

CLIMATE CHANGE, CLEAN ENERGY AND URBAN WATER IN AFRICA

PROMOTING MARKET-BASED
DEPLOYMENT OF CLEAN
ENERGY TECHNOLOGIES
AND SERVICES IN
MUNICIPAL WATERWORKS
PILOT INITIATIVE IN SOUTH AFRICA



REEEP®



BEST PRACTICE GUIDE

CLIMATE CHANGE,
CLEAN ENERGY
AND URBAN WATER
IN AFRICA

PILOT INITIATIVE
IN SOUTH AFRICA



REEEP®



Sustainable Development Goals (SDGs)

This Guide supports sustainable development by targeting the following 7 SDGs:

GOAL 6:

Ensure availability and sustainable management of water and sanitation for all.

GOAL 7:

Ensure access to affordable, reliable, sustainable and modern energy for all.

GOAL 9:

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

GOAL 11:

Make cities and human settlements inclusive, safe, resilient and sustainable.

GOAL 12:

Ensure sustainable consumption and production patterns.

GOAL 13:

Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.

GOAL 17:

Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.



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ACRONYMS & ABBREVIATIONS

| | | | |
|----------------|---|---------------|---|
| CAPEX | Capital expenditure | PFMA | Public Finance Management Act |
| CE | Cleaner energy | PSO | Project Support Office of the DoE |
| DEA | Department of Environmental Affairs | RE | Renewable energy |
| DoE | Department of Energy | REEEP | Renewable Energy and Energy Efficiency Partnership |
| DWS | Department of Water and Sanitation | | |
| EC | European Commission | ROI | Return on investment |
| EE | Energy efficiency | SANEDI | South African National Energy Development Institute |
| ESCO | Energy service company | | |
| ESKOM | Electricity Supply Commission of South Africa | SCM | Supply chain management |
| EU | European Union | SDGs | Sustainable Development Goals |
| GHG | Greenhouse gas (emissions) | UNIDO | United Nations Industrial Development Organization |
| IDP | Integrated Development Plan | | |
| IRR | Internal rate of return | | |
| kWh | Kilowatt-hour | ToR | Terms of reference |
| M&E | Monitoring and evaluation | ZAR | South African Rand |
| MFMA | Municipal Finance Management Act | | |
| NCPC-SA | National Cleaner Production Centre South Africa | | |

Introduction

This Guide is based on lessons learned during the Climate Change, Clean Energy and Urban Water in Africa project, which was funded by the European Commission, implemented by UNIDO and executed by REEEP. The project aimed to empower South African municipalities to implement CE solutions in their waterworks.

CLEANER ENERGY IN MUNICIPAL WATERWORKS

This Best Practice Guide (“the Guide”) intends to assist municipalities in the implementation of cleaner energy technologies (CETs) and services at their waterworks. The Guide suggests the key elements that municipal officials need to consider to implement a cleaner energy (CE) project, and provides information on developing strategies, formulating plans, providing adequate capacity and mobilising

resources for successful origination and implementation of a CE project.

The Guide also presents key considerations to ensure that CE projects are implemented and operated sustainably. It is hoped that the adoption of CE technologies and services at waterworks will create further support and an enabling environment for the wider adoption of cleaner energy interventions within municipalities.¹

The Guide was devised to answer several key questions:

1 Why implement cleaner energy interventions?

The Guide aims to provide municipal officials with the tools needed to make a case for and implement CE interventions in their municipalities. These tools include technical, budgetary and procurement processes the municipality will need to follow. In addition, the Guide provides an overview of the data and information required to plan a successful CE project.

2 What can the private sector offer to assist, and how can they be engaged to support a CE project?

The Guide outlines the options for engagement with the private sector and outlines the opportunities and challenges of private sector engagement.

3 How can CE interventions be financed?

The guide presents a range of financing options that the municipality could choose to pursue to ensure that the CE project is implemented and operated sustainably.

¹ The Guide is not intended as a national guide to energy efficiency, nor does it provide step-by-step instructions for CE project setup and implementation. All recommendations made in the Guide are subject to South African legislation and regulations that govern municipal waterworks. Though the authors have conducted extensive research on applicable legislation and regulations, and are confident of the accuracy of the information provided, readers are responsible for seeking their own legal advice. The Guide is not intended to provide legal advice and the authors assume no liability for any losses incurred through the implementation of the recommendations within it.



WATER WORKS

The term **waterworks** is used throughout the Guide to refer to **all components of water and sanitation services provision infrastructure, assets, installations and systems**. This includes water and wastewater treatment works, pump stations, pipelines as well as systems (including financial, monitoring and evaluation) required for continued management, operation, maintenance and renewal of such works.

CLEANER ENERGY

The term **cleaner energy (CE)** is used in the Guide to describe **technology and services that enable the more efficient use of energy** (energy efficiency; EE) or the **generation of energy through low-carbon sources** (renewable energy; RE).

