AN EXPLORATORY RESEARCH INTO THE DESIRABILITY OF REGIONAL TRANSMISSION ORGANISATIONS IN AFRICA

A Research Report
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by

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TM TWALA

DECLARATION

I declare that the work contained in this research report is the result of my own efforts, except where otherwise indicated. It is submitted in partial fulfilment of the requirements of the degree of Master of Business Leadership of the University of South Africa.

Signed by:

Date: 30/11/2004

DEDICATION

This dissertation is dedicated to my wife Nomsa and our children, Nokuthula, Mncedisi, Nolwazi and Langa, for their understanding and support during all the hard work in putting this research together.

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I would also like to thank my friends and study group members from JHB1202A for their support and encouragement.

I especially thank all the people I interviewed for this research - their time and information they shared is highly appreciated.

Lastly but not least, thanks to Glenda Buncombe for editing of this dissertation.

ABSTRACT

Africa is still regarded as a "Dark Continent" by many because electricity is still inaccessible to many parts of that continent. This has resulted in slow growth of social and economic development. This is what prompted this research on how Africa could help herself. The research study attempted to find an answer to the following question: How could regional transmission organisations (RTOs) be used as an enabling vehicle for transmission infrastructure development in Africa?

The research used the qualitative method to explore the viability and challenges of forming RTOs in Africa. Three cases were studied, namely the USA's RTOs, Westcor and Motraco, for insight into RTOs in general and how they are formed in Africa. Interviews were conducted with experts and leaders in the electricity industry in South Africa and correspondence through e-mails with experts in other African countries.

RTOs have been identified as a vehicle that could be used to expand the power grid infrastructure to the rest of Africa. NEPAD could facilitate the collaboration and raising of funds needed for such capital investments. The benefits of this research are that a debate on the formation of RTOs in Africa could be taken further and other entities such as Eskom could leverage their resources, create economic growth in Africa and hence improve the lives of Africans.

It is recommended that further research be carried out to determine ways of measuring the cost/benefit of RTOs in Africa. In the case where bilateral agreements existed between

industrial users and suppliers, ways should be found of also supplying to residents at market competitive prices.

It is also recommended that further detailed study of the nature, dynamics, strengths and weaknesses of the USA's RTOs be carried out. The study should also be done to find what Russia, China and India are doing regarding the RTOs or similar systems.

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ABBREVIATIONS/ACRONYMS

ATC – available transmission capacity

CEO – chief executive officer

EAC – East African Community

EE – Eskom Enterprise (Pty) Ltd

ESI – electricity supply industry

Eskom – Electricity Supply Commission

FERC – Federal Energy Regulatory Commission

FDI – foreign direct investment

IB – international business

IJV – international joint venture

IPP – independent power producer

ISA – independent scheduling administrator

ISO – independent system operator

ITC – independent transmission company

MDG – millennium development goal

MNC – multinational company

MOU – memorandum of understanding

NEPAD – New Partnership for Africa's Development

NGC – National Grid Company

O&M – operation and maintenance

OASIS – Open Access Same-time Information System

PPP – public-private partnership

RED – regional electricity distributor

RTO – regional transmission organisation

SADC – Southern African Developing Community

SAPP – Southern African Power Pool

STEM – Short-term Energy Market

SWOT – strengths, weaknesses, opportunities and threats

TransCo – transmission company

UNISA – University of South Africa

USA – United States of America

WAPP – Western African Power Pool

Westcor – Western Corridor

CHAPTER 1

INTRODUCTION

1.1 Introduction

For Africa to achieve social, political and economic stability, it needs to develop the environment conducive to do so. Development of infrastructure such as transport, communication and electrification, amongst other things, could enhance Africa's chances of attracting foreign investment. Eskom Holdings Ltd and other interested parties are seeking and pursuing ways to contribute towards Africa's development. Africa's electricity position relative to the rest of the world and infrastructure's long-term plan are depicted in Appendices 10 and 11, respectively. A regional transmission organisation (RTO) is one structure that other developed countries have used to improve their electrification programmes and infrastructure development.

An RTO is defined by the Federal Energy Regulatory Commission (1999) as an organisation that owns and controls the grid that transports electricity. Amongst its functions would be to invest in necessary transmission infrastructure and operate and maintain the stability of the transmission system.

This research study explores RTOs in the United States of America, and the Westcor and Motraco projects and lessons that could be learnt from them. It seeks opinions from experts in the academic environment and the electricity industry about the formation of RTOs in Africa.

1.2 Chapter Plan

Chapter 2 introduces the research problem, i.e. the management dilemma. Sections in this chapter also deal with research objectives, research boundaries, research relevance or benefits and research limitation.

Chapter 3 deals with the literature review. This literature is categorised into an electricity overview, electricity trends, electricity restructuring, globalisation, NEPAD, RTOs and SAPP. The review covers accredited academic literature, industrial literature and other sources.

Chapter 4 covers the research design and the applied methodology for this research study. This includes how data was collected. Since a qualitative approach was adopted for this research, interviews were conducted.

Chapter 5 discusses the formation of RTOs in the USA, policies put in place to regulate them, their functions and their cost/benefit. The strengths and weaknesses of RTOs are highlighted as well.

Chapter 6 discusses the Westcor project, which is a typical RTO case in the Southern region of Africa. This project is still in its early stages.

Chapter 7 discusses the Motraco project, another example of the RTOs in Southern Africa.

Chapter 8 discusses how the data was collected and techniques used.

Chapter 9 discusses findings, which address objectives of this research.

Chapter 10 is the conclusion and recommendations of all the findings and the literature review.

CHAPTER 2

RESEARCH PROBLEM

2.1 Introduction

The electricity industry in South Africa is currently undergoing major restructuring. The policy framework set out in the White Paper on the Energy Policy of the Republic of South Africa of 1998 highlights restructuring in the energy industry. "The distribution industry will accordingly be restructured into regional electricity distributors. Government will establish a transitional processes [sic] that will lead up to the formation of independant [sic] regional electricity distributors... Government supports gradual steps towards a competitive electricity market while investigations into the desired form of competition are completed. Eskom will be restructured into separate generation and transmission companies. Government supports the development of the Southern African Power Pool (SAPP)" (RSA, 1998:11).

It was the above developments that prompted a look at opportunities that RTOs could provide for Eskom to leverage their expertise that has been accumulated over many years in the electricity industry. Eskom Holding (Pty) Ltd had formed Eskom Enterprise (Pty) Ltd (EE) as its subsidiary, which was licensed to seek business outside the regulated business. EE is used as a vehicle by Eskom to do business globally but especially to concentrate on the African continent. Peter Ondeng, CEO of the New Partnership for Africa's Development (NEPAD) in Kenya, said: "A strong country like South Africa should position itself in a supportive role to allow private-sector interaction" (*Mail & Guardian*, 2004).

An RTO is "an independent entity that operates and controls a set of transmission facilities. This can be accomplished through direct ownership or through a group of owners putting their transmission facilities under control of the RTO" (Georgia Transmission Corporation, 2002:13).

Electric power is transported using a single integrated transmission grid; therefore the operation of transmission systems plays a direct role in how electric power is produced and used. The idea behind the RTO is that a separate independent or a group of entities dedicated exclusively to transmission can help plan, construct, operate, maintain and expand the electric grid more efficiently, ensuring that there is reliability in supply, control and an efficient spot market and associated transparent spot markets (FERC, 1999). From a business perspective an enterprise like Eskom can seize an opportunity offered by open markets to leverage its resources in forming or being part of such an RTO.

Power pools like SAPP have been set up to, among other things, free the energy markets and promote competition to the advantage of suppliers and customers by "levelling the playing field". The smooth functioning of these power pools depends to a large degree on the transmission of electricity from the suppliers to the customers. The new competition model is built on the premise that electricity can be purchased separately from "transportation". Customers and sellers can arrange for transport on fair and comparable terms over transmission and distribution wires owned by others (Payne, c1997).

It is clear that the control of transmission has to be separated from generation as well as from the retailing function. This is necessary to avoid a conflict of interest in the dispatching process and to avoid the appearance of self-dealing (Payne, c1997).

2.2 Issues concerning this Research

The issues that prompted this research study are the following:

- Africa has a deficit in electricity infrastructure.
- Individual African countries do not have the capacity to develop the transmission infrastructure for the following reasons:
  - Constraints in raising capital on their own
  - High cost of capital
  - High risk associated with borrowing
  - Inadequate ability to participate in an open market
  - No or low domestic demand that does not justify the cost of setting up their own power supply
  - Low demand spread over a very large area

2.2.1 Research Question

The research study attempts to find an answer to the following question: **How could regional transmission organisations (RTOs) be used as an enabling vehicle for transmission infrastructure development in Africa?**

2.2.2 Subquestions

In answering the above question the following subquestions have to be answered first, which form part of this study:

- How were RTOs formed in the USA and what was their mandate?
- How could RTOs be implemented in Africa?
- How could Eskom be instrumental in forming RTOs in Africa?
- What model could be best for Africa?

2.3 Research Objectives

The purpose of this research is to ascertain whether the RTO concept is viable in Africa and how Eskom could use it as a business opportunity. This is done by:

- Studying the RTOs in the USA.
- Studying opportunities that could be exploited in the SADC region and projects already taking place.
- Establishing how Eskom could leverage this, perhaps through an independent transmission company (ITC).
- Examining the role NEPAD could play.
- Identifying the challenges to implementing RTOs in Africa.
- Identifying new learning in areas of global strategy development, global venture creation, entry strategies, regional development, global alliances and cross-border risk management.

2.4 Research Boundaries

This research is concentrated within Africa, SADC in particular. Secondary data from other countries such as the USA and European countries is also investigated. Most interviewees are experts and leaders from the African continent, NEPAD, SAPP and Eskom.

2.5 Relevance/benefit of the Research

The benefits of this research would be the initiation of debate around RTO formation and the creation of opportunities for further research in this field. Eskom could identify future business opportunities by forming or being part of RTOs, not only in the SADC region, but further into the rest of Africa, e.g. Western, Northern, Eastern and Central African regions. Further benefit will be the knowledge that could be gained in RTO and related concepts.

2.6 Research Limitations

Some of the experts sought for opinions could not be reached due to geographic distances, for example NEPAD and SAPP representatives in other SADC countries. In other cases, due to the busy schedules of some sought-after respondents, interviews could not be held. Time seemed to have been a factor that prevented certain interviews from taking place.

2.7 Validity

The information obtained from the literature review is valid because most of it was from accredited academic research. The industrial and other secondary information was also from authoritative documents. The information obtained from these sources measures what RTOs are in the USA and elsewhere, which is the focus of this study.

The interviews were conducted face-to-face with respondents. In most cases a dictaphone was used to record exactly what the respondents were saying. These recorded responses were then summarised into this report. In cases where e-mails were sent, respondents also replied via e-mail. In all these cases the focus of questions and discussions was on the research topic, which is the formation of RTOs.

2.8 Reliability

The procedure adopted to gather secondary data, that is, through the literature review, was reliable in that accredited academic and authoritative sources were used.

Interviews and e-mail respondents were asked questions relevant to the research study and the structured questions were the same for all respondents. The bias was eliminated through open discussion where the respondents had freedom of expression and no opinion was forced on them. There is a high likelihood that this research method carried out again by somebody else could lead to the same results.

2.9 Practicality

The research method used here was economical, especially with the use of the Internet, and the libraries of both Eskom and UNISA. Interviews were conducted locally and e-mail and faxes were used for remote respondents. It was also convenient and practical to reach the respondents who were in South Africa (Eskom). For those some distance away, e-mails or faxes were a convenient and practical way to reach them.

In conclusion it could be said that the research problem was well defined and objectives of this research spelled out. The next chapter discusses the literature review, which is relevant to RTOs and globalisation.

CHAPTER 3

LITERATURE REVIEW

3.1 Electricity Overview

Electricity is a basic part of nature and one of the widely used forms of energy. Electricity, which is a secondary energy source, is obtained from converting other sources of energy, like coal, natural gas, oil, nuclear power, wind, water and other natural sources, which are called primary sources. Most people today never even stop to think what life would be like without electricity; most people take electricity for granted, as they do air and water.

Fundamentally, the electricity sector can be divided into three main areas, namely generation, transmission and distribution, as illustrated in figure 1 below. The supplementary areas are system operations and retail supply.

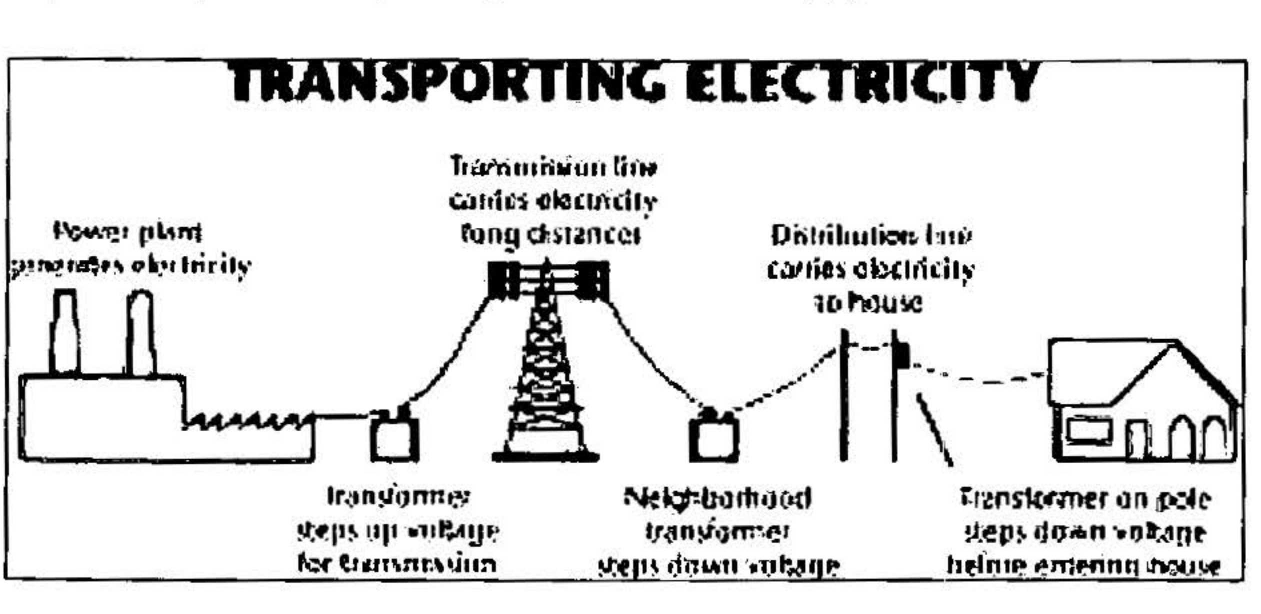


Figure 1: Three main electricity areas
Source: Energy Information Administration, 2004

Generation transforms various forms of energy (coal, nuclear, hydro, etc.) into usable electricity. It is the largest sector in the electric utility industry and accounts for more than half the utility assets. It also forms the bulk of the costs of producing and delivering the electricity to consumers (Warkentin, 1998). Transmission transports this electricity through high voltage power lines, normally over long distances, to the distribution networks and to heavy industries. Distribution involves the reticulation of medium and low voltage, normally over short distances. System operations coordinate and control this power supply to ensure that there is quality and consistency in the face of changing demand (Hansen, 2000). Retail supply comprises metering, billing, customer service and marketing. Municipalities and Eskom Distribution normally do retailing in South Africa.

3.2 Trends within the Electricity Industry

Historically electricity was produced and supplied to consumers by vertically integrated state-owned public sector monopolies. These utilities were highly regulated.

Many reforms have occurred since the beginning of the 21st century. Governments had structurally separated the three main components, that is, generation, transmission and distribution, corporatised their business (made them corporate entities), and in some cases sold their public electricity utilities to private sectors. Generators sell electricity under contracts or on the market through wholesale electricity pools. Distributors have a franchise on the region in which their poles and wires are installed, but can sell (as retailers) to customers outside their area using rival distributors' networks. Some retailers own no poles and wires and sell electricity using the networks of distributors, who charge for transmission (Rann, 1998).

Africa as a continent has lagged behind these developments (refer to Appendix 10). There are a number of factors contributing to this state of affairs in Africa, amongst others a lack of or slow economic development.

3.3 Globalisation

Globalisation refers to the increasing integration of economies around the world, particularly through trade and financial flows. The term sometimes also refers to the movement of people (labour) and knowledge (technology) across international borders (International Monetary Fund, 2000). One other reason why globalisation is of interest to this research is that, according to Cook (2003:129), one of the objectives of NEPAD's millennium development goals (MDGs) is for Africa to "develop a global partnership for development that includes an open, rule-based, predictable and non-discriminatory trading and financial system through which issues of official development assistance, market access, and indebtedness might be addressed".

Markets promote efficiency through competition and the division of labour – the specialisation that allows people and economies to focus on what they do best. Global markets offer greater opportunity for people to tap into more and larger markets around the world and maximise their wealth. It means that they can have access to more capital flows, technology, cheaper imports and larger export markets.

According to Hill (2003), such reasons for globalisation could be to:

- Earn greater return on assets and utilise core competencies, which are a strategic competitive advantage.
- Realise location economies by dispersing value creation activities to those locations where they can be done most efficiently.
- Realise experience curve economies, which reduces the cost of value creation.
- Diversify risks, which could include political, economic, business and financial risks.

The literature review for this study on globalisation concentrates on areas of global strategy development, global venture creation, entry strategies (including global alliances versus joint ventures), regional development, public-private partnerships and cross-border risk management.

3.3.1 Global Strategy Development

Firms go international for three reasons, namely to extract raw materials, source production from other countries and penetrate markets (Kogut, 1984). So the decision to go international is closely tied to the notion of strategic links of the value-added chain. The reason to operate across the border has to have the strategic advantage of supporting the higher costs of the organisation's world activities.

Companies use at least four basic strategies to enter and compete in the international environment. These are tabled below (Hill, 2003).

Table 1: Global expansion strategies

Strategy	Key Characteristics
International	• Transfer skill and products which locals lack.
Multi-domestic	• Strive to achieve maximum local responsiveness.
Global	• Reap cost reductions from experience curve & location benefits.
Transnational	• Tap into "global learning" - free flow of goods, services, skills, etc. • Strive for benefits from all above strategies to counter complexities.

Source: Hill (2003)

Eskom's strategy of vigorously promoting economic growth could be best described as a transnational strategy, focused on Africa. Eskom also supports NEPAD's initiative of development in Africa by Africans. Eskom intends to do this responsibly by putting in place good corporate governance measures and also embarking on empowering and improving the lives of people in the host countries. Where possible there should be "two-way" trade between countries so that Eskom is not seen to be another coloniser.

Questions regarding global strategy development (Coetzee, 2004) that must be answered and that are key to strategy decisions prior to developing a global business plan are:

- Why expand outside the home country?
- What global growth strategy should be pursued?
- What global business opportunity should be pursued?
- What entry strategy into a foreign market should be pursued?
- How should a global growth strategy be implemented?
- How should matters across borders be managed?

