



**REGULATORY POLICY
ON
ENERGY EFFICIENCY AND
DEMAND SIDE MANAGEMENT
FOR SOUTH AFRICAN
ELECTRICITY INDUSTRY**

APPROVED BY:

A handwritten signature in black ink, which appears to read 'Collin Matjila', is written over a horizontal line.

**NER Board Chairperson
Mr Collin Matjila**

02/07/2004

DATE

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EXECUTIVE SUMMARY

This policy identifies problems of peak generation capacity requirement in the near future and the inefficient end-use of electricity. It also examines the current regulatory mechanism of implementing energy efficiency and demand side management (EEDSM) programmes through Eskom. Existing government energy policy and legislature mandating the NER to develop a regulatory policy on EEDSM is highlighted.

An international desktop-survey was conducted for both developed and developing countries to determine the international practices on EEDSM specifically with regard to regulatory mechanisms to promote EEDSM within the framework of a regulatory policy. These mechanisms were examined in relation to what is applicable in SA and within the mandate of the NER.

The policy sets annual EEDSM targets and specifies the programmes that would qualify for EEDSM funding. Eskom is obliged to ensure that the EEDSM targets specified are met. All metros in SA are obliged to incorporate EEDSM in their planning and to ensure EEDSM implementation. The policy further outlines the conditions for EEDSM implementation in the current electricity industry and after restructuring. An Independent Monitoring and Verification Body (M&V), which would be accountable to the NER, will confirm the impact of each EEDSM project implemented and report to the NER in this regard.

Generally, the EEDSM policy describes the regulatory mechanisms to be implemented by the NER and outlines the following:

Access to funding; administration of funds; assets ownership; development of EEDSM plans; establishment of the Energy Agency in the future; obligation of the future REDs to implement EEDSM to all end-users through ESCOs; the requirement of licensees (distributors) to create awareness (advertise benefits) of EEDSM among customers and offer time-of-use tariffs to all industrial and commercial customers.

The NER envisages the successful implementation of EEDSM programmes as one of the solutions to the problems in the electricity industry. Through the regulatory mechanisms, the policy aims to ensure successful implementation of EEDSM programmes in the current electricity industry infrastructure and after restructuring.

DEFINITIONS

“Baselines” This is the most conservative value of the MW or energy usage before the implementation of an EEDSM project. The difference between the actual monitored and verified MW reduction/energy usage after the implementation of the EEDSM project and the Baseline gives the MW Reduction or Energy Saved due to the project.

“Capacity Factor” is defined as the percentage of time that the capacity of the load management resource can be fully utilised. “Hi CF MW” means that control algorithms are utilised to achieve a high capacity factor. There is a maximum percentage of time that the residential load management (RLM) resource can be utilised. In the maximum percentage mode the system peak MW can only be reduced by the amount reflected in the “Hi CF MW” column. The system peak can be further reduced by the amount in the “Balance of MW” column, when operated in the low capacity mode. The “Lo CF MW” column indicates the total reduction of the system peak if the entire load management resource is only operated in low capacity factor mode.

“captive customers” means all customers in the electricity distribution industry, including all customers under the current market structure but excluding contestable customers when competition is introduced.

“contestable customers” mean large industrial customers with a choice of supply when competition is introduced.

“demand (electrical)” means the rate at which electrical energy is delivered to or consumed by a system, part of a system, or piece of equipment, whether at a given instant or averaged over any designated period of time.

“Distributor” means a corporation, person, agency, authority, or other legal entity that owns and/or operates facilities within South African borders for distributing or selling electrical energy primarily for use by the public.

“Distributors Area of Supply” means the NER defined geographical area, which the distributors supply electricity to.

“Electricity Supplier” means the distributor or supplier of electricity to end-users.

“electricity industry” mean all the stakeholders responsible for the generation, transmission, distribution and users of electricity.

“EEDSM” refers to Energy Efficiency and Demand Side Management. It is the planning, implementation, and monitoring of distributors activities designed to encourage consumers to modify patterns of electricity usage, including the timing and level of electricity demand. It refers only to energy and load-shape modifying activities that are undertaken in response to distributors-administered programmes.

“Direct EEDSM Costs” means all the costs associated with the implementation of EEDSM projects and include personnel, material costs for the design, implementation, monitoring and evaluation and costs of EEDSM devices.

“EEDSM Plan (Rollout Plan)” means a table of projected megawatt (MW) Reductions for the various EEDSM programmes with associated direct EEDSM Costs over a planning period (years).

EDI Restructuring Bill (2000) means the Electricity Distribution Industry Restructuring Bill of 2000 that directs the Eskom and Local Government Electricity Distribution Activities to be merged into publicly owned Regional Electricity Distributors (REDs).

“Electricity Act” means the Electricity Act No 41 of 1987 as amended;

“electricity customers” means groups and individuals who purchase electricity for their private use or for resale to generate income or to provide services;

“energy efficiency” means ways of reducing the energy used by specific end-use devices and systems, typically without affecting the service provided;

“energy service companies (ESCOs)” means companies that provide energy-efficiency or load-reduction services to customers that own or operate facilities such as buildings or factories;

“Energy White Paper” means the White Paper on Energy Policy for the Republic of South Africa as gazetted in December 1998 by the Department of Minerals and Energy;

“Hot-water Load Control” (HWLC) means the installation of such equipment, which involves the control or switching off geysers (hot water cylinders) in participating residences. HWLC switches these electrical loads off during peak periods.

“Implementation Schedule” means a schedule of EEDSM projects to be implemented in the following year together with Budgeted EEDSM Costs.

“integrated resource planning” means the planning process for deciding on the most appropriate resources to be applied in the electricity supply sector to meet the electricity demand within a specific area of supply, and

- in which the demand-side and supply-side resources are treated with the same weight;
- in which demand-side options include energy efficiency and load-management programmes for the residential, commercial and industrial sectors;
- which may also incorporate environmental considerations;

“licensee” means the holder of a licence granted or deemed to be granted by the National Electricity Regulator;

“Major Distributor” means those Distributors selected by the NER as a pilot to develop EEDSM Plans and implement EEDSM. These distributors were selected on the basis of being one of the top ten electricity distributors in terms of energy or MW supplied to end users.

“M&V Body” An independent Body responsible for the monitoring and verification of the MW Reduction achieved by projects funded through EEDSM Funds.

“Municipal System Act” means the Municipal System Act No 32 of 2000;

“Municipal Structure Act” means the Municipal Structure Act No 117 of 1998 as amended;

“MW Reduction” means the difference in MW between the Baseline and the Actual MW after the implementation of EEDSM.

“peaking generation capacity” means the capacity of generating equipment normally reserved for operation during the hours of highest daily, weekly, or seasonal loads, which implies that some generating plants may be operated at certain times to supply peak load and at other times to serve base loads, depending on the primary energy (e.g. levels of hydro reservoirs) available to them;

“retail” means the sale of electrical energy to end-users by electricity distributors or utilities for residential, commercial, and industrial end-use;

“Retailer” The entity whose activity is the sale of electrical energy to end-users for residential, commercial, and industrial end-use;

“revenue” means the total amount of money that a firm receives from sales of its products and/or services, gains from the sales or exchange of assets, interest and dividends earned on investments and other increases in the owner’s equity, except those arising from capital adjustments;

“Wholesale Market” means the sale of electricity by generators directly to distributors, retailers and large customers.

