HISTORICAL OVERVIEW

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Cover: Matimba power station near Ellisras in the north-western Transvaal was officially opened on 16 November 1989 by Dr D.J. de Villiers, Minister of Mineral and Energy Affairs and Public Enterprises. It is the world's largest direct dry-cooled station.

HEAD OFFICE

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POSTAL ADDRESS

P.O. Box 1091, Johannesburg 2000

Copies of this report, as well as Eskom's Statistical Yearbook, may be obtained from the Communication Manager at the above address. These publications are also available in Afrikaans.

1882

South Africa was one of the first countries in the world to use electricity on a commercial basis. As elsewhere, the supply of electricity began under the auspices of various municipalities. Kimberley was the first to introduce electric street lights in 1882, before London had electric lights. Kimberley's first reticulation system was commissioned in 1890, followed by Johannesburg in 1891, Pretoria in 1892, Cape Town in 1895, Pietermaritzburg in 1896, Durban in 1897, East London in 1899, Bloemfontein in 1900 and Port Elizabeth in 1906.

1906

In the 1890s, mining groups combined to erect power stations to supply their own needs. The Victoria Falls Power Company Limited (VFP) was registered in 1906 to harness the Victoria Falls and supply electricity to industries on the Witwatersrand and in Southern Rhodesia, now Zimbabwe. For technical and financial reasons the project was abandoned and the VFP concentrated on the exploitation of Transvaal coal. By 1915 it operated four power stations under the name of The Victoria Falls and Transvaal Power Company and at one stage was the largest utility in the British Empire.

1923

The need for a national power system which could meet the demands of the entire country led to the Electricity Act of 1922 and the establishment of the Electricity Supply Commission in 1923. The Commission's first chairman was Dr H.J. van der Bijl, an internationally recognised scientist who also founded Iscor and the IDC. Eskom began generating power in 1925 and soon became South Africa's leading electricity supplier.

1948

Eskom took over the VFP in 1948, a further step towards a national supply system. By the end of 1989, Eskom was supplying about 97% of South Africa's electricity. It now ranks among the largest electricity utilities in the world.

1962

Eskom's first power stations were far advanced for their time, but small by today's standards with sets of 33 MW and later 60 MW. In 1962, the first "big" sets, 100 MW and 125 MW, were commissioned. This led to the present 600 MW sets which are among the largest and technologically most advanced in the world.

1973

The idea of an integrated transmission system, linking all major cities in the country, was first raised in the 1920s. By 1973 this had become a reality when all Eskom undertakings had been connected. The transmission system today has more than 210 000 km of lines of which 21 000 km are part of the national grid. In 1987, the first 765 kV lines were energised.

1984

With vast deposits of coal available, Eskom's base-load stations are mainly coal fired. It has also harnessed South Africa's meagre hydro potential. In addition, in 1984, South Africa's first nuclear power station became operational.

1985

Eskom was restructured in 1985 to meet the electricity demands of a changing South Africa. The Electricity Supply Commission was replaced by a body corporate known as Escom (Eskom since 1987), controlled and managed by the Electricity Council and Management Board. Eskom commits itself to being a professionally managed, customer orientated business.

1989

Eskom's commitment to business excellence and customer focus extends to include the accelerated electrification of urban and rural areas and closer contact with other utilities on the subcontinent.

PROFILE OF ESKOM

Eskom supplies nearly 97% of the electricity used in South Africa and more than half of the electricity used on the entire African continent. It is one of the ten largest utilities in the world.

At the end of 1989 Eskom's total assets stood at R36 092 million. Revenue for the year was R9 271 million and operating expenditure, including depreciation, was R5 644 million. Interest and finance charges were R3 386 million before capitalisation. Capital expenditure, including interest capitalised during the year, amounted to R3 993 million.

Revenue is expected to exceed R10 500 million in 1990.

Eskom operates under the Eskom Act 1987 and the Electricity Act 1987. It is an independent self-financing undertaking. It has no shareholders and is funded entirely from debt and retained earnings.

Its activities are planned and directed by the Electricity Council, appointed by the Government and consisting of independent experts and representatives of consumers' interests, and the Management Board, responsible for the day-to-day running of Eskom and appointed by the Council.

Eskom is divided into six functional groups and into strategic business units, which ensures functional and geographic decentralisation.

Eskom's corporate headquarters are in Sandton.

HUMAN RESOURCES

Eskom employs some 52 000 people. It is an equal opportunity employer and a meritocracy. Advancement and remuneration are linked to performance, without reference to race, creed or sex. All employees are encouraged to develop their potential through education, training and participative management.

TECHNICAL BACKGROUND

Eskom's 26 power stations have an installed capacity of 34 141 MW. The distribution system has more than 210 000 km of high-voltage power lines. Eskom operates some of the world's largest coal-fired power stations, has the only nuclear power station in Africa and has the world's largest direct and indirect dry-cooled stations. It is also a recognised authority on the use of coal of an extremely low grade for power generation and leads research into the effects of lightning on power supply systems.

Eskom operates a sophisticated distribution network which includes 765 kV lines, the first to operate successfully at this voltage at high altitude. Electricity can be distributed anywhere in South Africa and is exported to all neighbouring countries. Eskom imports power from Namibia and Mozambique's Cahora Bassa hydro-electric scheme when available.

MAIN CUSTOMERS

It is estimated that industry and business use 55% of the electricity generated in South Africa, mines 27%, households 14% and the railway system 4%. Eskom supplies most mines and many industrial users direct. 40% of its electricity is sold to municipalities and neighbouring countries which they resell to end-users.

Electricity demand is expected to grow at about 4% a year until at least the turn of the century. Much of this growth will come from the formal sector, but with the accelerated electrification of towns and rural areas the informal economy is expanding rapidly. There are 36 million people in South Africa of which 13 million have access to electricity. A regional electricity network will not only bring electricity to more people, but help create a basis for cooperation and mobilise the natural resources to turn the subcontinent into a growth area.

