

HOW TO INCLUDE ENERGY EFFICIENCY AND RENEWABLE ENERGY IN EXISTING INFRASTRUCTURE GRANTS

INFORMATION GUIDE FOR MUNICIPALITIES

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IMPRINT

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LIST OF ACRONYMS AND ABBREVIATIONS

BEPP	Built Economic Performance Plan
CFL	compact fluorescent lighting
CoGTA	Department of Cooperative Governance and Traditional Affairs
CNG	compressed natural gas
DWS	Department of Water and Sanitation
EE	energy efficiency
EEDSM	Energy Efficiency Demand Side Management
GIS	Geographic Information System
GTAC	Government Technical Advisory Centre
HPS	high pressure sodium
HVAC	heating, ventilation and air-conditioning
ICDG	Integrated City Development Grant
IPTN	Integrated Public Transport Network
LED	light emitting diodes
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MV	Mercury Vapour
NDPG	Neighbourhood Development Partnership Grant
PFMA	Public Finance Management Act
PTNG	Public Transport Network Grant
PV	photovoltaic
RBIG	Regional Bulk Infrastructure Grant
RE	renewable energy
SACN	South African Cities Network
SALGA	South African Local Government Association
SDBIP	Sector Delivery and Budget Implementation Plan
SEA	Sustainable Energy Africa
USDG	Urban Settlements Development Grant
WSA	Water Services Authority
WSIG	Water Services Infrastructure Grant

1

PURPOSE OF THIS BOOKLET

An important objective of local government as stated in Section 152 of the Constitution (Act No 108 of 1996) is *“to ensure the provision of services to communities in a sustainable manner”*. Municipal investments in energy efficient infrastructure is increasingly recognised as an important method to achieving this objective.

Capital grants are an important source of funding for local governments' infrastructure programmes. Although the Energy Efficiency and Demand Side Management (EEDSM) Grant provides funds for retrofitting existing infrastructure to become more energy efficient, municipalities have limited guidance on how other municipal capital grants may be used to invest in energy efficient infrastructure.

This booklet therefore aims to:

- Raise awareness regarding energy efficiency (EE) and renewable energy (RE) interventions that reduce municipal own consumption;
- Provide guidance on which EE and RE interventions can be financed with specific infrastructure grants; and
- Encourage municipalities to think more broadly about the use of grant funding for EE in their existing infrastructure programmes.

2

WHY REDUCE ENERGY USAGE?

2.1 Benefits

1. **Operational cost savings!** The most important reason to implement energy efficiency and renewable energy efficiency interventions is to achieve and maintain lower operating costs within the municipal budget. A reduction of expenditure on electricity can free up municipal funds to be used for the improvement in services provided to communities.
2. **Reduced greenhouse gas emissions.** The benefits to the environment are well documented and include reduced greenhouse gas emissions due to reduced electricity consumption. Given that most of South Africa's electricity supply is currently generated through the burning of coal, this translates to a direct reduction in GHG emissions. In addition, if any renewable energy source can be used to power municipal operations, this will result in an additional reduction of electricity required from the national grid. Potential opportunities are discussed in more detail below.

2.2 Challenges

Although the benefits of RE and EE are well documented and proven, three main challenges have been identified which hinder the successful implementation of energy efficiency interventions:

1. a lack of awareness and incentives;
2. insufficient implementation capacity; and
3. **limited access to funding.**

The focus of this booklet is on access to finance for EE and RE within the existing municipal infrastructure grants. Additional reading about these challenges and useful resources is provided in **Appendix A.**

3

ENERGY USE IN THE CONTEXT OF THE OBJECTIVES OF LOCAL GOVERNMENT

Section 152 of the Constitution (Act No 108 of 1996) sets out the overall objectives of local government. In addition to promoting social and economic development, providing local communities with accountable government and encouraging involvement of the community, an important objective of local government is:

“to ensure the provision of services to communities in a sustainable manner”

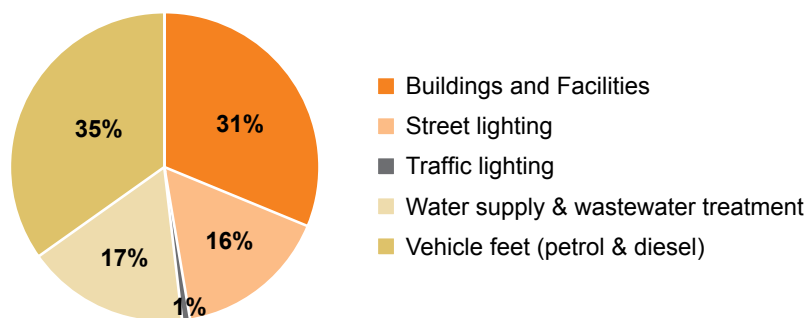
Implementing EE and RE principles in infrastructure investment and municipal operations is one way of supporting this objective. A municipality can reduce its own energy usage and maintain lower operating costs using EE and RE interventions through the construction, rehabilitation or refurbishment of municipal infrastructure and operational changes.