ABBREVIATIONS

Capex	capital expenditure
DME	Department of Minerals and Energy
DSM	demand-side management
EDI	electricity distribution industry
EE	energy efficiency
EEDSM	energy efficiency and demand side management
ESCO	energy service company
ESI	electricity supply industry
Gx, Tx, Dx	generation, transmission, distribution
Hi CF	high capacity factor
IDP	integrated development plan
IEP	integrated electricity plan (internal to Eskom)
IRP	integrated resources planning
ISEP	integrated strategic electricity plan (Eskom)
KWh	kilowatt hour
LIRP	Local Integrated Resource Plan
Lo CF	Low Capacity Factor
MW	megawatt
MW/a	megawatts per annum
M&V	Monitoring and Verification
NER	National Electricity Regulator
NRS047	National Regulatory Standards # 047
NSW	New South Wales
Opex	operating expenditure
RED	regional electricity distributor
TSO	Transmission System Operator
VSD's	variable speed drives

REGULATORY POLICY ON ENERGY EFFICIENCY AND DEMAND SIDE MANAGEMENT (EEDSM) FOR SOUTH AFRICAN ELECTRICITY INDUSTRY

1 INTRODUCTION

Energy Efficiency (EE) refers to the overall reduction in energy use by end-users through the use of energy-efficient technologies and retrofits. The result of implementing EE programmes is a reduction in the electricity consumption during all time periods. These programmes improve the efficient use of electricity by end-users, have a positive impact on the environment and directly reduce peak electricity demand.

Demand side management (DSM) activities involve a range of load management initiatives that focuses on the reduction of electricity during peak periods. Energy efficiency is one of the measures that fall under the umbrella of DSM. However, due to additional societal and environmental benefits of energy efficiency and the emphasis of Government on EE, the NER has referred to energy efficiency as a measure alongside DSM load management measures. Therefore, EEDSM refers to all energy efficiency and load management activities that reduce peak electricity demand.

The NER is mandated to ensure that there is sufficient installed generation capacity to meet the needs of future electricity demand. The forecasted demand indicates that there will be a need for new peak generation plants. The commissioning of new peak generation is inevitable.

However, in order to maintain a safe supply-demand situation (acceptable reserve margin), provide energy services at least-cost to all customers, improve on end-use energy efficiency and enforce government's objectives on energy efficiency in the electricity sector, EEDSM programmes must be successfully implemented.

The current implementation of EEDSM through the National Eskom DSM programme needs to be fast-tracked and an effective regulatory mechanism put in place. The NER has outlined a set of regulatory mechanisms in this policy that defines how the NER aims to promote EEDSM programme implementation in South Africa under the current electricity industry infrastructure and after restructuring.

1.1 Problem Statement

- The current installed peak generation capacity (while maintaining a safe reserve margin) is insufficient to meet future forecast peak load. This implies that new peaking generation capacity would have to be commissioned sooner in order to ensure that there is sufficient peaking generation to meet the demand.
- Further, SA is characterised by inefficient end-use of electricity in all consumer classes (Residential, Commercial, Industrial). This has compounded the requirements for new peak generation capacity as indicated by the Load Forecast.

- Under restructuring there is no guarantee that electricity suppliers would implement energy efficiency programmes or that end users would engage in these activities through market signals.
- Inefficient use of electricity has severe environmental impacts and negative health effects.
- There are insufficient regulatory mechanisms within national policy frameworks to ensure adequate implementation of EEDSM programmes.

1.2 Contextual Background

1.2.1 Current Implementation through Eskom

Formal EEDSM planning began in SA in the early 1990's as an activity of Eskom within the Integrated Electricity Plan. EEDSM options and supply side options were evaluated on equal economic terms using the Integrated Resource Planning (IRP) methodology.

One of the outputs of this planning process was a 10-year Rollout Plan for EEDSM. Within this EEDSM Rollout Plan, megawatt (MW) reduction targets (for specific programmes) are set for each year with associated costs. The NER has allowed these costs to be recovered through the electricity tariffs.

1.2.2 Municipal Implementation

In SA many municipalities and electricity suppliers have been engaged in EEDSM activities for many years particularly Load Management activities e.g. Hot Water Load Control (HWLC), where such programs were of benefit to the electricity supplier and customer. Some municipalities are currently adopting an integrated approach towards energy planning where EEDSM options are given consideration in the provision of energy services. This integrated energy planning process is specific to few municipalities and not yet adopted in all the major municipalities in the country.

1.2.3 NER and EEDSM Implementation

To address the current and future potential problems in the electricity industry, in lieu of government policies on energy and the current mechanism of EEDSM implementation, the NER has taken the position of developing a regulatory policy on energy efficiency and demand side management.

1.3 Rationale for Regulatory Policy

The development of a regulatory policy would guide the implementation of EEDSM programmes and thus, address the problems stated in section 1.1 above and simultaneously address the barriers that energy efficiency is facing within the South African context.

Energy efficiency offers benefits to electricity utilities (generation and distribution), customers and society as a whole (i.e. the overall economy and the environment). The benefits for utilities result from reduced operating costs in the generation, transmission, and distribution of electricity, reduced capital cost due to deferred construction of new generation plants, and upgrading of existing transmission and distribution systems. In addition, consumers benefit from lower electricity bills.

2 SOUTH AFRICAN ENERGY LEGISLATION AND POLICY

2.1 Energy White Paper of 1998

In the White Paper, energy efficiency is identified as one of the areas that need to be developed and promoted. The policy requires energy policy to consider 'energy efficiency and energy conservation' within the IRP framework from both supply and demand side in meeting energy service needs. It also states that awareness on economical and environmental benefits of efficient use of energy (i.e. energy efficiency) should be promoted, with consideration of incentives to that effect.

The development of energy efficiency measures in the context of the framework of integrated resource planning can be achieved by the Regulator through the establishment of an obligation on electricity suppliers to engage in such planning and to implement energy efficiency programmes in the electricity sector.

2.2 Electricity Regulation Bill

This Bill brings forth the role of the regulator, when the Energy Regulator comes into existence and the Electricity Regulator ceases to exist. The Bill prescribes the 'powers and duties' of the regulator which include advising the Minister on matters including energy efficiency. It goes further to state, under 'principles of regulation', that the regulator must encourage energy efficiency. It also requires 'compliance' measures for licensees to comply with standards and requirements on energy efficiency.

2.3 DME: Draft National Strategy on Energy Efficiency

This strategy has set a specific target for EE investments in the various sectors and requires the NER to perform a significant role in ensuring that these targets are met. The NER role in ensuring EE investments is listed as follows:

- Improving Education and Awareness levels of EE
- Monitoring and Verification of EE programmes
- Ensure financing of EE programmes
- Certification and Accreditation

This strategy further provides the NER with the mandate to develop the regulatory policy on EEDSM.

2.4 National Energy Bill

The EEDSM Regulatory policy complies with the directive on energy efficiency in section 22 (3) (c) (d) of the Bill. The Bill indicates that the Minister will establish national programmes to promote energy efficiency and set minimum requirements for contribution from the particular sectors of the economy (electricity sector included), which the Regulator would be responsible for.

The policy is also aligned with the requirement of the Bill with regards to data capturing, through monitoring of all EEDSM programmes implemented in the electricity sector.

2.5 Electricity Act No 41 of 1987

The Electricity Act No 41 of 1987 as amended requires the NER to issue licences for the generation, transmission and distribution of electricity. The Act further provides that the key “objects” of the NER is “to exercise control over the ESI so as to ensure order in the generation and efficient supply of electricity” (section 3). The NER is also given the authority to determine requisites with regard to the “conditions on which the licensee may supply and distribute electricity” and “any other matter connected with the carrying out of the undertaking” (sections 8(2)(d) and (h) of the Electricity Act respectively).

Therefore, NER has the authority to determine the conditions of supply and distribution, which include conditions relating to the development and implementation of EEDSM as an obligation of a licensee.

3 SUMMARY OF INTERNATIONAL SURVEY

3.1 Developed Countries

In developed countries, EEDSM practices are informed by clear policies or legislature from Government or the Regulator. These policies guide the involvement of regulators, utilities and customers in EEDSM implementation. In these countries, the Regulator plays a significant role in ensuring that the utilities invest in EEDSM programmes.

In Australia (NSW), guidance is provided by the Regulator to ensure that utilities incorporate EEDSM, in planning the expansions of a distribution system. Moreover, there is an obligation on utilities to evaluate EEDSM within the framework of an Integrated Resource Plan applicable to Denmark, USA and several other states.

An obligation may be placed on utilities to invest a percentage of their revenues on EEDSM, a common practice in USA (California, North West states, New York). Although some countries have de-regulated electricity markets, there is usually a dedicated fund established to attract and assist utilities and customers to participate in EEDSM programmes (UK, Britain, USA - California, Denmark, New Zealand).