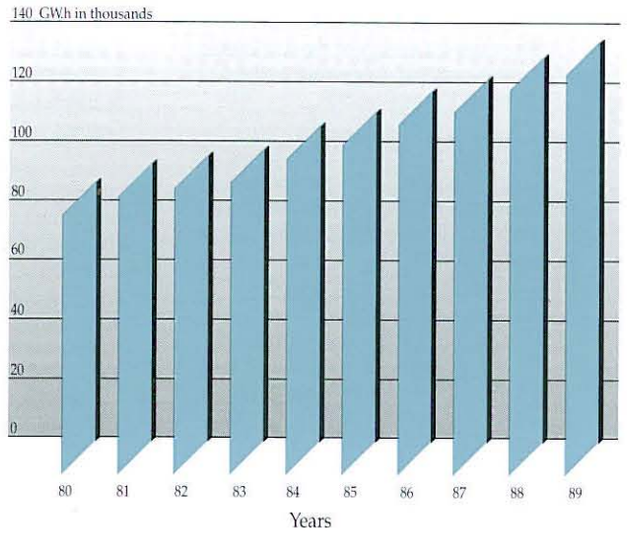
ESKOM'S VISION

Eskom has a vision of being excellent in its business performance and internationally recognised as a top utility. It has further committed itself to making electricity available to all in South Africa and to supporting a regional transmission grid to accelerate economic growth in the subcontinent. There are 100 million people in the region with limited access to electricity. Regional cooperation on energy affairs, similar to that found in Europe, is possible in Africa. The benefits are increasingly being recognised by countries in the region.

HIGHLIGHTS OF THE YEAR

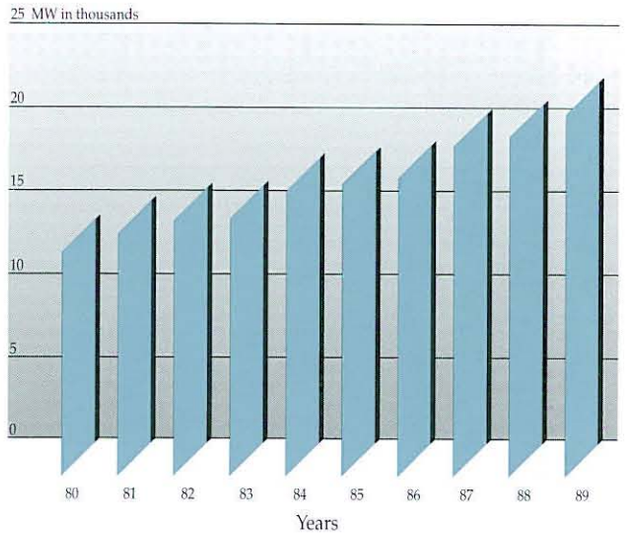
	1989	1988	% Change 1988–89	% Average yearly increase 1985–89
FINANCIAL				
Revenue (R million)	**9 271**	8 159	13,6	19,3
Net income (R million)	**728**	816	–10,8	–0,1
Fixed assets in commission, at cost (R million)	**31 199**	28 680	8,8	20,9
Works under construction (R million)	**6 638**	5 512	20,4	–1,8
Net capital expenditure (R million)	**3 993**	3 969	0,6	1,4
Total net borrowings (R million)	**24 630**	22 779	8,1	12,2
Average price per kW.h sold (cents)	**6,90**	6,30	9,5	14,0
Average coal cost per ton (rand)	**20,94**	18,67	12,2	10,8
OPERATIONS				
Electricity sold (GW.h)	**134 347**	129 493	3,7	4,7
Coal burnt in power stations (Mt)	**67,5**	64,5	4,7	2,8
Water consumed by power stations (Mℓ)	**260 154**	262 804	–1,0	–0,7
Peak demand on integrated system (MW)	**21 871**	20 589	6,2	4,8
	(21.07.89)	(24.06.88)		
ASSETS IN COMMISSION				
at 31 December				
Installed capacity (MW)	**34 141**	33 176	2,9	6,8
Assigned sent-out rating (MW)	**32 403**	31 465	3,0	6,9
Transmission lines (km)	**212 114**	201 802	5,1	7,4
STAFF EMPLOYED				
at 31 December	**51 554**	56 726	–9,1	–4,4

ELECTRICITY SALES
(from 1980 to 1989)

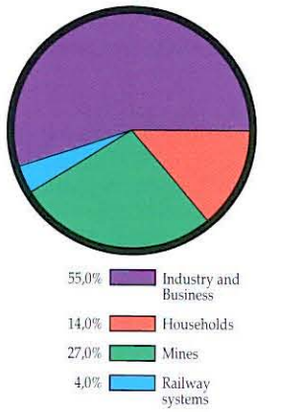


Electricity sales rose by 3,7% in 1989 and growth in demand is expected to continue at about 4% per year. Bulk sales to municipalities and neighbouring countries grew fastest and nearly 40% of Eskom's revenue is now derived from this source. Farming and rural sales increased by 8,7% and the number of supply points connected rose by more than 18 000. More than 143 000 GW.h of electricity was sent out on the Eskom system during 1989. The peak demand on the integrated Eskom system increased by 6,2 % to nearly 21 900 MW. A productivity improvement of 2,7%, or R 263 million, was achieved for the year and passed on to the customer.

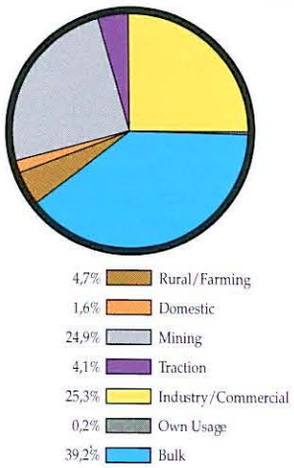
PEAK DEMAND
(on integrated Eskom system)



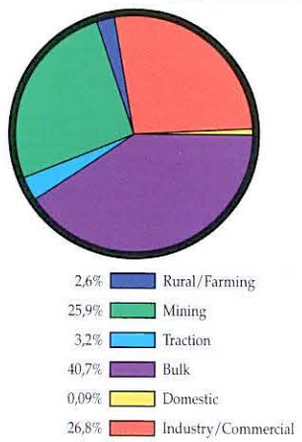
ELECTRICITY CONSUMPTION IN SOUTH AFRICA
(estimated usage in 1989)



REVENUE PER CATEGORY



SALES PER CATEGORY



Electricity Council

Dr J.B. Maree OMSG SSAS (65)

Chairman
D. Com. (Honoris causa) (Stell.), B. Com. (Witwatersrand). Appointed to the Electricity Council in 1985.

P.J. Botes (60)

Pr. Eng., B.Sc. (Heavy current) (Stell.). City electrical and mechanical engineer of Roodepoort. Member of the Executive Council of the Association of Municipal Electricity Undertakings and convenor of its Electricity Supply Committee. Appointed to the Electricity Council in 1985.

G.P. Croeser (52)

B. Com. (Stell.). Director general of the Department of Finance. Appointed to the Electricity Council in 1989.

Dr J.W.L. de Villiers OMSG (60)

Pr. Eng., D.Sc. (Stell.). Chairman of the Atomic Energy Corporation. Appointed to the Electricity Council in 1985.

A.B. Dickman (59)

B. Com. (Hons.) (Witwatersrand), FIBSA. Senior economic consultant and alternate director of Anglo American Corporation of S.A. Limited. Chairman of the SA Chamber of Business Standing Committee on Energy and Water Affairs. Appointed to the Electricity Council in 1985.