Coetzee (2004) mentions that, according to Barlett and Ghoshal (1993), key strategic thrusts of global growth strategies are:

- Global integration
- Local responsiveness
- Global learning

The strategic management process can take the following steps as outlined in figure 2 below:

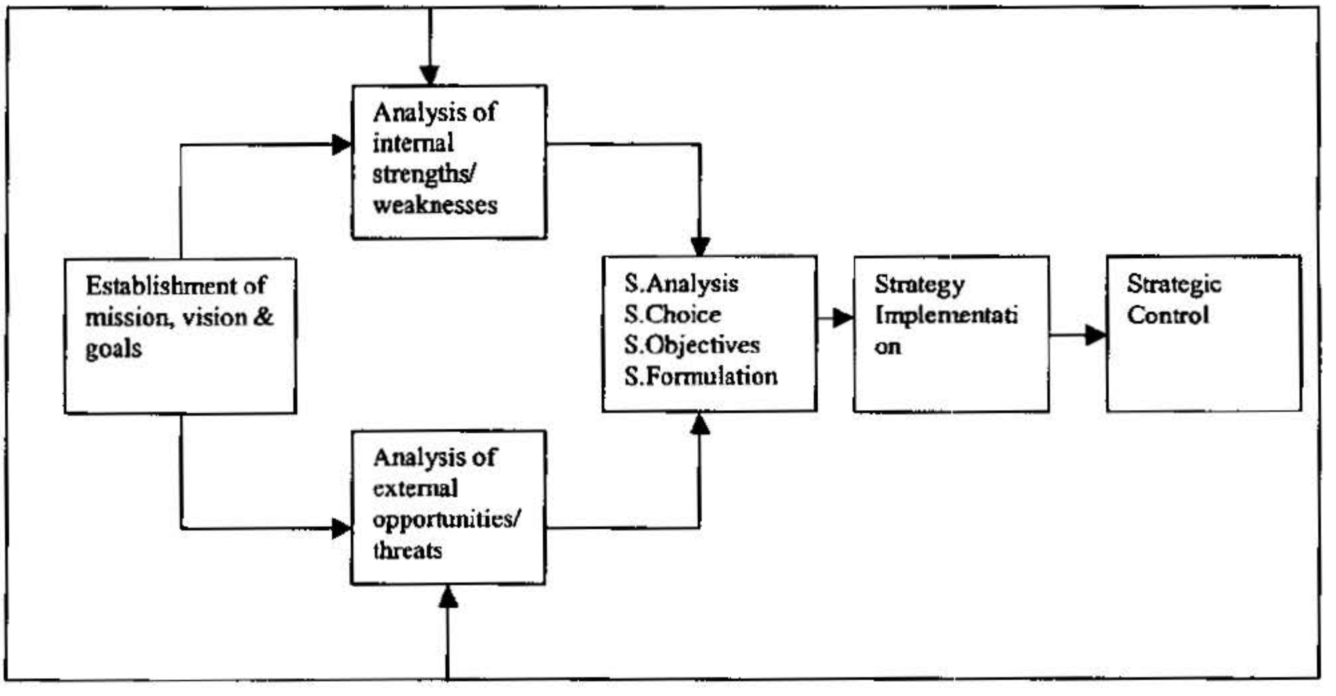


Figure 2: Strategic management process

Source: Coetzee (2004)

Further practical considerations when formulating global strategy are, according to Coetzee (2004), the following:

- Global growth objectives have to be quantified and benchmarked, time-based, pass a reality test, and clearly indicate the impact on the bottom line and improvements on strategic positioning and global risk exposure.
- An in-depth analysis of the business environment, including micro, market and macro environments (e.g. SWOT, trend, competitor and market analysis) must be carried out. There must be a holistic approach.
- Analysis and objective formulation must be on a matrix logic.

Coetzee (2004) came up with a matrix logic of developing a global strategy as shown in table 2 below:

Table 2: Matrix logic of developing a global strategy

Level of Business Analysis • Country • Industry • Competitor • Own company	**Levels of Strategy-making** • Corporate strategy • Business strategy • Functional strategy
Key Business Controls • Value = build new and protect existing • Ongoing reality checks, integration • Ongoing support from stakeholders • Efficiency of the business system - using classical systems thinking • Creative and unique enough • Project development – ongoing	**Key Strategic Questions** • Which growth model? • Which growth path? • What global focus? • Globalise to what extent? • How do I enter foreign market? • How do I build the global enterprise?

justification (the project health check)	

Source: Coetzee (2004)

3.3.2 Global Venture Creation

3.3.2.1 Use of Innovation and Technology

Generally global venture creation is based on innovative technology and intellectual property (Tatu, 2004). Strategies must then address global markets from the beginning. Technology-based new firms need to simultaneously manage product and process development, business model development and market development efforts when globalising their businesses. Using a case of Finland and Finnish companies in science and technology, two focus areas were distinguished, as illustrated in figure 3 below.

- Focus 1: The internalisation from the perspective of the new venture
- Focus 2: The internalisation from a financing and support perspective

It could be deduced that for any global venture to be successful, internal capabilities, processes and support mechanisms are needed (these include financial and market supports) (Tatu, 2004).

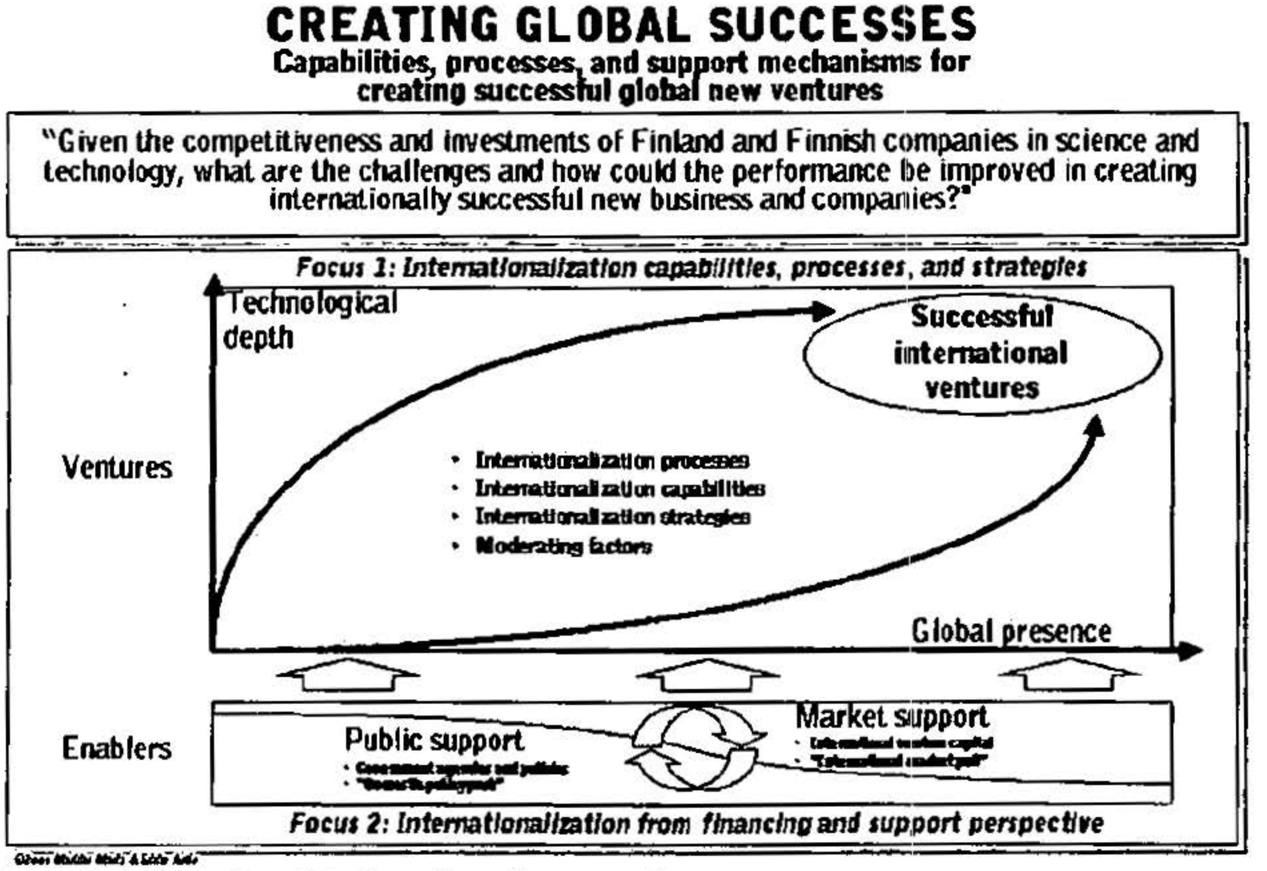


Figure 3: Finland's global venture framework

Source: Tatu (2004)

3.3.2.2 Public-private Partnerships

Public-private partnerships (PPPs) could also be used to create global ventures. A PPP is defined by the Canadian Public-Private Partnership (P3) Office (2003) as a "co-operative venture for the provision of infrastructure or services, built on the expertise of each partner that best meets clearly defined public needs, through the most allocation of resources, risks and rewards". The Freedictionary.com (2004) defines it as "a variation of privatization in which elements of a service previously run solely by the public sector are provided through a partnership between the government and one or more private sector companies".

PPPs can take many forms as listed in table 3 below:

TABLE 3: Forms of public-private partnership ownership

Contract	When is it Used	Average Term (Years)	Primary Funding and Financing Requirements	Responsible
O&M	New or existing systems	5-20	Capital improvements	Public
Design/build/ operate	New or existing systems	5-20	Debt & equity financing	Public/private
Concession/ lease	Existing system	15-25	Routing O&M costs Debt refinancing Working capital	Public/private
Finance, design build and operate	New system	20-25	Debt & equity financing	Public/private
Own and operate	New system or asset sale/transfer	20-25	Debt & equity financing/refinanc ing	Private
Asset sale/transfer	Existing systems	25+	Debt & equity financing	Private

Adapted from Public-Private Partnership (P3) Office (2003)

Kroukamp (2004a) states that reforms in PPPs are driven by reforms, largely influenced by the market model, which was founded on two postulates:

- That management methods originating in the private sector are superior to those traditionally used in the public sector.
- That the management of the economy must gradually give way to market forces.

Regarding the operation of PPPs, Kroukamp (2004b) identifies the following five key indicators as the yardstick for the success of PPPs:

- Output-based specifications where services are specified as outputs and payment is linked to the quality of their delivery.
- Long-term nature of contracts which provides scope to recover the initial capital investment, to develop alternative approaches to service delivery and to focus on whole life costing.
- Performance measurement and incentives which provide the means of securing the value for money promised by the original deal.
- Competition which makes it easier to demonstrate that value for money has been achieved.
- Private sector management skills delivering efficiencies and innovation with the financing, construction and operation of the total project.

Kroukamp (2004) further argues that because governments use PPPs to allow investments that would otherwise not be achieved and to provide more efficient and responsive services, a new framework to guide behaviour is necessary. It is necessary especially for those management systems that are desegregated, decentralised and devolved. The issues of accountability, transparency and public interest should be dealt with adequately.

3.3.3 Entry Strategies

3.3.3.1 Choosing the Entry Mode

Companies contemplating foreign expansion are faced with entry decisions to make. Hill (2003) highlights three basic entry decisions:

- Which foreign markets to enter, when to enter them and to what scale
- The choice of entry mode
- The role of strategic alliances

The decision of which foreign markets to enter is based on an assessment of a nation's long-run profit potential and that potential is a function of several factors, such as economic, political and social. All this should be balanced with cost/benefits and risks associated with doing business in that country. Eskom had already made a decision to assist in the African Renaissance by doing business with the rest of Africa.

3.3.3.2 Selecting the Entry Mode

Different entry modes can be used to enter foreign markets, such as exporting, turnkey projects, licensing, franchising, joint ventures with host country firms and setting up a new wholly owned subsidiary in the host country (Hill, 2003). These have different advantages and disadvantages as summarised in table 4 below:

Table 4: Advantages and disadvantages of entry modes

Entry Mode	**Advantage**	**Disadvantage**
Exporting	Ability to realise location and experience curve economies	High transport costs Trade barriers Problems with local marketing agents
Turnkey contracts	Ability to earn returns from process technology skills in countries where foreign direct investment (FDI) is restricted	Creating efficient competitors Lack of long-term market presence
Licensing	Low development costs and risks	Lack of control over technology Inability to realise location and experience curve in global strategic coordination
Franchising	Low development costs and risks	Lack of control over quality Inability to engage in global strategic coordination
Joint ventures	Access to local partner's knowledge Sharing development costs and risks Politically acceptable	Lack of control over technology Inability to realise location and experience economies
Wholly owned subsidiaries	Protection of technology Ability to engage in global strategic coordination Ability to realise location and experience economies	High costs and risks

Adapted from Hill (2003:489)

All companies should plan for growth and survival in a world of global competition (Root, 2003). Product or market entry strategies require decisions on:

- The choice of a target product or market
- The objectives and goals in the target market

- The choice of an entry mode to penetrate the target market
- The marketing plan to penetrate the target market
- The control systems to monitor performance in the target market

Foreign market entry modes may be classified in three groups (Root, 2003):

- Export entry mode is when a company's final or intermediary products are manufactured outside the target country and subsequently transferred into it.
- Contractual modes are long-term non-equity associations between an international company and an entity in a foreign target country and involve the transfer of technology or human skills from the former to the latter.
- Investment entry mode involves ownership by an international company of manufacturing plants or other production units in the target country.

Kim and Hwang (1991), in their study of global strategy and multinationals' entry mode choices, identified two categories that influence foreign entry choices: the environmental or transaction factors.

The environment variables comprise country risk, location unfamiliarity, demand uncertainty and intensity of competition. They explain these variables as follows:

- Country risk – When country risk is high, a multinational company (MNC) should limit its exposure to such risk by restricting its resource commitments.
- Location unfamiliarity – If there is a perception that the host country is too distant in terms of culture, economic systems and business practices, the MNC may avoid direct investment in favour of licensing or joint venture agreement.

- Demand uncertainty – If demand for an MNC product is uncertain, that MNC will be unwilling to invest substantial resources in such a country. This will enable it to exit that market without incurring substantial sunk costs should demand fail to reach a significant level. That means "when demand uncertainty is high, MNC will favor modes that involve low resource commitments" (Kim & Hwang, 1991:36).
- Intensity of competition – When the intensity of competition is high in a host country, Harrigan (1985a, 1985b) asserts that firms avoid internal organisation as such markets tend to be less profitable and therefore do not justify heavy resource commitments.

The transaction-specific variables comprise value of firm-specific know-how and tacit nature of know-how.

- The value of firm-specific know-how theory suggests that when the quasi-rents that can be earned from an MNC's firm-specific know-how are non-trivial, the propensity of licensees (or venture partners) to disseminate that know-how or expropriate it for their own self-interested purposes is likely to be high (quasi-rents are defined as the realisable returns entitled to a firm by way of its differential advantage in know-how). The greater the quasi-rent stream generated by an MNC's proprietary know-how, the greater the probability that the MNC will favour an entry mode with high control.
- Tacit nature of know-how – When the firm's specific know-how transferred by an MNC is said to be tacit, it means it is difficult to articulate. This makes it difficult to turn a technological blueprint into a successful product. So the greater the tacit component of the firm-specific know-how, the more an MNC will favour a high control entry mode.

3.3.3.3 Global Alliances versus Joint Ventures

Strategic alliances are formed when firms cooperate with their competitors for various reasons, which could range from facilitating entry into foreign markets, spreading the risks, bringing together complementary skills and assets and establishing technological standards for the industry that will benefit the firm (Hill, 2003). The main disadvantage of alliances is that they seem to give competitors a low-cost route to new technology and markets, in other words, a "firm could give away more than it receives" (Hill, 2003:495).

A joint venture is a jointly owned company usually by two or more otherwise independent companies. The most common joint venture is a 50/50 venture, in which there are two parties, each of which holds a 50% ownership stake and manages that company jointly (Hill, 2003).

The concept of relative strength of the international joint venture (IJV) parties contains two elements, namely ownership influence and management strength (Matthews, 1999).

- Ownership influence is the relative amount of influence that an IJV partner can exert by virtue of its legitimate ownership of the IJV company.
- Management strength is a measure of the relative strengths of the management teams that each parent organisation allocates to the task of managing its IJV company.

Matthews (1999) identifies the following four basic models:

- The independent model
- The dominant parent model
- The shared management system

- Transplant

The first three are illustrated in figure 4 below:

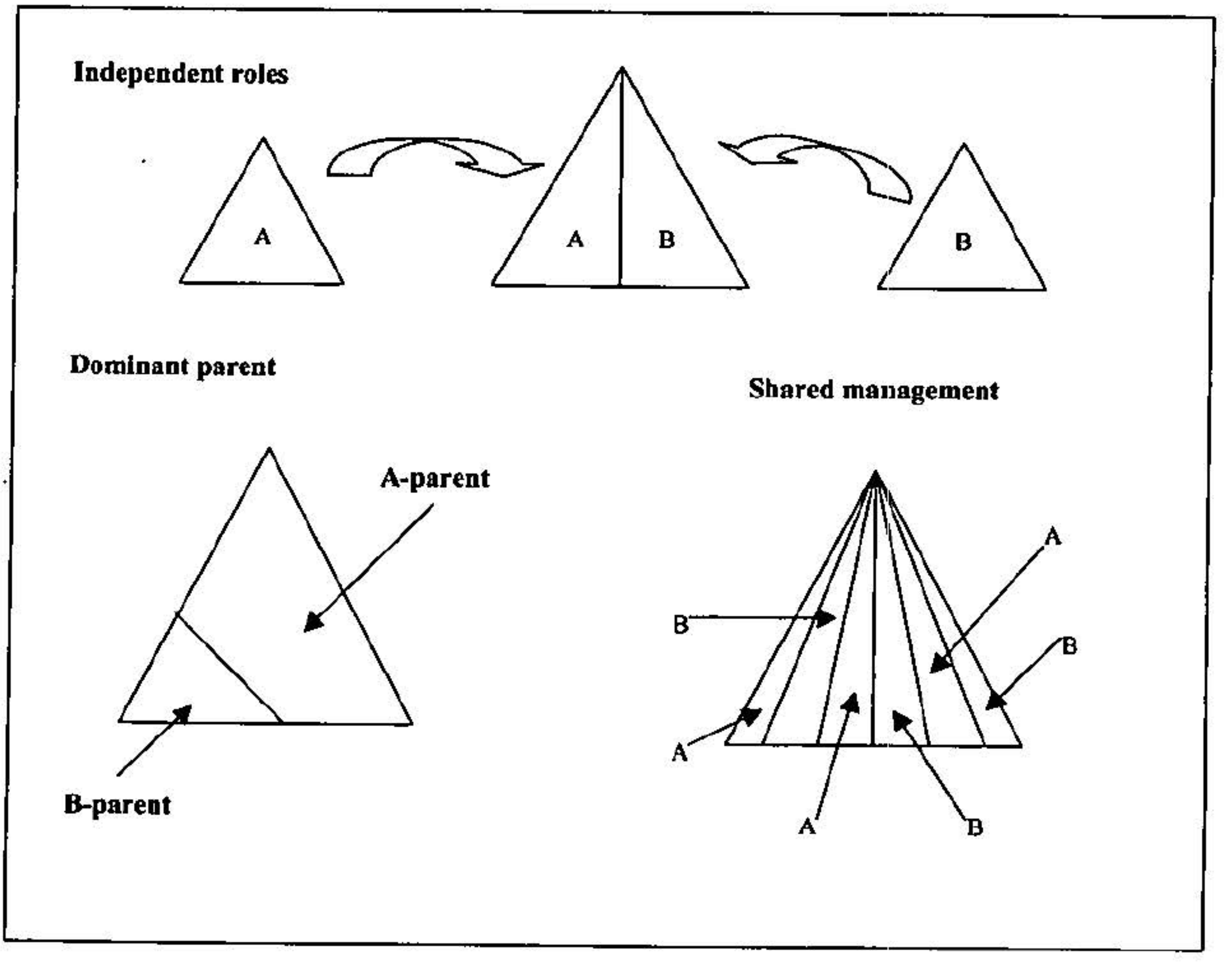


Figure 4: Three basic IJVs

Source: Matthews (1999)

In the independent roles model, the parent companies have 50:50 financial ownership. In the dominant parent model, the dominant parent (larger company) has an unequal (majority:minority) financial ownership and a domineering management style. In the shared management model, the task of managing the task is truly a shared one.

irrespective of the relative size, strengths or equity holding of the partner's parent organisation. In transplants, a proven 'host' business formula is transplanted into a remote business environment, normally in another country (Matthews, 1999).

