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EASTERN NILE POWER TRADE PROGRAM STUDY

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AfDB



POWER TRADE STRATEGY REPORT

VOL 4

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with participation of:

- EPS (Egypt)
- Tropics (Ethiopia)
- YAM (Sudan)

FINAL REPORT

15 NOVEMBER 2007



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PHYSICAL UNITS AND CONVERSION FACTORS

bbbl	barrel	(1t = 7.3 bbl)
cal	calorie	(1 cal = 4.1868 J)
Gcal	Giga calorie	
GWh	Gigawatt-hour	
h	hour	
km	kilometer	
km ²	square kilometer	
kW	kilo Watt	
kWh	kilo Watt hour	(1 kWh = 3.6 MJ)
MBtu	Million British Thermal Units	(= 1 055 MJ = 252 kCal)
	one cubic foot of natural gas produces approximately 1,000 BTU	
MJ	Million Joule	(= 0,948.10 ⁻³ MBtu = 238.8 kcal)
MW	Mega Watt	
m	meter	
m ³ /d	cubic meter per day	
mm	millimeter	
mm ³	million cubic meter	
Nm ³	Normal cubic meter, i.e. measured under normal conditions, i.e. 0°C and 1013 mbar	
	(1 Nm ³ = 1.057 m ³ measured under standard conditions, i.e. 15°C and 1013 mbar)	
t	ton	
toe	tons of oil equivalent	
tcf	ton cubic feet	
°C	Degrees Celsius	

General Conversion Factors for Energy

To:	TJ	Gcal	Mtoe	MBtu	GWh
From:	multiply by:				
TJ	1	238.8	2.388 x 10 ⁻⁵	947.8	0.2778
Gcal	4.1868 x 10 ⁻³	1	10 ⁻⁷	3.968	1.163 x 10 ⁻³
Mtoe	4.1868 x 10 ⁴	10 ⁷	1	3.968 x 10 ⁷	11630
MBtu	1.0551 x 10 ⁻³	0.252	2.52 x 10 ⁻⁸	1	2.931 x 10 ⁻⁴
GWh	3.6	860	8.6 x 10 ⁻⁵	3412	1

ABBREVIATIONS AND ACRONYMS

ADB	African Development Bank
ADF	African Development Fund
CC	Combined Cycle
CCGT	Combined Cycle Gas Turbine
CIDA	Canadian International Development Agency
CT	Combustion Turbine
DANIDA	Danish Development Assistance
DFID	Department for International Development (UK)
DIDC	Department for International Development Cooperation (GoF)
DSA	Daily Subsistence Allowance
EEHC	Egyptian Electricity Holding Company
EEPCO	Ethiopian Electric Power Corporation
EHV	Extra High Voltage
EHVAC	Extra High Voltage Alternating Current
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EN	Eastern Nile
ENCOM	Eastern Nile Council of Ministers
ENSAP	Eastern Nile Subsidiary Action Program
ENSAPT	Eastern Nile Subsidiary Action Program Team
ENTRO	Eastern Nile Technical Regional Office
ENTRO PCU	Eastern Nile Technical Regional Office Power Coordination Unit
FIRR	Financial Internal Rate of Return
GEP	Generation Expansion Plan
GTZ	German Technical Co-operation
HPP	Hydro Power Plant
HFO	Heavy fuel oil
HV	High Voltage
HVDC	High Voltage Direct Current
ICCON	International Consortium for Cooperation on the Nile
ICS	Interconnected System
IDEN	Integrated Development of the Eastern Nile
IDO	Industrial Diesel Oil
IMF	International Monetary Fund
JICA	Japanese International Co-operation Agency
JMP	Joint Multipurpose Project
LNG	Liquefied Natural Gas
LOLP	Loss of Load Probability
LPG	Liquefied Petroleum Gas
LRFO	Light Residual Fuel Oil
MENA	Middle East, North Africa Countries
MIWR	Ministry of Irrigation & Water Resources (Sudan)
MWR	Ministry of Water Resources (Ethiopia)
MWRI	Ministry of Water Resources and Irrigation (Egypt)
MSD	Medium Speed Diesel (TPP)
NBI	Nile Basin Initiative
NEC	National Electricity Corporation (Sudan)
NECC	National Electricity Control Centre (Egypt)
NELCOM	Nile Equatorial Lake Council of Ministers
NELSAP	Nile Equatorial Lake Subsidiary Action Program
NG	Natural Gas

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NGO	Non Governmental Organization
NORAD	Norwegian Aid Development
NPV	Net Present Value
O&M	Operations and Maintenance
OCGT	Open Cycle Gas Turbine
OPEC	Organization of the Petroleum Exporting Countries
PPA	Power Purchase Agreement
PBP	Pay Back Period
PHRD	Policy & Human Resource Development Fund
PIU	Project Implementation Unit
PRSP	Poverty Reduction Strategy Paper
RCC	Regional Electricity Control Centre (Egypt)
RMC	Regional Market Co-ordinator
RE	Rural Electrification
REB	Regional Energy Broker
REM	Regional Electricity Market
SAPP	Southern Africa Power Pool
SIDA	Swedish International Development Agency
SO	System Operator
SSD	Slow speed diesel (TPP)
STPP	Steam Turbine Power Plant
STS	Senior Technical Specialist
TAF	Technical Assistant Fund
TPP	Thermal Power Plant
UA	Unit of Account
UNDP	United Nations Development Program
WB	World Bank

1. INTRODUCTION

The following recommendations are based on the issues, options and proposals arising from the foregoing chapters of this report. The crystallization of these recommendations was a gradual and highly participative process, in order to build an international consensus among power policy makers and managers in the region. The objective was to develop recommendations that would not only support the development of the Regional Electricity Market (REM), but would be technically well-founded, would be consistent with and benefit from developments elsewhere, and would have a realistic prospect of being approved and implemented.

Following the Shared Vision of the Nile Basin Initiative adopted by the Nile Council of Ministers in Dar es Salaam on 22 February 1999, the Ministers responsible for electricity affairs in the countries of Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda, adopted, on May 20-21, 2003, the long-term vision for the Nile Basin Power Forum and approved the Regional Power Trade Project Implementation Plan, including the establishment of a Nile Basin Power Forum.

In February 2005, the Ministers in charge of Electricity Affairs signed the Inter-Governmental Memorandum of Understanding which enables the establishment of the East African Power Pool.

At the same time, the General Managers of the Electricity Utilities of the same countries signed the Inter-Utility Memorandum of Understanding, which establishes EAPP's basic management and operating principles.

These two MOUs are respectively presented in Appendix 1 and 2. They represent a major political recognition and endorsement of the necessity to establish the EAPP in Eastern Africa, with the view to improve the competitiveness and the economic efficiency of the electric systems in the region.

Moreover, an Agreement shall be signed between the Operating Members of the Power Pool which establishes the specific rules of operation and pricing and Operating Guidelines, which provide standards and operating guidelines. As example, the SAPP Agreement between Operating Members is presented on Appendix 3, while the SAPP Operating Guidelines is presented on Appendix 2 of Volume 3.

It is obvious that any further development towards the integration of the national electricity power systems should be integrated in the Regional Strategy for the implementation of the East African Power Pool.

2. TYPE OF POWER MARKET

We can take the normal starting point for most power markets as being that of a traditional state-owned, monopolistic power utility. Typically, it will be vertically integrated to cover not only generation, but also transmission and distribution. In addition, it will normally be self-sufficient in the sense that it will not rely on power imports to meet its customer demand.

From this point, power markets may evolve in several ways. For example, the market may evolve through “vertical” unbundling or separation of the generation, transmission and distribution functions into one or more separate entities. These entities can then be turned into individual cost and profit centers. They may be commercialized and even partially or fully privatized, which can result in varying degrees of competition in the electricity market. At the limit, individual consumers can choose between competing suppliers for their power requirements.

Significant savings and economies of scale, they come at the price of assuming more obligations and forgoing some measure of corporate control and national sovereignty. So far, most countries have favoured the more “loose” form of co-operation over the “tight” power-pool model.

In most countries, the trend has been partly in both directions, although it would be quite possible for a state monopoly power utility to interconnect with utilities in neighbouring countries. Similarly, there could be power sector institutional reform and market competition in a country even though it chose to remain isolated from its neighbours.

Figure 1. shows the range of possible ways in which the power market could evolve within the next 20 years.

From our enquiry, the following broad conclusions were drawn:

- There was an encouraging degree of consensus in favour of regional power-pool co-operation.
- All member countries expect to be trading electricity with neighbouring countries, and almost all expect that to be within the framework of a “loose” power pool.
- Countries would accept some level of power market competition.

3. RECOMMENDATIONS REGARDING THE REGIONAL ORGANIZATION

The objective is to build a consensus at the technical level as to what the next steps should be. The main recommendations are as follows:

1. An independent body, the EAPP Organizational Structure including the Ministerial Conference, the Steering Committee, the Independent Regulatory Board, the Permanent Secretariat, the Technical Sub-committees and the Coordination Centre are or will be established. At the beginning, the Permanent Secretariat and its subordinated bodies will have a mainly information and coordination role, and should not be involved in day-to-day regional electricity market operation. The EAPP Permanent functions, which will be approved by the Steering Committee and the Ministerial Conference, will include but will not be limited to:
 - Verification that REM members conform to the market standards and rules;
 - Ensuring that the necessary market information is available to all system operators;
 - Development of standardisation rules, such as communication standards, reserve and reliability requirements, training of technical staff, etc.

2. There is a need to harmonize the electricity sector legislation in the East Nile (East African) countries.
3. Traders may be either physical producers of electricity, or consumers or suppliers. An electricity trader must be recognised as a legal body situated in at least one of the East Nile member countries. Financial criteria must be set to ensure credit-worthiness of traders.
4. The shift from single trader to multiple traders will occur at different rates in different countries.
5. National Grid Codes should be harmonised. For the East Nile Region, it appears preferable to establish a common Regional Grid Code considering that no formal national system grid codes exists.
6. Upgrading of the information exchange infrastructure should be a high priority, in order to strengthen collaboration among the various dispatching centres in the East Nile Region and East African Region.
7. It will be necessary to develop and introduce a common transmission pricing methodology for the East Nile Region. Fair, cost reflective, transparent and non-discriminatory tariffs will facilitate electricity trade, including power transit through the national transmission networks. The simplest approach might be to make the East Nile Region transmission pricing methodology correspond to the transmission pricing methodology proposed by the European TSOs. Some of the basic pricing principles to be included are:
 - A congestion cost item is required in the transmission pricing methodology to reflect existing or future anticipated network limitations;
 - Transmission pricing should be based on the subsidiarity principle;
 - It will be necessary to define precisely the actual components of the transmission network with respect to the distribution network as well as the various types of services offered by the transmission network;
 - Posted fee structures would be helpful to allow network users to estimate the overall transmission fee;
 - Fees should be applied to physical rather than contractual power flows;
 - A reasonable rate of return on investment, according to European power industry practice, should be built in to the calculation of transmission costs in each country.
8. The following commercial recommendations must be considered:
 - REM participants should regularly announce the prices of electricity available for trade;
 - REM costs should be allocated to individual countries as incurred;
 - Agreement will be required on the treatment of stranded costs, which should be in accordance with accepted methods;
 - A standard contract format for spot market transactions will be required;

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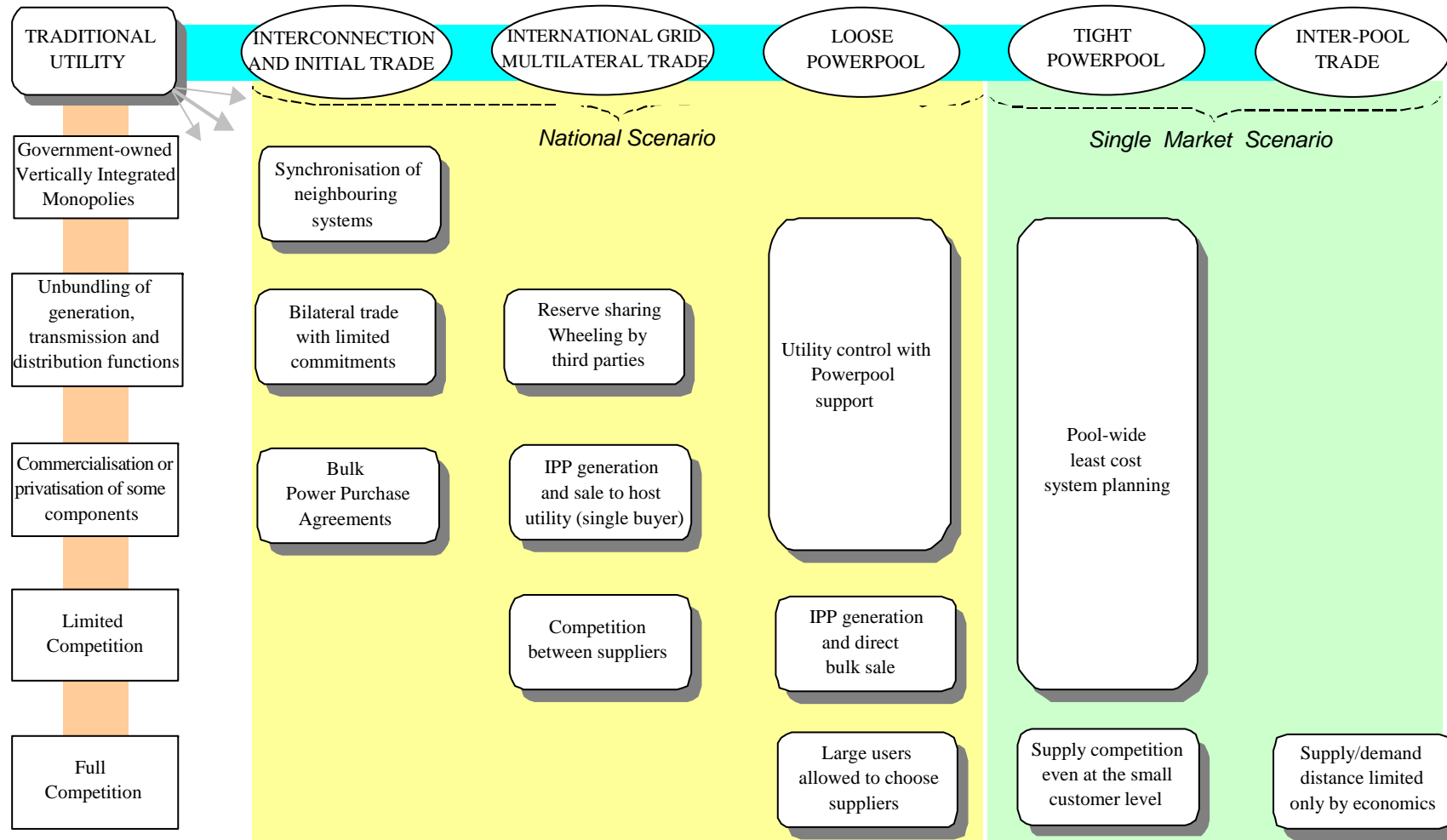
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- Documentation will be required on market code, market membership, eligibility criteria, bidding rules, transit power agreements, transaction information, transmission constraints and dispute resolution procedures;
9. Construction and upgrading of interconnection transmission lines, to improve the co-operation between the REM countries should be a high priority.

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Figure 1.: Power Market Evolution



4. RECOMMENDED REGIONAL ELECTRICITY MARKET DEVELOPMENT SCHEDULE

Figure 2., titled “Possible Phased Development of the East Nile Regional Electricity Market”, summarises the major steps required to implement the REM.

A number of specific milestones are shown. Future milestones will include the start of Regional Market Co-ordinator (EAPP Permanent Secretary) operations, the establishment of the Technical Sub-committees and the establishment the EAPP Information & Coordination Centre and of the Regional Electricity Broker (REB).

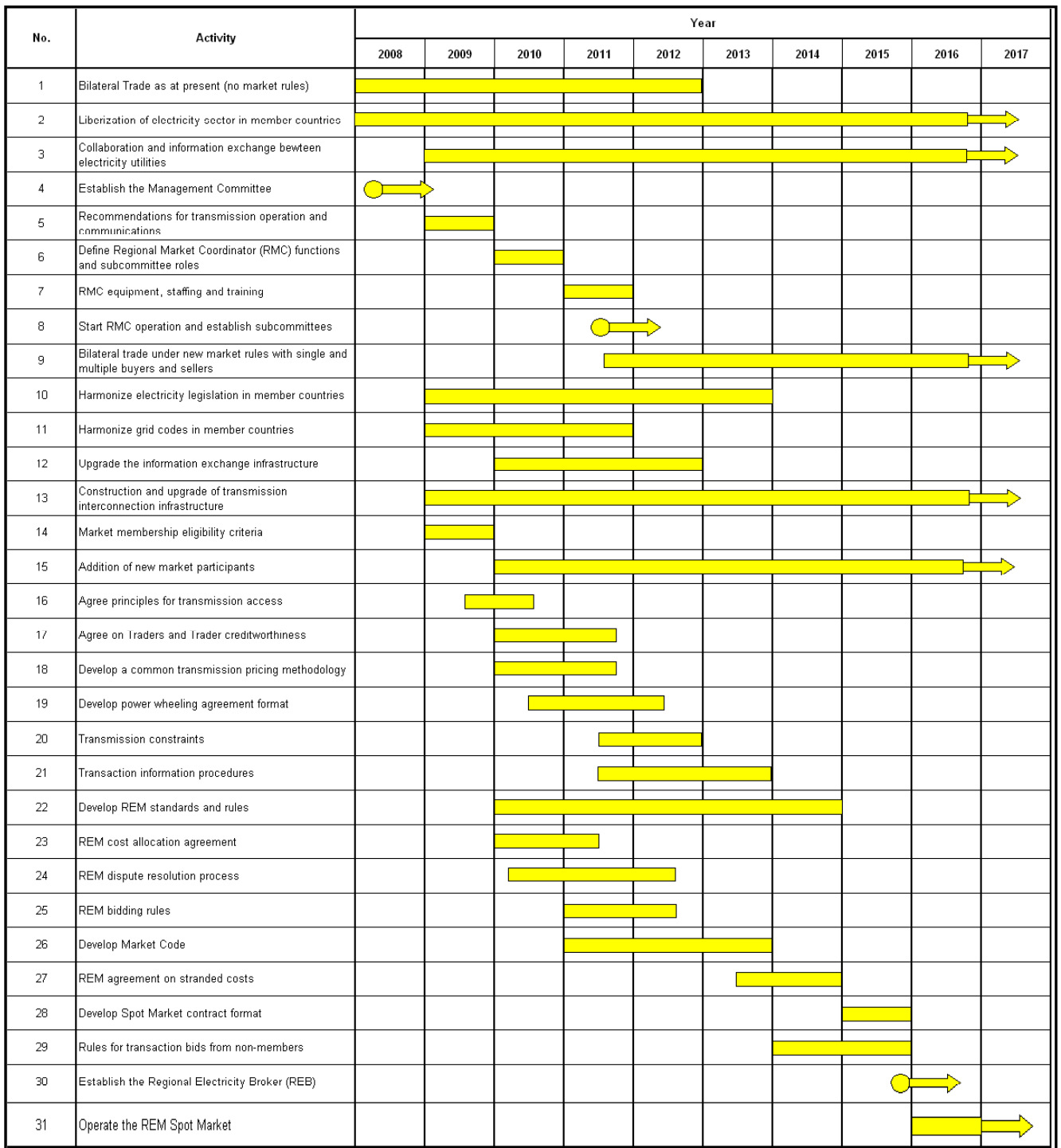
In addition, the chart shows a transition from the present type of bilateral trade towards bilateral trade under new market rules with single and multiple buyers and sellers. It also shows the start-up of a REM (as measured by the inclusion of a spot market to complement bilateral trade) starting operations in 2017.

Many steps will be required before that milestone is reached. The list of activities shown in the development schedule is by no means complete, but it gives a feeling for the scope and timing of initiatives that must be undertaken over the next coming years if the overall REM program is to be achieved.

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Figure 2.: Possible Phased Development of the East Nile Regional Electricity Market



5. COMMERCIAL AND CAPACITY BUILDING

The success of the implementation of the East Nile Regional Electricity Market depends on the ability of the member countries to find the most efficient way of achieving their ultimate objective and to manage change. It now becomes imperative to ensure that the decisions made to date be implemented, that impeding weaknesses in existing facilities and institutions be remedied, and possible counter-productive influences foreseen and mitigated.

Practical implementation of the REM is a task that requires tracking down and eliminating constraints, weaknesses and inconsistencies in the REM development process. Such constraints appear as a result of uneven levels of the national electric power sectors development among countries, lack of infrastructure, disparity between the level of development of the interconnected network infrastructure, on one hand, and the level of development of the institutional and legal framework on the other hand, as well as lack of local expertise to support further development of the regional interconnected grid and governance.

Therefore, it is important to adopt an accompanying Capacity Building and Training Programme for the national Ministries, electric operating entities, and other organizations involved in the electricity sector.

An indicative detailed list of proposed Capacity Building and Training Programmes/Activities is provided on Appendix 4.

