

**The Economic Validity of Investment by Power Utilities in the
Telecommunications Market: the case for Eskom**

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Research Report

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Declaration

I declare that this report is my own, unaided work. It is submitted in partial fulfilment of the requirements of the degree of Master of Commerce in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

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30 September, 1999.

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Broad Overview

One of the most difficult tasks facing a writer is deciding how to start his work. An elegant epigram or an eye-catching sentence might well fix the attention of the prospective readers or, more importantly, the supervisory committee at college, but such devices do not seem appropriate in this case.¹ At issue here is the phenomenal interplay between electricity and telecoms² and business opportunities arising out of that relationship.

It is no exaggeration to say fundamental social, economic, and technological³ tidal waves are pummelling the world economy with unstoppable determination. "Imagine an amount of money equal to US\$2.3 trillion, larger than the economies of most countries, moving through an electronic network."⁴ That is the magnitude of electronic financial transactions, which travel over just one network everyday. It is mind boggling, but only one example of the increasing flow of electronic information such as telephone conversations, fax, electronic mail and television broadcasts. This gigantic electronic wave illustrates the extent to which the world is becoming more dependent on electronic communications. The dependency is altering life-styles and societies. Banks offer services over the Internet, aborigines in Australia sell paintings using videoconferencing. Amazon.com has become the "official bookshop of choice."

The global economy is currently undergoing an information revolution which will be equally as significant in effect as the Industrial revolution of the 19th century. The production of merchandise, such as agricultural products or manufactured goods, has traditionally been the staple output of an economy. Lately however, the goods producing sectors of the economy are

¹ Rephrased from Lewis, R. & Pendrill, D. (1985) Advanced Financial Accounting London, p.1.

² The terms telecommunication, telecoms, telecom and telecoms tend to be used indiscriminately and interchangeably in the literature. Here we shall only use telecoms unless circumstances require another approach.

³ Economist (1994) February 05, p.75

⁴ Worldwide Interbank Financial Telecommunication. (1994) Annual Report.

contributing a smaller share of economic output, while the contribution of the service sector is growing.⁵

The service sector already accounts for over half of economic output in many countries and this trend is not limited to developed economies: a number of emerging economies as diverse as Singapore or Senegal, Hong Kong or Hungary, have service sectors that contribute over 60 percent of the nation's economic activity. Even in the worlds' least developed economies, the share of the service sector (43 percent) is higher than agriculture (37 percent), or industry (20 percent).⁶

Service based firms do not produce goods directly. Their activities involve the provision of services, distribution of goods, and most importantly, the exchange of information. The service sector is both a major consumer and producer of information. In fact, futurologists⁷ predicting the transformation to an information society, note that the overwhelming majority of service workers are actually engaged in the creation, processing and distribution of information.

Information is also important for non-service industries: one estimate suggests that information account for about 75 per cent of the value added in United States manufacturing.⁸ With these changes have also come changes in the regulatory regimes, liberalisation of the telecoms sectors of economies and a move towards radical transformation of state monopolies. South Africa's Eskom, the wholly owned government parastatal has not been immune from these onward marching forces of change.

⁵ Business Week (1995) August, No.07.

⁶ UNDP (1994) Human Development Report, New York.

⁷ Naisbitt, John (1982) Megatrends: Naisbitt chose the shift from "industrial to information society" as the first and most important of his 10 Megatrends.

⁸ Fortune (1995) August .7.

Statement and Analysis of the problem

Many electricity power companies around the world are stringing fibre optic cables onto electrical poles. They have embraced cellular technology and are spending hundreds of millions of rands in telecoms investments and have the support of their national governments. On the other hand, Eskom has over 26 000kms of electricity power lines, a sound and solid balance sheet, thousands of engineers and a good public image. The problem is, none of the above is leveraged for the benefit of adding value through optimal use of telecoms assets.

What we would like to do in this Report then is to amplify some of the already known but little tended concepts and insights into opportunities for business that the telecoms environment avails Eskom. We think that it is long overdue for the telecoms arm of the utility to run separately as a viable commercial venture. We are sustained in this by the amount of value locked in Eskoms' telecoms assets and are not realising the potential returns they would otherwise generate.

Scope and objective of the Report

The adopted approach in the conceptual construction of this Report is based on established managerial methodology⁹ for developing business strategy but has been specially adapted to meet the telecommunication industry and academic requirements and also the time scales of this Report.

⁹ The methodology is to be found in Thompson, J.L. (1993) Strategic Management Awareness & Change Ch.2 and Wright, P.Kroll, MJ and Parnell, J. (1996) Strategic Management-Concepts and Cases Ch 1.

Also, we concur that the subject of liberalisation of state monopolies and a search for business by these organisations is an immensely complex subject. For this reason what we offer to consider in the main body of the Report are **core thematic issues** underpinning these huge changes in the utilities.

Therefore, the approach will be rooted in Business Economics and whilst information technology (iT) and telecoms will be referred to, no attempt will be made to seek to postulate the report as an engineers technical document. Substantively, the objective of this Report is to systematically show that there is economic validity for investment in telecoms by a power utility like Eskom.

The Telecoms Act No: 103 of 1996 will serve as our substantive legal point of reference, it will guide and inform the discourse and flow of this Report. And for reasons of brevity, it will hereafter be stated as the Act, followed by the relevant section unless circumstances require otherwise.

Terms of Reference

To establish whether there are valid reasons for Eskom to invest commercially in the telecoms sector of the national economy. To collect information and provide telecoms managers of power utilities like Eskom with insights on business opportunities for their organizations to enter the telecoms market. The potential benefits to the core utility business, the risks involved and the steps necessary to plan and implement a successful entry into the market. We would like to assess Eskom's telecoms strengths and weaknesses in the context of the pending restructuring of both the telecoms industry and the Electricity Supply Industry (ESI). We shall develop and recommend strategies for Eskom's telecoms department to profitably exploit identified opportunities and counter threats, while at the same time,

ensuring that the needs of Eskom as an electricity utility are catered for effectively and that there is no undue impact on its business risk profile. We aim to present a business case supporting the recommended strategy which addresses issues such as the competitive pricing of telecoms services, the commercial and business skills required, information and business system needs and investment programs.

Limitations

Whilst reference will be made to economic issues, this Report is not intended to address the role of Telecoms in Economic Development. The Report concerns itself with Telecoms Opportunities for Business available to a Power Utility like Eskom. It does not address questions like which organization has 'superior' products or services. Neither does the Report deal with issues of political philosophies regarding telecoms, otherwise the narrow path of academic integrity will be lost. Similarly, no attempt will be made to delve into the Regulatory Frameworks of countries of the world. Institutions like the Federal Communications Commission (FCC) of the United States of America and the Office for Telecoms (OfTel), the British telecoms regulator, will be mentioned in the context of their locational relevance. Please note the Report does not examine developments in telecoms in South Africa after the year 1999.

Method of Research and Problems encountered

An attempt was made to elevate the Report above a narration of points and description of historical issues. More recent corporate information was used and sourced from the internet. Eskom documentation, the authoritative Eskom Telecommunication's ten-year plan and scholarly textbooks were employed. Formal structured interviews found no pride of place due to non-disclosure agreements between Eskom and senior management and therefore informal sessions were preferred. To that extent special thanks go to Mr. AJP Pollard, (Bearer Networks) Mr. M Ncgetezo (Marketing) and Mr. J Munchi (ISDN Networks) for their assistance and guidance.

Abbreviations

DCS	-	Digital Cellular System (for 1,800 MHz)
DECT	-	Digital European Cordless Technology
EDI	-	Electronic Data Interchange
EDI	-	Electricity Distribution Industry
EIU	-	Economist Intelligence Unit
ESI	-	Electricity Supply Industry
GSM	-	Groupe Special Mobile
GT&D	-	Generation, Transmission, & Distribution
IBA	-	Independent Broadcasting Authority
ILD	-	International Long Distance
IRR	-	Internal Rate of Return
ISDN	-	Integrated Services Digital Network
LA	-	Local Administration
LAN	-	Local Area Network
LD	-	(National) Long Distance
MAN	-	Metropolitan Area Network
Mbits	-	Megabits per second
MDSN	-	Managed Data Network Services
MNS	-	Managed Network Services
MTN	-	Mobile Telephone Networks
NER	-	National Electricity Regulator
Opex	-	Operating Expenditures
OPGW	-	Optical Ground Wire
PABX	-	Private Automatic Branch Exchange
PBX	-	Private Branch Exchange
PAS-4	-	PanAmSat(ellite)
PCN	-	Personal Communications Network
PCS	-	Personal Communications Service
PDH	-	Plesiochronous Digital Hierarchy
Pops	-	Population

PSTN	-	Public Switched Telephone Network
RECs	-	Regional Electricity Company
RED	-	Regional Electricity Distributors
RFS	-	Radio Frequency Spectrum
Row	-	Rights of Way
RSA	-	Republic of South Africa
SABC	-	South African Broadcasting Corporation
SDH	-	Synchronous Digital Hierarchy
Sub	-	Subscriber
Tetra	-	Trans European Trunked Radio (Standard)
VANS	-	Value Added Network Services
VSAT	-	Very Small Aperture Terminal
WLL	-	Wireless Local Loop

2.0 The Electricity Supply Industry in South Africa

Introduction. The forces of change facing Eskom are on several planes. The first relates to the process of transforming hitherto a state monopoly and its replacement by a leaner and more efficient corporate entity. The second refers to the endless search for innovation and new products at the technological level. In producing electricity, Public Utilities are using jet engine type generators using natural gas, which is in huge abundance and is cheaper and cleaner than coal. This in fact brings to question the usefulness of some of our power stations and the costs associated with maintaining them.

Then we have telecoms. The global telecoms industry has seen what amounts to discontinuous change in products and services in the context of this information economics. Market trends are posing key challenges for service providers. In recent years the industry has been shaped by the need to manage complex multi-service, multi-technology, multi-vendor networks; the need for maximum flexibility to enable value-added service delivery; the need for maximum service flow through automation to reduce network and staff costs; and the need for rapid deployment to facilitate short time to market and customer. We have seen deregulation, globalisation and consolidation. There has been exponential growth in Internet take-up and traffic which in turn has driven migration and servicing a multi-user multi-protocol open systems integration of voice, video, and data. We see infrastructures shifting from multiple overall networks to one integrated network seamlessly environment. The combination of all these forces: electricity, telecoms and policy, and their dialectical inter-active tendencies and contradictions, have impelled the need for Eskom to undertake a fundamental rethink

of the way things are done. Earlier in the year, Public Enterprise Minister Hon. Mrs Stella Sigcau and Eskom's Chairman Mr Ruel Khoza,¹⁰ announced far-reaching changes to Eskom's organisation and management structure. These changes were about Eskom's regulated and non-regulated business. But more fascinating perhaps was the observation in their statement that "these changes are very similar to the changes that are being made by all other major utilities in the world." What we then seek with this Report is to fathom, understand and justify these commercial and business opportunities available to Eskom in the context of these changes. The way to do it in a humble way is to appraise the overall situation in which the organisation operates, in terms of the inter-play between a power utility and telecoms.

It is proper at this stage to give a brief background to the current status of the electricity industry. This will prove extremely helpful as it articulates the working relationships between telecoms and electricity. It is to this that we now turn.

Background and Objectives

As in many developing countries, electricity is a vital engine for growth, development and prosperity in South Africa. Low-cost electricity plays a critical role in many of our most competitive and growing industries. Providing access to electricity is one of the essential basic services the electricity supply industry is successfully delivering to the millions of people previously denied it. The electricity supply industry is at a critical crossroads however.¹¹

¹⁰ Business Day (1999) January 28.

¹¹ For an exhaustive study into the challenges facing the electricity industry, see the ERIC(1998) Report. The document, by the Departments of Finance and Energy and Mineral Affairs, argues for restructuring especially the distribution and transmission sectors and makes recommendations how this should be done.

The current structure of generation and transmission is, in the short-term, able to adequately deliver against the industry's objectives. The electricity distribution industry on the other hand, whereby Eskom and over 400 municipalities distribute electricity, faces **three critical challenges** in continuing to meet the dual objectives of rapidly building the infrastructure to provide electricity access to 1.8 million homes, and provide low cost, equitable tariffs and services to customers.

First, the present structure of the distribution industry has led to a wide disparity in the cost, tariffs and service levels associated with supplying electricity. **Second**, current funding and pricing mechanisms, whereby electrification and a major contribution to other municipal services are funded out of current electricity tariffs, has led to an industry that is unable to meet its total financial obligations in the long-term. **Third**, many municipalities are not meeting their electrification targets because of their weak financial position and lack of skills in electrification. Moreover, there are at least 150 municipalities who are at financial risk just from the distribution of electricity, as evidenced by numerous municipalities unable to pay Eskom bulk accounts and serious end-user non-payment problems.

To address these challenges, government recommended that first, the electricity distribution industry be consolidated into the maximum number of financially viable independent regional distributors and second, there is a need for changes to how the entire electricity supply industry funds its obligations since restructuring alone will have limited impact on improving the overall financial health of the industry, particularly given the constraints placed on the process. Therefore, given the growing financial crisis in the industry, and the risk it creates for

electrification, government wishes to take action for if not, change will be forced on the industry in an adhoc manner as unviable distributors fail and the crisis facing the industry escalates. A coherent strategy is therefore urgently needed.