3.2 Developing Countries

The trend in most developing countries is similar to developed countries where the EEDSM costs incurred by utilities are recovered through the electricity tariffs as in the Philippines or from a dedicated fund as in Brazil and Thailand for example. There is also the establishment of Energy Conservation Centres and Energy Agencies that administer EEDSM programmes and provide advise to customers on energy efficiency in India, Pakistan, Thailand and Brazil.

Government policies place an obligation on the utilities to incorporate EEDSM in the planning and to develop DSM Plans as in Philippines or to invest a percentage of the utilities' revenue towards EEDSM as applied in Brazil. The implementation of EEDSM projects is ensured through Energy Service Companies (ESCOs), a proliferating industry particularly in Brazil, which has an advanced ESCO industry.

3.3 Recommended regulatory mechanism for SA

The NER project team recommends the following regulatory mechanism to be included in the framework of the regulatory policy to be implemented in the current SA electricity industry. To this effect, the team recommends that:

- The current EEDSM funding mechanism through the Eskom tariffs be maintained in the transition to the REDs.
- Eskom be obliged to implement EEDSM in accordance with the regulatory policy on EEDSM.
- Major distributors be obliged to develop EEDSM plans and Implementation Schedules and to ensure implementation accordingly.
- Licensed distributors be obliged to advertise EEDSM tips and measures on their customer's electricity bills.
- Licensed distributors be obliged to design and offer a time-of-use tariff to all their industrial and commercial customers.

In the future restructured electricity industry the following shall apply:

- An Energy Agency will be established to ensure the implementation of energy efficiency programmes for all energy carriers and to administer the dedicated funds.
- REDs will be obliged to develop EEDSM Plans using IRP methodologies.
- REDs will be obliged to implement EEDSM programmes as in the plans.
- REDs will recover the costs of EE programmes from the Energy Agency.
- REDs will recover the costs of DSM programmes from the tariffs.

The NER provide guidance on the implementation of EEDSM regarding:

- Benchmark evaluation and approval of projects
- Criteria for approval of ESCOs
- Financing EEDSM projects
- ESCO Maintenance Contracts
- EEDSM Asset ownership
- Monitoring and Verification of each EEDSM project implemented

4 REGULATORY POLICY ON EEDSM

In developing the following regulatory policy for the implementation of energy efficiency and demand side management programmes in the SA electricity sector, the NER is guided by the current implementation of EEDSM, the restructuring of the electricity industry and government policies on energy efficiency.

4.1 Vision

Successfully implement EEDSM Programmes within the electricity sector through the development and enforcement of effective regulatory mechanisms.

4.2 Mission

To support government objectives on energy efficiency by encouraging and facilitating the development and implementation of EEDSM programmes in the electricity industry.

4.3 Policy Goals

The policy goals are to:

- Ensure successful implementation of EEDSM by stakeholders within the electricity sector through:
 - Raising the level of awareness of the benefits among end users and electricity suppliers.
 - Ensuring a time-of-use tariff for all industrial and commercial customers.
 - Providing appropriate funding mechanisms.
 - Providing regulatory guidance for implementation.
 - Ensuring monitoring and verification of programmes.
- Protect electricity customers from rising electricity bills by ensuring that electricity suppliers provide energy services at least-cost to the end users through:
 - Setting license conditions that oblige electricity suppliers to incorporate EEDSM in their planning.
 - Establishment of an obligation for electricity suppliers to implement EEDSM options to all end users.

The NER seeks to establish a comprehensive EEDSM policy that outlines the procedures, responsibilities and obligations for the planning and implementation of EEDSM by the relevant stakeholders.

Policy Focus: This policy will currently focus on all customers and support EEDSM programmes implemented on the end user's premises that is beyond the metering point. Energy Efficiency programmes in the power generation sector will be evaluated and considered at a later stage.

EEDSM Targets and Programmes

The National Integrated Resource Plan 2003/2004 has identified of the following EEDSM programme categories with associated annual MW and MWh Targets which are listed in Annexure A. These targets and programmes will be developed in accordance with developments in the NIRP and subsequent NER Board Decisions. Eskom DSM is required to achieve the targets specified by regulatory policy.

Development of the Implementation Plan

Furthermore, a strategy for the implementation of EEDSM from the NER's perspective will be developed to elaborate on the regulatory policy and to indicate how the regulatory policy will be enforced. The Implementation Plan is scheduled for release by December 2004. The NER envisages that the approved EEDSM policy will be enforced in January 2005. In the interim, the NER will ensure that Eskom DSM implements EEDSM in accordance with the approved policy and the NER board decisions.

4.4 Principles of the Policy

In the current industry infrastructure (transition to formulation of REDs):

- Licensed distributors must advertise the EEDSM tips and measures on all their customers' electricity bills.
- Licensed distributors should develop and offer a time-of-use tariff to all their commercial and industrial customers.
- Eskom must implement EEDSM in its dealings with all customers in accordance with the regulatory policy on EEDSM and the DSM Rollout Plan submitted to the NER.
- The NER will approve the appropriate EEDSM costs to be recovered through Eskom tariffs.
- Major distributors (as defined below) must develop EEDSM plans as prescribed by the NER and submit these plans as part of their tariff approval process.
- NER will approve EEDSM Plans submitted by Major Distributors.
- Major Distributors are to obtain funding through the Eskom DSM fund.
- Eskom and Major Distributors must report all EEDSM progress to the NER in the format prescribed by the NER.
- Monitoring and Verification will be done on all EEDSM projects in accordance to the M&V protocols specified by the NER.

In the future restructured electricity industry, the policy principles are as described in section 4.10. These principles will be developed in accordance with transformation in the electricity industry and the approval of the NER Board.

4.5 Stakeholders in the Policy Environment

This policy specifically applies to the following stakeholders:

- Department of Minerals and Energy (DME)
- NER
- Eskom
- Energy Services Companies (ESCOs)
- Eskom Distribution Regions
- Licensed Distributors (Metros/Municipalities)
- All end users of electricity (Industrial, Commercial, Residential, Agricultural)
- Monitoring and Verification Teams

The policy would be of interest to the following stakeholders:

- National Treasury
- Energy Associations
- Educational Institutions

4.5.1 Roles and Responsibilities of Stakeholders

The following indicates the roles and responsibilities of the key stakeholders that are affected by the implementation of the policy in the current electricity industry. The roles and responsibilities are subject to change in accordance with future restructuring. That is, the formulation of REDs and the establishment of an Energy Agency.

4.5.2 NER

The NER, through a consultative process with all affected stakeholders, where necessary, will be responsible for or seek to do the following:

- Make EEDSM planning and implementation one of the license conditions of major distributors through issuing and renewing of licences.
- Ensure that major distributors use integrated resource planning practices in determining their electricity purchase plans and/or network development plans.
- Approve EEDSM plans submitted by major distributors.
- Establish the MW targets, budgets and measures to be implemented by Eskom and major distributors.
- Register, monitor, and evaluate all EEDSM undertakings by electricity distributors, and liaise with the DME in this regard.
- Require Eskom and the major distributors to compile and submit EEDSM progress reports and annual reports.
- Ensure that M&V is done for all EEDSM projects in accordance with the NER specified M&V protocols.
- Develop incentives (if needed) through the regulatory and tariffs methodologies to encourage distributors to invest in EEDSM.
- Establish mechanisms, which will ensure that major distributors recover the direct costs of EEDSM programmes.

