toc339620604)

[1.2.2 Scope Inclusions 5](#_Toc339620605)

[1.2.3 Scope Exclusions 5](#_Toc339620606)

[1.2.4 Assumptions 5](#_Toc339620607)

[1.2.5 Constraints 5](#_Toc339620608)

[1.2.6 Dependencies and related activities 5](#_Toc339620609)

[1.3 Project Funding 5](#_Toc339620610)

[1.4 The Panel 6](#_Toc339620611)

[1.5 Standard Templates 6](#_Toc339620612)

[1.6 Project Facilitation Service 6](#_Toc339620613)

[2 Project Governance 8](#_Toc339620614)

[2.1 Overview of roles 8](#_Toc339620615)

[3 Business Case 9](#_Toc339620616)

[3.1 Expected benefits 9](#_Toc339620617)

[3.2 Expected costs 9](#_Toc339620618)

[3.3 Risks 9](#_Toc339620619)

[4 Project Approach 10](#_Toc339620620)

[4.1 Determine Scope 11](#_Toc339620621)

[4.1.1 Minimum requirements 11](#_Toc339620622)

[4.1.2 Site selection 11](#_Toc339620623)

[4.1.3 Project solutions 11](#_Toc339620624)

[4.2 Expressions of Interest (EOI) 12](#_Toc339620625)

[4.2.1 Invitation 12](#_Toc339620626)

[4.2.2 Responses 12](#_Toc339620627)

[4.3 Request for Proposal (RFP) 12](#_Toc339620628)

[4.3.1 Tender evaluation 13](#_Toc339620629)

[4.3.2 Evaluation criteria 13](#_Toc339620630)

[4.4 Detailed Facility Study (DFS) Agreement 14](#_Toc339620631)

[4.5 Detailed Facility Study (DFS) 14](#_Toc339620632)

[4.6 Seek Funding Approval 15](#_Toc339620633)

[4.7 Energy Performance Contract (EPC) 15](#_Toc339620634)

[4.8 Installation 16](#_Toc339620635)

[4.9 Measurement & Verification (M&V) 16](#_Toc339620636)

[4.9.1 Measurement and Verification Plan 17](#_Toc339620637)

[4.9.2 Collaboration in M&V 17](#_Toc339620638)

[4.9.3 M&V options 18](#_Toc339620639)

[4.9.4 Baseline adjustment 18](#_Toc339620640)

[4.9.5 Frequency of M&V 18](#_Toc339620641)

[4.9.6 Savings guarantee 18](#_Toc339620642)

[5 Project Delivery plan 18](#_Toc339620643)

[6 Quality Plan 19](#_Toc339620644)

[7 Stakeholder Analysis and Communication Plan 19](#_Toc339620645)

[7.1 Communication objectives 19](#_Toc339620646)

[7.2 Key Stakeholders 20](#_Toc339620647)

[7.3 Mediums 21](#_Toc339620648)

[7.4 Activity Plan 22](#_Toc339620649)

[8 Risk Log 23](#_Toc339620650)

[9 Appendix A – Glossary of Terms 24](#_Toc339620651)

[10 Appendix B – Measurement & Verification 25](#_Toc339620652)

# Project Brief

## Background

Greener Government Buildings (GGB) is a program administered by the Department of Treasury and Finance (DTF) which aims to reduce Government’s environmental impact and operational costs by improving the energy and water efficiency of existing government buildings.

Under the GGB program, a methodology known as Energy Performance Contracting (EPC) is used to procure and implement energy efficiency projects. Departments are required to meet targets for their participation as agreed by the Government.

Funding is available for GGB projects in the form of a loan, which is required to be repaid using the savings achieved by the project. The EPC process involves a savings guarantee from the service provider, whereby the customer is reimbursed annually for any shortfall. As such, GGB projects provide a low risk method of implementing and funding projects, minimising impact on department and agency cashflows.

DTF provides facilitation support to departments and agencies in the scoping, procurement, implementation and contract management of these projects. A panel of pre-qualified service providers for EPC services simplifies procurement and standard templates and documentation are available to streamline the process.

## Project Definition

### Project objectives

Implement EPC project(s) at the sites specified in section 1.2.2 to identify, install, measure and verify all available energy and water efficiency opportunities that fall within an average simple payback period of five years.

### Scope Inclusions

[In this section, include a brief overview of the buildings/facilities to be included in the overall project scope]

[Where the project is to be tendered using a sample of sites please include details here. Eg. The overall scope includes 25 sites, however the Request for Proposal stage will be tendered based on a sample of 8 sites that are considered representative of the overall scope. The objective of using a sample of sites for the RFP is to fast-track the tender stage and be more acceptable to the market]

### Scope Exclusions

[In this section, list exclusions (e.g. buildings, parts of the building or certain systems) and provide the rationale.]

### Assumptions

[State any assumptions that the Project Board should be aware of. E.g. Buildings to be excluded due to potential inclusion in other major projects]

### Constraints

[List any constraints (e.g. time, expenditure, resources, technology) within which the project must operate.]