The Electricity Supply Industry (ESI)

Approximately 96 percent¹² of the electricity generated for resale in South Africa is produced by Eskom, the state-owned electricity utility. The remaining 4 percent is generated by 8 municipalities for their own use. In addition, a small number of privately-owned units generate about 1200 MW of electricity (equal to about 4 percent of Eskom's production) for their own use in South Africa. Eskom is therefore virtually the monopoly generator of electricity for public use.

The main transmission system, which transports electricity generated in Eskom's power stations to all parts of the country, is owned and operated by Eskom. Eskom is therefore the monopoly transmitter of electricity in South Africa.

The distribution of electricity is undertaken by Eskom and 420 municipalities. The municipalities collectively serve about 60 percent of total customers by number, and about 40 percent of total customers by sales volume. Municipalities generally supply to consumers in their local government areas. The municipal distributors differ greatly in customer density, size and type of customer base, geographic spread and financial base. Eskom distributes to most of the customers directly, and has customers spread throughout the country. Eskom has taken over, the electricity businesses in the former independent states and self-governing territories. In addition to Eskom and municipalities, a small amount of electricity is distributed by a few provinces and services councils.

¹² Eskom 1999 Annual Report

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¹² Eskom 1999 Annual Report

There are also a small number of privately owned distributors serving a limited number of customers.¹³

Following numerous studies into the electricity supply industry over the past 25 years, government established the National Electricity Regulator (NER) in 1995 as the regulatory authority over the whole electricity supply industry. Soon after, the Electricity Restructuring Inter Departmental Committee (ERIC) was set up to formulate government's position on the restructuring of the electricity industry. Government believes that the distribution industry restructuring should be done such that: 1). electrification targets are met 2. the structure model must ensure that electrification targets are met and achieved in the most efficient way possible 3. The industry provides low-cost electricity 4. It facilitates better price equality and 5. Improve the financial health of the industry.

Against this background, it was decided that Eskom needed to develop a concrete strategy to protect its own interests and to proactively prepare for the opportunities and threats of a rapidly changing environment, characterised by the interplay of electricity and telecoms [against the backdrop of the convergence of technologies, experiences of other Utilities; the deregulation of South Africa's Telecoms sector, changes to the Electricity Supply Industry (ESI) and Eskom including outsourcing of the Information Technology (iT) function within the organisation].

There is an extensive array of in-house telecoms facilities inside of Eskom. The deregulation of the electricity industry immediately calls for addressing issues of telecoms assets. To understand how these are handled, it will be helpful to undertake a review of the telecoms sector in the Republic.

¹³ Examples of these distributors are: Orlando Power Station (Johannesburg City Council) and the Kelvin Power Station (Sandton City Council).

3.0 Review of South Africa's Telecommunications Sector

South Africa's telecoms sector is the most important and largest on the African continent and is on par with that of several advanced countries.¹⁴ Underlying demand indicators suggests that the market is on the verge of the explosive growth and change in line with changes occurring in the country as a whole. The market size in 1997 was in the region of 25bn Rands. Of this, Telkom accounted for over 10bn Rands. The rest can be mainly attributed to some large value added service providers, the cellular operators, Eskom, and Transtel. The current tariff levels and structure present a unique opportunity for a new entrant to exploit (especially in long distance services). Even though Telkom will attempt to rebalance its tariffs this will take a considerable number of years.

The government's aim is to address the imbalance of the provision of telecom services to different population groups. The Government policy not only aims to increase overall penetration¹⁵ level but currently considers Telkom to have the main responsibility for achieving this goal-which is a significant driver for the government's regulation policy. The other important driver for the government's telecoms policy, at least in the short-term, is the intention to raise cash from the privatisation of Telkom. This has led the government to protect Telkom from competition for a longer period than stated in the Act. However, much resistance exists to this move and the decision may be reversed. The only areas where competition is allowed are in data and value added services, trunked mobile radio, and cellular (GSM). Companies particularly banks, foreign groups and Transtel, have expressed interest in competing once the sector is liberalised.

¹⁴ BMI-Technowledge (1998) Communications Handbook.

¹⁵ Teledensity statistics from the 1996 Census suggest South Africa's overall access was 81.6%- however the figures are much higher now given Telkom's roll-out and the spread of cellular phones.

Regulatory Situation

Parliament enacted the Telecoms Act No 103 in 1996, which outlines policy for the telecoms sector of South Africa. Due to the pressing need to fulfil the economic and social policy objectives as well as other factors of national concern, many areas have remained closed to competition but certain business opportunities are already available and Eskom may wish to prepare for liberalisation in the year 2001 when Telkoms' PSTN monopoly expires.¹⁶

Currently, Telkom has a monopoly in the fixed network sector (local, long distance and international) and has been protected by an exclusivity period till 31st December 2001. This is mainly due to the concerns of the Government about competition in the profitable long-distance and international areas, which would make it difficult for Telkom to finance its investment program and to achieve the 20% penetration target envisaged by the year 2000. The Government is also concerned about the possible impact of competition on Telkom's value, and thus the proceeds to the Government from the privatisation of Telkom.

In mobile communications a duopoly (for network operators) currently exists, but a third license (PCN) is in the making.

In point of fact SATRA are holding final public hearings before issuance of the license to the successful bidder. Data communications and value added network services (Vans)¹⁷ are semi-liberalised. Current law does not explicitly cover VANS and providers of VAN-Services have to obtain a license from Telkom.

¹⁶ The Act (s36&40) provides Telkom with three 25 years licenses: one for PSTN services, another for VAN services whilst the third is for use of the radio spectrum. In addition, the SATRA license, under Exclusive Rights s3.1 states "subject to the Act and to the other provisions of this license, the Licensee is authorised to provide on an exclusive basis for a period of five (5) years from the effective date the following elements of the Public Switched Telecoms Services: (a) the National Long-distance Telecommunication Service; (b) the International Telecommunication Service; (c) the Local Access Telecommunication Service."

¹⁷ S40 of the Act prohibits anyone except Telkom to be deemed to be the holder of the Vans license.

As far as the legal situation is concerned, there is no indication whether liberalisation of services should be accelerated; i.e. the date of full liberalisation brought forward-or further delayed. Therefore, Eskom's telecoms strategy must be flexible to different legislative outcomes, especially timing and extent of liberalisation.

Main Sector Players

At the top is the Minister of Posts, Telecoms and Broadcasting, and at industry level there is:

Fixed Telephony: No of operators: 1]. Telkom

Cellular: No of operators: 2, Vodacom & MTN

Paging: No of operators: 23 Autopage Paging Plus Radiospoor

VANs: No of operators: 75¹⁸

EDS Africa; FirstNet: Trafex

Main Providers) No of operators 3

Fleetcall: Q Trunk: One-two-one

Satellite: No of operators 4

Orbicom, Sentech, Telkom and Transtel

Parastatals:

Number of operators 02

Eskom and Transnet / (Transtel)

Not stated: The South African National Defence Forces also own and operate a 'tin-house' telecoms service.

¹⁸ BMI-TECHNOLOGY HANDBOOK (1998) p.508

Size of the Market and Growth

Cellular Mobile Telephony. In September 1993, two 15-year GSM licenses were awarded to Vodacom and Mobile Telephone Networks (MTN). Both networks started to offer service in June 1994 and since then the South African cellular market has been one of the fastest growing in the world. The success of the two GSM networks was partly based on a rapid rollout and partly due to intensive marketing by Vodacom, MTN and over a dozen service providers. The pre-paid phenomenon has had a dramatic effect on reducing the price of access.¹⁹ Cut throat competition between service provider and dealers drove prices down to a very low level (even by international standards).

Most cities and towns are now covered by the two networks. Vodacom has gained the dominant position in the market and currently enjoys a 67% market share (this according to the authoritative Cellular.co.za). However a US operator, SBC²⁰ became a shareholder in MTN and with others like M-Cell and Naftel, have enabled MTN to make the necessary investments to catch up.

By mid 1995, due to the unexpected very strong demand, Vodacom and MTN had to start to manage the growth of subscribers by increasing tariffs, reducing their marketing through retail outlets, and reducing bonuses to service providers. In addition, in the first half of 1996, both operators had to disconnect over 50,000 subscribers for unpaid bills. Although this consolidation led to a slowdown in growth, projections are still optimistic with between 3-4 million subscribers expected by the year 2000.

¹⁹ Martin Stocks, Chairman of the GSM Association says in an interview that "Basic pre-paid access starts at R10.00, which is phenomenally cheap at (\$1.64/E1.56) per month." MTN Press Releases (October 1999).

²⁰ Telkom was granted a five-year monopoly in 1997 when SBC Communication and Telkom Malaysia bought a 30% stake in the utility. "Telkom still call the shots" www.fm.co.za/topco99/vtele.htm (04.10/99)

This will to a large part depend on future development of the economy as a whole as well as developments in the telecoms sectors (for example, the issue of a 3rd license).

CELLULAR FACT BOX

- The SA market is currently worth R7 to R8 billion and will grow to around R15 billion by 2004
- Total Subscribers as of May 1999 is 3 000 000 (three million)
- State of the market is characterised by continued strong growth
- Growth from 1997 to 1998 was dominated by prepaid service which grew by 161%
- Market share: Vodacom (56%), MTN (44%)
- Technology: Digital
- Protocol: GSM 900
- Potential by Year 2005: 10 million users
- Most of the urban areas and national roads in South Africa have GSM 900 cover
- Together the two networks cover more than 70% of the population

Source: www.cellular.co.za/south_africa_stats.htm (30 June 1999)

Our cellular market estimate is based on the assumption that the growth remains strong over the next 10 years. With more and more marginal customers getting a mobile phone, average revenue per subscriber falls. However, total cellular revenues continue to increase. By 2005, South Africa is estimated to have over 10 million subscribers, or a penetration of 20%. If a third mobile operator were to compete late 1999, it might capture 20% of the subscribers and 20-5% in terms of gross revenue of R3bn.²¹

²¹ Nielsen and Wills (1999) Cellular Bid Submission Analyser

Fixed Telephony. By 31st March 1999 5 075 417 main lines were installed.²² Teledensity is unimpressive by developed country standards. Even so, at around 10% (compared with African continent average of 1.6%) it is the third highest in Africa, bettered only by the small island communities.²³

The Government has quoted a 20% penetration aim for the year 2000. The target implies that 5 million new lines will have to be installed for the duration of Telkom's license monopoly. Most of the line growth will therefore be in rural areas and townships. Telkom are confident about the rollout, saying; "In the past two years alone, amid difficult economic conditions, we have added more than 900 000 new lines to our network and replaced approximately 740 000 non-digital lines, without in any way jeopardising our inherent financial stability".²⁴

Whilst figures for the waiting list are not available, the average waiting time is 29 days.²⁵ Much of the unsatisfied demand comes from the financially disadvantaged and affordability of charges will be an important issue over the years to come.

²² Telkom (1999) Annual Report. Operational Statistics.

²³ According to BMI-T (1997) Handbook (p.28) South Africa's ratio of main telephone lines per 1000 people stood at 9.45

²⁴ Telkom (1999) Annual Report. Highlights

²⁵ BMI-T (1998) Handbook p.172.

Datacoms and VANS. Although data communications, or Telematics as Telkom calls them, accounted for only 10% of Telkom's traffic in 1994, demand for Datacoms and VANS is expected to grow strongly,²⁶ particularly with South Africa's rapid re-integration into the world economy and anticipated continuous economic growth. Other drivers behind the demand for these types of services are the increasing computerisation of businesses and the sophistication of users and thus user requirements.

While the value-added network services (VANS) market has been deregulated to a degree, VANS providers still need to use leased lines from Telkom. Moreover, the license set out that the ratio between what Telkom earned from that customer needed to be a minimum of a 3:1 ratio. Therefore, a maximum of 25% of revenue earned per customer might have to be paid to Telkom by the VAN service providers.

VANS providers offer managed data network services (MDNS), virtual private networks, electronic data interchange (EDI), electronic mail, and fax services. The main players are Trafex (Standard Bank and IBM), EDS/Vanco (Dimension Data and EDS), and FirstNet (First National Bank and BT's Concert).

Trunking Sector. The industry began operating in February 1994 and it is still relatively small but growing. There are numerous public operators but the main ones are Fleetcall, Q-Trunk²⁷ and One-2-One. They all have operator licenses, and services reach all parts of the country.

²⁶ The EMI-T Handbook (1998) says Internet take-up in South Africa is 120% and the market for Vans was worth R300m last year (p.502).

²⁷ Telkom is to sell Q-Trunk, its wholly owned subsidiary. The company was expected to lose close o R27m in the 1999 financial year. One reason cited by Telkom for Q-Trunk's under performance is that Telkom is not in a position to give the subsidiary the attention and resources it deserves," (iTweb 30.08.99)

Radio Trunking was negatively affected by the popularity of the two new GSM networks. However, demand is expected to grow, particularly with the implementation of digital technology. Additionally, data transmission will see increased demand for Radio Trunking. And apart from the impact of cellular phones, the market for radio trunking could be described as highly competitive, continuously demanding new and better services, which in turn require infrastructure investment. The client base of Trunking services includes the South African Police Services and security companies, local Authorities, companies in distribution, mining, transportation and construction.