Dr R.A.P. Fockema (66)

Ph.D. (Geol.) (Witwatersrand), M.Sc. (Pret.). Director of companies. Member of the S.A. Chamber of Business Standing Committee on Energy and Water Affairs. Appointed to the Electricity Council in 1985.

J.F.W. Haak (72)

B.A., LL.B. (Stell.). Attorney and businessman. Appointed to the Electricity Council in 1985.

Prof. D. Konar (36)

D. Com. (SA), M.A.S. (Illinois, USA), C.A. (S.A.). Professor and head of accountancy at University of Durban Westville and director of companies. Appointed to the Electricity Council in 1985.

Prof. I.J. Lambrechts (47)

D. Com. (Stell.), MBA (Stell.). Professor of business economics at the University of Stellenbosch. Chairman of the Sub-committee for Energy of the Afrikaanse Handelsinstituut. Appointed to the Electricity Council in 1985.

B.J. Lessing (52)

B.Sc., B. Eng. (Stell.). Deputy general manager of railways at S.A. Transport Services. Appointed to the Electricity Council in 1988.

F.J. Malan (61)

M.Sc. (Agric.) (Stell.). Wine farmer and director of the K.W.V. Chairman of the S.A. Agricultural Union's Electricity Committee. Appointed to the Electricity Council in 1985.

Dr I.C. McRae (60)

D.Sc. (Honoris causa) (Witwatersrand), Pr. Eng., B.Sc. (Mech. Eng.) (Witwatersrand). Chief executive of Eskom and chairman of the Management Board. Appointed to the Electricity Council in 1985.

Dr D.C. Neethling (56)

Sci. Nat., Ph.D. (Natal), B.Sc. (Hons.) (Pret.), B.Sc. (Stell.). Chief executive of the National Energy Council and chairman of the Electricity Control Board. Appointed to the Electricity Council in 1985.

R.B. Savage (46)

M.Com. (Witwatersrand), C.A. (S.A.). Executive chairman (Corporate Services and Strategic Planning) of Altron Limited. Vice-president of the S.A. Federation of Steel and Engineering Industries. Appointed to the Electricity Council in 1985.

A.A. Sealey (57)

B.Sc. (Eng.) (Witwatersrand). Deputy chairman of Rand Mines Limited and chairman of the Coal and Base Minerals Division. Executive director of Barlow Rand Limited. Appointed to the Electricity Council in 1988.

Prof. H.C. Viljoen (52)

Pr. Eng., Ph.D. (Eng.) (Stell.). Dean of the faculty of engineering at the University of Stellenbosch and chairman of the SABC Control Board. Appointed to the Electricity Council in 1986.

R.C. Webb (59)

Director of companies. Involved with the Small Business Development Corporation. Appointed to the Electricity Council in 1985.

Prof. J.L. Weyers (59)

D. Litt. et Phil. (SA). Vice-principal Planning of Unisa. Appointed to the Electricity Council in 1986.

Members of the Electricity Council, left to right, seated: Dr R. A. P. Fockema, F. J. Malan, P. J. Botes, Dr D. C. Neethling, Prof. J. L. Weyers, Dr I. C. McRae, Dr J. B. Maree (chairman), Prof. H. C. Viljoen, J. F. W. Haak. *Left to right, standing:* G. P. Croeser, R. C. Webb, R. B. Savage, Prof. I. J. Lambrechts, B. J. Lessing, Prof. D. Konar, A. B. Dickman. *Absent:* Dr J. W. L. de Villiers, A. A. Sealey.

Management Board

Dr I.C. McRae (60)

D.Sc. (Honoris causa) (Witwatersrand), Pr. Eng., B.Sc. (Mech. Eng.) (Witwatersrand). Chief Executive of Eskom and chairman of the Management Board. Joined Eskom in 1947. Appointed to the Management Board in 1985.

M.L. Davis (32)

B. Com. (Hons.) (Rhodes), C.A. (S.A.). General Manager (Finance). Joined Eskom in 1986. Appointed to the Management Board in 1988.

J.S. Els (61)

Pr. Eng., B.Sc. (Eng.) (Stell.), Hons. B.Sc. (SA), GDE (Witwatersrand). General Manager (Strategic Planning). Joined Eskom in 1953. Appointed to the Management Board in 1985.

R.A. Forbes (57)

Pr. Eng., MBL (SA), B.Sc. (Elec. Eng.) (Witwatersrand). General Manager (Distribution and Marketing). Joined Eskom in 1949. Appointed to the Management Board in 1985.

A.J. Ham (52)

Pr. Eng., B.Sc. (Mech. Eng.) (Natal). General Manager (Engineering). Joined Eskom in 1966. Appointed to the Management Board in 1987.

Dr G.F. Lindeque (48)

D. Phil. (PU vir CHO). General Manager (Human Resources). Joined Eskom in 1975. Appointed to the Management Board in 1987.

P.J.T. Oosthuizen (60)

B.A. LL.B (UOVS). General Manager (Privatisation and Legal). Joined Eskom in 1959. Appointed to the Management Board in 1985.

P.M. Semark (45)

Pr. Eng., B.Sc. (Mech. Eng.) (Cape Town), B.A. (SA). General Manager (Generation). Joined Eskom in 1972. Appointed to the Management Board in 1987.

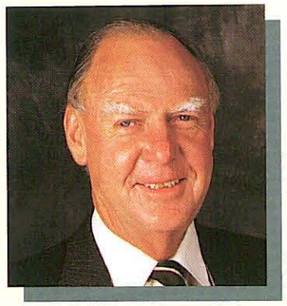
J.P. van den Bergh (43)

Pr. Eng., B.Sc. (Mech. Eng.) (Pret.), B. Com. (SA). General Manager (Management Services). Joined Eskom in 1970. Appointed to the Management Board in 1988.