### Dependencies and related activities

[Detail any other projects or Divisions or Groups that this project will impact upon or be impacted by.]

## Project Funding

A fundamental element of the EPC process is that the savings are contractually guaranteed by the energy services company. If savings in any year fails to meet the guaranteed savings, the energy services company is required to reimburse the department or agency undertaking the project to the degree of the shortfall.

EPC projects under the Greener Government Buildings (GGB) program may therefore be funded using **a temporary repayable advance** from DTF.

Advance funding applications for EPC projects may be granted by DTF to departments directly or to departments on behalf on behalf of a public body within their portfolio on the condition that the loan is repaid over a five year period following practical completion of the project.

The savings delivered by the EPC project (i.e. reduced energy and water expenditure and maintenance cost savings) are realised by the department or agency undertaking the project and can be used to repay the loan. This process effectively renders EPC projects self-funding, and minimises impacts on department or agency cash flow.

## The Panel

Through a public Expression of Interest process and comprehensive assessment of submissions, DTF has established a panel of pre-qualified Energy Services Companies (ESCOs) for the GGB program. Members of the panel have demonstrated required competencies, and in most cases have previous experience, in delivering EPC projects.

The intention of the panel is to build a streamlined tender process and reduce the administrative burden for each Victorian government EPC (or equivalent) project. Departments and agencies wishing to engage in an EPC project are able to tender selectively from the panel for a Request for Proposal (RFP), bypassing the Expression of Interest process.

Based on the ongoing performance of panel members and changes in industry, the panel may be updated with additional or removal of suppliers by DTF as required.

Access to information on members of the panel may be obtained from GGB facilitators within DTF, and online at [www.procurement.vic.gov.au](http://www.procurement.vic.gov.au).

## Standard Templates

To assist in the tender process, a template for the RFP document is available for use in the select tender for an EPC project.

In addition, use of standard templates for the Detailed Facility Study (DFS) agreement and EPC has been agreed between the Victorian government and all members of the Panel (see Section 1.4).

The template RFP document, and the standard DFS and EPC contracts may be obtained from GGB facilitators within DTF, and online at www.procurement.vic.gov.au.

## Project Facilitation Service

As part of the GGB, all departments and agencies will be supported by a central facilitation service from DTF for all EPC or equivalent projects. GGB facilitators will be available to assist with the following:

* access to standard tender documentation and contracts;
* scoping of potential options for tendering of projects;
* advice and support in the management of tender processes;
* advice and support in determining appropriate funding requirements;
* advice and support in the implementation of projects;
* access to specialist technical and legal advice if required;
* access to specialist monitoring and verification advice if required; and
* coordination of program results and case studies.

# Project Governance

|  |
| --- |
| **Delegated Approver** |
| e.g. CEO, Board, Minister |

|  |  |  |
| --- | --- | --- |
| **Project Control Board** | | |
| **Project Sponsor** | **Departmental Representative** | **Other Representative  (e.g. facilities, operations, environment)** |
|  |  |  |

|  |
| --- |
| **Project Manager** |
|  |

|  |
| --- |
| **DTF Facilitator** |
| Sam Burke, Peter Phan |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Project Management Team** | | | | |
| **Project Manager** | **Facilities Rep 1** | **Facilities Rep 2** | **Finance Rep** | **DTF Facilitator** |
|  |  |  |  |  |

## Overview of roles

The **Delegated Approver** should be a senior member of the organisation who either has delegation to sign the final EPC contract and authorise application for funding based on the estimated project implementation costs (see section ).

# Business Case

## Expected benefits

The scale of the project will be determined through the RFP and DFS stages of the projects (refer to section 4 for further details) and will be dependent upon the degree of energy and water savings identified by the service provider that are possible within an average simple payback period of five years.

Guaranteed savings delivered by the project will be used to repay the funding over a period of five years. Should there be any shortfall in savings delivered by the project (i.e. actual savings are less than the guaranteed savings), the service provider will be contractually obliged to refund this amount.

Any savings achieved in excess of the guaranteed savings (i.e. actual savings are greater than the guaranteed savings), the surplus savings may either be retained, or used to supplement the agreed temporary advance repayment schedule (i.e. enabling the advance to be repaid over a shorter period).

Savings delivered by the project after the loan has been repaid will be retained and may be reallocated towards other agency priorities.

## Expected costs

Due to the structure of an EPC project, the actual projects costs will not be known until audits have been undertaken as part of the Request for Proposal (RFP) tender and subsequent detailed facility study (DFS) stages of the EPC project.

It is expected however, that the project may require investment costs in the range of $x million to $y million. These estimates are based on the potential to save 30 percent on current annual utility costs within a payback period of five years, a rule of thumb which is consistent with other projects implemented under the GGB program in recent years.

Eventual costs will depend largely on the range and complexity of solutions identified by the energy services company. Project costs therefore cannot be accurately determined prior to completion of the DFS.

Indicative project costs will be determined through the RFP audit (to a specified level of accuracy) and final project costs established following the DFS (refer to Section 4 for further details on the EPC process).