The life cycle of an IJV is clearly defined by Matthews (1999) to consist of an initiation stage, the early partner agreement stage, the learning stage, changes in dependency stage, buy-out discussion stage and termination stage as depicted in figure 5 below:

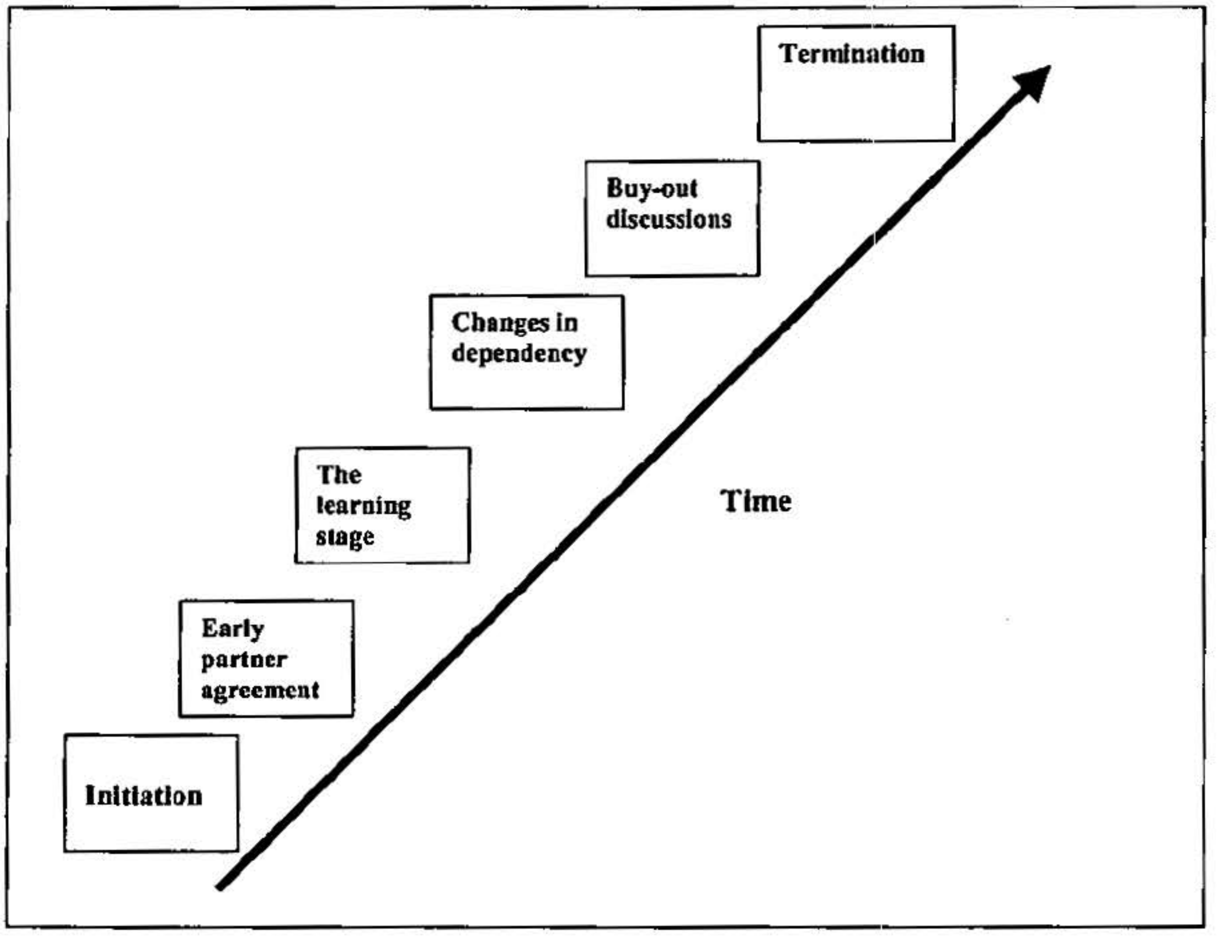


Figure 5: The IJV life cycle

Source: Matthews (1999)

Matthews (1999) defines the IJV stages as follows:

1. **Initiation** – In this stage there are early discussions between the parties in response to the business and market conditions that are pressurising the IJV to form.

2. **The early partner agreements** – The agreements are reached by contracting parties of the IJV. There is no guarantee at this stage that these agreements will last into the operational stages of the IJV.

3. **The learning stage** – In this stage the organisation is still learning, gaining knowledge about its partners. The learning takes place between IJV partners in both directions simultaneously.

4. **Changes in dependency** – The dependency of one partner on the other's technical skills or market knowledge soon changes. It could also be financial dependency: once the investment has been made, maybe through heavy capital expenditure, then the dependence starts to decrease.

5. **Buy-out discussions** – Buy-out discussions are about changes in the financial ownership of the IJV business. Usually one partner is wanting to buy out the other. Although these discussions may seem to be an indication of failure of a venture, this is not at all the case. The nature of an IJV as a transitional organisation means that it is not expected to be permanent in a single form. It is a stage of development in which partners discuss these things to avoid negative results.

6. **Termination** – IJVs come to an end at some stage. There are various ways to end them, some by formal written agreements and some are allowed to wither away. When done formally, all the details of dissolution of the management team and division of the joint assets are clearly spelled out.

3.3.4 Regional Development/integration

Hill (2003) speaks about regional integration as both economic and political. Regional integration promotes development. Unrestricted free trade allows countries to exchange products and services that they produced efficiently in their countries as well as on foreign soil. FDI can transfer technology, markets and skills to host countries (Hill, 2003). Africa, according to Cook (2003), exports only 1% of its manufactured products whereas Europe and North America are responsible for 61% of manufactured exports. The World Bank research quoted by Cook found that there was a positive relationship between exports of manufactures and rate of economic growth.

Political integration, like economic integration, could also promote development. Hill (2003) mentions linking neighbouring economics and making them dependent on each other. In this way "incentives are created for political cooperation between the neighboring states" (Hill, 2003:262).

The are nine trade blocs on the African continent, namely EAC, ECOWAS, COMESA, CEEAC, SADC, AMU, Central African Economic and Monetary Community, Southern African Customers Union and West African Economic and Monetary Union. Progress has been slow in establishing meaningful trade blocs due to political turmoil in several African nations which has been an impediment to such progress (Hill, 2003). According to Hill (2003), the most recent attempt to re-energise the free trade movement in Africa occurred in early 2001, when Kenya, Uganda and Tanzania as member states of the East African Community (EAC) committed themselves to relaunching their bloc, 24 years after it had collapsed. Their intention was to establish a customs union, regional court, legislative assembly and political federation. Their programme included cooperation on immigration, road, telecommunication network, investment and capital markets.

3.4 Cross-border Risk Management

According to Meldrum (2000), all business transactions involve some degree of risk, but there are additional risks when business transactions are across international borders. These risks arise from various things such as economic structures, policies, socio-political institutions, geography and currencies. "Country risk analysis (CRA) is a measure of identifying the potential for these risks. It is based on the premise that the imbalance in economic, social, or political factors between countries increases the risk of a shortfall in the expected return on an investment" (Meldrum, 2000:33). Some analysts have categorised country risks into the following six main categories (Meldrum, 2000):

- Economic risk – significant change in the economic structure or growth rate that produces major fluctuations in the expected return on an investment.
- Transfer risk – restrictions by foreign governments to capital movements, thereby making it difficult to repatriate profits, dividends or capital.
- Exchange rate risk – unexpected adverse movement in the exchange rate, unexpected change in currencies.
- Location or neighbourhood risk - includes spillover effects caused by problems in a region (e.g. problems in Zimbabwe spilling over to South Africa), in a country's trading partner, or countries with similar perceived characteristics.
- Sovereign risk – government's willingness or ability to meet its loan obligations.

- Political risk – risk of change in a political institution from a change in government control, social fabric, or other non-economic factors. It includes the potential for internal or external conflicts (e.g. wars) and expropriation risk.

"Risk management is the process of responding to an event that offers negative or positive consequences. In risk management, the goals are to maximize the gain from positive risks, often referred to as opportunities, and minimize the loss from negative risks" (Kliem, 2004:12). According to Kliem (2004), risks could be sorted into basic categories which are financial, technical, managerial, behaviour and legal. An example of each risk is given in table 5 below.

Table 5: Offshore development risks by category

Type of Risk	Categories of Risk	Risk Examples
Financial	Currency exchange fluctuations	Currency fluctuations
	Management reserve	Insufficient management reserve available
Technical risks	Communications infrastructure	Antiquated network backbone
	Complexity	Development of "spaghetti" code
	Configuration control	No versioning of objects or modules
	Databases	Expensive conversion of data
	Methodologies	Non-compliance with embraced methodologies
	Standards	Conflicting development standards
	Requirements	Poorly articulated requirements
	Tools	Incompatible development tools
Managerial risks	Change management	No prioritisation of change requests
	Communications	No information-sharing
	Decision-making	Poor communication of decisions
	Delegation	Unwillingness to yield control
	Project management	Little or no project management practices in place
	Reporting	Inadequate feedback on schedule or cost performance
	Roles and responsibilities	Unclear responsibilities
	Special skills availability	Unavailable expertise
	Visioning	Scope creep
Behavioural risks	*Esprit de corps*	Unmanaged conflict
	Morale	High turnover
	Teaming	No interaction among members

Table 5 continues

	Language	Language difficulties
	Cultural	Culture shock
Legal risks	Import-export restrictions	Trade barriers
	Privacy	Release of personal data to unauthorised people
	Socio-political turmoil	Border tensions between countries

Source: Kliem (2004)

3.5.1 Culture risk

Culture is defined as a "system of values and norms that are shared among a group of people and that when taken together constitute a design for living" (Hill, 2003:9). Values are abstract ideas about what a group believes to be good, right and desirable, or shred assumptions about how things ought to be, e.g. attitude towards honesty and loyalty Norms are social rules and guidelines that prescribe appropriate behaviour in particular situations, e.g. attitude to time, dress code (Coetzee, 2004).

Therefore, culture equals the sum of values, norms, social structure, religion, language and education. This excludes others such as history, productivity, corruption, gangsterism, geography, climate, demography and lock-in (Coetzee, 2004).

In terms of risk, according to Coetzee (2004), about 50% of global business deals fail due to cultural ignorance. Figure 6 below shows a curve of international business (IB) maturity of a project team for a host and home country.

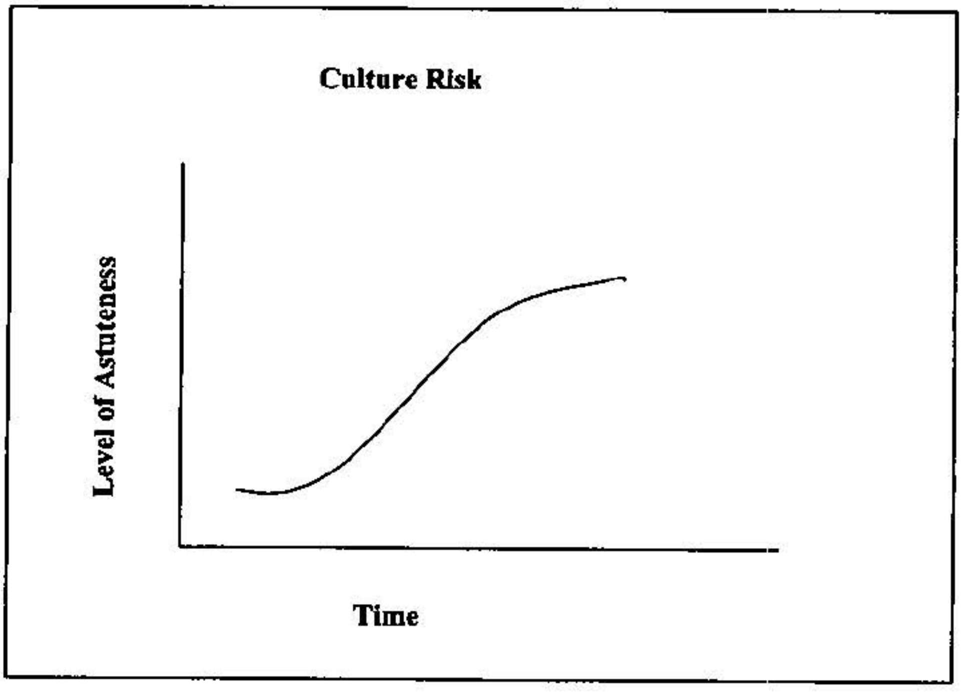


Figure 6: IB maturity curve
Source: Coetzee (2004)

Coetzee (2004) suggests the following as helpful in bridging cultural barriers:

- Acknowledging and respect cultural differences.
- Explaining your expectations and asking what the other party's expectations are.
- Guarding against stereotypes - not all people in the same culture have the same characteristics.
- Offering reassurance when talking to others, speaking their cultural language.
- Empowering the other person, and learning as much as you can about the other.
- Not having to give up your own values and culture.

3.4.2 Expatriate Management Risk

Some businesses fail because expatriate managers failed to adapt to a foreign country. Failure rates are said to be about 15% for the USA, about 10% for European countries and about 1,8% for South Africa.

Coetzee (2004) mentions some of the reasons why these businesses fail:

- Inability of spouse to adjust
- Inability of manager to adjust
- Family problems
- Emotional immaturity to deal with above
- Inability to cope with larger responsibility
- Cultural shock

It is important to understand the culture shock cycle for expatriate managers as depicted in figure 7 below.

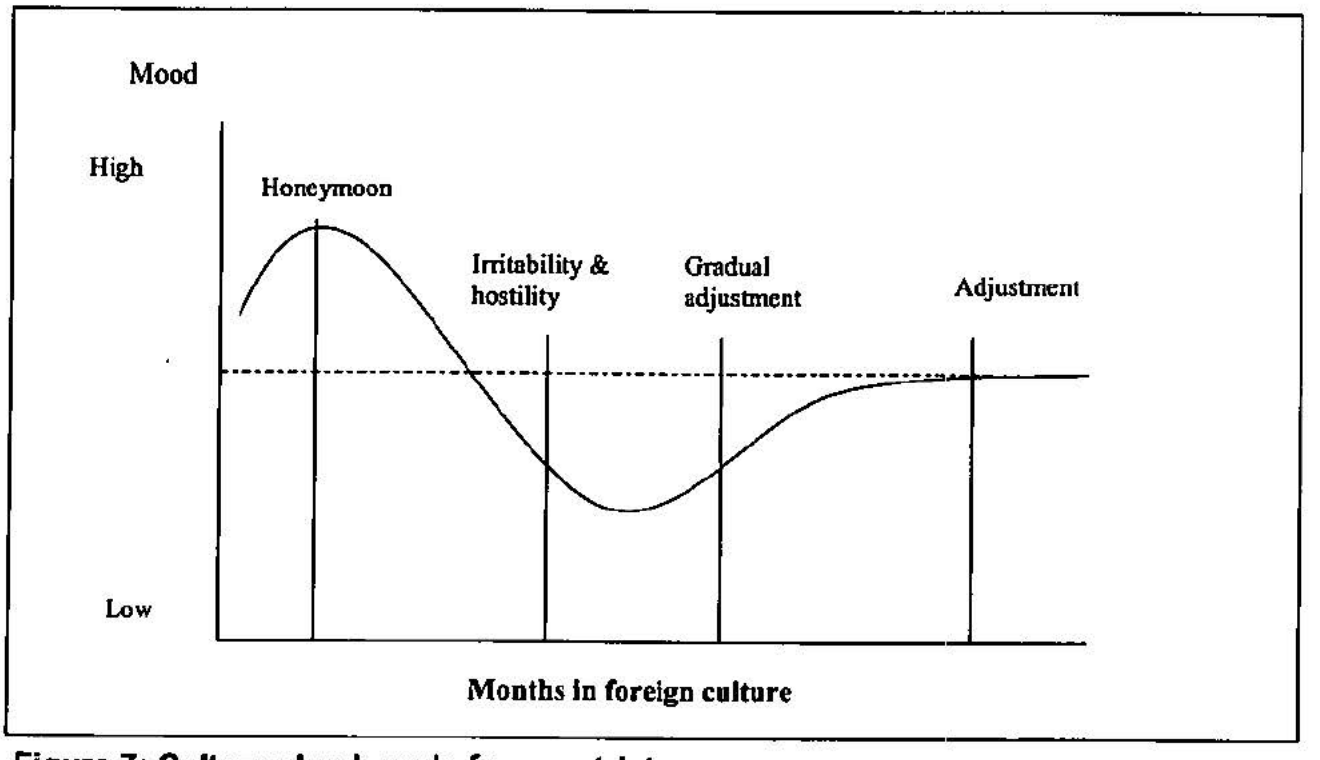


Figure 7: Culture shock cycle for expatriate managers
Source: Coetzee (2004)

3.4.3 Productivity Risk

Productivity is interpreted differently from country to country. Factors such as the following (Coetzee, 2004) play a part:

- Time required for daily maintenance
- Delivery of spare parts
- Weather conditions, religious requirements
- Management time, decision-making time

3.4.4 Corruption Risk

Businesses are conducted differently from country to country and between different cultures. According to Coetzee (2004), IB requires that business be done differently by clarifying the value system up front and noting how corruption is defined in that particular host country. Businesses should take care not to set themselves up for corruption. Cost of business contributions should be noted. Local advice should be sought for such cases. Coetzee (2004) says "rather walk away from a project or country", because reputation, corporate standing and even share price are at risk.

3.5 NEPAD

The shocking statistics reveal that in Africa, 340 million people, or half the population, live on less than US$1 per day. The mortality rate of children under 5 years of age is 140 per 1 000 and the life expectancy at birth is only 54 years. Only 58% of the population have access to safe water. The rate of illiteracy for people over 15 is 41%. There are 18 mainline telephones per 1 000 people in Africa, compared with 146 for the world as a whole and 567 for high-income countries (United Nations Economic Commission for Africa, 2001).

The New Partnership for Africa's Development (NEPAD) is a pledge by African leaders, based on a common vision and a firm and shared conviction, that they have a pressing duty to eradicate poverty and to place their countries, both individually and collectively, on a path of sustainable growth and development, and at the same time to participate actively in the world economy and body politics. The programme is anchored on the determination of Africans to extricate themselves and the continent from the malaise of underdevelopment and exclusion in a globalising world (United Nations Economic Commission for Africa, 2001).

To achieve the above objections, NEPAD needs, among other things, businesses that are willing to invest in Africa. Companies such as Eskom which are themselves African corporate citizens should drive such developments. Eskom Holdings (Pty) Ltd's Chairman Reul J Khoza said: "Eskom is in tune with the new societal and continental imperatives, new economic realities and challenges, which are being conceptualised and given coherence and political muscle through the visions of our continental leaders, manifest in NEPAD, the African Union and the African Renaissance in general" (Eskom Annual Report, 2002). Eskom is committed through NEPAD to contribute towards the development of Africa, and it has already invested in operations and maintenance projects in several African countries, for example in Mali through the Eskom Energie Manantali project, and in Mozambique by supplying Mozal, an aluminium smelter, with electricity through the Motraco project. Eskom CEO Thulani Gcabashe told delegates at the opening of the International Union of Electricity Applications Conference, in Durban, South Africa: "We have made it our business to deliver on the NEPAD objectives as they relate to the energy sector" (*Engineering News*, 2004).

NEPAD is still in its infancy, with not much that could be used as a measure of its success or failure. Not all African countries have 'bought in' to this new concept, with some countries criticising it as being driven by neo-colonisers from the West.

3.6 Electricity Restructuring

There is currently a review of the electricity markets due to liberalisation of the economies and globalisation. The electricity markets are being restructured and there is a move towards privately owned utilities to run the markets in a competitive environment.

"Privatization in the Electricity Supply Industry (ESI) is a process which begins with the vertical separation (financial and then often real) of the generation, transmission and distribution functions; proceeds with opening up of the transmission grid to independent generators; and goes on to the corporation and eventual whole or partial privatization of state-owned electricity companies" (Pollitt, 1995:2).