APPENDIX 1:

EAST AFRICAN POWER POOL

**“INTER-GOVERNMENTAL
MEMORANDUM OF UNDERSTANDING”**

**EASTERN AFRICA POWER POOL
(EAPP)**

**INTER-GOVERNMENTAL MEMORANDUM
OF UNDERSTANDING
(M.O.U)**

FEBRUARY, 2005

ADDIS ABABA, ETHIOPIA

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Middle: *HY* and a large stylized signature
Right: *ms* (underlined)

PREAMBLE

The New Partnership for the Development of Africa (NEPAD), Launched in 2001 by the African Head of States, has defined the energy sector as one of the priority sectors in the continent requiring integration. Despite the huge electrical power potential in the region, the rate of access to electricity for the population is low, ranging from 5% to 20% except in Egypt where the access rate is 99% . In addition, the quality and reliability of electricity in a number of the Eastern Africa Countries is very low. In order to overcome these shortcomings and in response to globalization, the Eastern Africa Governments must enhance the development and integration of their power systems. It is in response to this need that the formation of the Eastern Africa Power Pool has been conceived.

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This Inter-Governmental Memorandum of Understanding (MOU) is signed at Addis Ababa on 24 February 2005 by the Governments of the Eastern African countries and the Arab Republic of Egypt; namely:

- The Republic of Burundi
- The Democratic Republic of Congo
- The Arab Republic of Egypt
- The Federal Democratic Republic of Ethiopia
- The Republic of Kenya
- The Republic of Rwanda
- The Republic of Sudan
- The United Republic of Tanzania
- The Republic of Uganda

Hereinafter known as "The Parties".

WHEREAS the Lagos Plan of Action of the Organization Of African Unity (OAU) now African Union (AU) advocated the setting up of regional entities in order to gradually and progressively establish an African Common Market;

WHEREAS regional integration remains one of the African Union's goals;

CONSIDERING that Eastern Africa region is endowed with enormous energy resources;

CONSIDERING that despite these resources, Eastern Africa is inadequately electrified;

CONSIDERING that this situation may be adequately improved by setting up an institutional framework for the pooling of energy resources in the region and power exchanges between the power utilities;

NOW THEREFORE, THE PARTIES HAVE AGREED AS FOLLOWS:

MTSC

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[Signature]

ARTICLE 1 : DEFINITIONS AND MEANINGS OF TERMS

In this MOU the following terms have the meaning assigned to them :

"The Parties" : The Governments of the following countries having agreed to sign this MOU, namely :

- The Republic of Burundi
- The Democratic Republic of Congo
- The Arab Republic of Egypt
- The Federal Democratic Republic of Ethiopia
- The Republic of Kenya
- The Republic of Rwanda
- The Republic of Sudan
- The United Republic of Tanzania
- The Republic of Uganda

This definition is extendable to any other Government from the Region who signs this MOU.

"EAPP" : Eastern Africa Power Pool;

"Power-Pool" : A framework for pooling energy resources and promoting power exchanges between utilities in a given geographic area in order to secure their respective power supply, provide mutual assistance in case of failure in their respective power systems and reduce power supply costs based on an integrated master plan approach and pre-established rules.

"EAPP Member" : Public or concessionary utility/company in charge of Power generation ,Transmission and/or Distribution in the countries of the Parties.

"ACTIVE MEMBERS" : All EAPP Members except Independent Power Producers..

"NEPAD" : New Partnership for Africa's Development.

"REGION": a geographic area covering at least four countries whose utilities are members of the EAPP.

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ARTICLE 2 : PURPOSE

The Parties have decided under this MOU to formally set up the EAPP and allow the power utilities operating in their respective countries to sign an inter-utility Memorandum Of Understanding relating to the EAPP which defines the fundamental principles to establish and operate the EAPP.

ARTICLE 3 : EAPP's OBJECTIVES

The main objectives of the EAPP are the following:

- Secure power supply for the Region's countries;
- Optimize the usage of energy resources available in the Region by working out regional investment schemes in Power Generation, Transmission and Distribution .. taking into account the socio-economic and environmental aspects;
- Increase Power supply in the Region in order to increase the access rate of the population to electricity.
- Reduce electricity cost in the Region by using power systems interconnection and increasing power exchanges between countries;
- Provide efficient co-ordination between various initiatives taken in the fields of power production, transmission as well as exchanges in the Region;
- Create, in the framework of NEPAD, a conducive environment for investments, in order to facilitate financing of integration projects in the fields of power generation and transmission in the Region.
- Facilitate, in the long-term, development of electricity market in the Region.

ARTICLE 4: EAPP HEADQUARTERS

The EAPP headquarters is located in Addis Ababa, Ethiopia.

It may be moved to another country in the Region if approved by two-thirds of the Parties.

ARTICLE 5: OBLIGATIONS OF PARTIES

5.1 The Parties commit themselves to support and assist the EAPP members to implement policies and programmes intended to promote, on the basis of an integrated Regional power systems master plan, the interconnection priority projects in their respective territories so as to facilitate cooperation between national power systems.

5.2 The Parties commit themselves to provide EAPP with any required information

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relating to actions to be undertaken as well as any relevant data on power facilities required to implement the integrated Regional Power master plan, in the framework of the EAPP.

- 5.3 The Parties commit themselves to mutually provide, within their respective territories, the necessary facilities for activities relating to studies, construction, refurbishment, operation and maintenance of interconnectors.
- 5.4 The Parties commit themselves to ensure that, in the framework of studies and activities relating to construction, refurbishment, operation and maintenance of interconnectors, optimum security conditions are guaranteed for individuals, facilities, equipment and materials.
- 5.5 The Parties commit themselves to facilitate cooperation between the EAPP members in the framework of development and running of the EAPP, so as to ensure settlement of transactions.
- 5.6 The Parties commit themselves to support bilateral and multilateral funds to be mobilized in the framework of the EAPP's activities.
- 5.7 The Parties commit themselves to do their best to attract private funds for bilateral or multilateral investments to be carried out in the framework of the EAPP.
- 5.8 The Parties understand that EAPP membership shall not, in any manner, alter the relationship existing between the power utility and the Government of the country in which it operates in particular laws and policies.

ARTICLE 6: RESOURCES

- 6.1 EAPP resources shall be derived from members' contributions, services' fees, grants and any other income.
- 6.2 Financing of infrastructures and capacity building will be secured from private, public, bilateral and multilateral development partners under specific agreements in addition to members contributions.

ARTICLE 7 : EAPP ORGANIZATIONAL STRUCTURE

- 7.1. The EAPP organizational structure consists of the following organs and bodies illustrated in Figure 1 attached to this MOU :
 - The Conference of Ministers : consists of Ministers responsible for electricity in the region.
 - The Steering Committee : consists of the Chief Executive Officers of EAPP Active Members.
 - The Independent Regulatory Board : Consists of nominees of national regulatory boards in the countries of the Parties.

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- **The Permanent Secretariat** : is led by an Executive Secretary recommended by the Steering Committee as defined in the Bylaws and approved by the Conference of Ministers.
- **The Technical Sub-Committees in charge of specific issues such as**
 - Planning
 - Operation
 - Environment
- **The Coordination Center** :- Under the guidance of the sub-committee on operation, a coordination center will be established. This center will handle, on a real time basis, collection of technical and commercial information necessary for the operation of the Regional interconnected power system and exchanges of power between EAPP members. An operation agreement to be signed by EAPP members will define the duties and modalities to operate the coordination center on both the short and long term.

7.2 Should it be necessary, the Steering Committee may set up other sub-committees to deal with specific matters.

ARTICLE 8 : ASSIGNMENTS OF EAPP ORGANS

The main assignments of the various organs and bodies of the EAPP are defined as follows :

8.1. Conference of Ministers Responsible for Electricity

- Sign and amend the Inter-Governmental Memorandum Of Understanding (M.O.U) related to the EAPP;
- Approve the Common Electrical Energy Policy (C.E.E.P);
- Approve the Regional Power Development Master Plan
- Provide strategic guidance and oversight to the EAPP Steering Committee.
- Approve the members of independent Regulatory board of EAPP.
- Approve admission of new members.
- Take sanctions against defaulting members of the EAPP.
- Approve the appointment of the Executive Secretary.

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JMM

8.2. Steering Committee

- Define the Common Electrical Energy Policy;
- Define and ensure the implementation of schemes related to the C.E.E.P., especially in terms of tariffs, planning and standardisation policies ;
- Approve the plans, programmes and reports issued by the various Technical Sub-Committees;
- Work out, using EAPP technical structures, standard rules and procedures in the framework of enforcing the Operation Agreement relating to the EAPP;
- Propose to the Conference Of Ministers responsible for electricity options to develop the power systems in the region ;
- Submit quarterly Progress and Operation Reports to the Conference of Ministers.
- Recommend appointment of the Executive Secretary to the Conference of Ministers.
- Approve the budgets ;
- Approve the training programme of staff involved in EAPP operation;
- Set up ad hoc sub-committees as the need arises.
- Harmonise and approve the rates of access to networks ;
- Enact the rules governing the members participating in the power exchanges within the EAPP ;
- Recommend admission of new members to the Conference of Ministers;

8.3. Independent Regulatory Board

- Enforce standards, procedures and specifications as set out by the Steering Committee ;
- Organise power markets in the EAPP ;
- Follow up the application of the rules governing members participating in the power exchanges within the EAPP ;
- Harmonise the accounting and billing procedures of power exchanges ;
- Settle any disputes which may arise between the members and related to the exchange and transactions within the EAPP.

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8.4 Permanent Secretariat

- Manage and update a database of regional power systems ;
- Provide secretarial services to the conference of Ministers, the Steering Committee and the Technical Sub Committees ;
- Seek ways and means to mobilise funds for common interest projects according to guidelines of the Steering Committee of EAPP;
- Follow up the implementation of power interconnection projects ;
- Ensure the co-ordination of works of the Technical Sub-Committees;
- Ensure the liaison between EAPP organs, the Regional Economic Communities and other international organisations involved in development of the power sector ;
- Submit to the Steering Committee, draft plans and programmes of action and related budgets ;
- Foster co-operation relationships between EAPP with the African and International Financing Institutions ;
- Keep records of the minutes of EAPP organs ;
- Manage the permanent office of the EAPP ;
- Follow up the implementation of decisions of other organs of the EAPP ;
- Prepare training programmes for the staff involved in EAPP.
- Process applications for membership.
- Prepare and submit financial statement to the Steering Committee on regular basis.

8.5. The Technical Sub-Committees

Deal with specific issues relating to the operation and development of the EAPP. At this stage, three (3) Technical Sub-Committees are envisaged namely :

- Sub-Committee on Planning;
- Sub-Committee on Operation;
- Sub-Committee on Environment.

The Sub-Committee on Planning shall be the organ responsible for the co-ordination of master plans and development programmes of member utilities.

The Sub-Committee on Operation shall be responsible for the definition of the operating and maintenance rules of power plants and networks involved in the EAPP. Other specific tasks will be defined in the "Operation Agreement".

MTSE

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- As →
- CF
- JMD

The Sub-Committee on Environment shall be responsible for the environmental impact assessment and mitigation measures on the electrical installations within EAPP.

ARTICLE 9 : COOPERATION

- 9.1 The Parties agree to ensure that duties and responsibilities binding on the EAPP members are governed by internationally acceptable commercial, legal and technical principles and rules.
- 9.2 The Parties agree to promote cooperation with other power pools in the other African regions and with International Organizations dealing with Energy issues.

ARTICLE 10 : RELATIONSHIP BETWEEN THE EAPP AND THE REGIONAL ECONOMIC COMMUNITIES AND/OR REGIONAL DEVELOPMENT INITIATIVES

- 10.1 The activities of the EAPP shall be consistent with the Regional development vision as defined by the political leaders in the framework of Regional Economic Communities and/or regional development initiatives.
- 10.2 The Parties agree that it is their responsibility to define and harmonize the national power policies in line with the Regional Economic Communities and regional development initiatives.
- 10.3 The EAPP together with the Regional Economic Communities and regional power initiatives will endeavour to meet as frequently as necessary in order to have a better coordination of the defined policies and the integrated projects to be implemented. The findings and recommendations reached will be submitted to the Conference of Ministers.

ARTICLE 11 : RESOLUTION OF DIFFERENCES

The Parties shall use their best effort to settle amicably all differences arising from or in connection with this MOU, or its interpretation.

ARTICLE 12 : AMENDMENT

This MOU may be amended by the Conference of Ministers by decision of two-thirds of its members.

ARTICLE 13 : ENFORCEMENT

This MOU shall be effective once it has been signed by at least four (4) Ministers responsible for electricity in the Region.

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ARTICLE 14 : SIGNATORIES

In witness whereof, the Parties hereto have signed this MOU by their duly empowered Representatives.

1. FOR THE REPUBLIC OF BURUNDI


Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005

 24/02/05

H.E. Dr. Prof. ANDRÉ NKUNDIKIJE
Minister of Energy and Minerals


2. FOR THE DEMOCRATIC REPUBLIC OF CONGO

Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005


H.E. Prof. PIERRE MUZYUMBA MWANAHEMBE
Minister De L'Energie De La Republique Democratique Du Congo


3. FOR THE ARAB REPUBLIC OF EGYPT

Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005


H.E. Dr. HASSAN AHMED YOUNES
Minister of Electricity and Energy

4. FOR THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005


H E HAILE ASSEGIDE
State Minister of Infrastructure

MTSE

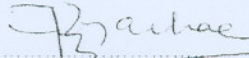






5. FOR THE REPUBLIC OF KENYA

Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005



Hon. SIMEON NYACHAE
Minister for Energy

6. FOR THE REPUBLIC OF RWANDA

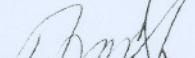
Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005



Hon. EVARISTE BIZIMANA
Minister of Infrastructures

7. FOR THE REPUBLIC OF SUDAN

Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005



H. E. Eng. JOSEPH MALWAL DONG
Minister of Electricity

8. FOR THE UNITED REPUBLIC OF TANZANIA

Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005

Hon. DANIEL YONA
Minister of Energy and Minerals

9. FOR THE REPUBLIC OF UGANDA

Thus done and signed at Addis Ababa, Ethiopia on the 24th day of February 24, 2005


Hon. SYDA N. M. BBUMBA
Minister of Energy and Mineral Development

MTSE



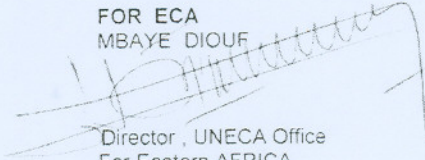
WITNESSES

for FOR COMESA
DR. GEREMEW DEBELIE



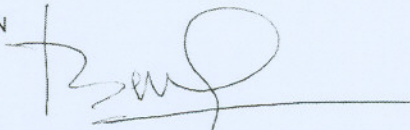
COMESA, Head Of Delegation
Addis Ababa

FOR ECA
MBAYE DIOUF



Director, UNECA Office
For Eastern AFRICA

FOR THE AFRICAN UNION



Dr. BERNARD ZOBA
Commissioner in charge of Infrastructure and Energy

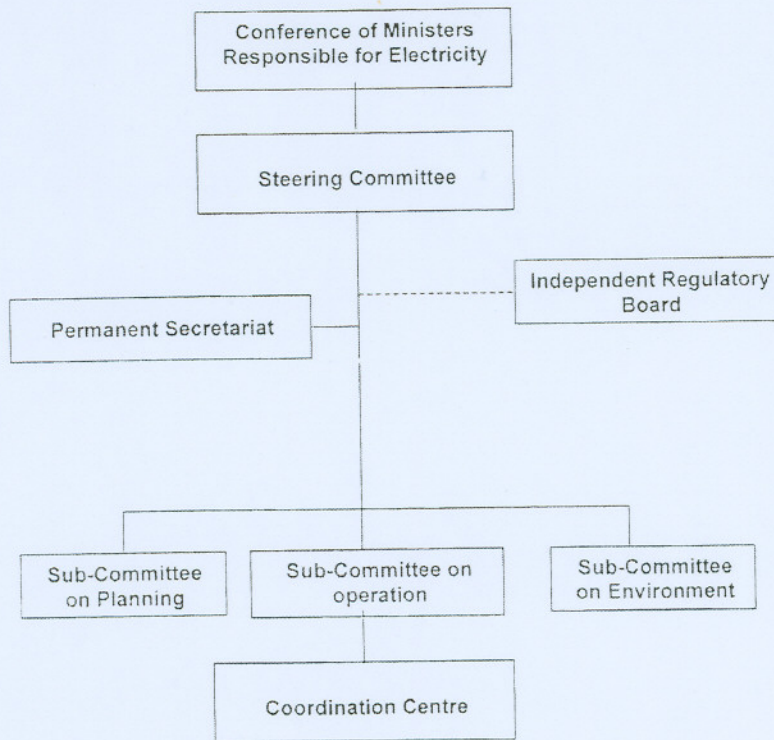


FIGURE 1 : EAPP ORGANIZATIONAL CHART

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 MTSE 14 [Signature]

APPENDIX 2:

EAST AFRICAN POWER POOL

**“INTER-UTILITY
MEMORANDUM OF UNDERSTANDING”**

**EASTERN AFRICA POWER POOL
(EAPP)**

INTER-UTILITY MEMORANDUM OF
UNDERSTANDING
(M.O.U)

FEBRUARY 2005

Handwritten signatures and initials:
A large signature *Amu* is written above the date box.
Below the date box, there are several handwritten initials and signatures: *HE*, *P.A.M*, *W*, *S*, *D.J*, *J*, and *81*.

preamble

This Memorandum of Understanding (MOU) is signed at ...ADDIS ABABA on 24 February 2005 between the following Utilities :

- REGIDESO (BURUNDI)
- Société Nationale d'Electricité (SNEL-DR Congo)
- Egyptian Electricity Holding Company (EEHC-Egypt)
- Ethiopian Electric Power Corporation (EEPCCO-Ethiopia)
- Kenya Power and Lighting Company (KPLC-Kenya)
- Kenya Electricity Generating Company (KenGen-Kenya)
- National Electricity Corporation (NEC-Sudan)
- ELECTROGAZ (Rwanda)
- Tanzania Electricity Supply Company (TANESCO-Tanzania)
- Uganda Electricity Transmission Company Ltd (UETCL-Uganda)
- Uganda Electricity Generation Company Ltd (UEGCL-Uganda)
- Uganda Electricity Distribution Company Ltd (UEDCL-Uganda)
- Uganda Electricity Board (UEB-Uganda)
- Société Internationale d'Electricité des pays des Grands Lacs (SINELAC)

Hereinafter known as "Parties".

WHEREAS Eastern Africa region is endowed with huge energy resources ;

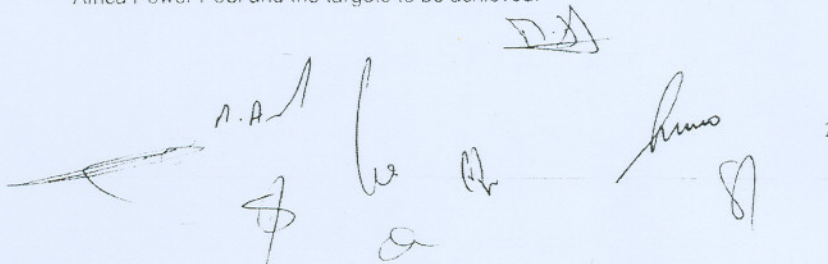
CONSIDERING that despite these resources, Eastern Africa is inadequately electrified and that the rates of electrification range between 5 to 20 % whereas the quality of supply is featured in a number of countries in the region by frequent unavailability ;

CONSIDERING that this situation may be adequately improved by setting up an institutional framework for power exchanges between the Region's power utilities ;

NOW THEREFORE

ARTICLE 1: PURPOSE

This MOU is aimed at defining the fundamental principles to run the Eastern Africa Power Pool and the targets to be achieved.

The bottom of the page contains several handwritten signatures and initials. From left to right, there is a large signature, the initials 'A.A.', a signature that appears to be 'W. A.', another signature, and a final signature. A small number '2' is written to the right of the signatures.

ARTICLE 2 : MEANINGS OF TERMS :

In this MOU the following terms have the meaning assigned to them:

2.1. **EAPP** : Eastern Africa Power Pool

2.2. **Power-Pool** : A framework for pooling energy resources and promoting power exchanges between utilities in a given geographic area in order to secure their respective power supply, provide mutual assistance in case of failure in their respective power systems and reduce power supply costs based on an integrated master plan approach and pre-established rules .

2.3. **EAPP Member** : Public or concessionary utility in charge of Power Production, Transmission and/or Distribution in an Eastern African country.

2.4. **UPDEA** : Union of Producers, Transporters and Distributors of Electric Power in Africa.

2.5. **NEPAD** : New Partnership for Africa's Development.

2.6. **REGION** : A geographic area covering at least 4(four) countries whose utilities are members of the EAPP;

ARTICLE 3 :EAPP's OBJECTIVES

The main objectives of the EAPP are the following :

- Secure power supply for the Region's countries ;
- Optimize the usage of energy resources available in the Region by working out regional investment schemes in Power Generation, Transmission and Distribution, taking into account the environmental effects ;
- Increase Power supply in the Region in order to increase the access rate of the population to electricity in Eastern Africa ;
- Reduce electricity production cost in the Region, using power systems interconnection and increasing power exchanges between countries ;
- Provide efficient co-ordination between various initiatives taken in the fields of power production, transmission as well as exchanges in the Region ;
- Create, in the framework of NEPAD, a conducive environment for investments, in order to facilitate integration projects financing in the fields of power generation and transmission in the Region.

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- Facilitate, in the long term, the development of an electricity market in the Region.

ARTICLE 4 : TYPE OF MEMBERS

There are two types of Members: Active Members and Affiliate members.

4.1 : Active Members

Public or concessionary utilities in charge of electric power production, Transmission and/or distribution in the Region and who have fulfilled membership conditions.