The Division of Revenue Bill mandates the transfer of several conditional infrastructure grants to municipalities. The investment of these funds into municipal infrastructure creates an opportunity for implementing EE and RE interventions. This brochure provides a case for reducing municipal own energy consumption, lists possible RE and EE interventions, and details how the existing local infrastructure grants can be used to implement them.

The next section provides an overview of current municipal energy consumption by sector and the savings potential that this implies.

Sustainable Energy Africa (SEA) estimates that municipalities themselves (as opposed to the households and businesses residing within their jurisdiction) account for 2% of total energy consumption in South Africa (including both liquid fuels like petrol and diesel, and electricity). While this may seem low, reducing energy consumption within municipalities can lead to great benefits (see above). There is also a call for all spheres of government to lead by example.

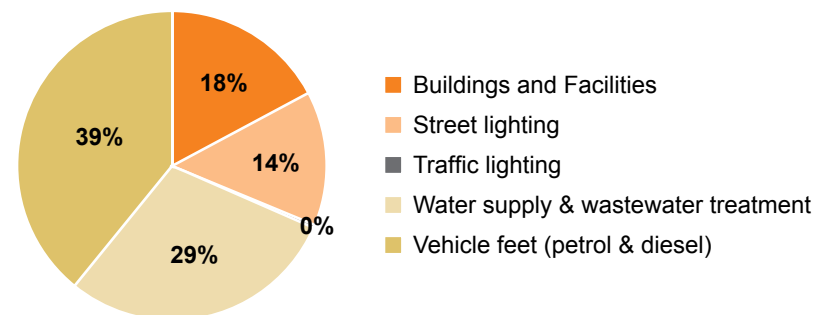
The South African Cities Network's (SACN) undertook a study to model energy efficiency potential in municipal operations for their nine member cities. Their findings of how this 'own' consumption was distributed across the different elements of the municipal infrastructure sector is shown below (South African Cities Network, 2015).



Average baseline energy consumption per sector (GJ/annum)
(Source: SACN, 2015)

Municipal vehicle fleets currently account for the greatest proportion of total energy consumed by municipalities at 35%, followed closely by buildings and facilities at 31%. Water supply and wastewater treatment comprise 17% of the total while street lighting accounts for 16%. Traffic

lighting makes up a negligible 1% of the total, which is a significant change from previous years. Since many previous energy-efficiency programmes in metropolitan municipalities targeted low hanging fruits such as street and traffic lighting, it is not surprising that these contribute the least to the current total.



Potential savings per sector (in % of total energy (GJ) saving potential)
(Source: SACN, 2015)

The share of each sector expressed in terms of the total potential energy savings to municipalities is shown above. The vehicle fleet sector accounts for the greatest proportion of the end-use energy saving potential at 39% followed by water supply and wastewater treatment at 29%. Municipal buildings and facilities account for 18% of total savings potential, while traffic lighting accounts for 14%. It is important to note that traffic lighting savings appear small on the above graph because these have already been the target of energy efficiency retrofit campaigns in metros. For municipalities which have not yet implemented traffic light retrofitting, savings of 80% can be achieved with this intervention. Traffic and street lighting still present opportunities for saving energy in municipalities that are still in the beginning stages of improving their energy efficiency.

The section below outlines the types of EE and RE interventions that municipalities can readily implement. More information on context, detailed information on interventions in the water sector, and solutions to barriers to implementing EE and RE projects can be found in Appendix A.

5.1 Energy Efficiency Interventions

The type of interventions that municipalities can implement to reduce their own energy use can broadly be divided into two categories, namely:

- Operational changes or process optimisation, and
- Equipment / technology interventions.

Optimisation refers to the changes to existing processes that ensure the highest possible efficiency. Demand-side management interventions which focus on process optimisation seek to achieve reductions in energy use through a reduction in demand for the associated service e.g. reducing water losses reduces the amount of water which needs to be pumped and treated, resulting in energy savings.

Equipment related interventions seek to ensure that the infrastructure in place is energy efficient. These include:

- the purchase of new energy efficient equipment;
- replacing or retrofitting existing infrastructure with new energy efficient alternatives (e.g. replacing old incandescent bulbs with light emitting diodes (LEDs); and

- upgrades to old infrastructure that increase energy efficiency. Examples include retrofits to lighting and upgrading water pumping technology.

Due to this guide's focus on existing infrastructure grants, in addition to the EEDSM grant, the interventions presented below are focussed on equipment to ensure compatibility with the purpose of the capital infrastructure grants. Operational changes are best funded through operational grants such as the equitable share, an unconditional grant provided to all municipalities.

High Mast, Street and Traffic Lighting

LED lights are now considered a standard retrofit option for traffic lighting whereas for street light municipalities are experimenting with several different technologies (or luminaires) such as high pressure sodium, compact fluorescent lighting (CFL), induction, and LED (SALGA, 2015). It is important to note that **the Department of Energy now recommends that only LED lighting is installed.**

High mast lights can require up to 6000 Watt per mast (for 6 lights on a 40m high mast). Using LED lamps instead of High Pressure Sodium or Mercury Vapour lights can lead to savings of up to 60%, for a final installed demand of sometimes as low as 2400 Watts on a 40m high mast. As a result, besides saving electricity, energy efficient high mast lighting can also ensure timely energisation in areas where the grid capacity is constrained.