Arthur Maurice, Vice-President of the New Jersey Business and Industry Association (commissioned by the New Jersey Policy Research Organisation), identifies the following five key dimensions of the electricity industry structure (Payne, c1997:114):

1. How much competition? Must there be access to alternative suppliers for all customers, or is a wholesale market pool sufficient to ensure the benefits of competition?
2. Trading arrangements: What rules should govern the wholesale power market and bilateral trades, how should the transmission system be controlled and priced?
3. Ownership: Are there certain functions that need to be operated separately because of market power concerns or conflicts of interest?
4. Regulation: How should provision be made for continued regulation of services which are not competitive (e.g. distribution and transmission)? How should environment issues be handled? What remains of the obligation to serve?

5. Transition: How should the transition be managed especially with regard to the measurement and recovery of stranded costs? Are there other above-market costs, such as social programmes, which need to be funded in other ways?

Restructuring the industry along each of these dimensions requires the revision of existing rules and the development of new ones.

Figure 8 below provides a graphic overview of the future industry structure. The key to the new scenario is that electricity can be purchased separately from "transportation", and customers and sellers can arrange for transport on fair and comparable terms over transmission wires owned by others.

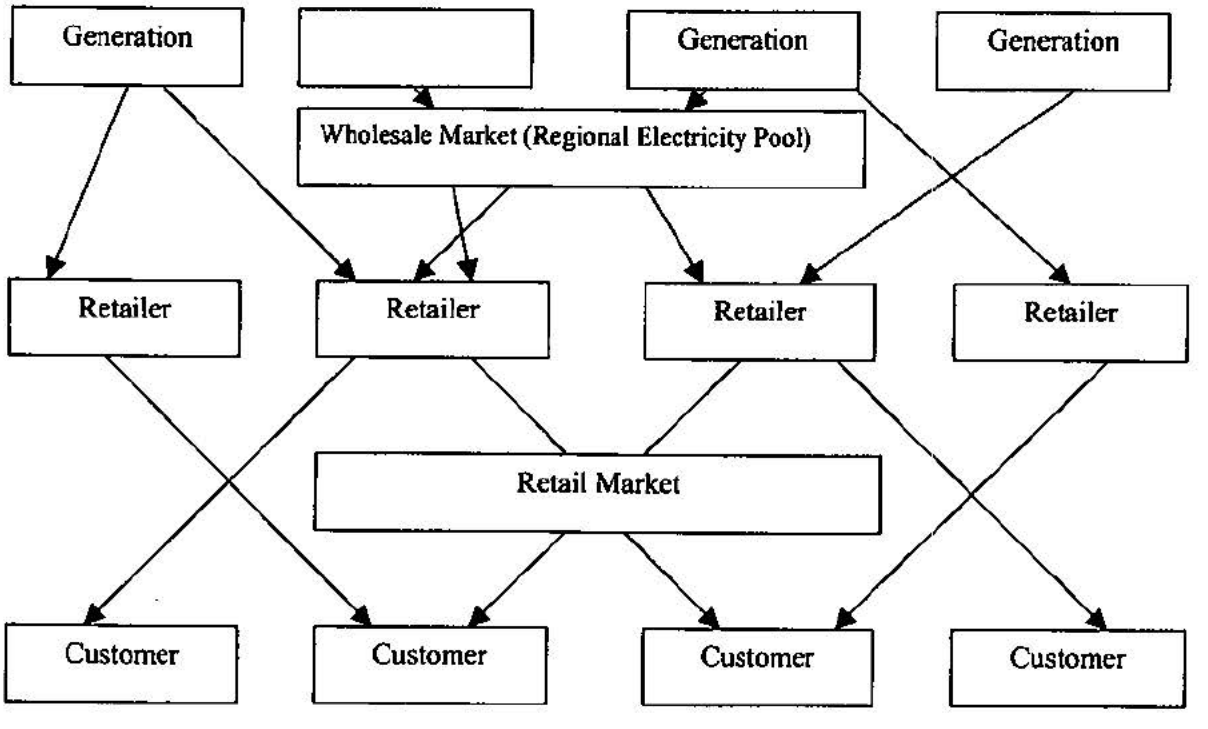


Figure 8: Future electricity industry

Source: Payne (c1997)

In the UK this process of transferring an almost wholly state-owned ESI into a collection of privately owned generation, transmission and distribution utilities is almost complete. Europe is following closely on the heels of the UK. Portugal has completed a radical unbundling of its formerly vertically integrated industry. Finland is close to the initial partial privatisation of the state-owned electricity company, IVO. In Ireland the state-owned vertically integrated utility ESB is also changing. In Italy the state-owned electric utility, ENEL, was turned into a joint stock company in 1992. In France, EdF was under pressure from the European Commission to open up its domestic electricity market to foreign competition.

In Eastern Europe, restructuring of national ESIs is underway. In Hungary the national electricity board, MVN, has separated generation, transmission and distribution operations. It was expected that 49% of MVN would be privatised once the restructuring was complete. Poland has transferred some of generating stations to the control of the Ministry of Privatisation with a view to possible asset sales. The huge Russian electricity industry was being considered for privatisation and the Russian government had engaged western advisors.

Outside Europe similar trends in restructuring and ownership transfer in ESI are observable. In Canada publicly owned provincial utilities are being exposed to increased competition from independent generators and one provincial utility, NOVA Scotia Power Corporation, was privatised in 1992. In the USA there is a large privately owned electricity sector but further competition is being encouraged in the wholesale generation sector through improved access to transmission systems. The Federal Energy Regulatory

Commission (FERC) is driving this process in the USA. In Australia, the vertical separation of generation, transmission and distribution has advanced and the interstate electricity grid is nearing completion. In New Zealand a process of corporatisation and deregulation has occurred and eventual privatisation of the state-owned generation and transmission utility Electricorp is on the way (Pollitt, 1995).

In South Africa the electricity industry is also undergoing restructuring. In terms of the White Paper on the Energy Policy of the Republic of South Africa of 1998, the distribution industry "will be restructured into regional electricity distributors. Government will establish a transitional processes [sic] that will lead up to the establishment of independant [sic] regional electricity distributors... Government supports gradual steps towards a competitive electricity market while investigations into the desired form of competition are completed. Eskom will be restructured into separate generation and transmission companies. Government supports the development of the Southern African Power Pool" (RSA, 1998).

3.7 Power Pools

The power pooling system forms the basis of this research for studying RTOs. It is therefore important to give some background of how the Southern African Power Pool (SAPP) was established.

According to the United Nations Economic Commission for Africa (2002), SAPP was established in August 1995 to provide a platform and coordinate the trading of electricity among SADC countries. There are currently 12 participants representing their countries, namely Angola's Empresa Nacional de Electricidade (ENE), Botswana's Power Corporation (BPC), the Democratic Republic of Congo's Société Nationale d'Electricité (SNEL), Lesotho's Lesotho Electricity Supply Commission (LEC), Malawi's Electricity Supply Commission (ESCOM), Mozambique's Electricidade de Mocambique (EDM), Namibia's Namibia Power (NamPower), South Africa's Electricity Supply Commission (Eskom), Swaziland's Swaziland Electricity Board (SEB), Tanzania's Tanzania Electricity Supply Commission (Tanesco), Zambia's Zambia Electricity Supply Commission (ZESCO) and Zimbabwe's Zimbabwe Electricity Supply Authority (ZESA).

SAPP is governed by four agreements:

1. Inter-Governmental Memorandum of Understanding (enabled the establishment of SAPP)
2. Inter-Utility Memorandum of Understanding (established basic management and operating principles)
3. Agreement Between Operating Members (established specific rules of operation and pricing)
4. Operating Guidelines (provides standards and operating guidelines)

The objectives of SAPP are to:

- Provide a forum for the development of a world-class, robust, safe, efficient, reliable and stable interconnected electrical system in the region.

- Harmonise interutility relationships.
- Coordinate the development of common regional standard on quality of supply; measurement and monitoring; enforcement of standards.
- Facilitate the development of expertise through training programmes and research.

The role of SAPP in achieving these objectives include the following:

- Coordinate the planning and operation of the electric power system among member utilities.
- Reduce both capital and operating costs through coordination.
- Increase system reliability through emergency support when required.
- Provide a forum for regional solutions to electrical energy problems.

This coordination function has been tasked to the SAPP Coordination Centre, which was set up to implement SAPP objectives, provide a focal point for SAPP activities and facilitate the Short-term Energy Market (STEM). The STEM operates as follows (United Nations Economic Commission for Africa, 2002):

- Participants trade energy on a day ahead hourly basis.
- Bids and offers are set at 1 MW increments.
- Participants need to be in a SAPP control area (ZESCO control area, ZESA control area or Eskom control area).
- A participant can also use STEM to cover a temporary shortage that it may be experiencing.

Because SAPP is still fairly new, having been established in 1995, it makes it difficult to draw substantial lessons from it to form a formidable RTO model.

3.8 Regional Transmission Organisations (RTOs)

3.8.1 The USA's RTOs

An RTO is an independent entity that operates and controls a set of transmission facilities. This can be accomplished through direct ownership or through a group of transmission owners putting their transmission facilities under the control of the RTO (FERC, 1999). This research study considers Eskom as an independent entity that could team up with other entities or act on its own to build, operate and control a set of transmission facilities.

According to FERC (1999), the proper functioning of RTOs could provide the following types of economic benefits:

- Improvements in transmission system operations with resulting enhancements to interregional trade, congestion management, reliability and coordination.
- Improved performance of energy markets, including greater incentives for efficient generator performance and enhanced potential for demand response.

Based on the above benefits, FERC then decided that a "properly structured RTO will be an entity that is independent from all generation and power marketing interests, and has the exclusive responsibility for grid operations, short-term reliability and transmission service within a region". Furthermore, the minimum characteristics of RTO would be:

- Independence from power market interests.

- Scope and regional configuration.
- Exclusive operational authority.
- Maintenance of short-term reliability.

The minimum functions would be:

- Tariff administration and design.
- Congestion management.
- Parallel path flow.
- Ancillary services.
- Run a single Open Access Same-time Information System (OASIS) node providing TTC and ATC information.
- Market monitoring.
- Planning and expansion.

Three concepts have emerged under an umbrella of RTOs, namely independent system operator (ISO), independent scheduling administrator (ISA) and the independent transmission company (ITC) or TransCo.

An ISO is a regulated, not-for-profit entity chartered to maintain system reliability and provide coordination and reliability assurance services to the users of the transmission system. An ISA is a supervisory organisation responsible for coordinating transmission systems that remain under the direct control of their existing owners. An ITC is a FERC-regulated, for-profit company that operates, administers and owns or leases all the transmission facilities within a defined region (Tabors, 2000).

3.8.2 England's RTOs

England's ESI is structured in such a way that there is a separation of competitive and monopolistic functions. Generation and retail supply is organised competitively, and transmission and distribution remain regulated monopolies. The central and most innovative element of the system is the Pool. It is an organised short-term wholesale market for electricity. All generators and retail suppliers are members of the Pool and have to trade all their electricity requirements through it. The generators compete daily via price bids in shares of total electricity demand aggregated by the Pool. There are 12 regional electricity companies that distribute electricity in their franchised region. They have to plan, build, operate and maintain a distribution grid designed to meet the requirements of regional electricity demand. The transmission part of the Central Electricity Generating Board was commercialised as a separate public limited company named National Grid Company (NGC). NGC is owned by the regional electricity companies and was therefore indirectly privatised. NGC's function is to plan, build, operate and maintain a transmission grid designed to meet the requirements of regional electricity demand. It is obliged to connect any generator or consumer to their grid and allow utilisation to any interested party based on generalised conditions (tariffs) (Creipi Report, 1995).

The literature review had demonstrated that RTOs do exist in other countries and there is adequate data to justify their existence. The following chapters will look at case studies of RTOs in USA and Africa.

CHAPTER 4

RESEARCH DESIGN

4.1 Research Methodology

This is an exploratory research study and is descriptive. A case study approach was chosen for this study due to the limited knowledge and complexity of this phenomenon called RTO. Typically, research deals with at least four problems:

- What questions to study
- What data is relevant
- What data to collect
- How to analyse that data

According to Gummesson (c2000:75), "Yin distinguishes between three types of uses of case study research; exploratory, descriptive, and explanatory". Gummesson further suggests that researchers in business-related subjects traditionally limit case studies to the exploratory use. The author of this study has also adopted the same approach. This research is taken as a pilot study for further research on RTOs in Africa.

A better understanding was sought through the USA case study where RTOs have already been introduced. Some experts and business leaders were interviewed and emails sent requesting their opinions on the matter.

A qualitative technique has been chosen as a tool to gather and analyse the data. The qualitative method refers "to the meaning, definition or analogy or model or metaphor characterizing something" (Cooper & Schindler, c2001:139).

4.2 Pilot Study

Unstructured and informal interviews were held with various people within Eskom. Secondary data from academic and industry literature was used to formalise the research problem. The questionnaire and responses are found in Appendices 2 to 8. The research design for this study evolves as indicated in table 6 below.

Table 6: Research design

Phase	Method	Purpose
Literature review	Reviewed reports, articles and other research work	Get in-depth knowledge about how power systems work. What could be learnt from others that have similar systems?
Phase 1	Reviewed South African government and Eskom energy strategic intent	Collect secondary data
Phase 2	Compiled questionnaires and personal interview guidelines	Collect data
Phase 3	Organised data into meaningful information	Develop a framework for analysis
Phase 4	Analysed data collected from survey of existing RTOs	Establish factors affecting successful formation of RTOs
Phase 5	Reviewed stages 1-4 towards streamlining earlier findings	Make conclusion and recommendations

Assumptions were formed in this research as mentioned in section 4.5. The research assumptions are based on the observations of current events in Africa and her history.

Secondary data which includes that from other countries such as the USA, some of the European countries, and the Westcor and Motraco projects in Africa is also investigated.

4.3 Sampling

Non-probability sampling (purposive sampling) was used for this research where expert knowledge was sought. This research was concentrated within SADC in Africa. Most interviewees were experts and leaders from the African continent, NEPAD, SAPP and Eskom.

4.4 Data Collection

The method of data collection was a literature review of academic books from the Eskom and UNISA libraries, journals, magazines, newspapers and the Internet using search engines such as Google, EDBSCO and Yahoo. Other literature was sourced from Eskom work documents.

In-depth interviews were held with some Eskom senior managers, engineers involved in African projects and advisors working on the NEPAD project. Other information was obtained from respondents outside South Africa working on African affairs such as SAPP, Western African Power Pool (WAPP) and NEPAD.

4.5 Assumptions

The assumption made in this research was that African countries have a problem obtaining funds for big capital projects due to the following:

- High country risks of various African countries
- High political instability and unpredictability
- Poor governance track records

The following chapter discusses a case study of USA RTO as part of secondary data. This was aimed at raising awareness and understanding of RTOs.

CHAPTER 5

USA'S RTOS

5.1 Introduction

FERC of the USA was given its regulations under the Federal Power Act to advance the formation of RTOs. The Act requires each utility that owns, operates or controls facilities for the transmission of electric energy in interstate commerce to make certain filings with regard to forming and participating in an RTO (FERC, 1999). FERC's objective was to promote non-discriminatory transmission access to facilitate the development of an efficient, competitive wholesale electricity market. Ultimately this would lead to lower priced electricity, better service, improved innovation and improved environmental quality.

In order to achieve that goal, FERC had to issue several orders such as Order 888, Order 2000 and Notice of Proposed Rulemaking on Standard Market Design (SMD) (Morey & Hirst, 2002).

RTOs in the USA are shown in Figure 9 below:

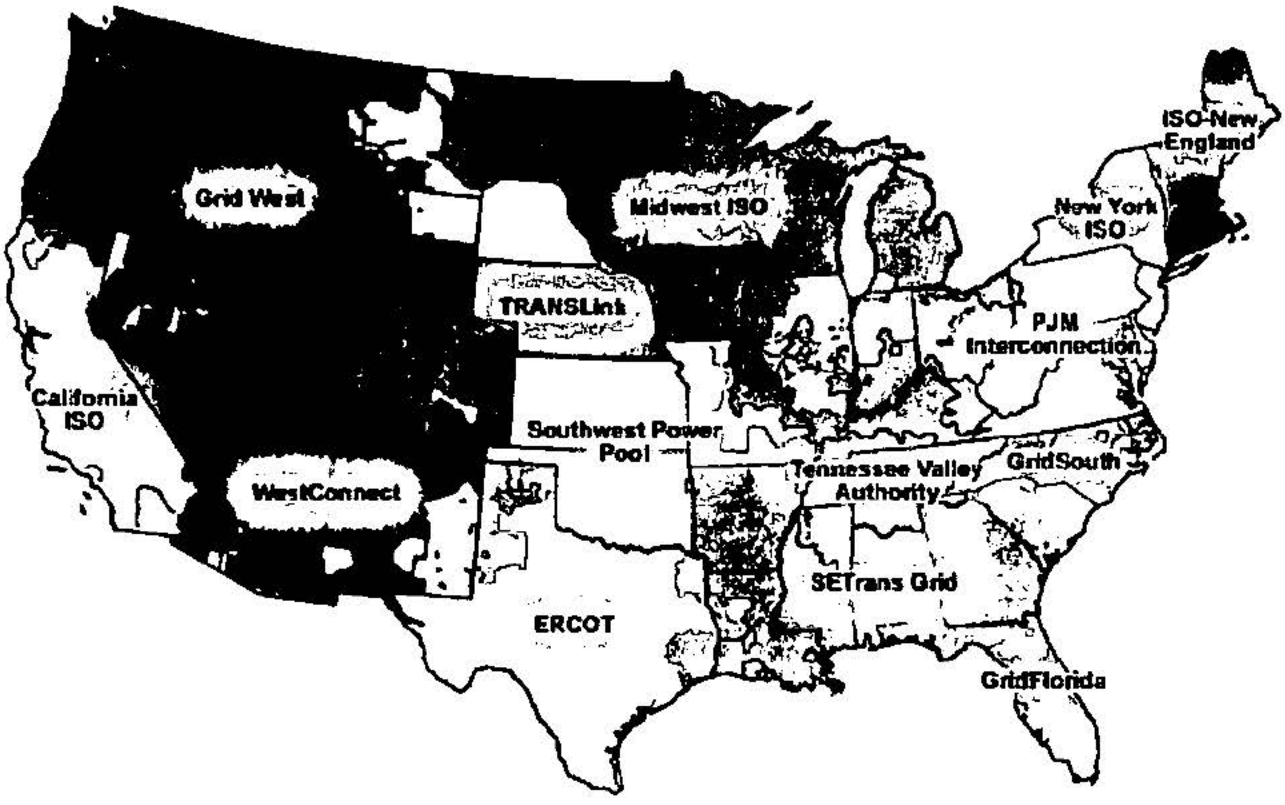


Figure 9: USA's RTOs
Source: FEMP

5.2 Background

In the early 20th century, there was anti-trust regulation and political manoeuvring in the USA which led to a monopolistic electric utility structure. States granted companies a monopoly within discrete geographic areas or service territories. Companies were earning a preset rate of return on investment. Investor-owned utilities' earnings would flow from an allowed return on investment and regulators would set the return to be sufficient to attract and maintain a flow of capital to the firm under normal circumstances. This created a stable flow of capital from financial markets to fund the construction of the electric system in the USA.

In the 1970s, the regulated system of monopolies allowed rates to climb, particularly in the northern-eastern USA, parts of the Midwest and the far West. Ultimately the high rates prompted some customers to build their own power supplies. Inefficiencies in the regulatory system itself coupled with high investment costs due to some companies investing heavily in large power plants led to costs spiralling out of control (Brown & Sedano, 2003).

The near-disaster in 1979 at the Three Mile Island nuclear station in Pennsylvania also pushed the costs up. Also in the 1970s, the USA faced two oil embargoes and fuel prices shot upwards. In response, the federal government enacted the Public Utility Regulatory Policies Act of 1978. The law required utilities to grant transmission access to and buy power under certain conditions from the independently owned generators known as independent power producers (IPPs).

According to Brown and Sedano (2003), from the 1980s into the early 1990s, the IPPs were building an increasing proportion of all power plants. This then necessitated the introduction of competition through wholesale electricity markets. FERC was then charged with the task of setting up RTOs.