4.2 : Affiliate Members

Independent Power Producers (IPP's) operating in the Region and who have fulfilled the membership conditions

ARTICLE 5 : ACQUISITION OF MEMBERSHIP

5.1 Active Members

Any Eastern Africa power utility (apart from IPP's) may become EAPP's Active Member, provided that the utility signs this Memorandum of Understanding.

Any applicant for membership shall submit a written request to the Permanent Secretariat on satisfying the conditions as stipulated in the By laws and sign this Memorandum of Understanding.

5.2 Affiliate Members

Any Independent power producer operating in the Region who submits a written request for membership to the Permanent Secretariat on satisfying the conditions as stipulated in the By-laws.

ARTICLE 6 : RIGHTS AND OBLIGATIONS OF MEMBERS

6.1 Active Members

The EAPP member utilities have to agree on equal rights and obligations, and to operate in solidarity without abusing their favourable position to the detriment of the other members.

The members commit themselves to sharing information and knowledge necessary for the smooth running of the pool.

Each member utility of the power pool is responsible for the maintenance of its own power generation and/or transmission infrastructures.

WA or HE *M. R. A* *[Signature]* *[Signature]* *[Signature]* *[Signature]* *[Signature]*

Regarding common facilities undertaking in the framework of the power pool, the members will agree on specific patterns of management, operation and maintenance.

The EAPP Active Members have a right to vote.

6.2 Affiliate Members

They shall have same rights and obligations as the EAPP members but they have no right to vote.

ARTICLE 7 : EAPP ORGANIZATION CHART

7.1. The EAPP organization chart consists of the following organs and bodies as illustrated in Figure 1 attached to this MOU. :

- The Conference of Ministers consists of Ministers responsible for electricity in the Region.
- The Steering Committee : consists of the Chief Executive Officers of the Active Members.
- The Independent Regulatory Board : Consists of nominees of national regulatory boards in the countries of the Parties.
- The Permanent Secretariat : is led by an Executive Secretary recommended by the Steering Committee and approved by the Conference of Ministers.
- The Technical Sub-Committees on :
 - Planning
 - Operation
 - Environment
- The Coordination Center :- Under the guidance of the sub-committee on operation, a coordination center will be established. This center will handle, on a real time basis, collection of technical and commercial information necessary for the operation of the Regional interconnected power system and exchanges of power between EAPP members. An operation agreement to be signed by EAPP members will define the duties and modalities to operate the coordination center on both the short and long term.

7.2 Should it be necessary, the Steering Committee may set up other sub-committees to deal with specific matters.

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ARTICLE 8 : ASSIGNMENTS OF EAPP ORGANS

The main assignments of the various organs and bodies of the EAPP are defined as follows :

8.1. Conference of Ministers Responsible for Electricity

- Sign and amend the Inter-Governmental Memorandum of Understanding related to the EAPP ;
- Approve the Common Electrical Energy Policy (C.E.E.P) ;
- Approve the Regional Power Development Master Plan;
- Provide strategic guidance and oversight to the EAPP Steering Committee;
- Approve the members of the Independent Regulatory Board of EAPP.
- Approve admission of new EAPP members.
- Take sanctions against defaulting members of EAPP;
- Approve the appointment of the Executive Secretary.

8.2. Steering Committee

- Define the Common Electrical Energy Policy;
- Define and ensure the schemes implementation programme related to the C.E.E.P., especially in terms of tariffs, planning and standardisation policies ;
- Approve the plans, programmes and reports issued by the various Technical Sub-Committees ;
- Work out, using EAPP technical structures, standard rules and procedures in the framework of enforcing the Operation Agreement relating to the EAPP ;
- Propose to the Conference of ministers responsible for electricity, options to develop the power systems in the Region ;
- Submit quarterly Progress and Operation Reports to the Conference of Ministers.
- Recommend the appointment of the Executive Secretary to the Conference of Ministers ;
- Approve the budgets ;

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- Approve the training programme of staff involved in EAPP operation ;
- Should the need arise, set up technical or ad hoc sub-committees
- Harmonise and approve the rates of access to networks ;
- Enact the rules of the game between members participating in the power exchanges within the EAPP ;
- Recommend admission of new members to the Conference of Ministers ;

8.3. Independent Regulatory Board

- Enforce standards, procedures and specifications as set out by the Steering Committee ;
- Organise power markets in the EAPP ;
- Follow up the application of the rules of the game between members participating in the power exchanges within the EAPP ;
- Harmonise the accounting and billing procedures of power exchanges ;
- Settle any disputes which may arise between the members and related to the exchange and transactions within the EAPP.

8.4 Permanent Secretariat

- Manage and update a database of regional power systems ;
- Provide secretariat services to the conference of Ministers, the Steering Committee and the Technical Sub Committees ;
- Seek ways and means to mobilise funds for common interest projects according to guidelines of the Steering Committee of EAPP ;
- Follow up the implementation of power interconnection projects ;
- Ensure the co-ordination of works of the Technical Sub-Committees ;
- Ensure the liaison between EAPP organs, the Regional Economic Communities and other international organisations involved in development of the power sector ;
- Submit to the Steering Committee, draft plans and programmes of action and related budgets ;
- Foster co-operation relationships between EAPP with the African and International Financing Institutions ;
- Keep records of the minutes of EAPP organs ;
- Manage the permanent office of the EAPP ;
- Follow up the implementation of decisions of other organs of the EAPP ;
- Prepare training programmes for the staff involved in EAPP.
- Process applications for membership.
- Prepare and submit financial statement to the steering committee on a regular basis.

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8.5. The Technical Sub-Committees

Deal with specific issues relating to the operation and development of the EAPP. At this stage, three (3) Technical Sub-Committees are envisaged namely :

- Sub-Committee on Planning ;
- Sub-Committee on Operation ;
- Sub-Committee on Environment.

The Sub-Committee on Planning shall be the organ responsible for the co-ordination of master plans and development programmes of member utilities.

The Sub-Committee on Operation shall be responsible for the definition of the operating and maintenance rules of power plants and networks involved in the EAPP. Other specific tasks will be defined in the "Operation Agreement".

The Sub-Committee on Environment shall be responsible for the environmental impact assessment and mitigation measures on the electrical installations within EAPP.

ARTICLE 9 : EAPP OPERATION

9.1 Operation Agreement

- For rational operation requirements of the interconnected regional network, there will be an Operation Agreement which will define the conditions and modalities to operate the EAPP interconnected power system.
- This multilateral Agreement will replace the one in force relating to the existing interconnections in the region.

9.2 EAPP Headquarters and Staff

- The Permanent Secretariat will be located in its own headquarters in Addis Ababa, Ethiopia.
- Apart from the permanent secretariat and the Independent regulatory Board, the EAPP organs will be led on a rotational basis by appointees from the various countries of member utilities following mechanisms to

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be defined in the Bylaws, which will be drafted by the Permanent Secretariat.

- The Secretariat will be on full time employment. Staff recruitment shall be by outside sourcing. Executive Secretary to be on a four years contract, renewable once.
- The provisions relating to the running of EAPP organs will be specified in the by-law.

ARTICLE 10 : FINANCING OF EAPP ACTIVITIES

- 10.1 Pending the effectiveness of power exchanges involving a greater number of countries in the region, the Permanent Secretariat will be financed by :
- Contributions of member utilities ;
 - Services fees
 - Grants and any other revenues
- 10.2 Financing of infrastructures and capacity building will be secured from private, public, bilateral and, multilateral development partners under specific agreements in addition to members contributions.

ARTICLE 11 : EAPP-UPDEA Relationships

- EAPP shall endeavour to establish and maintain close relationship with UPDEA as regards :
 - Power exchanges with the other power-pools in Africa.
 - Mobilization of funds for projects with regional interest.
 - Liaison with African development institutions and/or organizations.
- Depending on needs in the aforementioned fields, technical Assistance agreements may be signed between EAPP and UPDEA.

ARTICLE 12 : AMENDMENT OF MOU

This MOU may be amended by the Steering Committee if decided by at least two-thirds of the EAPP members .

ARTICLE 13 : SUCCESSION AND TRANSFER

Any EAPP Member may bequeath this MOU to a legal successor without consent of the existing Active members, provided that the successor shall agree in writing to take over all the commitments of the outgoing member.

ARTICLE 14 : OFFICIAL COMMUNICATION

All correspondence or documents to be sent to EAPP shall be forwarded to the Permanent Secretariat at the official address of the headquarters.

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e
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ARTICLE 15 : ENFORCEMENT

This MOU shall be effective once the following conditions are fulfilled:

- 1) Signing of the Inter-Governmental Memorandum of Understanding by Ministers responsible for Electricity in at least four countries in the Region
- 2) Signing of this M.O.U by Chief Executives of power utilities from countries whose Ministers have signed the Inter-Governmental Memorandum of Understanding.

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ARTICLE 16 : SIGNATORIES

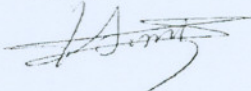
In witness whereof, the parties hereto have signed this MOU by their Representatives duly authorized.

1. THE REPUBLIC OF BURUNDI

Régie de Production et de Distribution d'Eau et d'Electricité (REGIDESO)

Done and signed at... *Arde, Abakana*
on... *24.7.2005*

DANIEL SEJJI
Chief Executive

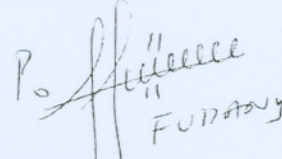


2. THE DEMOCRATIC REPUBLIC OF CONGO

Société Nationale d'Electricité (SNEL)

Done and signed at... *CAIRRE*
on... *08-05-2005*

VIKA-di-PANZU
Chief Executive



FURANGI

3. THE ARAB REPUBLIC OF EGYPT

Egyptian Electricity Holding Company (EEHC)

Done and signed at... *ADU, Abakana*
on... *24-2-2005*

M. Awad
Dr. MOHAMED M. AWAD
Chairman

6

Ch

4. FOR THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
Ethiopian Electric Power Corporation (EEPCO)

Done and signed at CAIRO
on 08/05/2005

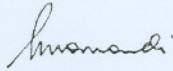
MIHRET DEBEBE
General Manager



5. FOR THE REPUBLIC OF KENYA
The Kenya Power & Lighting Company Ltd (KPLC)

Done and signed at CAIRO
on 8th May 2005

JASPER ODUOR
Managing Director



6. FOR THE REPUBLIC OF KENYA
Kenya Electricity Generating Company Ltd (KenGen)

Done and signed at Cairo
on 8th May 2005

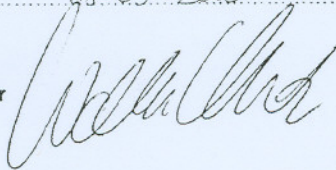
EDWARD NJOROGE
Managing Director



7. FOR THE REPUBLIC OF RWANDA
Etablissement Public de Production, Transport et de Distribution d'Electricité, de l'Eau et du Gaz (ELECTROGAZ)

Done and signed at CAIRO
on 08-05-2005

WALTER KLOTZ
Managing Director



4. FOR THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
Ethiopian Electric Power Corporation (EEPCO)

Done and signed at CAIRO
on 08.10.2005

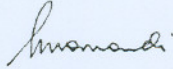
MIHRET DEBEBE
General Manager



5. FOR THE REPUBLIC OF KENYA
The Kenya Power & Lighting Company Ltd (KPLC)

Done and signed at CAIRO
on 8th May 2005

JASPER ODUOR
Managing Director



6. FOR THE REPUBLIC OF KENYA
Kenya Electricity Generating Company Ltd (KenGen)

Done and signed at Cairo
on 8th May 2005

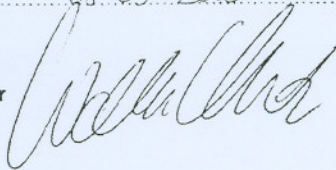
EDWARD NJOROGE
Managing Director



7. FOR THE REPUBLIC OF RWANDA
Etablissement Public de Production, Transport et de Distribution d'Electricité, de l'Eau et du Gaz (ELECTROGAZ)

Done and signed at CAIRO
on 08-05-2005

WALTER KLOTZ
Managing Director



8. THE REPUBLIC OF SUDAN
National Electricity Corporation (NEC)

Done and signed at... ADDIS ABABA
on... 24/12/2005

2005/12/24
MAKKAWI MOHAMMED AWAD
Managing Director

9. THE UNITED REPUBLIC OF TANZANIA
Tanzania Electric Supply Co. Ltd (TANESCO)

Done and signed at.....
on.....

RUDY HUYSEN
Managing Director

10. THE REPUBLIC OF UGANDA
Uganda Electricity Transmission Company (UETCL)

Done and signed at.....
on.....

KIYEMBA ERIASI
Managing Director

10. THE REPUBLIC OF UGANDA
Uganda Electricity Generation Company Ltd (UEGCL)

Done and signed at.....
on.....

MUGYENZI JOHN ERIC
Managing Director

11. THE REPUBLIC OF UGANDA
Uganda Electricity Board (UEB)

Done and signed at.....
on.....

FATUMAH NSEREKO
Managing Director

12. THE REPUBLIC OF UGANDA
Uganda Electricity Distribution Co. Ltd (UEDCL)

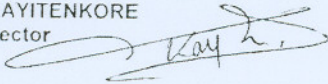
Done and signed at.....
on.....

IRENE MULONI
Managing Director

13. THE REPUBLICS OF BURUNDI/RWANDA/DR CONGO
Société Internationale d'Electricité des pays des Grands Lacs(SINELAC)

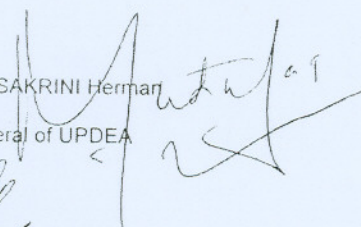
Done and signed at ADDIS ABABA.....
on 24/2/05.....

Ir. CLAUDE KAYITENKORE
Managing Director



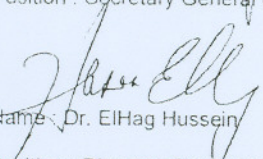
WITNESS

Name : Eng. MUTIMA SAKRINI Herman
Position : Secretary General of UPDEA



Name : Dr. ElHag Hussein

Position : Director of the African Energy Commission - AFREC



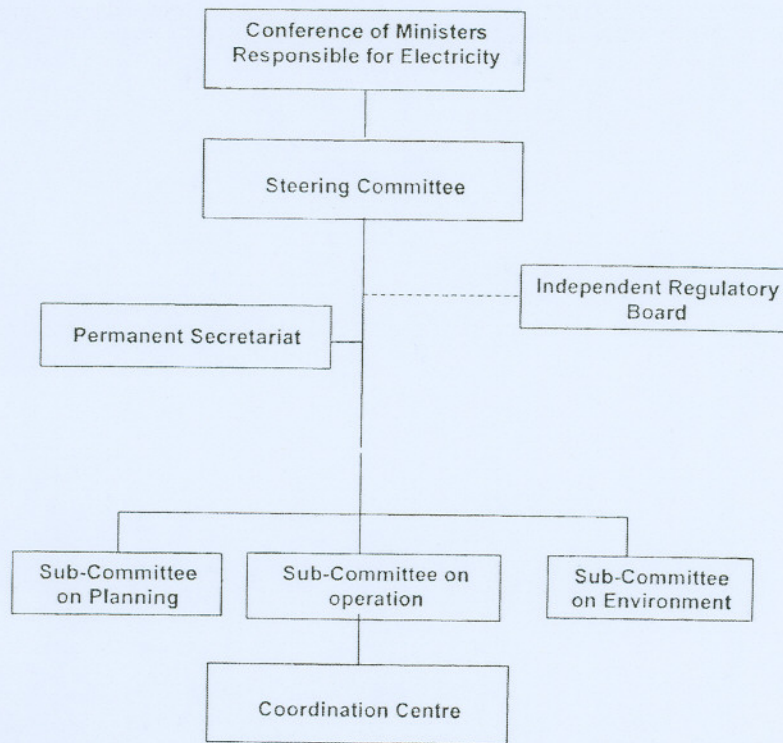


FIGURE 1 : EAPP ORGANIZATIONAL CHART

Handwritten notes and signatures are present below the caption:

- A signature on the left side.
- A signature in the center, possibly reading "N.A.A.".
- A signature on the right side, possibly reading "hmo".
- A signature below the center, possibly reading "W".
- A signature on the right side, possibly reading "S".
- A signature on the right side, possibly reading "Ch".
- The number "15" is written at the bottom right.

APPENDIX 3:

EAST AFRICAN POWER POOL

“AGREEMENT BETWEEN OPERATING MEMBERS”

SOUTHERN AFRICAN POWER POOL



AGREEMENT

BETWEEN

OPERATING MEMBERS

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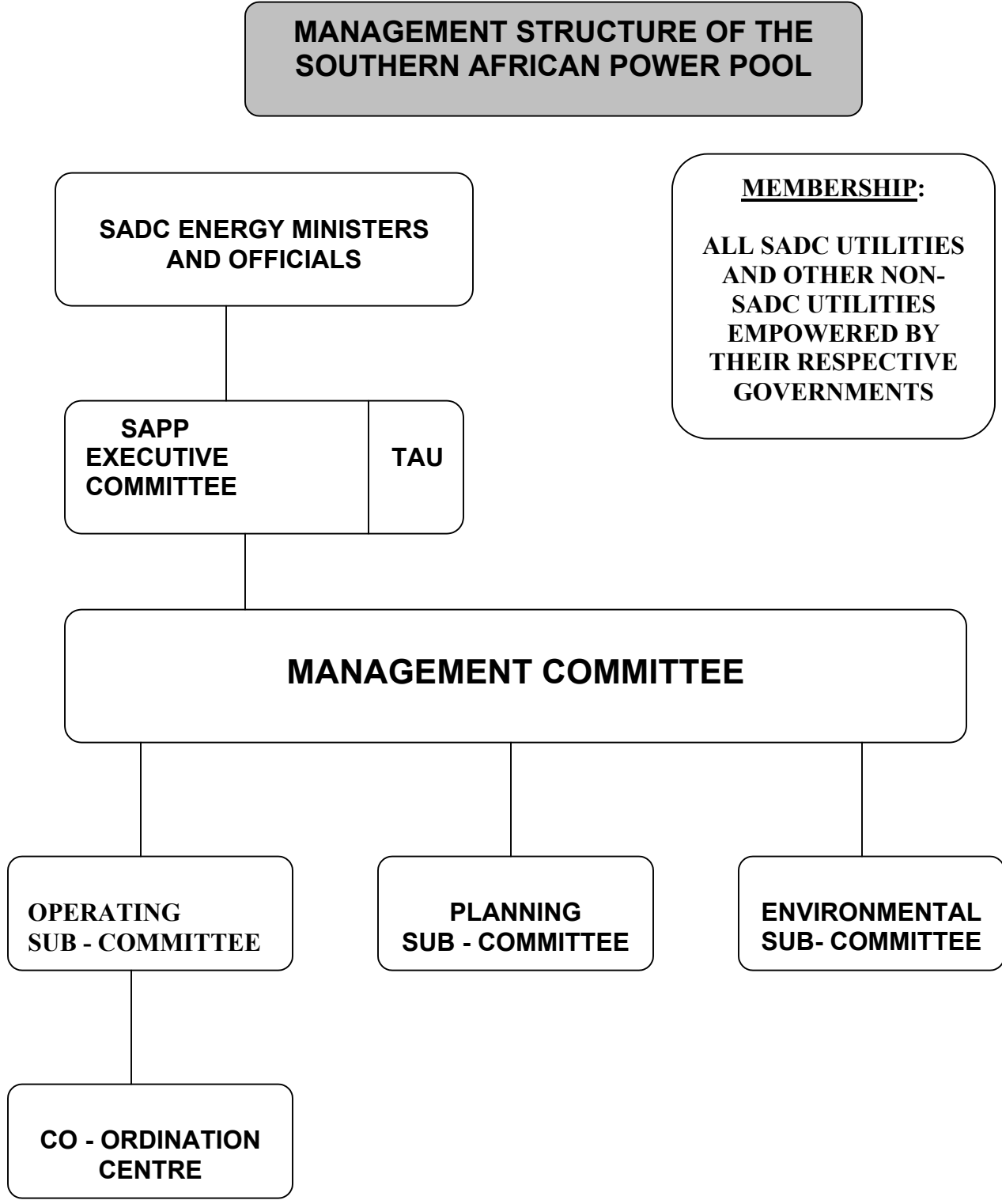


FIGURE 1.

**SOUTHERN AFRICAN POWER POOL (SAPP)
AGREEMENT BETWEEN OPERATING MEMBERS**

PREMABLE

This Agreement is made and entered into by the signatories referred to as “Operating Members” who are also “Members” of the Southern African Power Pool.

Signatories of this Agreement may be added from time to time provide they are also signatories of the “Inter-Utility Memorandum of Understanding” of the Southern African Power Pool.

RECITALS

WHEREAS, the signatories of this Agreement are Electricity Supply Enterprises in their own countries; and

WHEREAS, the “Operating Members” wish to continue with the development of interconnections between their respective networks and expand capacity and energy trade among themselves; and

WHEREAS, the “Operating Members” desire to enhance the reliability of supply to their customers and share in the other benefits resulting from the interconnected operation of their systems; and

WHEREAS, the “Operating Members” wish to create further opportunities to co-ordinate the installation and operation of generation and transmission facilities in their respective networks; and

WHEREAS, the “Operating Members” wish to co-operate and seek mutually beneficial arrangements wherever possible and refrain from arrangements that would be detrimental to any “Operating Member” or “Member”;

NOW THEREFORE, the “Operating Members” agree to enter into this Agreement for the operation of the portion of the “Southern African Power Pool” which is interconnected.