When referring specifically to EE or RE hardware, the term **cleaner energy technology (CET)** is used.

TARGET AUDIENCE

The Guide is aimed at municipal officials (especially technical managers and managers of municipal waterworks) and councillors who are responsible for the planning, procurement, contract administration, implementation, and operation and maintenance of CETs.

The Guide will also be useful to private sector providers of CE interventions and services, as well as financiers (public and private), in order to gain insights into the municipal approach to planning, procuring and implementing CE at waterworks.

BASIS FOR THE GUIDE

To ensure that the Guide addresses key issues, obstacles and opportunities faced by municipal officials, government, private sector players and financiers, these stakeholder groups were convened and consulted during a series of roundtable discussions and engagement events with municipalities. All roundtable events were held at the South African National Energy Development Institute (SANEDI) in Johannesburg and were well attended, indicating that there is demand for cross-sector engagement in both the public and private sectors.

In the final roundtable event, a draft version of the Guide was presented. The feedback received from the participants was documented and has been used to refine the content and presentation of this final version of the Guide.

THERE IS DEMAND FOR CROSS-SECTOR ENGAGEMENT IN BOTH THE PUBLIC AND PRIVATE SECTORS.



WHY CLEANER ENERGY?

Investing in CE at municipal waterworks creates both short and long-term benefits for local governments, and contributes to the responsible stewardship of tax and rates payers' money.

Through implementation of CE, municipalities can reduce their energy consumption at waterworks, lower operating costs and improve long-term financial sustainability.

CE at waterworks also has the potential to address some of the economic and environmental challenges facing cities and enhance municipalities' ability to address economic development and transformation.

The five core benefits of CE at municipal waterworks are:

- 1. LOWER ENERGY COSTS:**

CETs reduce energy consumption at waterworks, which in turn, results in lower energy bills. Energy costs often represent more than half of the variable costs at waterworks sites, and normally constitute the highest operating cost. Monetary savings from reduced energy consumption can be used to recapitalise waterworks assets.
- 2. IMPROVED MUNICIPAL SERVICES:**

Enhanced management of municipal assets and more reliable service delivery can be achieved with the cost savings.
- 3. ECONOMIC BENEFITS:**

Investing in CE can stimulate economic development through the boosting of local markets, as well as support the development of markets for CE-related services. Growing demand for CE interventions would enable manufacturers to benefit from economies of scale, lowering the unit costs of production. CETs also increase the energy available for other key local economic activities and stabilise the energy supply to businesses, thereby providing other indirect benefits such as improved job security.
- 4. LOWER POWER DEMAND:**

CE interventions can be designed to both reduce and optimise the peak instantaneous power consumption at waterworks, which is likely to reduce both the peak access charge and instantaneous demand charge. This is typically only applicable to waterworks that consume enough energy to warrant a demand charge tariff.
- 5. ENVIRONMENTAL BENEFITS:**

The implementation of a CE project can significantly reduce GHG emissions by decreasing the consumption of fossil fuel-based energy. Through the implementation of CE interventions, municipalities can contribute to the Sustainable Development Goals and South Africa's commitments under the Paris Agreement on Climate Change, as set out in its Nationally Determined Contribution.²

Key Elements



The Best Practice Guide is organised into seven sections, each presenting a key element that should be addressed to ensure the successful implementation of CE projects.

The sections cover project origination to project planning, implementation and monitoring. It is recommended that Element A be undertaken before starting the other six elements, however, this is not a requirement. Elements B to F can to some extent be executed simultaneously, if required, or staggered as appropriate, before the commencement of the final element, Element G.

A. FOUNDATION: STRATEGY DEVELOPMENT

CE Strategies, and the Policies that support them, are powerful instruments to align the organisational activities, incentives and resources required to deliver specific targets and commitments.

The process of strategy development and adoption also ensures broad and high-level support for CE interventions. **Strategies can help to ensure that a municipality achieves long-term benefits from CE, sensitise municipal officials to CE issues and emphasise the importance of accurate and useful tracking of CE benefits.**

CE strategies should set ambitious yet realistic targets and include the following elements:

- The reasons why CE is important and its potential benefits, referencing the municipality's Integrated Development Plan (IDP), relevant energy consumption reduction targets and policies, socio-economic benefits, improved cash flow management to be achieved, more sustainable service delivery, and national government's commitments in respect of CE and climate change mitigation.
- An overview of how the municipality intends to deliver CE projects and their impact on the services to its residents. It should include the type of projects, roles and responsibilities of stakeholders, a description of how these projects are delivered and how the costs are recovered.