Attractiveness and Accessibility

The market for telecoms in the short-term is complex but real opportunities can be expected to develop in some key areas.

Fixed Telephony. The segment appears to offer several opportunities for new entrants. The first is amongst the less wealthy sectors of the population where the Government policy is encouraging new connections and higher penetration. The problem for a commercially focused provider is that the revenues will remain low.

The second and more significant opportunity for new entrants is to take market share from the incumbent (Telkom) in more lucrative segments; the wealthier parts of the population (high usage residential) and businesses - particularly as tariffs for long-distance and international calls are relatively high and Telkom's quality of service is perceived to be poor. Moreover, new entrants will also be able to benefit from general market growth, i.e. traffic growth amongst these high usage segments.

Although penetration in these segments is starting from a high level, there will be significant growth from traffic generated, particularly from long-distance and international services.

The main barrier against exploiting the opportunity in the short-term is the regulatory one, which restricts new entrants for some years. The size of the country and the resulting high-cost of infrastructure for long-distance network construction could also be a significant barrier particularly to potential new entrants without easy access to appropriate rights of way.

Mobile Telephony. The growth in mobile subscribers and the relatively quick implementation possibilities (compared with providing fixed access) suggests that mobile could present a potential opportunity. This opportunity could become accessible if the government goes ahead with awarding a new third license. The accessibility will however, be highly limited - to one operator or consortium.

Datacoms and VANS. This sector is open and growing, however, it could become crowded with limiting attractiveness.

Radio Trunking. This sector will offer significant growth potential in the future. The main demand for trunked radio services is likely to come from user groups such emergency services, government department, the police, etc. Despite its growth prospects, radio trunking will remain a niche service required only by these type of customers.

Conclusion. The market characteristics and developments suggest that there will be a significant and growing opportunity for new entrants in the coming years. Assuming that the proposed regulatory changes occur as currently proposed, this opportunity

will develop gradually over time. This has the advantage for Eskom that, if it wishes to create a commercial telecoms business, it has time to develop its business. However, it should be aware that other potential new entrants are also in this position.

Eskom's case for a public service licence, and particularly in advance of the currently proposed liberalisation dates, would be enhanced if it were able to show that it could contribute to the broad development agenda of the country. Eskom therefore needs to develop an evolutionary strategy which allows it to build on its strengths to create a strong position early and to adopt a strategy which takes into account the uncertainty of liberalisation and the threat from increased competition by allowing a number of different end and possibly exit points. The strategy adopted will depend largely on what Eskom possesses by way of assets. The next chapter is dedicated to the review of Eskom Telecommunications.

4.0. Eskom Telecommunications Review

Introduction. Eskom, in common with most other electricity utilities around the world, has invested in a nation-wide private telecoms network,²⁸ primarily to meet the operational requirements for control and protection of the power system including Generation, Transmission, Distribution businesses for the safety of its operating personnel.

Dependable, secure and cost-effective telecoms systems are required in order to support Eskom's operational and business functions.

Eskom may not use the services and infrastructure of Telkom as this option seems to be insecure and not practical. It also found this option to be more expensive. Eskom now operates two in-house networks: one for the above operational objectives, and another network for administrative purposes.

The permission Eskom currently holds effectively requires Eskom to lease lines from Telkom for its administrative network, but allows Eskom to build and use its own infrastructure for operational purposes. Eskom's permission to build and use its own telecoms infrastructure for in-house purposes is therefore more restrictive than that of Transnet, which has permission written into the Transport Services Act and can use its network for operational and administrative purposes and for both voice and data.

²⁸ The Act (s38.3) forbids Transnet and Eskom from operating a network except for own use-effectively eliminating the competition Telkom could face at home from the two organisations. It says, "No license to provide a national long-distance telecommunication service shall be granted to Transnet or to Eskom, but such a license may, with the concurrence of the Minister, be granted to a subsidiary company of Transnet or Eskom."

The telecoms function is fragmented within Eskom. Each main business group i.e. generation, transmission and distribution- has telecoms personnel and assets, but the majority of the assets and the provision of backbone service is in the National Telecoms Department (NTD), which currently is part of the Transmission Group. The Department provides telecoms services to all other groups within Eskom, including the iT Department, which is one of its main customers.

The assets are impressive and numerous. In the section below we discuss technical and non-technical elements of these assets. This is helpful in that it gives us insights into how and to what extent the company's business strategy will be influenced by these assets as the search continues to seek business opportunities.

Telecommunications Infrastructure²⁹

This section introduces the technicalities presented by way of considering what Eskom telecoms has in stock. These range from core bearer networks, switches to voice and data networks. It also addresses and importantly so, the carrying capacity of these transport systems. In addition we discuss human capital, Eskom's relations with government and other intangible assets. We shall begin with the backbone network.

Backbone bearer network

- The Microwave systems uses 2, 7, 8 and 13GHz bands
It is based primarily on SDH digital microwave network
- Spur links use microwave radio at 8Mbits (in 23GHz band)
- Also a small amount (<200km) of fibre network is operating at 155Mbits and 622Mbits

²⁹ Information on this section is based on: The Eskom Telecoms 10 Years Plan. The document details annual telecoms capital projects from 1995-2004, to provide systems for the main network. Ch4 Bearer Systems; Ch6 Power line carriers; Ch7 Network Management and Ch9 Voice Network of the Plan.

Voice Network

- Large PABX network (mostly digital)
- PABX sizes vary from 50 ports up to 400 ports

The network is based on a 2 level network hierarchy, with tandem switches and is operational at 51Mbits and 155Mbits

Data switching

Both frame relay and X.25 networks are in operation, current growth in internal data requirements is approximately 30% per annum

Power line carriers

Power line carrier equipment is gradually being updated. It is used for tele-protection purposes

Network Management

An Integrated Network Management System and Center has been completed as planned

Key Assets

Eskom has two key physical assets within its telecoms business, which could be used as the foundation of an infrastructure based business: Eskom's Electricity Grid and MicroWave installations within the Distribution System.

Eskom's **national electricity grid** is not only its principal core business asset but it could also be the key asset in building an infrastructure. For instance Wrapped Fibre could be installed on both transmission and distribution routes to provide a nation-wide, high capacity network.

Eskom also has some local distribution assets (poles, ducts, cabling), and may be able to use similar assets of other distributors, as the basis of telecoms customer access networks.

Microwave network. Eskom has an extensive nation-wide microwave network designed for providing internal services. This network would need to be upgraded for use in commercial telecoms business and would have a number of key roles like for instance:

- to provide services quickly, in advance of optical fibre rollout.
- as backup to an optical fibre network
- to gain access to low-density areas or cities not covered by an optical fibre network.

Other Assets. In addition to the electricity grid and microwave network, Eskom has other physical and soft assets, which could be exploited and these are:

Property³⁰ and buildings. Electricity switching stations could be used to house telecoms equipment. Office sites could be used for administration and network control Towers (electricity and radio) could be used for microwave and other wireless antenna systems.

Human Resources Capacity. Eskom has a number of staff who could significantly contribute to a telecoms business, they are technicians, engineers and support functionaries in -

- electricity plant installation and maintenance,
- network planning, legal, finance, human resources
- project planning, project evaluation & financing
- customer services

³⁰ Eskom Properties (Esprop) is the administrative arm of the assets whilst Eskom Finance Corporation (EFC) serves as the equivalent of a home loans institution on the high street.

Relationship with Government. The Government is the owner of Eskom. Since Eskom will need changes to the regulatory position and will also need to be awarded the rights to provide telecoms services, it should be in a strong position to influence Government policy in this respect.

Finance. Eskom's core business is a stable business currently not under threat and it would be in a strong position to raise finance (at reasonable rates) for diversification.

The above considerations suggest Eskom have assets that will stand the company in good stead when branching out into profitable territories. To get a comparable picture of utilities and other new entrants involvement in telecoms; and what strategies they deployed in entering the respective markets is the subject of the next chapter. Let us proceed to this review.

5.0. Precedents in other countries

By way of introduction, until recently telecommunications was universally the preserve of state owned monopoly suppliers. Over the last ten years, markets have been opened up to new competitive players. These new entrants have come from many sectors, but foremost amongst them are telecoms operators (entering new markets and service lines), electricity companies, railways and other utilities. These companies have particular assets and competencies that they have been able to exploit in their new telecoms businesses. We have briefly summarised the experience and strategies of a selection of these companies.³¹ Beginning with the **United Kingdom (UK)**.

In the UK the telecommunications market has been gradually liberalised over the past ten years or so and is now almost completely open. About equally the same time, a consortium including the international operator, Cable & Wireless, created the first competitor to BT. Now there are over 200 licenses. Amongst the most significant of these are electricity companies including The National Grid Company which set up Energis³² to offer telecommunications services, Scottish Power which created ScottishTelecom and a number of Regional Electricity Companies (RECs) (Yorkshire, Eastern, South Wales) which have invested in a range of services including: dark fibre, wireless

³¹ This segment is couched in terms of the steps actually taken in certain countries. The discussion herein is intended only to be an example of what has been necessary and successful in these countries. It should not be viewed as advocating that South African Utilities and Eskom should copy these examples. The companies and countries reviewed in this section is in no priority order. The section relied on Annual Reports (in some cases of holding companies only) and where possible relevant regulatory authority documents.

³² Oftel, the British Regulator, granted Energis the license on 24.05.93. The company grew 127 per cent market share to year end 1997 and is competing with companies like Eastern Group Ltd and Scottish Power Telecoms Ltd for the share of the British market. The company amassed an impressive client list which includes Boots, Sainsburys, the BBC, Lloyds Bank, Microsoft, Reuters and Unisys. Energis has already spent about 600m pounds stringing cable from the National Grid electric poles and through the London Underground subway system to build a 6,500 km nationwide fiber-optic network.

and fibre local access, telephony, leased circuits and cable TV. Following the trend set by electricity companies in the UK, Sweden and Finland, several electricity utilities in other European countries are actively evaluating telecoms opportunities (Greece, Italy, etc).

As for the **United States of America** or (USA), following the divestment of AT&T in the early 80's interconnect rights were established for competitive carriers. MCI became the first direct competitor to AT&T when it launched its long-distance and leased circuit services in 1971. Now a full telephone company with an international venture with BT, MCI has about 20% of the long-distance and international telephony markets and Sprint in excess of 10%. Electricity, rail and pipeline companies have provided the basis for competitive fibre supply and some have become telecoms operators. Duke Energy Corporation of Carolina,³³ for example, has an extensive fibre optic network offering third party telecoms services and has recently formed a consortium with Bell South and other companies to offer mobile telephony (PCS and DCS).

The **Swedish** telecoms market is now one of the most open however, a de facto duopoly has been formed with Telia and Tele2 being the main players. Tele2 is owned by Kinnevik,³⁴ which also owns mobile networks, and Cable & Wireless. Tele2 provides international and long-distance telephony services and in 18 months gained 10% of the international market. Tele2 used infrastructure from the rail utility for its network. Another nordic state that made huge advances much earlier on in liberalising the telecoms market is **Finland**. By 1994, all the areas of telecoms were opened up to competition. Amongst the

³³ Like National Grid in Britain, Duke Energy Corporation set up a subsidiary DukeNet Communications. The company is an established player providing a 3 300 mile fibre optics telecoms network, digital, wireless personal communication service, bandwidth, WLL solutions, and network turnkey solutions.

³⁴ Investment AB Kinnevik is an industrial giant with interests in electricity power supply, Railways and electronics.

companies that entered the market are Imatran Voima Oy (IVO) the largest power utility and owner of most of Finland's High Voltage (HV) transmission network.

The company entered the telecoms market through its 100% subsidiary Telivo Ltd. The company was activated in the spring of 1992 around the same time as IVO submitted an application for an operator license. The latter was able to maximise the return on its assets by providing long-distance and international telephony services. The company also offers local calls but mainly to IVO-group customers and some electrical utilities. Intelligent network services are offered with examples being: freefone (0800 services), Premium rate (0700/0600) services, Virtual Private networks (VPN services) and Personal Numbers (PN services). IVO has since sold Telivo to Telia for an undisclosed (but believed to be substantial) amount.

Following reform of the telecoms sector in **Japan**, Tokyo Electric Power entered the telecoms market in order to maximise exploitation of its electricity infrastructure. It first provided local telephony services and then leased circuits. Other electricity companies have entered the long distance telecoms market with fibre on the High Voltage system.

In **New Zealand**, following the process of liberalisation of the telecoms market in 1992, a new entrant, Clear Communications Ltd, was created by a number of companies including British Telecom (BT), TV New Zealand (TVNZ) and NZ Rail. Clear started service with leased lines and then entered the long distance and international telephony markets where it took a 20% share in 3 years. The initial plan was for the holding companies to increase their eventual shares in Clear. However, TVNZ indicated its interest to sell at some point to concentrate on core business. Clear has become 100% owned by BT.

