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South African Local Government association

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Local Government Toolkit:
Financing Energy Efficiency and Renewable Energy

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1. INTRODUCTION

Owing to the challenges that have arisen with respect to national energy generation shortages and the increasing cost of electricity and fuels, municipalities in South Africa are playing an expanded role in energy management, which now includes the promotion of energy efficiency and renewable energy generation over and above their historic role of electricity distribution.

One of the main drivers of this more holistic focus on energy management by municipalities has been decreased levels of energy security in the country as a result of Eskom's difficulties in supplying sufficient electricity to meet demand. Municipalities have considerable influence over how energy is supplied and used in their areas of jurisdiction. After Eskom, local municipalities play the biggest role in distributing electricity in South Africa.

Municipalities are increasingly identifying the need to consider forms of local energy generation to protect their local economies from disruptions and have also prioritised energy efficiency so that they can assist in reducing pressure on the national grid. Municipalities have identified local provision of energy services as a key economic growth opportunity. Rather than exporting money from their local economies for the purchase of energy in the form of electricity and imported fuels, local energy generation and energy efficiency services can create local jobs.

As the South African Government has committed the country to reducing its impact on global climate through cutting carbon (or greenhouse gas) emissions by 34% by 2020 and 42% by 2025, South African municipalities are required to respond at the local level by reducing the total greenhouse gas emissions footprint within their areas of jurisdiction. Considering that electricity provision in South Africa is carbon intensive, municipalities are looking for alternative forms of energy provision and ways to reduce energy consumption that reduce their greenhouse gas footprints and help to create low carbon living and working environments.

While there are many reasons and motivations for municipalities to implement energy efficiency and renewable energy projects, the primary barrier to progress cited by municipalities across the country is a lack of access to funding.

This toolkit aims to empower all municipalities in South Africa with the knowledge and a set of practical tools to assist them in effectively raising the funds needed to implement energy efficiency and renewable energy projects.

2. MECHANISMS FOR FINANCING ENERGY INVESTMENTS

The purpose of this section is to present a suite of mechanisms that are currently available for financing energy efficiency and renewable energy investments. In preparing this toolkit, a number of additional mechanisms were identified which have not been included as they were either not currently available in South Africa or are not feasible given current conditions. However, if these conditions change, more options may become available in the future.

While the focus of the toolkit is on funding mechanisms available to local government for financing energy investments, a number of additional mechanisms have been included in the toolkit which may be more relevant to local residents and businesses.

This does not however mean that local government has no role to play in assisting local residents and businesses in accessing these financing mechanisms, particularly if the municipality intends to pursue a reduction in the municipal total energy demand and greenhouse gas footprint. The role that local government can play for each of the identified financing mechanisms is discussed in the tables that follow. Note also that some of these financing mechanisms may even result in a revenue loss for local government through reduced electricity sales.

The following financing mechanisms are grouped into four categories, namely external funding, internal funding, incentives and partnerships, and regulation.

2.1 External Funding

Mechanism	Description	Examples	Strengths	Weaknesses	Municipality's role
Grants	Non-repayable funds made available by a government department, donor funder or the private sector.	EEDSM programme Green fund Donor funding from foreign countries	The most accessible form of funding for municipal EE / RE initiatives. Provides a municipality with access to its own energy efficiency or renewable energy fund. Can custom-make the application of the fund to serve the needs of the municipality. If the municipality can demonstrate a good track record, future funding opportunities increase. There is replicability and peer-learning between municipalities.	Access to these funds tend to be highly competitive and hence not easily accessible. Funds tend to have a short-term time horizon seeking to address a multitude of objectives. Funding often for pilot projects - not roll-out. Municipality may not have the capacity, skills or experience to implement. If the municipality demonstrates a poor implementation track record, then they may lose future funding opportunities.	Municipality applies for funds, which often implies preparing and submitting a proposal to funding agents. If successful, municipality implements the project subject to the specified terms. On-going monitoring and evaluation of project. Reporting on project achievements, sharing learnings with other municipalities etc.
Loans	Borrowing money from the private/ financial sector.	Commercial banks e.g. Standard bank DTI Manufacturing Competitiveness Enhancement Programme (MCEP) IDC & Kfw Green Energy Efficiency Fund (GEEF) French Development Bank (AFD) Sustainable Settlements Facility (SSF) The Development Bank of Southern Africa (DBSA)	Can provide funding for upfront costs, particularly if the payback period is short. Often loans from the foreign funders have reduced / lower interest rates than local commercial banks. The fund can be custom-made to serve the need of the user.	Municipalities may choose not to take loans for EE / RE initiatives unless the financial benefits can be clearly defined in relation to the loan repayment criteria. Municipalities cannot provide loans to the private sector due to restrictions imposed by the MFMA. Fund will have to be repaid with interest. Securing the funds could take a long time and be associated with high transaction costs. A municipality can borrow funds to implement projects only if it can demonstrate the ability to repay the loan.	Providing the relevant information to industry and other partners concerning the options available. Assisting the private sector in finding and negotiating the terms of the finances, as well as implementing the project. Facilitator / mediator between users and loan financers - see Olievenhoutbosch Project in Tshwane.
Carbon Trading	Sale of Certified Emissions Reductions (CERs), and/ or Verified Emissions Reductions (VERs) credits to co-finance EE / RE project.	Kuyasa CDM Project Marianhill / Bisasaar Rd Landfill gas-to-electricity projects	Can provide valuable co-financing for EE / RE projects. Has marketing and/or labelling benefits.	High transaction cost for achieving certification and paying for ongoing verification. High barriers to entry in certification and compliance reporting - cumbersome and complex process. Requires projects of sufficient scale to implement. Certification can be expensive, take a long time and require highly specialised knowledge. Viability dependent on the market price one can obtain for the product - in the case of carbon this is highly variable. Need to be able to prove that the project will not be feasible without the revenue from carbon credit sales (something called "additionality") - this can be a major stumbling block in the certification process.	Identify, initiate and facilitate projects. Likely to carry the transaction costs of certification. Some of the activities could be assigned to third parties at the cost of the municipality. Long term commitment to monitoring and verification costs and expertise required.