- A framework that includes the legal and legislative context with which local government's activities relating to CE must comply, including legislation related to: municipal service provision; the Municipal Finance Management Act (MFMA) and the importance of managing the municipality in an efficient manner, particularly by reducing costs.
- The appointment of a suitable project lead ("champion") in the municipality, to drive and oversee all related strategies, plans and project implementation.
- The roles and responsibilities of the council, executive management and officials / administration in CE implementation.

In addition to the development of strategies, the development of EE policies, too, is critical for proper project implementation, as the process of creating a policy formalises the municipality's commitment to reducing energy consumption. A policy - as a statement of intent - should clearly state the municipality's objectives, which can be used to rally support from elected officials and buy-in from local government agencies.

B. DATA: ESTABLISHING A BASELINE

Conducting a baseline energy assessment and energy audit are pivotal initial steps when considering a CE project at a municipal waterworks.

These steps are the most technical in a CE project's implementation, since they include data collection, filtering and analysis.

There are different types of baseline energy assessments, which are needed at different stages of a CE intervention.

During the planning process, a baseline energy assessment commonly referred to as a **desktop or a walk-through energy assessment**³ should be conducted. This assessment will help the municipality to gain more detailed information about current energy consumption patterns of its waterworks assets. These are then compared to the assets' designed performance levels or benchmark sites. The assessment's aim is to collect the necessary evidence to gain executive approval for a CE project.

Once a CE project has been approved, a detailed energy audit is required to explore further the potential cost savings.

The energy audit can be used to model potential energy savings based on past energy consumption trends, and thereby verify the selection and ranking of assets for the CE project.

The audit report should also include a high-level analysis of project risks and mitigating actions.

The energy audit also establishes the reference point that will be used to assess, after implementation, whether the CE intervention has reduced energy consumption. In other words, the audit serves as the yardstick to judge the performance of the CE project.

Though a walk-through/desktop energy assessment can generally be conducted by technical staff from the municipality, a full energy audit requires specialist knowledge and requires the appointment of an external service provider.

3. ESKOM have produced a guide for walk-through energy assessments: <http://www.eskom.co.za/sites/idm/EnergyAdvisory/Documents/AdvisoryServicesWalkthroughassessment.pdf>. In addition, the NCPC-SA's website includes a range of digital resources useful when conducting energy assessments: <http://www.ncpc.co.za>

BASELINE ENERGY ASSESSMENT

In this Guide, a baseline energy assessment refers to the **process of identifying where and how much energy is being consumed and evaluating the efficiency of all components and systems that impact energy use.**

This includes establishing energy baselines, benchmarks and EE performance metrics using established technical modelling tools.

The baseline energy assessment, which usually precedes an energy audit, helps to define which assets should be included in an energy audit.

ENERGY AUDIT

In this Guide, an energy audit refers to the **collection and analysis of energy usage data of targeted municipal assets** identified as potential sites for a CE intervention. As such, an energy audit assesses a CE project's technical viability.

For CE projects with a high capital value and long-term potential value creation, an **investment-grade audit** is required. This type of audit analyses the interaction between efficiency strategies and project life cycle costs and typically takes

a comprehensive and integrated view of a waterworks site or facility. If an ESCO is selected as the implementation agent of the CE project, then the ESCO will conduct this investment-grade audit.

The five main steps to crafting a credible baseline energy assessment and energy audit are:

- 1. Collect energy consumption data of municipal waterworks assets:**
 - a. Collect and filter current consumption data of waterworks assets;
 - b. Feed data into technical modelling tools to develop a detailed assessment of current energy consumption of assets;
 - c. Compare the energy performance of entire waterworks facilities or distinct waterworks components (e.g. aerators, thermal drying beds, etc.) to their designed performance standards and/or the performance of similar assets across the country;
 - d. Confirm the list of assets to be audited, based on their size and energy consumption.
- 2. Select and conduct the most appropriate type of energy audit, taking into consideration:**
 - a. The complexity of the waterworks asset portfolio targeted;
 - b. The size, scope, and ambition of CE goals, and the associated budget required;
 - c. The in-house resources and expertise available;
 - d. The cost-effectiveness and efficiency of using internal compared to external resources;
 - e. The value a potential funder places on the results of an independent energy audit, especially the financial analysis of CE measures.
- 3. Determine whether follow-up analyses are required:**
 - a. Based on the results of the initial energy audit, the municipality may decide to raise capital to implement the CE project (how feasible this is will depend upon the municipality's creditworthiness). To do so, a more thorough financial analysis of the CE project's potential energy and cost savings will need to be conducted. This can be done using in-house resources or outsourced;
 - b. Alternatively, the municipality can contract an ESCO to conduct the financial analysis as part of the performance contract process.
- 4. Compile a final list of targeted waterworks assets and their respective CE interventions to be implemented, taking into consideration:**
 - a. Any benefits that may be derived from implementing multiple CE measures simultaneously.
- 5. If appropriate, implement a pilot CE intervention using funds from the internal budget and/or grants to:**
 - a. Gather performance data, identify areas for improvement and demonstrate energy savings;
 - b. Refine the implementation plan for the CE project by addressing any technical, managerial or system-related implementation challenges;
 - c. Identify and mainstream aspects of the pilot that work well.