Germany. A number of companies are already investing heavily in telecoms infrastructure. Amongst these are VIAG Interkom and Veba. They all have significant investments in optical fibre and are active in providing private corporates and mobile services. They have strong ambitions to become public operators as well. Veba also has a stake in E-Plus Mobilfunk, a (PCN) mobile operator which has been very successful in competing with two earlier established GSM networks. In fact Germany boasts the second biggest GSM Network after Italy within the GSM Association.³⁵ Total subscribers at March 1999 stood at 15 154 400. Italy had 18 762 900 subscribers.³⁶

Approaches Adopted

The new entrants originate from dissimilar backgrounds and have been subject to a number of different regulatory and market regimes. We therefore find a number of varying approaches to the creation of their telecoms businesses. There are, however, some common themes, and because of their importance, these are individually addressed below, beginning with services:

Service Portfolio. From their official documents it is clear the new entrants have generally entered the market with one or two services and later expanded their range to create portfolios. In most cases, the entrants have launched their telecoms businesses with high-level, high-value services such as long-distance and international telephony, leased circuits or mobile telephony. Where initial services have been dark fibre (e.g. UK Regional Electricity Companies), provision has generally been opportunistic with investment being made to meet specific requirements.

³⁵ The GSM Association is the industry body representing the interests of 347 network operators, regulators and administrative bodies from 133 countries around the world. It is Chaired by Michael Stocks, GM of legal and regulatory affairs at MTN South Africa.

³⁶ www.cellular.co.za/gsm-stats.htm

Market Positioning. The new entrants have achieved significant penetrations into their chosen markets. They have been able to do this because, unlike the incumbent Telcos, they have been able to cream-skim. That is, they have chosen high-spending customers, high-value and high-return services and they have concentrated on the most profitable routes and geographical locations.

Exploitation of Assets. Although some of the new entrants have had financial resources and telecoms know-how to exploit, many of the recent new players have been utility companies who have assets such as rights of way and a customer base. The electricity companies are able to exploit their transmission and distribution networks to carry optical fibre - a method that is in most cases more economical and reliable than laying cable alongside railway tracks or under roads. The electricity company entrants have set out with the aim of maximising the exploitation of their electricity assets.

Partnerships. Entrants opted for partnerships to create their telecoms businesses. This is usually because the telecoms business is often quite different commercially from their core business. They need the know-how that a partner brings to create the new business. Other reasons for partnerships include financing and international connectivity.

Achievements. In spite of being faced by entrenched monopoly suppliers, new entrants made substantial inroads to their target markets. They exploited modern technologies and indirect access to build market share quickly. Early competitors built up market shares slowly. They were slowed down with their implementation due to the need to build infrastructure to every customer.

New entrants have been able to achieve market share far more rapidly than longer-term competitors. There are two principal reasons for this 1. The latest advances in technology (e.g. optical fibre transmission, wireless local loops, etc) have given new entrants a significant technology and cost advantage 2. The concept of interconnect and indirect access (using the incumbent's network to access subscribers) has evolved over the last few years and has offered the more recent entrants a lower barrier to entry.

Lessons from new entrants

Many electricity transmission/distribution companies have successfully entered the telecoms market in their countries. New operators have obtained market share more rapidly than might be expected. Innovative marketing appears to have played a substantial part in the success of new operators. Upon analysing annual reports and information on companies selected for consideration, we cannot fail but determine there are other factors we found contributed to the success of the new entrants: the following are prominent

- Partnerships appear essential. In the countries studied, partners appear to have contributed some or all of the following to the business: the need to decide whether domestic and/or foreign partners would have all of the following to the business- a]. Marketing and product management skills, b]. Systems, technology and R&D c].Established relationships with international PTO's; Infrastructure in places which would otherwise not be covered and the experience of starting up as a second operator and of providing telephony d].Investment in capital.

- The availability of indirect access via the PTO allows new operators to become established faster and with less capital than if they had to extend their infrastructure all the way to their customer premises.
- The level of interconnection charges has a major impact on the profitability of the new business, while the access arrangements determine how easy it is to gain market share. New operators need to be allocated numbers for their directly connected customers, a process that is usually controlled by the PTO's.
- The operators studied had an evolving service portfolio, although there is no standard order for rolling out different services.
- The organisation of the new operators is significantly different from those of the established PTO's. New operators tend to have more sophisticated network management systems requiring less maintenance technicians, whereas they have proportionally more sales, marketing and customer care staff. Add that the success of the entrants has been variable depending on other factors e.g. (regulatory, market, etc).

To conclude, prospects are encouraging for Eskom especially when looking at the experiences of other companies and utilities as they search for opportunities in telecoms. From the USA and across Europe to Japan this section provides interesting insights into market entry strategies deployed. To make more meaningful the insights we have just gained, let us tie them with an understanding of Eskom Telecoms' capabilities analysis.

6.0. CAPABILITY ANALYSIS

We have undertaken a SWOT analysis of Eskom to assist us in evaluating the different services and scenarios. It is hoped that the exercise will contribute towards informing the new strategy recommendations that will follow.

Strengths

- Eskom has Rights of Way (RoW) to enable the construction of a long distance optical fibre backbone network and for site sharing.³⁷
- It operates a nation-wide digital backbone network, capable of being expanded for higher bandwidth operation.
- There is ample experience in design, installation and operation of microwave radio systems.
- The company has experience of operation in a wide range of telecoms services (voice and data)
- Most properties are suitable for the installation of telecoms equipment: this includes radio towers suitable for the installation of antennas for fixed and mobile radio systems.
- By definition Eskom is about large, complex projects undertaken by nation-wide able staff with resources and knowledge.
- The Eskom brand and image is a high value intangible, with wide finance sector / shareholder acceptability.
- Eskom is influential in government and has national and international credibility
- Eskom has access to crucial resources e.g. finance and is known to adopt a long term investment returns view

³⁷ At the time of compiling this Report, the Eskom Telecoms Revenue for site sharing alone stood at R1.3m (Monthly Revenue Statement 08/99 Germiston)

Weaknesses

- The organisation has no public telecoms switching capability
- No current authorisation to provide third party services
- limited local loop infrastructure represents a weakness
- Limited support capabilities (network management, customer care systems, billing systems, etc.)
- Fragmentation of telecommunications capabilities throughout the organization is a weak point
- Low commercialisation and "Low risk" culture dominates
- There is uncertainty about distribution assets
- Diversification experience is limited
- Limited experience of commercial telecoms critical to competitive success in marketing, product management, pricing / tariffing and regulation / interconnection
- Limited experience of commercial telecoms investment decisions and partnership formation and limited experience in design, installation and operation of optical fibre systems and mobile systems.

Technology Opportunities

A number of new technologies are available which can enable Eskom to 'leap-frog' the technology base of an incumbent, gaining cost and functionality advantages. These are:

Switching³⁸

- 64kbits digital, processor controlled switches
- A small number of large processor sites, with remote multiplexing and concentration.

Long distance transmission

- Fibre optics operated at STM1 (155Mbits) STM4 (622Mbits) rates or higher
- SDH multiplexing, with self healing rings
- Fibre mounted on overhead electricity routes
- Digital microwave radio spurs where appropriate

Local loop

- Point to point digital microwave radio at 64kbit/s, 2Mbits and 8Mbits
- Buried fibre
- Wireless (e.g. PCN, DECT)
- Indirect access (via Telkom)
- Access over electricity distribution infrastructure.

Radio based network

- Eskom could build a backbone network for third party provision using fixed point to point microwave radio systems.

Fibre based network³⁹

The overhead electricity network could be used to support an optical fibre based network

- Optical Ground Wire (OPGW) could be installed. However the cost of the new earth wire would have to be fully covered by the telecoms requirement.

³⁸ Crossley, W. (1999) Telkom SA.

³⁹ www.siemens.com/cability (01.09.1999)

- Installation of wrapped fibre-installed on the existing earth wire-appears to be the most attractive prospect. Wrapped fibre can be installed at a relatively rapid rate (in excess of 2km per day per team).

Threats / constraints

The Telecoms Unit currently operates under a number of business constraints which if applied in the longer-term would restrict its ability to enter new markets and provide new services, these include -

- Restrictions on growth of staff numbers. Eskoms' 1986 annual report shows that headcount stood at 66 000. This was putting a heavy burden on finances and human capital costs were disproportionate to revenue per head. The then Chairman of the Board John Maree initiated a company wide drive to align the organisation with global best practices and standards. One of the objectives was to reduce by half, employee numbers over a ten-year period. As at 1999 Eskom had 36 000 employees and the numbers are still going down.
- Restrictions on investment in new infrastructure and equipment, and depreciation rates for capital investments that do not realistically reflect the lifetime of telecoms equipment, etc.

Given that these constraints would curtail the options, we are assuming that they would be lifted or at least modified if an attractive strategy was available.

6.0 Entry Options & Choices

The lines of service open to a new entrant vary from basics such as rental of land or other facilities to significant national operations with massive infrastructure provision. Strategies of entrants are determined by their assets and aspirations as well as by regulatory, commercial and market factors. For an assessment that will follow, we can outline a range of services to determine their general characteristics:

Possible Services⁴⁰

Line of Service	Service Description	Customers	Geography
Exploitation of Property and Rights of Way (ROW)	Lease radio sites and ducts	Telecoms operators	national
Dark Fibre	Build fibre optic network, and sell unequipped fibre	Telecoms operators	national
Bandwidth	Build fibre optic network, and sell bandwidth	Telecoms operators	national
Vans and Data	Provide data and Value added Services	Businesses	national
Virtual private Networks (VPNs)	Manage private Network on behalf of large businesses	Large businesses and administrations	national
Leased Circuits	Lease private circuits	Large & medium organisations	national
National Long Distance (LD)	Inter-urban telephony	Businesses & households	national
Metropolitan Area Networks (MANS)	Several virtual private networks integrated	Large business administrations	Urban & regional
International Long Distance (LD)	Inter-urban telephony	Businesses & households	national
Local Access Telephony	Provide alternative local telephony	Businesses & households	Urban & rural
Trunked Radio	Provide Public Access trunked radio	Businesses and administrations	regional
(Mass) Mobile Telephony	Low cost digital telephony	Businesses & households	National & regional

⁴⁰ The list is non-prescriptive and is composed of actual products and services provided by the companies mentioned in "Review of Utilities and Other New Entrants Involvement in Telecommunications."

The bundle of services (**what to sell**) above suggest Eskom have a wide range of services to work on in preparation of their business case. It is expected that some services could be expanded to include "secondary or related services". And without being prescriptive, we conjecture that it will be appropriate for Eskom strategists to address managerial investment decision criteria in building their plan. Below we outline some of the key issues.

Commercial Evaluation Criteria

We appreciate that Eskom not only faces several important issues at the same time, but also has a relatively risk-averse culture, which should be reflected in any business proposition and the assessment of the business finances. We also admit that Eskom has few formal guidelines to judge the acceptability of a commercial business case, particularly regarding investments in currently non-core businesses such as telecoms.

We shall therefore make the following assumptions for the acceptability of a commercial business, based on our understanding of Eskom's objectives and existing criteria.

- Given the level of management time needed to create a commercial business, the long-term potential of the business should be of **significant scale** relative to the core electricity business (it should typically have a turnover of at least 10% of that of the core businesses). We note that Eskom's balance sheet is strong⁴¹ and strengthening and Eskom should therefore be able to finance even a relatively large-scale telecommunications business.

⁴¹ Net Profit for 1999 stood at R2 750 millions. Eskom (1999) Annual Report.

- That the **Internal Rate of Return (IRR)**⁴² significantly exceed returns that Eskom would expect to achieve by investing in its core business (a real return of 4-6% plus a risk premium) or in "zero-risk" investment vehicles such as government gilts. Given current and projected interest rates in South Africa, the IRR hurdle rate might have to be at least 12-15% (real) to reflect the greater risk that the business will have compared to an electricity business investment.

Combined, the scale and the IRR criteria will help to test the proposed strategy to ensure that the strategy will create sufficient shareholder value for Eskom. Other financial criteria will address criteria such as:

- **Size / Scale / Revenues:** To justify that the scale is sufficient in comparison to Eskom's core business
- **Profitability / Rate of Return:** To justify that the profitability is high enough, particularly considering the risk
- **Level of Risk:** It is important to find the right discount factor and make qualitative judgements

In addition to financial criteria, other criteria and objectives are recommended below.

Non financial measures

- **Infrastructure:** can Eskom use existing assets? to what extent must it build new plant and equipment?
- **Know-how Required:** what know-how is required, is it already in-house or can it be acquired.

⁴² By selecting the IRR as the evaluation tool we are not being prescriptive. Numerous other methods of capital appraisal are used. This section benefited from Drury, C. (1988) Management and Cost Accounting, and Rao, R. (1992). Financial Management: Concepts & Applications

- Requirement for Partner: can Eskom pursue the option on its own or will it need to find a partner.
- The utilisation of existing assets and competencies (strategic fit) to improve the bottom line and to create synergies
- To improve the servicing of the electricity distribution and supply industry
- To avoid operational risk in the electricity business
- To be politically attractive and acceptable e.g. contributing to the Government policy-so that the Government will be inclined to allow Eskom to operate as desired (award a license, accelerate liberalisation or waiver regulatory constraints).
- To fit with Eskom's strategic vision for Southern Africa (for example, the Southern African Grid).