Under GGB, it is recommended that a project be limited only by the savings achievable within a five year payback period. As such, there is no specific restriction upon project costs on the condition that the payback period is compliant.

## Risks

Refer to Section 8 for the full Risk Log.

# Project Approach

The following section provides a detailed guide on how to implement EPC projects under GGB. For further detail regarding the program, please contact a GGB facilitator at DTF.

Further recommended technical and EPC specific reference material released by the Energy Efficiency Council includes:

* Best Practice Guide to EPC (refer to [www.eec.org.au](http://www.eec.org.au))
* Best Practice Guide to M&V (refer to [www.eec.org.au](http://www.eec.org.au))

The standard EPC process is illustrated below:

**1. Determine Scope**

**3. Request for Proposal (RFP)**

**4. Detailed Facility Study (DFS) Agreement**

**5. Detailed Facility Study**

**6. Seek Funding**

**7. Energy Performance Contract**

**2. Expressions of Interest (EOI)**

**8. Installation**

**9. Measurement & Verification (M&V)**

## Determine Scope

### Minimum requirements

EPC projects should aim to maximise energy and water savings within an average simple payback period of five years for all existing buildings or infrastructure where agencies directly pay the utility bills.

### Site selection

The EPC process is suitable for single facilities with high energy consumption levels (e.g. greater than 1 GWh of electricity consumption per annum). Alternatively, smaller facilities may be grouped together to achieve a sufficiently large scale to be of interest to EPC service providers.

When scoping the EPC project, it is often simplest to include all areas and systems within the buildings (i.e. all opportunities that can be found within the building). There may be certain scenarios however, where exclusions are appropriate. For example, at sites that agencies deem to have a practical life of less than five years (e.g. a leased facility with five years remaining, or a building planned for demolition), it may be acceptable to either define a shorter maximum payback period when tendering (e.g. to payback within the lease term remaining), or defer the implementation of works at this site until there is a greater opportunity (e.g. the lease renewed for a longer period, or the tenant moves to a new building).

### Project solutions

As part of an EPC project, ESCOs are responsible for identifying, designing, validating, installing, commissioning and guaranteeing the performance of all technologies implemented. As such, there is no requirement on the agency to perform audits and design solutions of their own as part of the EPC project.

ESCOs will propose an overall solution set with a blended payback period that average five years, that is, the EPC may include measures with individual payback periods of 12 years, and others with three years, as long as the overall project payback period is five years or less it will be deemed compliant. This methodology can increase the project scope by enabling the inclusion of solutions that may otherwise fall outside the required payback period, such as cogeneration and renewable technologies.

While the ESCO will be responsible for identifying all energy and water efficiency solutions that comply with an average five year simple payback, the agency is advised to be aware of the following systems/initiatives that often fall within the project scope:

* lighting and lighting control systems;
* heating, ventilation and air-conditioning systems;
* building automation systems;
* water saving opportunities;
* power factor correction opportunities; and
* demand-side response opportunities, giving agencies the capability to respond to price signals during periods of peak demand in the National Electricity Market.

## Expressions of Interest (EOI)

At this stage, a document or invitation which details the scope and opportunities for the EPC will be distributed to a panel of ESCOs. These ESCOs have been pre-qualified by DTF and have demonstrated the required competencies, and in most cases, previous experience in delivering EPC projects. Access to information on members of the panel may be obtained from GGB facilitators within DTF, or online at:

[www.procurement.vic.gov.au/CA2575BA0001417C/pages/energy-performance-contracting](http://www.procurement.vic.gov.au/CA2575BA0001417C/pages/energy-performance-contracting)

### Invitation

The invitation should detail the sites to be retrofitted within the EPC project scope and include:

* location and size of sites
* associated utility consumptions
* relevant existing infrastructure
* an indicative timeline for the project

This is to ensure that the invited ESCOs will have sufficient knowledge of the scope before committing to a tender.

### Responses

Upon reviewing the information provided, the ESCO will determine whether they will respond with an EOI based on their skills, capacity and willingness to commit. These EOIs should be no more than two pages and address three key criterion:

* Willingness to participate
* Previous experience in providing energy efficient services at similar facilities
* Suitability in the project outlined

The ESCO at this stage may also provide feedback or alterations to the scope to match their specific needs. These alterations may remove some constraints such as capacity or timeframe issues, and allow the ESCO to participate in the tender. However, is it up to the agency to decide whether they would like to alter their scope to allow inclusion of said ESCO.

The agency will then review the EOIs received and select the best three ESCOs to proceed to the next stage.

## Request for Proposal (RFP)

During the RFP stage, an RFP document will need to be prepared by the agency describing how the tender will be conducted and assessed. A standard RFP document is available from DTF for use as a template.

Service providers will be required to prepare a document which details the proposed energy solutions, including costs and savings estimates. This process will involve the ESCOs to competitively audit the buildings to identify energy and water conservation measures to the standard of a level two energy audit (AS/NZS3598:2000) that are understood to be approximations to ±20 per cent accuracy.