ORGANISATION STRUCTURE

AS AT 28 FEBRUARY 1990

OFFICE OF THE CHIEF EXECUTIVE



Chief Executive
Ian McRae

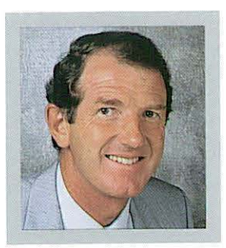
GENERATION GROUP

Mission

Generation and transmission of electricity

Functions

1. Division I: Generation of electricity at Arnot, Kriel, Matla and Hendrina power stations
2. Division II: Generation of electricity at Tutuka, Lethabo, Duvha and Majuba (Ingagane) power stations
3. Division III: Generation of electricity at Camden, Grootvlei, Komati, Kendal (Wilge) and Matimba power stations
4. Division IV: Generation of electricity at Koeberg, Drakensberg, Orange River hydro stations and in the Orange Free State and Western Cape
5. Interconnected System
6. Generation Technical Services
7. Fuel and Water
8. Group Finance and Services



General Manager
Paul Semark

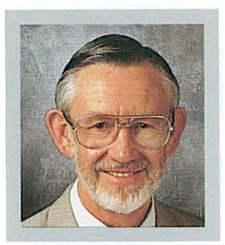
DISTRIBUTION AND MARKETING GROUP

Mission

Marketing and distribution of electricity to Eskom customers

Functions

1. Division I: Distribution of electricity in Eastern Natal, Western Cape and Central Transvaal regions
2. Division II: Distribution of electricity in North-Eastern Transvaal, Southern Cape and Eastern Cape regions
3. Division III: Distribution of electricity in Western Transvaal, Eastern Transvaal and Southern Transvaal regions
4. Division IV: Distribution of electricity in Northern Cape, Orange Free State and Western Natal regions
5. Marketing
6. Reticulation Market Development
7. Distribution Engineering
8. Group Finance and Services



General Manager
Randolph Forbes

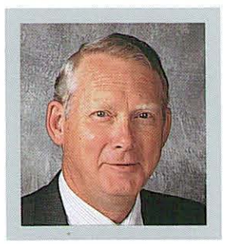
ENGINEERING GROUP

Mission

Provision of assets and scientific and technical support services for the generation and transmission of electricity

Functions

1. Power Station and Transmission Engineering Projects
2. Transmission Engineering
3. Power Station Engineering
4. Eskom International (London)
5. Engineering and Scientific Investigations
6. Technical Standardisation – Eskom and national projects
7. Group Manpower Services
8. Group Financial Services



General Manager
Alex Ham

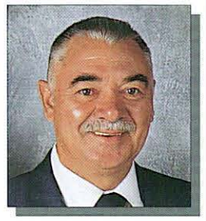
PRIVATISATION AND LEGAL SERVICES
(in the Office of the Chief Executive)

Mission

Provision of legal services to Eskom and legal assistance in the consideration and evaluation, and if required the implementation, of the privatisation of Eskom

Functions

1. Legal Services
2. Privatisation Projects Coordination



General Manager
Ters Oosthuizen

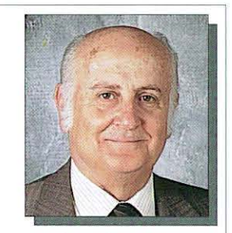
STRATEGIC PLANNING
(in the Office of the Chief Executive)

Mission

Ensuring strategic-action orientation and management processes at top and senior management levels

Functions

1. Strategic Planning Coordination
2. Special Investigations
3. Nuclear Safety Review Committee
4. Southern Africa Outreach Drive



General Manager
Bussie Els

FINANCE GROUP

Mission

Financial and business management of Eskom

Functions

1. Treasury
2. Financial and Management Accounting
3. Taxation Services
4. Management Consulting
5. Financial Planning
6. Insurance and Risk Management
7. Productivity Measurement
8. Group Human Resources

General Manager
Mick Davis

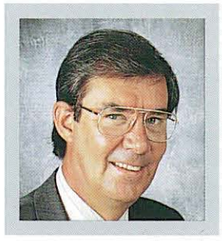
HUMAN RESOURCES GROUP

Mission

Management of Eskom's human resources

Functions

1. Personnel
2. Industrial Relations
3. Performance Management
4. Equalising Opportunities
5. Technical Training
6. Management and Supervisory Development
7. Safety Risk Management
8. Learning Technology and Services
9. Group Resources Services
10. Group Financial Services