5.3 Policy Objectives

For FERC to promote non-discriminatory transmission access service to facilitate the development of an efficient, competitive, wholesale electricity market, they had to eliminate the market power of vertically integrated utilities that owned and controlled transmission assets and also owned generation assets that would compete with non-utility owned supply. They also had to maximise the value of transmission use by allocating existing transmission capacity to those who value it most highly (Morey & Hirst, 2002).

Order 888 required open access to transmission by all participants and provided for standardisation of tariff designs and recovery of stranded costs for transmission owners (FEMP, 2003). It imposed standards of conduct that were designed to prohibit self-dealing by utilities with both marketing and transmission operations. It also provided for the formation of ISOs and for-profit, speculative TransCos that would own and operate multiple transmission systems to form a large, regional power market.

Order 2000 required FERC jurisdictional transmission-owning entities to form RTOs. It also identified the primary characteristics and functions of an RTO as listed in the next section.

5.4 Functions of RTO

According to FERC Order 2000, as outlined by the Basin Electric Power Cooperative (2004), RTOs have to embrace four core characteristics and eight key functions. The core characteristics are:

- Independence
- Scope/regional configuration
- Operational authority
- Short-term reliability

The eight key functions are the following:

- Tariff administration and design – RTOs have to administer their own tariffs and are the sole decision-making authority on the provision of transmission service.
- Congestion management – ensures that mechanisms are in place to manage congestion.
- Parallel path flows – RTOs have to implement procedures that address problems associated with parallel path flow.
- Ancillary services – RTOs are providers of last resort for ancillary services.
- OASIS and Capability Calculations – RTOs act as a single OASIS node. They calculate transmission capability and available transmission capacity.
- Market monitoring – RTOs submitted a plan to FERC that ensured that there was objective information about the markets. Procedures of whether efficiency improvements, market flaws and market power existed and even performance evaluation of participants were included.
- Planning and expansion – RTOs had to develop plans and expansion proposals that encouraged prevention and relieving of congestion.
- Interregional coordination – RTOs had to develop mechanisms to ensure the integration of reliability.

In summary, RTOs are supposed to promote a more robust market while maximising the efficiency of the electric transmission system and ensuring that the system is reliable and economic for both wholesale and retail consumers. The RTOs have to "level the playing field", ensuring that no one is disadvantaged and that the consumer derives the maximum benefit. RTOs facilitate the transition from the "functionally unbundled" electric system to "structural" reorganisation of the industry (Winter, 2004).

5.5 Cost/benefits of RTOs in USA

ICF Consulting undertook a study of four independent system operators, namely NEPOOL, NYISO, PJM and CAISO, to evaluate the cost/benefit of RTOs. Table 7 below gives a summary of the cost per MW installed, with cost per GWh delivered energy, cost per customer served and cost per network node (ICF Consulting, 2002).

Table 7: Characteristics of existing ISOs in USA

	CAISO	PJM	NEPOOL	NYISO	Total National
Installed Capacity (MW)	44200	57100	24600	36100	630710
Annual Energy (TWh)	220	249	121	149	3434

Population Served (Millions)	27	22	13	22	257
Network Nodes	3000	1900	1100	1168	46000

Source: ICF Consulting (2002)

The cost/benefit study revealed that even if the start-up costs are at the high end of the range, they are essentially one-time costs that are netted out against the ongoing economic benefits of the RTOs. Even a $5 billion initial cost would be rewarded after several years with economic gains that appear to justify the initial expense (ICF Consulting, 2002).

Some of the benefits are:

- Lower electricity rates for consumers, although to some this is still questionable. For example, Henderson (2003:10) asks "how are consumers best served ultimately?", because at times unprecedented high spot market prices are experienced.
- More use of the transmission lines by more players for various reasons.
- Protection of undue discrimination in the use of transmission lines.
- Short-run benefits, which are efficient dispatch/congestion management, non-discriminatory access.
- Long-run benefits, such as transmission investment planning, demand response, reliability, market power mitigation (Henderson, 2003).

5.6 Problems/unanswered Questions about RTOs in USA

According to Hogan (2000), there is a continuing debate about the best model for coordinating and controlling the transmission system, including dispatch and coordination of energy balancing or spot markets. Pricing has the potential to create huge problems, for example market participants want flexibility and choice, but object to consistent pricing as too complex. So "every electricity market must confront the problem of congestion management and the tradeoff between monopoly control and market mechanisms" (Hogan, 2000:28).

In the Notice of Proposed Rulemaking report (FERC, 2000:32), the Commission grouped two barriers to not achieving full competitive electricity markets, namely (1) the engineering and economic inefficiencies inherent in the current operation and expansion of the transmission grid and (2) continuing opportunities for transmission owners to unduly discriminate in the operation of their transmission systems so as to favour their own or their affiliates' power marketing activities.

In the first point, this occurs when each separate operator makes decisions independently about the use, limitations and expansion of its piece of the interconnected grid based on incomplete information, even though that action may have a negative impact on the transmission facilities of all other providers.

CHAPTER 6

WESTCOR

6.1 Introduction

The Western Power Corridor (Westcor) project is a typical RTO case. Westcor is a combined initiative by five SADC power utilities, namely ENE of Angola, BPC of Botswana, Eskom of South Africa, NamPower in Namibia and SNEL of the Democratic Republic of Congo (DRC). According to Naidoo (2004:10), it was "first identified as a strategic regional project by the Southern African Power Pool (SAPP) which saw the huge synergies which could result if the hydroelectric resources of the DRC and – to a lesser extent Angola – could be tapped by the countries of southern Africa". Figure 10 below shows how the route for the power grid from the DRC to South Africa through Angola and Namibia will be formed. It also shows other potential corridors, that is on the eastern and northern sides.

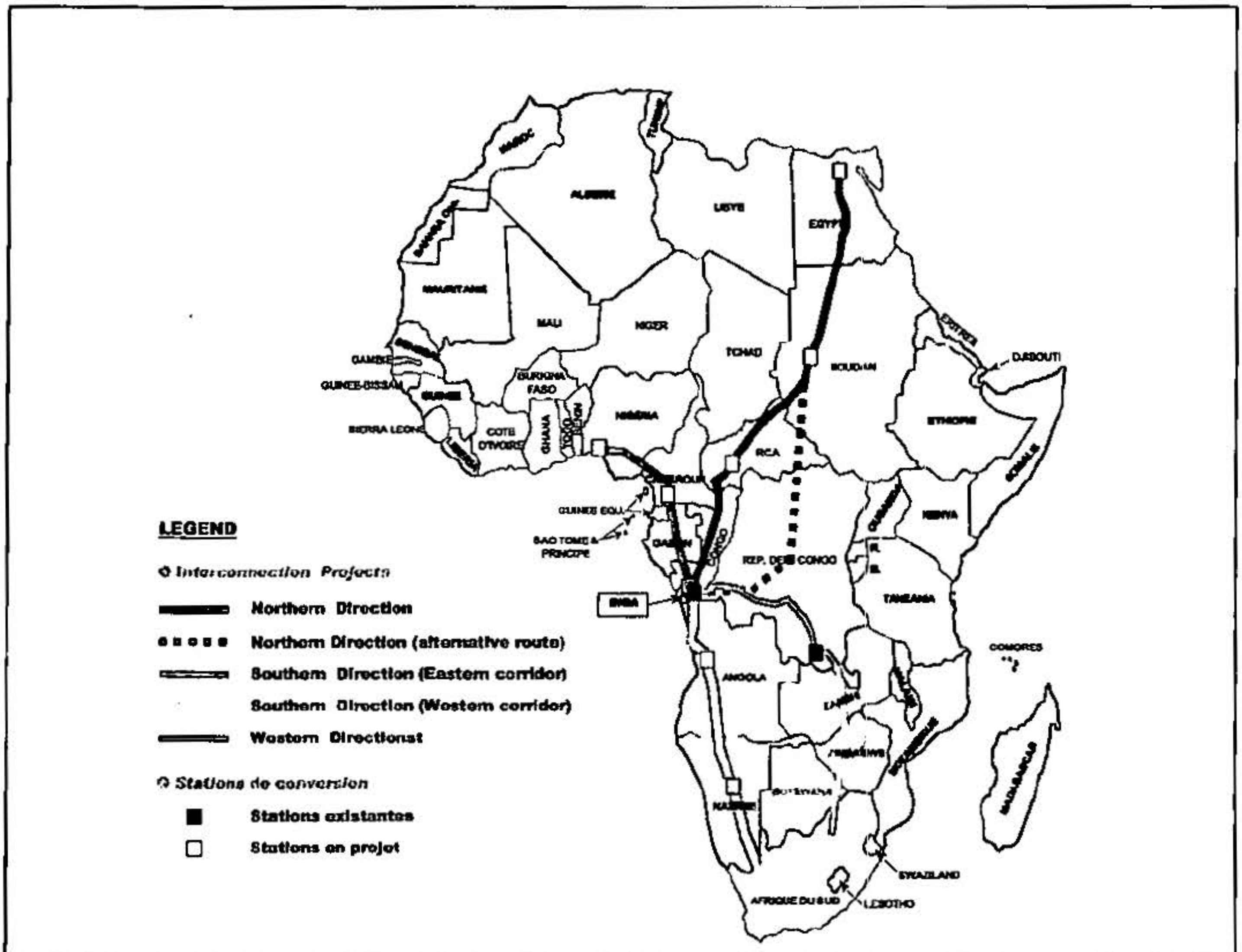


Figure 10: Corridor from DRC and Angola to South Africa
Source: Naidoo (2003)

6.2 Formation of Westcor

At its 11th meeting, on 24 April 2002, the Executive Committee of the SAPP announced that it had "resolved to intensify its efforts to attract energy intensive users into the region to take advantage of the low cost, high quality and reliable electrical energy" (SAPP, 2002). That was the beginning of the Westcor project that included the DRC, Angola, Namibia, Botswana and South Africa.

According to an unpublished Eskom working group report (2002), the purpose of the Westcor project was to exploit the environmentally friendly, renewable, hydroelectric energy of the Inga rapids site in the DRC. SNEL owns and operates the two existing power stations, Inga 1 and Inga 2, which combined, have a capacity output of 1 770 MW. Inga 3 is the next phase of the development, with a rated output of 3 500 MW. The power to supply the rest of Southern Africa is envisaged to come from Inga 3 at the total output of 40 000 MW. The Westcor Steering Committee was formed under the auspices of the SAPP to initiate the studies to determine the viability of Westcor. Five utilities representing their countries, namely SNEL (DRC), ENE (Angola), NamPower (Namibia), BPC (Botswana) and Eskom (South Africa) were represented on the steering committee. Each utility will own 20% of the share capital of the proposed new joint venture company, Westcor. This company, Westcor, is to be registered in Botswana, and each company will contribute US$100 000 as a start-up to fund the first phase of this project (Westcor report, 2003).

The base case (integration of Inga 3 into the southern networks) of Westcor's capital investment will comprise two classic HVDC terminals and Inga 3 power station. The tariff structure will recover a minimum gross return on capital invested to cover interest and redemption of loans, operating and maintenance costs, taxes and dividends to shareholders. This project will be done in phases, the first phase being the study of the whole project. The study itself is to be conducted in three phases, with a decision point at the end of each phase to ascertain whether to proceed if the project is viable. The first phase of the study is a high-level scoping study, whose objective is to identify the best techno-economic solution to exploit Inga 3 and transmit its output southwards and determine order of magnitude level costs.

The second phase of the study is a pre-feasibility study, which will firm up on project scope. Equipment parameters and detailed system study will be confirmed and more detailed costing used. The third phase will then produce a bankable study report, which will be used to secure funding to proceed with construction. The final confirmation of the project scope by system studies will be compiled and used for a detailed bill of materials for use in tender documents and detailed costing.

Once all studies are done, and funding has been sought and approved, the first phase of the project will see 4 000 MW of hydroelectric power from Inga 3 site on the Congo River and from sites on the Kuanza (Cuanza) River in Angola being supplied to Namibia, Botswana and South Africa. The scheme, estimated to cost in the region of US$4 billion, is planned to enter the construction phase in 2005 with commissioning in 2009 and 2010 (Naidoo, 2003).

The figure 11 below illustrates Inga's base case.

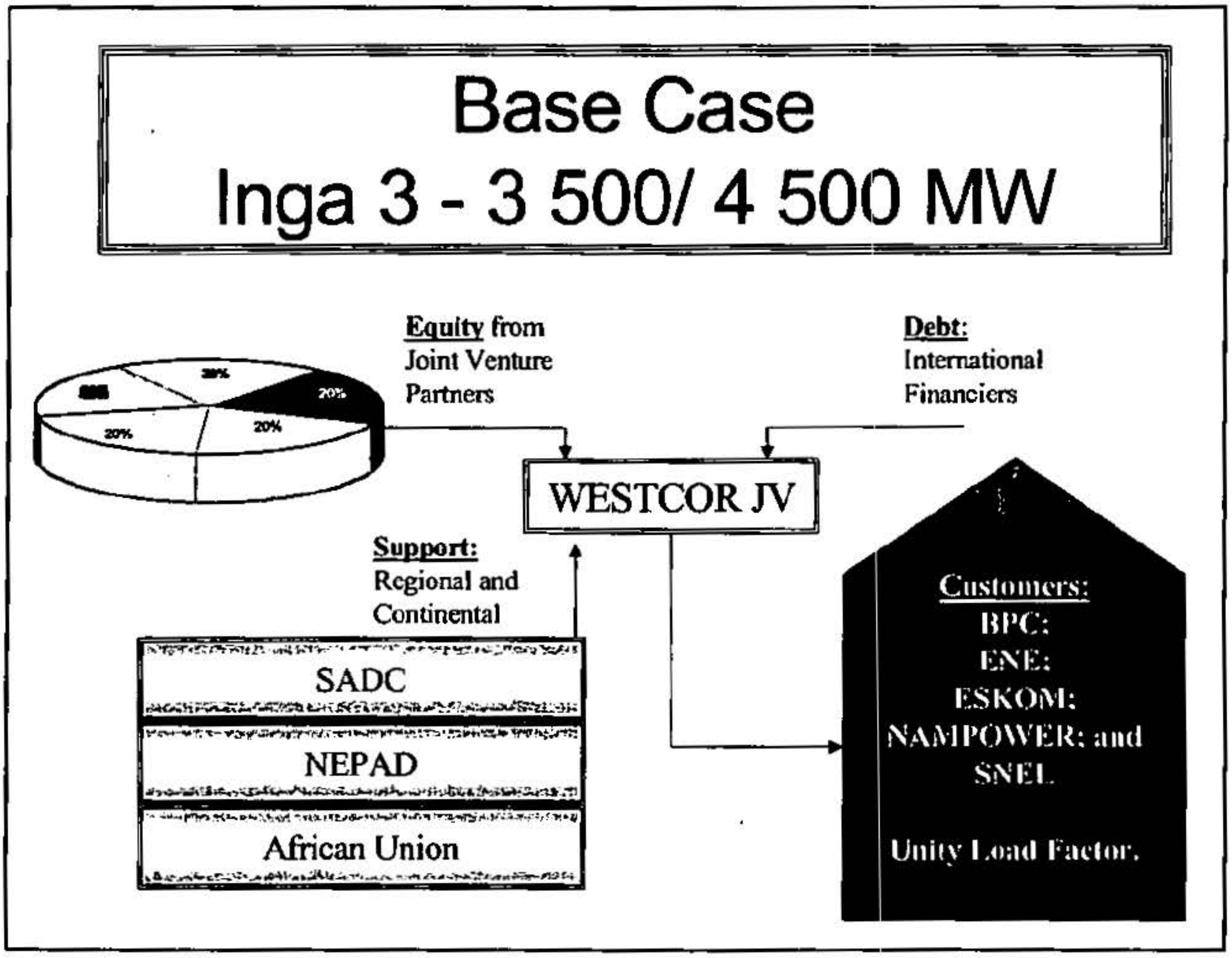


Figure 11: Inga's base case

Source: Naidoo (2003)

6.3 Westcor Technical Overview

Transmitting the power generated at Inga and the Angolan hydros to countries further south will involve the construction of two 500 kV HVDC lines. This could mean transporting it from Inga site to Koeberg near Cape Town with a single DC tap at Auas near Windhoek. It will carry 2 000 MW of power over a distance of 3 000 km, with 500 MW allocated to NamPower. The second DC line will run from Kuanza in Angola through Pegasus in Dundee in South Africa and will be routed via the Trans-Kalahari corridor with a 500 MW DC tap in Gaborone, all this carrying 2 000 MW of power. This would have been sourced half from Inga and half from Angolan hydropower plants. The power from Inga will be transmitted to the converter station at Kuanza via a 400 kV HVAC line (Naidoo, 2003).

The power imported to South Africa via the first phase of Westcor will be about 3 000 MW. This could come in handy, especially as South Africa is envisaged to run out of surplus base-load capacity by 2010.

Table 8 below summarises some of the data discussed above.

Table 8: Westcor data

WESTERN POWER CORRIDOR (Snel-ENE-NamP-BPC-Eskom)	
Voltage type	HVDC
Length	3000 km
Capacity (MW)	3 500 MW
Power Demand	3 000 MW
Converter Stations	Kuanza (Angola) Auas (Namibia) Gaborone (Botswana) Omega (South Africa) Pegasus South Africa)
Investment Costs	5 000 millions Euro
Study completed	Pre-feasibility (2003)

Source: Naidoo (2003)

Figures 12, 13 and 14 show a base case for Westcor and existing Inga 1 and 2 hydro layout, respectively. This is meant to demonstrate the magnitude of power source available that could be exploited to the benefit of most African countries and bring much needed revenue to the Congolese and Angolans.