ARTICLE 1: PURPOSE AND CONTENT OF THIS AGREEMENT

1.1 PURPOSE:

The purpose of this Agreement is to establish the basic principles and rules under which the interconnected portion of the Southern African Power Pool (herein referred to as the "Pool" or the "SAPP") will operate. These are based on the need for all Operating Members:

- (i) to co-ordinate and co-operate in the operation of their systems to minimize costs while maintaining reliability;
- (ii) to fully cover their costs, and
- (iii) to share equitably in the resulting benefits.

Among the benefits that will be achieved are reductions in required generating capacity, reductions in regional fuel costs and improved use of hydro-electric energy. This Agreement establishes the rules under which these benefits can be realized, but also recognizes that these rules and their implementation as given in the Service Schedules may be modified from time to time as conditions change.

1.2 HIERARCHY OF THE DOCUMENTS GOVERNING THE SAPP:

The following documents shall govern the establishment and administration of the SAPP. In case of inconsistency, the first document shall have precedence over the second document; the second document over the third document and the third document over the fourth document.

- (i) The Inter-Governmental "Memorandum of Understanding".
- (ii) The Inter-Utility "Memorandum of Understanding".
- (iii) This Agreement between Operating Members.
- (iv) The "Operating Guidelines".

No other document can be construed as governing the establishment and administration of the SAPP.

ARTICLE 2: DEFINITIONS

In addition to the definitions given in the Inter-Utility MOU, the following definitions shall apply:

2.1 ACCREDITED CAPACITY:

The Accredited Capacity of an Operating Member shall mean its Nett Generating Capacity plus Participation Power purchases minus Participation Power sales.

2.2 ACCREDITED CAPACITY OBLIGATION:

The Accredited Capacity Obligation of an Operating Member shall mean its Monthly System Peak Obligation plus its Reserve Capacity Obligation based on its Annual System Peak Obligation.

2.3 ANNUAL SYSTEM PEAK DEMAND:

The Annual System Peak Demand of a Member shall mean the highest hourly integrated system demand occurring in the supply area of such Member during twelve month period from 1 April of a year until 31 March of the next year. This system demand shall include transmission losses but exclude the consumption of power station auxiliaries.

2.4 AREA CONTROL ERROR (ACE):

The Area Control Error shall mean the difference between actual and scheduled tie line interchanges between Control Areas, taking into account the difference between the actual and scheduled frequency.

2.5 AUTOMATIC GENERATION CONTROL:

Automatic Generation Control shall mean control instrumentation as defined in the Operating Guidelines (see also Article 5.2)

2.6 AVAILABLE ACCREDITED CAPACITY:

The Available Accredited Capacity of a Member shall mean its Accredited Capacity adjusted for:

- (i) generating capacity out of service for maintenance or repair,
- (ii) any other miscellaneous change in capacity (see also Article 8 and Appendix 1).

2.7 AVERAGE PRODUCTION COST:

The Average Production Cost shall be defined as follows:

$$\text{Average Production Cost} = \frac{F_T + W_T + C_T + M_T + L_T}{S} \text{ \{US Dollar/ MWh\}}$$

Where:

F_T	= Fuel	total cost of fuel to send out S MWh;
W_T	= Water	total cost of water to send out S MWh;
C_T	= Chemicals	total cost of chemicals to send out S MWh;
M_T	= Maintenance	total cost of maintenance to send out S MWh;
L_T	= Labour	total cost of labour to sent out S MWh;
S	= Sent Out Generation	This is equal to the Generated MWh; less the Auxiliary Station Power MWh.

Fuel	(F_T):	total cost of fuel (i.e. coal, furnace oil nuclear fuel, gas or other). This is equal to the average cost per unit of fuel (ton, cubic meter etc) for the year multiplied by the required quantity of fuel.
Water:	(W_T):	total cost of water (cooling water, potable water etc.) This is equal to the average cost of water for the year multiplied by the required quantity of water.
Chemicals	(C_T):	total cost of chemicals This is equal to the average cost of chemicals or the year multiplied by the required quantity of chemicals.

- Maintenance (M_T): 100% of the annual cost of maintenance, spares and maintenance contracts. This does not include costs of repairs that cannot be attributed to normal fair wear and tear. Station maintenance staff costs must be included in Labour.
- Labour (L_T): 100% of the annual labour cost for station operation and maintenance staff only. No administration staff or overheads to be include.

If, in a year, a Member fails to review the costs/rates above (as specified in Article 5.6). the costs/ rates in Financial Year “n+1” shall be equal to the costs in Financial Year “n” multiplied by the ratio between the Production Price Index in the United States in October of Year “n” divided by that in October of Year “n-1”.

2.8 COLD RESERVE:

Cold Reserve shall mean generating capacity available for operation, but not synchronized to the system. It shall be equal to Slow Reserve plus Quick Reserve.

2.9 CONTROL AREAS:

Control Area shall mean an electrical system with borders defined by Points of Interconnection and capable of maintaining continuous balance between the generation under its control, the consumption of electricity in the area and the scheduled interchanges with other Control Areas.

2.10 CO-ORDINATION CENTRE:

The Co-ordination Centre, shall mean a Centre as defined in Article7. It shall report to the SAPP structures as defined in the “Inter-Utility Memorandum of Understanding” of the SAPP.

2.11 ECONOMY ENERGY

Economy Energy shall mean energy produced at thermal power station(s) that one Operating Member purchases from another Operating Member to replace higher cost energy by lower cost energy (see also Schedule C).

2.12 EMERGENCY ENERGY:

Emergency Energy shall mean energy supplied from other Operating Members to an Operating Member who experience a loss of generating or transmission facilities as the result of an unscheduled outage (or outages) or any cause not reasonably foreseeable. Such energy shall be available for period of six hours starting from the occurrence of the emergency, after which the Operating Member must obtain other types of services or shed load, should the shortage continue (see also Article 5.1 and Schedule A).

2.13 EMERGENCY SITUATION:

An Emergency Situation shall mean a situation where a Member is faced with an unplanned loss of generation or transmission facilities or another situation beyond its control, which impairs or jeopardizes its ability to supply its System Demand, adjusted for imports and exports of Firm Power. Such emergency shall not exceed six hours.

2.14 ENERGY BANKING :

Energy Banking or "Banking" shall mean an arrangement whereby one Operating Member can store energy in the system of another Operating Member and withdraw it at mutually agree times (see also Schedule E).

2.15 ESCALATION:

Escalation (or Standard Escalation) in a time interval, shall mean the ratio of the Production Price Index as issued monthly by the Department of Commerce of the Federal Government of the United States of America at the end of the Interval divided by the same index at the beginning of the interval.

2.16 FINANCIAL YEAR:

Financial Year shall mean a twelve month period starting on 1 April of a year and ending on 30 March of the following year.

2.17 FIRM POWER:

Firm Power shall mean contracted capacity and associated energy intended to be available at all scheduled times for the duration of the transaction. Unless arranged separately through another contract, Firm Power shall include the necessary Reserve Capacity to ensure adequate reliability of supply (see also Schedules F and K).

2.18 FORCE MAJEURE:

Force Majeure shall mean any of the following:

2.18.1 any overwhelming occurrence of nature which could not reasonably have been foreseen or guarded against;

2.18.2 any of the following occurrence initiated by human agency: war, blockade, foreign hostile acts, civil war, rebellion, revolution, insurrection or sabotage;

2.18.3 strikes or other similar stoppages of work by employees which are not caused by unreasonable actions on the part of a Member;

2.18.4 any other cause beyond the control of a Member or a Member experiencing such cause and another affected Member(s) agreeing by mutual negotiation or otherwise, that such cause should be regarded as Force Majeure.

2.19 INADVERTENT ENERGY FLOW:

Inadvertent Energy Flow shall mean the difference between the nett scheduled energy delivered and the actual nett energy delivered in any specific hour.

2.20 INTERRUPTIBLE OR CURTAILABLE LOAD:

Interruptible or Curtailable load shall mean a consumer load or a combination of consumer loads which can be contractually interrupted or reduced by remote control or on instruction from the Member where such contracts are in place and such instructions have been given from the Member's Control Centre. The notice that such an interruption or reduction will take place, shall be less than the time specified in the Operating Guidelines for Quick Reserve to be converted into power and energy.

2.21 LEVELISED COST

Levelised cost shall mean an amount expressed in constant money value (i.e assuming constant purchasing power) and repeated every year over the life of the plant, which accumulates to a present value equal to the actual expenditure incurred. This expenditure may cover capital costs, production costs or any other type of cost.

2.22 MONTHLY SYSTEM PEAK DEMAND:

The Monthly System Peak Demand of a Member shall mean the highest hourly integrated system demand occurring in the supply area of such a Member during a calendar month. This system demand shall include transmission losses, but exclude the consumption of power station auxiliaries.

2.23 MOTHBALLED CAPACITY:

Mothballed Capacity shall mean thermal plant which is dry stored, sometimes partially dismantled and which is specifically protected for a storage period longer than one year, but which can be returned to operating status within three (3) years.

2.24 NETT GENERATING CAPACITY:

The Nett Generating Capacity of a Member shall mean that capacity in MW, that the generating facilities of such Member can supply simultaneously to its system and other systems at the time of its Monthly System Peak Demand. The generating units of a Member which are out of service for maintenance or repair for less than four (4) consecutive months as well as capacity in Cold Reserve which can be recommissioned within two (2) months, shall be included in the Nett Generating Capacity.

2.25 OPERATING RESERVE:

Operating Reserve shall mean the unused capacity above System Demand which is required to cater for regulation, short-term load forecasting errors and Unplanned Outages. It must be available within the time prescribed in the Operating Guidelines and consists of Spinning and Quick Reserve (see Schedule H).

2.26 OPERATING RESERVE OBLIGATION:

Operating Reserve Obligation shall mean the amount of Operating Reserve that an Operating Member is obliged to maintain in terms of the Operating Guidelines. The Operating Reserve Obligation can be met by own plant or by contract.

2.27 PARTICIPATION POWER:

Participation Power shall mean the lease of a specific generating unit (or units) or a portion of such units(s) and the sale of its production by one Operating Member to another Operating Member. This capacity and energy shall be continuously available except when such unit (or units) is out of service for maintenance or repair during which time the delivery of energy from other sources shall be at the Seller's discretion (see Schedules G and L).

2.28 PLANNED OUTAGE:

Unless otherwise agreed between all relevant Control Centres, Planned Outages shall mean outages which are scheduled with the advance notice specified in the Operating Guidelines.

2.29 POINTS OF INTERCONNECTION:

The Points of Interconnection between Operating Members shall be those locations where their respective transmission facilities are physically connected. Unless otherwise agreed, the transactions under the Service Schedules shall be deemed to take place at the Points of Interconnection. The Management Committee shall update from time to time, the list giving the Points of Interconnection between the networks of the Operating Members.

2.30 POOL OPERATING RESERVE OBLIGATION:

The Pool Operating Reserve Obligation shall mean the amount of Operating Reserve that must be collectively maintained by the Operating Members in terms of the Operating Guidelines.

2.31 QUICK RESERVE:

Quick Reserve shall mean curtailment of load or capacity readily available from Cold Reserve, which can be made available within the time period specified in the Operating Guidelines.

2.32 RESERVE CAPACITY:

The Reserve Capacity of a Member (in a time interval) shall mean the excess in MW of such Member's Accredited Capacity above its System Peak Obligation in the same time interval (i.e. year, month, week etc.) Alternatively, the Reserve Capacity can also be expressed in percent of the Member's System Peak Obligation.

2.33 RESERVE CAPACITY OBLIGATION:

The Reserve Capacity Obligation of a Member shall mean the amount of Reserve Capacity that such Member is obliged to maintain in terms of this Agreement. Reserve Capacity Obligation shall be equal to the Annual System Peak Obligation multiplied by the percentage (%) reserve level specified in Appendix 1.

2.34 RESERVE STORAGE:

Reserve Storage shall mean thermal plant that is stored for more than three months in a wet or dry condition. Some auxiliary plant can be run occasionally to prevent degradation.

2.35 SERVICE SCHEDULES:

Service Schedules shall mean schedules governing various types of transactions that may be entered into between Operating Members to reduce costs or improve reliability of supply. They are dealt with in Article 9 and Appendix 2 hereto.

2.36 SHORT RUN MARGINAL COST OF GENERATION:

The Short Run Marginal Cost of Generation (SRMC) shall be defined as follows:

$$\text{SRMC} = \frac{\text{F+W+C+M+L}}{\text{S}} \quad [\text{US Dollar / MWh}]$$

Where:

- | | | | |
|---|---|-------------|--|
| F | = | Fuel | variable cost of fuel to send out S MWh. |
| W | = | Water | variable cost of water to send out S MWh; |
| C | = | Chemicals | variable cost of chemicals to send out S MWh; |
| M | = | Maintenance | variable cost of maintenance to send out S MWh
deemed to be 20% of total maintenance cost |
| L | = | Labour | variable cost of labour to send out S MWh,
deemed to be 10% of total labour costs. |

S = Sent out Generation	This is equal to the Generated MWh less the Auxiliary Station Power MWh.
Fuel: (F)	variable cost of fuel (i.e coal, furnace oil, nuclear fuel, gas or other). This is equal to the average variable cost per unit of fuel (ton, cubic meter etc.) for the year multiplied by the required quantity of fuel.
Water (W):	variable cost of water (cooling water, potable water etc). This is equal to the average variable cost of water the year multiplied by the required quantity of water.
Chemicals (C)	variable cost of chemicals. This is equal to the average variable cost of chemicals for the year multiplied by the required quantity of chemical.
Maintenance (M)	20% of the total cost of annual maintenance spares and maintenance contracts. This does not include costs of repairs that cannot be attributed to normal fair wear and tear. Station maintenance staff costs must be included in Labour.
Labour (L)	10% of the annual labour cost for station operation and maintenance staff only. No administration staff or overheads to be included.

If, in a year a Member fails to review the costs above (as specified in Article 5.6), the costs in Financial Year "n+1" shall be equal to the costs in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-1".

2.37 SLOW RESERVE:

Slow Reserve shall mean capacity readily available from Cold Reserve and considered to be ready for synchronization to the system within the time period specified in the Operating Guidelines. The purpose of Slow Reserve is to replace any generating unit on unplanned outage or to meet an unexpected surge in demand.

2.38 SPINNING RESERVE:

Spinning Reserve shall mean the unused capacity of synchronized generating units which can be delivered without manual intervention within the time period specified in the Operating Guidelines.

2.39 SPINNING RESERVE OBLIGATION:

Spinning Reserve Obligation shall mean the amount of Spinning Reserve that a Member is obliged to keep or contract for in terms of the Operating Guidelines.

2.40 SURPLUS ENERGY:

Surplus Energy shall mean hydro energy purchased by one Operating Member from another Operating Member to replace higher cost energy by lower cost energy (see also Schedule D).

2.41 SYSTEM DEMAND:

The System Demand of a Member shall mean the number of MW which is equal to the number of MW required in any clock hour to supply the consumers of electricity in the supply area of such a Member. It includes transmission losses, but excludes the consumption of power station auxiliaries.

2.42 SYSTEM ENERGY:

System Energy shall mean energy purchased by one Operating Member from another Operating Member to defer the use of fuel or water, to reduce transmission losses, to offset outages of generating units, to improve environmental conditions or for any other reason of a similar nature (see also Schedule B).

2.43 SYSTEM PEAK OBLIGATION (ANNUAL OR MONTHLY):

The Annual or Monthly System Peak Obligation of a Member shall mean its Annual or Monthly System Peak Demand minus the Firm Power purchases scheduled for that month plus the Firm Power Sales scheduled for the same month.

2.44 UNPLANNED OUTAGE:

Unless otherwise agreed between all relevant Control-Centres, Unplanned Outages shall mean outages which are not scheduled with the advance notice specified in the Operating Guidelines.

2.45 WHEELING:

Wheeling shall mean transmitting a contractual amount of power over specified time periods through the system of an Operating Member who is neither the Seller nor the Buyer of this power (see also Scheduled I).

ARTICLE 3: COMMENCEMENT AND TERMINATION OF THIS AGREEMENT

3.1 COMMENCEMENT DATE:

Upon signature by the relevant Operating Members, this Agreement shall be implemented in several stages in accordance with what is technically and administratively feasible, as new interconnections between Members and transmission of data between Control Centres become operational. It shall remain in effect until terminated in accordance with Article 3.2 below.

3.2 TERMINATION:

Any Operating Member may terminate its participation in the Agreement between Operating Members as of midnight of 31 December 2004 or as at midnight of 31 December of any year thereafter by delivering written notice of such termination at least forty-eight (48) months in advance to every other Member, to allow for replanning of transmission and generating facilities.

If such termination results in a physical separation of the interconnected system within the SAPP, the existence of this Agreement in its original form shall come to an end. Any unfulfilled duties including financial obligations existing as a result of the interconnected operation of the Pool at the date of termination shall still continue in full force until such items have been fulfilled or have expired.

3.3 RESTORATION:

Any Member or group of Members shall then have the right to restore the interconnected operation of the Pool as governed by the documents listed in Article 1.2 by re-establishing one or more interconnections with another Member or Members.

ARTICLE 4: MEMBERSHIP

4.1 MEMBERSHIP:

An Electricity Supply Enterprise, as defined in Article 3.3 of the "Inter-Utility Memorandum of Understanding"

- (i) which is a Member of the SAPP;
- (ii) which is interconnected with other Member(s) of the SAPP.
- (iii) which undertakes to comply with all the rules and requirements specified in this Agreement and in the Operating Guidelines;

may become an Operating Member of the Southern African Power Pool by signing this Agreement. Admission as full Operating Member shall require a two thirds majority by the Members of the Executive Committee who are already signatories of this Agreement.

4.2 OBSERVER STATUS:

By consensus or, failing this by a two-third majority, the Executive Committee may grant, upon approval by the Council of SADC Ministers of Energy, observer status to an Electricity Supply Enterprise interested in the interconnected operation of the Pool. Electricity Supply Enterprises having obtained observer status shall all have the same rights and obligations as specified in advance by the Management Committee.

4.3 INDEPENDENT POWER PRODUCERS:

An Independent Power Producer may become an Operating Member of the SAPP and the procedure or criteria for acceptance shall be the same as for Electricity Supply Enterprises. This membership shall however be of a limited nature: such Operating Member shall be entitled to participation in the Operating and Planning Sub-Committees, but not in the Management or the Executive Committees, of the SAPP.

ARTICLE 5: RIGHTS AND OBLIGATIONS OF THE OPERATING MEMBERS

(See also Article 7 in the “Inter-Utility Memorandum of Understanding”)

5.1 EMERGENCY ENERGY:

As soon as an Emergency Situation develops in the system of an Operating Member the other Operating Members shall supply Emergency Energy up to the full amount of their Available Accredited Capacity, provided the Operating Member experiencing the Emergency Situation complies with the provisions of Service Schedule A. In terms of priority, Emergency Energy shall over-ride all non-firm types of transactions. Operating Members whose facilities are required to wheel Emergency Energy to the Operating Member experiencing an emergency, shall be obliged to

make these facilities available on a firm basis for the duration of the emergency (i.e not exceeding six [6] hours), subject exclusively to technical limitations in terms of the Operating Guidelines.

5.2 AUTOMATIC GENERATION CONTROL:

Every Operating Member shall provide in its own Control Area the Automatic Generation Control (AGC), telemetering and telecommunication facilities which are specified in the Operating Guidelines. If such AGC facilities are not in service, the Member shall contract with another Operating member to become part of its Control Area (see Schedule M). As long as this is not done, the Operating Member's tie line(s) with the rest of the Pool shall remain open, unless otherwise agreed by the Operating Sub-Committee.

5.3 WHEELING:

Each Operating Member of the Pool undertakes to allow the wheeling of capacity or energy through its system where this is technically and economically feasible, subject to the conditions specified in Schedule I. When such wheeling endangers the wheeler's facilities or interferes with its obligations towards its own customers or other Members, this shall be brought to the attention of the Operating Sub-Committee.

5.4 ACCREDITED CAPACITY OBLIGATIONS:

Each Operating Member shall comply with its Accredited Capacity Obligation as specified in Article 8 and Appendix 1.

5.5 MAINTENANCE SCHEDULES:

Maintenance Schedules leading to Planned Outages of generation and transmission facilities, shall be submitted to the other Operating Members and to the Operating Sub-Committee in the manner prescribed from time to time by the Operating Sub-Committee.

5.6 DISCLOSURE OF COSTS AND OTHER PARAMETERS:

The Operating Members shall disclose all information and costs relating to their generating facilities in the manner prescribed by the Planning Sub-Committee. In particular, Members having thermal generation, shall provide details of their Average Production Costs and Short Run Marginal Cost of Generation at each of their thermal generating facilities.