The number of sites audited at the RFP stage will depend on the size of the overall portfolio of buildings considered in the EPC. For large or complex projects involving multiple or geographically distant facilities, it is often beneficial to simplify this step and limit the RFP to a reduced scale, with the understanding that the full scope of opportunity be reinstated at the next step (the DFS). In these instances it will be important for the customer to select a sample that is closely representative of the project in it’s entirety (e.g. if the greater project involves two types of facilities such as hospitals and office buildings, at least one of each type of these buildings should be included in the RFP stage).

### Tender evaluation

Agencies should look to proposals that **maximise the scope of annual greenhouse gas and water savings within an average five year simple payback period**.

This principle aims to ensure greater environmental benefits from the EPC project, and greater financial savings delivered to the agency.

To maximise savings, agencies should ensure that tenderers offering lower payback periods are not given advantage over tenderers with longer (but still compliant) payback periods. To illustrate, please consider the following scenario:

*Example Scenario:*

Responding to a tender specifying a five year payback period, the following responses are received:

* Tenderer A proposes a project costing $5 million, with guaranteed annual savings of $1 million, 30 per cent energy saving, and five year overall project payback; and
* tenderer B proposes a project costing $2 million, with guaranteed annual savings of $600 000, 20 per cent energy saving, and 3.3 year overall project payback.

Despite Tenderer A having a higher payback period than Tenderer B (five years compared to 3.3), Tenderer A’s proposal should be selected due to having greater annual savings and greenhouse gas reductions.

### Evaluation criteria

While tender evaluation criteria may be determined and weighted by each agency, it is recommended that criteria and weightings reflect the intent of the GGB program. That is, weightings should emphasise:

* reduction of greenhouse gas emissions; and
* reduction in water consumption.

Value for money in a GGB project is controlled by the requirement of a five year simple payback period and the financial guarantees from the EPC process. When assessing the financial returns of the project, the required maximum five year payback period should be used as a hurdle rate, with which the tenderer is either compliant or non-compliant.

Other evaluation criteria should include those that target the quality of delivery, service, and performance of installations, such as:

* compliance with specifications and proposed contracts;
* DFS offering;
* operations, maintenance and training offering;
* methodology; and
* expertise in electrical, mechanical, water and other technical disciplines.

## Detailed Facility Study (DFS) Agreement

After assessing the submitted RFPs, the preferred service provider will be notified of their success, and a DFS agreement is negotiated. The DFS agreement is essentially an agreement that the ESCO will perform a DFS, which will include proposals to:

* identify energy (and related) cost saving measures;
* define the scope of work to be undertaken;
* identify the costs, to investment grade level, for the implementation of the scope;
* identify performance levels (including estimated savings levels) and guarantees by the ESCO; and
* identify Measurement & Verification methods to ensure savings are demonstrated over the life of the project.

An important aspect of the DFS is to establish the conditions of the project to ensure flexibility as well as scope.

## Detailed Facility Study (DFS)

Once the DFS agreement has been signed, the service provider will perform the DFS – essentially an audit of the customer’s facilities equivalent to a Level three energy audit under AS/NZS3598:2000.

The general purpose of a DFS is to give the customer an indication of the possible extent of savings that may be achieved in an EPC, and what level of savings the EPC service provider is prepared to guarantee. In order to achieve the maximum benefit from a DFS, the customer is encouraged to work collaboratively to build a long term partnership with the EPC service provider, providing any reasonable information where required and ensuring that this is accurate.

It is important for the DFS and each subsequent phase of the project that the EPC service provider is afforded reasonable access to the facilities. What constitutes reasonable access will be determined by the nature of each organisation, and should be established in advance to satisfy the requirements of both parties.

Careful consideration should be afforded to each of the proposed works as outlined by the EPC service provider, ensuring that they pass a ‘fit for purpose’ test for the requirements of each site. For example, while light fittings installed with timer controls may guarantee an amount of annual savings, it may be appropriate only for a site that has constant occupancy times (i.e. a library), and is not fit for the purposes of a site where occupancy varies (i.e. an operating theatre).

When the DFS is concluded, the customer can assess the recommendations, negotiate any changes, and decide whether to implement the proposed works. It should be noted that the ±20 per cent allowable margin of error for the RFP submission does not apply to the DFS submission, which has no allowed error. The stipulated costs and benefits from the DFS form the basis for a performance guarantee from the EPC service provider.

The EPC service provider will on completion of the DFS be entitled to fair payment for conducting the DFS. The conditions of payment to the ESCO depend on whether the criteria of the study are met. If the DFS adequately meets the pre-determined criteria, then:

1. if the decision is to implement the works, the DFS fee may be rolled into the overall project cost and included as part of the Energy Performance Contract; and
2. if the decision is to not implement the works, the ESCO will be paid a fee for conducting the DFS.

If the DFS does not meet the pre-determined criteria as stated in the DFS agreement, then the agency is not obliged to pay anything.

## Seek Funding Approval

EPC projects under the GGB program may be financed completely or in part using a temporary repayable advance from DTF.