2.2 Internal Funding

Mechanism	Description	Examples	Strengths	Weaknesses	Municipality's role
Municipal fiscus	Motivation for allocation of municipal funds (generated by the municipal rates base, and user charges for municipal utilities) for EE / RE initiatives.	EE and RE projects motivated through and included in municipal: • IDP • SDBIP • Sector Plans • Project Business Plans.	Very direct impact with high visibility. Strong demonstration effect. Municipality can offset the cost of implementation with internal savings from reduced grid electricity consumption in its service delivery infrastructure and administrative buildings. Reduced operating costs in the medium to long term, helping to ensure sustainable service delivery. Renewable energy generation within the municipality's own infrastructure can help to enhance the security of supply of essential services (e.g. wastewater treatment).	Limited budget available in most municipalities. EE / RE may be a low priority for many municipalities which see their primary mandate as delivering basic services. Cost savings cannot necessarily be ring-fenced to recover costs of initial implementation.	Identification of feasible EE / RE projects with a reasonable payback period that can be motivated for internal funding. 'Piggy back' energy efficiency projects onto other capital and infrastructure maintenance projects for which funding is secured.

2.3 Incentives and Partnerships

Mechanism	Description	Examples	Strengths	Weaknesses	Municipality's role
Structured user charges	User charges are a form of payment for the use of resources, infrastructure, and services. Municipalities can structure charges in such a way that they influence behaviour i.e. incentivise peak load shifting, energy efficiency and use of renewable alternatives.	Time of use energy tariffs, block pricing for water and electricity.	Municipalities can structure charges in such a way that they influence behaviour in the desired manner.	Extra revenue generated may not be able to be ring-fenced and used to fund EE / RE initiatives. Difficult to introduce new charges where there are no alternative services / resources that low income users can switch to. Unintended consequence may be loss in revenue for municipality (e.g. through reduced consumption of electricity). Can have unintended consequences for low-income households e.g. inclining block tariffs. High costs associated with the installation of new meters across the customer base.	Municipality has to develop, implement and enforce the charges. Municipality has to develop user charges in consultation with residents and businesses to ensure their buy-in. Regularly revising charges to ensure that they cover actual costs of providing services and incentivise the kinds of behaviours desired.
Eskom rebate	Rebate received on the purchase and installation of selected energy efficiency / renewable energy products.	For households: • Solar Water Heaters • Heat pumps. For businesses: • Standard product • Standard offer • ESCO funding • Customer model.	Very direct impact with high visibility. Strong demonstration effect.	Subject to Eskom having the finance available to implement. Administrative process is long and can be cumbersome, particularly monitoring and evaluation post installation. Municipality may not have necessary skills or budget to design project and apply for rebate, and undertake the required monitoring and verification (usually required at their own cost). Rebate programmes tend to be very selective, earmarking only certain technologies and excluding others. Implementation only by certified ESCOs, which can be problematic if there are none or few in the area. This also poses a problem for municipal procurement processes. Rebates only valid for a limited period.	Providing the relevant information to residents and businesses / industry, as well as other partners concerning the rebate options available. Assisting residents and businesses / industries in finding and then applying for the rebate, directly or indirectly through ESCO - see Shisa Solar Programme. Applying for the rebate for municipal infrastructure retrofits / upgrades as may be feasible, and implementing the projects and associated monitoring and verification requirements.