Conclusion

Although constrained in many ways by the political and regulatory situation in South Africa, we believe that Eskom should not be averse to lobbying government and influence change the (telecoms/regulatory) framework to expand the range of possible activities in which it can participate. Following this review, we should like to recommended that Eskom adopt a new strategy to strengthen its capabilities and establish telecoms as a commercial function, providing services to Eskom (legislation permitting), to the ESI and the external market. This approach should offer Eskom a viable incremental strategy with several possible endpoints and exit options. The strategy should be implemented in stages with checkpoints. Below we consider each product and service mentioned in Section 7.0 under "Possible Services" above, and extend the treatment to include issues of re-structuring and

ring-fencing; the integration and development of Eskom's role and contribution, possible commercial opportunities by product, partnerships, risks and pricing. We now set out the new strategy rationale and the recommended plan of implementation in stages.

8.0 New Strategy Rationale

Currently, Eskom is a government owned organisation whose strategic focus is on the core electricity business. For this business it aims to: (a) achieve the Social Upliftment goals for electrification (b) become the lowest cost provider of electricity and (c) drive the expansion of a Southern African grid. The final scenario is still unclear regarding the restructuring of the Electricity Supply Industry but Eskom is likely to retain significant distribution assets. However, it will also need to trade with third party distributors. What is significant is that in the future, ownership of the GT&D groups (or parts of them) may change. It is therefore entirely consistent with these changes that Eskom should seek opportunities to create financial value through determined strategies, both inside and outside its current sector. And one of the key ways that electricity sector companies are achieving this worldwide is through the exploitation of opportunities in the telecoms sector.

At present, the telecoms strategy of Eskom is focused entirely on the effectiveness and economy of internal communications, which remains a key need of the business in Generation, Transmission and Distribution. Telecoms supports these businesses directly and via Information Systems.

Recognising that significant parts of Eskom's telecoms are mission critical and that the consequences of failure would be extremely serious, Eskom wishes to keep them under its control for operational reasons. However, it is appreciated that control could be achieved through different structures than the present ones. Furthermore, many of the telecoms requirements are specialised and could not be provided by Telkom at an appropriate cost, neither with the necessary reliability, nor in an acceptable time frame. Therefore Eskom already self-provides a noteworthy amount of telecoms services.

Eskom's existing assets, particularly its Rights of Way (ROW) and support structures along the transmission and distribution networks, put it in a very strong position to offer telecoms services internally as well as to the ESI and other third parties. Existing telecoms competencies are primarily in engineering; commercial competencies would need to be strengthened for a more commercial future (especially marketing, product management and tariffing, and corporate finance skills).

Currently, the telecoms responsibility is fragmented. And although the bulk of it is located within the Transmission Group. Modern telecoms requires an integrated system in order to be most effective. The fragmentation of responsibility across Eskom has several negative effects such as loss of potential economies of scale and scope; reduction of the performance to end users; lack of overall end to end accountability for the services, creation of inefficiencies in network operation and fault restoration; stranded resources and restrictions on the career path for some staff. Question becomes what strategies are there? What happens if Eskom does nothing?

Do Nothing Now. Under this strategy, Eskom would concentrate on its core businesses, electrification, generation, distribution and transmission. Telecoms would remain a purely supportive function. Eskom may seek to provide some telecoms services to the wider ESI (mainly for operational purposes) but would not seek to further develop the telecoms function except in terms of internal effectiveness and economy.

Pursuing this strategy does not seem to be in the best interest of Eskom. The initiative to improve Eskom's commercialisation would not be sufficiently supported by this option. One feature of this strategy is that it avoids risk. It thus is not proper to follow this strategy.

Restructuring & Ring - Fencing of the Telecommunications Department

Currently telecommunications services are treated as a cost to the business, not as a self-financing profit center. This is inconsistent with commercial practice. We recommend that the telecoms department be established as a self-financing, ring-fenced group with asset usage and service level agreements with the other parts of Eskom. This amalgamation of telecoms resources and responsibilities should provide: (a) improved services for users (b) reduced costs of the overall telecoms services and (c) a stronger base for further commercialisation. Given that telecoms is required by each of the GT&D groups it would seem preferable to place it outside the control of any one of these groups in due course.

The Telecommunications Department should develop full commercial accounts (income statement, balance sheet, etc) and be granted (under commercial agreements) the right by the GT&D groups to install telecoms infrastructure on Eskom assets (rights of way, power lines, buildings, land, etc).

The company will also provide services to the GT&D groups commercially under service level agreements with clear financial terms. Also we recommend that Eskom should document and promulgate a policy on sourcing of services. Under this policy other parts of Eskom should procure services from the Telecoms Dept and only go outside or self-provide if the Dept cannot meet their requirements or is far more expensive.

This would allow Eskom to maximise its overall investments in telecoms and strengthen the commercial competencies of the business unit before subjecting it to competition. It also gives greater control and better bargaining for services procured from Telkom, should it be necessary to do so (the Dept is unlikely to be completely self-sufficient anyway).

This internal supply policy should be eased when the external telecoms market is partially or fully liberalised and when Eskom is itself fully commercialised and is providing services to third parties. Eskom would then have to compete with Telkom, other operators and self-provide telecoms services within. In the short term the focus of Eskom should be:

- 1). To **provide services internally** (GT&D and other groups and divisions) with targets for basic service improvement and lower cost; in addition, Eskom should work closely with GT&D and other Groups and divisions to identify imaginative new ways of enhancing efficiencies internally and with Eskom's customers.

2). To seek to provide services to the wider ESI, i.e. to the extent permitted by the new telecoms regulation or by special permission to support electricity supply.

Integrate and Develop Eskom Telecommunications' Role and Contribution

Under this strategy, Eskom would seek to develop telecoms' contributions to Eskom's financial and non-financial objectives by improving the services provided internally (to Generation, Transmission, Distribution, etc), seeking to provide services to the wider ESI, and seeking to provide services to third parties to the extent regulation allows and in particular where synergies can be exploited by serving both third parties and Eskom and the ESI.

Overall, this strategy would appear to be best suited to achieve Eskom multiple strategic objectives including improvement of the utilisation of its telecoms assets, contribution to the servicing of the ESI, maximising value creation, improving services to internal Eskom customers while at the same time exploring opportunities to provide services to third parties. Revenues from services to third parties can be used in two ways: (1) to recoup investment costs in telecoms infrastructure necessary for Eskom's core operations and hence contribute to the goal of lower electricity prices, and (2) to create new value for Eskom's shareholders.

Coterminous with the recommendations above, Eskom is strongly advised to develop a consummate Business Plan the purpose of which is to address the specific market opportunities identified. It is to these that we now turn.

Commercial Opportunities

The following are the most obvious lines of business for Eskom to develop: These are strongly recommended and include,

- providing high bandwidth and/or dark fibre services,
- Partnering to operate a digital trunked mobile service,
- providing telecoms services to the ESI,
- long distance telephone services (including value added services such as 0800 and virtual private networks),
- leased circuits services for business customers,
- Metropolitan area networks and high speed data services.

Eskom should also consider providing a fuller range of telecoms services to a broad set of market segments in competition with Telkom. The core service is likely to be long distance telephony. The most obvious segments to develop would include major businesses, small and medium sized enterprises and top end residential customers.

The development of such a broad scope of business may be necessary for Eskom to secure a sustainable and competitive position in the long term and would probably require a strategic (telecoms) partner. Assuming Eskom forms a joint venture with 40-60% of the equity, an investment by Eskom in the order of R350-500m may be necessary over the 5-10 year time frame. Of course it would also be possible for Eskom to play a reduced role by taking a smaller stake. It is important that Eskom understand the potential end games in telecoms available to it, and should decide in broad terms what position it would like to achieve, before it embarks on major entry investments. Below we will appraise individual service options in respect of the following categories: Price, Risk and Partnership requirements, beginning with services to the ESI.

Provide Telecommunications Services to the ESI

This should include telecontrol and other service support for operational purposes, data and voice services for administrative purposes, other services from trunked radio to long distance telephony and Eskom owned telecoms infrastructure. Telecoms consultancy, management and outsourcing services may also be offered.

It is currently not clear whether Eskom can use the RoW and other assets of the distribution companies (e.g. poles, ducts, sites, etc) for telecoms services to Eskom, the ESI and the wider public.

Eskom's image is generally good, but not among some of the distributors; distribution companies may not be keen on entering a partnership with Eskom but on the other hand they may lack funds and other resources to build their own telecoms networks. Given the strong case for an integrated network, use of telecoms services provided by Eskom may be in their best interest.

For Eskom to serve the ESI is probably not going to require significant system and infrastructure investments. Eskom could begin by using existing infrastructure and then gradually build out its network to cover more sophisticated services and greater bandwidth. Eskom could also collaborate with electricity distribution companies to build local access networks (with or without cable TV) to serve business and possibly residential customers. The more control Eskom retains over the ESI, the greater its access to rights of way and other assets required to provide telecom services. Eskom will require overwhelming presence within the Distributor business. (A scenario which is explosive is one whereby say, just after a political decision is reached in parliament to liberate the distribution industry,

endow it with all the rights of a free market player including striking deals with players of choice, a huge distributor like the current Eskom Durban Distributor, decides to join up with the current Distributor of Durban City Council and in turn together invite a British or US outfit in partnership to distribute electricity and build their own telecoms network with a view for expansion. The threat is potentially real and could have dire consequences for whatever will remain of Eskom Corporate).

There will be no requirements for a partner, although partnerships/joint ventures with some of the larger (independent) local distributors may be desirable. However, Eskom should seriously try to cover as much as possible of the ESI to achieve a high level of integration of the telecoms functions within the ESI and seek some form of co-operation to be able to use their assets for telecoms.

Pricing: Undercut Telkom regarding pricing, with the aim for long-term contracts. Bundle services for operational purposes with telecoms for administrative purposes.

Risks: The risks associated with providing telecoms services to the ESI mainly arise due to the uncertainties surrounding the restructuring of the ESI but also due to the uncertainties surrounding Eskom's rights to provide telecoms services to the ESI.

Bandwidth & Dark Fibre

Eskom could provide high bandwidth long distance microwave fibre circuits to major organisations via its backbone transmission infrastructure. Eskom could be somewhat more proactive in building and marketing capacity and could also provide certain services including bandwidth switching for customers.

Dark Fibre. Eskom may want to use its Rights of Way (RoW) to build optical fibre infrastructure from which it could lease dark (unequipped) fibre to telecom operators or to large users. Eskom could pursue this option in two ways, either by proactively building a network and then lease it to users or provide upon request by a customer. The latter option is the less risky one and the concept assumes that fibre will be built only on-demand from a customer or where it is economic as part of an electricity transmission project (newly built or refurbishment).

Potential customers: Typical customers would include telecoms operators, security forces, other utilities, broadcasting companies, very large companies and government departments and agencies.

Opportunity in South Africa: At the moment Telkom and Transtel are rapidly stringing fibre to major centers around the country. It is expected that packaged products and services emanating from VPNs and VANS will require increased bandwidth and these companies will be in a position to provide on demand.

Note also that the fibre network can be used internally. This internal demand for bandwidth may not be insubstantial, particularly with new bandwidth intensive IT applications being used and Eskom providing telecoms services to large parts of the ESI. Another advantage is that a fibre optic system could be used for national long distance telephony service.

Requirement for Partner: A strategic partner is not necessary, but fibre-optic network would position Eskom as very attractive candidate in South Africa.

Pricing: Long-term contracts would have to be sought. Pricing is likely to be cost based, but would also depend on bandwidth and duration. Tariffs would have to be competitive with Telkom tariffs unless Telkom cannot provide similar service / bandwidth in which case a higher margin could be achieved.

Risks: The main risks are: uncertain regulatory situation; threat of Telkom political intervention; and the relatively high investment costs. The first two risks are best addressed by Eskom lobbying the government and forming "alliances" with key potential users who are seeking an alternative telecoms infrastructure provider. The third risk is best addressed by only building on request (including internal and third party requests).

Trunked Radio: Public Access Mobile Radio Operator (PAMR)

Most trunked radio operators, private and public, are currently using the **Trans-European** Trunked Radio system. This new standard has several advantages which could make it an interesting service option, particularly as Eskom itself may require such a service for its own operations.

Advantages: The advantage of Tetra would be that ESKOM could use it internally, but also to offer services to the ESI and third parties.

Potential Users:

- Eskom internal and ESI (distribution companies etc)
- Public safety (police, fire and ambulance service)
- Public utilities (electricity, gas, water, etc)
- Transportation (rail, bus and motoring organisations)
- Other government users (municipalities, customs, etc)
- Other users (for on-site users) such as airports & harbors

Requirement for Partner: A partnership or joint venture with an equipment supplier may be beneficial to Eskom to share the risk and to obtain maximum service levels. Also a partnership would provide knowledge transfer and may increase success chances of application. Additionally, a partnership with an existing operator, particularly Transtel, or some key user groups could increase the commercial soundness of this service option.