Buildings

The buildings and facilities sector provides the greatest opportunity to reduce municipal electrical consumption as it is currently the largest source of demand for electricity. The energy efficiency interventions associated with buildings and facilities include building lighting, motion sensors, shading, insulation, water heating, ventilation and air-conditioning (HVAC). The buildings and facilities sector benefits from established regulations for new buildings and large scale renovations. The SANS 10400-XA and SANS 204 regulate the energy efficiency of new buildings (SACN, 2014). Municipalities are required to comply with performance parameters which include maximum energy demand and the maximum annual energy consumption, measured in volt-amperes per square meter of floor space (VA/m²) depending on building type and climatic zone (SEA, 2013).

INTERVENTION IN PRACTICE



**GREEN
BUILDING**

CITY OF CAPE TOWN

The City of Cape Town's Human Settlements Contact Office in Manenberg was the first municipal building in South Africa to receive a Green Star SA rating in 2013. The materials used in the process were all sustainable. Furthermore, solar panels supply 30 to 40% of energy consumed by the building. On cloudy and rainy days, a wind turbine supplements the solar energy.

Source:
<http://www.infrastructurene.ws/2013/01/29/municipal-building-achieves-four-star-green-star-rating/#>

Water and Wastewater Treatment

Opportunities for interventions in water and wastewater treatment depend on the equipment used within the water lifecycle, particularly the water pumps and water treatment systems. Interventions associated with water treatment include:

- improving existing pumps;
- upgrading pumping technology;
- matching pumps to their uses (SACN, 2014);
- optimising waste water treatment processes
- optimising aeration of waste water
- aligning control parameters with the discharge standard on aerobic wastewater systems.

INTERVENTION IN PRACTICE

ETHEKWINI MUNICIPALITY

The need to relocate the Point Pump Station in eThekwin municipality presented an opportunity to install new energy efficient pumps fixed with variable speed drives instead of simply refurbishing the old ones. The estimated cost saving was R200 000 and 401 MWh energy savings per annum. The project was completed in 2013.

Source:
http://www.cityenergy.org.za/uploads/resource_264.pdf



**ENERGY EFFICIENT
WATER PUMPS**



Vehicle Fleet

The municipal vehicle fleet is currently different from the other municipal energy-using sectors in that it consists primarily of liquid fuel, namely petrol and diesel. Interventions for reducing energy use consist of:

- replacing the asset itself: replacing energy inefficient vehicles with more efficient models,
- changes to behaviour: changes in driving behaviour, maintenance practice and overall fleet management (SALGA, 2014).
- more efficient planning of routes (for example waste collection routes),
- encouraging non-motorised transport, where feasible,
- planning for public transport

It is important to note that behavioural changes are costless, and are known to be a significant potential source of energy savings.

INTERVENTION IN PRACTICE



ENERGY EFFICIENT BUSES

CITY OF JOHANNESBURG

The City of Johannesburg added 70 energy efficient buses to their Metrobus fleet in 2015. These included 40 new dual-fuel buses and 30 existing buses that were rehabilitated and converted to use both diesel and compressed natural gas (CNG). The buses were also fitted with fleet management systems to allow driver performance tracking.

Source:
<https://www.reavaya.org.za/news-archive/july-2015/1200-metrobus-new-green-bus-fleet-unveiled>

5.2 Renewable Energy Interventions

The focus of this section is on operational interventions within municipal infrastructure, where the renewable energy installation aims to replace or supplement grid electricity, with the intention of reducing energy costs, or increasing security of supply. Interventions that are therefore solely focused on electricity generation (for re-sale) are not covered here. Current types of energy used to generate electricity in municipal operations include solar energy, biomass, biogas or hydroelectricity (micro turbines). Several types of RE investments are eligible for funding under several of the existing municipal infrastructure grants, as in following sections of this booklet. Examples of these interventions are discussed on the following pages.

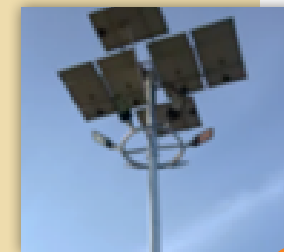
Solar Energy

Solar energy, which uses solar photovoltaic (PV) panels to generate electricity which can be used to power infrastructure such as street lights, water pumps, and municipal buildings.

INTERVENTION IN PRACTICE

BA-PHALABORWA MUNICIPALITY

Ba-Phalaborwa municipality in Limpopo installed 20 solar based high mast street lights in villages that previously had no access to street lighting. Photovoltaic panels are installed on the lights and these generate the requisite power for lighting.