Mechanism	Description	Examples	Strengths	Weaknesses	Municipality's role
Tax rebate	Business and industries are entitled to claim a tax deduction for substantiated energy efficiency savings.	Manufacturing-related projects with a 10% energy demand reduction component. Energy efficiency projects that reduce energy use.	Available to qualifying industries in all municipalities. No direct cost to Municipality.	Option not available to municipalities. Municipalities do not have any control over whether the private sector will make use of the rebate or not. Rebates only valid for limited period.	Providing the relevant information to the private sector and other partners concerning the rebate options available.
Performance contracting	Initial improvements identified, implemented, and paid for by service provider. Percentage of savings made is paid to service provider to cover initial costs and maintenance. Alternatively the improvements are paid for by the municipality and the service provider is required to guarantee the savings will be achieved and pay the difference if the expected savings are not achieved.	SABC & Johnson Controls City of Cape Town	Visible and immediate benefits for all parties. Easy to implement and operate. Incentive for contractor to maximise energy savings achieved by the project as income is a percentage of these cost savings, but also to limit the costs of installation thereby maximising cost efficiency. Municipality does not have to have in-house capacity and expertise for successful implementation – contracted third party usually uses their team of specialists. Often includes maintenance during the contract period - no additional burden on municipal staff.	Requires significant foresight and vision to identify the project and craft the contract. Could be time-consuming and lead to delays as parties negotiate the terms of the contract. Transaction costs can be high, with a significant percentage of savings going to the contracted third party. These kinds of contracts are usually longer than three years and will thus involve additional procedures in order to comply with the MFMA.	Providing the relevant information to industry and other partners concerning the options available. Facilitating the implementation of projects using a performance contracting model. Appointing Monitoring and Verification specialists to check and report on energy savings achieved.
Public-Private Partnerships (PPPs)	Long-term contractual agreements between a private operator/company and a public entity, under which a service is provided, generally with related investments by both private and public sector partners.	Installation of small-scale renewable energy alternatives (Working for Energy) Johannesburg and EnergSystems - Waste to energy initiatives. Olievenhoutbosch Housing Project	Can secure long-term and substantial financial support, particularly for large and complex projects. Can inject external expertise into the ambit of the municipality operating context. Municipality can achieve desired outcomes (e.g. renewable energy generation, reduced carbon emissions) without having to carry the full costs of installation and operation.	Very high barriers to entry and transaction costs with the establishment of PPPs. Cumbersome, complex contracting process requiring substantial legal expertise. Requires projects of sufficient scale to implement. Poor performance of private sector partner creates liability and costs for the municipality.	Identify projects, initiate and facilitate process. Likely to carry the transaction cost. Some of the activities could be assigned to third parties at cost to the municipality.
Facilitation / support	Municipality supporting third-party implementing agents.	Solar Water Heater roll-out in eThekwini, Nelson Mandela Bay, City of Cape Town and Ekhurhuleni. Renewable Energy Independent Power Producer Programme (REIPPP) projects.	Low cost to the municipality, but with significant savings to industry and households.	Municipality needs competent partners and service providers to work with. Existing EE / RE rebate / incentive programmes are usually needed to make the project work. Cost to municipality can be high if uptake is slow.	Municipality to identify potential programmes, commence with marketing, dissemination of information, and facilitation of the implementation process. All or parts of the process can be contracted to third parties. Planning approvals and environmental management support for REIPPP projects being implemented in the municipal area.

Mechanism	Description	Examples	Strengths	Weaknesses	Municipality's role
Power Purchase Agreements (PPA)	Municipality agree to purchase power from an independent power producer (IPP) or embedded power generation (EPG) facility.	Mbombela Municipality and Friedenheim Irrigation Board	Increased surety of electricity supply. Opportunity for cost-cutting if production costs are lower than Eskom Tariffs. Opportunity to promote the establishment of renewable energy generation projects locally with associated socio-economic benefits.	Tariffs cannot exceed Eskom rates, so the rate of return may be unfavourable for energy producers. MFMA makes the process of municipalities entering into contracts of longer than 3 years complex. Independent power producers would typically look for a 20 year contract. Technical challenge to connect independent power producer to network. Does not become a funding source for municipal EE / RE initiatives.	Municipality can identify projects, partners, and draft contracts for PPA. Long-term purchasing of energy.
Wheeling Agreements	Municipality allows energy producer to distribute electricity to buyers using the municipal grid.	Amatola power	Small amounts of revenue can be generated by the municipality by allowing producer to use municipality's grid. Opportunity to promote the establishment of renewable energy generation projects locally with associated socio-economic benefits.	Revenue loss for municipality through reduced electricity sales. Not a funding source for municipal EE / RE initiatives.	Provide relevant information to industry / residents / businesses, as well as other partners concerning available options. Establish wheeling agreements to facilitate producers using the municipal grid.
Voluntary Energy Conservation Agreements	Formal negotiated agreements between groups / agents and the government to limit the over use or encourage sustainable management of energy supplies.	Agreement with large energy users to reduce their usage during peak periods or to make a percentage reduction in energy use to avoid emergency load shedding. South Africa's Voluntary Energy Efficiency Accord	Very powerful demonstrative effect. Can lead to self-policing and highly efficient reduction in energy use. Changing behaviour of big industry can reduce the burden on the network, and their operating costs - e.g. running night shifts to take advantage of reduced electricity tariffs. Can provide starting point for mainstreaming energy efficiency within an organisation. Reduced load on network - fewer outages, load shedding etc.	Process could be hijacked by individuals and/or powerful lobby groups. It could only be a paper-based exercise without implementation follow-through Long and protracted processes to determine the agreements with high transaction costs. Monitoring and evaluation tends to be time consuming and costly, leading to inefficiencies. Not a funding source for municipal EE / RE initiatives. Loss of revenue for municipality through reduced electricity sales.	Municipality will have to identify projects, partners, and draft agreements, and/or outsource that function to third parties such as renewable energy service providers.
Environmental certification	Voluntary compliance with principles and standards recognised as being sustainable/ responsible. Compliance assessed by third party. Incentives for certification largely market driven.	Energy Efficiency Leadership Network (EELN) ISO 500001 SANS energy efficiency standards National greenest municipalities award Green Star Ratings for buildings	Likely to be among the cheapest and most efficient options available. Will generate a "team effect" in the sense that "together as a municipality and industry we can change things for the better." Positive marketing benefits / opportunities.	Third-party evaluation could be expensive. Monitoring and evaluation (compliance-related issues) likely to be complex and difficult. Not a funding source for municipal EE / RE initiatives. Loss of revenue for municipality through reduced electricity sales.	Municipality may have to identify / develop certification system, including its terms, rewards and implement the system. All or parts of the process can be contracted to third parties.