C. WORKPLAN: PLANNING PROCESSES

The purpose of a CE intervention workplan is to provide the municipalities' decision-makers (executive management and/or council) with the information that they need to approve a CE intervention.

This plan should include an assessment of the feasibility of the intervention, supported by analysis of the costs, projected savings, and technology used.

A project "champion" (as noted in element A, "Foundation: Strategy Development") should be appointed at the earliest possible stage. This individual should be involved in as

much of the project planning as possible, and should lead the workplan development. This will provide him/her with a thorough understanding of the project and increase his/her ownership of the project.

Capacity building training should be made available to the selected champion if he/she does not possess all the necessary skills.

Having already developed a CE Strategy (Element A), which outlines the intentions and objectives of the municipality's CE initiative(s), it is imperative to produce a project workplan that clearly answers the following questions:

- 1 What are the motivations and targets for the CE project?
- 2 Is the CE project financially viable and economically net-beneficial?
- 3 What risks is the local government exposing itself to by undertaking the CE project?
- 4 How will the project be implemented, and using which type of contracting model?

The project champion should undertake the following steps to address these questions:

PREPARE A PROJECT-SPECIFIC VISION STATEMENT:

This is a declaration of what the project aims to achieve. It should be fully aligned with the objectives of the municipal CE Strategy (see Element A), the Integrated Development Plan (IDP) and climate change initiatives of national and/or provincial government.

DEFINE SHORT-, MEDIUM- AND LONG-TERM OBJECTIVES OF THE CE PROJECT:

These could include energy and cost savings, improved service delivery, market development and environmental or climate change impacts such as reduced GHG emissions. Whereas short-term objectives are specific to the project, long-term objectives can relate to the broader goals of the CE Strategy.

DEFINE THE SCOPE OF THE PROJECT:

Based on the desktop or walk-through energy assessment referred to in Element B, select the waterworks sites or assets for project implementation.

PREPARE A FINANCIAL PLAN:

This should include an estimate of the CE intervention's cost and a high-level cost-benefit analysis of the project, using estimated savings.

Elements to be included are:

- Costs for planning and preparation of the project (including any audits required);
- Equipment costs for selected technologies;
- Projected installation costs;
- Operation and maintenance costs of the intervention for a period of ten years, including energy consumption and human resources (this should be compared to operation and maintenance costs for current technology);
- Projected energy savings (kWh and ZAR);
- Payback Period / Internal Rate of Return (IRR) / Return on Investment (ROI);
- Assessment of the municipality's ability to secure finance (creditworthiness).

DRAFT A HIGH-LEVEL IMPLEMENTATION PLAN AND PROGRAMME:

This plan should identify activities to be undertaken in the course of project implementation, and internal and external stakeholders with the specialist skills required to undertake those activities.

- Based on the scope of the project and resources available for implementation and maintenance of the project, as well as the respective risks, determine whether the project should be implemented by an internal technical team or a private energy services company (ESCO);
- Based on the point above, specify the resources needed for successful implementation of the project, including: materials, equipment, skills, person-days, outsourced technical services, and management systems;
- Identify a multidisciplinary internal project team with the required skills and influence in different departments (including Finance);
- Conduct internally, or outsource privately, a pre-feasibility study that should, inter alia, identify project risks and associated mitigating factors;
- Develop a high-level project programme, which breaks down the project into its core components. Each component should be briefly described, start and end dates and a critical path defined, and the responsible party identified;
- Define technical performance indicators and develop the technical part of the tender for technology/service providers. These activities can be outsourced if the required technical and managerial skills are not readily available in the municipality.

Once the project plan has been completed and the intervention champion has tested the viability of the CE project(s), the plan should be submitted to senior officials and/or executive committees for approval. The champion must ensure that the plan is submitted to all relevant committees in the right format, and that it is included in these committees' meeting agendas.

This is an important step, because it provides officials with the evidence necessary to allocate human and financial resources to the CE project. Before documents are submitted for scrutiny and approval, the project champion should consider whether the questions listed on the previous page have been adequately addressed.

D. PARTNERS: PRIVATE SECTOR SERVICES

As alluded to in the previous sections, the private sector can provide services to support municipalities at different stages of CE projects.

The range of services the private sector can provide includes:

- Providing cost-effective technologies and services for measuring and monitoring energy savings, such as training on energy management, risk management, project & performance guarantees;
- Analysing energy systems and recommending optimal packages of CE technologies and services;
- Mobilising resources in an efficient and effective manner, drawing on the experience of construction management services, equipment commissioning, equipment maintenance, and project management;
- Providing access to alternative sources of funding. Unlike public authorities who face constraints on their borrowing capacity, private contractors are usually able to finance projects through mechanisms that are different from formal loans and that can be tailored to project cash flows;

- General project management support, including (advice on) selecting subcontractors, managing projects, overseeing construction work, and implementing quality and risk management controls.