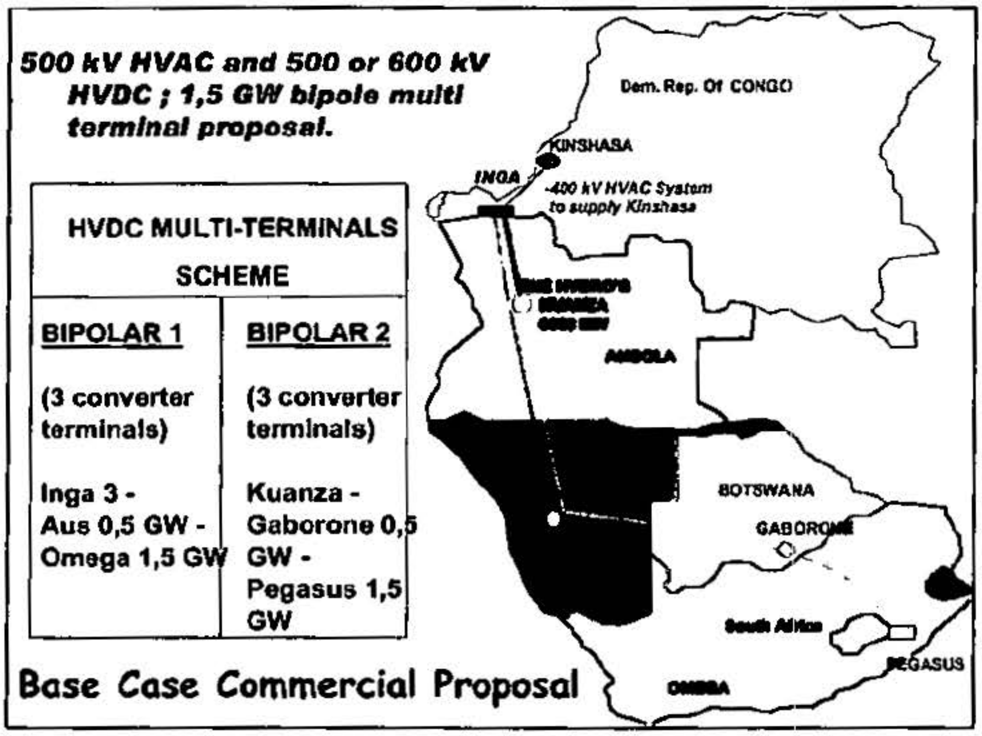


Figure 12: Base case for Westcor
Source: Naidoo (2003)

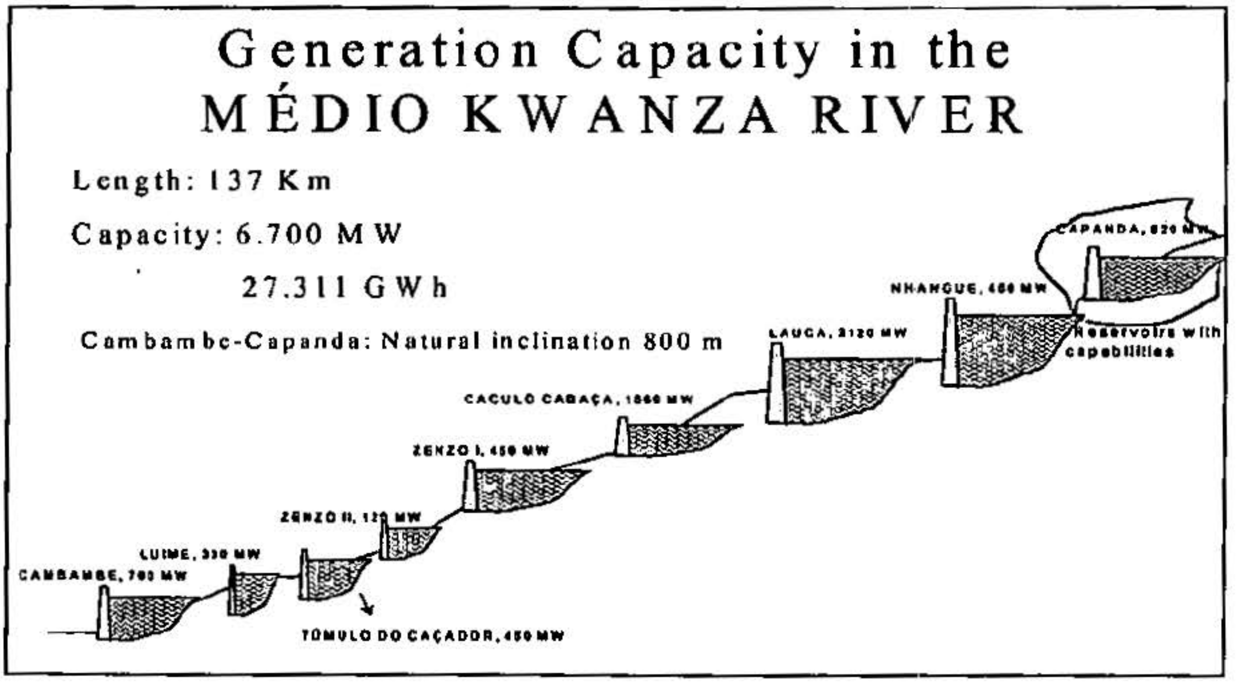
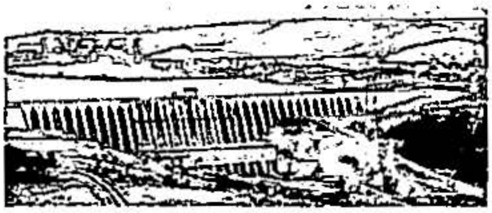
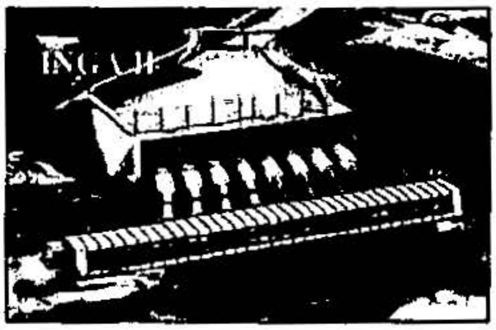


Figure 13: Inga 2 hydropower layout
Source: Naidoo (2003)

3.2. EXISTING POWERSTATIONS





	INGA I	INGA II
Commissioned in	1972	1982
Water head (m)	50	58
Turbine Water flow (m^3/s)	780	2.800
Number of units	6	8
Installed Capacity (MW)	351	1.424
Productiàn (TWh/an)	2,4	10,4

Figure 14: Inga 1 and 2 hydropower
Source: Naidoo (2003)

6.4 Conclusion

In Naidoo's words (2003) "there is a recognition that this is a project that could help transform the economy of the entire region". This Westcor project is still at a very early stage to reach any conclusive evaluation, but the progress made so far indicates its potential of being a success. An office to coordinate and run this project has already been opened in Harare. The Memorandum of Understanding (MOU) has already been put in place ready to be signed by all parties (see Appendix 9).

The Westcor project has also been designed to even open up the continental corridors north of Inga and into West, North and East Africa, as seen in figure 9.

Just before the finalisation of this research report, an announcement was made by Sithole (*Business Report*, 2004) that "the company to run the $4.5 billion (R22.7 billion) West Corridor power project would be established after the signing of the shareholder agreement in the first week of next month" meaning December 2004. According to Sithole (2004), each country will own a 20% stake in this company.

CHAPTER 7

MOTRACO

7.1 Introduction

Motraco is another typical example of an RTO in Africa. It has been fully operational since 2000. Motraco is a joint venture company between Eskom, EdM and SEB. The formation of Motraco was the result of an intergovernmental memorandum of understanding between Mozambique and South Africa and between Mozambique and Swaziland, the purpose of which was to attract Billiton Ltd, an international company, to build an aluminium smelter, Mozal, in Mozambique (Naidoo, 2003).

To make Mozal a reality, a reliable supply of continuous bulk electricity at economically feasible rates was required. Neither EDM nor SEB had the infrastructure or capacity to supply electricity to Mozal. Eskom, by contrast, had the capacity to supply the required electricity to Mozal but not the infrastructure. Establishing this infrastructure for Eskom to supply reliable bulk electricity to Mozal meant that the transmission network had to be extended from South Africa across both Mozambique and Swaziland to reach Mozal. This, therefore, created an ideal opportunity for the formation of Motraco as a joint venture company with participation of the associated national utilities.

7.2 Formation of Motraco

Billiton Ltd, an aluminium producer, wanted to build an aluminium smelter in Mozambique. In order to do so it required the following:

- 450 MW of power by 2000
- Firm supply of power
- Reliability and continuity of supply

Billiton, driven by the success of Alusaf/Hillside in South Africa (production of 600 000 tons of aluminium per annum), wanted to expand and have an advantage over its competitors. The price of electricity supplied by Eskom is low.

Mozambique was driven by the political recovery in 1994, economic development and investment, tax concessions and industry-free zone (Naidoo, 2003).

All this led to an agreement between Billiton and Mozambique for the construction of Mozal in 1997. An MOU was entered into between the governments of South Africa and Mozambique. Later the SEB was also involved.

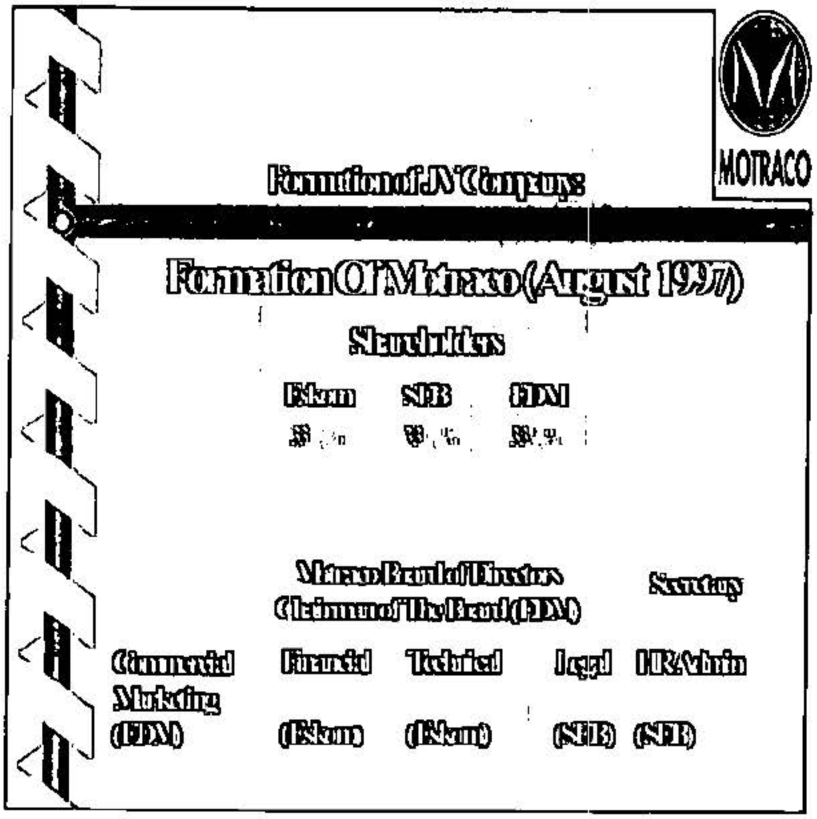


Figure 15: Formation of Motraco

Source: Machinjike (1999)

7.3 Motraco's Network

Motraco's network consists of two 400 kV substations, one in Mozambique (Maputo) and the other in Swaziland (Edwaleni II), which are interconnected via some 600 km of 400 kV lines to the Eskom Transmission network at Arnot and Camden Substations. See figure 16 below.

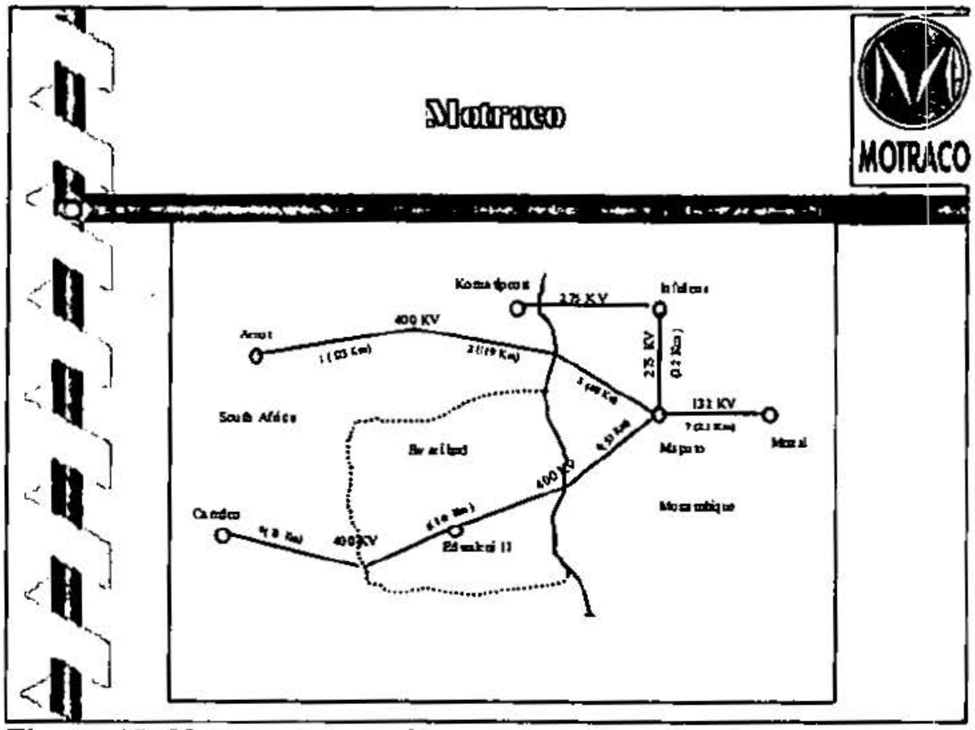


Figure 16: Motraco network

Source: Machinjike (1999)

Now that the Motraco network is fully operational, Eskom's responsibilities to Motraco can be summarised as follows:

- Eskom is a shareholder in Motraco.
- Eskom is the supplier of electricity to Motraco. Motraco in turn supplies power to Mozal and also wheels power over its network from Eskom to EdM and SEB.
- Eskom is required to provide training to Motraco's candidates (mainly from Mozambique and Swaziland) with the intention that these candidates will take over the operating and maintenance on the Motraco network.
- Eskom is the provider of services to Motraco for a period of six years.

7.4 Benefits of the Project

There will be an increase in electricity sales of some 450 MW once Mozal is in full production. The network extension will also enhance the reliability of supply to both EDM and SEB. There will be direct involvement in realising the African Renaissance through regional development, employment creation in Mozambique and human resource development in both Mozambique and Swaziland. Development of staff and strengthening of human relationships with neighbouring utilities will be a further benefit.

These benefits are summarised below as follows:

- Mozal investment: $1.3 billions.
- Motraco investment: $125 millions.
- Employment creation by Mozal, during construction – 6 000 jobs, during operations – 1 000 jobs. About 70% of jobs to locals.
- Motraco network strengthens and increases capacity for developments in the region.
- Regional cooperation has stimulated growth and development – foreign income, job creation.
- Transfer of technical skills.
- Prospects for the whole region.

7.5 Motraco Experiences

According to Naidoo (2003), what was learnt from the Motraco project could be summarised as follows:

- A network across three countries requires the support of local resources, authorities and adhering to the rules.
- Crossing the border with equipment and resources involves a lot of authorising of documents, taxes, clearance certificates, work permits, etc.
- Cultural and language issues affect the smooth running of the project and have to be resolved from time to time.
- Environmental issues have to be dealt with such as an environmental impact analysis.
- Dominance by one joint venture partner in the entire project is required.
- Management of contractors and consultants needed close monitoring and control.
- Consensus must be reached in decision-making.
- Sometimes there is conflict of interest by the participating partners from all countries involved.

7.6 Success Factors of Motraco

Motraco has been fully operational since 6 July 2000. The network was completed under budget. It had reached full load towards the end of December 2000 (Naidoo, 2003).
The success of the project boasts well in terms of regional cooperation and proves that by joining forces the region has the capacity to attract large-scale foreign investment for growth and development.

Other critical success factors include the following:

- Regional cooperation (governments of the region, regulators, utilities, suppliers, etc.).
- Shareholders' equity and commitment.

- Capital investment.
- Skills and resources development amongst utilities.
- Accommodating and understanding cultural differences.
- Building of a multi-skilled team to operate and maintain the Motraco infrastructure.

In could bė concluded that Motraco displays features of an RTO, with a potential of even used to benefit the resident customers. The next chapter will discuss how the data for this research was collected.

CHAPTER 8

DATA COLLECTION

8.1 Introduction

A qualitative method was adopted for this case study research. It is an exploratory type of research, therefore two exploratory techniques, namely secondary data analysis and experience survey, were used (Cooper & Schindler, 2001).

For secondary data, three types of data collection methods were used, that is a literature review of accredited academic secondary data, secondary data from industry and newspapers, interviews and written correspondence from respondents.

For the experience survey, three cases were studied, namely the USA's RTOs, the Westcor RTO and the Motraco RTO, all of which were discussed in the previous chapters.

8.2 Interviews

The interviews were conducted with ten people from Eskom who are in senior management positions and specialists in their fields of expertise. Two types of interviews were conducted: those conducted during a pilot study phase and during the actual research.

The outcome of these interviews is incorporated in Appendices 3 to 8.

The pilot phase concentrated on determining whether there is a management dilemma regarding the formation of RTOs in Africa. Through the literature review, the author identified the need to explore the RTO concept further, but whether that could be of interest to Eskom had to be established. The interviews were informal and unstructured. Information obtained from these discussions formed part of the research proposal. The issues that Africa is facing, for example lack of raising capital for infrastructure development and high risk associated with borrowing in Africa, emerged from an informal discussion with one of the senior managers (Naidoo, 2004).

The main research interviews were carried within Eskom head office. The respondents were notified through formal letters (see Appendix 1 for a sample) and questionnaires attached. The author conducted interviews with the respondent on a one-on-one basis. In almost all cases a dictaphone was used to record the interview. The author also took notes. Those respondents who were outside South Africa, for example in Zimbabwe Harare, were sent an e-mail with a letter and a questionnaire attached. Respondents replied via e-mail with their comments.

The findings and analysis of the above data are discussed in the next chapter.

CHAPTER 9

FINDINGS

9.1 Introduction

In this chapter, all critical information pertaining to the USA's RTOs, Westcor and Motraco is analysed. The interview data collected from respondents is analysed per question posed on the questionnaire. Due to the fact that this is a case study research, the author sought to obtain a holistic view of this specific phenomenon called RTO.

9.2 USA's RTOs

As discussed in section 5.2, the USA in the 1970s experienced high rates in electricity prices due to the regulated system of monopolies. This prompted some customers to build their own power supplies at very high capital expenditures. This led to costs spiralling out of control (Brown & Sedano, 2003). A system was needed that would control this and at the same time protect the customers. Such a need gave rise to RTOs being formed, which also introduced competition in the market. FERC was then charged with the responsibility of setting up RTOs in the USA.

Policies had to be formed under the Federal Power Act. FERC then issued Orders 888 and 2000 which promoted non-discriminatory transmission access service to facilitate the development of an efficient, competitive, wholesale electricity market. Participants had to provide the standardisation of tariff designs. Standards were set which prohibited self-dealing. RTOs also opened opportunities for ISOs, ITCs and TransCos. These companies provide the daily operation of transmission functioning, including maintenance and trading. RTOs oversee the smooth running of this system.

RTOs were mandated to facilitate transition from a "functionally unbundled" electric system to "structural" reorganisation of the industry in the USA while still maintaining an open market system with non-discriminatory access to transmission lines. RTOs were also mandated to ensure the development and operation of market mechanisms to manage congestion (FERC, 1999). The success of this system is yet to be seen as the RTO system is fairly new in the USA (started in the 1990s).

There are still problems to be resolved around ownership, control and pricing mechanisms in the USA's RTO system, but structures are in place for the FERC to effect changes and control.

9.3 Opportunities in Africa; Westcor and Motraco Projects in SADC

One of the subquestions of this research was: How could RTOs be implemented in Africa? The two case studies of Westcor and Motraco discussed in chapters 6 and 7 partly offer an answer to this question. Westcor involves five countries, namely the DRC, Angola, Namibia, Botswana and South Africa. These countries came together and decided to embark on such a project which would benefit all them. Once completed, this RTO company, Westcor, will oversee the transmission of electricity to all these countries and also ensure reliability (quality of supply), congestion, pricing and maintenance of this grid that runs across more than one country. Westcor will also in future be expanded to run along the eastern and northern corridors, hence filling the gaps in the African continent.

Although Motraco's primary purpose is to supply Mozal, the aluminium smelter, it also involves EDM, SEM and Eskom from Mozambique, Swaziland and South Africa, respectively. It could therefore be classified as an RTO. Eskom from South Africa, having the skills, expertise and resources to run a utility of this nature, has provided support for Motraco as a supplier of electricity. Motraco as an operator is responsible for maintenance and pricing of electricity to Mozal. Motraco has been fully operational since 2000 and has so far been running successfully.

9.4 Response from Interviews

Twelve respondents were interviewed on a one-on-one basis, and three respondents replied via e-mail. Two questions specific to Eskom were added to the questionnaire for Eskom respondents. These questions were omitted from the questionnaire to non-Eskom respondents.

A summary of the responses to each question is given in Table 9 below. For detailed individual responses, see Appendices 3 to 8.

Table 9: Summary of in-depth interviews with respondents

Question	General Response
1. How could RTOs be formed in Africa?	Interest groups coming together, e.g. formation of SAPP. These groups could form joint ventures, broken into entities.