Mechanism	Description	Examples	Strengths	Weaknesses	Municipality's role
Green Energy Certificates / Green Power Tariff	Consumers voluntarily pay more for green power and this additional money is used to invest in green power developments or passed onto a green power seller.	eThekwini Green Power Tariff Cape Town Green Energy Certificates	Purchasers can use credits for carbon footprint / sustainability reporting. Energy producers receive additional income, improving the financial viability of projects. Can be a funding source for municipal EE / RE initiatives.	Likely to be slow uptake with increasing electricity prices as business and private consumers don't have additional disposable income to pay more for power. Likely to become irrelevant in future as South Africa reduces its carbon intensity of electricity.	Municipality can develop a tariff / certificate structure and implement it, including the promotion thereof.

2.4 Regulation

Mechanism	Description	Examples	Strengths	Weaknesses	Municipality's role
Non-compliance charges	A fee imposed on a user who does not comply with energy efficiency requirements and regulations.	Municipal by-laws Nation-building requlations.	Can create local demand, which if taken advantage of, can result in local economic development - local manufacturing and servicing. Municipalities can use by-laws and National Building Regulations to influence behaviour, i.e. incentivise the use of energy efficient and renewable alternatives.	Monitoring and evaluation tends to be time consuming and costly, and hence leads to inefficiencies. Municipality may not have the capacity or required expertise to enforce. Revenue collected from fines may not be able to be ring-fenced and used for EE / RE initiatives.	Municipality could develop a fee structure, implement it, including the costs of monitoring / evaluation and enforcement. The process of developming the fee could be contracted to third parties, but the implementation and the enforcement will remain the municipality's responsibility.

3. ASSESSING WHICH FINANCING MECHANISM TO USE

This section presents an evaluation of the financing mechanisms detailed in Section 2, based on a set of financial, socio-economic, environmental, institutional, and policy criteria. For each of the financing mechanisms, the extent to which they satisfy the criteria is rated using the scores below:

Importantly, while some financing mechanisms are good for society (i.e. they meet the majority of criteria), they may not necessarily align with the priorities of the municipality. The municipality therefore needs to prioritise the criteria based on their obligations, then select the financing mechanisms which meet these priority criteria.

☺	• Very good at meeting this criterion • Limited uncertainty and risk • The level of effort will be rewarded by the returns.
☺	• Good at meeting this criterion.
😐	• Moderately good or bad at meeting this criterion • Outcome is uncertain as it is case dependent.
☹	• Not good at meeting this criterion • Consider carefully and avoid risks.
☹	• Little or no contribution to meeting this criterion • Very uncertain and risky outcome • The level of effort might not be rewarded by the returns.

	FINANCIAL			ENVIRONMENTAL		SOCIO-ECONOMIC			INSTITUTIONAL	POLICY
	Transaction and administrative costs in relation to the benefits	The certainty of the financing option	Requirement to repay the funds	Benefits to environment and human health	Impact on polluting behaviour	Impact on businesses / the local economy	Socio-economic impact at the household level	The likely popularity of such an intervention with the general public	The ease at which these measures can be implemented and enforced	How well the money raised achieves EE / RE policy objectives
External Funding										
Grants	😐	☹	🙂	🙂	😐	🙂	🙂	🙂	🙂	🙂
Loans	☹	☹	☹	🙂	🙂	😐	😐	☹	🙂	🙂
Carbon Trading	☹	☹	🙂	🙂	🙂	🙂	🙂	🙂	☹	🙂
Internal Funding										
Municipal fiscus	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂
Incentives and Partnerships										
Structured user charges	☹	😐	🙂	😐	🙂	☹	☹	☹	🙂	🙂
Eskom rebate	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂
Tax rebate	🙂	🙂	🙂	🙂	🙂	🙂	😐	🙂	🙂	😐
Performance contracting	😐	🙂	🙂	😐	🙂	🙂	🙂	🙂	😐	🙂
Public-Private Partnerships (PPPs)	☹	🙂	🙂	🙂	😐	🙂	🙂	🙂	☹	🙂
Facilitation / support	🙂	😐	🙂	🙂	😐	🙂	🙂	🙂	🙂	🙂
Power purchase agreements (PPA)	😐	😐	🙂	🙂	😐	🙂	😐	🙂	😐	🙂
Wheeling	🙂	😐	🙂	🙂	😐	🙂	😐	🙂	😐	🙂
Voluntary agreements	🙂	😐	🙂	🙂	🙂	🙂	😐	🙂	🙂	🙂
Environmental certification	☹	☹	🙂	🙂	🙂	🙂	😐	🙂	😐	🙂
Green energy certificates / Green power tariff	🙂	😐	🙂	🙂	😐	😐	😐	🙂	🙂	🙂
Regulation										
Non-compliance charges	😐	☹	🙂	🙂	😐	🙂	🙂	🙂	🙂	🙂

4. TOOLS FOR UNLOCKING PROJECT FINANCING

4.1 The Project Business Plan

4.1.1 Why are Project Business Plans Important?

When motivating for funding for energy projects, having a solid Project Business Plan is a critical requirement. Funders (whether internal or external to the municipality) will look to this plan for an understanding of the technical and organisational aspects of the project, what it aims to achieve, its feasibility (financial, technical, social and environmental), who will be involved and who will benefit, and the risks associated with the project (and how these can be managed). Project Business Plans produced by government should, in addition, explain how the particular project contributes towards the broader goals of the municipality – for example in terms of aims of the municipal Integrated Development Plan (IDP), or national policy directives that the municipality needs to respond to.