Pricing: Should be competitive to mobile operators and public trunked radio operators obviously considering coverage and services offered. One-2-One is using fixed price charges. This is done to "ensure accurate budgeting, unlike other mobile communication systems."⁴³

Risks: These relate to the uncertainty surrounding Eskom's chances to obtain a license. Q-Trunk, One-2-One and numerous others are already operating in a very competitive market using state of the art technology.

National Long Distance Full Service Provider

National LD provides a solid business opportunity.

Requirements for Partner: To become a long distance operator Eskom should form a joint venture with a (probably foreign) strategic partner.

State of the art Information and Business Systems will be required. This will be used for complex and sophisticated billing, network management, information management.

Pricing: Undercutting Telkom by 10-20% (depending on service. However, Eskom may not have to only compete on price. Innovative marketing strategies could be used (such as bundling of tariffs and services (long distance and MANS and VANS) to tie in existing customers as well as to attract new customers.

⁴³ www.one-2-one.co.za/trunking.htm (09/20/99)

Risks: The main risks concern the uncertain regulatory situation and the timing of phased deregulation and "full" liberalisation.

Implications for Eskom:

Eskom would need to invest in backbone: upgrade existing microwave network and coterminously build a fibre optic backbone network (which could be limited to certain regions). It would also achieve maximum leverage from electricity transmission and microwave radio network assets. The configuration could include selling high bandwidth (carriers carrier) and "normal" bandwidth leased circuits to business customers.

New Mobile Operator / Public Communications Network (PCN)

Potentially one of the most significant opportunities for Eskom with very high returns, the next generation of digital cellular mobile is expected to be targeted at the mass market. SATRA are holding final public hearings for the third license.⁴⁴

We believe it will be important for Eskom to prepare rigorously for the **fourth mobile license**⁴⁵ to be issued in about two year's time.

As it is, the third operator is expected to have generated about R3billion gross revenue by 2005. In the meantime, projections are that there will be 10 to 14 million subscribers in South Africa by 2005.⁴⁶ PCN networks have become very popular in the UK, Germany, several Asian countries and recently the US.

Partnering with a mobile operator and others would help to

⁴⁴ The author was privileged to attend all recent public hearing for the third cellular license. It was interesting to note that bidders except Telia/Telenor, consisted of many empowerment groups. Some bidders have direct investment by equipment suppliers. And Parastatals like Eskom and Sentech had proposed to take an equity stake in the bidders.

⁴⁵ Satra believe it is economically feasible to sustain four cellular operators. This was after a detailed review of telecoms markets and cellular operators worldwide. Satra concurs that the new generation cellular technologies present vast opportunities for cellular growth resulting in the need for two more operators (www.cellular.co.za/news).

⁴⁶ 3rd cellular bids reviewed (www.itweb.co.za/office/bmi/report2.htm)

reduce Eskom's investment burden quite significantly. Eskom's electricity infrastructure could be used to support microwave or fibre optic network links; substations, towers and other assets could be used for base stations. Expertise in radio communications could be leveraged for the mass mobile business.

Requirement for a Partner: It will be necessary for Eskom to form a consortium. This consortium will need to include an international operator with significant experience in building and operating PCN type networks. A successful consortium would most probably also have to include at least one "black" business group and possibly a trade union.

The consortium formed with other parties will have to make quite significant investments in information systems particularly to provide adequate billing services to customers, but also to make sure that the network is managed and operated to maximum effectiveness and economy.

Pricing: Mass mobile, high capacity mobile networks like PCN typically compete on price to gain market share, also new mobile users are attracted by the low cost proposition. Eskom may also chose to use a very simple pricing strategy to attract customers deterred by complex and confusing pricing options currently offered.

Risks: The investment requirements for this type of service will be significant, but Eskom will be able to share this commercial risk with its partners. Although the commercial viability of a third PCN type network has been proven, it is still difficult than being the first or second network operator. These are best addressed by preparing a business plan and presenting a case to the government for lobbying purposes.

Local Access

The attractiveness and availability of this option very much depends on factors such as: (1) the relationship that Eskom has (post Telkom PSTN license monopoly expiry) with local distribution companies or other companies with an appropriate urban infrastructure (sites, property and rights of way), (2) the actual deregulation of local access and the number of licenses, (3) the economics of wireless local loop and other advanced technologies and (4) the interconnect regime.

In the long-term, however, particularly as a full service provider, the company would wish to provide limited local access to its key customers. However, if the new Telecoms business were to operate a mobile PCN network as well, it might be able to use that technology to provide local access instead (at least to the residential and small business segments).

Resale of Long Distance Telephony Services

The Act states that new entrants could sell long distance capacity leased from Telkom as of year 4, which is 1 year before new long distance operators would be allowed to use their own infrastructure. Resale of Telkom capacity will probably not be very attractive for Eskom in its own right. However, it is difficult to exactly match available capacity with actual demand and Eskom may find it possible to improve its margins by reselling some of its capacity leased from Telkom to 3rd parties. It could also be a measure to enlarge its customer base in anticipation of becoming an infrastructure based long distance provider in subsequent years.

International Long Distance Services

If we go by the letter of the Act, international long distance services will be liberalised in year 2002 (possibly only to one second operator, but possibly also to an unlimited number of new players). Although Telkom would have some years to rebalance its tariffs i.e. increase local tariffs and reduce long distance margins on international long distance telephony services are likely to remain high and make this service very attractive.

Eskom would require an international partner, or at least an international correspondent carrier, otherwise accessibility and attractiveness are quite high. Eskom may also be able to make use of its cross-border transmission lines in Southern Africa to carry international traffic. In the long-term as a full service provider - Eskom would need to offer all types of services including full international telephony services to avoid being squeezed by Telkom rebalancing its tariffs.

Value Added Networks (VANS) & Virtual Private Networks (VPNs) ⁴⁷

The market for VANS and particularly VPNs is expected to grow strongly. There were 700 000 registered users of the Internet in 1998 with projections that numbers could reach 1.4 million users by the year 2000.⁴⁸ However, despite these growth prospects, the business case for Eskom to provide VANS and VPNs is weak (outside Eskom and the ESI). As the barriers to entry are relatively low, the market for these services usually becomes very competitive with subsequent low margins. Eskom is currently also limited in the commercial skills required (including applications skills in customer sectors, for example banking or retailing), although a strategic partner could bring in the

⁴⁷ VPNs are wide networking capabilities over shared (some one else's) but secure infrastructure.
⁴⁸ Vodacom entered the VANS market in October 1998. Part of the strategy was to lower barriers to entry by offering computers, modems and internet access in bundled packages. Affordable prepaid access and brand name were part of the formula to cultivate a 250 000 home-user segment.
www.vodacom.co.za/press_internet.html (21.10.98)

required skills and knowledge. Overall, Eskom would want to offer VANS and VPNs to the external market in combination with other services as part of a strategy to become a full service provider.

Metropolitan Area Networks (MANs)

A metropolitan area network is typically provided as a fibre network to major businesses in central business district(s) of large cities. It effectively enables the combination of private networks. In addition the MAN provider can sell or resell long-distance capacity to its customers. In fact at ScottishTelecom, early success was achieved through the completion of several high profile projects. The installation of both the Glasgow City Watch surveillance scheme and the Scottish universities' MAN provided tremendous publicity for ScottishTelecom.

Also, the completion of a project to provide the BBC sound and vision services to Scotland via a connection between the ScottishTelecom network and the BBC's Blackhill transmitter was one of the largest success stories for the company.⁴⁹

The attractiveness and availability of this option depends on a number of factors such as (1) the relationship that Eskom has at that point with local distribution companies or another company with a good urban infrastructure (sites, property, ducts and poles suited for fibre), (2) the actual deregulation of local access and number of licenses, (3) the demand for local private networks and VANS/VPNs and (4) the interconnect regime and required universal access fund contribution permitting economic long distance services. A MAN business could fit well with a long distance service (once regulation permits).

⁴⁹ www.scottishpower.com (20.09.1999)

Rights of Way and Property Sharing

Utility companies like Eskom can exploit their properties and rights of way to allow telecoms operators to construct networks. Typical options include (1) leasing rights of way for installation of a fibre network, (2) leasing radio sites for mobile service providers, and (3) leasing property for housing of telecoms equipment. RoW for Eskom would include electricity transmission lines and power ducts. Potential customers may be telecoms operators, broadcast organisations and other utilities. Utilisation of Eskom's RoW could have the advantage of being low risk and not capital intensive. Eskom could share buildings, transmission lines, towers, etc with third parties such as Transtel, Vodacom, MTN, etc. However, this option would prevent Eskom from using some of its assets for more lucrative services on its own.

Eskom should not completely disregard sharing property and Rows but very carefully evaluate the implications of enabling competitors (by leasing properties & RoW) on its strategic intentions. In addition, Eskom will be able to provide a range of services to the ESI, including local authorities but also regional distributor etc, depending on the eventual ESI restructuring outcome.

Paging

Paging has been excluded as an option for Eskom. Even if Eskom were to buy-out or take a stake in some of the existing players we believe that the market potential does not justify the effort. Why do we say this? The continual technological improvements and refining as contained in cell phones will push paging more and more towards the periphery. For instance cell phones have a short message (SMS) transmit and receive capability in addition to voice, real time transmission. Other

basic functions performed by cell phones include for instance: diary and or phone book, calendar and calculator, call barring, Internet access, call waiting and call diverting. Paging gadgets cannot match these capabilities. Moreover, just about all of the functionality provided by paging is being provided by cellular phones and trunked radio anyway, and therefore paging will (to put it mildly) become an even more a specialised niche product than it is now.

Concluding summary. Without doubt, the size of the product/services basket above is by no means exhausted. What we sought to do was to illustrate the extent to which each of the mentioned product/service offering justifies consideration for investment. We sought to show what is involved, what is at stake, what works and how.

Appraisals were made for business opportunities on a stand-alone basis, and this is not fair. In practice the businesses may share capital assets and other resources. Integrated business plans would demonstrate better returns. For instance the bandwidth and long distance telephony opportunities would be particularly synergistic through network sharing. The mobile phone and Tetra opportunities may also be synergistic through transmitter site and network sharing.

In the context of this assignment it has not been possible to validate all of the assumptions. The full validation would be one of the objectives of full business planning for each opportunity. More detailed and integrated business and financial planning may lead to material changes to the underlying assumptions, and thus the output projections.

The remainder of this section will deal with both technical and organisational issues for Eskom to address in formulation of their new telecoms strategy. These technical and organisational issues are many and varied, but for purposes of this works we consider issues of integration of telecoms function, technology acquisition and which partners to choose and for what alignment. The section ends with that all-important topic - communications and the actual management of change. We now turn to issues of strategy implementation, beginning with technical aspects thereof.

9.0. Strategy Implementation

It is recommended Eskom consider the following **Technical Issues**.

- The full integration of all telecoms functions after amalgamation into Eskom might require a project team.
- Also consider issues involved in the acquisition and implementation of technology, equipment, and IT (network management, billing etc) to provide services to the ESI and third parties.
- Appraise requirements for further expansion of the microwave backbone network and/or installation of a fibre-optic backbone network.
- Technical planning and implementation to provide Tetra (trunked mobile radio). Technical planning to prepare business plan for bid for fourth mobile license. Technical planning to provide long distance telephone and leased circuits.

Operational and Organisational Issues

- Strategic Partners and Joint Ventures: We recommend that Eskom initiate a process of finding one or more appropriate partners for the following:
- find and select partners for a consortium to bid for the fourth mobile license. This is likely to involve an experienced foreign operator, a black business corporation or financial institution, and one or more unions;
- find and select partner(s) for the digital public access mobile radio network (Tetra), a company with Tetra experience, key customers, (a consortium of) electricity distributors or Transtel; and consider a strategic partnership to prepare for becoming a national long distance telephone operator in the medium term and a full service provider in the long-term may involve a partner in another line of business (mobile or Tetra) or it could be a new partner not previously involved.

Communication and the Management of Change⁵⁰

"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success than to take the lead in the introduction of a new order of things."

(Machiavelli)⁵¹

Internally, Eskom should also consider strategically planning communicating the reasons for the amalgamation, "ring-fencing", and commercialisation to senior staff in key user groups and, most importantly, to staff who will be directly affected (telecoms engineers and technicians). Staff that will be directly affected, must also be informed about the benefits of these processes to themselves (better career opportunities, more exciting work environment, potentially higher pay, etc) to gain their commitment. Eskom may wish to consider a long-term communications strategy for the directly affected employees to help them adjust to their "new" work environment and keep them informed about the changes on an on-going basis.

Responsibilities for managing change and communications plans are too frequently being performed as an 'elite' staff function located at corporate HQ, remote from day to day events and those directly affected. Plans that are developed in isolation from current activities and key stakeholder involvement. These plans will either gather dust on the shelf or lead to costly and bad management decisions. Clarity of roles is crucial.

Who does what, when, how and why cannot be over-emphasised. The themes below need be carried and spread across the organization;

⁵⁰ There is an extensive literature on Corporate Communications and Change Management. We make no pretense to having read them all, and for purposes of this Report our favorites are by Peters, T. and Waterman R.H. (1982) In Search of Excellence; and Kanter R.M. (1983) Change Masters. Add also Thompson J.L. (1993) Strategic Management: Awareness and Change.