4.5.3 Eskom, Major Distributors and All Licensed Distributors

As a condition of the approval of the annual Eskom price increase, Eskom will be obliged to:

- Continue with the implementation of EEDSM in accordance with the regulatory policy on EEDSM.
- Continuously invest in EEDSM measures in order to reduce the peak load
- Apply the appropriate benchmarks when approving EEDSM projects
- Approve the project proposals submitted by all approved ESCOs
- Facilitate the implementation of EEDSM projects by ESCOs
- Make funds available to major distributors for EEDSM projects
- Initiate the M&V of all EEDSM projects
- Submit progress reports and annual reports to the NER in the format prescribed by the NER

As a license condition, major distributors will be required to:

- Evaluate EEDSM options that reduce the peak load
- Develop EEDSM plans using the IRP methodologies
- Submit these plans to the NER for the approval
- Ensure implementation of EEDSM programmes (approved by the NER), to all their customers, through ESCOs.
- Apply for EEDSM funding through Eskom
- Initiate the M&V of all EEDSM projects
- Submit progress reports and annual reports to the NER in the format prescribed by the NER

All licensed distributors (Metros, Municipalities, Eskom Distribution) must engage in the following:

- Introduce a time-of-use tariff (approved by the NER) to small industrial and commercial customers
- Advertise the benefits of EEDSM on their customers' bills

4.5.4 Independent Monitoring and Verification Body

The M&V Body would be an independent body accountable to the NER and required to:

- Perform M&V on all projects (utilising EEDSM funds from Eskom) in accordance with the M&V protocols specified by the NER
- Provide the M&V plans on the respective projects to the NER, Eskom, major distributors and the customers.
- Provide the M&V reports to the NER in the format prescribed by the NER
- Submit M&V costs to the NER for approval (costs would be recovered from the Eskom DSM funds)
- Ensure that M&V data is collected at a Central Database and reports made available in the format specified by the NER.

4.5.5 Energy Services Companies (ESCOs)

These are either entrepreneurial entities who implement EEDSM projects on the customers' site or customers who have established an ESCO within their organisation (Internal ESCO).

- Develop project proposals and submit to Eskom or major distributors for approval
- Ensure that a maintenance contract is in place with the customer for each EEDSM project
- Implement the project and ensure the sustainability of the EEDSM measure at least over the useful life of the EEDSM measure.

4.5.6 All End Users

The NER has no mandate to place regulations on end-users. Customers are therefore encouraged to implement energy efficiency measures or to shift their energy usage from peak to off-peak periods and collaborate with ESCOs and electricity suppliers.

4.6 Obligation on all Licensed Electricity Distributors

4.6.1 Advertise the benefits of EEDSM

All licensed distributors must advertise on their customers' electricity bills, each month, the EEDSM tips and measures that the customer should adopt to reduce their consumption of electricity. These tips and measures should describe the energy efficiency measures/devices and load management measures/ devices the customer should implement. The advertising should be done on all classes of customers' electricity bills – Residential, Commercial, Industrial and Agricultural. The licensed distributor will be allowed to recover only the costs of administering advertisements on the electricity bills through their respective tariffs (approved by the NER).

Further, the licensed distributor must display on each customers electricity bill, historic monthly energy consumption. More information on the mandatory advertising on customers' bills will be provided within the relevant Customer Services Standard (NRS047).

(The above condition would come into effect immediately after the approval of the draft policy by the NER Board).

4.6.2 Time-Of-Use Tariff to all Commercial and Industrial Customers

All licensed distributors should design a time-of-use tariff for all their industrial and commercial customers. The tariff should be designed such that it reflects the price of electricity which the distributor pays during peak, standard and off-peak periods.

These tariffs must be submitted to the NER for approval when the licensed distributors' tariffs and price increase are approved.

For distributors that already have a time-of-use tariff/s in place, the NER will review all existing TOU tariffs and associated conditions with the intent of ensuring that the tariff is 'fair' to all customers and does provide the appropriate EEDSM pricing signal.

4.7 Implementation in the Current Industry Infrastructure

4.7.1 Assumptions

- The current Eskom vertically integrated utility will undergo restructuring whereby the Generation, Transmission and Distribution will be separated in accordance with government ESI Restructuring Bill.
- EDI restructuring is not complete i.e. Transition period to REDS
- There is no legal separation between Retail and Distribution (Wires)
- The major distributors are determined by the quantity of energy sold. As a pilot for developing EEDSM Plans, and EEDSM implementation in the current electricity industry, all Metros in SA together with Eskom Distribution were selected by the NER. These distributors in total supply approximately 85% of electricity to all end-users. The major distributors identified by the NER are as follows:

Table 1: List of major Distributors

Major Distributor
1. Each Eskom Distribution Region
2. eThekweni
3. City Power
4. City of Cape Town
5. Tshwane
6. Ekurhuleni
7. Nelson Mandela
8. Mangaung
9. Buffalo City

4.7.2 EEDSM Implementation Model: Current Industry Infrastructure

With Reference to Figure1 on page 20:

- Eskom is required to implement EEDSM as a condition for the approval of Eskom's tariffs/price increase in accordance with the regulatory policy on EEDSM. Eskom is to submit an EEDSM Rollout plan to the NER.
- Eskom will evaluate and approve EEDSM projects submitted by ESCOs and any customers' Internal ESCO.
- The NER would set a license condition of the Major Distributors to develop an EEDSM Plan and Implementation Schedule and submit these to the NER for approval.
- Major Distributors would Screen EEDSM project proposals from ESCOs and Customers.
- The NER would approve the benchmark criteria for approval of EEDSM projects by Eskom and for screening of project proposals by Major Distributors.

- ESCOs should investigate feasible projects with customers and obtain a Letter of Intent from the customer. A project proposal should then be submitted to Eskom DSM/Major Distributor for funding of the project.
- The Independent M&V Body would be initiated before implementation of the project to verify the MW Reduction and/or energy to be saved per EEDSM project and report to the NER, Eskom DSM, Major Distributor and Customer.

With reference to Figure 2 on page 21:

- Eskom would establish the EEDSM Fund and recover the direct EEDSM costs from the tariffs of all customers in the manner specified by the NER.
- Eskom would provide EEDSM Funds for:
 - Implementation of projects by Major Distributors. (The Major Distributor must apply for funds through the Eskom DSM Fund).
 - Implementation of projects by approved ESCOs
 - Independent M&V Costs
- All customers participating in energy efficiency programmes (using EEDSM funds) will be required to contribute 50% of the capital costs of the project as described in section 4.8.6.
- ESCOs will be required to have a Maintenance or Performance Contract with the customer.
- All maintenance costs will be borne by the customer.
- The NER will approve all M&V Benchmarked costs.
The EEDSM Funds would be recovered from Eskom tariffs only because additional recovery from the tariffs of Major Distributors would imply higher electricity prices for those customers in the Major Distributor's area of supply.