In instances where DTF funding is available, the responsible minister must make the advance application to the Treasurer on behalf of the portfolio agency. In cases where a portfolio agency is requesting funding via their department, it is recommended that the agency establish a separate agreement with their department prior to the department making the advance application to DTF.

## Energy Performance Contract (EPC)

The DFS forms a technical basis on which an EPC is negotiated. Negotiations on an EPC include such issues as:

* the included scope, as described and analysed in the DFS;
* any scope exclusions, or inclusions not specified in the DFS;
* changes to work as described or analysed in the DFS;
* if there is additional work not described or analysed in the DFS;
* changes to the measurement and verification plan (MVP);
* maintenance issues (e.g. who will take responsibility, level of service, timing);
* commissioning issues and performance criteria for Energy Conservation Measure (ECM) acceptance certificates;
* training requirements and schedule; and
* the estimated budget and installation timing implications of the above decisions.

In order to streamline the process, the scope of works included in the EPC should remain reasonably consistent with that which was agreed in the DFS. If the scope of works changes from the final DFS, details of the proposed changes should be to a level of detail consistent with a DFS. The agency will need to carefully review any new documents produced, including:

* ECM purchase price and disbursement plan;
* equipment specifications (i.e. plans, engineering designs, drawings); and
* equipment performance requirements.

Once the terms and conditions are agreed and negotiations are successful, the EPC will be signed, and implementation of the proposed works may begin.

## Installation

During the installation, the ESCO may itself install, or engage subcontractors to install the ECMs.

It is important for the project manager to take reasonable steps to minimise the impact of any works to normal operations within the facility, including:

* works implemented outside of normal operating hours wherever possible;
* all contractors to be inducted and to follow processes required by facility manager(s); and
* head contractor be required to address any major issues within an appropriate timeframe.

## Measurement & Verification (M&V)

Measurement & Verification (M&V) of each ECM’s performance is an important step in maximising savings returns on the agency’s investment – the Energy Efficiency Council has shown M&V to improve energy saving results by 20-30 per cent over projects with no M&V.

M&V involves utilising a set of methods and processes, defined as part of the International Performance Measurement & Verification Protocol (IPMVP), to quantify real energy savings from installed ECMs, which can then be compared to the EPC service provider’s savings guarantee. M&V procedures are additional to the existing functions of facility and energy managers in energy monitoring and reporting, and are focussed on the impacts of specific ECMs.

### Measurement and Verification Plan

A critical part of the M&V phase is the establishment of a Measurement and Verification Plan (MVP) in the works specification, and sets out procedures to determine the actual energy savings from installed ECMs. In partnership with the EPC service provider, an MVP agreement should include the following in detail:

* baseline energy consumption and conditions of operation for existing systems prior to introduction of ECMs (an important step to identify and evaluate change in any baseline adjustments at a later date);
* a tracking and reporting method to capture the changes to the assumed post-installation conditions;
* method of determining energy savings - generally using the following simplified formula:

*Energy savings = Baseyear Energy Consumption ± Baseline Adjustment[[1]](#footnote-1) - Post ECM Energy Consumption*

* details of key assumptions for determining baseline, including consideration of significant variables and current and future unknowns (i.e. weather, occupancy level);
* description of ECMs and intended results;
* formulae and procedures for determining post ECM installation energy consumption (including specification of M&V Options – see Appendix B);
* procedures for performing the statistical validation and the level of accuracy of results to be achieved for the entire analysis, or at least key components;
* specification of equipment and procedures used to collect, measure or obtain results;
* method and format of reporting results to the agency;
* schedule of reporting to the agency;
* process and conditions under which the agency must notify the ESCO of changes to the facility (i.e. occupancy change, added equipment); and
* agreement on a representative and accurate method in baseline adjustment (see Appendix B) to capture changes to the facility.

### Collaboration in M&V

To ensure confidence in the M&V information presented, DTF recommends that the agency engage closely with the ESCO to understand the procedures and methods of calculation conducted for M&V.

It is also important for the agency to provide, where necessary, data such as monthly energy bills, occupancy (i.e. average daily admittance, occupied beds (hospitals), occupied days (schools), occupied area (leased space), production data and changes in use (see Appendix B - Baseline Adjustment) to assist the ESCO in the M&V process.

### M&V options

There are four standard options as set out in IPMVP and recognised by the Energy Efficiency Council to measure and verify the actual performance of installed ECMs (See Appendix A). It is important to note that the most simple, focused, representative and accurate option be chosen to minimise time and cost spent on M&V.

### Baseline adjustment

Every facility will undergo numerous changes during the life of an EPC project - approximately five years. Baseline adjustments correct for any changes in energy use between the base year and the performance periods caused by unexpected material changes to the facility’s use or operation. These adjustments then form a new baseline to which the actual performance after installation may be compared.

See Appendix A for more information.

### Frequency of M&V

M&V is an active and on-going process, occurring on an annual basis for the term of the contract, which is generally equivalent in length to the payback period for the project (i.e. the point at which accumulated annual savings match the initial capital costs).