2. How should RTOs be controlled?	Not easy, but could be defined in terms of boundaries. It must have control over national transmission operators. Issues of ownership, legal rights jurisdiction etc. should be well defined. Controlled concessions from governments.
3. What could be their boundaries?	Country borders and those determined contractually. Unlimited, continental grid growing from strength to strength.
4. What should be their objectives?	Ensure smooth running of transmission system, open access to regional grid, enhance efficiency. Serve customers such as traders, brokers, suppliers and consumers.
5. What could be their functions?	Same as above, but also centralised planning, reliability of supply, facilitating development, trading and wheeling. Manage the balance between supply and demand.
6. Are there any barriers that you foresee in the formation of RTOs in Africa?	Politics, cultural issues, governments not issuing concessions, lack of requisite infrastructure, lack of funding, lack of institutional and regulated framework. Control of RTOs.
7. How could African governments assist in the formation of RTOs?	Governments could enact legislation that creates an enabling environment for RTOs, e.g. ECOWAS, SAPP, binational commissions. MOU between developers, policies.
8. What are the areas of synergy between RTOs and NEPAD?	NEPAD gives support and paves the way for such economic endeavours, serves as an umbrella body for policy-making.
9. How could RTOs create opportunities for other investments?	Common servitude for gas pipework, telecommunications and water pipelines, design wholesale package, O&M companies.
10. How could globalisation learning/experience add value to the formation of RTOs?	Energy as commodity is subject to globalisation, opportunity to acquire skills. Provide opportunity for investment.
11. In what way could RTOs add value in Africa?	Attract FDI and hence regional development, RTOs define business model in Africa.
12. In what way could RTOs add value to Eskom's vision and standing in Africa (Eskom)?	It is Eskom's goal to have an African super-grid which will mean electricity in the entire continent. Increase Eskom markets, serve local, regional and international customers. Getting energy from low-cost production to low-cost consumer.
13. In what way could RTOs facilitate regional growth in Africa?	Direct impact on GDP in each country, capital infrastructure development, creating jobs. Regional integration, a reliable electricity system reducing overall industrial operational costs. Better social services and better living standards for all in Africa.
14. What are the bottom-line	There will be increase in sales and revenue, large

values (financial & non-financial) RTOs could deliver to Eskom?	balance sheet. Access to environmentally friendly hydro-based plants of Africa, energy will be cheaper, reduced risks. Improved quality of supply, access to common pool for operations and maintenance. Access to advanced technology resulting in low operation costs.

Based on the information above it could be said that there was general agreement on the formation of RTOs in Africa. The respondents saw RTOs as one of the vehicles for Africa's development, particularly because energy, especially electricity, is one of the means of revitalising the economy. Almost all the respondents cited SAPP and Westcor as examples of RTOs in Africa.

The respondents agreed that NEPAD and the African governments have a major role to play in the formation of RTOs in Africa. They all seemed to see politics as a threat to the formation of RTOs or African development as a whole.

Eskom respondents all concurred that RTOs could offer opportunities for Eskom to expand its business to other African countries and hence increase its bottom line and transfer skills where needed. Eskom could do this by forming strategic joint ventures or alliances with host countries where the transmission line could be build.

9.5 Lessons from Globalisation

The formation of RTOs in Africa and elsewhere often involves more than one country. Therefore the literature review on globalisation yielded several important issues that could assist, such as global strategies that could be applied. Companies embarking on globalisation should consider the following, according to Coetzee (2004):

- Why expand outside the home country?
- What global growth strategy should be pursued?
- What global business opportunity should be pursued?
- What entry strategy into a foreign market should be pursued?
- How should a global growth strategy be implemented?
- How should matters across borders be managed?

It is also important to manage the process properly, and align the company's vision and mission with a globalisation strategy and implementation.

When choosing entry modes it is important to consider the advantages and disadvantages of each entry mode, and also which of the three modes as mentioned by Root (2003), namely export, contractual and investment entry mode, the company pursues.

When a joint venture option is chosen, the pros and cons of IJV should be noted. Matthews (1999) states that an IJV has several stages in its life cycle, namely the initiation stage, the early partner agreement stage, the learning stage, changes in dependency stage, buy-out discussion stage and termination stage.

The risks associated with international business were noted, such as country, political, cultural, expatriate management, productivity and corruption risks. Coetzee (2003) quotes studies that show that about 50% of global business deals fail due to cultural ignorance.

The IB maturity curve shows IB astuteness for expatriate managers versus time (see figure 6). Knowing the position of expatriate managers helps to plan and put mechanisms in place to curb such cultural risk.

The next chapter discusses conclusions and recommendations emanating from the above findings.

CHAPTER 10

CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

10.1.1 RTOs as an enabling vehicle for transmission infrastructure development in Africa

This research study has established that RTOs are a vehicle for transmission infrastructure development in Africa. The USA's RTO model studied showed that RTOs could be formed to serve the large regions with reliable and low-cost electricity. It showed that the USA has used RTOs for capital expansion, and also to promote competition in an open market. RTOs are used to enable open access to transmission lines, thus promoting non-discriminatory use of the transmission grid.

The other point observed from the USA was that the governments of different states within the USA, together with major private electricity companies, played a leading role in the formation of RTOs. The result was the formation of FERC, which was mandated through the Federal Power Act to advance the formation of RTOs.

10.1.2 Implementation of RTOs in Africa

The case studies of Westcor and Motraco showed that RTOs can be formed in Africa. In fact these are typical RTOs in Africa. Although Westcor is still at a scoping study project stage, planning has been carried out, and an MOU and funding have been obtained. Motraco, on the other hand, is fully operational. These RTOs have been facilitated by state-owned companies within their countries and supported by their governments. These through SAPP will eventually also be part of the wholesale competitive open market system. They are still, however, guided by bilateral agreements.

These RTOs will in future open more opportunities for further development in Africa, for example the technology used in Motraco has been imported from other countries (South Africa and elsewhere) to a host country, Mozambique. Training of local staff, technicians, engineers, system operators and administrators has been overwhelming. It has created jobs for locals and other people. Similarly, Westcor will create a lot of jobs during construction and afterwards. It will also improve the skills level of people and hence their standard of living. This will not only affect the employees, but will have a spin-off effect on local communities in that schools could be built, and especially small and medium businesses could be established, all because of RTOs.

NEPAD has a role to play in paving the way and being an enabler for similar projects in the future. It could enable this by supporting funding and urging affected governments to playing a leading and meaningful role when such concepts are negotiated.

Globalisation, as was found in the literature review, has a major influence on the formation of RTOs in Africa. It has promoted economic developments by enabling trade barriers to be broken. Globalisation has encouraged entrepreneurial innovation to be realised. RTOs normally run across borders and involve several countries. So learning how to survive in different cultures, business ethics, legal aspects and markets calls for an understanding of the global business arena. It is essential to know how to manage cross-border risks, and formulate and implement winning strategies.

10.1.3 Eskom's Role

Eskom's CEO Gcabashe (2004:16) sums it up as follows: "Africa urgently needs to build public and private sector capabilities that can compete in the global economy and bring much-needed prosperity to the continent. As Africa's pre-eminent supplier of energy, Eskom has explored mechanisms for financing growth, transferring technologies, setting up public-private sector partnerships and, most importantly, changing global mind-sets about the continent."

Eskom was instrumental in the formation of SAPP with other SADC countries to promote open access to electricity through the wheeling of power, security and reliability of electricity supply within the SADC region. It is playing a very crucial role in the formation of Westcor, which will supply electricity from the DRC across Angola, Namibia and Botswana to South Africa. The long-term plan is to also expand to the eastern and northern corridors (see figure 10).

10.1.4 Model Best for Africa

The initiative has already started in Africa in putting the transmission infrastructure in place in the whole continent, which seems to be the model working so far. SAPP, WAPP and Eastern African Power Pool (EAPP) are in the process of being formed. The examples of

Westcor and Motraco are an indication that this model has the potential to realise the African dream of improving its economy through energy.

10.2 Recommendations

10.2.1 Eskom/NEPAD

The following is recommended:

- That details of the nature, dynamics, strengths and weakness of the USA's RTOs be studied beyond what was covered in this research.
- That ways of supplying the resident consumers be found when RTOs involve only the supply of bulk electricity for industrial purposes, e.g. in the Motraco case, there is a bilateral agreement to supply only Mozal.
- That what Russia, China and India are doing regarding RTOs be followed.
- That details of legal rights surrounding RTO ownership be determined.

10.2.2 Academic Research

With regard to academic research the following is recommended:

- That a cost/benefit analysis of RTOs be carried out.
- That the best pricing mechanisms for RTOs be studied that will also consider resident consumers' interests.
- That the best model for coordination and control of the transmission system, including dispatch and energy balancing or spot markets, be studied.

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APPENDIX 1

T M TWALA

12 August 2004
Tel: (011) 800-4937
Fax:(011) 800-2336

Resources and Strategy
Eskom Holdings Ltd
Megawatt Park

Johannesburg

Attention: Dr Steve Lennon

Dear Sir,

Re: Research for MBL

I am an Eskom Employee working for Transmission group. I am busy with a research report in partial fulfillment of Masters in Business Leadership (MBL) degree through the University of South Africa. I therefore kindly request your valuable time for an interview to discuss issues pertaining to the whole concept of the formation of Regional Transmission Organisations in Africa, the role African governments, Eskom and NEPAD could play.

I have attached the proposal of my research for your information and questionnaire of issues that could be discussed.

I am looking forward to our meeting.

Yours sincerely

Thami Twala

Key Accounts Manager

Transmission Services: Business Ventures

APPENDIX 2

QUESTIONNAIRE FOR REGIONAL TRANSMISSION ORGANISATION (RTO) RESEARCH

1. **How could RTOs be formed in Africa?**
2. **How should RTOs be controlled?**
3. **What could be their boundaries?**
4. **What should be their objectives?**
5. **What could be their functions?**
6. **Are there any barriers that you foresee in the formation of RTOs in Africa?**
7. **How could African governments assist in the formation of RTO?**
8. **What are the areas of synergy between RTOs and NEPAD?**
9. **How could RTOs create opportunities for other investments?**
10. **How could globalisation learning/experience add value to the formation of RTOs?**
11. **In what way could RTOs add value to Eskom's vision and standing in Africa?**
12. **In what ways could RTOs facilitate regional growth in Africa?**
13. **What are the bottom-line values (financial and non-financial) RTOs could deliver to Eskom?**

APPENDIX 3

QUESTIONNAIRE FOR REGIONAL TRANSMISSION ORGANISATION (RTO) RESEARCH - Interview with Dr S Lennon - Managing Director: Resources and Strategy, Eskom – 09/09/2004

1. How could RTOs be formed in Africa?

RTO concept need development, can be broken into entities, stand-alone entities

2. How should RTOs be controlled?

Not easy across- borders because of legal implications, but could be overcome e.g. Westcor and Motraco

3. What could be their boundaries?

Country borders and those determined contractually.

4. What should be their objectives?

5. What could be their functions?

Establish, maintenance, infrastructure development, centralised procurement, economies of scale and standardised processes.

6. Are there any barriers that you foresee in the formation of RTOs in Africa?

- Political will
- Defined regulatory rules
- Technology and management skills t affect mergers
- National barriers

7. How could African governments assist in the formation of RTO?

Bi-national commissions, governments enable environment where these things could happen, but they must not interfere, they must let power entities run on their own.

8. What are the areas of synergy between RTOs and NEPAD?

NEPAD provides enabling vehicle

Focuses on interconnecting

9. How could RTOs create opportunities for other investments?

Provide long-term projects

They could design the wholesale package

10. How could globalisation learning/experience add value to the formation of RTOs?

By providing information on investment opportunities, e.g. O&M type opportunity.

11. In what way could RTOs add value to Eskom's vision and standing in Africa?

Valuable lessons have been learnt in Africa, so RTO could form a basis that defines business model

12. In what ways could RTOs facilitate regional growth in Africa?

By bringing low-cost and affordable electricity e.g. Westcor and in future eastern corridor. This then is an incentive for foreign investment.

13. What are the bottom-line values (financial and non-financial) RTOs could deliver to Eskom?

ESKOM WILL SCORE HIGH IF THERE IS CONSISTENT SUPPLY AND DEMAND

There will be an increase in sales and hence revenue

Risks is regulatory risk

Eskom on its own has a limitation

O&M expertise

APPENDIX 4

QUESTIONNAIRE FOR REGIONAL TRANSMISSION ORGANISATION (RTO) RESEARCH - Interview with Mr B Munanga - Projects Manager – Eskom External Division - 24/8/2004

1. How could RTOs be formed in Africa?

Development of Pools within regional communities i.e. WAPP, SAPP, North Pool to provide links to connect those pools with different forms of energy such as gas etc.

2. How should RTOs be controlled?

Politics is more powerful than business in Africa, so buy-in of African Union (AU) is essential and control be by operators

3. What could be their boundaries?

Continents as boundaries, regional within SADC

4. What should be their objectives?

Optimise sharing of resources and allow trade

5. What could be their functions?

- Integrated planning tool for expansion
- Facilitate integration
- Set rules for power trading
- Trading and wheeling

6. Are there any barriers that you foresee in the formation of RTOs in Africa?

- Politics
- Huge capital requirements
- Self-sufficiency
- Skills to run complex structures

7. How could African governments assist in the formation of RTO?

AU and NEPAD concept

8. What are the areas of synergy between RTOs and NEPAD?

NEPAD is about alleviating poverty and creating jobs.

9. How could RTOs create opportunities for other investments?

Yes, RTOs can promote establishment of industries meaning investment

10. How could globalisation learning/experience add value to the formation of RTOs?

Energy as commodity hence subject to globalisation. Opportunity to acquire skills.

11. In what way could RTOs add value to Eskom's vision and standing in Africa?

It is Eskom's dream to have African supergrid which will mean electricity in the entire continent.

12. In what ways could RTOs facilitate regional growth in Africa?

Energy sources will be considered for imports and exports

13. What are the bottom-line values (financial and non-financial) RTOs could deliver to Eskom?

ACCESS TO ENVIRONMENTALLY FRIENDLY HYDRO-BASED PLANTS OF AFRICA

Energy will be cheaper

APPENDIX 5

QUESTIONNAIRE FOR REGIONAL TRANSMISSION ORGANISATION (RTO) RESEARCH - Interview with Mr J Machinjike: General Manager – Eskom Transmission Services - 27/09/2004

1. How could RTOs be formed in Africa?

Differs, but should have a political will. Collaborating strategies private/government, partnership and joint ventures

2. How should RTOs be controlled?

Regional regulations, controlled concessions from governments, tax issues, customs regulation, risk analysis.

Private company owned by a single entity.

3. What could be their boundaries?

Willing buyer-seller. Hindrance on open access by other governments

Issuing of licences

Low ROEs and trading charges that could be high

4. What should be their objectives?

- ROE/A must be attractive
- Government interconnection through utility
- Facilitate major corridors e.g. Westcor
- Greenpower

5. What could be their functions?

- Reliability of supply
- Facilitate development
- High ROE/A
- Trading and wheeling

6. Are there any barriers that you foresee in the formation of RTOs in Africa?

- Politics

- Cultural issues
- Perceptions
- Government cannot give concessions

7. How could African governments assist in the formation of RTO?

- AU high level
- Regional corporation bodies like SAPP
- Each government with policies/legislation process
- Intergovernmental MOU
- MOU between developers
- Detailed working agreements

8. What are the areas of synergy between RTOs and NEPAD?

RTO are part of NEPAD, can also be formed outside NEPAD

NEPAD will have government support

9. How could RTOs create opportunities for other investments?

Yes, RTOs can promote development in the following:

- Energy
- Telecommunications
- Servitude
- Gas pipelines
- O&M companies
- Movement of power for growth and prosperity

10. How could globalisation learning/experience add value to the formation of RTOs?

Energy as commodity hence subject to globalisation. Opportunity to acquire skills.

11. In what way could RTOs add value to Eskom's vision and standing in Africa?

It is Eskom's dream to have African super-grid which will mean electricity in the entire continent.

12. In what ways could RTOs facilitate regional growth in Africa?

Energy sources will be considered for imports and exports

13. What are the bottom-line values (financial and non-financial) RTOs could deliver to Eskom?

ACCESS TO ENVIRONMENTALLY FRIENDLY HYDRO-BASED PLANTS OF AFRICA

Energy will be cheaper

Revenue streams for Eskom

APPENDIX 6

T M TWALA

P.O Box 1412
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02 August 2004
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South African Power Pool
Co-ordination Centre Manager
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Zimbabwe

Attention: Dr Lawrence Musaba

Dear Sir,

Re: Research for MBL

I am an Eskom Employee working for Transmission group. I am busy with a research report in partial fulfillment of Masters in Business Leadership (MBL) degree through the University of South Africa. My research is about the formation of RTOs in Africa following after USA model. I am doing this research in my private capacity.

In view of the role that SAPP is playing in the development of Africa and your expert knowledge in this regard, I kindly request your opinion to the whole concept of the formation of Regional Transmission Organizations in Africa, the role African governments, Eskom and NEPAD could play.

Due to geographic distance and budget constraints, I could not physically reach you for a face-to-face discussion. Therefore, I have attached a brief proposal of my research as background information and questionnaire of issues to respond to.

I will very much appreciate your positive response as soon as your time allows.

Yours sincerely

Thami Twala
Key Accounts Manager

APPENDIX 6 continues

Eskom Transmission Services: Business Ventures
QUESTIONNAIRE FOR REGIONAL TRANSMISSION ORGANISATION (RTO) RESEARCH

1. How could RTOs be formed in Africa?
It is very difficult to have one RTO for Africa. Instead several RTOs in each country can agree to work together and cooperate in the operations of their grid networks. This is the practice in SAPP and also in Nordic Countries and other power pools.

2. How should RTOs be controlled?
Each country can have their own RTO and the control should depend on the laws (Electricity Supply Act) prevailing in the concerned country.

3. What could be their boundaries?
National or country boundaries, as is the current practice.

4. What should be their objectives?
To provide transmission services.

5. What could be their functions?

- Main grid operations, development and investment
- Providing safe and efficient transmission of electricity in the grid.
- Manage the balance between supply and demand
- Facilitate the exchange of information between participants
- Maintain bulk power system reliability
- Etc.

6. Are there any barriers that you foresee in the formation of RTOs in Africa?
- Different regulatory systems in different African countries
- Control of RTO

7. How could African governments assist in the formation of RTO?
RTO are already in existence in each country. Individual governments have already formed them.

8. What are the areas of synergy between RTOs and SAPP?
N/A

9. Can RTOs create opportunities for other investments?
Yes. By identifying transmission constraints and areas where investment could improve system operations of the grid. The RTO can then assist investors to invest in the identified areas.

10. How could globalisation learning/experience add value to the formation of RTOs?
N/A

11. In what way could RTOs add value to Africa?
N/A

12. In what ways could RTOs facilitate regional growth in Africa?
N/A

APPENDIX 7

QUESTIONNAIRE FOR REGIONAL TRANSMISSION ORGANISATION (RTO) RESEARCH

From: Shokunbi Olumuyiwa – ECOWAS Secretariat, Abuja, Nigeria

1. **How could RTOs be formed in Africa?**

As in other regions, interest groups come together to form RTO, regional integration/cooperation efforts in the area of energy can be geared towards this. An ISO (independent system operator) is a form of an RTO, the difference occurs only in their organizational structure – RTOs have a regional oversight/responsibility over transmission services while ISO have control areas within the same region, in this respect it is possible then to have an ISO that has [sic].

2. **How should RTOs be controlled?**

RTO control will be defined by the extent of its boundaries and functions. An RTO that has control over national transmission operators control areas will likely be controlled by a regional body. The set up of the regional transmission body will have to define this area, so that issues of ownership, legal rights and jurisdiction etc. are attended to.

3. **What could be their boundaries?**

RTO boundaries most likely will be international transmission lines, in this way national transmission lines will still be under the purview of the National transmission organizations. Now if ISOs already exist in the system then RTO coordination should be implemented through the ISOs.

4. **What should be their objectives?**

Amongst others the objectives of RTOs are:

a. Ensure the smooth and efficient operation of the transmission system
b. Maintain open access on the regional transmission grid
c. Monitor the transmission system and Identify any failures that might arise
d. Enhance system efficiency

5. **What could be their functions?**

RTO functions are defined by their objectives and all that will be required to fulfil its set objectives will be regarded as their function.

6. **Are there any barriers that you foresee in the formation of RTOs in Africa?**

a) Lack of the requisite infrastructure
b) Capacity/availability of excess power (despite the available resources)
c) Funding/investment dirge
d) Lack of Institutional and regulatory framework

e) Conflict of responsibilities and/or interests (local utility vs. ISO, ISO vs. RTO)

f) Political Interferences

g) Language barriers

More generally issues covering integrated planning, rates/price setting will be problem areas for RTOs. Who has the responsibility to plan the capacity requirement, should it be done on a regional level or at an ISO level? What about siting of infrastructure, to whose advantage is it? Is a regional body really that concerned about a local utility?