SOLAR LIGHTING



Source:
http://www.cityenergy.org.za/uploads/resource_398.pdf

INTERVENTION IN PRACTICE


**SOLAR POWER
PUMPS FOR
WATER
CIRCULATION**
MAGARENG MUNICIPALITY

Magareng municipality in the Northern Cape replaced pumps at the Majeng and Windsorton Station water and wastewater treatment plants with solar water pumps. This was done as part of the maintenance of infrastructure.

Source:
<http://francesbaard.gov.za/wp-content/uploads/2015/04/Projects-brochure-English.pdf>

INTERVENTION IN PRACTICE


**SOLAR POWERED
MUNICIPAL
BUILDINGS**
UMHLATHUZE LOCAL MUNICIPALITY

uMhlathuze in KwaZulu-Natal installed a solar PV system at the Empangeni library to provide electricity for lighting and computers and replaced 337 fluorescent lights. The system comprises 23 solar panels with a total capacity of 6 kW, an inverter, and 8 batteries. The installation was primarily for load shedding periods and provides power for up to 2.5 hours.

Source:
http://urbanleds.iclei.org/index.php?id=127&tx_ttnews%5Btt_news%5D=200&cHash=2e7af3e-8e508c1df4dc0c074dc817019

Bio-mass Energy

Bio-mass energy, such as the use of wastewater effluents to generate electricity to power the rest of the wastewater treatment works.

INTERVENTION IN PRACTICE

JOHANNESBURG WATER

Johannesburg Water has upgraded their sludge handling and digestion facilities at its wastewater treatment plants, to provide for the harvesting and cleaning of the biogas produced in the digesters. The biogas is in turn used to generate electricity and heat through the burning of methane.

The combined heat and power (CHP) generation is possible of producing about 57% of the electricity needs of 5 of the City's wastewater treatment plants.


**BIOGAS TO
ENERGY
WASTEWATER
TREATMENT**

Source:
http://carbonn.org/uploads/tx_carbonndata/BIOGAS%20PAPER%20REV4.pdf
http://www.cityenergy.org.za/uploads/resource_171.pdf

Hydro-kinetic Energy

Hydro-kinetic energy, which makes use of the gravitational flow of water in piped water systems to generate the electricity through the use of in-line turbines.

INTERVENTION IN PRACTICE



CONDUIT HYDROPOWER INSTALLATION

BLOEMWATER

Bloemwater, through a partnership with the WRC, University of Pretoria and other municipalities installed a 96kW conduit hydropower installation. The technology involves tapping into an unutilised source of hydropower by using excess energy in pressurised conduits to produce hydroelectric power.

The installation produces enough energy to power Bloemwater's head office.

Source:
The Water Wheel May/June 2015

6 USING EXISTING INFRASTRUCTURE GRANTS TO FINANCE EE AND RE INTERVENTIONS

The following is a summary of each grant by purpose, transferring department and recipient, type of transfers, process of allocation, and relevant EE and RE interventions that can be funded with the grant.

Appendix B provides a broad overview of infrastructure grants by intervention.

6.1 District and Local Municipalities Infrastructure Grants

6.1.1 Municipal Infrastructure Grant

MUNICIPAL INFRASTRUCTURE GRANT
Purpose
The municipal infrastructure grant (MIG) is designed to provide specific capital financing for poverty eradication through reducing municipal infrastructure backlogs for poor households, micro-enterprises, and social institutions that serve poor communities. The focus of MIG is to provide infrastructure at the basic level.
Transferring department, recipients and type of transfers
It is administered by the Department of Cooperative Governance and Traditional Affairs (CoGTA) in close collaboration with all sector departments that are integral to achieving the objective (e.g. water, transport and public works). The MIG is a direct grant reserved for category B and C municipalities.

Allocation process

The MIG is allocated based on a formula that uses a vertical and horizontal division. The vertical division allocates funds between sectors while the horizontal takes account of backlog and poverty data to determine the allocations received by each municipality. The Division of Revenue Bill sets out the formula used for the allocation. Most of the grant is reserved for water and sanitation (48.8%) and roads (15.6%).

Municipalities are provided with an industry guideline¹ to assist them to estimate reliable projections in terms of project unit costs information and making informed decisions during the pre-implementation phase (business plan preparation and application for MIG funding stages).

This guideline was last updated in 2010 and the DCoGTA is currently in the process of updating it. An important inclusion in the latest update of its guidelines relates to green infrastructure, as highlighted in the quote below from the terms of reference.

“Allows green infrastructure, alternative technologies and innovation in the various areas to be appropriately articulated that will allow municipalities to consider the full spectrum of infrastructure technologies and associated operations and maintenance solutions.”

The updated guideline will therefore provide unit cost guidelines for EE and RE interventions to assist municipalities to spend MIG funds on these technologies.