A well-written, thorough Project Business Plan sends a strong message to funders that the project applicant is serious about the project, and that they have thoroughly thought through and planned the project.

4.1.2 What should a Project Business Plan Contain?

There is no hard and fast rule for what a Project Business Plan must contain. Different funders may have specific requirements for what needs to be presented to them in a Business Plan, or how certain information must be articulated. Generally, however, Project Business Plans will contain the following components:

A. EXECUTIVE SUMMARY

The executive summary is a **short and concise** section that summarises the main elements of the Business Plan in such a way that readers can rapidly become acquainted with the large body of material contained within it without having to read it all. It will usually contain a brief statement of the project, contextual information, a concise analysis of project feasibility and risks, as well as the main conclusions / recommendations of the Plan. It is intended as an aid to decision making by potential funders and has been described as possibly the most important part of a Business Plan. It must be short and to the point.

B. INTRODUCTION

The Introduction sets the context for the rest of the Business Plan by stating succinctly WHAT the project is about, WHO is involved and WHY its being proposed / implemented:

- Who is proposing the project, including any partners that are already involved,
- What the project is aiming to achieve (i.e. primary goals / outputs), and
- Why the project is being undertaken, and
- Why it's important.

The Introduction must also state what the purpose of the Business Plan is (e.g. to support an Application for Funding from a foreign donor).

C: PROJECT CONTEXT

This section explains the context of the project in terms of how it will contribute towards meeting local, regional or national energy and climate protection targets, environmental protection and / or social equality aims, and financial sustainability obligations. In some cases this section may also refer to how the project will assist a municipality meet its statutory obligations in terms of service delivery or legal compliance with national building regulations etc.

D. PROJECT DESCRIPTION

This section needs to describe in as much detail as possible the exact nature of the project. This needs to include a statement of the WHAT, WHERE, WHEN and HOW:

- What the aims and / or goals of the project are (e.g. to reduce current electricity consumption in targeted buildings by 30%),
- What the project will involve (e.g. energy efficiency retrofit in municipal buildings), including the scope and extent of the project (e.g. 10 buildings with a total square meterage of 6,000m^2 will be retrofitted),
- Where the proposed project is to be located,
- Exactly how the project will be implemented, e.g.:
  - what technologies will be utilised (e.g. LED lights, heat pumps and hydroboils will be retrofitted),
  - where the equipment and materials will be sourced from (e.g. locally produced or imported),
  - who will implement the project, and who will benefit from the project (and how they will benefit),
  - the timeframes of the project – projected start and end dates.

E. PERMITS AND LICENSING

Should the project require any permits or licenses, such as Environmental Authorisations, Water Use Licenses, Air Emissions Authorisations or Permits, these should be detailed here. The timeframes for obtaining such permits and licenses need to be explained.

F. ORGANISATIONAL PLAN

The organisational plan needs to spell out how the project will be set up institutionally, what human resources will be needed to drive, coordinate and operate it, what skills requirements there are, and how the project will address skills development and transfer where required. A project organogram should be included that clearly defines the human resources needed for implementation of the project, the reporting structures and reporting lines within the project.

G. FINANCIAL PLAN

The project financial plan needs to clearly articulate the capital and operational investment requirements of the project, as well as the projected returns (see example below). It is in this section of the Business Plan that the **financial feasibility** (See section 4.2) of the project needs to be clearly demonstrated. Any proposed investment structures (e.g. as in Public Private Partnerships) need to be clearly defined in this section of the Business Plan.

The financial plan must present the overall financial picture for as long as is relevant to the project. If a project has an eight year lifespan, the financial plan must be presented for the entire lifespan of the project. However, if a project is to be implemented and has an indefinite lifespan, the financial plan needs to present at least a 3 to 5 year time horizon.

Financial plans prepared for businesses and profit-making projects will usually include a statement of the projected "Internal Rate of Return" (IRR), which is the discount rate at which the net present value (NPV) of costs (i.e. negative cash flows) of the investment equals the net present value of the benefits (i.e. positive cash flows) of the investment - or in other words, the rate at which an investment breaks even. IRR calculations are commonly used to evaluate the desirability of investments or projects. The higher a project's IRR, the more desirable it is to undertake the project. Assuming all projects require the same amount of up-front investment, the project with the highest IRR would be considered the best and undertaken first.