7. How could African governments assist in the formation of RTO?

By enacting legislation that creates an enabling environment for RTO formation (e.g. in the ECOWAS region there is the ECOWAS Energy Protocol which is at various stages of ratification into national law by the parliament of the member states) and recognition of regional energy cooperation in the energy sector at the national level.

8. What are the areas of synergy between RTOs and SAPP?

Going by earlier explanation of RTO and ISO, SAPP itself is then be an RTO

9. How could RTOs create opportunities for other investments?

Good governance and operation enables/fosters investments.

- Transparent operations
- Proper pricing schedules

10. How could globalisation learning/experience add value to the formation of RTOs?

- You don't need to invent a wheel. You borrow from experience of others.
- Cost share/synergy of efforts is a great incentive, as they say two (good) heads are better than one.

11. In what way could RTOs add value to Africa?

The perceived image of cooperation from communicating RTOs in the region serves only to attract much needed FDI to the regional which will accelerate development.

12. In what ways could RTOs facilitate regional growth in Africa?

Effective management of an RTO will certainly foster regional integration, a reliable electricity system will reduce overall industry operational cost thus bring with it increased growth of the small businesses and better health and social services.

APPENDIX 8

Title: A case study of the formation of regional transmission organisations as enablers of the transmission infrastructure development in Africa.

Chapter 1

Chapter 2

Chapter 3

Interview with Pat Naidoo - 28/07/2004

Research question:

RTOs as an enabling vehicle for infrastructure development

Issues:

Africa has a deficit in infrastructure
African individual countries do not have the capability to develop the infrastructure because of the following:

- Constraints in raising capital on their own.
- Reduce risk associated with borrowing.
- Cost of capital high.
- Inadequate ability to participate in an open market.

Recommend: RTO model is considered to help overcome constraints for infrastructure development in Africa.

Response to questionnaire:

1. How could RTOs be formed in Africa?

Based on workings of SAPP whereby industrial transmission companies of partly state utilities could come together and form an association that covers common interest such as Power system pperation & maintenance, planning expansion and engineering.

The focus will be on transmission and distribution and generation will be left out.

There will be an economic of scale dominance, one planning department, specialising in a particular issue,
There will be efficient operation and maintenance and low cost of operation.

2. How should RTOs be controlled?

The control will be empowerment, classic type won't work due to cultural differences. Common work ethics and value light keeping on; Formation of central committee and following customer charter.

3. What could be their boundaries?

Unlimited, continental grid that could grow from strength to strength and grow the continental economy.

4. What should be their objectives?

Servicing customers such as the traders, brokers, suppliers, consumers and also reliability of the transmission lines.

5. What could be their functions?

Classic functions, planning etc. centralised not duplication, populated with empowered employees.

6. Are there any barriers that you foresee in the formation of RTOs in Africa?

Natural state monopoly

7. How could African governments assist in the formation of RTO?

Reducing independence of transmission companies to capital or borrowings.

8. What are the areas of synergy between RTOs and NEPAD?

NEPAD can serve as an umbrella body for policy-making and enabling environment for established RTOs in Africa.

9. How could RTOs create opportunities for other investments?

Common servitudes for gas pipework, fibre optic lines, telecommunication markets, water-pipe lines.

10. How could globalisation learning/experience add value to the formation of RTOs?
Learning can be continuous and vice versa.

11. In what way could RTOs add value to Eskom's vision and standing in Africa?
Increase Eskom markets, serve local, regional, national and international customers. Getting energy from low-cost production to low-cost consumer.

12. In what ways could RTOs facilitate regional growth in Africa?
Direct impact on GDP in each country. Capital infrastructure development creates jobs. Salaries increase and quality of life improves.

13. What are the bottom-line values (financial and non-financial) RTOs could deliver to Eskom?

Financial:

Increase in cash flow for each country
Larger balance sheets
Access to low-cost capital
Reduced risks

Non-financial:

Improved quality/security of supply
Improved reliability of supply
Access to common pool for operations and maintenance. Access to advanced technology which will translate to low operating costs for the organisation.

APPENDIX 9

INTER-GOVERNMENTAL MEMORANDUM OF UNDERSTANDING ('IG MOU')

Amongst

THE GOVERNMENT OF THE REPUBLIC OF ANGOLA
('ANGOLA'),

THE GOVERNMENT OF THE REPUBLIC OF BOTSWANA
('Botswana'),

THE GOVERNMENT OF THE DEMOCRATIC REPUBLIC OF CONGO
('DR CONGO'),

THE GOVERNMENT OF THE REPUBLIC OF NAMIBIA
('NAMIBIA'),

and

THE GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA
('SOUTH AFRICA')

(hereinafter referred to as "Parties")

ON THE CO-OPERATION FOR THE ESTABLISHMENT AND DEVELOPMENT OF THE WESTERN POWER CORRIDOR PROJECT.

PREAMBLE

WHEREAS:

(i) Angola, Botswana, DR Congo, Namibia and South Africa have stated their intention to enter into agreements to facilitate the realisation of the Western Power Corridor project, which is defined as the 'Project' in Article 1 hereof;

(ii) The purpose of the Project shall be to create, develop, manage, maintain, operate and promote the Hydro Power Plants, the International Transmission Inter-connector and the Broadband Telecommunications for the benefit of all the Parties;

(iii) The Parties have expressed their common intention to establish a process of co-operation to facilitate the implementation and continued operation of the Project by the Participating Utilities and to establish a Joint Commission for this Project;

(iv) The Parties wish to promote the spirit of good neighbourly relations and peaceful co-operation amongst the States as cited in the various SADC and SAPP Agreements amongst the Parties;

NOW THEREFORE THE PARTIES AGREE AS FOLLOWS:

ARTICLE 1: DEFINITIONS

In this IG MOU unless the context otherwise indicates:-

Broadband Telecommunications shall mean a communications channel that has a greater bandwidth than a voice grade line and is potentially capable of greater transmission rates.

Hydro Generation Plants shall mean the development of INGA III hydro power plant in the DR Congo and the possible development of:

(i) hydro power plants in Angola

(ii) Grand INGA hydro power plant in DR Congo,

(iii) hydro power plants in Namibia

International Transmission Inter-connector shall mean the transmission lines created within the Project including all the associated infrastructure and equipment that will create links for the trading of electrical energy amongst Angola, Botswana, DR Congo, Namibia and South Africa.

Joint Commission shall mean the commission to be established under Article 4 of this IG MOU.

Participating Utilities shall mean Empresa Nacional de Electricidade ('ENE') of Angola, Botswana Power Corporation ('BPC') of Botswana, Societe Nationale d' Electricite ('SNEL') of DR Congo, Namibia Power Corporation ('NamPower') of Namibia and Eskom Holdings Limited ('ESKOM') of South Africa.

Project shall mean the studies, design, insurance, financing, construction, operation and maintenance of the International Transmission Inter-connector, Hydro Generation Plants, Broadband Telecommunications and the formation of a holding company to be known as Western Power Corridor ('WESTCOR').

SADC shall mean the Southern African Development Community

SADC Secretariat shall mean the Directorate of Infrastructure and Services at the SADC Secretariat which shall be responsible for guiding and co-ordinating co-operation and the harmonisation of energy policies and programmes in SADC.

SAPP **shall mean the Southern African Power Pool**

Western Power Corridor ('WESTCOR') shall mean a company to be registered in Botswana that will be created to develop, manage, maintain, operate and promote the Hydro Power Plants, the International Transmission Inter-connector and the Broadband Telecommunications for the benefit of all Parties and the Participating Utilities.

ARTICLE 2 : PURPOSE OF THIS IG MOU

2.1 The IG MOU shall facilitate:

(i) The construction of the International Transmission Inter-connector,

(ii) The construction, development, operation and maintenance of the 3 500 MW (three thousand five hundred megawatt) INGA III Hydro Power Generation Plant at INGA in DR Congo,

(iii) The possible development of:

(a) Hydro power plants in Angola;

(b) a 40 000 MW (forty thousand megawatt) hydro power plant called Grand Inga in DR Congo;

(c) Hydro power plants in Namibia.

(iv) The installation of Broadband Telecommunications for the operation of the International Transmission Inter-connector and for future business development,

(v) The formation of Western Power Corridor ('WESTCOR'), a company that will eventually develop, manage, maintain, operate and promote the infrastructure referred to in the above clauses, for the benefit of all the Parties.

2.2 This IG MOU details the rights and obligations of the Parties.

2.3 This IG MOU acknowledges that the Participating Utilities have taken certain preliminary steps to initiate the Project and hereby grants the Participating Utilities authority to enter into such further agreements as may be necessary for the development of the Project, subject to compliance with applicable legislation in each State.

2.4 This IG MOU provides for the establishment of a Joint Commission amongst the Parties.

ARTICLE 3 : RIGHTS AND OBLIGATIONS

3.1 The Parties shall co-operate on the facilitation, implementation and the continued operation of the Project by the Participating Utilities.

3.2 Each Party shall give assistance where possible to the Project in dealing with any Ministry, Government department, Government agency (inclusive of any Provincial, Local and such other Government structures that complement the National Government) or body incorporated by statute within its jurisdiction so as to assist in the performance of obligations under various contracts in the Project.

3.3 Each Party shall promptly furnish to the other Parties copies of all notices, reports, proposal or other data relating to the occurrence of any event which may threaten the Project.

3.3 Each Party may, at any time when in its opinion the Project is threatened, require a meeting with the other Parties within the Joint Commission regarding the measures to be taken to ensure the continued operation of the Project, such meeting shall be held within a period of 14 (fourteen) calendar days from the date of receipt of the notification or such shorter periods as the Parties may agree.

ARTICLE 4 : ESTABLISHMENT OF A JOINT COMMISSION

4.1 The Parties shall establish and undertake to maintain a Joint Commission under the auspices of their respective Ministers of Energy to serve as a forum for discussions, information sharing, negotiations and consultations between the Parties as set out in Article 7.

4.2 Each Party shall appoint 3 (three) permanent representatives to the Joint Commission one of which shall be a representative of each Participating Utility. Each Party shall also nominate 1 (one) alternate representative.

4.3 Each Party shall within 1 (one) calendar month of entry into force of this IG MOU appoint its representatives and an alternate on the Joint Commission and shall within such period communicate the names of such nominees to the other Parties through diplomatic channels. Each Party may at any time terminate such nomination for whatever reason provided written notice is communicated to the other Parties, including notice of the replacement nominee.

ARTICLE 5 : MEETINGS OF THE JOINT COMMISSION

5.1 The first meeting of the Joint Commission shall be convened by Angola and shall be held in Luanda within 2 (two) months of entry into force of this IG MOU.

5.2 All subsequent meetings of the Joint Commission will be held in rotation in Botswana, DR Congo, Namibia, South Africa and Angola, unless otherwise decided by the Joint Commission. The Joint Commission shall meet at least every 6 (six) months, unless the Parties agree otherwise. Any Party may request additional meetings.

5.3 One of the permanent representatives of the Party in whose State the meeting is to be held shall, in respect of that meeting, be the Chairperson. The Party in whose State the meeting is to be held shall be responsible for the preparation and timeous distribution of the proposed agenda, the recording and distribution of the minutes, to make available a suitable venue and for all other secretarial services.

5.4 Recommendations of the Joint Commission shall be made on the basis of consensus amongst the representatives but in the event that the Joint Commission fails to reach such consensus, the matter shall be referred to the Parties within 30 (thirty) calendar days by the representatives for further discussion and recommendation.

5.5 The Joint Commission shall establish its own governance rules and procedures insofar as its meetings are concerned.

ARTICLE 6 : FUNDING OF THE JOINT COMMISSION

6.1 As to costs incurred in order to enable the operation of the Joint Commission:

(i) each Party shall in respect of all meetings of the Joint Commission be responsible for its own costs incurred as a result of its attendance of and participation in such meetings; and

(ii) the Party hosting a meeting shall bear all costs in accordance with Article 5.3.

ARTICLE 7 : FUNCTIONS OF THE JOINT COMMISSION

7.1 The Joint Commission shall be a forum for discussions, information sharing, consultations and negotiations amongst the Parties with the aim of achieving the following in respect of the Project:

(i) Facilitate and with the intent to harmonise, approvals, authorisations, licences, environmental, health and safety standards and such other requirements that must be complied with in each of the States;

(ii) Assist the Parties and also the Participating Utilities in addressing issues to be dealt with under this IG MOU;

(iii) Advise on measures that may be implemented by the Parties to alleviate problems resulting from interruptions of the Project taking into account the resources available to each Party;

(iv) Advise on the necessary steps that may be taken to protect the functioning of the Project;

(v) Advise on Multilateral Agreements amongst the Parties, Participating Utilities and International Funding Agencies which may be accessed for the implementation of the Project; and

(vi) Facilitate implementation of the Project should one of the Parties to this IG MOU and/or Participating Utilities withdraw from the Project.

7.2 The Joint Commission shall peruse the documents supplied to each Party under Article 3.3 and Article 9 and may invite representatives and/or technical experts of the Project to any meetings for consultation on any problems experienced in the Project which require an inter-governmental solution.

ARTICLE 8 : GOVERNMENT UNDERTAKINGS

ARTICLE 9 : EXCHANGE OF INFORMATION AND CONFIDENTIALITY

9.1 The Parties shall ensure a free flow of information between them, through the Joint Commission or other Government entities involved in the implementation of the Project.

9.2 However, any information marked as confidential supplied by one Party to the other Parties shall remain confidential and shall not be further disclosed by the receiving Parties without the prior written consent of the supplying Party.

ARTICLE 10 : FORCE MAJEURE

In the event that a situation or situations arise that would render difficult or impossible the normal implementation of this IG MOU, the Parties shall meet to review the situation or situations and decide on collective corrective measures to be taken.

ARTICLE 11 : SETTLEMENT OF DISPUTES

11.1 In the event of any dispute between the Parties as to the interpretation, application or performance of this IG MOU including its existence, validity or termination, such dispute shall as far as possible be settled amicably by the Parties.

11.2 Should the dispute not be resolved in the manner provided for in Article 11.1 of this IG MOU, any Party may submit the dispute to the SADC Tribunal established in terms of Article 9 and Article 16 of the SADC Treaty for final and binding arbitration.

ARTICLE 12 : AMENDMENT OF THE IG MOU

No variation, modification, waiver, failure, delay, relaxation or indulgence of any provision of this IG MOU, or consent to any departure therefrom, shall in any way be of any force or effect unless it is agreed to by consensus, confirmed in writing and signed by all Parties and then such variation, modification waiver or consent shall be effective only in a specific instance and for such purpose and extent for which it was made.

ARTICLE 13 : ENTRY INTO FORCE

This IG MOU shall enter into force on the date on which each Party has notified the other Parties in writing through diplomatic channels of its compliance with constitutional requirements for its implementation, the date of entry into force being the date of last notification.

ARTICLE 14 : TERMINATION

Any of the Parties may withdraw from this IG MOU prior to establishment of WESTOR as an incorporated entity provided however that a written 12 (twelve) month notice of such intention and the reasons for such withdrawal are communicated to all Parties to this IG MOU.

In the event of such notice being given, a meeting amongst all the Parties shall be convened within 30 (thirty) days of the date of the notice to discuss the impact to the Project and its future implementation.

ARTICLE 15 : GENERAL PROVISIONS

All notifications and furnishing of information shall be channelled through the diplomatic channels and copied to the SADC Secretariat.

IN WITNESS HEREOF the undersigned being duly authorised by their respective Governments, have signed and sealed this IG MOU in 15 (fifteen) originals of which 5 (five) are in English language and five in Portuguese language, five in French language, all versions being equally authentic, taking into account that the negotiation of this IG MOU has been done in English.

This IG MOU signed at ________________on ______ day of _________ 2003.

For: **THE GOVERNMENT OF THE REPUBLIC OF ANGOLA**

________________________________.

SIGNATURE

________________________________.

FULL NAME AND DESIGNATION

For: **THE GOVERNMENT OF THE REPUBLIC OF BOTSWANA**

________________________________.

SIGNATURE

________________________________.

FULL NAME AND DESIGNATION

For: **THE DEMOCRATIC GOVERNMENTOF THE REPUBLIC OF CONGO**

SIGNATURE

FULL NAME AND DESIGNATION

For: **THE GOVERNMENT OF THE REPUBLIC OF NAMIBIA**

SIGNATURE

FULL NAME AND DESIGNATION

For: **THE GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA**

SIGNATURE

FULL NAME AND DESIGNATION

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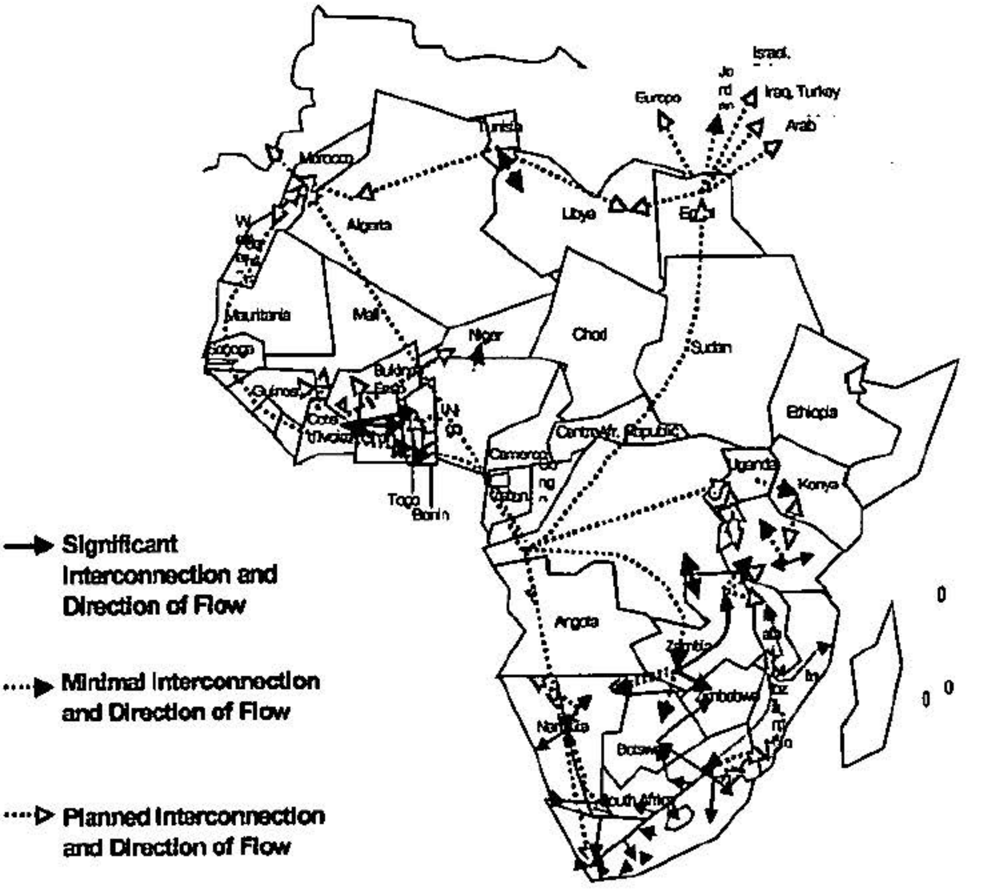
APPENDIX 10


Israel,
Iraq, Turkey
Europe
Arab
Morocco
Tunisia
Algeria
Libya
Mauritania
Mali
Niger
Chad
Sudan
Ethiopia
Central Afr. Republic
Cameroon
Uganda
Kenya
Togo
Benin
Angola
Zambia
Zimbabwe
Namibia
Botswana
South Africa
Significant Interconnection and Direction of Flow
Minimal Interconnection and Direction of Flow
Planned Interconnection and Direction of Flow

APPENDIX 11

AFRICA CHALLENGE