General Manager
George Lindeque

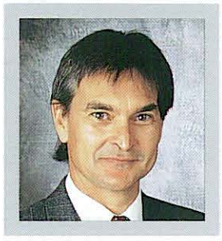
MANAGEMENT SERVICES GROUP

Mission

Provision of services and resources to facilitate the operation of Eskom

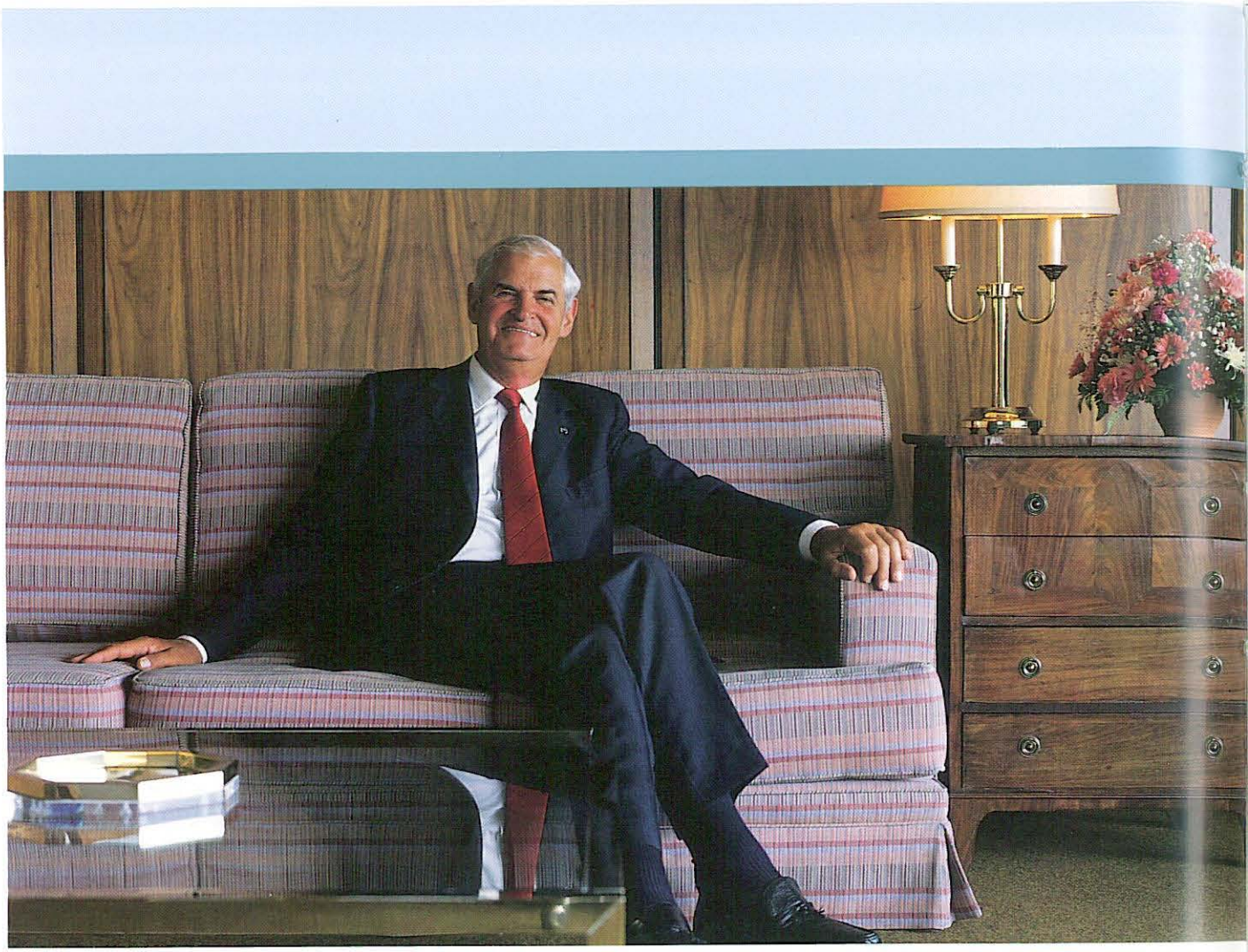
Functions

1. Information Technology
2. Information Security
3. Industrial Engineering
4. Commercial Services
5. Corporate Productivity
6. Environmental Impact Management
7. Protective Services
8. Communication
9. Properties Management
10. Group Manpower and Services
11. Group Financial Services



General Manager
Johan van den Bergh

CHAIRMAN'S REVIEW



"Eskom will have to strengthen its balance sheet by reducing borrowings and increasing its reserves. We have since 1986 resisted, in the national interest, the option to increase electricity prices in line with rising inflation. Instead, we have focused on cost control and improved productivity. However, Eskom is unable to consistently absorb rising costs outside its control without impairing the financial health of the organisation."

OPERATING RESULTS

During the year lower growth in the demand for electricity was experienced. This was brought about by slower economic growth, which affected industrial electricity demand, and a decline in certain international commodity markets, which influenced parts of the mining sector. The full impact of this slower growth was in part offset by a growth of more than 10% in bulk supplies to municipalities.

By keeping a tight control on operating costs and by improving productivity the surplus of R728 million, although R88 million lower than the previous year, was nevertheless in line with budget.

I am encouraged by the way in which Eskom is managing the challenging task of adjusting its cost structures to slow revenue growth. This has resulted in price increases being kept substantially below the rate of inflation. The 10% increase in the price of electricity for 1989 was some five percent below the inflation rate. The real price of electricity has declined, in fact, by 6,7% or more than 2% per year since 1986 and the increase of 14% for 1990 is again below the expected rate of inflation.

The 12% rise in operating costs in cents per kW.h, compared with the year before, must be viewed against an inflation rate of 15,2%. The primary energy component of operating costs – fuel and water – actually rose by 17,2%, but this was offset by the very modest rise of only 9,8% in the other components – a considerable achievement in containing costs in areas over which we have greater control. Total finance charges, however, increased by 26,0% in a year in which interest rates continued to rise while the authorities followed a tight monetary policy.

FINANCIAL MANAGEMENT

Because Eskom is a large borrower and finance charges are such a large component of total costs, we have to ensure that we borrow as efficiently and as cheaply as possible. During the past year we have continued to be leaders in the financial market. We have been innovative in floating new instruments and, consequently, have been able to borrow at a cheaper rate than most other institutions and corporations.

"I am encouraged by the way in which Eskom is managing the challenging task of adjusting its cost structures to slower revenue growth."

The yields available on South African gilts attracted substantial amounts of foreign money into the capital market through the financial rand. This resulted in lower than expected long-term interest rates at year end. Bearing in mind that this may be a short-term phenomenon and that these flows could be reversed when other opportunities arise in the world financial markets, we funded a large proportion of our needs for 1990 at lower rates.

We continue to focus on the management of our cash. During the past five years Eskom has drastically curtailed its capital expansion programme and its concomitant need for investment funds, without compromising our long-term commitment to meet the country's electricity needs. Nevertheless, the higher costs of servicing existing debt, R24 630 million at the end of 1989, highlighted our vulnerability to rises in interest rates and the need to continue to reduce borrowings. It is our policy to cover all foreign liabilities against changes in exchange rates, but the cost of doing this has nearly doubled from R441 million in 1988 to R836 million in 1989. These costs will continue to rise in the future, requiring careful management of Eskom's interest rate risk.

BALANCE SHEET

As we are approaching the end of a major capital expenditure programme, our assets have been growing at a slower rate than in previous years. Borrowings have also increased at a slower rate in 1989, but because net income was modest, there has been no real improvement in our balance sheet.

The main message from 1989 is that Eskom will have to strengthen its balance sheet by reducing borrowings and increasing its reserves. We have since 1986 resisted, in the national interest, the option to increase electricity prices in line with rising inflation. Instead, we have focused on cost control and improved productivity. However, Eskom is unable to consistently absorb rising costs outside its control without impairing the financial health of the organisation.

Low increases in the price of electricity in a highly inflationary climate may in the short term benefit the consumer, but to continue indefinitely with such a practice will result in lower profitability and reduce our ability to attract the new funds at acceptable cost when we start our

next growth phase at the end of the 1990s. This has become even more important because Eskom's preferred position as a borrower on the local capital market has been affected negatively by the abolition of prescribed investments. We now compete on equal terms with other institutions for funds, and in future lenders will look much more critically at Eskom's balance sheet and income statement ratios.

PEOPLE AND PRODUCTIVITY

While Eskom's overall technical performance was good, and in some cases outstanding, availability and reliability of plant were marginally down compared with the previous year. Quality of supply has improved, but a series of interruptions late in the year gave rise to concern; the measures introduced to avoid similar occurrences are already having the desired effect.

We believe that our workforce can make a major contribution to the improved operation of our business if they are given the opportunity to apply their talents, skills and knowledge. We strive to create these opportunities for people at all levels. To encourage them to become more involved and identify more closely with the organisation and its goals, recognition is given to those who do contribute to Eskom becoming a more efficient organisation.

It is our goal to steadily improve the efficient and effective use of all our resources so as to become comparable with the world's best utilities. To this end we are identifying areas of improvement and setting higher standards against which we will measure our performance.

"One of the most serious constraints in the development of our economy is the chronic shortage of skills. The education system is turning out people with an academic orientation, while the market place requires technical and practical skills. This is an issue that has to be addressed as a matter of national priority."

Over the past year Eskom customers have benefited by R430 million through a price increase that was well below the increased cost of Eskom's resources. Of this benefit, R262 million was financed through a 2,7% productivity improvement and the balance from net income. In measuring productivity, Eskom is working closely with the National Productivity Institute.