ARTICLE 6: OPERATING SUB-COMMITTEE

(See also Article 14 of the “Inter-Utility Memorandum of Understanding”)

The duties of the Operating Sub – Committee shall include, but shall not be limited to the following:

- 6.1 Approve the methods and standards used for testing generating units in order to establish their sent out generating capacity.
- 6.2 Conduct short-term (maximum three years) system reliability studies as required, using inter alia, the reliability criteria specified by the Planning Sub-Committee or in the Service Schedules.
- 6.3 Establish and review the methods and standards (e.g. INIPEDE) used to measure the performance (planned and forced outage rates, mean time to failure, etc) of generating units and transmission facilities.
- 6.4 Establish and review the formula to derive the Operating Reserve Obligations of the Operating Members (as specified in the Operating Guidelines) and ensure that these obligations are met.
- 6.5 Determine annually the System Peak Obligation and the Accredited Capacity Obligation of each Operating Member for each month of the next twelve (12) months. Each Operating Member shall be required to provide plans for meeting its monthly Accredited Capacity Obligation for each of the next twelve (12) months.

- 6.6 Establish and update the Operating Guidelines and resulting procedures for the operation of the Pool. Such procedures shall deal with, but shall not be limited to transfer limits, frequency control, voltage control, tie-line power control, Automatic Generation Control, data exchanges, telecommunication, switching, safety, load shedding, restoration of supply and the application of Service Schedules.
- 6.7 Co-ordinate the generation and transmission maintenance schedules of the Operating Members, so as to maintain at all times, the required reserves and the agreed upon services.
- 6.8 In co-operation with the Operating Members of the Planning Sub-Committee, establish and update standards and procedures applicable to the Service Schedules and review their order of priority; submit proposals to the Operating Members of the Management Committee.
- 6.9 Establish short-term transfer limits between the systems of the Operating Members (adjacent and non-adjacent systems).
- 6.10 Ensure that each Operating Member is equipped with or contracts for the required Automatic Generation Control (AGC), telemetering and telecommunication facilities in accordance with the Operating Guidelines.
- 6.11 Determine the Nett Generating Capacity in the Member's systems.
- 6.12 Evaluate software and other tools which will enhance the value of Pool operations in areas such as unit commitment, overall generation dispatch or reliability monitoring; submit proposals to the Operating Members of the Management Committee.
- 6.13 Review and submit the budget for the operation of the Co-ordinate Centre to the Management Committee for approval.
- 6.14 Determine payments of penalties for insufficient Accredited Capacity and administer the rules governing the accreditation of a Member's Nett Generating Capacity.

ARTICLE 7: CO-ORDINATION CENTRE

7.1 FORMATION:

The Co-ordination Centre (CC) shall be implemented as an independent and neutral entity located at a permanent location and funded by the Members of the Pool. The Co-ordination Centre shall be implemented in stages as recommended by the Operating Sub-Committee and agreed upon by the Management Committee.

7.2 REPORTING STRUCTURE:

The Manager of the Co-ordination Centre shall be appointed on a contract basis by the Management Committee upon recommendation of the Operating Sub-Committee and shall report to the Operating Sub-Committee.

7.3 STAFFING:

The responsibilities of the CC shall include, but shall not be limited to the following:

7.4.1 Monitor continuously the operation of the Power Pool;

7.4.2 Monitor transactions between Operating Members and between Members and non-Members;

7.4.3 Monitor time correction procedures;

7.4.4 Monitor the inadvertent power flows and the return in kind between the Members;

- 7.4.5 Provide routine daily reports, data and information relevant to the operation of the Power Pool to the Operating Sub-Committee and to the Members;
- 7.4.6 Monitor and advise on the use of the Operating Guidelines:
- 7.4.7 Monitor and report on the control performance criteria, as specified in the Operating Guidelines, to all the Operating Members;
- 7.4.8 Convene, following a disturbance affecting the parallel operation of the Pool, a post disturbance committee;
- 7.4.9 Provide information and give technical advise / support to Members of the SAPP, in matters pertaining to parallel operation;
- 7.4.10 Evaluate the impact of future projects on the operation of the Pool and advise the Operating Sub-Committee.
- 7.4.11 Perform various operational planning studies to highlight possible operating problems;
- 7.4.12 Give advice on short-term and long-term operating problems;
- 7.4.13 Perform studies to determine transfer limits on the lines and inform Operating Members accordingly. Monitor adherence of Operating Members to these limits;
- 7.4.14 Establish and update a data base containing historical and other data to be used in Planning and System Operation studies;
- 7.4.15 Monitor the availability of the communication links between the Control Centres of the Operating Members and between these Control Centres and the Co-ordination Centre;

- 7.4.16 Advise on the feasibility of wheeling transactions;
- 7.4.17 Gather and act as the official custodian of data pertaining to transactions between Operating Members and between Operating Members and non-Members;
- 7.4.18 Monitor the calculation and implementation of the various types of reserves;
- 7.4.19 Carry out projects and assignments as directed by the Operating Sub-Committee;
- 7.4.20 Monitor the protection performance on all tie lines;
- 7.4.21 Monitor the co-ordination of protection on all tie lines;
- 7.4.22 Monitor adherence to the Agreement by the Operating Members, inter alia regarding Accredited Capacity Obligation and calculate the penalties for insufficient Accredited Capacity and their re-allocation among Members.
- 7.4.23 Disseminate the generation and transmission maintenance schedules received from the Operating Members and advise on the adjustments that are required to maintain at all times the contractual Pool reserves and the agreed upon services;
- 7.4.24 Co-ordinate the training of the Member's staff and if necessary organize training seminars focusing on the operation of the interconnected system.
- 7.4.25 Prepare and issue annually a control performance summary report for the benefit of the Operating Sub-Committee.
- 7.4.26 Identify capital projects required by the Co-ordination Centre and make proposals to the Operating Sub-Committee.

7.4.27 Endeavour to obtain funding for the capital projects of the Co-ordination Centre upon the approval by the Operating Sub-Committee.

7.4.28 Prepare and present an annual budget covering the Co-ordination Centre expenditure for approval by the Operating Sub-Committee;

7.4.29 Produce a monthly financial statement as specified by the Operating Sub-Committee.

7.5 COSTS:

7.5.1 ANNUAL COSTS:

Members will pay their contributions up front for the Financial Year based on the approved budget of the Co-ordination Centre. The contributions shall be calculated in accordance with Article 7.5.3.

7.5.2 ADDITIONAL COSTS:

If the Co-ordination Centre Manager foresees that a shortage of funds will arise before or after or at the end of the Financial Year, he must explain the variance to the Operation Sub-Committee and apply for additional funds. These additional funds shall be approved by the Management Committee upon recommendation by the Operating Sub-Committee. The additional contribution of each Member shall again be calculated in accordance with Article 7.5.3.

7.5.3 ALLOCATION BETWEEN MEMBERS:

The allocation between the Members of the costs budgeted by the Co-ordinate Centre shall be as follows;

- 1) 30% (thirty-per cent) shall be shared equally between all the Operating Members.

- 2) 30 % (thirty percent) shall be allocated between the Operating Members in proportion to the actual energy measured in MWh and imported from other Members or other Parties during the Financial Year
- 3) 20 % (twenty per cent) shall be allocated between all SAPP Members in proportion to their Annual System Peak Demand in the Financial Year.
- 4) 10 % (ten per cent) shall be allocated between Operating Members in proportion to the combined 75°C thermal rating of their interconnections with other Members.
- 5) 10 % (ten per cent) shall be deemed to constitute a benefit payable only by the host Member.

The terms of Article 11.3, where applicable, shall apply to the monies due to the Co-ordination Centre.

7.5.4 BUDGET AND FINANCIAL RECORDS:

- 1) The budget shall include all the Co-ordination Centre expenses, i.e. operating costs, staff salaries or capital expenditure etc.
- 2) A record shall be kept of all expenses incurred by the Co-ordination Centre;
- 3) Financial statements shall be prepared and issued for each Financial Year, at least, six months after the end of the Financial Year;
- 4) The remuneration package and salary adjustments of the staff shall be determined by market rates.

ARTICLE 8: ACCREDITED CAPACITY OBLIGATION
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8.1 REQUIREMENTS:

The Accredited Capacity Obligation of each Operation Member shall be determined as follows and the penalties for not complying shall be calculated in accordance with Appendix 1.

8.1.1 Over each calendar month every Operating Member of the Pool shall provide an Accredited Capacity at least equal to its Accredited Capacity Obligation in that month as specified in Appendix 1. The Accredited Capacity Obligation shall be equal to the Monthly System Peak Obligation, plus the Reserve Capacity Obligation based on the Annual System Peak Obligation.

8.1.2 The Reserve Capacity Obligation of a Member for any month, shall be as specified in Appendix 1.

8.1.3 In respect to commitments of power from or to an Electricity Supply Enterprise, which are not covered by the Service Schedules of this Agreement, but are under separate contracts now existing or hereafter created, such commitments shall be reflected in a Member's System Peak Obligation (Annual and Monthly) as the case may be.

8.1.4 Prior to the beginning of each calendar month, an Operating Member which does not meet its Accredited Capacity Obligation under Article 8.1.1, shall acquire additional capacity or reduce its System Peak Obligation so as to meet it. This can be done as follows;

- (i) by advancing the completion date of new facilities;
- (ii) by purchasing Firm Power (Service Schedules F and K) from Operating Members or non-Members of the Pool;

- (iii) by purchasing or leasing capacity from one or more generating units from outside its system such as with Participation Power (Service Schedules L and G);
- (iv) by reducing its Monthly System Peak Obligation;

8.1.5 The System Peak Obligation and the Accredited Capacity Obligation of each Operating Member shall be determined annually by the Operating Sub-Committee for each of the next twelve (12) months, as specified in Article 6.5 and Appendix 1.

8.1.6 Nothing contained in this Agreement shall be interpreted to require a Member to install facilities or to restrict a Members' choice to install facilities or purchase power to maintain its Accredited Capacity.

8.2 FAILURE TO COMPLY:

8.2.1 If in any month, the Accredited Capacity Obligation of an Operating Member is not fulfilled, such Member shall be charged for the number of megawatts required to fulfill the obligation multiplied by the penalty rate given in Appendix 1.

8.2.2 The payments by deficient Members under Article 8.2.1, shall be split among the Members having a surplus of Accredited Capacity following the method given in Appendix 1.

8.2.3 If an Operating Member increases its Accredited Capacity or reduces its System Peak Obligation after the beginning of the month, then the penalty to be paid by this Operating Member shall be proportionally adjusted to take into account the number of full days the Accredited Capacity was at the higher level or the System Peak Obligation was at the lower level.

8.2.4 Any dissenting Operating Member may refer the matter to the Management Committee. This shall be done in writing within fourteen (14) days that the disagreement regarding Accredited Capacity has arisen.

ARTICLE 9: SERVICE SCHEDULES

9.1 LIST OF SERVICES :

The services available under this Agreement are given in the Service Schedules of Appendix 2 and are as follows:

"A" EMERGENCY ENERGY	"H" OPERATING RESERVE
"B" SYSTEM ENERGY	"I" WHEELING
"C" ECONOMY ENERGY	"J" SCHEDULED OUTAGE ENERGY
"D" SURPLUS ENERGY	"K" FIRM POWER
"E" ENERGY BANKING	"L" PARTICIPATION POWER
"F" SHORT-TERM FIRM POWER	"M" CONTROL AREA SERVICES
"G" SYSTEM PARTICIPATION POWER	

9.2 RATES APPLICABLE TO THE TRANSACTIONS:

For any transaction the relevant rate(s) or price(s) shall be that which has been quoted and agreed upon before the start of the transaction. The said rate(s) or price(s) shall remain as agreed for the whole duration of the transaction. Other issues relating to transactions are dealt with in Article 11 "Settlements" and in the "Schedules" of Appendix 2.

9.3 AMENDMENTS AND UPDATES:

Service Schedules for capacity, energy, wheeling or any other service, may be added, amended or updated from time to time. The new versions shall be prepared by the prepared by the Operating Members of the Planning Sub-Committee in consultation with the Operating Sub-Committee, reviewed by the Management Committee and approved by the Executive Committee in accordance with the provisions of the inter-utility MOU.

9.4 CONTINUTTY OF SUPPLY:

- 9.4.1 Capacity and Energy agreed upon under this Agreement shall be fully delivered at all times as scheduled except where interruptions or curtailments are caused by Force Majeure or by the operation of protection schemes or by the installation, maintenance, repair and replacement of facilities where such events were unforeseeable and therefore notice could not be given. Such events shall not be a breach of this Agreement.
- 9.4.2 Where any of these events can be pre-planned, every Operating Member of the Pool shall give one (1) month notice to the other Operating Members and shall schedule such events so as to cause as little inconvenience as possible to the other Members. Failure to give such notice shall be a breach of this Agreement.
- 9.4.3 The provision of penalties or bonuses, if any, shall be dealt with separately in their specific transactions or agreements between operating Members.

9.5 ACTIVE AND REACTIVE POWER FLOWS:

The Operating Members recognize that the flows of the power between their respective systems are governed by physical laws and that power delivered under this Agreement will flow through paths determined by the physical parameters of the network.

9.6 HARDSHIP CAUSED TO OTHER MEMBERS:

Each Operating Member shall at all times co-operate to ensure that:

- 9.6.1 no overload or damage to equipment is caused to other Members or any other party by power flows of scheduled deliveries;
- 9.6.2 no overload or damage to equipment is caused to other Members or any other party when abnormal conditions or Force Majeure arises.

ARTICLE 10: METERING

10.1 METERING EQUIPMENT

Metering equipment as well as telemetering and communication facilities shall be installed so as to determine the actual flows of active and reactive power at the Points of Interconnection.

10.2 RECONCILIATION:

Where meters are temporarily not equipped with communication facilities as specified in Clause 10.1 the differences between locally metered figures and those quantities used in daily energy accounting shall be reconciled monthly.

10.3 TESTING:

Metering equipment shall be tested by the owner as recommended by the Operating Sub-Committee. In addition, special tests shall be made on request by any other Operating Member. If the meter complies with the specified accuracy, then the Member who has requested the tests, shall bear the costs thereof. Otherwise, the costs of such tests shall be borne by the owner of the meter. Representatives of any Member shall be given the opportunity to witness the tests.

10.4 ACCOUNT ADJUSTMENTS:

If the accuracy of the meter(s) is not as specified, the accounts between the Operating Members shall be adjusted to correct for the full inaccuracy. Such adjustment shall be limited to the current month unless it is possible to determine the period over which such inaccuracy occurred. In that case, the correction must be done for the full period of inaccuracy.

ARTICLE 11: SETTLEMENTS

11.1 RECORDS AND ACCOUNTING:

Each Operating Member of the Pool shall maintain and keep for sixty (60) months, an accurate record of the Capacity and Energy scheduled and delivered. It shall disclose such information to the other Operating Members and to the Co-ordination Centre once it is established.

11.2 INADVERTENT ENERGY FLOWS:

11.2.1 Inadvertent energy flows shall be returned during a time period when they have approximately the same value as when they occur. The implementation of this principle shall be as defined in the Operating Guidelines.

11.2.2 Regular checks of inadvertent energy flows shall be carried out in accordance with the Operating Guidelines.

11.3 ACCOUNTS:

11.3.1 Monthly accounts shall be prepared and sent by the Operating Members themselves, and shall be settled monthly in cash unless otherwise agreed. In this context, a month shall mean a calendar month, unless otherwise approved by the Management Committee.

11.3.2 For billing purposes, the amounts of energy delivered and the amounts of generation or transmission capacity involved in a transaction (including wheeling) shall be the amounts scheduled in advance at the Points of Interconnection.

- 11.3.3 When wheeling takes place, the purchasing Member shall be liable for the additional losses (positive or negative) incurred in the wheeler's system. Unless otherwise agreed between all the relevant parties, the payment for additional losses (positive or negative) in the wheeler's system shall be returned in kind in the form of hourly schedules for additional capacity determined in advance and purchased by the purchasing Member from the selling Member so as to make the transaction neutral from the point of view of losses in the wheeler's system. The amount of additional losses shall be determined in accordance with Service Schedule 1.
- 11.3.4 To facilitate and simplify payment procedures, Operating Members may provide services in exchange for other services, rather than for cash payments. These exchanges must be acceptable to the Pool as a whole or to the other Operating Member(s) involved, as appropriate.
- 11.3.5 Unless otherwise agreed, the bills shall be settled within forty-five (45) days without any deduction whatsoever and returns in kind shall take place as agreed between the relevant Members. Any unpaid amount shall bear interest from the date due until the date of payment and the annual interest rate shall be 150% of the three (3) month United States Treasury Bill as published in the Wall Street Journal.
- 11.3.6 All bills under this Agreement shall be in US Dollars, unless otherwise agreed between the relevant Members.
- 11.3.7 (i) If a bill is submitted by an Operating Member to another Operating Member for a service which is not Emergency Energy and the bill exceeds the amount resulting from scheduled transactions by more than 50% the debtor Member shall have the right to pay only the amount resulting from scheduled transactions.

- (ii) with regards to the excess, the debtor Member shall give notification in writing to the other Member and to the Co-ordination Centre within fourteen (14) days from the date of receiving the bill, stating the reasons for the dispute and the amount in dispute.
 - (iii) If settlement of the dispute is in favour of the creditor Member, interests as calculated in Article 11.3.5. shall apply to the amount in dispute.
- 11.3.8 If a Member wants to dispute all or any part of the charges submitted by another Member when these charges cover Emergency Energy or exceed scheduled transactions by less than 50% the Member shall nevertheless pay the full amount when due and give notification in writing to the other Member and to the Co-ordination Centre within fourteen (14) days from the date of receiving the bill, stating the grounds for the dispute and the amount in dispute. If settlement of the dispute results in a refund to the payee, interest as calculated in Article 11.3.5 above shall be added to the refund.
- 11.3.9 (i) Failure to settle, inclusive of interest, a bill which is not in dispute within a period of these (3) months from the date due, shall give the creditor Member the right to request the Management Committee to revoke from the debtor Member the privilege of buying or selling Economy Energy and Surplus Energy (as per Service Schedules) until the debt is settled.
 - (ii) If three (3) months after that date, the debtor Member has still failed to settle his debt in full, inclusive of interest, the creditor Member shall have the right to request the Management Committee to revoke the privilege of using any Service Schedule except Wheeling for future transactions from this debtor Member until its debt is settled.

- (iii) The Management Committee shall be obliged to comply with the request of the creditor Member for revoking the privileges of the debtor Member upon submission of proof that financial obligations have not been fulfilled for the specified periods.
- (iv) In all cases the debtor Member shall continue to be under the obligation to wheel and shall be entitled to the proceeds of wheeling transactions in accordance with Service Schedule 1.

11.4 TAXES:

11.4.1 Any tax imposed by the Government or any other authority of the country of an Operating Member (the first Member) and levied upon or measured by capacity or energy exported to or imported from other Member(s), shall be borne and paid for by the first Member in such a way that transactions are settled by the other Operating Members(s) as if there had been no such tax.

11.4.2 The first Member indemnifies any other Member against any loss or damage which such other Member may suffer if, under Article 11.4.1 above the first Member fails to pay such tax timeously or at all.

ARTICLE 12: FAILURE TO COMPLY WITH THIS AGREEMENT
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12.1 DISPUTE RESOLUTION:

12.1.1 Disputes between Operating Members concerning the interpretation of this Agreement or arising out of the non-observance or non-performance of any portion of this Agreement, shall be brought by the aggrieved Member to the attention of the Chairperson of the next meeting of the Management Committee, who within thirty (30) days shall call a meeting of the Operating Members of the Management Committee. At this meeting, the Member(s) claiming that the Agreement is not being complied with, shall present material evidence to support its (their) claim.

This evidence shall have been forwarded by the aggrieved Member at least two weeks before the meeting to the Members against which the complaint is being lodged.

- 12.1.2 The Operating Members of the Management Committee may choose by a simple majority to hear both sides to a dispute and render a judgment based on simple majority. In this case the Members involved in the dispute may elect to abide by the decision of the Operating Members of the Management Committee; they shall refer the matter to the Executive Committee if any one Member in dispute feels that the decision of the Management Committee is not fair.
- 12.1.3 Alternatively, the Operating Members of the Management Committee may by a simple majority decision, refer the matter directly to the Executive Committee without hearing it themselves.
- 12.1.4 If the Operating Members of the Management Committee cannot arrive at a decision either concerning the judgment in a dispute or whether the matter should be dealt with by the Committee itself or by the Executive Committee, the matter shall be referred to the Executive Committee.
- 12.1.5 The Operating Members of the Executive Committee may choose by a simple majority to hear both sides to a dispute and render a judgment based on simple majority. In this case the Members involved in the dispute may elect to abide by the decision of the Operating Members of the Executive Committee; otherwise they shall refer the matter to Arbitration in accordance with Article 13 if at least one Member feels that it is disadvantaged by the decision of the Executive Committee.
- 12.1.6 Alternatively, the Operating Members of the Executive Committee may by a simple majority decision, refer the matter directly to Arbitration without hearing it themselves.

12.1.7 If the Operating Members of the Executive Committee cannot arrive at a decision either concerning the judgment in a dispute or whether the matter should be dealt with by the Committee itself or by Arbitration, the matter shall be referred to Arbitration as provided in Article 13.

12.1.8 In all cases, the Arbitration ruling shall be final and not open to appeal. A Member not abiding by the ruling shall be in breach of this Agreement.

12.2 FAILURE TO COMPLY:

12.2.1 An Operating Member which persistently fails to comply with the Agreement or with an Arbitration ruling shall be issued with a warning letter by the Operating Members of the Management Committee requesting the Members to submit plans for meeting reasonable levels of compliance the non-complying Member shall acknowledge the letter within thirty (30) days and shall propose corrective action within three (3) calendar months to resolve the problem.