Example of a financial Plan for Small-scale Solar Energy Generation Project	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
COSTS						
Capital Costs						
Purchase of equipment	R1,500,000					R1,500,000
Costs of Certification	R800,000					R800,000
Installation Costs - labour	R450,000					R450,000
Installation Costs – plant hire	R450,000					R450,000
Operating Costs						
Annual service of equipment		R50,000	R55,000	R60,500	R66,500	R232,000
Replacement of parts			R5,000	R10,500	R16,500	R32,000
Monitoring & Verification		R20,000	R22,000	R24,200	R26,620	R92,820
TOTAL COSTS	**R3,200,000**	**R70,000**	**R82,000**	**R95,200**	**R109,620**	**R3,556,820**
OPERATING INCOME						
Sales of electricity generated		R400,000	R440,000	R484,000	R532,400	R1,856,400
TOTAL INCOME		**R400,000**	**R440,000**	**R484,000**	**R532,400**	**R1,856,400**
ANNUAL NETT PROFIT / LOSS (income - costs)	**- R3,200,000**	**R330,000**	**R358,000**	**R388,800**	**R422,780**	**- R1,700,420**
ACCUMULATED PROFIT / LOSS	**- R3,200,000**	**- R2,870,000**	**- R2,512,000**	**- R2,123,200**	**- R1,700,420**	

For public entities like municipalities, IRR may be used to select which investments to undertake, but usually Cost-effectiveness, Payback period or Benefit-cost Analysis is used instead (see Section 4.2). Some financial institutions may, however, require the IRR to be presented in a Business Plan. The calculation of NPV and IRR is complex – unless you have studied accounting or economics. Fortunately, modern versions of Microsoft Excel and other spreadhseet programmes contain built-in formulae that calculate NPV and IRR for you. It is therefore suggested that Financial Plans be crafted in such a spreadsheet programme in order that any necessary financial analyses can be performed using the "financial formulae" functions.

H. SWOT ANALYSIS

The inclusion of a "Strengths, Weaknesses, Opportunities and Threats" analysis is an optional component of the Business Plan. Owing to the fact that SWOT analyses in Business Plans are conducted by the proponent of the project, most funders will not pay a significant amount of attention to the content, and will do their own SWOT analysis of the project when considering whether to fund it. It is, however, a useful exercise to do a SWOT analysis when planning a project, as the deeper understanding of the project that is gained often assists in preparing other sections of the Project Business Plan.

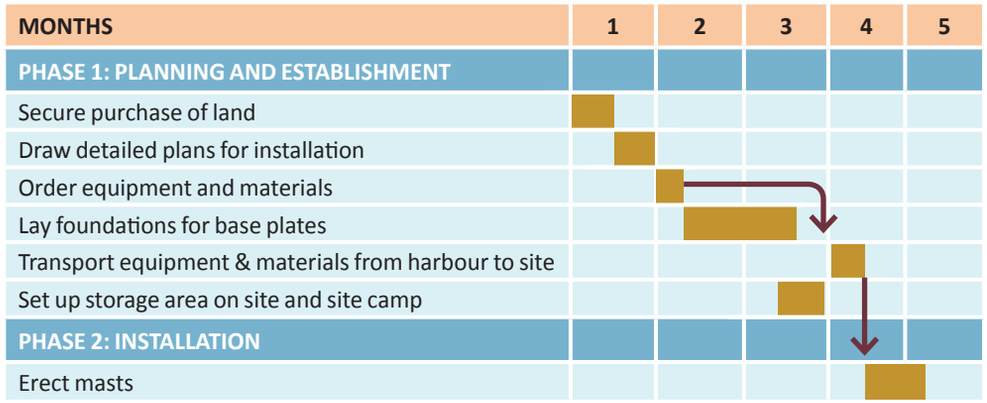
- **Strengths:** are current strong points about the project that are known. They may include the fact that the municipality has strong institutional capacity and financial backing for the project; or that there is significant technical expertise for the project within the municipality.
- **Opportunities:** are potential future strengths that are anticipated. An example may include an identified opportunity to sell electricity generated by a renewable energy project to an industry. As this deal has not yet been struck it is presented as an opportunity rather than a strength.
- **Weaknesses:** these are known / existing weak points in the project or project plan. For example that the technologies required for a certain project can only be sourced from overseas, which may mean spare parts are not readily available.
- **Threats:** these are identifiable future weaknesses or risks that may affect the viability or performance of the project.

I. RISK ANALYSIS

This section must describe all potential risks (technical, logistical, financial, human resources / skills etc.) that may result in the project failing. The measures that the project owner / developer will put in place to address these risks must also be described. It is important that when preparing this section that honesty prevails – a funder that can spot obvious financial, technical or other risks in the project that are not included in the Business Plan will begin to doubt whether the project has been properly thought through.

J. PROJECT PROGRAMME

The Project Programme must illustrate the expected duration of various phases of the project, from planning to contracting, construction, certification, operation and monitoring and verification. An example is presented below:



4.2 Establishing the Financial Feasibility of a Project

Whilst for some government projects financial feasibility is not a critical aspect in motivating for funding (e.g. implementation of social services to enhance human well-being), the question of financial feasibility is usually asked in respect of energy efficiency and renewable energy projects because these are not always seen as being related to local government's basic services delivery mandate. By being able to demonstrate that an energy project is financially feasible (i.e. the monetary savings / returns from the project outweigh the costs of implementing it), local government project managers find themselves more able to motivate for funds to be directed towards such projects both from internal sources and from external funders.

In order to establish the financial feasibility of a project, the following three basic methods can be used:

1. The Payback period;
2. The Cost-effectiveness method;
3. A Benefit-cost analysis.

These three methods will be discussed briefly in the pages that follow.

4.2.1 Payback Period

The payback period method refers to the duration, either in months or years that it will take to recover the cost of an investment through either fees, charges or other form of income; or cost savings. Examples are presented below.