¹ The current version of the guideline can be accessed here:
<http://mig.cogta.gov.za/Content/Documents/Guidelines/Industry%20Guide%20-%20Infrastructure%20Service%20Delivery%20Level%20and%20Unit%20Cost%20Final.pdf>

Relevant EE and RE interventions

The objective of the MIG is to provide basic municipal infrastructure to poor households. It is thus a good source of funding for EE and RE interventions in the public lighting sector, water sector and municipal buildings, where these serve poor communities. EE pumping technology can be procured where projects include construction of new water and efficient treatment systems can be used in wastewater treatment infrastructure. Installing EE lighting such as LED in all new high mast, street and traffic lighting is also an optimal way to ensure future operational cost savings. Newly constructed municipal buildings should adhere to the SANS 10400-XA and SANS 204 which regulate the energy efficiency of new buildings. Additionally, solar panels to power buildings can be considered. All these interventions can be incorporated into the planned investments and funded with MIG.

Project example – Ga-Segonyana Local Municipality

The Ga-Segonyana local municipality's MIG three-year plan includes the construction of Sedibeng Community Hall in 2017/18. This community hall will be added to the stock of assets belonging to the municipality thus providing an opportunity to reduce municipal own consumption of energy. Two relevant interventions that can be included in the construction phase are a solar panel to power the building and energy efficient lighting.

6.1.2 Regional Bulk Infrastructure Grant

REGIONAL BULK INFRASTRUCTURE GRANT

Purpose

The regional bulk infrastructure grant (RBIG) is designed to fund large bulk water and wastewater projects within a municipality or projects that cut across several municipalities. It is intended for use to develop infrastructure that connects water resources to reticulation infrastructure, thus providing water and sanitation services to individual households. The grant seeks to enable access to water supply and proper wastewater management through regional bulk infrastructure.

Transferring department, recipients and type of transfers

The RBIG has direct and indirect aspects, both transferred by the Department of Water and Sanitation (DWS). The grant is targeted at Water Services Authorities (WSA). The type of transfer a municipality receives is dependent on their capacity. Well capacitated municipalities that can implement the projects independently are eligible to receive a direct grant. It can be used for investments in new infrastructure, for upgrading and for replacement of ageing infrastructure. The DWS implements projects on behalf of municipalities through an indirect grant where the municipality has insufficient capacity to implement projects.

Allocation process

The grant is allocated on a project basis to eligible water service authorities. Projects are assessed individually at a regional level by DWS and recommended to the national department after feasibility and implementation readiness studies are completed and the project is found to be viable. The national department makes allocations based on factors such as:

- demand for water;

- the overall infrastructure needs for the benefiting institution;
- the strategic nature of the project; and
- economic importance of an area.

All proposed projects are registered on DWS provincial bulk master plans. A co-ordination committee of key stakeholders to assist the WSA with planning, assessment, and implementation is also set up at a regional level.

Relevant EE and RE interventions

The grant is well placed to fund EE interventions in the water and wastewater sector where new infrastructure is purchased or ageing infrastructure is replaced. Both cases present opportunities to install EE pumping technology or other interventions described above (section 5). The department will consider all projects submitted for review. A WSA that opts for a technology with high upfront costs and lower operations and maintenance costs in the long term must present this case in the feasibility assessment. However, it is important that the technology proposed is aligned with the municipality's capacity and resources e.g. technology that requires engineering expertise to operate and maintain in a municipality where these skills are limited is unlikely to be recommended for funding.

Project example – Mhlabatshane bulk water supply

An example of a project which presents an opportunity to integrate EE is the construction of the Mhlabatshane bulk water supply in Ugu District Municipality. This project was funded with the RBIG (budget: R8.8 million) and comprised the construction of a dam, a raw water pump station, rising mains, a booster pump station, water treatment works and a command reservoir. The project information does not state what type of pumping technology was installed, however ensuring that energy efficient technologies are installed contributes to a reduction in operating costs.

6.1.3 Water Services Infrastructure Grant

WATER SERVICES INFRASTRUCTURE GRANT

Purpose

The water services infrastructure grant (WSIG) is a consolidation of the municipal water infrastructure grant (MWIG), the rural household infrastructure grant and the water services operating subsidy. The grants were merged to rationalise, overlap, and ensure greater alignment between water and sanitation projects. The WSIG is designed to address the water and sanitation backlogs and improve the sustainability of services in prioritised district municipalities with the focus on rural municipalities.

Transferring department, recipients and type of transfers

The grant is administered by the DWS which provides funding for construction of new infrastructure, renewal and extension of existing infrastructure. It is targeted at WSAs in B and C category municipalities. The WSIG has both direct and indirect aspects which are transferred based on the municipality's capacity. Well capacitated municipalities that can implement the projects independently are eligible to receive a direct grant. The DWS implements projects on behalf of municipalities through an indirect grant where the municipality has insufficient capacity to implement projects.

Allocation process

The grant is allocated on a project basis to eligible water service authorities. WSAs are required to submit a business plan for each planned project based on a template and guideline provided by the department. The projects are reviewed at the regional level and recommendations are made to the national DWS for to allocate available funds.

Relevant EE and RE interventions

Similar to the RBIG, the WSIG can be spent on more energy efficient technology in the water sector, when investing in new or replacing old infrastructure.