Figure1: Implementation of EEDSM under the Current Industry Infrastructure

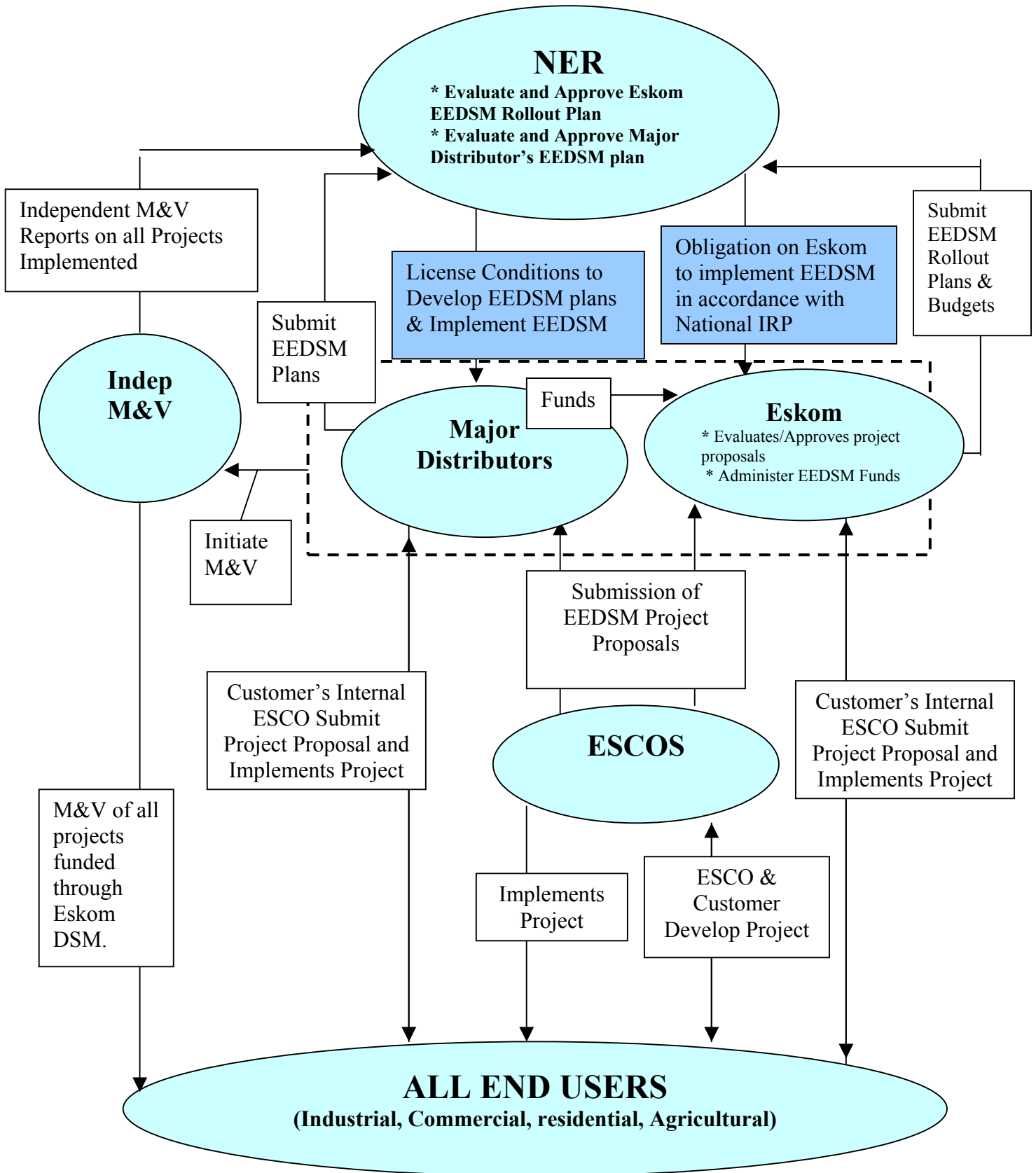
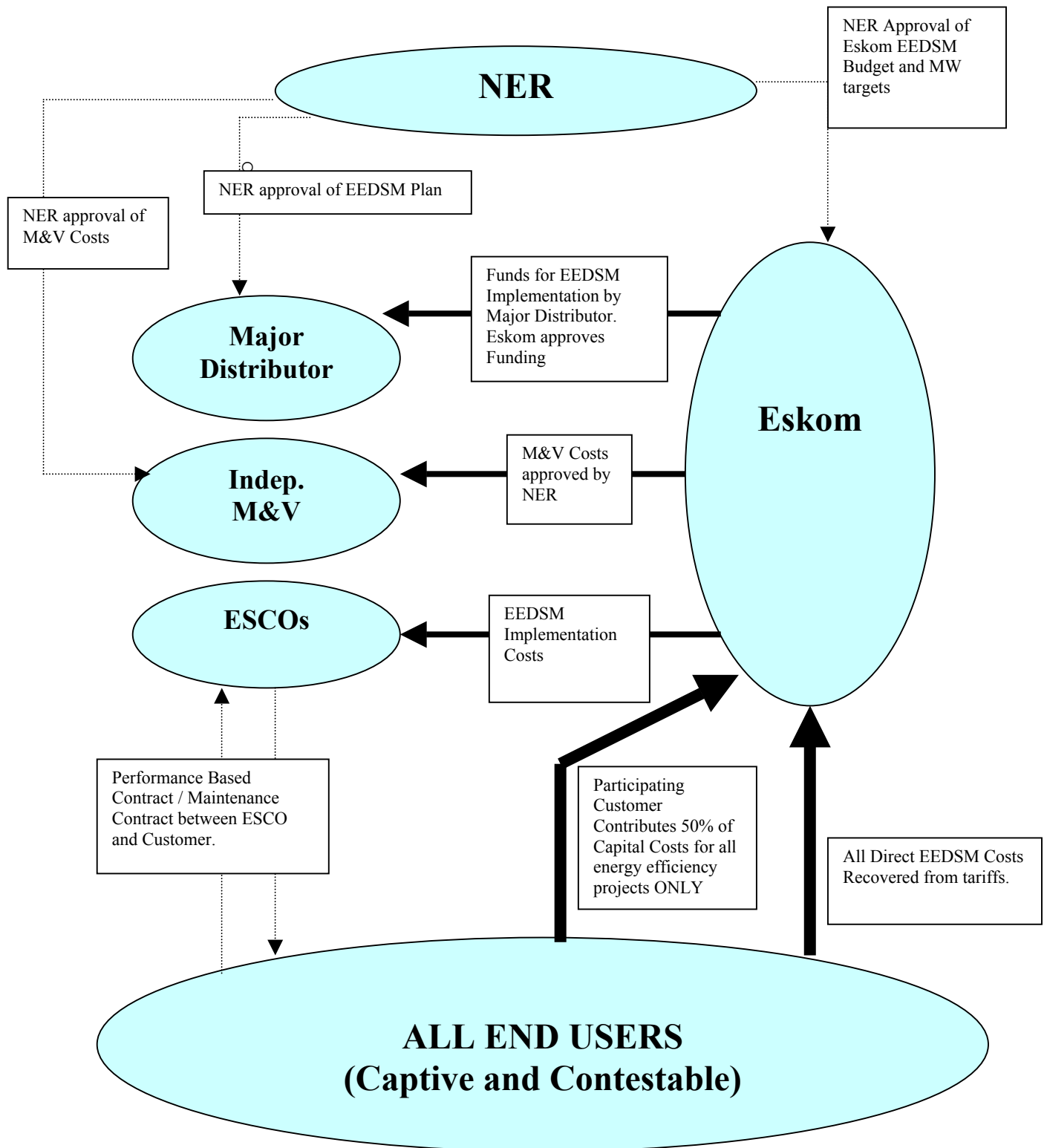


Figure2: The EEDSM Funding Mechanism: The Flow of Funds and Approval



4.7.3 Eskom's Obligation to Implement EEDSM

As a condition for the approval of Eskom tariffs/price increase, Eskom will implement EEDSM programmes in accordance with the NER regulation on EEDSM and the DSM Rollout Plan submitted to NER. The DSM Rollout Plan should continue to be developed in accordance with the Integrated Resource Plan methodologies.

The DSM Rollout Plan including the MW Targets and associated costs should be submitted to the NER in June preceding the year of implementation.

4.7.4 Major Licensed Distributors to Develop EEDSM Plans and Implementation Schedule

The major distributor must ensure implementation of EEDSM programmes with regard to all customers it supplies and reduce its internal demand.

The following would be required of Major Distributors:

- Develop EEDSM plans using the methodologies of integrated resource planning.
- Develop an Implementation Schedule for the following year.
- Submit plans, schedules and budgets to NER for approval during the distributor's annual price/tariff increase.
- Ensure implementation of EEDSM as laid out in the Implementation Schedule
- Evaluate and revise plans annually (NER approval)
- Format and details of plans will be prescribed by NER
- Funding of EEDSM should be obtained through the Eskom DSM Fund

4.7.5 Funding EEDSM through the Tariffs

The EEDSM budget must be 'ring-fenced' within Eskom as follows:

- Eskom maintain a separate account for EEDSM
- Separate Financial Statements for EEDSM
- Keep a separate assets register for all applicable EEDSM Assets

Eskom will be allowed to recover all direct EEDSM costs through the tariffs. The budget for EEDSM for each year would be submitted to the NER in July preceding the year of implementation. The NER would evaluate and approve the EEDSM expenditure to be recovered in the year of implementation.

Eskom is to *expense* all EEDSM expenditure except Monitoring and Verification Assets, which would be capitalised and recovered from the tariffs as depreciation.

Any excess recovery for EEDSM expenditure would be retained in the EEDSM account and utilised in the following year.

4.7.6 Financing EEDSM projects

Energy Efficiency programmes is considered differently from the other category of DSM programmes due to their relative costs and their impact on the national load profile and is therefore financed differently.