⁵¹ An introduction to Chapter 24: Managing Change, by John Thompson.

Communication of plans: To get employee buy-in and commitment to plans, a robust communications and promotion strategy must be developed and implemented. Also, clear communication of the success of plans must be channeled throughout the organisation.

Intervention exercises: It is recommended, dynamic planning workshops for the entire management structure. The workshop program content should include: the information era imperative with the use of living examples of public utilities in the process of change: include facts and figures from the ITU databases, Telkom, including material from the very useful www.energyonline.com⁵² website. In combination, this will be helpful for Eskom employees to see that after all they are not the only ones affected by the unstoppable forces of change in the Utilities Industries.

Searching for business opportunities by Eskom will not be enough if the exercise does not consider the country's economy and demographics. South Africa is a vast country with geographic, political and economic problems all its own. Section 10 below considers these including potential business customers, location and type of business customers, the population, geographical spread and average income. We address first the economy and an analysis of demographics of the country.

⁵² Energyonline.com is a resourceful database on changes in the Power Utilities. It is entitled "Restructuring Blueprints"

10. Economic and Demographic Analysis

Although South Africa is going through a difficult transitional period, projections by research institutes such as the Economist's Intelligence Unit (EIU), a source relied on by investors, point upwards and have a positive impact on demand for telecoms. The population is around 42 million of which 60% live in urban areas. The main centers are Gauteng which includes Johannesburg and Pretoria, Durban, Port Elizabeth, and the Cape Peninsular. By addressing customers in these and key secondary areas, Eskom would cover a significant amount of the market.

PROVINCIAL STATISTICS

Province	Population	Main City	Population
Northern Cape	0.80m	Kimberly	0.18m
Eastern Cape	7.14m	Port Elisabeth	0.72m
Western Cape	3.85m	Cape Town	2.01m
Free State	2.99m	Bloemfontein	0.33m
Northern Province	5.56m	Pietersburg	0.07m
North West	3.79m	Klerksdorp	0.34m
Kwazulu/Natal	9.18m	Durban	0.49m
Mpumalanga	3.09m	Nelspruit	0.07m
Gauteng	7.19m	Johannesburg	1.66m

Source: Statistics South Africa Publication Sub Division Provincial Statistics Part 1-9 (1996) Pretoria.

Potential Business Customers

We have also identified a number of large South African businesses, which could be potential customers of the Eskom company. A selection of these companies is shown in the table below. This selection is not complete and does not for example include multinationals, municipalities as well as MTN, Multichoice and Vodacom. The companies have significant communications and information infrastructures. Please turn the page.

Potential Business Customers

Name	Type of Business	Location
ABSA Bank	Banking	Johannesburg
Nedcor	Banking	Johannesburg
Standard bank	Banking	Johannesburg
First National Bank	Banking	Johannesburg
Boland Bank	Banking	Paarl
NBS	Banking	Durban
Pepkor	Clothing/retail	Cape Town
Wooltru	Clothing/retail	Cape Town
Edgars	Clothing/retail	Cape Town
Engen	Petroleum	Cape Town
SAB	Beer/retail/industrial	Johannesburg
Pick & Pay	Retail	Cape Town
Liberty Group	Insurance & Investment	Johannesburg
Southern Life	Insurance & Investment	Johannesburg
Metropolitan	Insurance & Investment	Cape Town
Old Mutual	Insurance & Investment	Cape Town
Barlow Rand	Industrial Holding	Johannesburg
Anglo American	Mining / Investment	Johannesburg
Murray & Roberts	Construction	Johannesburg
Premier Group	Food	Johannesburg
Sasol	Petroleum	Johannesburg
Sappi Ltd	Paper/Wood Products	Johannesburg
Iscor	Steel Manufacturing	Pretoria
Gencor	Mining	Johannesburg
Remgro	Tobacco/Investments	Stellenbosch
SABC	Public Broadcasting	Johannesburg

Source: Adapted from: www.fm.co.za/topco99/dtab6.htm (04.10.99)

The table illustrates that although most of these companies will have a nation-wide presence, their headquarters are concentrated in a few areas/cities of South Africa. Eskom could therefore target national and regional headquarters of these companies

without having to serve the entire country. On request, Eskom could still provide services to sites not covered by providing VANS via leased lines.

Demographic Analysis

We have identified a number of key regions based on population, number of people employed, total disposable income and the number of large/medium businesses. Most potential customers are concentrated in the Northeast of South Africa, mainly Gauteng. Other important cities/sub-regions include Cape Town and environment, East London, Port Elizabeth, and Durban.

Population & Income Distribution

Area	Province	Population In '000s	Employment In '000s	Disposable Income 1990 prices Rm
Western Cape Cape Town + Environs	Western Cape	2,778	1,067	24,427
PE - Uitenhage	Eastern Cape	918	298	6,315
East London Ciskei area	Eastern Cape	866	170	3,662
Freestate Goldfields and Bloemfontein	Freestate	1,581	558	8,201
Durban- Pietermaritzburg	Kwa-Zulu/Natal	4,759	1,408	22,030
Mpumalanga	Mpumalanga	1,216	425	6,926
Pietersburg Seshego area	Northern Province	599	168	2,050
Pretoria area	Gauteng	2,853	947	16,504
Johannesburg Including Soweto	Gauteng	5,015	2,11	51,476
Vaal Triangle	Gauteng	845	212	6,485
Klerksdorp Potchefstroom Rustenburg	North West	1,033	393	6,050

Source: Bureau for Market Research (UNISA) 1995

The table suggests the geographical concentration of business

and residential customers has important implications for a new entrant as it influences where the entrant needs to build-out the network first. By serving businesses in the Western Cape, Gauteng, and Pietermaritzburg/Durban alone, Eskom would be serving well over 60% of all businesses. This targeting is very important, especially in the initial stages of investment roll out program.

It will be proper at this stage to discuss also the region we operate from, more so because our country has one of the highest telecoms traffic flows which stays within the country. Section 11 below will discuss the importance of southern Africa with regard to telephony (fixed and mobile), data communications and value added networks, the parastatals and broadcasting.

11. Importance of Southern Africa

A detailed analysis of the opportunities in Southern Africa as a region is outside the scope of this study. For this reason, we have not addressed the possible venue impact of international telecoms traffic should Eskom decide to put fibre optic cable on its international transmission grid.

Still, South Africa has one of the highest percentages of traffic that stays within Africa. This is partly because South Africa offers transit and switching services to countries in Southern Africa. Other reasons include migrants from neighbouring countries working in South Africa as well as close trade ties. In 1997, more than 30% of Southern African traffic was to South Africa while 20% came from South Africa. This percentage was even higher for countries that border South Africa. The largest intra-African routes are between South Africa and a neighbour. The biggest is between Namibia and South Africa, accounting for 61 million minutes in 1997. This is more than 1.3 times the next biggest route, South Africa-Zimbabwe, which accounted for 49 million minutes in 1996.⁵³

Fixed Telephony. Telkom, the 100% state-owned telecoms operator, has a monopoly in fixed network service. Telkom installs, maintains and operates voice and non-voice networks. Some 92.5% of Telkom's exchanges are now digital⁵⁴ and the official target is full digitalisation by 2005. Telkom is required to install 4-5 million lines over the next 5 years.

Mobile Telephony. The two GSM operators are Vodacom and (MTN). Telkom has shares in Vodacom. Transnet owns 20% of MTN. There is a dozen or so service providers in the cellular market, three

⁵³ John Temple (1999) Telkom SA

⁵⁴Of the 3512 exchanges, 3 388 are digital. Telkom (1999) Annual Report. Operational Statistics.

trunking operators and a reducing number of paging operators.

Datacoms and VANS. Competition in the datacoms and value added network services is quite intense with a large number of companies, including international operators, offering services in South Africa, particularly for foreign multinationals. Among the foreign companies offering services are AT&T, IBM, BT, and Sprint. Telkom itself has increased the number of products it offers in this area, but it has difficulties competing due to its unbalanced tariff structure.

Parastatals. The two parastatals, Eskom and Transnet, its division Transtel, have their own telecoms networks. They provide extensive "tin-house" telecoms services to support their core activities. The Transnet network is approximately 1.5 the size of Eskom's, and features some of the latest transmission technology.

Broadcasting and Satellite. In television and broadcasting sector, the key players are the South African Broadcasting Corporation; (SABC) and M-Net, Multichoice. Sentech, an affiliate of SABC and Orbicom, an affiliate of M-Net, provide broadcast signal distribution services by means of a range of technologies, including leased Telkom lines, microwave links they supply themselves, or leased satellite links. More satellite based pay-TV services operated by Multichoice became available in late 1995. Transtel uses satellite communications to support its transport operations in Southern Africa. Telkom also makes use of satellite technology.

And whilst at it, the discussion will not be complete if we do not address key players e.g. Telkom, Vodacom, MTN and Transtel. Telkom is the largest telephone operator in Africa. The company is in the top ten of South Africa's groups. The next Section

considers Telkom and the said players from the variable basket of their core strengths, tariffs, debt exposure, key operating statistics as well as weaknesses. We undertake an overview of Telkom first.

Key Telecommunications Players

Telkom. The government owned giant currently provides most of South Africa's telecoms services on a monopoly basis. As such, it provides all switching, local, national long distance, and international services.

In the face of increasing international competition, Telkom began to rebalance tariffs in January 1995, reducing the cost of long-distance calls and raising local charges. An attempt has been made to further rebalance tariffs again in 1999. In a step to make tariffs 'more cost oriented, Telkom has introduced different charges for business and residential lines, reduced the duration of local call units, and adjusted trunk call distance intervals. From the 20 September 1999 calls from fixed lines (Telkom) to cellular phones have been differentiated by time of day and day of the week. Standard and Callmore charges apply depending on when the client uses the phone.⁵⁵ Despite these and numerous other marketing designs the challenges for Telkom are huge. AT&T for instance have moved on beyond packaging prices the normal way. Instead clients can call from anywhere in the USA at any time at (US) 7cents per minute.⁵⁶

Telkom's workforce complement of 61 237, represents a high headcount. This after having taken a 50% stake in the profitable Vodacom, and bought a 70% holding in radio-trunking company Q-Trunk, which enables long-distance road hauliers to communicate

⁵⁵ Telkom Customer communication inset accompanying the October '99 monthly domestic telephone services statement of accounts.

⁵⁶ www.att.com (09/99)

with one another at a flat rate regardless of the number of calls made. It set up a new subsidiary, Swiftnet (of which it owns 60%), that will enable credit card transactions, security messages and meter readings to be sent by radio rather than telephone lines.

Telkom has a major role in Government policy i.e. in the context of license requirements to meeting social obligations around the empowerment of historically disadvantaged groups, increasing teledensity and bridging the digital divide within a broad development framework. For instance, the company is committed to install 1 million new lines a year for the five years of the license exclusivity period [Telkom paid R3.3million to SATRA as penalty tied to service targets set out in its operational license, which also grants it exclusive rights].⁵⁷ in remote and isolated villages, meaning Telkom will increase its current annual installation of nearly 200,000 lines by five times to achieve this target. This program will more than double the installed base of 5 million lines and raise the penetration rate to 20%. For under-serviced metro/urban areas Telkom's penetration target will be 40% by the year 2000. The exercise has not come inexpensively. To fund the rollout, Telkom had to shoulder interest-bearing debt of R13.54bn as at March 1999. However, it has upgraded aspects of its existing services, improved customer service and introduced new technologies and services. As part of this program Telkom is in the process of introducing ISDN in the main cities and it aims for complete digitalisation of its network by the year 2005.

⁵⁷ In terms of these rights, Telkom must reach certain targets on its level of service and the number of new lines installed. Failure to achieve brings about a penalty (iTwab 13.08.99).

Tariffs. Comparing the structure of Telkom's tariffs to operators such as AT&T, which have re-balanced their tariffs to avoid losses on the access service, the analysis suggests that there is significant cross-subsidisation of the access and local call services by trunk and international services. This is particularly likely given the low local call tariffs in South Africa.

Selection of Telkom Tariffs

		Dollar	Rand
PSTN connection charge (single line)		40.01	92.38
PSTN rental per month	Business	13.38	64.24
	Residential	11.57	55.54
PSTN calls/unit	Peak	0.08	0.386
	Off-peak	0.02	0.116
Cellular three minute call	Peak	0.92	4.43
	Off-peak	0.46	0.22
320km(200 mile) long distance	Peak	0.25	1.19
call per minute	Off-peak	0.12	0.59
International call to USA		0.95	4.58
Leased line 64 kbps to Europe		5.113.51p/m	24.555.60

Source: BMI-TECHNOWLEDGE 1998 COMMUNICATION HANDBOOK p.178

Telkom's local and access tariffs appear to be rather low and not cost oriented. In some areas the fixed network now faces competition with the mobile services. Telkom is most vulnerable in long-distance and international service areas. A recent mild rebalancing of tariffs was designed to respond to competition by call back and other services provided by other international carriers. However, the issue of affordability and the fact that for most tariff changes it requires approval by the Minister will limit Telkom's ability to fully rebalance tariffs in the short - and medium-term.