However, the balance between a need for performance verification and ongoing cost may vary over time depending on the level of realised savings and the agency’s confidence in the ECM’s ongoing performance. The agency has the option to notify the EPC service provider to discontinue M&V of an installed ECM if it is deemed that the ongoing reporting costs outweigh the benefits of continued M&V. Such a decision on the part of the agency should only follow a risk management analysis, as once M&V is discontinued, the EPC service provider will no longer be obligated under the EPC agreement to guarantee a level of savings to the agency.

### Savings guarantee

Every year for the term of the contract, an M&V report is submitted by the ESCO to the agency, stipulating actual savings achieved. If savings in any year fails to meet the guaranteed savings (as stated in the EPC), the ESCO may negotiate to change, replace, remove, alter or add to any equipment or procedures introduced as part of the project in order to achieve its guaranteed savings commitment, otherwise the ESCO is required to reimburse the agency to the degree of the shortfall.

# Project Delivery plan

The project delivery will be dependent upon the outcomes of the tender (RFP) and the DFS. A works plan is required to be developed by the EPC service provider within 30 days of the execution of the EPC. This works plan will provide all required details on scheduling of installation works, commissioning, communications and other relevant procedures.

# Quality Plan

Project savings are required to be guaranteed by the EPC service provider and meet an average simple payback period of five years; and subsequent to project implementation, monitoring and verification (as per International Performance Measurement and Verification Protocol) of project savings will be performed by the service provider on an annual basis for the term of the contract (five years). Any shortfalls in the annual savings are required to be reimbursed by the service provider (e.g. savings guaranteed).

# Stakeholder Analysis and Communication Plan

## Communication objectives

It is the intention of the department or agency undertaking the project to actively engage all stakeholders as listed in Table 7.2 from project inception to ensure all relevant project issues and risks are identified and addressed.

More broadly, this project demonstrates leadership in action on climate change and environmental sustainability within and external to Government, and thus presents outstanding opportunities for all stakeholders to further communicate the wider social, environmental, and economic benefits arising from the project.

## Key Stakeholders

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Stakeholder** | **Current Snapshot (Needs, expectations, issues)** | **Role and Desired Mindset** | **Communications Approach** | **Principle Contact** |
| Senior Management |  |  |  |  |
| Project Control Board |  |  |  |  |
| Building Occupants |  |  |  |  |
| Facility Managers |  |  |  |  |
| On-site Maintenance Contractor |  |  |  |  |
| Department (which oversees the agency undertaking the project) |  |  |  |  |
| Department of Treasury and Finance | Owners of the Greener Government Buildings Program. | DTF are responsible for managing and reporting whole of government targets and providing facilitation and administration support to all projects. | DTF facilitators to be invited to project meetings and utilised as required | Sam Burke |
| Etc.. |  |  |  |  |

## Mediums

| **Medium** | **Activity** | **Target Stakeholder** | **Strategic Intent**  **(H/M/L)** |
| --- | --- | --- | --- |
| **Meeting, forums and events** – *keep informed, engaged and test strategy direction* |  |  |  |
| **Web** *– keep informed and updated* |  |  |  |
| **Publications** – *keep informed and updated* |  |  |  |
| **Ministerial and executive communications** – *keep informed* |  |  |  |

## Activity Plan

| **Timeline/ Key Date** | **Activity** | **Stakeholders** | **Details** | **Responsibilities** | **Status** |
| --- | --- | --- | --- | --- | --- |
|  | Approval of Project Plan |  | Including approval to tender and delegation to sign DFS agreement | Approval from financial delegate (e.g. board, CEO, Minister) based on forecast contract size. |  |
|  | Request for Proposal |  |  | Project Manager |  |
| + 8 to 12 weeks | Proposal Submitted |  |  | ESCO |  |
| + 3 weeks | DFS Agreement signed |  |  | [Agency delegate] / ESCO / Board |  |
| + 12 to 20 weeks | DFS Submitted |  |  | ESCO |  |
| + 2 weeks | Project Implementation Approval |  |  | Project Control Board / Board |  |
| + 1 week | Funding Application Lodged |  |  | Project Manager / Department |  |
| + 6 weeks | Funding Approval |  |  | DTF |  |
| + 2 weeks | EPC Signed |  |  | [Agency delegate] / ESCO |  |
| + 4 weeks | Works Specification Submitted |  |  | ESCO |  |
| TBA | Works Specification Approved |  |  | Project Manager |  |
| TBA | Works begin |  |  | ESCO |  |
| +6 months or more | Practical Completion of Works |  |  | ESCO / Project Manager |  |
| Practical compl. | Guarantee Period Commences |  |  | N.A. |  |
| Annually | Monitoring and Verification Report |  |  | ESCO / Project Manager |  |