EXAMPLE 1: Fees, charges, or another form of income.

A municipality proposes to install Solar Water Heaters (SWHs) at 100 households. The total capital cost of the project is R 1,000,000. Each recipient of a SWH is expected to pay a monthly instalment of R200 until they have repaid the cost of their SWH (R 10,000), interest free.

Calculation of the repayment period:

- Capital cost = R 1,000,000
- Capital repayment fee = R 20,000/month (R 200/month x 100 beneficiaries)
- Repayment period = R 1,000,000 / R 20,000 = 50 months (or 4.2 years).

Usually the shorter the repayment period, the better an investment option is.

EXAMPLE 2: Cost savings (i.e. a reduction in cost, due to the capital investment).

The electricity consumption of traffic lights costs the municipality R 150,000 a month. The municipality then retrofits all its traffic lights with energy efficient LEDs, at a cost of R 1,000,000. This reduces the energy consumption of traffic lights and the associated monthly electricity cost to the municipality by 67% - from R150,000 to R 50,000 per month.

Calculation of the repayment period:

- Capital cost of the project = R 1,000,000
- Operational cost before the project = R 150,000/month
- Operation cost after the project = R 50,000/month
- Cost avoided or saved as a result of the project = R 100,000/month
- Repayment period = R 1,000,000 / R 100,000 = 10 months (or < 1 year).

Usually the shorter the repayment period, the better an investment option is.

4.2.2 Cost-Effectiveness Method

The cost-effectiveness method is mostly used to identify which option, among two or more, is the best when they either have the same benefits or the benefits are unknown or undefined. Example 3 shows how the cost-effectiveness of a project can be calculated.

EXAMPLE 3: Cost-effectiveness.

The municipality decides to embark on a programme to replace old incandescent light bulbs with new LED lights in all their buildings. They have been provided with three quotes from three suppliers and have to take a decision as to which of them is the best option:

Quote 1: The import of 10,000 LED light bulbs (20 Watt each), which will last 200 hours each, at a cost of R 500,000.
Quote 2: Buying 10,000 LED light bulbs (20 Watt each) from a local producer, which will last 500 hours each, at a cost of R 1,000,000.
Quote 3: Buying 25,000 LED light bulbs (15 Watt each) from a local producer, which will last 500 hours each, at a cost of R 1,000,000.

While Quote 1 is the lowest in price, it may not be the most cost-effective. In this example, Watt hours (Wh) per Rand will be used to determine the cost-effectiveness of the three quotes received:

Quote 1: The total energy produced, in terms of light, is 40 million Wh (10,000 LEDs x 20 W x 200 hours). If the total cost is R 500,000, 80 Wh is produced for every Rand spent (40 million Wh / R 500,000).
Quote 2: The total energy produced, in terms of light, is 100 million Wh (10,000 LEDs x 20 W x 500 hours). If the total cost is R 1,000,000, 100 Wh is produced for every Rand spent (100 million Wh / R 1,000,000).
Quote 3: The total energy produced, in terms of light, is 187.5 million Wh (25,000 LEDs x 15 W x 500 hours). If the total cost is R 1,000,000, 187.5 Wh is produced for every Rand spent (187.5 million Wh / R 1,000,000).

Thus, in terms of cost-effectiveness, Quote 3 is by far the best as one will get 187.5 Wh for every Rand spent, whereas with Quotes 2 and 1, one would only get 100 Wh and 80 Wh per Rand spent respectively.

4.2.3 Benefit-Cost Analysis

The benefit-cost analysis method is usually used when both the benefits and costs of a project are known. Such an analysis compares the benefits, often over time, with the cost of a project. If the benefits exceed the costs, then the project is deemed feasible. If not, then the project is not feasible. Examples 4 and 5 below illustrate this method.

Benefit-Cost Analyses can be undertaken from a number of stakeholder perspectives. In most cases, if the municipality is conducting the Benefit-Cost Analysis, financial feasibility from the municipality's own perspective will be the primary focus. In other cases, the municipality may undertake a Benefit-Cost Analysis of a project from the perspective of another stakeholder group, e.g. Benefits vs Costs of installing solar water heaters to reduce household energy consumption and associated costs. Here, the municipality would try to determine whether the solar water heater project would be a good investment from a homeowners perspective, and not necessarily from the municipality's own perspective, as the municipality may incur losses from reduced electricity sales. But in order to encourage homeowners to reduce their peak hour energy consumption and help the municipality shift peak load, such a Benefit-Cost Analysis would be an important exercise to determine whether the municipality should encourage homeowners to switch to solar water heaters.

EXAMPLE 4: Benefit-cost analysis.

The municipality proposes to implement an energy efficiency project with a capital cost of R 10 million. The life span of the project is 8 years. It is assumed that the municipality will be able to recover R 750,000 per annum from beneficiaries of the project, starting in Year 2. While it is assumed that there will be no inflation, the municipality's discount rate is 8%, meaning that the value of money, or the purchasing power of money, depreciates (or reduces) at 8% a year.

The benefit to cost ratio is calculated as follows:

- Value of the benefits: R 4,037,256 (R 750,000 x 7 years, discounted at 8% per annum).
- Value of the costs: R 10,000,000.
- Thus, the benefit-cost ratio is 0.40 (R 4,037,256 / R10,000,000).