Project example – Mphanama village, Sekhukhune District Municipality

The Sekhukhune district municipality spent R105 000 of its MWIG in 2013/14 to procure and install an electrical submersible pump complete with motor, to replace booster pumps and complete connections to regional water scheme. Similar to the RBIG, purchasing energy efficient booster pumps is one way to incorporate EE into existing infrastructure programmes.

6.2 Infrastructure Grants for All Cities

6.2.1 Neighbourhood Development Partnership Grant

REGIONAL BULK INFRASTRUCTURE GRANT
<p>Purpose</p> <p>The neighbourhood development partnership grant is designed to help cities (metropolitan municipalities and secondary cities) develop and implement urban network plans. The grant is intended for planning and investment in targeted locations to catalyse, attract, and sustain third party capital. The investments are aimed at spatial transformation that will improve the quality of life and access to opportunities for under-served residents (particularly in townships). The outcomes of the grant are spatially integrated cities and towns, improved municipal capacity to support infrastructure investments and diversity in public and private capital investments.</p>
<p>Transferring department, recipients and type of transfers</p> <p>This grant is also transferred by National Treasury as a direct transfer with two components: technical assistance allocations and capital grant allocations. Technical assistance allocations support planning and management activities to attract and sustain third party capital. Capital grant allocations are determined through a prioritised list of projects emerging from the planning process. Recipient municipalities are required to commit to developing relationships with businesses, investors and other stakeholders that are key to leveraging third party capital investment.</p>
<p>Allocation process</p> <p>The grant is allocated to eligible municipalities that submit NDPG related municipal plans and/or deliverables with the stipulated timeframes. The plans must outline, amongst others, the municipality's ability to attract and report on third party funding leveraged, the quality of performance and progress as well as the level of alignment across municipal strategies.</p>

Relevant EE and RE interventions
<p>The NDPG's objective make it a suitable source of funding for EE and RE interventions in the water sector, municipal buildings and vehicle fleets. Where catalytic projects include construction of water and wastewater treatment works, infrastructure with EE pumping technology can be installed. Municipal buildings can be constructed to adhere to the SANS 10400-XA and SANS 204 which regulate the energy efficiency of new buildings. Additionally, solar panels to power buildings can be considered. In areas where projects include public transport infrastructure, EE vehicle fleets can be prioritised.</p>
<p>Project example – Leratong City integrated nodal development</p> <p>The Leratong City integrated nodal development is an example of the use of NDPG to attract third party capital. It is planned for joint implementation by Mogale City local municipality, McCormick Property Development, Calgro M3 and Sasuka Logistics Services. The project will include 4 200 fully subsidised breaking new ground units, 8 300 grass roots affordable housing and others. To complement the housing, social amenities such as a community centre, educational facilities and healthcare facilities will be developed. These developments would add to the stock of municipal buildings and contribute to municipal own energy consumption. In such project, municipalities could have the opportunity to ensure that all buildings constructed, whether individual homes, community or municipal buildings meet the SANS 10400-XA and SANS 204 requirements on energy. There is an opportunity to save energy and costs by installing EE HVAC systems in healthcare facilities, solar water heating, installing LED luminaires for all lighting and powering the buildings with solar energy by installing solar panels.</p>

6.3 Metropolitan Municipalities Infrastructure Grants

6.3.1 Urban Settlements Development Grant

URBAN SETTLEMENTS DEVELOPMENT GRANT

Purpose

The urban settlements development grant (USDG) is designed to support the national human settlements development programme in the eight metropolitan municipalities. It is a supplementary grant as cities are expected to raise their own revenue to provide infrastructure municipal services to urban informal settlements.

Transferring department, recipients and type of transfers

The transfer is a direct grant administered by National Treasury with a condition that a minimum of 50% of the allocation must be spent on the provision of individual basic services to households living in informal settlements. The grant is transferred in three instalments and transfers are conditional on submission of reports and progress in spending.

Allocation process

The grant is allocated on a formula basis with the base allocation derived from the MIG formula. Household backlogs in basic services and access to socio-economic services and poverty weighted data is used in the formula to determine the size of the allocation.

Municipalities must submit annual Built Economic Performance Plan (BEPP), a comprehensive USDG performance matrix and Sector Delivery and Budget Implementation Plan (SDBIP) that are aligned to

the IDP to National Treasury and the Department of Human Settlements. The USDG performance matrix is required to include indicators and targets as well as a project list with project names, project descriptions, classification of infrastructure, Geographic Information System (GIS) coordinates and wards in which projects are being developed.

Relevant EE and RE interventions

The USDG is a suitable source of funding for EE and RE interventions in the metropolitan water as well as lighting sectors. Provision of basic services to urban informal settlements requires investment in infrastructure to provide water. Any new infrastructure investments can ensure EE pumping technology in water works or efficient treatment systems. Additionally, where new high masts, streets and traffic lighting are constructed, energy efficient LED luminaires can be prioritised for lighting.

Project example – Mangaung Municipality

In 2014/15 the municipality installed an additional 11 high mast lights and provided an additional 1 649 households with water connections. An opportunity to implement EE with the high mast lights is installing LED luminaires. The connection of new households to water requires the construction of reticulation infrastructure and water treatment works. There is scope herein to invest in EE water pumping technology.