# Risk Log

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Author & Date** | **Description** | **Likelihood**  (H/M/L) | **Impact**  (H/M/L) | **Risk Rating**  (H/M/L) | **Proximity**  (when likely to occur?) | **Countermeasures**  (Treatment: to prevent, reduce, transfer, contingency, accept) | **Owner** | **Status** |
| 1 | SB | Annual project savings not achieved – installations unable to realise guaranteed savings | L | M/H | **M** | Annually | EPC process followed to ensure savings are monitored, verified and guaranteed by service provide, utilising expertise of DTF facilitator(s) | Energy services company (ESCo) |  |
| 2 | SB | Annual project savings not achieved - Energy services company  entering insolvency | L | L | **L** | Unknown | Inclusion of a Bank Guarantee in the Energy Performance Contract. EPC | Building owner/ operator |  |
| 3 | SB | Major disruption to operations of facility | L | M/H | **M** | During installation / work | Potentially disruptive works to be implemented outside of work hours  All contractors to be inducted and to follow processes required by facility manager(s).  Head contractor required to address any major issues within an appropriate timeframe | Building owner/ operator |  |
| 4 | SB | Maintenance costs incurred to address latent site defects and unsafe conditions | M | M | **M** | During installation and DFS | Targeted hazmat audit before works.  Contract allows for impacted works to be stopped. | Building owner/ operator |  |

|  |  |
| --- | --- |
| Low Risk | **L** |
| Medium Risk | **M** |
| Medium/High Risk | **M/H** |
| High Risk | **H** |

# Appendix A – Glossary of Terms

DTF Department of Treasury and Finance

GGB Greener Government Buildings

EPC Energy Performance Contract

ESCO Energy Services Company

RFP Request for Proposal

DFS Detailed Facility Study

ECM Energy Conservation Measure

M&V Measurement and Verification

MVP Measurement and Verification Plan

IPMVP International Performance Measurement and Verification Protocol

# Appendix B – Measurement & Verification

There are four generic M&V options as outlined in the International Performance Measurement & Verification Protocol (IPMVP), and are summarised in the table below.

|  |  |  |
| --- | --- | --- |
| **IPMVP** | **How Savings Are Calculated** | **Common Use** |
| **Option A:**  Partially Measured Retrofit isolation | Engineering calculations using short term of continuous post-retrofit measurements and stipulations | For a single ECM where the performance of the ECM can be measured but it may be best to stipulate its operation. |
| **Option B:**  Retrofit Isolation | Engineering calculations using short term or continuous measurements | For a single ECM where the performance and operations of the ECM should be measured. |
| **Option C:**  Whole Facility (Building) | Analysis of whole facility of building utility meter or sub-meter data, available continuously, using techniques from simple comparison to regression analysis | For a single ECM or multiple ECMs with or without energy interactions within a whole facility or building. Energy use is measured by utility meters for at least 12 months of the base year and continuously throughout the post-retrofit period. |
| **Option D:**  Calibrated Simulation | Energy use simulation, calibrated with hourly or monthly utility billing data and/or end0use metering | For single ECM or multiple ECMs with or without energy interactions within a whole building but where no base year data are available. Post-retrofit measurements are used to calibrate the simulation model. Base year energy use and demand are generated by the simulations model. |

**Note:** Adaptation of Table on page 22 of the IPMVP Vol. 1, “Overview of M&V Options”

**Option A- Partially Measured Retrofit Isolation**

Option A is mainly intended for non-complex ECMs and involves short term measurements before and after installation. Post installation performance data is measured temporarily, using a representative sample size where there are numerous standard components in an ECM; this data is then used in an engineering or statistical analysis to estimate the annual consumption.

This method typically applies to specific components (such as lighting retrofits, lighting controls, constant load motors) where performance and thus energy consumption does not vary significantly from the nameplate value, and so output is largely dependant on usage patterns.

Using Option A is often the least expensive option, although it should be noted that the accuracy of Option A is usually inversely proportional to the complexity of the ECM. For example: Option A will be reasonably accurate for lighting retrofits due to their simplicity but will be less accurate for a complex ECM such as a chiller, which has a greater range of operating regimes, higher number of assumptions and variables that are not easily accounted for without conducting a longer-term measurement.

**Use of Option A should be supported by annual commissioning of the installation for the life of the project.** This ensures that the installation’s proper functionality where there is no measurement of its performance.

**Option B – Retrofit Isolation**

Option B is mainly intended for individual ECMs of significant size - those with expected savings of up to 20 per cent of the total facility energy use - where performance and operation is expected to vary. Measurements should be specifically targeted (i.e. with separate metering) for the ECM and conducted continuously over the performance period.

This method typically applies to single equipment replacements (such as a HVAC chiller/ boiler), where a large number of variables necessitate continuous measurement for a degree of accuracy in actual energy consumption that engineering estimates cannot reliably achieve.

Savings created by most ECMs and all end-use technologies may be determined with Option B, but the degree of difficulty and associated costs increases as measurement complexity increases. Option B therefore presents results that are typically more accurate than Option A, especially in cases where operations vary significantly, but with greater cost to the customer.

**Option C – Whole Facility**

Option C is intended for projects where savings are expected to be large enough to be differentiated from the random or unexplained energy variations that are normally found at the whole-facility level. It involves the use of continuous measurement techniques (from utility meters or whole building sub-meters and/or regression modelling) to determine energy savings for the total site, facility or building.