One of the most serious constraints in the development of the economy is the chronic shortage of skills. The situation is aggravated by the mismatch between the output of the education system and the skills required by the market place. The education system is turning out people with an academic orientation, while the market place requires technical and practical skills. In 1988, this mismatch resulted in about 80 000 matriculants being unemployed while economic growth is hampered by a shortage of skilled people. This is an issue that has to be addressed as a matter of national priority.

ENVIRONMENT

Eskom activities have an impact on the environment. We are sensitive to this and are committed to finding the optimum balance between supplying electricity at an economic price and limiting its impact on the environment. On a wider front, electricity is a clean energy form; bringing it to people who currently use other forms of energy will significantly reduce the atmospheric pollution at present experienced in urban areas.

PRIVATISATION

During 1989, further studies were undertaken into the possible privatisation of Eskom. In response to a request by the Minister of Mineral and Energy Affairs and Public Enterprises, a study

was undertaken and a report submitted to him on the likely financial consequences if Eskom were to become a taxable entity.

OUTLOOK

It is difficult to anticipate how the economy is going to perform in the 1990s and consequently what the demand for our product will be. We are currently planning on an average annual growth rate in electricity demand of approximately 4%. Our capacity management system, however, will enable us to meet a greater demand if growth rates are higher.

It is anticipated that a tight rein will be kept on the economy during 1990, and most probably for some time after that. As a result of the slower economic growth and improved control over Government spending, there should be a lower demand for long-term funds and conditions in the capital market should be easier. At the same time, improved perceptions of the political climate should lead to a greater inflow of capital. The financial markets, however, could be more volatile with interest rates showing greater fluctuations. It is expected that the authorities will maintain short-term rates at their existing high levels to ensure that their objective of constrained economic growth in 1990 is met.

The move to let free-market forces shape the country's economy, improved control over Government spending and the removal of restrictions which hamper development, together with the efforts to end our political isolation, could put South Africa back on the path of economic growth. Eskom is able to meet the higher demand for electricity this will bring about.

"Electricity is a major factor in the economic development of not only South Africa, but the whole of southern Africa."

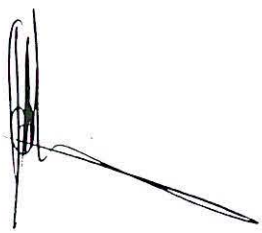
We foresee that Eskom's present excess capacity will not be absorbed until the year 2000, and only then will new plant be needed. Because of the long lead times, the decision on such new plant will have to be taken within the next few years. Coal will continue to dominate our plant mix, but as we move into the next century, nuclear power and natural gas – should this be discovered in sufficient quantities – will start to play a bigger role.

We believe that electricity is a major factor in the economic development of not only South Africa, but the whole of southern Africa. We have taken a number of initiatives which have accelerated electrification in South Africa and have led to much greater regional cooperation on energy matters.

ACKNOWLEDGEMENTS

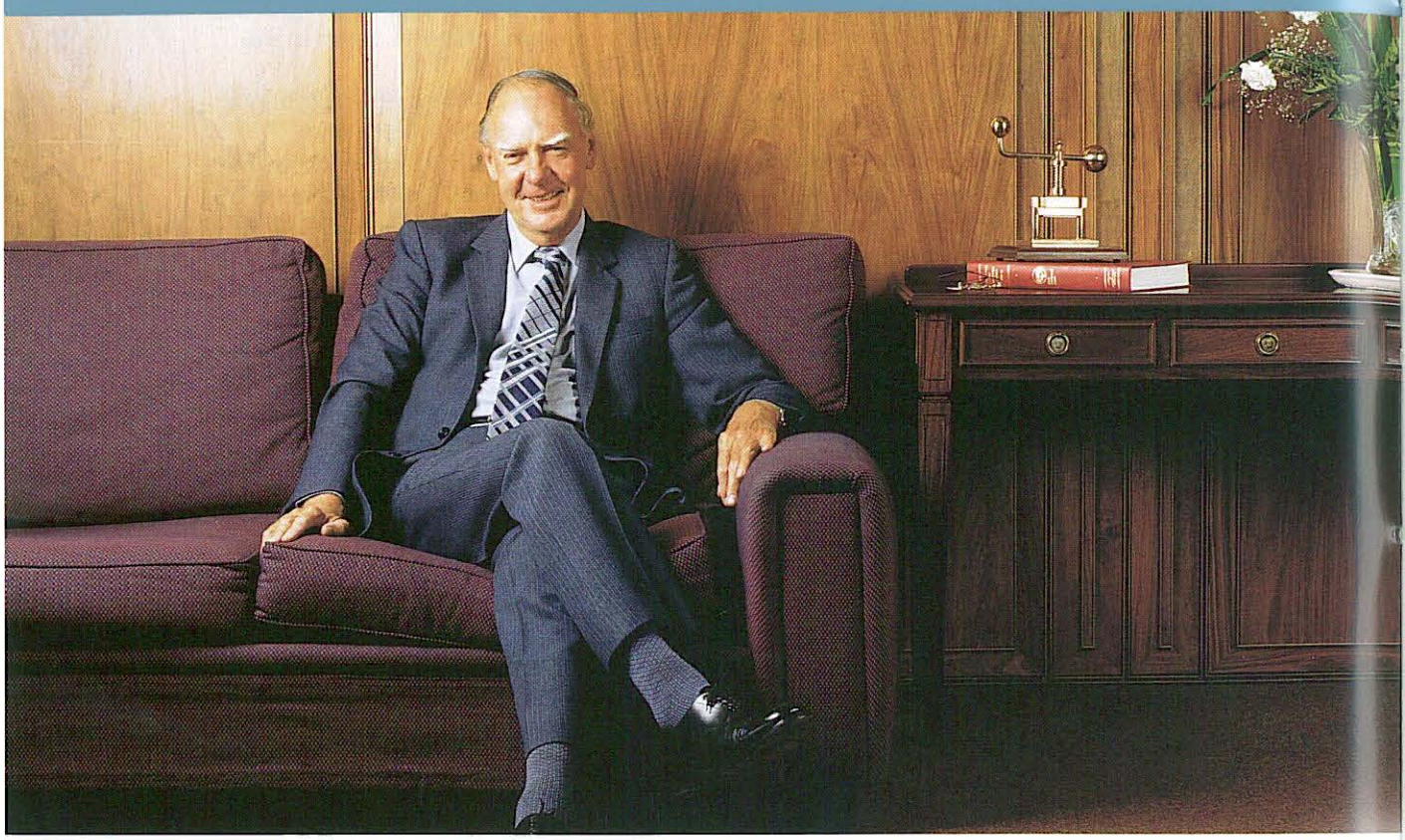
I thank the members of the Electricity Council for their willingness to apply their knowledge and experience to the affairs of Eskom and for their support during the year. Chris Stals, on his appointment as governor of the Reserve Bank, retired from the Council. I wish him success in his new position and thank him for his valuable contribution over the years. We welcome the new director general for Finance, Gerhard Croeser, to the Council. I further wish to record my thanks to Eskom's Management Board and all members of the staff, who, under the capable leadership of Ian McRae, made considerable strides in turning Eskom into a highly professional organisation. It is a matter of great pleasure and pride to us that an honorary doctorate in engineering was recently conferrred on him by the University of the Witwatersrand.