Telkom's current tariff structure makes it vulnerable to competition in long distance and international telephony, which could represent a significant opportunity for new entrants such as Eskom.

Operations and Network Statistics

In order to assess the ability of Eskom to compete with Telkom, we also analysed Telkom's strengths and weaknesses based on standard performance indicators.

Key network statistics

Number of new lines in service	849 134
Replacement of non-digital lines	746 458
New public pay phones installed	59 606
New lines installed in under-serviced areas	590 461

Telkom SA Annual Report 1999

Service Quality statistics

		Business	Residential
Fault reports per 1000 lines	Target Achieved	530 349	550 487
Faults cleared within 48 hrs	Target Achieved	90 76	83 68.4
Services activated within 28 days	Target Achieved	75 87	68 76

Telkom SA Annual Report 1999

Observations

The highest demand for basic telephony comes from less wealthy parts of the population. Connecting these is also the aim of the

Government policy. Telkom will have to face the challenge of completing the digitalisation of its network. At the same time, it will have to improve its customers service, meet its Government policy targets, and introduce new services. Finally, Telkom will need to improve its quality of service and efficiency to effectively compete with new entrants. Measured by faults reports per 1000 lines and, faults cleared within 48 hours and the length of time it takes to activate a service, then Telkom is inefficient. The high head count at Telkom is also an area of considerable advantage for new entrants.

Telkom Strategy and Strengths / Weaknesses

Seeing the threat to its telecoms monopoly, Telkom has become very protective⁵⁸ and aims to improve its customer service and upgrade its network while at the same time achieving the ambitious targets of Government policy. Although Telkom has significant strengths due to its dominance, it also has several substantial weaknesses making it vulnerable to competition.

Strengths

- Telkom is the largest telephone operator in Africa, with over 5 million lines and a range of services. Ranked among Top 10 local companies, it has shares in Vodacom and other companies, including extensive networks, and fibre optics.
- Telkom is the dominant operator in the largest market in Africa. South Africa is a good springboard to other countries and is establishing itself as a leader in the region.
- The company already recognised the need for change to transform itself into a modern corporation.
- It is the single most influential player in the sector.

⁵⁸ The latest manifestation involves SAVA, the value-added operators and Telkom in conflict over the multi-billion rands value-added network sector. Sava accuses Telkom of ignoring the SATRA ruling (no: 53) ordering the company to refrain from "making statements to Vans customers regarding the legal status of VANS operators.
(www.itweb.co.za/sections/telecoms/1999/9909151348.asp) 16/09/99.

Weaknesses

- Telkom carries a high debt burden (and high interest rates) with net debt amounting to R13 541m as at March 1999.
- It is regularly a victim of vandalism, crime and theft. Poor image and a lacking customer focus.
- It has an unbalanced tariff regime and is vulnerable in international and national long distance sectors.
- There is a high head count, with many non-core businesses plus a poor quality of service
- The company has a tradition of problematic militant trade union tendencies.

Vodacom South Africa.

Vodacom has been investigated for alleged collusion with MTN; opened networks in Lesotho, Botswana and Swaziland. The company started with bundled Value Added services and bought Afrilink's subscriber base from Teljoy. The recent deal (R420 billion) between Bell Atlantic Corp. of the USA and Britains' Vodafone AirTouch will bring big benefits to Vodacom subscribers. The deal means that Vodacom (31.5% owned by Vodafone AirTouch) is now part of the largest cellular entity in the world. Benefits to subscribers include; free roaming in many countries, Vodacom will be able to partake in centralised buying to obtain better prices etc.⁵⁹

⁵⁹ "Bell Atlantic and Vodafone deal brings US roaming to Vodacom SA subscribers in 2000"
www.itweb.co.za/services/print.asp?storyID=7232

Vodacom Figures⁶⁰

Capex 1998: R2.8billion
Capex 1999-2000: R2.3billion
Total Base stations: 2 700
International Roaming Partners: 104
1997/98 - revenue R4.4billion
1997/98 attributable profits: R460m

Strengths - Vodacom has the largest number of subscribers (1.6m users or 67% market share); shares transmitters with MTN; widest coverage; also service provider via Telkom which has 50% shareholding; Vodacom is exposed to little risk due to service provider carrying risks; The company's long distance tariffs are lower than Telkom. Vodacom has limited contact with individual cellular customers, therefore coverage and quality of the network are critical success factors.

Weaknesses

Very rapid subscriber growth affected quality of network and services. Several service providers ran into problems, Vodacom must lease circuits from Telkom.

Strategy

- To achieve more presence in the service provider arena.
- Service expansion into neighboring countries.
- Improve quality of service and network

MTN

Developments - MTN was also investigated for alleged collusion with Vodacom. It started Value Added Services and obtained full control over M-Tel, the service provider. The company has gained enormous benefits from the entry of SBC as a new shareholder.

⁶⁰ "Statistics of Cellular in South Africa" www.cellular.co.za (30/06/99).

In collaboration with Spoornet, MTN sealed a deal worth R100 million to provide total cellular coverage of the Richards Bay to Witbank Coal Rail line.⁶¹ Deals with the governments of Rwanda, Uganda and Swaziland have been concluded enabling MTN to secure licenses aimed at expanding the cellular network business. The company is also spending R1 billion installing Pico system (cellular sites within buildings) all over South Africa. Pico enables better network quality and service and dramatically enhance coverage in areas such as lifts and bathrooms.

Strengths - Sharing transmitters with Vodacom means little risk due to service provider carrying most risk. Long distance tariffs are lower than those of Telkom. It is a service provider via M-Tel.

Weaknesses - MTN has less regional coverage than Vodacom (but improving fast) and therefore a smaller market share. Like Vodacom, it must provide community service and it has to lease circuits from Telkom to connect base station etc.

Strategy

- To achieve more presence in the service provider arena.
- Expand coverage and improve services.

⁶¹ MTN Press Releases (1998) www.mtn.co.za/

Transnet/Transtel⁶²

Transnet is the transportation parastatal, which in 1992 became a statutory organization. It led to Transtel getting its own identity. Core businesses of Transnet are:

Spoornet: Heavy rail traffic

SA Airways (SAA): Domestic and international air transport

Autonet: heavy road transport and busses

Portnet: Harbours and lighthouses

Petronet: pipeline transportation of crude and refined oil

PX: Container shipment and consignment distribution

Metrorail: Commuter rail service provider

Transtel is the communications arm of Transnet. It was born out of the Telecoms Department of South African Railways and Harbors and initially provided simple local telephone services for management and running of the Railway services throughout South Africa. Transtel has a staff complement of 3,100 as at the end of March 1999. It also has an investment budget of R120 million with diverse telecoms interests covering

- An extensive in-house telecoms network (over 100 000 telephones with national dialing capability and 20 000 computer terminals) including paging services, radio trunking, voice and data networks. The network features country wide coaxial cable, fibre optics, microwave and satellite transmission systems.
- It has a 20% stake in cellular operator MTN and ownership of a cellular service provider, Transtel Cellular (exclusively MTN)
- And also a 50% plus 1 share stake in radio-trunking operator Fleetcall (the market leader in public mobile radio systems)
- MNT leases two telecoms transponders on PanAmSat 4 with 70 VSAT sites in South Africa.
- fibre optic network - fibre optic systems have been installed

⁶² Transnet (1999) Annual Report

between Johannesburg, Pretoria, Witbank and Middelburg as well as certain ports.

Strengths

- It can count on the size and diversity of Transnet Group
- The company has sound political connections,
- It boasts the second largest infrastructure after Telkom
- There is a rich diversity of interests and experience

Weaknesses

- union resistance to privatisation
- less influential in telecoms than Telkom
- no direct ownership of RoW as Eskom
- access to railway RoW less secure
- outstanding debt

Transtel's Strategy

Transtel's strategic goal is to be the customer driven one-stop telecoms company serving Transnet and business throughout Africa with a range of telecoms and I.T. related products of guaranteed quality and appropriate technology designed to enhance client competitive advantage. Transtel is in favour of privatising Telkom and open competition in telecoms and sees itself along with Telkom and Eskom as the initial long distance service providers. The organisation also wants to be able to build up its own telecoms infrastructure to enter the field as a full service provider once regulation permits.

Transtel would most likely be Eskom's strongest competitor for a second network operator license. Eskom would also see itself competing against Transtel in several other telecoms services such as mobile, trunked radio and value added services. However, Eskom might be able to turn this threat into an opportunity by forming an alliance with Transtel and a mobile like MTN. It will

not be difficult for such an alliance to take place, but should be explored further.

Although in certain areas they would complement each other well (Transnet has more telecoms assets and experience and Eskom has a stronger balance sheet and better rights of way), in other areas there may be duplication of assets and other resources.

Final conclusion and recommendations.

We have run the distance. We can safely conclude evidence suggests there is scope for Eskom to invest in telecoms. We were able to establish the interplay between electricity and telecoms - and business opportunities arising out of that relationship.

That the global economy is undergoing an information revolution which will be equally as significant in effect as the industrial revolution of the 19th century. The growth in information has spawned a business opportunity. Call it the information transportation opportunity. With these changes have also come changes in the way Utilities are managed, changes in the regulatory regimes as explained by liberalisation of the telecoms sectors of national economies and a move towards radical transformation of state monopolies. In that context South Africa's Eskom, the wholly owned government parastatal has not been immune from these changes. We also examined core themes and issues underpinning these huge changes in the utilities. To that extent, yes we are satisfied that a business case for investment in telecommunications is valid.

We should therefore like to recommend that Eskom adopt a strategy to strengthen its capabilities and establish telecoms as a commercial function, providing services to Eskom, to the ESI and the external market. The approach must be couched in such

a way that it is flexible and versatile. We believe Eskom should not be averse to lobbying government and influence change the (telecoms/regulatory) framework to expand the range of possible activities in which it can participate.

Market characteristics and developments suggest that there will be a significant and growing opportunity for new entrants in the coming years. Assuming that the proposed regulatory changes occur as currently stated, this opportunity will develop gradually over time. This has the advantage for Eskom that, if it wishes to create a commercial telecoms business, it has time to develop its business case. Eskom's desire for a public service license, and particularly in advance of the currently proposed liberalisation dates, would be enhanced if it were able to show that it could contribute to the broad development agenda of the country.

Eskom's electricity grid is not only its principal core business asset but it could also be the key asset in building an infrastructure. It is recommended that Wrapped Fibre be installed on both transmission and distribution routes to provide a nation-wide, high capacity network with a full services network in mind.

To strengthen market entry preparations, we recommend Eskom to decide on domestic and/or foreign partners as a matter of must, and also engage Telkom, the government and service providers on a). interconnection charges and b). facilities and site sharing. The organisation of the new operators is significantly different from those of the established PTO's. New operators tend to have more sophisticated network management systems requiring less maintenance technicians, whereas they have proportionally more sales, marketing and customer care staff. It is imperative therefore that Eskom addresses questions of type of structure in

concert with scope and objectives of the organisation.

South Africa's telecoms market size in 1997 was in the region of 25bn Rand. Of this, Telkom accounted for over 10bn Rand. The rest can be mainly attributed to some large value added service providers, the cellular operators, Eskom, and Transtel.

By 2005, South Africa is estimated to have over 10 million subscribers, or a penetration of approximately 20%. If a third mobile operator were allowed to compete in late 1999, it might capture 20% of the market in terms of subscribers and 20-25% in terms of gross revenue of R3bn.

Demographic and business location considerations have shown that most of companies have a nation-wide presence, their headquarters are concentrated in a few areas/cities of South Africa. We recommend that Eskom target national and regional headquarters of these companies without having to serve the entire country, especially in the initial stages. The highest demand for basic telephony comes from less wealthy parts of the population. Connecting these is also the aim of the Government policy. Telkom will have to face the challenge of completing the digitalisation of its network. At the same time it will have to improve its customers service, meet its Government policy targets, and introduce new services. Add to these challenges Telkom faces like the high debt, vandalism and a problematic service culture. All these plus the current tariff levels by Telkom and industry structure present a unique opportunity for a new entrant to exploit. Even though Telkom will attempt to rebalance its tariffs this will take a considerable number of years.

Apart from Telkom, which will put up a stubborn and determined fight to retain market domination, Eskom is going to face tough competition from the already established operators. On the one

hand there is MTN and Vodacom even though these are cellular operators and are not into the fixed lines business. MTN has lesser regional coverage than Vodacom and therefore a smaller market share. Like Vodacom it must provide community service and it has to lease circuits from Telkom to connect base station etc. The two companies are determined to achieve more presence in the service provider arena and expand coverage and improve services.

And then there is Transtel? The company is striving to be a customer driven one-stop telecoms company serving Transnet and business throughout Africa. It intends to readily provide a range of telecoms and I.T. related products of guaranteed quality and appropriate technology designed to enhance client competitive advantage. Transtel would most likely be Eskom's strongest competitor and/or natural partner for a second network operator license. Both belong to government parastatals. Several technical synergies exists between the two organisations. Eskom could form an alliance with Transtel and a mobile like MTN.

In general the telecommunications scenario in South Africa looks exciting for the foreseeable future. The best that we can do is to wish them luck.

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