



ENERGY OFFICE

eThekweni. The sustainable energy hub.

3rd Floor Florence Mkhize Building
251 Anton Lembede Street, Durban
T + 27 (0) 31 311 1139
F +27 (0) 31 305 2730
morgand@durban.gov.za

eThekweni Municipality Internal Energy Management Policy

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1 DEFINITIONS

CDM	Carbon Development Mechanism
CO2e	Carbon Dioxide Equivalent
DoE	Department of Energy
EMIP	Energy Management Implementation Plan
EEMS	eThekwini Energy Management System
EMSC	Energy Management Steering Committee
EO	Energy Office
GHG	Green House Gases
KPIs	Key Performance Indicators
RE	Renewable Energy

2 PREAMBLE

- (1) Energy¹ supply in South Africa is constrained due to both national and international energy supply trends and prices. Energy prices, having already increased substantially, are expected to continue to rise even further in the future.
- (2) Concerns regarding climate change have also resulted in pressure on the country, in general, and on the corporate sector, in particular, to reduce emissions of green house gases (GHGs).
- (3) In response, eThekwini Municipality developed and adopted the eThekwini Energy Strategy in 2010. The Energy Strategy includes an objective to reduce the energy use within the municipal infrastructure systems². This Internal Energy Management Policy is aimed at the management of energy in these infrastructure systems.
- (4) At a municipal level, energy management includes all the measures that are planned and implemented to ensure optimal energy consumption by municipal infrastructure systems. Similar to other management systems, energy

¹ Energy, in this context, refers to electricity and fossil fuels (liquid, solid, gas).

² Municipal infrastructure systems include buildings, plant & equipment and vehicles.

management also influences the municipality's organisational and technical procedures, as well as behaviour patterns, in order to achieve a desired outcome.

- (5) The Internal Energy Management Policy seeks opportunities for energy reduction and saving as well as the generation of green energy³.
- (6) The predominant energy forms consumed within the eThekweni Municipality include electricity and liquid fuels (petrol, diesel and oil). There is an existing eThekweni Motor Fleet Policy, which takes into account liquid fuels. This Energy Management Policy therefore focuses on the management of electricity energy.

3 PURPOSE

- (1) To optimise the use of energy by the municipality by systematic improvement in the energy economy⁴ of the infrastructure operated by the municipality, thereby reducing costs and mitigating the impact of GHG emissions on the environment
- (2) To provide a *systems approach* for the eThekweni Municipality that will enable it to optimise energy use on an on-going basis and to promote the development of renewable energy sources for its own use.
- (3) To develop an accurate energy monitoring and evaluation management process for ensuring the implementation of energy efficiency measures.
- (4) To implement an eThekweni Energy Management System (EEMS) that will manage the municipality's internal energy demand as well as to identify potential renewable energy opportunities for implementation. The EEMS would be the basis for investing in and initiating internal energy efficiency and renewable energy interventions. The EEMS would also include the organisational and informational structures as well as the resources required for implementing this internal energy policy.

³ Green energy or renewable energy means energy generated from natural non-depleting resources including solar energy, wind energy, biomass energy, biological waste energy, hydro energy, geothermal energy and ocean and tidal energy;

⁴ Energy economy is the efficiency with which energy (in particular) is used within a society or element thereof.

4 PROBLEM STATEMENT

- (1) Effective energy management is fundamental to sustainable and profitable business practices and is in line with national imperatives⁵ that specifically deal with the generation and consumption of energy in all its forms.
- (2) Energy is used by the eThekweni Municipality in the provision of municipal services, notably: transport, the operation and maintenance of municipal infrastructure (such as office buildings, street lights, traffic signals, waste treatment plants, public facilities, markets, the distribution of water and electricity, etc).
- (3) The two primary forms of energy purchases are liquid fuels (diesel and petrol) and electricity.
- (4) The predominant electricity consuming municipal infrastructure systems include public housing (hostels), water treatment plants, street lighting, buildings and recreational facilities. Currently the estimated municipal consumption is in excess of 860 GWh of electricity per annum (including transmission losses). This equates to an approximate cost of R473 million and 886,786 tons of carbon dioxide equivalent (CO₂e)⁶ per annum (2010).
- (5) While there are a number of energy management and renewable energy initiatives taking place throughout the municipality, there remain a number of key gaps, which can be summarised as follows:
 - a. There is no clearly articulated and over-arching approach and methodology for energy management,
 - b. There exists no centralised institutional structure within the municipality that is responsible for internal energy use and, therefore, no coherent approach to monitoring and management of energy use,
 - c. There are no clearly articulated incentives to save energy or implement energy saving programmes, and
 - d. There is a lack of accurate baseline data for energy use across most infrastructures operations.