Finally, my thanks to the Minister of Mineral and Energy Affairs and Public Enterprises, Dr Dawie de Villiers, for his guidance and advice. We are indeed fortunate to have a person of this calibre as our minister.



John Maree
8 March 1990

CHIEF EXECUTIVE'S REPORT



"We, with our main customers, are working on a new pricing policy which will encourage greater use of off-peak electricity. This will enable us to use our supply system more cost effectively by spreading our load more evenly; and the customer stands to benefit."

ELECTRICITY SALES

The quantity of electricity Eskom sold in 1989 rose by 3,7% (1988: 5,7%) to 134 347 GW.h. Although this growth rate is substantially lower than that recorded for 1988, it was higher than the budget of 3,6% set for the year. Slower growth was expected following the Government's measures to cool down the economy.

Sales to the mining sector, representing 26% of Eskom's total sales, grew by 0,9% in 1989 (1988: 4,5%). Sales to industry and commerce, representing just under 27% of total sales, showed a negative growth rate of 2,1%, compared with a positive growth rate of 3,7% in 1988. By contrast, bulk sales to municipalities and neighbouring states, now representing more than 40% of Eskom's total sales, grew by 10,1% (1988: 8,8%). The decline in sales to industry is only partly due to reduced economic activity. Some industrial customers were transferred when networks were sold to municipalities and, in addition, a number of larger customers experienced their own technical problems and consequently their electricity consumption was lower.

In the smaller supply categories, traction (just over 3% of total sales) increased by 2,7% (1988: 1,7%) and rural and farming sales rose by 8,7%, nearly double the growth rate recorded in 1988. Direct sales to domestic users not supplied by municipalities, less than one percent of Eskom's total sales, declined by 9,0% in 1989. This was due to the selling of networks, particularly to the six Tygerberg municipalities, also resulting in a reduction in the number of customers, mainly domestic users.

FINANCIAL PERFORMANCE

As discussed in the Financial Report, Eskom's financial performance is strongly affected by interest rates and, for the past few years, by increases in the price of electricity being kept to well below the rate of inflation, in line with the commitment given to consumers. The average price of electricity increased by 9,5% from 6,3 cents per kW.h in 1988 to 6,9 cents per kW.h in 1989.

The 1989 inflation rate of 15,2% measured by the Producer Price Index, brought strong upward pressures on operating and other costs. We were able to resist some of these pressures and I believe it was a considerable achievement to have contained increases in operating costs to the extent we did. The productivity improvements that Eskom has achieved, both technological and human, are commendable, but cannot be expected to offset the effects of a high inflation rate indefinitely.

"The productivity improvements Eskom has achieved are commendable, but cannot be expected to offset the effects of a high inflation rate indefinitely."

CUSTOMER RELATIONS

We, with our main customers, are working on a new pricing policy which will encourage greater use of off-peak electricity. This will enable us to use our supply system more cost effectively by spreading load more evenly, and the customer stands to benefit. This is a further refinement of a system already in operation and we hope to have more details about the scheme available later in 1990.

Eskom is a market-driven organisation and we keep in close touch with the needs of customers to find ways of using electricity more effectively. The establishment of information centres to assist customers in this regard has been very successful. So far six such centres have been opened, three of them in 1989. More are under way.

Eskom worked hard at finding solutions for continuing improvement in quality of supply and consumer-related metering and billing problems. Our recommendations have not yet been accepted in all cases, but discussions and negotiations are still in progress.

POWER SYSTEM AND PLANT PERFORMANCE

The maximum demand on the integrated Eskom system rose by 6,2% in 1989 to 21 871 MW. Nearly 141 300 GW.h was sent out on the Eskom system. During the year, two new units – Lethabo 5 and Matimba 4 – with a combined capacity of 1 283 MW were taken into commercial service. A further 15 units, with a total capacity in excess of 10 000 MW are on order and will be commissioned between 1990 and 2001. More than 10 000 km of lines were added to the

transmission and distribution systems during the year.

At the end of 1989, Eskom had an installed capacity of 34 141 MW, of which 3 825 MW is in reserve storage or in mothballs. The excess capacity, that is capacity above the required operating reserve, stood at 4 363 MW over the winter peak of 1989. At present it is expected that demand will absorb this by the end of the 1990s. Excess capacity arose as the growth rate in electricity demand declined in tandem with the slower economic growth of recent years. The situation is being carefully managed, and we are taking this opportunity to modernise and upgrade plant not in use with the objective of extending its life. This defers the need for new plant.

Eskom is striving for plant performance that can compare with the best in the world. Over the past few years we have made considerable progress in this direction. The availability and thermal efficiency of some of the first 600 MW sets now outrank world averages. Generally, plant reliability needs to be improved and a structured, concentrated effort is being made to achieve our targets. For most of the year quality of supply was on target, but a series of incidents in September, October and November affected supplies to customers in the Southern Cape and Natal. Veld and cane fires, weather conditions and the human factor are the main causes of such disruptions. Measures have been introduced to avoid similar occurrences.

MANPOWER PERFORMANCE

For Eskom the key to providing a good service to customers lies in improving productivity – and this means not only gains from improved technology, but the better use of human resources. We are investing heavily in the development of our people. We believe the country has the potential to overcome whatever skills shortages there may be, provided the potential of people is identified and developed. Eskom's programme is consequently called "No Potential Lost". We see this programme in its wider context of bridging cultural gaps that may exist between various population groups and assisting with creating home environments which are conducive to the development of potential. Eskom is also investing in the education of children in order to provide a pool of educated youths for further development.

"There is a perception that many job opportunities will be lost through productivity improvement. We believe that the strategy Eskom has adopted will eventually secure far more job opportunities with higher skills requirements."

There is, unfortunately, a perception that many job opportunities will be lost through productivity improvement. We believe that the strategy Eskom has adopted will eventually secure far more job opportunities, with higher skills requirements. In the long term this will ensure a solid basis to improve the quality of life of all our employees.

Our relations with the trade unions are on a sound footing. Eskom had a year of relative labour peace and was little affected by industrial action. We recognise that the unions have interests to protect on behalf of their members but we are confident that we can eliminate most of our differences through negotiations and that we can find common ways of serving the best interest of Eskom and all of its people. A dispute concerning salary adjustments for white collar staff was settled early in 1990 by a referee and two arbitrators. An important element of the dispute was the principle of pay for performance.