As each R 1 of cost is only generating R 0.40 worth of benefits, the project is not financially viable.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	TOTALS
Cost	R 10 000 000								R 10 000 000
Benefit	R 0	R 750 000	R 750 000	R 750 000	R 750 000	R 750 000	R 750 000	R 750 000	R 5 250 000
Depreciated benefit at 8% / annum		=750,000 / 1.08	=750,000 / 1.16	=750,000 / 1.24	=750,000 / 1.32	=750,000 / 1.40	=750,000 / 1.48	=750,000 / 1.56	
	R 0	R 694 444	R 646 551	R 604 838	R 568 181	R 535 714	R 506 756	R 480 769	R 4 037 256

EXAMPLE 5: Benefit-cost analysis.

The municipality proposes to implement an energy efficiency project with capital cost of R 10 million, and an annual operational cost of R 100,000 (increasing at 8% a year). The life span of the project is 8 years. It is assumed that the municipality will be able to recover R 2,500,000 per annum from beneficiaries of the project, starting in Year 2. While it is assumed that there will be no inflation, the municipality's discount rate is 8%, meaning that the value of money, or the purchasing power of this income, depreciates at 8% a year.

The benefit cost ratio is calculated as follows:

- Value of the benefits: R 13,457,523 (R 2,500,000 x 7 years depreciating in value at 8% per annum).
- Value of the costs: R 10,924,000 (R 10,000,000 + R 924,000).
- Benefit cost ratio is R 1.23 (R 13,457,523 / R10,924,000).

As each R1 of cost is generating R1.23 worth of benefits, the project is financially viable.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	TOTALS
Cost (capital)	R 10 000 000								R 10 000 000
Cost (operational) increasing @ 8% / annum		R 108 000.00	R 116 000	R 124 000	R 132 000	R 140 000	R 148 000	R 156 000	R 924 000
Benefit		R 2 500 000	R 2 500 000	R 2 500 000	R 2 500 000	R 2 500 000	R 2 500 000	R 2 500 000	
Benefit Depreciation @ 8% / annum		=2,500,000/1.08	=2,500,000/1.16	=2,500,000/1.24	=2,500,000/1.32	=2,500,000/1.40	=2,500,000/1.48	=2,500,000/1.56	
		R 2 314 814.81	R 2 155 172	R 2 016 129	R 1 893 939	R 1 785 714	R 1 689 189	R 1 602 564	R 13 457 523

4.2.4 Conclusion

In most cases it is possible to use a combination of methods, like benefit-cost analysis and payback period, or payback period and cost-effectiveness. Using a combination can often assist in leading to more informed decisions. An advantage of doing financial appraisal is the realisation that cost and value is not the same. Value can either be in the service (i.e. the amount of Wh of service by the light bulbs purchased) or in the benefit one can derive from it in terms of a resale. It is often better to have a value focus than a cost focus as this assists in determining the best/optimal and/or most effective option.

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6. GLOSSARY – ACRONYMS AND TECHNICAL TERMS

Additionality	Additionality is the requirement that the greenhouse gas emissions after implementation of a CDM project activity are lower than those that would have occurred in the most plausible alternative scenario to the implementation of the CDM project activity.
CDM	Clean Development Mechanism (under the Koyoto Protocol)
CER	Certified Emissions Reduction
EE	Energy Efficiency
EEDSM	Energy Efficiency Demand Side Management
EPG	Embedded Power Generation
ESCO	Energy Services Company
FBE	Free Basic Electricity
GHG	Greenhouse gas
IDP	Integrated Development Plan
IPP	Independent Power Producer
IRR	Internal Rate of Return: the rate of interest that it would take to turn the value of an investment today, to zero in the future; i.e. the rate at which it takes an investment to break even.
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light emitting diode
M&V	Monitoring and Verification – this is a formal term used to describe the process by which projected energy savings are measured and verified in order for financial rebates and incentives to apply. This term is also used for carbon trading projects where estimated carbon emissions reductions are measured and verified.
MFMA	Municipal Finance Management Act (Act 56 of 2003)
MW	Megawatt
NPV	Net Present Value: compares the value of a Rand today to the value of that Rand in the future, taking inflation and returns into account – to evaluate the profitability of a project/investment.
Payback Period	The period of time required to recoup the funds expended in an investment, in the case of energy investments this is usually as a result of the investment resulting in reduced electricity costs and the time taken for the cost savings to balance with the investment amount.
PES	Payment for Ecosystem Services
PPA	Power Purchase Agreement
PPP	Public Private Partnership: SA law defines a PPP **as** a contract between a public sector institution/municipality and a private party, in which the private party assumes substantial financial, technical and operational risk in the design, financing, building and operation of a project.
PV	Photovoltaic
RE	Renewable Energy
REIPPP	Renewable Energy Independent Power Producers Programme: a Programme implemented by the National Department of Energy using local and international funding to stimulate the development of renewable energy generation by independent producers in South Africa.
RSA	Republic of South Africa
SALGA	South African Local Government Association
SANS	South African National Standards
SARS	South African Revenue Service
SDBIP	Service Delivery and Budget Implementation Plan
SDC	Swiss Agency for Development and Cooperation
SWH	Solar Water Heater
VER	Verified Emissions Reduction
Wh	Watt hour

SALGA

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