12.2.2 If the non-complying Operating Member fails to make appropriate corrections, a final warning letter will be sent at the discretion of the Operating Members of the Management Committee and the issue will be remanded to the Operating Members of the Executive Committee to take one of the following actions:

Level 1: revoke the privilege to use Economy Energy and Surplus Energy (as per Service Schedules C and D) until compliance is Restored;

Level 2: revoke the privilege of using any Service Schedule except Wheeling for future transactions until compliance is restored:

Level 3: revoke Operating membership of the SAPP.

ARTICLE 13: ARBITRATION

13.1 PROCEDURE

13.1.1 In the event of a disagreement or a dispute between Operating Members at the Executive Committee concerning the interpretation of this Agreement or arising out of the non-observance or non-performance of any portion of this Agreement or when a Member has elected not to abide by the decision of the Executive Committee as per Article 12.1.5, the dissenting Member or Members shall within thirty (30) days appoint one Arbitrator and the other Member(s) shall appoint another Arbitrator.

13.1.2 The Arbitrators shall in turn, appoint within thirty (30) days of their appointment, a third Arbitrator by consensus. All Arbitrators shall be individuals known internationally for their expertise in the specific problem causing the dispute, The decision shall be laid down by the Arbitrators themselves without reference to statutory requirements applicable to arbitration.

13.2 DECISIONS

The decision(s) of the Arbitrators shall be by simple majority within ninety (90) days that they have all been appointed, unless a longer period is mutually agreed between the Members in dispute. The decisions of the Arbitrators shall be binding on all Members.

13.3 COSTS

The costs of Arbitration shall be equally spread between all the Members involved in the dispute unless the majority decision of the Arbitrators specifies otherwise.

ARTICLE 14 : FORCE MAJEURE

14.1 SCOPE:

No Member shall be considered to be in default in respect of this Agreement, if prevented from fulfilling its obligations due to Force Majeure, as defined in Article 2.17.

14.2 DURATION

Any Member unable to fulfill an obligation by reason of Force Majeure, shall remove such inability within the shortest possible time.

ARTICLE 15 : INDEMNITY

Each Member shall defend and indemnify other Members against any claim or liability against them for injury or damage to persons or property including any related loss or expense resulting from the damage caused to other Member's during the facilities owned, operated and maintained by the indemnifying Member or by act of negligence by other Member(s) employees or agents.

ARTICLE 16 : WAIVERS

Waiver at any time by a Member, of some or all of its rights with respect to a default or with respect to any other matter arising in connection with this Agreement shall not be deemed a waiver of Member's rights in any further default by the defaulting Member thereafter.

ARTICLE 17: AMENDMENTS

This Agreement may be reviewed from time to time, but no modification shall be of any force or effect unless reduced to writing and approved by the Operating Members of the Management Committee.

ARTICLE 18: ASSIGNMENT

Each Operating Member shall have the right to assign this Agreement between Operating Members to any successor to all or substantially all of its electric properties, whether by merger, consolidation, sale or otherwise without the consent of the other Operating Members, provided such successor shall agree in writing to assume all the obligations of such Operating Member. The Member assigning this Agreement between Operating Members, shall thereupon be released from all liability thereafter arising under this Agreement. This provision shall be applicable to assignees in succession.

ARTICLE 19: NOTICES AND DOMICILIUM

19.1 COMMUNICATION:

Any communication or documents given or sent by any Operating Member to any other Operating Member shall be in writing and shall be deemed to have been duly delivered to the Member to which it is addressed at its respective address, namely:

19.1.1 For BPC:

Chief Executive	Telephone: +267-3603000
Botswana Power	Telefax: +267-373563
Corporation	
Motlakase House	
Macheng Way	
PO BOX 48	
GABORONE, Botswana	

19.1.2 For EdM:

Director Geral	Telephone: 258-1-42-2071/2
Electricidade de	Telefax: 258-1-42-2074
Mozambique	
Ave Agostinho, Neto 70	
Caixa Postal 2447	
MAPUTO, Mozambique	

- 19.1.3 For ENE:
- Director Geral Telephone: +244-2-326582
Empresa Nacional Telefax: +244-2-323433
De Electricidade
Predio Geominas-6,7 Andores
LUANDA, Angola
- 19.1.4 For ESCOM:
- General Manager Telephone: +265-622000
Electricity Supply Telefax: +265-622008
Commission of Malawi
PO BOX 2047
BLANTYRE, Malawi
- 19.1.5 For ESKOM:
- Chief Executive Telephone +27 11-800-5510
Eskom Telefax: +27-11-800-5583
PO BOX 1091
JOHANNESBURG, 2000
South Africa
- 19.1.6 For LEC:
- Managing Director Telephone: +266-312236
Lesotho Electricity Telefax: +266-310093
Corporation
PO BOX 423
MASERU 100, Lesotho
- 19.1.7 For SEB:
- Chief Executive Tel: +268-42548/42521/46638
Swaziland Electricity Telefax: +268-42335
Board +268-41931
PO BOX 258 +268-48274
MBABANE, Swaziland

19.1.8 For SNEL:

President Delege General
Societe Nationale d' Electricite (SNEL)
B.P. 500
Avenue de la Justice 2381
KINSHASA, Zaire
Telex: 63400 RCNF
(Att: DMS Zaire SNEL 10)
Telephone: +243-12-33736 +871-682622676
Telefax: +243-12-33657 +871-682622677
+260-2-313835 (SNEL Shaba c/o Merzario)

19.1.9 For SWAWEK:

Chairman & Managing Telephone: 261-2-31830
Director Telefax: 261-2-32805
SWAWEK
Swawek Centre
Corner Robert Mugabe
And Martin Luther Streets
PO BOX 2864
WINDHOEK, Namibia

19.1.10 For TANESCO:

Managing Director Telephone: +255-51-46242
Tanzania Electricity Telefax: +255-51-44668
Supply Company (Ltd) +255-51-36247
PO BOX 9024 +255-51-26704
DAR ES SALAAM, Tanzania

19.1.11 For ZESA:

Chief Executive
Zimbabwe Electricity
Supply Authority
Electricity Centre
25 Samora Machel Avenue
P.O Box 377
HARARE, Zimbabwe

Telephone: +263-4739033
Telefax: +263-4739854/5

19.1.12 For ZESCO:

Managing Director
Zambia Electricity
Supply Corporation
Stand 6949
Great East Road
PO BOX 33304
LUSAKA, Zambia

Telephone +260-1-225074
Telefax: +260-1-222753

19.2 DELIVERY TIME:

19.2.1 If communication is delivered by hand, it shall be deemed to have been received by the addressee on the date of delivery.

19.2.2 If posted by pre-paid registered post, it shall be deemed to have been received by the addressee on the fourteenth (14) day after postage.

19.2.3 If sent by telex, telegram or facsimile, it shall be deemed to have been received by the addressee one (1) day after dispatch.

19.3 CHANGE OF ADDRESS:

Any Member may, by written notice to all of the other Members, change the address to which any notice or request intended for the Member giving such notice, shall be addressed.

ARTICLE 20: SIGNATORIES

IN WITNESS whereof the said Operating Members have hereto set their hands:

20.1 SIGNED ON BEHALF OF BPC AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

CHIEF EXECUTIVE
BOTSWANA POWER
CORPORATION TITLE: _____

20.2 SIGNED ON BEHALF OF EdM AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

ELECTRICIDADE DE
MOCAMBIQUE TITLE: _____

20.3 SIGNED ON BEHALF OF ENE AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

DIRECTOR GERAL
EMPRESA NACIONAL
DE ELECTRICIDADE
ANGOLA TITLE: _____

20.4 SIGNED ON BEHALF OF ESCOM AT _____ ON THIS
_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

GENERAL MANAGER
ELECTRICITY SUPPLY
COMMISSION, MALAWI TITLE: _____

20.5 SIGNED ON BEHALF OF ESKOM AT _____ ON THIS
_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

CHIEF EXECUTIVE
ESKOM OF SOUTH AFRICA TITLE: _____

20.6 SIGNED ON BEHALF OF LEC AT _____ ON THIS
_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

MANAGING DIRECTOR
LESOTHO ELECTRICITY
COMMISSION TITLE: _____

20.7 SIGNED ON BEHALF OF SEB AT _____ ON THIS
_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

CHIEF EXECUTIVE
SWAZILAND ELECTRICITY
BOARD TITLE: _____

20.8 SIGNED ON BEHALF OF SNEL AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

PRESIDENT DELEGUE GENERAL TITLE: _____
SOCIETE NATIONALE D'ELECTRICITE
ZAIRE

20.9 SIGNED ON BEHALF OF SWAWEK AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

CHAIRMAN & MANAGING TITLE: _____
DIRECTOR SWAWEK, NAMIBIA

20.10 SIGNED ON BEHALF OF TANESCO AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

MANAGING DIRECTOR
TANZANIA ELECTRIC TITLE: _____
SUPPLY COMPANY

20.11 SIGNED ON BEHALF OF ZESA AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

CHIEF EXECUTIVE
ZIMBABWE ELECTRICITY TITLE: _____
SUPPLY AUTHORITY

20.12 SIGNED ON BEHALF OF ZESCO AT _____ ON THIS

_____ DAY OF _____

SIGNED: _____ WITNESS: _____

NAME: _____ NAME: _____

MANAGING DIRECTOR
ZAMBIA ELECTRICITY
SUPPLY CORPORATION

TITLE: _____

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APPENDIX 1

CHARGES FOR INSUFFICIENT ACCREDITED CAPACITY

(See also Article 8 of this Agreement)

These charges shall become effective from the commencement date of the SAPP Agreement.

1. ACCREDITED CAPACITY OBLIGATION

An Operating Member's Accredited Capacity Obligation in any month shall be no less than its Monthly System Peak Obligation forecasted by the Member, plus its Reserve Capacity Obligation based upon the Annual System Peak Obligation.

The Reserve Capacity Obligation of a Member for any month, shall be equal to 19% of the Annual System Peak Obligation of such Member when the generating plant is thermal and 10% when the generating plant is hydro. A weighed average shall apply to Members who have a mixed system.

2. OBLIGATION ENFORCEMENT

2.1 BEFORE THE FACTS

The Accredited Capacity Obligation calculations shall be carried out for each of the twelve (12) months starting with the month of April of each year and ending with March of the following year. Input data shall be provided by the Member to the Operating Sub-Committee. The results shall then be circulated among the Operating Members for information.

2.2 AFTER THE FACTS:

At the end of the system peak month, the actual Accredited Capacity Obligation shall be calculated by the Operating Sub-Committee based on the actual transactions and the actual Monthly System Peak Demands. Should the calculation indicate a deficit, the Member shall then be subject to the penalty under item 3.

2.3 DISTRIBUTION OF PENALTIES:

The payment by deficient Members shall be split among Operating Members having a surplus of Accredited Capacity in proportion to each Operating Members contribution to the total excess of Accredited Capacity in the Pool, adjusted if necessary for Transmission restrictions to the deficient Member.

3. PENALTY RATES

The penalty shall be based on Service Schedule "L", "Participation Power" and shall be equal to five (5) times the Participation Power Rate specified under Schedule "L", Paragraph 3.1. In January 1994, money value, it shall be US\$ 36.15/kW.

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APPENDIX 2

SERVICE SCHEDULES

SERVICE SCHEDULE A: EMERGENCY ENERGY

Service Schedule A shall become effective from the commencement date of the SAPP Agreement.

1. EMERGENCY SERVICE

- 1.1 Emergency Energy shall mean energy supplied from other Operating Members to an Operating Member who experiences a loss of generation or transmission facilities as the result of an unscheduled outage (or outages) or any cause not reasonably foreseeable. Such energy shall be available for a period of six (6) hours starting from the occurrence of the emergency, after which the Member must obtain other types of services or shed load, should the shortage continue (Article 2.11).
- 1.2 The energy transfers (purchases and sales) are non-capacity transactions and shall not be credited towards a Member's Accredited Capacity.

2. SERVICE CONDITIONS

- 2.1 The provision of Emergency Energy shall be up to the full amount of the Operating Member's available Accredited Capacity, but only if the Operating Member which experiences an Emergency Situation complies with its Accredited Capacity Obligation.

- 2.2 Any Member, if so requested, shall supply Emergency Energy unless the supply of Emergency Energy will overload or endanger its own system or the performance of its contractual obligations to others. Specifically, supplies of Emergency Energy shall not interfere with any service provided on a firm basis. However, an Operating Member who is simultaneously selling non-firm energy or any comparable service to another Member shall, if necessary, interrupt these non-firm services in order to supply Emergency Energy.
- 2.3 A member which is selling non-firm energy or any comparable Service to another system, shall not be eligible to receive Emergency Energy unless such service is interrupted, following the emergence of an Emergency Situation.
- 2.4 If the supplying and receiving Members are not directly interconnected, Wheeling shall take place in accordance with Service Schedule I and shall be firm.
- 2.5 Emergency Energy shall be converted as soon as possible into another type of transaction in accordance with the procedures specified in the Operating Guidelines. After six (6) hours, there shall no longer be an obligation by the other Operating Members to continue the supply of Emergency Energy and the Member receiving this service shall then resort to load shedding if necessary.
- 2.6 Emergency Energy shall be purchased and sold at the Points of Interconnection.

3. RATES FOR EMERGENCY ENERGY

- 3.1 Unless otherwise agreed between the Members, Emergency Energy shall be charged at a rate which is the greater of 150% of the total costs of owning and operating a new coal-fired station or 115% of the Seller's short Run Marginal Cost of Generation. In January 1994 money value the rate shall be at least equal to US\$31.92 / MWh; this rate shall be reviewed annually by the Planning Sub-Committee.

- 3.2 If, in a year, the Planning Sub-Committee fails to review the Dollar rate as per item 3.1 above and if the Parties do not agree otherwise the Dollar rate for Emergency Energy in Financial Year “n+1” shall be equal to the rate in Financial Year “n” multiplied by the ratio between the Production Price Index as issued by the Department of Commerce of the Federal Government of the United States of America for October of Year “n” divided by that of October of Year “n-1’.

- 3.3 The supplier of Emergency Energy may, at his discretion, require the purchaser to return such energy at such times and under such conditions that the supplying Member will not experience a loss due to the transactions or under conditions mutually agreeable to both Members.

- 3.4 Wheeling charges, if any, shall be to the account of the receiving Member and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

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SERVICE SCHEDULE B: SYSTEM ENERGY

Service Schedule B shall become effective from the commencement date of the SAPP Agreement.

1. SYSTEM ENERGY

- 1.1 System Energy shall mean energy purchased by one Operating Member from another Operating Member to defer the use of fuel or water, to reduce transmission losses, to improve environmental conditions or for any other reasons of a similar nature (Article 2.42).
- 1.2 The energy transfers (purchases and sales) are non-capacity transactions and shall not be credited towards Accredited Capacity.

2. SERVICE CONDITIONS

- 2.1 Operating Members are qualified to purchase System Energy only to the extent that they have alternate and defined dependable capacity, including purchased capacity, that could otherwise be started up and used.
- 2.2 The notice to be given for the interruption of System Energy shall influence the rates at which the transaction takes place.
- 2.3 No System Energy transaction, even when the ultimate purchaser is not an Operating Member of SAPP, can conflict or interfere with the purchase or sale of Emergency Energy and only System Energy shall be discontinued if necessary, to prevent such conflict or interference from occurring.

- 2.4 The Members shall mutually agree on the following:
- (a) The amount of such System Energy which the buyer desires to purchase and which can be delivered by the Seller;
 - (b) The selling price of such System Energy;
 - (c) The schedule for delivery of such energy;
 - (d) The notice of interruption which shall typically be one (1) hour; eight (8) hours; sixteen (16) hours or twenty-four (24);
 - (e) Any other pertinent factor.
- 2.5 The seller may furnish at the agreed selling price the requested System Energy from any available source it chooses, including purchases from non - Members for resale to the Buyer.
- 2.6 If the Seller's and Buyer's systems are not directly interconnected, Wheeling shall take place in accordance with Schedule I and the wheeling contract shall be of the same duration as the main contract.
- 2.7 The Wheeling required for such a service may be non-firm.
- 2.8 System Energy shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

3. RATES FOR SYSTEM ENERGY

- 3.1 If the selling Member increases generation at thermal units or if the selling Member is importing System Energy and re-selling it, the rate shall be a function of the Seller's Short Run Marginal Cost of Generation (SRMC) and of the notice to be given before an interruption.

Unless otherwise agreed between the Parties, the rates shall not exceed:

120% of the Seller's SRMC if the notice is one (1) hour
125% of the Seller's SRMC if the notice is eight (8) hours
130% of the Seller's SRMC if the notice is sixteen (16) hours
135% of the Seller's SRMC if the notice is twenty-four (24) hours

- 3.2 If the selling Member increases generation at hydro units and if the Buyer reduces its generation at thermal units, the rate shall be a function of the Buyer's Short Run Marginal Cost of Generation (SRMC) and of the notice to be given before an interruption.

Unless otherwise agreed between the Parties, the rates shall not exceed:

85% of the Buyer's SRMC if the notice is one (1) hour
88% of the Buyer's SRMC if the notice is eight (8) hours
92% of the Buyer's SRMC if the notice is sixteen (16) hours
95% of the Buyer's SRMC if the notice is twenty-four (24) hours

- 3.3 If the selling Member increases generation at hydro units and if the Buyer reduces generation also at hydro units, the selling price of System Energy shall be determined by mutual consent.
- 3.4 The wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

SERVICE SCHEDULE C: ECONOMY ENERGY

Service Schedule C shall become effective from the commencement date of the SAPP Agreement.

1. ECONOMY ENERGY

- 1.1 Economy Energy shall mean energy produced at thermal power station(s) that one Operating Member purchases from another Operating Member to replace higher cost energy by lower cost energy. The savings resulting from such a transaction, shall be split between the purchasing and the selling Members.
- 1.2 Economy Energy purchases and sales are non-capacity, non-firm transactions. They do not include a demand or capacity charge and shall not be included in the calculation of Accredited Capacity.

2. SERVICE CONDITIONS

- 2.1 Economy Energy may be interrupted at any time after notification, at the sole discretion of the Seller.
- 2.2 An Operating Member may purchase Economy Energy only to the extent that such a Member has alternative capacity which is synchronised either in its own system or through contract in another system, that could otherwise be used.
- 2.3 No Economy Energy transaction will conflict or interfere with the purchase or sale of Emergency Energy and any transfer of Economy Energy shall be curtailed or discontinued if necessary, to prevent conflict or interference.
- 2.4 If the supplying and receiving Members are directly interconnected, Wheeling shall take place in accordance with Schedule I and the wheeling contract shall be of the same duration as the main contract. The transmission required for such a service may be non-firm.

- 2.5 Economy Energy shall be purchased and sold at the Points of interconnection and the transactions shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

3. RATES FOR ECONOMY ENERGY

- 3.1 The overall savings per MWh are equal to the difference between the Short Run Marginal Costs of Generation (SRMC) of the Seller and the Buyer. The billing rate shall be equal to one half of the overall savings per MWh added to the Short Run Marginal Cost of Generation of the Seller, unless otherwise agreed.
- 3.2 If the Purchasing Member reduces its own hydro generation and if the selling Member increases its own thermal generation or imports Economy Energy for re-sale the charge shall not exceed 115% of the Seller's Short Run Marginal Cost of Generation, unless otherwise agreed.
- 3.3 Wheeling charges if any, shall be to the account of the Buyer and comply with the provisions of Article 11.3.3 and Service Schedule I.

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SERVICE SCHEDULE D: SURPLUS ENERGY

Service Schedule D shall become effective from the commencement date of the SAPP Agreement.

1. SURPLUS ENERGY

- 1.1 Surplus Energy shall be from hydro power stations that one Operating Member purchases from another Operating Member to replace higher cost (or higher replacement cost) energy and which enables the purchasing and selling Members to share the savings through more efficient use of resources.
- 1.2 The energy transfers (purchases and sales) are non-capacity non-firm transactions and shall not be included in Accredited Capacity calculations.

2 SERVICE CONDITIONS

- 2.1 An Operating Member may purchase Surplus Energy only to the extent that such a Member has alternative capacity which is synchronized either in its own system or through contract in another system, that could otherwise be used.
- 2.2 No Surplus Energy transaction will conflict or interfere with the purchase or sale of Emergency Energy and any transfer of Surplus Energy shall be curtailed or discontinued if necessary, to prevent such conflict or interference.
- 2.3 If the supplying and receiving Members are not directly interconnected, Wheeling shall take place in accordance with Schedule I and the Wheeling Contract shall be of the same duration as the main contract. The transmission required for such a service may be non-firm.

- 2.4 Surplus Energy shall be purchased and sold at the Points of Interconnection and the transactions shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected system.
- 2.5 Surplus Energy may be interrupted at any time after notification, at the sole discretion of the Seller.

3. RATES FOR SURPLUS ENERGY

- 3.1 When the Selling Member increases its generation at hydro units and the Buyer reduces its generation at thermal units, the rate shall not exceed 75% of the Buyer's Short Run Marginal Cost of Generation unless otherwise agreed by the Parties.
- 3.2 When the Selling Member increases generation at hydro units and the Buyer reduces generation also at hydro units, the selling price of Surplus Energy shall be determined by mutual consent.
- 3.3 Wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Schedule I.

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SERVICE SCHEDULE E: ENERGY BANKING

Service Schedule E shall become effective from the commencement date of the SAPP Agreement.