6.3.2 Integrated City Development Grant

INTEGRATED CITY DEVELOPMENT GRANT

Purpose

The integrated city development grant is a financial incentive provided to metropolitan municipalities to achieve a more compact urban spatial. The receipt and size of grant received is thus dependent on the degree to which metropolitan municipalities use infrastructure investments and regulatory instruments to achieve efficient urban spaces. The key outcome for the grant is an improved spatial targeting and sequencing of public investments.

Transferring department, recipients and type of transfers

The grant is also transferred by National Treasury as a direct transfer. The grant is restricted to only metropolitan municipalities that obtained a financially unqualified audit opinion and achieved acceptable levels of capital expenditure performance.

Metropolitan municipalities have full autonomy to select their preferred investments within the identified integration zones. The transfer can be spent on infrastructure within the functional mandate of the municipality and on any authorised direct operating expenditure that is related to the development or implementation strategies in the identified integrated zones.

Allocation process

To access the grant, municipalities are required to submit BEPP in accordance with the guidelines. Allocations are made on a population-weighted basis to reflect the fact that larger metropolitan municipalities face greater planning complexities and investment needs. As this is an incentive grant, the following weighted indicators inform final allocations made to metropolitan municipalities:

Indicator	Performance	Weight (%)
Debt to equity ratio	no decrease in total debt to equity ratio	20
Vacancies	No Section 57 vacancies longer than 6 months	20
Audit opinion	Unqualified audit opinion by the auditor general (with or without findings) for the last financial year	30
Wasteful expenditure	Decrease in total value of irregular, fruitless and wasteful expenditure identified by AG	20
Submission of BEPP and performance indicators	Timely submission of BEPP and performance indicators	10

Relevant EE and RE interventions

Similar to the USDG, the ICDG is a suitable source of funding for EE and RE interventions in the water as well as lighting sectors. The ICDG provides incentives to improve spatial development and one such development can be the construction of water and wastewater treatment works or installing new street lighting in an integrated zone. Any new infrastructure investments can ensure streamlining of energy efficiency options in the water and waste water sectors. Where new high masts, streets and traffic lighting are constructed, energy efficient LED luminaires can be prioritised for lighting.

Project example – Mangaung Municipality

The City of Cape Town allocated approximately R170 million of the ICDG in the 2015/16 for infrastructure projects in the Voortrekker Road Corridor. Of this amount, R25 million was set aside for a wastewater treatment works facility in Bellville. The project information does not state what type of pumping technology was installed, however the municipality has an opportunity to install energy efficient alternatives for the pumping technology. Furthermore, solar panels can be installed to power the pumping.

6.3.3 Public Transport Network Grant

PUBLIC TRANSPORT NETWORK GRANT

Purpose

The public transport network grant (PTNG) provides funding for accelerated construction and improvement of public and non-motorised transport in metropolitan municipalities. This includes bus rapid transit systems, conventional bus services and upgrades for pedestrian and cycling infrastructure. A key outcome for this grant is improved and accessible public transport network infrastructure and services that are safe, affordable and well maintained.

Transferring department, recipients and type of transfers

The grant is transferred by the Department of Transport and is composed of two components: network operations and network infrastructure. The operations component can fund security, network management, insurance, compensation for economic rights of existing operators and maintenance of infrastructure. The infrastructure component can fund non-motorised transport infrastructure, new and upgrades of existing public transport infrastructure.

Allocation process

The PTNG is currently allocated on a project basis. Municipalities must submit business plans based on sound Integrated Public Transport Network (IPTN) operational plans. A formula and non-formula basis is used to allocate funds. The formula-based allocation (80%) methodology is going to be phased in over the medium term. It aims to provide more certainty about the extent

of national funding that municipalities expect when planning their public transport networks. The variables to be considered in the formula include the size of the city's economy, the number of people in the city and the number of public transport users. A non-formula component (20%) is allocation in joint consultation with National Treasury and agreed on at a joint committee.

Relevant EE and RE interventions

The USDG is a suitable source of funding for EE and RE interventions in the metropolitan water as well as lighting sectors. Provision of basic services to urban informal settlements requires investment in infrastructure to provide water. Any new infrastructure investments can ensure EE pumping technology in water works or efficient treatment systems. Additionally, where new high masts, streets and traffic lighting are constructed, energy efficient LED luminaires can be prioritised for lighting.

Project example – Mangaung Municipality

In 2014/15 the municipality installed an additional 11 high mast lights and provided an additional 1 649 households with water connections. An opportunity to implement EE with the high mast lights is installing LED luminaires. The connection of new households to water requires the construction of reticulation infrastructure and water treatment works. There is scope herein to invest in EE water pumping technology.

Appendix A

RECOMMENDED READING ON EE AND RE

The following resources are recommended for further reading. These resources provide context, information on potential interventions and detail solutions to barriers to implementing EE and RE projects.