Eskom should finance the capital costs of Eskom approved projects in the following manner:

Energy Efficiency Projects

Eskom should finance 100% of the capital costs of these programmes. The ESCO/Customer would be responsible for the procurement of all EEDSM Assets.

Also, customers, where applicable, benefiting from the program would be required to contribute 50% of the total capital costs of the project. The customer's contribution may be once off or in equal instalments including interest over the contract term period (interest determined by NER).

All monetary contributions from customers benefiting from the EEDSM programme will be debited into the EEDSM account (monitored by NER).

Load Management DSM Projects

Eskom should finance 100% of the capital costs of these programmes. The ESCO/Customer would be responsible for the procurement of all EEDSM Assets

For all projects (energy efficiency and load management DSM), the customer would:

- Assume ownership of the asset after installation
- Insure the assets
- Ensure maintenance of the assets over the useful life of the equipment (contract term period)
- Be required to enter into an EEDSM Agreement with Eskom DSM where applicable. (For the DSM Agreements already signed before approval of the policy, the customer will be given the prerogative to either enter into a new EEDSM Agreement or remain on the existing DSM Agreement. Eskom will facilitate all EEDSM Agreement changes through the guidance of the NER).

All M&V Costs (approved by NER) would be met through EEDSM Funds.

EEDSM Audits: Eskom DSM would also finance a portion of the costs of EEDSM audits and feasibility studies not exceeding 80% of the cost of the audit.

Eskom DSM would finance the audit in advance of such studies being undertaken subject to the following conditions:

- Eskom DSM is to develop a formal procedure for applications in financing EEDSM Audits, which would be approved by the NER.
- Eskom is to report on such studies to the NER on a monthly basis

- The results of such studies are to be evaluated by Eskom DSM. Should the technical and financial quality of a study be deemed unacceptable the costs of the study are to be recovered from the ESCO by Eskom DSM.

4.7.7 EEDSM Asset Ownership (Maintenance & Insurance)

The following table suggests who would take ownership of the various assets.

Table 2: EEDSM Asset Ownership

No	Class of Asset	Location of Asset	Controlled by	Maintained and Insured	Ownership
1	EE Appliances and Devices	Customers Site	Customer	Customer/ESCO	Customer
2	Load Management Equipment and Devices	Customers Site	Customer	Customer/ESCO	Customer
3	Energy Management Systems	Customers Site	Customer	Customer/ESCO	Customer
4	HWLC Control Equipment/Devices	Customers Site	Municipality/TSO	Municipality/ESCO	Municipality
5	Monitoring and Verification Equipment	Customers Site	M&V Teams	Eskom	Eskom

The customer would assume ownership immediately after installation. The customer will be responsible for the insurance and maintenance of those DSM Assets over the useful life of the asset (contract term period).

ESCOs would be required to enter into Maintenance and/or Performance contracts with the customers to ensure the sustainability of the EEDSM programme. Customers implementing EEDSM themselves (Internal ESCO) will be required as part of the EEDSM Agreement to ensure that the maintenance is carried out over the duration of the Agreement.

The contract term period is determined by the useful life of the EEDSM measure.

Periodic monitoring and verification after implementation would be carried out to ensure that the respective M&V assets and EEDSM measure is maintained.

4.7.8 Benchmark Evaluation of Projects

The NER would prescribe a benchmark for evaluating and approving the EEDSM project proposals from the all ESCOs. Eskom would apply these benchmarks when approving projects.

4.7.9 Benchmark approval of ESCOs

The NER would specify criteria to certify/accredit ESCOs to implement EEDSM. ESCOs must be registered with Eskom/Major Distributors as bona-fide entities to implement EEDSM before allowing ESCOs access to EEDSM funds.

Customers wishing to implement EEDSM projects themselves using EEDSM funds should only be allowed to do so when they have established an approved Internal ESCO within their organisation. The approval of such an ESCO would be done using the same criteria as for other ESCOs.

4.7.10 Monitoring and Verification

Monitoring and verification would be required of all projects funded through EEDSM Funds. The NER would set up the governance of the existing Independent M&V Teams to establish an Independent Monitoring and Verification Body.

The M&V Body would be accountable to the NER and provide the respective reports to the NER, Eskom, Major Distributors and customers. The M&V Body should adopt appropriate M&V protocols to determine the most conservative Baselines when calculating the MW reduction and energy savings and supply the associated M&V costs to the NER.

These M&V protocols and costs would be approved by the NER. The M&V Team should provide the projected and actual impact of each EEDSM project on the national load peaks and off-peak periods.

4.7.11 Progress Reporting by Eskom and Major Distributors

Eskom and Major Distributors must provide the following reports to NER:

- Quarterly progress reports on EEDSM in the format prescribed by the NER
- An annual report in the format prescribed by the NER
- Eskom is to submit a monthly report to the NER for all project proposals evaluated.

4.8 Penalties for Non-Conformance

The regulatory policy requires both Eskom and Major Distributors to submit EEDSM plans to the NER and Implement EEDSM in accordance with the approved plans. Failure to comply with these conditions would result in the NER imposing fines as outlined in Chapter 2 (sub-section 29) of the proposed Electricity Regulation Bill, version ii.

The fines imposed will be determined by the NER after evaluating the degree of non-compliance of the respective entity.

Further, it is envisaged that fines would be imposed by the NER for non-attainment of the EEDSM targets by Eskom DSM.

The detailed mechanism of imposing fines would be evaluated and communicated in the Implementation Plan (to be developed).

4.9 Implementation in the Future Restructured Electricity Industry

4.9.1 EEDSM in a Restructured ESI in South Africa

The successful implementation of the NER Regulatory Policy on EEDSM is dependent on the current and future structure of the electricity industry. Currently, the South African electricity industry is undergoing restructuring with a separation of generation, transmission and distribution (ESI restructuring). The distribution sector will be further restructured to form six regional electricity distributors (REDs) made up of municipalities and Eskom distribution regions (EDI restructuring).

This section also intends to describe the regulatory mechanism that should be put in place to ensure EEDSM investments in the restructured electricity industry.

4.9.2 Assumptions

- ESI restructuring is complete.
- EDI restructuring is complete i.e. Formation of six REDs complete.
- Competitive electricity market (Wholesale competition) yet to be introduced.
- EEDSM funds administration through Eskom to be phased out
- Establishment of an Energy Agency.
- The new Energy Agency would administer funds for all energy efficiency (EE) only.
- The REDs will source financing of EE programmes from the Energy Agency.
- The REDs will source financing of all other DSM programmes through the RED's tariffs.

4.9.3 EEDSM Implementation Model: Restructured ESI

In order to ensure sufficient investments in EEDSM in the restructured industry, the NER proposes that the following model be developed. This model is proposed taking into account the above assumptions and is subject to change in accordance with developments in the electricity industry. Further, the principles of the policy for the future restructured electricity industry is outlined below and would be detailed in the future.

With reference to figure 3:

- The NER and government would together embark on establishing an Energy Agency. The Energy Agency would be an independent institution tasked with administering the National Energy Efficiency Programmes within all energy sectors. The responsibilities of the energy agency amongst others would be:
 - Administration of Energy Efficiency Funds
 - Promoting mechanisms that ensure Energy Efficiency implementation for all energy carriers.
 - R&D for new energy efficiency measures
 - Evaluation/Approval of funds for all Energy Efficiency project proposals from REDs
- The NER would set a license condition for each RED to develop an EEDSM Rollout Plan and Implementation Schedule using IRP methodologies (i.e. RED is to develop a Local Integrated Resource Plan LIRP) and submit it to the NER for approval.
- ESCOs and Internal ESCOs should submit their project proposals to the respective RED for funding of an EEDSM projects and not directly to the Energy Agency (subject to change with developments in the electricity industry).
- The REDs will be required to evaluate and approve project proposals submitted by ESCOs and customers.
- The NER would specify the benchmark criteria for approval of Energy Efficiency projects by the Energy Agency
- The NER would specify the benchmark criteria for approval of all other DSM projects by the REDs.
- The REDs will ensure that approved projects are implemented by the ESCOs
- Monitoring and verification will be done by the Independent M&V Body accountable to the NER:
 - On relevant projects funded by the Energy Agency
 - On relevant projects funded through the RED's tariffs

With reference to figure 4:

- The NER would determine the annual budget for Energy Efficiency programmes in the electricity sector to be administered by the Energy Agency
- The NER would determine the mechanism through which funds for EE is allocated to the Energy Agency.
- The NER would establish the criteria for the financing of EE programmes by the Energy Agency.
- Each RED would tender for funding of EE projects from the Energy Agency
- The Energy Agency would:
 - Evaluate and fund EE projects from REDs
 - Fund the respective M&V Costs

- The NER would evaluate the EEDSM Plans submitted by the RED and evaluate the appropriate funding of DSM programmes to be recovered via the tariffs of the RED
- The RED would recover the EE programme costs through the Energy Agency.
- The RED would recover the DSM costs through the tariffs
- The RED would pay the costs of projects implemented by ESCOs, for all EEDSM programmes implemented by ESCOs.