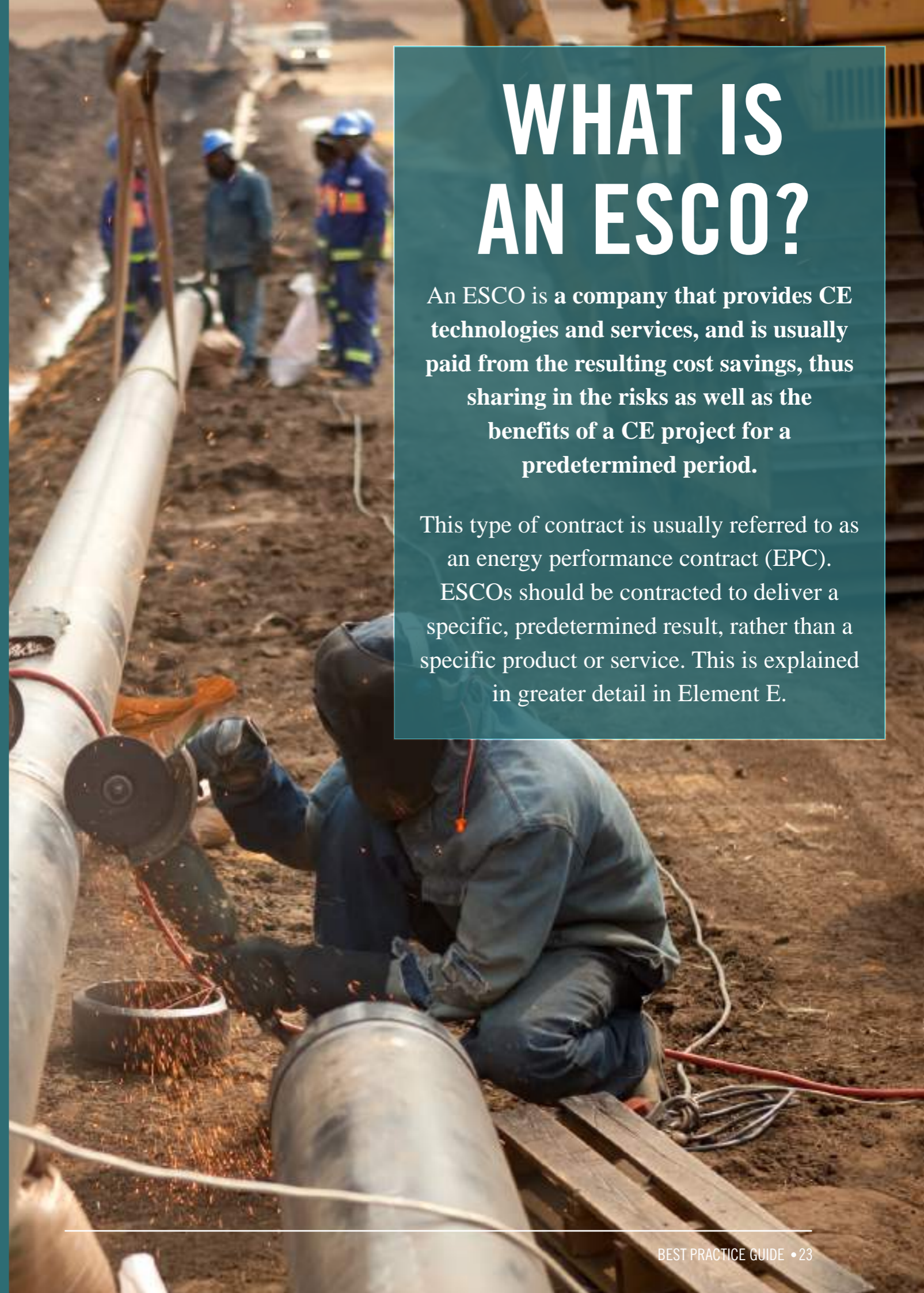
When a municipality enters into an agreement with a private service provider, payments can be made based on a contractually guaranteed level of energy and cost savings.

The private sector service provider is contracted to deliver a specific result rather than specific products or services. This performance contracting is further described in Element E.

WHAT IS AN ESCO?

An ESCO is a company that provides CE technologies and services, and is usually paid from the resulting cost savings, thus sharing in the risks as well as the benefits of a CE project for a predetermined period.

This type of contract is usually referred to as an energy performance contract (EPC). ESCOs should be contracted to deliver a specific, predetermined result, rather than a specific product or service. This is explained in greater detail in Element E.