The City Energy website: www.cityenergy.org.za

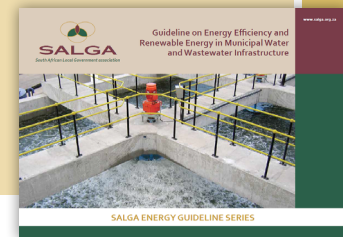
A web platform has been developed jointly between SALGA and Sustainable Energy Africa (SEA). It aims at supporting South African local governments to meet sustainable energy and climate change challenges. The platform is used to disseminate information specifically to municipalities on energy efficiency and renewable energy innovations, including guidelines and case studies on topics aligned with the SALGA energy efficiency and renewable energy strategy.



Guideline on Energy Efficiency and Renewable Energy in Municipal Water and Wastewater Infrastructure, SALGA

This guideline by SALGA focuses on EE and RE interventions in the water and wastewater sector. It provides the municipality with information on how to assess and plan for reducing energy consumption cost effectively i.e. best energy savings per Rand spent. It also discusses ways to choose the right energy efficiency technologies for specific municipal contexts and needs, as well as cost effective, serviceable options for renewable energy generation in the water and wastewater infrastructure sector.

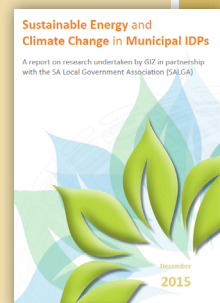
For further reading visit:
http://www.cityenergy.org.za/uploads/resource_264.pdf



Sustainable Energy and Climate Change in Municipal IDPs, GIZ and SALGA

This report summarises research conducted by GIZ in partnership with SALGA to determine the extent to which SA municipalities have integrated the sustainability or 'green' agenda into development planning at a local level by studying their integrated development plans. The number and examples of renewable energy, energy efficiency, energy access, and other climate change projects listed in the IDP are summarised at a provincial level. The study finds that there is general increasing interest in greening municipal services with larger municipalities making good progress in planning for and implementing projects. The study also finds that human resources and financial capacity continues to be a major barrier to implementation and highlights areas where additional awareness and capacity building would be most useful.

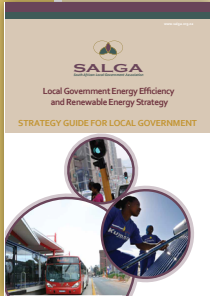
For further reading visit:
http://www.cityenergy.org.za/uploads/resource_398.pdf



Local Government Energy Efficiency and Renewable Energy Strategy. Strategy Guide for Local Government, SALGA

This guideline by SALGA focuses on EE and RE interventions in the water and wastewater sector. It provides the municipality with information on how to assess and plan for reducing energy consumption cost effectively i.e. best energy savings per Rand spent. It also discusses ways to choose the right energy efficiency technologies for specific municipal contexts and needs, as well as cost effective, serviceable options for renewable energy generation in the water and wastewater infrastructure sector.

For further reading visit:
http://www.cityenergy.org.za/uploads/resource_291.pdf



Energy Performance Contracting for municipalities

A website developed by the South African Cities Network (SACN) aims to guide municipalities on energy performance contracting. Energy performance contracts are contracts that link the payments from the municipality to the contractors with the savings achieved through the implementation of the energy measures identified. The cost of investment into the energy efficiency project is paid back through the generated savings.

For further reading visit:
<https://www.energy-contractsupport.org/>



Increasing Investment in Climate Change Related Projects at the Sub National Level. Phase 2: Towards a Financing Framework for Implementing Climate Change Projects, TAU (now GTAC)

The Technical Assistance Unit, now the Government Technical Advisory Centre (GTAC) was commissioned by the Western Cape Department of Environmental Affairs and Development Planning to identify barriers to investment climate change mitigation and adaptation for sub-national government. The research additionally investigated innovate financing practices within the bounds of the Public Finance Management Act (PFMA) and the Municipal Finance Management Act (MFMA) that ease the implementation of climate change related initiatives. The result is a high level set of recommendations for a financing framework that assists provincial and local government to access financing for climate change projects.

For further reading visit:
https://www.e3g.org/docs/FINAL_Finance_Framework_Repor_October_2013.pdf



Appendix B

INFRASTRUCTURE GRANTS BY EE AND RE INTERVENTIONS

	Energy Efficiency and Demand Side Management	Urban Settlements Development Grant	Integrated City Developments Grant	Public Transport Network Grant	Integrated National Electrification Grant	Municipal Infrastructure Grant	Neighbourhood Development Partnership Grant	Regional Bulk Infrastructure Grant	Water Services Infrastructure Grant
Opportunity for EE / RE investment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Street and Traffic lighting	✓	✓	✓			✓			
Municipal buildings	✓					✓	✓		
Water and Wastewater	✓	✓	✓				✓	✓	✓
Vehicle Fleet				✓			✓		
Solar Lighting		✓	✓			✓			
Solar Buildings						✓	✓		
Solar Water Pumps		✓	✓			✓			

Sustainable Energy Africa, 2015, State of Energy in South African Cities.

[illegible]