Option C presents an added difficulty in determining savings as whole building measurements do not isolate the drivers behind any variances in overall energy consumption the expected levels, this is complicated further given the inevitable changes in the facility during the performance period. Hence accounting for non-ECM changes affecting measured post-retrofit energy use is the major challenge.

**Option D – Calibrated Simulation**

Option D uses computer simulation software to predict facility energy use for the baseyear and/or post-retrofit period. As it is a simulation, results are based heavily on the assumptions and parameters of the model, as such are limited in their accuracy to estimate the actual consumption of more complex ECMs.

Option D may be considered:

* to assess the performance of all ECMs in a facility. assess just the performance of an individual equipment, subsystem or system within a facility;
* when the baseyear data does not exist or are unavailable;
* when the post-retrofit measurement data is unavailable;
* where the impact of non-ECM factors can’t be quantified with sufficient accuracy and confidence to estimate Baseline Adjustments (see below);
* when the expected savings are not large enough to be separated from variations in the facility’s utility meter data; and
* when the savings for individual ECMs have to be determined but the Option A or B isolation approach is too difficult or costly.

#### Selecting an Option

As the customer is required to pay for the costs for M&V, there needs to be consideration of a number of factors when selecting the savings determination approach; time, complexity, cost and credibility of the savings outcomes. An underlying goal for the customer in M&V planning should therefore be to incur no more cost than necessary to receive performance data from the ESCO with a sufficient level of accuracy, consistency and verifiability.

It is recommended here that the customer encourage the ESCO to take a balanced M&V approach. A balanced approach incorporates cost benefit considerations and aims to minimise complexity and effort, while ensuring the accuracy and validity of data and leaves flexibility for continuous change in the facility environment. By selecting a retrofit isolation method, using one or a combination of Options A, B or D to analyse each installed ECM, the ongoing M&V analysis may target each ECM individually and is thus independent of the changes around it. For example: New lighting ECMs are installed across a floor at a hospital, if new energy intensive medical equipment is installed, performance measurement of the ECMs using Option A will not be affected by the change. Using Option C however will require further analysis and cost to isolate the change from the ECM’s performance.

Option C is the most complex and costly of the four options, and so it is recommended that the customer carefully assess other options prior to conducting an Option C M&V. Where it is not feasible or practical to isolate the effects of each individual ECM, Options C and/or D may be used.

As a general rule of thumb, both the IPMVP 1997 and IPMVP 2001 (March 2002) Volume 1 quotes that typically:

*It would be expected that the average annual savings determination costs do not exceed more than about 10 per cent of the average annual savings being assessed.*

**Baseline Adjustment**

Every facility will over the performance period of an EPC experience some level of unforeseeable, routine and non-routine change in its operation compared to the baseyear (the year in which the baseline energy consumption is taken). Baseline adjustments correct for any changes in energy use between the baseyear and the performance periods caused by unexpected material changes to the facility’s use or operation.

Baseline adjustment is available to the ESCO so that they are not disadvantaged in achieving their savings guarantee by any unforseen changes outside their control. It also increases the acceptability and correctness of reported savings by incorporating baseline changes.

It is important for the customer to regularly check energy and water records for any irregularities and keep the ESCO informed about any planned or unplanned changes to the facility that may cause a baseline adjustment, this includes:

* Seasonal weather changes
* Physical changes to facilities - renovations, extensions, additions, or closures
* Changes in usage, occupancy, hours of operation, or building activity
* Changes in the amount of space being heated or air-conditioned
* Changes in energy subsystems and end-use equipment/appliances
* Changes in the amount or use of equipment
* Changes in environmental conditions (lighting levels, set-point temperatures, etc)
* Changes in production throughput, schedules or product mix
* Changes in maintenance practices

*Example 1: Weather changes*

When considering ECMs related to a building’s HVAC system, the unforeseeable changes in atmospheric temperature and humidity will affect the system’s energy consumption. Weather information for the year measured post installation should be compiled by the ESCO based on Bureau of Meteorology data, and changes to the baseline consumption should be made as a minimum to reflect the actual weather patterns.

*Example 2: Customer initiated changes*

An ESCO implements Lighting ECMs to an office facility. After installation the customer informs the ESCO that the occupancy levels have changed from 12 hours to 24 hours. A baseline adjustment calculation to capture the extra energy consumption as a baseline should be done by the ESCO. Calculations of actual energy incorporating this new usage condition to show the savings will also be presented to the customer for verification.

*Example 3: Tariff changes*

The ESCO’s savings guarantee is essentially guaranteeing the energy consumption savings, generally not based on a value of money, and thus tariff changes will not require baseline adjustments by the ESCO. If savings guaranteed are based on monetary savings, then tariffs are usually fixed at the time of negotiation. In this case, if the tariff changes, the nominated tariff is used to determine energy cost savings.

1. Baseline adjustment is used to capture facility changes post ECM installation that could increase or decrease the baseline energy usage and is outside the control of the ESCO (see Baseline Adjustment below). [↑](#footnote-ref-1)