E. PERFORMANCE: CONTRACTING FOR THE LONG TERM

Performance Contracts are the industry standard, regardless of whether an ESCO or another type of private sector provider is procured.

The two most common models for the structuring of performance contracts are the **guaranteed savings model** and the **shared savings model**. These are explained below, using the example of an ESCO as ESCOs are most commonly used.

The primary difference between these two models is whether the private service provider or the municipality/provincial government assumes the credit risk. A third option is to develop a hybrid contract that incorporates specific elements of each.

Under a guaranteed savings model:

A municipality sources capital directly from a third-party financier and assumes the financial risks arising from the loan.

An ESCO is paid by the municipality to provide all necessary technology, implementation and support activities as well as facilitate financial arrangements. The ESCO provides a guarantee that the monetary value of energy savings will cover the repayments. If the monetary value of the energy savings is lower than expected, the ESCO is obliged to reimburse the municipality for the difference between realised and expected savings.

If energy savings are higher than expected, the municipality keeps the excess, unless further sharing agreements have been made.

Under a shared savings model:

The monetary value of energy savings is shared between the municipality and the ESCO, based on a negotiated rate stipulated in the contract. If there are no cost savings, the municipality pays the energy bill and owes the contractor nothing for that period.

Typically, the ESCO provides financing and bears both project development and performance risks. Since an ESCO typically agrees that the municipality will not pay more for energy than it did at the start of the contract (energy price is fixed), it is exposed to the risk of rising energy costs.

If there are no energy savings, the ESCO is still responsible for meeting financial obligations arising from upfront capital investment in equipment. At the end of the contract, ownership of equipment transfers to the municipality, based on the conditions specified in the contract.

In summary, the key difference between the two contracting models is as follows:

- A guaranteed savings contract can be used to reduce the cost of financing a CE intervention, primarily because it increases the municipality's cash flow, thereby reducing the probability of the municipality defaulting on contract payments to the private service provider.
- A shared savings contract allows a municipality that may not have access to up-front capital (for example, due to poor creditworthiness) to enter into an agreement with an ESCO that can secure up-front financing. A shared savings contract also makes it easier for a public entity to afford an ESCO as they are paid based on the energy savings produced over time.

Under a shared savings contract, there are usually no up-front costs for the municipality, and the municipality will still reap the long-term benefits resulting from CE at their waterworks.

In the case of ESCOs, payments are typically linked to energy savings. Monitoring and evaluation provisions, stipulated in the contract, determine the value of payments.

The ESCO designs and implements the monitoring and evaluation plan, delivering the results to the municipality, and a third party validates the results.

DOES OUR CE INTERVENTION COMPLY WITH THE MFMA?

Performance contracts, like any municipal contract, are governed by the Municipal Finance Management Act 56 (MFMA) of 2003. As performance contracts need to be of long enough duration not only for the implementation of the CE intervention but also for the resulting savings to materialise and be paid out to the ESCO, these are often longer than three years. As a result, Section 33 of the MFMA is of relevance.

Section 33 stipulates that a municipality can only engage in a contract that imposes financial obligations on the municipality beyond a three-year period if:

- The municipality has ensured that the contract brings in significant capital investment or financial benefit, having considered the contract's financial obligations and their impact on the municipality's tariffs and revenue;
- A draft of the contract is publicly advertised for comment 60 days prior to the municipal council meeting where the contract will be considered for approval;
- The municipal council has considered the financial implications of the contract and any comments received on the proposed contract; and
- The municipal council has adopted a resolution on the financial benefits of the contract and authorising the municipal manager to sign the contract on behalf of the municipality.

Under a **Guaranteed Savings Contract**, the municipality pays the ESCO for the CE intervention upfront and, as a result, the financial obligations on the municipality are generally confined to a three-year period. The service provider, on the other hand, is often required to provide a guarantee to the municipality beyond a three-year period if the payback period of the intervention exceeds three years. However, since the guarantee is a financial obligation imposed on the service provider and not the municipality, Section 33 does not apply. **Shared Savings Contracts** tend to have durations longer than three years. Since the contractor (e.g. ESCO) is paid from the savings accrued from the implemented intervention(s), the contract period of a shared savings contract must exceed the length of the payback period of the intervention(s). This payback period can be less than three years, however this is not common. Section 33 of the MFMA applies to all shared savings contracts with a duration of longer than three years.

F. FINANCING: LONG-TERM SUSTAINABILITY

Financing the implementation and operations over the full lifecycle of the proposed CE intervention is crucial to ensuring the intervention's sustainability.

If the required financing expertise is not available internally, the intervention champion will need to appoint a consultant.

This section does not discuss specific financing options for CE interventions, as options available depend on the intervention's location, existing policies at the municipal level (e.g. by-laws) and the creditworthiness of the municipality.