⁵ *White Paper on Energy Policy* (1998), *National Energy Act* (2008), *Energy Efficiency Strategy of South Africa*, First Review, October 2008

⁶ 1 kWh grid electricity = 1.03kg CO₂

5 POLICY MEASURES

(1) Institutional responsibilities

- a. The Energy Office is responsible for the overview of this policy
- b. An Energy Management Steering Committee (EMSC) will be constituted with membership representing each of the entities responsible for major energy use within the municipality. The EMSC will be chaired by the Deputy City Manager (Human Settlements and Infrastructure). Responsibility for the implementation of each of the interventions identified by the EMSC will be allocated to the entity within the municipality unit most directly responsible for the system concerned.

(2) Systems Optimisation

- a. The eThekwini Municipality will adopt a Systems Optimization Approach to Energy Management,⁷
- b. An eThekwini Energy Management System (EEMS) will be developed to systematically record energy demand by its internal infrastructure systems as well as to plan, implement, audit and make continuous improvements to the system (i.e. adopting a Plan, Do, Check and Act cycle) which is described in more detail in the procedures section of the policy.

(3) Monitoring System

- a. The Energy Office will establish a system of electricity monitoring that will provide up to date and accurate information to municipal departments on their electricity use.

(4) Financing

- a. An energy intervention finance competency will be established at the Energy Office to assist departments to secure funding for energy

⁷ Systems optimization is defined as the continuous monitoring of a set of energy-related parameters, in order to optimize the use of energy within certain constraints.

management interventions identified by the Energy Management Steering Committee.

(5) Performance indicators and incentives

- a. Baselines and energy saving targets for the municipal units will be defined through the EMSC.
- b. The targets will be incorporated into Key Performance Indicators (KPIs) of the head of the respective municipal unit or department.
- c. The Energy Office will work with designated staff members to develop programmes and projects to meet the KPIs.

6 PROCEDURES

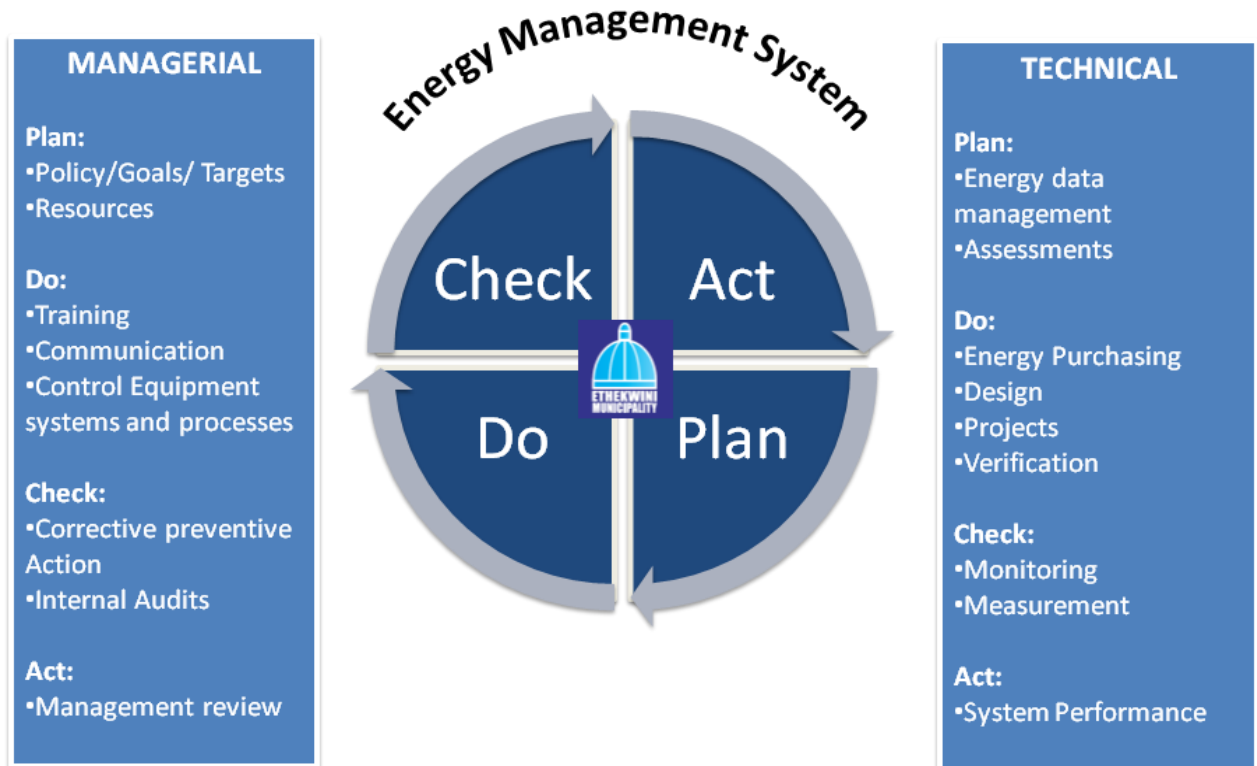
(1) Constitution of the Energy Management Steering Committee:

- a. An Energy Management Steering Committee (EMSC) will be constituted with an associated secretariat supplied by the Energy Office.
- b. Membership of the EMSC will include representation from all the departments that use of significant quantities of energy.
- c. The committee will be chaired by Deputy City Manager, Human Settlements and Infrastructure or his/her designated representative.
- d. The EMSC will meet on a quarterly basis and will oversee the Energy Management System.
- e. The agenda for the EMSC will cover; baselines and targets, technology, projects and programs and the allocation of responsibilities, and budgeting and implementation issues.
- f. The following departments will participate in the EMSC:
 - i. Architecture Department
 - ii. Electricity Department
 - iii. Energy Office
 - iv. Environmental Planning and Climate Protection Unit
 - v. Housing Department
 - vi. Treasury Cluster
 - vii. Water and Sanitation Department

(2) Energy Management System

- a. The EMSC will oversee the implementation of the *eThekweni Energy Management System* (EEMS) following the plan, do, check, act approach outlined below:

Figure 1: Energy Management System⁸



i. **Plan**

- a.a. The Energy Management Steering Committee (EMSC) will develop and review an Energy Management Implementation Plan (EMIP). The EMIP will:

- a.a.a. set targets for energy use and energy generation in different areas of municipal operation. Targets will be established with reference to national energy targets

⁸ Original model developed by Dr. W. Edwards Deming, 1950

Image adapted from <http://www.mse2000.net/MSEOverview/tabid/54/Default.aspx>

and national allocations made to the eThekweni Municipality;

a.a.b. set a clear list of tasks and activities to achieve the targets;

a.a.c. outline a clear allocation of responsibilities;

a.a.d. outline a clear system for monitoring and evaluation of actions; and

a.a.e. outline an allocation of human and financial resources.

a.b. The EMSC will meet on a quarterly basis to review the tasks and activities

a.c. The EMSC will meet annually to revise the Energy Management Implementation Plan.

ii. Do

a.a. Municipal units responsible for energy use will implement the aspects of the EMIP relevant to them.

a.b. To promote implementation, municipal units will allocate energy management responsibility to a relevant staff member who will participate in the EMSC, design the components of the energy management implementation plan relevant to their unit and promote the implementation of these components within their unit.

a.c. Municipal units will ensure that the activities and outcomes of the energy interventions are communicated within their respective departments

iii. Check

a.a. The Energy Office will audit the effectiveness of the implementation of the plan through a system which records all activities undertaken by line functions in implementing energy initiatives;

a.b. The Energy Office will report to the EMSC on the effectiveness of the various energy interventions carried out by the municipal units on a quarterly basis;

a.c. The EMSC will outline corrective or preventive actions based on the report back by the Energy Office.

iv. Act

a.a. The EMSC will review the implementation plan at the end of each year based on the results generated through the monitoring system and amend the plan based on the experiences of the previous year.

(3) Monitoring System:

- a. A clear methodology and system for Monitoring and Verification will be developed by the EMSC and included in the Energy Management Implementation Plan
- b. The Energy Office will take responsibility for implementing the procedures for the establishment and maintenance of the monitoring and verification system.
- c. The monitoring and verification system will include:
 - i. Establishment of a system providing current and regular reports from the monitoring equipment;
 - ii. Installation of monitoring equipment;
 - iii. Checking the accuracy of and reusing of existing monitoring and measuring equipment and/or installing new monitoring equipment;
 - iv. Maintaining records of significant and accidental deviations from normal energy consumption;
 - v. Comparing energy indicators against those of similar municipalities;
 - vi. Evaluating compliance of municipal energy use with standards and targets.

- (4) Financing:
- a. An energy intervention finance competency within the Energy Office will be established
 - b. The energy intervention finance competency will:
 - i. Assist line departments to develop business plans for the identified energy interventions.
 - ii. Investigate funding sources for interventions, that include donor agencies, national public sector departments and the private sector
 - iii. In the absence of external funding options, present the business plan to the eThekwini Treasury, through the Energy Steering Committee for funding.
 - iv. Once funding is secure, be responsible for financial reporting to the funding agent.

7 POLICY EVALUATION AND REVIEW

- (1) The overall policy will be evaluated for effectiveness at intervals of three years.
- (2) The evaluations will be done on the basis of the recorded achievements in the generation of energy from renewable sources and in obtaining energy efficiencies within the eThekwini Municipal operations. These achievements together with their contribution towards the reduction in GHG emissions will be measured against subsequent targets.
- (3) The evaluations will be done by the Energy Office, in consultation with each of the responsible entities involved. The outcome of the evaluation will be presented to the EMSC
- (4) The evaluation will make recommendations to:
 - a. retain a particular policy measure unaltered;
 - b. amend a particular policy measure (giving the amendments proposed);
or,
 - c. discard a particular policy measure in its entirety.
- (5) The revised policy is to be communicated to all entities within eThekwini Municipality immediately on approval.