Figure 3: Implementation of EEDSM after restructuring (formation of REDs) and the transition period to the Introduction of competition.

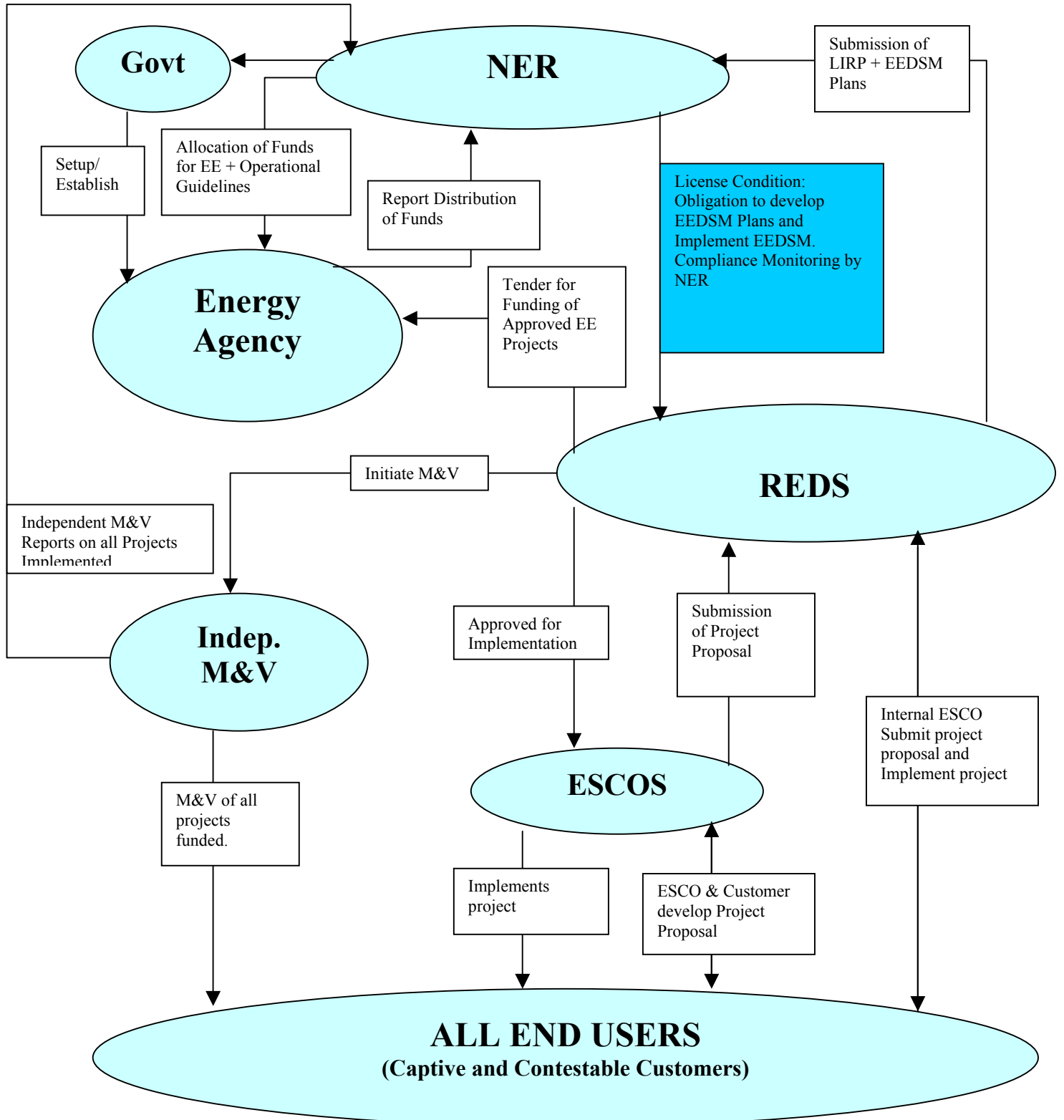
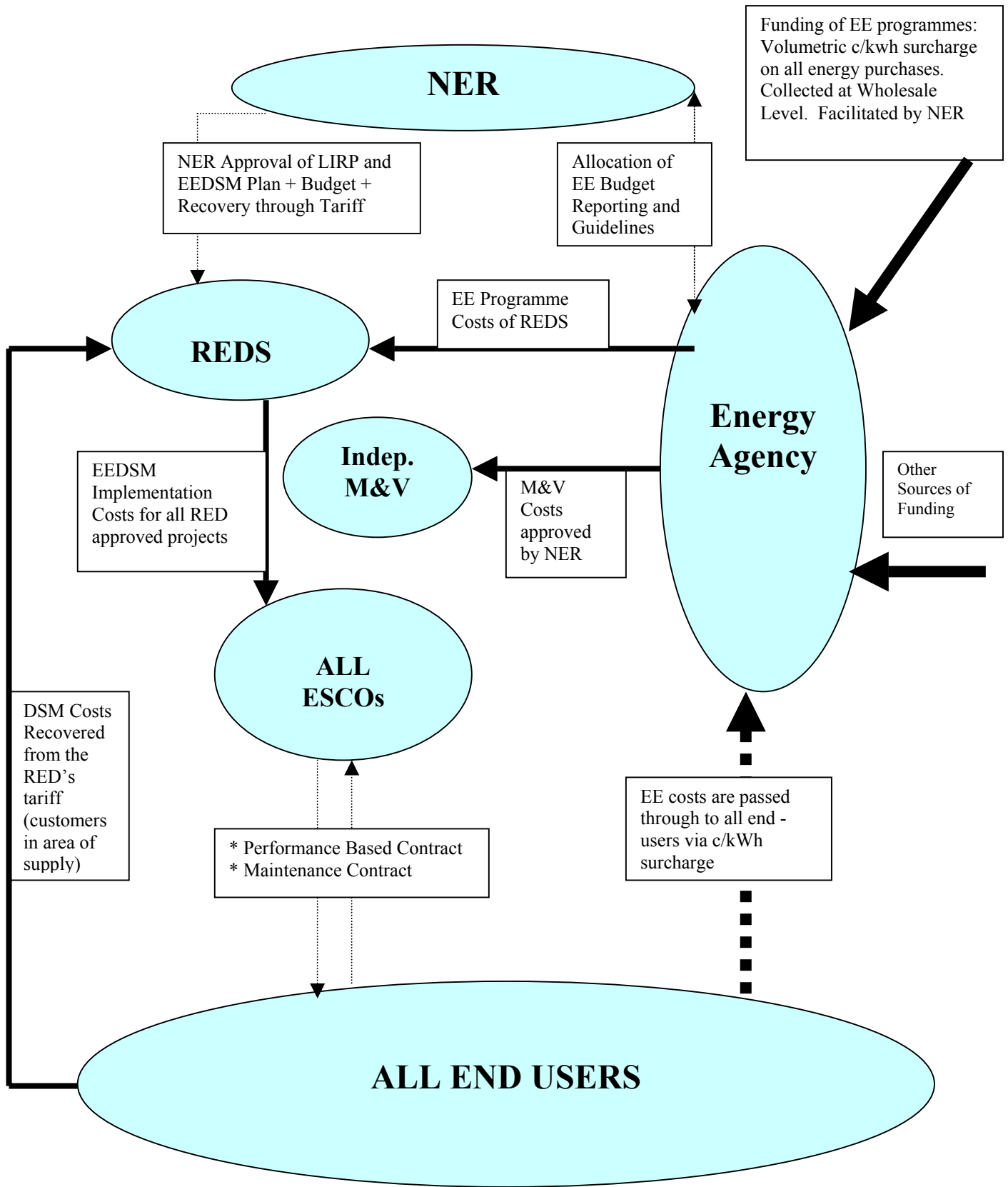