However, in general, the following financial instruments exist:

- **Grants:** Municipalities can apply for national government (including MIG, MWIG, RBIG, EEDSM, etc) or donor grants to serve as risk-free seed capital. In return, they must meet negotiated performance targets and report to donors how the money was used.
- **Capital budgets and operating budgets:** Using existing capital or operating budgets has many advantages: funding is already on hand, there is no need to negotiate financing arrangements, and there are no interest payments. However, this financing mechanism requires significant advance planning.

- **Energy Performance Contracts:** Under a performance contract an ESCO can be used as a vehicle to raise funding for the CE intervention, allowing the municipality to finance energy-saving capital improvements with no initial capital investment⁴, and paying for them using money saved through reduced utility expenditures.
- **Traditional debt:** The municipality can apply for loans from an institutional lender or issue bonds. Bonds are well suited for CE interventions, as they allow municipalities to spread the repayment of the capital costs over several years, which means that energy savings can be used for repayments.
- **Public sector loans, rebates, and other assistance:** For example, certain government agencies, including parastatals, provide financial assistance through low-interest loans that can be paid off using energy cost savings.

- **Eskom rebates and other incentives:** Demand side management programmes allow a municipality to qualify for rebates or other financial assistance to offset the cost of implementing CE in their facilities.

Municipal officials should consider both internal and external financing strategies, beginning with the simplest way to secure funding and continuing to consider more complex ways, whilst adhering to the procedural requirements of SCM and PFMA⁵/MFMA. The risk profiles of the financing options and the potential effects these might have on the municipality's financial position are not considered in this Guide, as these needs to be analysed on a case-by-case basis.

As part of the financial planning process, municipalities need to determine the following:

- What is the extent of municipal capital resources that can be allocated to early stage project development and how much additional funding is required?
- Will the private sector be engaged for the project and what financial contribution would the private sector partner be able to make?
- What are the short-term funding needs for e.g. baseline studies, project development, upfront capital costs and resource requirements, and what are the medium- to long-term costs associated with the project, if any?

- Will the municipality need debt funding to implement the project, and what income (or savings) would the project generate that may be set aside to repay this debt?
- What is the extent of debt financing that is feasible given the credit rating of the municipality (the Municipal Finance Department should be able to assist in determining this)?

Once the options are clear to the project team, a detailed financial model should be prepared and a range of variables such as the interest rate, expected savings and other factors should be tested against the expected outcomes of the project to ensure that it is financially sustainable.

4. Though in some instances co-financing may be required.

5. Public Finance Management Act (PFMA)

G. “LIFT OFF”: 10 STEPS FOR IMPLEMENTATION

In this section, the CE project ‘takes off’
- resources are mobilised, equipment is installed,
and results are monitored.

By this stage, the champion has a clear understanding of the CE intervention, and can test and verify that the information gathered in the previous steps is correct.

This section outlines 10 actions and/or decisions needed to implement CE interventions:



Depending on the implementation option selected, certain steps may be more important than others. If, for example, an ESCO model is chosen, the project champion will focus on launching SCM processes and will not need to get directly involved in the installation.

1. Create a high-level flowchart of the CE intervention's critical success factors and associated goals

- a. Use the chart as a tool to gain an idea of the type of resources required, and at what level and which stage of the intervention they will be needed.

2. Confirm the completeness of the high-level implementation plan and programme

- a. Compare the draft high-level implementation plan and programme (see Element C) with the flowchart and adjust the plan if necessary;
- b. Add detail to the high-level implementation plan and programme, ensuring that the CE intervention starts with implementing the most cost-effective and feasible CE measures before moving on to more complex measures as the intervention matures.

3. Verify the barriers and risks described in the high-level implementation plan, and identify any additional barriers, procedures and processes that might hinder implementation

- a. The Municipal Systems Act requires an assessment of internal and external service delivery options (as defined in Section 78) if, as a result of the implementation, a municipal service is outsourced to a third party, and if this has implications for existing organisational arrangements;
- b. If municipal assets are to be leased or sold to establish a partnership, the municipality must comply with the asset disposal strategy;
- c. A municipality needs to comply with Section 33 of the MFMA if it plans to enter into a contractual commitment for longer than three years.

4. Understand resources needed, in terms of people, skills, materials, logistics support and equipment, to execute the implementation plan

- a. Identify resources that are not available internally and list resource constraints that need to be addressed through partnerships, hiring personnel, or hiring resources;
- b. Approach Human Resources to recruit personnel with relevant skills and experience to join the CE project team;
- c. The resources needed if an ESCO performance contract is used will be different because the arrangement decided on will affect the design and scope of the tender process in the following ways:
 - i. The bidder will need to conduct an investment-grade audit;

- ii. The CE project manager will need to negotiate with the bidder to agree on the energy baseline;
- iii. The bidder needs to develop a detailed monitoring and evaluation plan based on the results of the audit, in partnership with the CE project manager.