1. ENERGY BANKING

- 1.1 This Schedule provides for interchange of energy between Members. Energy Banking shall mean energy which a Member desires to sell from its own system that is in excess of its commitments and which the other Member desires to purchase to improve its electrical system operation. Energy Banking may include energy interchange for the purpose of pond storage control or to facilitate banking of thermal energy. Energy Banking may also include an agreement for the interchange of energy on a daily or weekly basis.
- 1.2 The Energy transfers (banking, purchases and sales) are non-capacity, non-firm transactions and shall not be credited towards Accredited Capacity.

2. SERVICE CONDITIONS

- 2.1 The Members shall agree on the following:
- The period the transaction is effective
 - The scheduling of energy
 - The price of the transaction
 - That the exchange may provide for the return of equivalent energy
 - Other pertinent factors.
- 2.2 If the two Members are not directly interconnected, Wheeling may take place in accordance with Schedule I and the wheeling contract shall be of the same duration as the main contract.

- 2.3 Wheeling may be non-firm.
- 2.4 Banking Energy shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transaction facility or endanger the operation of the interconnected systems

3. RATES FOR ENERGY BANKING

- 3.1 The rates and terms for Energy Banking shall be negotiated by the Member and may include the return of equivalent energy.
- 3.2 The savings resulting from an Energy Banking transaction that includes an agreed exchanged of energy on a daily or weekly basis between the thermal units of a member and the hydro units of another Member, shall be shared equally between the Parties. Such savings shall be the difference between the “value of energy” and the “cost of energy” after Wheeling, transmission losses and spillage have been taken into account. In particular:
 - 3.2.1 Unless otherwise agreed the “cost of energy” shall be the thermal unit’s SRMC of Generation for energy delivered to the hydro system and the “value of energy” shall be the thermal units SRMC of Generation when energy is delivered back to the thermal system.
 - 3.2.2 Spillage shall be that energy lost if the hydro system must spill water from its reservoirs during the period that energy is stored in the hydro system. The quantities of energy lost in this manner shall be deducted from the energy to be returned to the thermal system.
- 3.3 Unless otherwise agreed, the following shall apply where the interval between the deposit and withdrawal of energy is more than one (1) week:

- 3.3.1 If the Depositor is the requesting Party it shall be credited for each deposit it makes with an amount equal to the energy deposited multiplied by the "cost of energy" in 3.2.1 less a negotiated margin not exceeding 20% where both the Depositor and Banker have hydro systems, the rate for deposited energy shall be by mutual consent.
- 3.3.2 If the Banker is the requesting Party, the Depositor shall be credited for each deposit it makes with an amount equal to the energy deposited multiplied by the cost of energy in 3.2.1 plus a negotiated margin not exceeding 20%. Where both the Depositor and Banker have hydro systems, the rate for deposited energy shall be by mutual consent.
- 3.3.3 The Depositor Member may withdraw energy from its account from time to time at a rate not exceeding that specified in advance until the account is depleted. The value of the energy withdrawn at any time will be the amount of energy multiplied by the "value of energy" in 3.2.1 or that agreed by mutual consent if both the Depositor and the Banker have hydro systems.
- 3.3.4 The requesting Party shall pay for the wheeling charges if any. The Purchaser of banked energy (whether the Depositor or another Member) will pay the wheeling charges if any, when energy withdrawal takes place. Wheeling shall comply with the provisions of Article 11.3.3 and of Schedule "I".

SERVICE SCHEDULE F: SHORT-TERM FIRM POWER

Service Schedule F shall become effective from the commencement date of the SAPP Agreement.

1. SHORT-TERM FIRM POWER

- 1.1 Short -Term Firm Power shall mean contracted capacity and associated energy intended to be available at all scheduled times for the duration of the transaction.
- 1.2 Such power shall include the required reserve capacity.

2. SERVICE CONDITIONS

- 2.1 This Schedule shall be available for the sale of Short-Term Power for periods of seven (7) or more consecutive days and shall not exceed a period of six (6) consecutive months.
- 2.2 Short -Term Firm Power shall be included in the Monthly System Peak Obligation of a Member only when a special condition applies, such as:
 - 2.2.1 when a significant new industrial customer's load is imposed upon a Member's system at a time different from the purchase period for which other schedules are applicable; or
 - 2.2.2 when a generator or transmission line addition does not meet the scheduled in-service date; or
 - 2.2.3 when it is being purchased for resale to a party which is not a Member.
- 2.3 Wheeling for this type of transaction, shall be firm and the duration of the wheeling contract shall be the same as that of the main transaction.

3. RATES FOR SHORT-TERM FIRM POWER

- 3.1 The receiving Member shall pay to the supplying Member for Short - Term Firm Power supplied during any month, a capacity rate of US\$1,92/kW per week in January 1994 money values, unless otherwise agreed. This rate shall be reviewed yearly by the Planning Sub-Committee.
- 3.2 Unless otherwise agreed, if the sale is from a predominantly thermal system, the energy charge shall not exceed 115% of the Seller's Short Run Marginal Cost of Generation.
- 3.3 If a hydro system sells Short -Term Firm Power to a thermal system, the energy charge shall not exceed 80% of the Buyer's Short-Term Run Marginal Cost of Generation, unless the Parties have agreed on other terms.
- 3.4 When a hydro system sells Short-Term Firm Power to another hydro system, the energy rate shall be determined by mutual consent.
- 3.5 The wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and of Schedule I.
- 3.6 If, in a year, the Planning Sub-Committee fails to review the rate as per item 3.1 above and if the Parties do not otherwise agree, the rate in Financial Year "n+1" shall be equal to the rate in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-1".

SERVICE SCHEDULE G: SYSTEM PARTICIPATION POWER

Service Schedule G shall become effective from the commencement date of the SAPP Agreement.

1. SYSTEM PARTICIPATION POWER

- 1.1 System Participation Power provides for the sale of Firm Capacity and Energy by any Member to another Member for a specified period, not exceeding a six (6) month period.
- 1.2 The Member purchasing the capacity shall be required to provide the reserve.

2. SERVICE CONDITIONS

- 2.1 This Schedule shall be available for the sale of System Participation Power for periods of seven (7) or more consecutive days.
- 2.2 System Participation Power is intended to be available at all times during the period covered by the commitment. However, should problems occur, the Seller's Firm Power sales and services to its own customers shall have priority if the transaction is for less than six consecutive months, in which case the supplying Member shall have the right to notify the Buyer to reduce its schedule, which shall be promptly complied with until such problems have been rectified.
- 2.3 System Participation Power shall be included in the Accredited Capacity only when a special condition applies, such as:
 - 2.3.1 when the purchase is for resale to a party which is not a Member; or
 - 2.3.2 when a Member purchases System Participation Power for a period of six(6) consecutive months.

- 2.4 System Participation Power shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.
- 2.5 Wheeling for this type of transaction shall be firm and the duration of the wheeling contract shall be the same as that of the main transaction.

3. RATES FOR SYSTEM PARTICIPATION POWER

- 3.1 The rate for capacity shall be equal to US\$0.190/kW/day in January 1994 money values, unless otherwise agreed. This rate shall be reviewed annually by the Planning Sub-Committee.
- 3.2 Unless otherwise agreed, if the sale is from a system which is predominantly thermal, the energy rate shall not exceed 115% of the Seller's SRMC.
- 3.3 If System Participation Power is obtained from a hydro unit and sold to a thermal system, the energy rate shall not exceed 80% of the Buyer's Short Run Marginal Cost of Generation, unless otherwise agreed.
- 3.4 Wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.
- 3.5 If, in a year, the Planning Sub-Committee fails to review the rate in item 3.1 above and if the Parties do not otherwise agree, the rate in Financial Year "n+1" shall be equal to the rate in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-1".

SERVICE SCHEDULE H: OPERATING RESERVE

Service Schedule H shall become effective from the commencement date of the SAPP Agreement.

1. OPERATING RESERVE SERVICE

- 1.1 Operation Reserve under this Service Schedule shall mean unused capacity above System Demand which is required only to cater for Unplanned Outages (Article 2.44).
- 1.2 An Operating Member may purchase Operating Reserve from another Operating Member as part or all of its Operating Reserve Obligation.
- 1.3 Operating Reserves purchased under this Service Schedule shall not be credited towards the Accredited Capacity of the receiving Member.

2. SERVICE CONDITIONS

- 2.1 The Operating Reserve shall be capacity made available as scheduled unless, in the opinion of the supplying party, it is prevented or made inadvisable due to an Emergency Situation or another unforeseen condition.
- 2.2 The energy flows resulting from the Operating Reserve contracted for, must be available within the time prescribed in the Operating Guidelines. As soon as Operating Reserve is taken up by the receiving Member who then starts to also receive energy, the transaction shall be converted into System Energy (Schedule B).
- 2.3 Unless otherwise agreed, the portion of Spinning Reserve and Quick Reserve making up the Operating Reserve purchased under this type of transaction, shall be as specified in the Operating Guidelines.

- 2.4 Operating Reserve shall be converted into System Energy interruptible at a one (1) hour notice rate, unless otherwise agreed. This shall be for less than ten(10) occurrences in any calendar month. Energy deliveries beyond these limits shall be treated as Short-Term Firm Power.
- 2.5 The Wheeling required for such services may be non-firm. The wheeling contract shall be of the same duration as the main contract.
- 2.6 Operating Reserve shall be purchased and sold at the Points of interconnection.
- 2.7 Operating Reserve transactions shall always be for complete days.

3. RATES FOR OPERATING RESERVE

- 3.1 Unless otherwise agreed by the parties, the rate for "Operating Reserve" shall be 20% of the total fixed costs per kW of owning and operating a large coal-fired station. In January 1994 money value, the rate shall be US\$47,5/MW per day. This rate shall be reviewed every year by the Planning Sub-Committee.
- 3.2 The Energy Rate shall be as per item 2.4 above.
- 3.3 With short-term contracts (one months or less) the receiving Member may cancel all or part of a scheduled transaction with a minimum notice of twenty-four (24) hours and the cancellation fee shall be equal to the price to pay if the agreement had continued for another twenty-four (24) hours.
- 3.4 If the Selling Member is unable to provide all or a portion of the required energy within the time specified in the Operating Guidelines, it shall not be entitled to the payment corresponding to the shortfall over a period of twenty-four (24) hours.
- 3.5 Wheeling charges shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

- 3.6 If, in a year Planning Sub-Committee fails to review the rate in item 3.1 above and if the Parties do not otherwise agree, the rate in Financial Year “n+1” shall be equal to the rate in Financial Year “n” multiplied by the ratio between the Production Price Index in the United States in October of Year “n” divided by that in October of Year “n-1”.

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SERVICE SCHEDULE I : WHEELING

Service Schedule I shall become effective from the commencement date of the SAPP Agreement.

1. WHEELING

Wheeling shall mean transmitting a contractual amount of power over specified time periods through the system of an Operating Member who is neither the Seller nor the Buyer of this power (Article 2.45).

2. SERVICE CONDITIONS

- 2.1 Firm Wheeling: The Operating Member whose assets are engaged in Wheeling guarantees that the Wheeled power will enjoy the same priority as any firm supply to its own customers. It should be able to provide such service for various conditions as specified in the Operating Guidelines.
- 2.2 Non-Firm Wheeling: The Operating Member whose assets are engaged in non-firm Wheeling may curtail or interrupt the flow of wheeled power based on technical and economic considerations for its system without any penalty.
- 2.3 Whenever the service is interrupted, the Buyer has the right to request justification of any curtailment or interruption. This information may be submitted to the Operating Sub-Committee for comments.
- 2.4 A wheeling transaction in which the transmission facilities of more than one Operating Member are involved, shall be categorized as non-firm if at least one Operating Member does not guarantee a firm wheeling transaction and more than 10% of the total scheduled transaction goes through that system.

- 2.5 For any Wheeling arranged under this Agreement, the required transmission capacity of the wheeling Member shall be reserved for the same time period as the main transaction. For deals longer than three (3) months, the reservation of transmission capacity shall be contained in a written agreement between the purchasing Member and the wheeling Member.
- 2.6 Firm wheeling shall always be applicable to Emergency Energy, Firm Power and Participation Power (Service Schedules A, F, K, G and L).
- 2.7 The capability to provide specific wheeling services and the determination of the charges for each transaction shall be determined in chronological order in which the wheeling contracts are signed.
- 2.8 Unless otherwise agreed between the parties, reservation of transmission facilities for wheeling purposes, shall be a "take or pay" transaction or alternatively, the notice for cancellation shall be at least three (3) months.
- 2.9 If, due to load growth in excess of the forecast submitted to the Planning Sub-Committee, a wheeling transaction becomes detrimental to an Operating Member's obligations towards its own customers, then such a situation shall be brought to the attention of the other parties and shall constitute sufficient ground for the re-negotiation of the wheeling arrangement, unless specified to the contrary in the wheeling transactions covering a period longer than three (3) years.
- 2.10 Wheeling shall cover the full distance between Points of Interconnection.

3. COSTS RECOVERED IN THE WHEELING CHARGE

- 3.1 The monies to be recovered by the wheeling Member shall include the following:

- 3.1.1 Rent of Assets: this charge shall be derived from the levelised capital costs of the transmission facilities used for wheeling in proportion to the use made of such facilities to implement the wheeling transaction.

- 3.1.2 Where applicable for long-term deals, the opportunity cost of foregone benefits as a direct consequences of the wheeling transaction must be taken into account. Conditions necessary to claim opportunity costs are as follows:
 - 3.1.2.1 Demonstrate the financial loss of the wheeler due to a firm transaction replacing Firm Sale which the wheeler could otherwise have made.

 - 3.1.2.2 Prove the loss of opportunity of connecting new large customers.

 - 3.1.2.3 Prove foregone potential contributions to existing system costs by other potential transactions.

 - 3.1.2.4 Prove foregone savings in distribution costs, should cheaper energy be accessible from elsewhere.

- 3.2 Unless otherwise agreed between the parties, the extra transmission losses (positive or negative) in the wheeler's system shall be compensated by extra generation by the Seller or energy as specified in Article 11.3.3.

- 3.3 If the wheeling transaction is firm, full rent of transmission assets is to be recovered, but if the wheeling transaction is non-firm, only 50% of the rent is to be recovered. Unless the wheeling transaction extends over more than three (3) years, Operating Members shall not be allowed to include in wheeling charges any other cost than those given in 3.1 above.

4. ASSETS INVOLVED IN WHEELING

An Operating Member making use of transmission facilities belonging to another Member for the purpose of wheeling shall pay a rent for the assets used in accordance with the procedures determined by the Planning Sub-Committee. These procedures shall use the following guidelines:

- 4.1 Calculate the transmission losses caused by the wheeling transaction by comparing load flow studies with and without Wheeling. The increase (saving) in losses shall be supplied by the Seller of energy and purchased by the Buyer in accordance with Article 11.3.3 if several wheeling transactions occur at the same time, they will be classified into firm and non-firm transactions and the magnitude of the losses will be determined considering first the chronological order in which the firm wheeling transactions were agreed upon (last signature) and thereafter the chronological order in which the non-firm wheeling transactions were agreed upon (last signature).
- 4.2 Identify the cost of the assets used in the wheeling transaction. These shall either be transmission lines plus their feeder bays (at either end) or coupling transformers plus their switch bays on either side. Common equipment such as bus couplers, bus sections, reactors, capacitors SVC's etc and their switching equipment as well as control rooms shall be ignored when calculating the rent of assets in a wheeling transactions.
- 4.3 Determine the proportional usage of transmission assets for wheeling purposes by conducting load flow studies and assuming that plant is fully loaded (utilised) either at its name plate rating (switchgear, transformer etc) or at the limits stipulated by the Planning Sub-Committee (transmission lines). System conditions may be modeled hourly post factum on the basis of metered data; alternatively, typical system conditions and their duration as agreed upon between the Purchaser and the Seller of wheeling services, are modeled ante factum.

- 4.4 Calculate the rent payable for the usage of assets engaged in Wheeling. This rent shall be based on the replacement costs of the assets updated from time to time by the Planning Sub-Committee, an economic life of twenty-five (25) years and a nett discount rate not exceeding 6%. Until reviewed by the Planning Sub-Committee, the nett discount rate shall be 4%. The annual operation and maintenance costs on the facilities engaged in Wheeling, shall be 2% of the replacement costs of these assets and shall be added to the value of the assets.

5. RENT OF TRANSMISSION FACILITIES

5.1 FORMULA:

The rent formula shall be as follows:

$$R = r / [1 - (1+r)^{-n}]$$

Where: r is the nett discount rate
 n is the economic life of the asset
 R is the rent per annum for an asset worth US\$1,00

If the nett discount rate or required return on investment “ r ” (in constant money values) is 4% and the economic life is twenty-five (25) years, $R = 6,40\%$ per annum.

$$R = 0,04 / [1 - 1.04^{-25}] = 4\% \times 1,6003 = 6,40\%$$

For non-firm Wheeling, half of this value shall apply.

5.2 COSTS COVERED BY THE RENT FORMULA:

The difference between “ R ” and the nett discount rate “ r ” covers the generation of funds for the replacement of the plant at the end of its life. In other words, the rent formula provides the wheeler with the means of replacing its assets after twenty-five (25) years plus, in this example, a real return on assets equal to 4%. The return on asset for this type of plant should be lower than for generating plant, because the financial risk of building new transmission facilities is also less.

For simplification purposes, a relatively low return on the un-depreciated value of the assets has been assumed rather than a higher return on assets which have already been depreciated over a number of years,

5.3 IMPLEMENTATION:

Bearing in mind that system conditions change in time, so does the proportional utilisation of the assets engaged in wheeling. In principle, the calculation should be repeated each time a change in system conditions occur, alternatively typical system a conditions and their duration are agreed before the facts.

Where power exchanges are monitored on an hourly basis, it is appropriate to calculate the hourly wheeling charge for each hour. The hourly rent for using an asset in full, can be taken as:

$$\text{Hourly rent} = \text{Annual rent} / 8760$$

5.4 STANDARD COSTS OF TRANSMISSION FACILITIES:

Until reviewed by the Planning Sub-Committee, the value of the transmission assets used in wheeling shall be established using the standard replacement costs given in Tables 1,2 and 3 attached. These costs are valid in the 1994 -1995 Financial Year. Costs in Financial Year "n+1" shall be equal to the costs in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-1".

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SERVICE SCHEDULE I: WHEELING

<p align="center">TABLE 1</p> <p align="center">TRANSMISSION LINE REPLACEMENT COSTS</p> <p align="center">FINANCIAL YEAR 1994-1995</p>		
ITEM OF PLANT	COND. SQ MM	REPLACEMENT COST (US\$10³ / KM)
400kV Quad Wolf	4/158	125
400kV Quad Zebra	4/427	188
400kV Triple Bersfort	3/687	175
400kV Twin Bersfort	2/687	153
400kV Triple Bison	3/382	156
400kV Triple Tern	3/404	155
330kV Triple Bison	3/382	146
330kV Twin Tern	2/204	112
330kV Twin Zebra	2/427	117
330kV Twin Bison	2/382	113
275kV Twin Zebra	2/427	93
275kV Twin Bear	2/265	84
275kV Quad Tern	4/404	144
220kV Single Zebra	1/427	81
220kV Single Tern	1/404	77
132kV Single Wolf	1/158	58

SERVICE SCHEDULE I: WHEELING

TABLE 2				
SWITCH BAY REPLACEMENT COSTS. THESE COSTS INCLUDE PROTECTION, CARRIERS AND MEASUREMETS, CIVIL WORK AND CABLING FINANCIAL YEAR 1994-1995				
kV	ITEM OF PLANT	AMPS	FAULT kA	REPLACEMENT COSTS (US\$ 10³)
400	Line Bay	2500	31	1123
	Line Bay	3150	50	1205
	Transformer Bay	2500	31	757
	Transformer Bay	3150	50	805
330	Line Bay	2500	31	902
	Transformer Bay	2500	31	839
275	Line Bay	2500	31	852
	Line Bay	3150	50	861
	Transformer Bay	2500	31	573
	Transformer Bay	3150	50	557
220	Line Bay	2500	31	852
	Transformer Bay	2500	31	750
132	Line Bay	2500	25	343
	Line Bay	2500	40	366
	Transformer Bay	2500	25	277
	Transformer Bay	2500	40	282

SERVICE SCHEDULE I: WHEELING

**TABLE 3
TRANSFORMER REPLACEMENT COSTS.
THESE COSTS INCLUDE CIVIL WORK,
PROTECTION, MEASUREMENTS, CABLING, ETC.
FINANCIAL YEAR 1994-1995**

VOLTAGE			
HV SIDE	LV SIDE	RATING MVA	REPLACEMENT COST (US\$10³)
400	330	500	2435
400	275	800	3860
400	275	400	2760
400	220	630	3885
400	220	500	3690
400	220	315	2780
400	132	500	3720
400	132	250	2635
400	132	125	1890
275	132	500	3010
275	132	250	2130
275	132	180	1845
275	132	125	1530
220	132	500	2520
220	132	250	1780
220	132	125	1285
330	220	315	2450
330	220	160	1740
330	220	120	1490

SERVICE SCHEDULE J: SCHEDULED OUTAGE ENERGY

Service Schedule J shall become effective from the commencement date of the SAPP Agreement.

1. SCHEDULED OUTAGE ENERGY

- 1.1 This Schedule provides for the supply of energy from a Member to any other Member during Scheduled Outages for maintenance of generating or transmission facilities or both.
- 1.2 The capacity transfers resulting from Scheduled Outage flows shall not be credited to the Accredited Capacity of the receiving Member.