Figure 4: Funding Mechanism showing Flow of Funds and Approval in the Restructured Electricity Industry:



4.9.4 Funding Mechanism

Energy Efficiency:

The NER together with Government is to establish a non-profit Energy Agency to administer a dedicated fund for Energy Efficiency within the SA. For the electricity sector, it is envisaged that funds for EE would be collected through a volumetric energy surcharge (c/kWh), which would be collected at the wholesale market level. The energy surcharge would be determined by the NER annually in the following manner:

$$\text{Total Budgeted Direct EEDSM Costs (Rands) / Total Energy Sold in Wholesale Market} = \text{c/kWh surcharge}$$

The collection from the surcharge would be done in the year of implementation. The funds would be maintained in a ring-fenced account of the Energy Agency.

The Energy Agency would report to the NER on all activities surrounding the administration of EE Funds

Demand Side Management (excluding EE):

The RED would recover costs for all other DSM programmes through the tariffs. The NER would evaluate the EEDSM Plans of the RED each year during the tariff/price increase and allow the appropriate DSM costs to be recovered.

4.9.5 Obligation of RED to Develop EEDSM Plans

Through the license, the NER would specify the following conditions for all electricity suppliers (REDS/Retailers) requiring them to:

- To develop EEDSM plans using IRP methodologies (LIRP);
- Submit EEDSM Plan and Budgets to the NER for approval;
- Develop implementation Schedule for the following year of implementation;
- Implement EEDSM as laid out in the Implementation Schedule (approved by the NER);
- Adhere to the format and details of the EEDSM Plan would be prescribed by the NER;
- To apply for the funding of EE through the Energy Agency;
- Recover other DSM costs through the tariffs (approved by the NER);
- Provide the following reports to the NER;
 - Quarterly progress Report
 - Annual EEDSM Report
(Format prescribed by the NER)

4.9.6 Regulatory Guidance on EEDSM

In addition, the NER would provide guidance in the implementation of EEDSM in the following manner:

- Ensuring that criteria be set for the approval of ESCOs.
- Establishing a benchmark for the evaluation and approval of project proposals by the REDs and the Energy Agency.
- Requiring that a maintenance contract be in place between the ESCO and customer for each project utilising EEDSM Funds.
- Providing guidelines relating to the ownership of EEDSM Assets.
- Providing NER specification/approval of Monitoring and Verification/Evaluation procedures and costs.

4.9.7 Revenue Loss due to EEDSM

Mechanisms to compensate the REDs for net revenue loss due to EEDSM will be investigated and adopted by the NER in line with the regulatory regime (ROR, IBR).

4.9.8 EEDSM in a Competitive Market Environment

With the introduction of competition, market participants would bid their demand and supply of electricity in a spot or day-ahead market (i.e. those that elect to purchase electricity through the market instead of fixed contracts with generators). In these markets, the price is determined by the supply–demand balance.

These market platforms also provide an opportunity for customers to bid in their reduction in demand due to load management activities commonly referred to as Demand Side Bidding (DSB). Customers participating in DSB are compensated through the market for making available their reduction in electricity consumption and also when they are requested to reduce their demand by the system operator.

DSB therefore provides opportunities and incentives for electricity customers to engage in load management programmes.

The NER will investigate the feasibility of introducing a DSB programme and incorporate such a programme within the design of the future electricity market in addition to the other regulatory mechanisms.

4.10 Conclusion

The NER envisages achieving its EEDSM goals and ensuring successful implementation of EEDSM in any restructured electricity industry in SA, through the promulgation of the regulatory mechanisms described above.

5 ENFORCEMENT

5.1 Commencement Date of Policy

Once the policy has been approved, an Implementation Plan will be developed which outlines in detail, the mechanics of how the policy will be enforced among all the stakeholders.

It is envisaged that the detailed Implementation Plan would be complete by December 2004.

Therefore, the enforcement of this policy would come into effect after this process is complete and approved by the NER Board for implementation in the SA electricity industry. It is therefore envisaged that the **approved policy would come into effect in January 2005.**

In the interim (2004), the NER has issued directives to Eskom DSM to proceed with EEDSM implementation in accordance with the approved policy and NER Board Decisions.

5.2 Policy Monitoring and Evaluation

The Implementation Plan will detail the responsibilities of the Policy Actors. The NER will ensure monitoring and evaluation of the policy actors' compliance to the policy. The monitoring measures of compliance will be detailed in the Implementation Plan.

The effectiveness of the policy will also be monitored and evaluated by the NER project Team through impact assessment of the EEDSM programmes implemented.

All progress and performance by Eskom DSM and the Major Distributors on EEDSM implementation will be disclosed in the public domain. This is particularly in regard to MW reduction achieved, MWh energy saved and the total costs of the EEDSM programmes.

5.3 Policy Review

The NER has established an EEDSM Stakeholder Working Group representing all relevant stakeholders in the electricity industry. The working group will be tasked with the review of the regulatory policy on a bi-annual basis.

The NER Project Team will therefore ensure that after monitoring and evaluation of EEDSM implementation, and after evaluating the compliance of policy actors to the policy and to changes in the electricity industry, a review would be made of the approved policy in conjunction with the Stakeholder Working Group established.

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ANNEXURE A

1. EEDSM Targets and Programmes

The National Integrated Resource Plan 2003/2004 has identified the following EEDSM programme categories with associated annual MW Targets. These targets and programmes will be developed in accordance with the NIRP and subsequent NER Board Decisions.

Through the proposed regulatory mechanisms, the NER envisages that EEDSM programme implementation would result in:

152 MW Annual Reduction in Peak Demand

The annual reduction in energy consumed in the electricity sector due to energy efficiency programmes is targeted to be:

292 GWh Annual Energy Displaced

Table 1: Categories of EEDSM and Annual Targets

Programme Category	Annual MW Displacements	Annual Energy Displaced GWh
Residential Energy Efficiency	32	115
Commercial Energy Efficiency	14	68
Industrial and Mining Efficiency	16	109
Residential Load Management	49	-
Industrial and Mining Load Management	41	-
Annual Total	152	

The following tables list all the programmes that will be eligible for EEDSM Funding.

Table 2: Residential Energy Efficiency Programmes

Programme	MW/a	GWh/a
Integral CFL's	25.20	91.97
Hotwater System Efficiency	2.93	10.13
Low flow showerheads	2.38	8.22
Hotwater conservation	0.47	1.63
Cooking Awareness	1.34	3.44
Total	32.32	115.39

Table 3: Commercial energy efficiency programmes

Programme	MW/a	GWh/a
Supervision	2.05	10.60
Fans and Pumps	0.64	4.68
Lighting	9.53	43.54
VSD's	0.26	1.90
Motor Replace	0.68	3.50
Motor Upgrade	0.66	3.40
Total	13.82	67.62

Table 4: Industrial and Mining Energy Efficiency programmes

Programme	MW/a	GWh/a
Supervision	2.24	15.33
Fans and Pumps	1.31	9.26
Compressed Air	2.26	16.54
Lighting	3.77	23.44
VSD's	4.40	29.3
Motor Replace	1.13	7.72
Motor Upgrade	1.06	7.02
Total	16.17	108.61

Table 5: Residential Load Management Programmes

Programme	Hi CF MW/a	Balance of MW/a	Lo CF MW/a
Hot Water Load Control	49	49	98

Table 6: Industrial and Mining Load Management

Programme	Hi CF MW/a	Balance of MW/a	Lo CF MW/a
Industrial/ Mining Load	40.9	40.9	82