5. Approach outside stakeholders from the DoE project support office (PSO) and DEA for technical assistance, to address potential barriers and to share the implementation plan with them

6. Launch supply chain management (SCM) processes, which might include

- a. Using the results of the energy audit to ensure there is demand for the CE service provider;
- b. Developing a tender specification template;
- c. Drafting the tender documents, and ensuring the technical specifications are easy to understand. Stipulate the project technical goals, minimum energy savings requirements, sharing of savings and required services, etc;
- d. Pre-qualifying bidders that meet the minimum set of technical and financial requirements to implement the CE intervention;
- e. Inviting pre-qualified bidders to submit a comprehensive proposal and give them the results of the baseline energy assessment and energy audit;
- f. Ensuring that the proposals submitted by pre-qualified bidders contain at least the following:
 - i. Engineering design with source data, assumptions and calculations;
 - ii. Detailed construction documentation for installation;
 - iii. A preliminary assessment of energy savings: this should be a detailed document stating the cost and projected savings for each CE measure, showing energy savings calculations and stating methodologies used and assumptions made;
 - iv. Confirmed minimum and actual net present value of the proposed intervention;
 - v. Qualifications of the proposed experts;
 - vi. Financial proposal to secure funding for the CE project (only applicable for projects where the bidder will play a role in securing funds).
- g. Note that discrepancies are expected to arise between the energy audit conducted during the project's planning and baseline establishment phases and the investment grade audit conducted by the ESCO (if applicable).

These audits are performed at different levels of detail, using different methodologies to calculate savings. Calculating energy savings is not an exact science as it is based on assumptions, which is why each bidder must submit detailed calculations;

- h. Evaluating bids and ranking bidders, based on criteria specified in terms of reference (ToRs) and on value for money offered;
- i. Notifying the Bid Adjudication Committee of the bidder selection and confirming that the Bid Adjudication Committee approves of the process followed;
- j. Appointing and notifying selected bidder, provided the Bid Adjudication Committee is satisfied with the SCM tender process;
- k. Negotiating contract with selected bidder;
 - i. Decide on shared savings or guaranteed savings performance contracting model with the preferred bidder;
 - ii. Draft contracts and appendices, and incorporate the M&E plan into the final energy performance contract with the selected bidder.

7. Establish project governance structures and reporting mechanisms

- a. Establish communication channels between the CE project team and other departments, especially between implementing agents and support service departments, to troubleshoot potential SCM bottlenecks;
- b. Develop the architecture of a monitoring and evaluation (M&E) system to track progress and calculate the energy savings generated by the CE project. M&E is a subset of the evaluation process that determines the real, measurable benefits associated with the implemented CE.
 - i. If an ESCO implementation model was selected, use the protocols attached to the contract as the starting point;
 - ii. Two types of reviews should be built into the M&E system: Firstly, a regular (weekly/monthly) review that ensures that information in the system is up to date. Secondly, periodic reviews, for example, every quarter, that test whether interim goals and milestones are being met and predict the likelihood of meeting performance targets;
- c. Create and approve reporting standards and templates to provide the Council, Mayoral committee, donors and funders with information in their preferred formats as required;

8. Install new CETs at the waterworks

- a. Sequence the installation of new equipment and upgrades in a logical, systems-oriented way;
- b. Ensure professional technical oversight throughout the installation process, especially for the purposes of sign-off completion certificates;
- c. Ensure officials involved in the installation and maintenance of new technologies receive training.

9. Operate and maintain CETs at waterworks and evaluate their performance

- a. Test and update on-site management systems on a regular basis. Each large waterworks site should have a dedicated on-site technical team. Smaller sites can be clustered and managed by a unit;
- b. Gather information on energy consumption and costs from the energy management system. It is suggested that the integrity of the information is verified by a third party;
- c. Analyse verified data against defined metrics to determine CE achievements, and compare these to the performance contract guarantees.
 - i. Calculate gross and net savings compared to the energy baseline survey and established energy saving goals. Gross savings represent the changes in energy use and demand observed since implementing the CE project. Net savings are determined by accounting for energy savings from behaviour changes and/or CE projects that are external to the project in question;
 - ii. Calculate co-benefits of the CE intervention and compare to broader CE policy intentions and strategy objectives and CE intervention-specific goals. Co-benefits include avoided greenhouse gas emissions and other environmental benefits, energy price effects and job creation.
- d. Ascertain whether the CE intervention has achieved its goals at the project and individual site level, and take the appropriate remedial actions if not.

10. Create a communications plan to inform executive management and stakeholders about the results of the CE intervention

- a. Develop a communications strategy that uses different platforms (website, media, events, etc.) to inform stakeholders about the results of the CE project;
- b. Share information about the results and progress of the CE project on a regular basis to increase internal awareness and to promote increased adoption of CE.