2. SERVICE CONDITIONS

- 2.1 Scheduled Outage Energy is only to be purchased against Accredited Capacity out of service for maintenance or when that capacity is limited due to maintenance.
- 2.2 If the Seller suffers a loss of generation, but can still meet firm load commitments, the Scheduled Outage Energy must continue unless the Buyer agrees to a reduction or termination.
- 2.3 A Member shall sell Scheduled Outage Energy to a requesting Member only when this Member has utilized its available Accredited Capacity to meet its load commitments and Operating Reserve obligations.
- 2.4 Scheduled Outage Energy may be scheduled from a Member not directly interconnected, provided such energy is available at a lower delivered cost, including Wheeling. Wheeling for this type of transaction shall be firm.

2.5 Scheduled Outage Energy shall be purchased and sold at the Points of Interconnection and the transaction should not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

2.6 Wheeling may be non-firm.

3. RATES FOR SCHEDULED OUTAGE ENERGY

3.1 Unless otherwise agreed, the Buyer shall pay to the Seller the greater of:

(a) 115% of the Average Production Cost incurred by the Seller to produce such energy, or

(b) 115% of the Average Production Cost incurred by the Buyer if the Buyer had produced such energy with the generating unit that is out of service.

3.2 Under 2.3 the Seller may require an additional payment for any financial loss that accrues to the Seller due to this transaction replacing a sale to another Party.

3.3 The Seller may require the Buyer to return such energy at times and under conditions that the Seller will not experience a loss due to the transaction, or under conditions acceptable to both Parties.

3.4 Wheeling charges, if any, shall be to account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

SERVICE SCHEDULE K: FIRM POWER

Service Schedule K shall become effective from the commencement date of the SAPP Agreement.

1. FIRM POWER

- 1.1 Firm Power shall mean contracted capacity and associated energy intended to be available at all scheduled times for the duration of the transaction.
- 1.2 Firm Power shall include the necessary Reserve Capacity.
- 1.3 Firm Power purchases shall be credited to the Monthly System Peak Obligation of the receiving Member; Firm Power sales shall be debited against the Monthly System Peak Obligation of the supplying Member.

2 SERVICE CONDITIONS

- 2.1 Any transaction under this Schedule shall cover a period of six (6) months or longer.
- 2.2 Firm Power can be base, intermediate or peaking power; it can be continuous or intermittent, as specified in the particular contracts.
- 2.3 Adequate provision shall be made for transmitting the energy and when Wheeling through the system of another Operating Member is required, the Wheeling shall be firm.
- 2.4 When Wheeling is required, the provisions under Service Schedule I shall apply. The duration of the Wheeling arrangement shall be the same as that of the main transaction.
- 2.5 Firm Capacity shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

3 RATES FOR FIRM POWER

- 3.1 The recommended capacity rate for Firm Power shall be 115% of the total fixed costs of owning and operating a new coal-fired power station and shall be reviewed every year by the Planning Sub-Committee, taking into account new capacity either commissioned, under construction or planned in the Region. In January 1994 money values, the rate shall be US\$8,31/kW per month, unless otherwise agreed between the Parties. The terms for Firm Power shall be negotiated by the Members for each transaction.
- 3.2 If dedicated transmission lines must be built to transport the Firm Power to the Buyer's system, a rent of transmission facilities as calculated in Schedule I on wheeling, shall be levied upon the Buyer.
- 3.3 If the sale is from a predominantly thermal system, the energy rate shall not exceed 115% of the Seller's Short Run Marginal Cost of Generation unless the Parties have agreed on other terms.
- 3.4 If a hydro system sells Firm Power to a predominantly thermal system the energy charge shall not exceed 80% of the Buyer's Short Run Marginal Cost of Generation unless the Parties have agreed on other terms.
- 3.5 When a hydro system sells Firm Power to another hydro system, the energy charge shall be determined by mutual consent.
- 3.6 The wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and of Schedule I.
- 3.7 The degree of firmness, the penalties and the amount of load shedding if any, that must occur in the Seller's system before Firm Power may be curtailed or interrupted, must be clearly specified in the agreement covering the transaction and may command a premium.

- 3.8 If, in a year, the Planning Sub-Committee fails to review the rate as per 3.1 above and if the Parties do not otherwise agree, the rate in Financial Year “n + 1” shall be equal to the rate in Financial Year “n” multiplied by the ratio between the Production Price Index in the United States in October of Year “n” divided by that in October of Year “n-1”.

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SERVICE SCHEDULE L: PARTICIPATION POWER
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Service Schedule L shall become effective from the commencement date of the SAPP Agreement.

1. PARTICIPATION POWER

- 1.1 Participation Power shall mean the lease of a specific generating unit(s) or a portion of such unit(s) and the sale of its production from one Operating Member to another Operating Member. This capacity and energy shall be continuously available except when such unit(s) is out of service for maintenance or repair during which time the delivery of energy from other sources shall be at the Seller's discretion (see Article 2.26)
- 1.2 The Member purchasing the capacity shall be required to provide the reserve.
- 1.3 Participation Power shall be credited towards the "Accredited Capacity" of the receiving Member and debited against the "Accredited Capacity" of the supplying Member.

2. SERVICE CONDITIONS

- 2.1 This Schedule shall be available for the sale of Participation Power for a period of six (6) months or more.
- 2.2 Participation Power shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.
- 2.3 Wheeling for this type of transaction shall be firm.

3. RATES FOR PARTICIPATION POWER

- 3.1 The terms for Participation Power shall be negotiated by the Members for each transaction. Unless otherwise agreed, the capacity rate shall not exceed the fixed costs per kW of owning and operating a large coal-fired station. In January 1994 money value, this cost equals US\$7,23/kW per month. The rate shall be reviewed by the Planning Sub-Committee every year.
- 3.2 In the event that services cannot be supplied on the effective date of an Agreement due to a delayed in-service date, the capacity rate to be paid by the purchasing Member, shall not become effective until the date such facilities are certified as Accredited Capacity.
- 3.3 Unless otherwise agreed, if the Seller has a system which is predominantly thermal, the energy rate shall not exceed 115% of the Seller's Short Run Marginal Cost of Generation.
- 3.4 If Participation Power is obtained from a hydro unit and sold to a thermal system, the energy rate shall not exceed 80% of the Buyer's Short Run Marginal Cost of Generation, unless otherwise agreed.
- 3.5 Wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.
- 3.6 If, in a year, the Planning Sub-Committee fails to review the rates as per 3.1 above and if the Parties do not otherwise agree, the rates in Financial Year 'n+1' shall be equal to the charges in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of year "n" divided by that in October of Year "n-1".

SERVICE SCHEDULE M: CONTROL AREA SERVICES

Service Schedule M shall become effective from the commencement date of the SAPP Agreement.

1. CONTROL AREA SERVICES

Control Area Services is a contract one Operating Member (Member A) has with another Operating Member (Member B) to be part of its Control Area (Control Area of Member B). This Schedule is available to the Operating Members who have difficulty in meeting the control criteria as specified in the Operating Guidelines.

2. SERVICE CONDITIONS

- 2.1 A Member may purchase Control Area Services only from an Operating Member or non Pool Member to which it is directly connected.
- 2.2 Any transaction under this Schedule shall cover a period of at least three (3) months.
- 2.3 The energy flows resulting from this type of transaction shall be calculated as specified under 2.4 below and shall be returned in kind or contracted for separately, for example in the same way as for energy flows resulting from Operating Reserve Services.
- 2.4 The hourly energy flows shall be equal to:
 - (i) the sum of all the actual energy flows in a clock hour through the Points of Interconnection linking Member A to all other Members, where exports are positive and imports are negative;
 - (ii) minus the sum of all the scheduled energy flows in the same clock hour through the Points of Interconnection linking Member A to all other Members, where exports are positive and imports are negative;

A negative value means that Member A shall return energy to other Members.

3. AMOUNT OF CAPACITY REGULATED
--

The amount of capacity regulated by Member B on behalf of Member A in an hour shall be equal to the sum of:

- (i) the largest difference in that clock hour between the (actual) instantaneous power exports and the scheduled power flows at the same moment, and
- (ii) the largest difference in the same clock hour between the (actual) instantaneous power imports and the scheduled power flows at the same moment.

4. RATES

Unless otherwise agreed between the Parties, the rates for Control Area Services shall be the same as for Operating Reserve (item 3.1, Schedule H) and shall apply to the amount of capacity regulated as specified in item 3 above.

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CALCULATION OF ENERGY AND CAPACITY RATES

1. CAPITAL AND PRODUCTION COSTS AT A NEW COAL-FIRED STATION

1.1 INPUT DATA:

We assume as a benchmark, a new coal-fired power station, dry cooled and equipped with six (6) units developing 635 MW-SO each.

In January 1994 (US\$/ Rand exchange rate of R3,30 / US\$), the cost per kW , after adjustment for construction time is about \$1010/kW (no SO₂ nor NOx removal) and the fixed operation and maintenance (O & M) costs, once the station is fully commissioned, are about \$4,25 million per month. The variable O & M costs are \$0,53/ MWh-SO.

The fuel costs are assumed to be proportional to the energy sent out and are equal to \$9,10/ ton \$5,51/ MWh (33 % efficiency; 18 GJ / ton) . The average load factor is in the vicinity of 65%; the energy produced every month is thus 1808 GWh (730 hours in a month).

1.2 LEVELISED COST OF CAPITAL AND FIXED O & M COSTS:

Assuming an economic life of thirty (30) years and a nett discount rate of 6% the levelised cost of capital or rent value of the capital invested in the plant is \$6,11/kW per month;

$$R = r / [1-(1+r)^{-n}] = 0,06 / (1 - 1,06^{-30}) = 7.26\%$$

$$\$1010/ kW \times 7,26\% / 12 = \$6,11/ kW \text{ per month}$$

With a 65% load factor, the levelised cost of capital is also equal to \$12,88/MWh:

$$\$6110/MW / (730h \times 65\%) = \$12,88/MWh$$

The fixed O & M costs are \$4,25 million per month or \$1,12/ kW per month, or \$2,36 / MWh:

$$\$4,25 \text{ million} / (6 \times 635 \text{ MW}) = \$1,12/ \text{ kW per month.}$$

$$\$1120/\text{MW} / (730\text{h} \times 65 \%) = \$2,36 / \text{MWh}$$

1.3 TOTAL FIXED COSTS (JANUARY 1994):

The total fixed costs are therefore \$7,23 / kW per month:

$$\$6,11 / \text{ kW} + \$1,12/ \text{ kW} = \$7,23/ \text{ kW per month}$$

Expressed in energy terms, the total fixed costs are equal to US\$15,24/ MWh:

$$\$12,88/ \text{ MWh} + \$2,36/ \text{ MWh}$$

1.4 VARIABLE COSTS (JANUARY 1994):

With a load factor of 65% the energy delivered by the station is 1808 GWh per month and the variable O & M plus fuel costs are \$6,04/MWh or \$10,92 million per month or \$2,86/ kW per month:

$$6 \times 635 \text{ MW} \times 8760 \times 0,65 / 12 = 1\,808 \text{ GWh per month}$$

$$\$5,51/ \text{ MWh} + \$0,53/ \text{ MWh} = \$6,04/ \text{ MWh}$$

$$\$6040/ \text{ GWh} \times 1\,808 \text{ GWh} = \$10,92 \text{ million per month}$$

$$\$6,04 / \text{ MWh} \times 730 \text{ hours} \times 65\% = \$2866/ \text{ MW per month}$$

1.5 TOTAL COSTS (JANUARY 1994):

Energy as a basis (fixed plus variable costs):

$$\text{US\$15,24 / MWh} + \text{US\$6,04 / MWh} = \text{US\$21,28 / MWh}$$

Installed capacity basis (fixed plus variable costs):

$$\text{US\$7,23 / kW} + \text{US\$2,86 / kW} = \text{US\$10,09 / kW per month}$$

LEVELISED COST OF NEW COAL FIRED STATION, 65 % LF							
	FIXED			VARIABLE			F.&V. TOTAL
JAN 1994	CAPITAL	O&M	TOTAL	O&M	FUEL	TOTAL	TOTAL
\$/kW pm	6.11	1.12	7.23	0.25	2.61	2.86	10.09
\$/MWh	12.89	2.35	15.24	0.53	5.51	6.04	21.28

2. RATES USES IN THE SCHEDULES

2.1 PARTICIPATION POWER AND SYSTEM PARTICIPATION POWER

The capacity rate for Participation Power (Schedule L) is deemed not to exceed US\$7,23/ kW per month (the fixed portion of levelised cost of a new coal-fixed station as determined above). The capacity rate for Short -Term or System Participation Power (Schedule G) should not exceed 80% of US\$7,23/ KW per month or US\$0,190/ kW per day or US\$1,33/ kW per week.

The capacity rate for Participation Power in turn forms the basis for other capacity rates as given in the paragraphs which follow.

2.2 FIRM POWER AND SHORT-TERM FIRM POWER:

The capacity rate for Firm Power (Schedule K) is taken to be 115% of the maximum capacity rate for Participation Power, i.e. $1,15 \times 7,23 = \text{US\$8,31/ kW per month}$. The 15% represents the reserve margin required to make the power firm. It is the average between 10% reserve for hydro plant and 19% reserve for thermal plant.

The capacity rate Short-Term Firm Power (Schedule F) is taken to be the same as the capacity rate for Firm Power converted to a weekly rate i.e. $8,31 / 4,33 = \text{US}\$1,92 / \text{kW}$ per week.

2.3 PENALTY FOR SHORTAGE OF ACCREDITED CAPACITY:

The penalty is equal to five times the monthly rate for Participation Power or $\text{US}\$36,15 / \text{kW}$ (see Appendix 1). The five times comes from the consideration that the annual peak can occur in any of the five coldest months of the year (May to September). The penalty is also set to make it unattractive to have insufficient Accredited Capacity compared to buying Participation Power or Firm Power.

2.4 EMERGENCY ENERGY:

The rate for Emergency Energy (Schedule A) is equal to $\text{US}\$31,92 / \text{MWh}$, which is equal to 150% of the total levelised cost in MWh of new coal-fired station.

$$21,28 \times 1,5 = 31,92$$

2.5 OPERATING RESERVE AND CONTROL AREA SERVICES:

The rate for Operating Reserve (Schedule H) and Control Area Services (Schedule M), is equal to 20% of the capacity rate for Participation Power or $\text{US}\$47,5 / \text{MW}$ per day.

$$20\% \times \$7,23 / \text{kW} \times 12 / 365 = 0,0475$$

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**TABLE 1
SCHEDULED TRANSACTIONS
(PART 1: ENERGY EXCHANGES)**

SCHEDULED TRANSACTION		DURATION [NOTICE]	ENERGY RATE (JAN 1994)	CAPACITY RATE (JAN 1994)	WHEELING CHARGE (IF ANY)	TYPE OF WHEELING (IF ANY)
Emergency Energy	[A]	< 6 Hours	>\$31.9/MWh <115 % SRMC		To be added and paid by Buyer	Firm
Economy Energy (Thermal to Thermal or Hydro)	[C]	[0 Hours]	Th: Share savings Hy: < 115% SRMC	--	Included in savings calculation	Non- firm
Surplus Energy (Hydro to Thermal or Hydro)	[D]	[0 Hours]	Th: <75% SRMC HY: Consent	--	Included in charge	Non- firm
System Energy (From Thermal)	[B]	> [1 Hour] < [24 Hours]	<120% SRMC <135% SRMC	--	To be added and paid by Buyer	Non- firm
System Energy (from Hydro to Thermal)	[B]	> [1 Hour] < [24 Hours]	<85% SRMC <95% SRMC	--	Included in Charge	Non- firm
Energy Banking (Short –Term)	[E]	Max. Weekly Cycles	Share savings	--	Included in savings calculation	Non- firm
Energy Banking (Long –Term)	[E]	Longer Cycles	<120% SRMC > 80% SRMC	--	To be added and paid by Buyer	Non- firm
Scheduled Outage Energy	[J]	Not Specified	<115% SRMC (Seller) >115% SRMC (Buyer)	--	To be added and paid by Buyer	Non- firm

**TABLE 2
SCHEDULED TRANSACTIONS
(PART 2: CAPACITY EXCHANGES)**

SCHEDULED TRANSACTION		DURATION [NOTICE]	ENERGY RATE (JAN 1994)	CAPACITY RATE (JAN 1994)	WHEELING CHARGE (IF ANY)	TYPE OF WHELLING (IF ANY)
Operating Reserve	[H]	>One Month >[24 Hours]	System Energy Short Term Firm Power	\$47.5/ MW per day	To be added and paid by Buyer	Non-Firm
System Participation Power	[G]	7days to 6 Months	Th: < 115% SRMC Hy: < 80% SRMC	\$1.33/kW per week	Included in savings calculation	Firm
Participation Power	[L]	Longer than 6 Months	Th: < 115% SRMC Hy: < 80% SRMC	\$7.23/kW per month	Included in charge	Firm
Short Term Firm Power	[F]	7days to 6 Months	Th: < 115% SRMC Hy: < 80% SRMC	\$1.92/kW per week	To be added and paid by Buyer	Firm
Firm Power	[K]	Longer than 6 Months]	Th: < 115% SRMC Hy: < 80% SRMC	\$8.31/kW per month	Included in Charge	Firm

**APPENDIX 1
ACCREDITED CAPACITY
ACTUAL LOAD -GENERATING CAPACITY DATA
YEAR**

Reporting System :

Member:

Prepared By:

Telephone:

Date:

		APR.	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Day :													
Hour Ending :													
1	Monthly System Peak Demand												
2	Annual System Peak Demand												
3	Monthly Firm Purchases-Total (See Table 2)												
4	Monthly Firm Sales-Total (See Table 2)												
5	Monthly System Peak Obligation (1-3+4)												
6	Annual System Peak Obligation (2-3+4)												
7	Net Generating Capacity												
8	Participation Purchases-Total (See table 3)												
9	Participation Sales-Total (See table 3)												
10	Accredited Capacity (7+8-9)												
11	Reserve Capacity Obligation-Thermal 19% Hydro 10% or Weighted Aver (% of line 6)												
12	Accredited Capacity Obligation (5+11)												
13	Surplus or Deficit (-) Capacity (10-12)												
14	Planned Maintenance												
15	Monthly Net Energy Requirements (GWh)												
16	Did your system experience any hour during the month with a lesser surplus or greater deficit ? YES or NO *												

* If YES, provide a supplementary sheet with full load and capacity information for the hour of least surplus/greatest deficit.

TABLE 1

APPENDIX 1 (CONTINUED)
ACCREDITED CAPACITY
FIRM PURCHASES AND SALES
YEAR

Reporting System :

Member:

Prepared By:

Telephone:

Date:

Purchases From:	APR.	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Total Firm Purchases:												

Sales To:	APR.	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Total Firm Sales:												

TABLE 2.

APPENDIX 1 (CONTINUED)
ACCREDITED CAPACITY
PARTICIPATION PURCHASES AND SALES
YEAR

Reporting System :

Member:	Prepared By:			Telephone:				Date:				
Purchases From:	APR.	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Total Participation Purchases:												

Sales To:	APR.	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Total Participation Sales:												

TABLE 3.

APPENDIX 4:

Detailed List of Proposed Capacity Building and Training Programmes/Activities

*Training
or
Study*

Programme / Activity Description

Capacity Building for Regional Regulation

Basic Course in Electricity Regulation Components

- T The Technical Fundamentals of Electricity Supply
- T The Economic Fundamentals of Electricity Supply
- T Basic Forms of Regulation
- T Fundamental Concepts of Public Utility / Economic Regulation
- T Political and Social Context of Regulation
- T Legal Framework for Regulation
- T Regulatory Process and Procedures
- T Modalities of Regulation
- T Disputes and Appeals
- T Enforcement of Regulatory Decisions
- T Information Collection and Management
- T Managing the Regulatory Process

Regional Restructuring and Regional Trading: Implications for Regulation

- T Market Structure Reform and Regulatory Adjustments
- T Internal Transactions
- T Economic Regimes for International Trading
- T Distinctive Regulatory Aspects of International Trading
- T International Regulation of Transmission Transactions

Economic Principles of Electricity Service – Pricing, Accounting, and Financing in Evolving Industry Context

- T Domestic Pricing Regimes for Electricity Services
- T Pricing Regimes for Transmission and Bulk Power Services: the International Experience
- T Accounting and Utility Regulation
- T Financing Utility Investment

Capacity Building to Support Formulation of Pool Rules and Institutions

- T Pool Structure Overview: Alternatives for Transaction Structure for West Africa
- T Transaction Clearing and Operation in Multiple Currencies
- T Pool Operations: How it Works Day-to-Day

Capacity Building for Hydroelectric Operations in a Pool Environment

- T Fundamentals for of Hydroelectric Operations in a Pool – Implications for Policy
- T Hydroelectric Operations in a Pool: Day to Day Considerations and Methods

Training
or
Study

Programme / Activity Description

Building Power Contracting Capabilities

	Long Term Contracting
T	Contracting Processes and Mechanics
T	The Long Term PPA: Structure and Contents
T	The PPA Competitive Procurement / Bidding Process
T	Negotiating Skills
T	Bilateral Energy Contracting
T	Contracting for Wheeling Services

T Dispatch Operations Training

Analysis and Resolution of EAPP Key Issues

	System Stability/Standards-Setting Study
S	Dispatch Centre Planning
S	Wheeling Contracting and Payment Regimen
	Standard Energy Contracting Regimen
S	Short Term Energy Contract Template
S	Long Term Energy and Capacity Contract Standard Term