OUTLOOK

The business mood in South Africa is cautiously optimistic after the recent political developments. While this may not necessarily lead to an immediate economic recovery, the prospects for growth are improving. Re-establishing international trade links, in particular, should have a positive effect on the industrial demand for electricity.

Eskom's own initiatives to provide electricity to all in South Africa will also stimulate the economy as more people become economically active. At the end of 1989 there were 48 electrification projects under way, affecting about 300 000 households – approximately three million people – countrywide. I am also confident that with the improved political climate Eskom's initiatives to foster cooperation between electricity utilities in southern Africa will gain further momentum. This past year has already seen a substantial increase in requests for Eskom services from neighbouring utilities. The benefits of rapid electrification and a regional electricity grid cannot be over-emphasised.

"The prospects for consistent growth in electricity demand in the long term are more favourable now than at any time in the past."

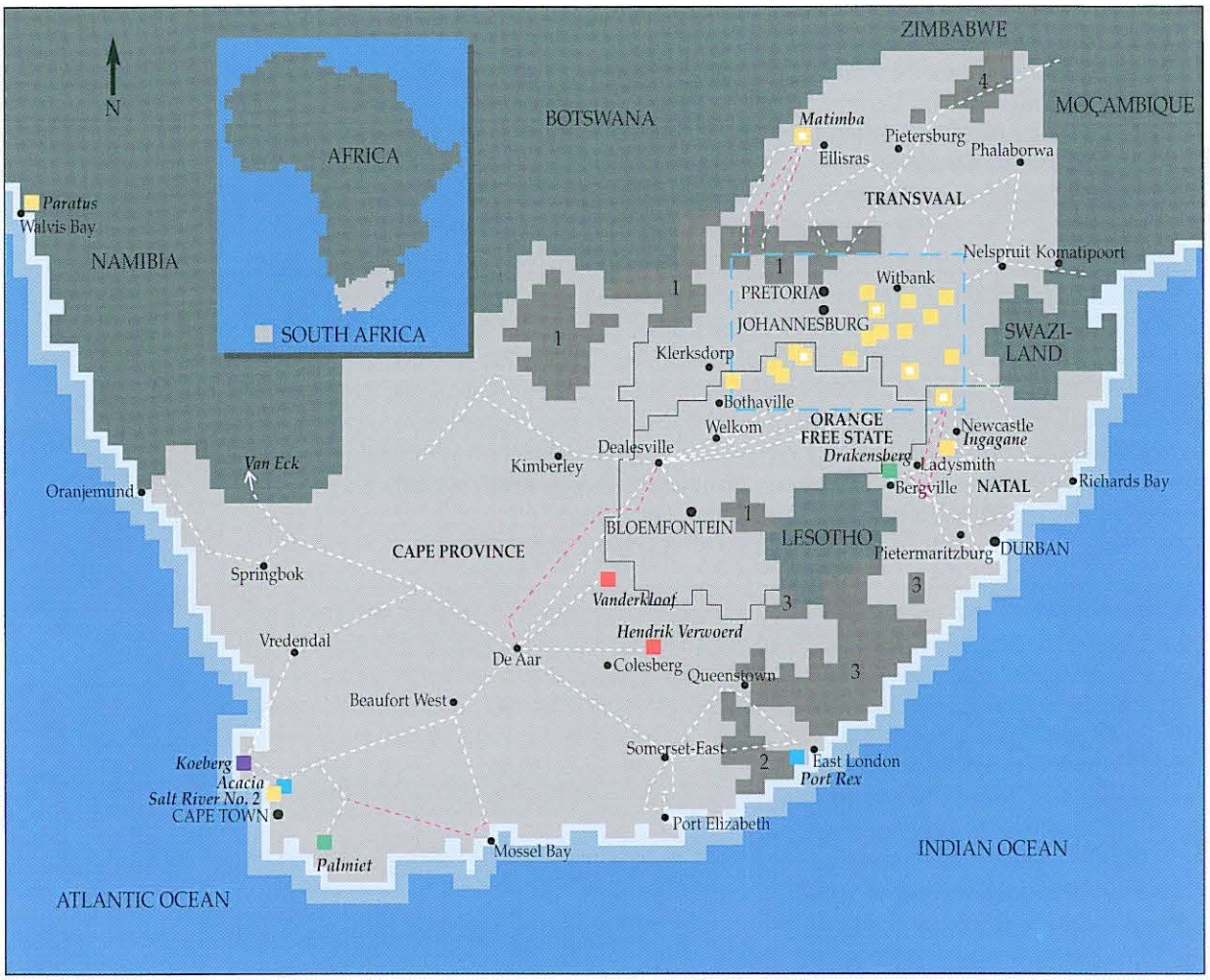
The prospects for consistent growth in electricity demand in the long term are more favourable now than at any time in the past.

ACKNOWLEDGEMENTS

The invaluable guidance of the Electricity Council was a source of inspiration and direction for us during 1989, and for this we extend our sincere thanks. The constant support and involvement of the chairman, John Maree, was instrumental in achieving the advances recorded over the year. I am indebted to the Management Board for their commitment and professionalism. Ed Ralph, general manager for strategic technologies, left the Board to become corporate advisor on strategic technologies, and Lood Rothman, senior general manager, retires in March 1990. I thank both of them for their valuable service over the years. Finally, my warm thanks to our staff. They performed well in 1989 and are turning Eskom into a top utility.

Ian McRae
8 March 1990

THE NATIONAL GRID



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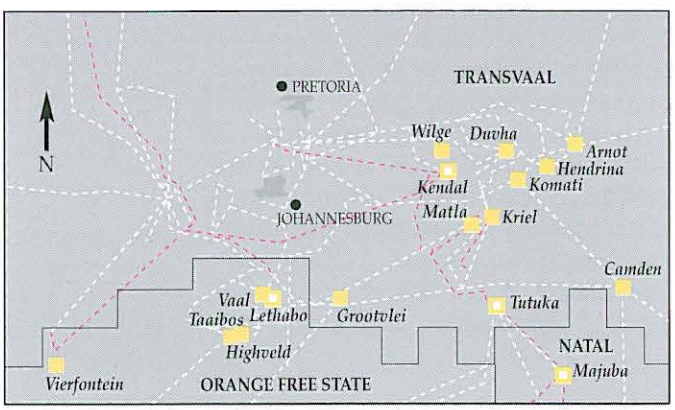


LEGEND

POWER STATIONS

- Coal-fired
- Nuclear
- Hydro
- Pumped storage
- Gas turbine

POWER STATIONS UNDER CONSTRUCTION

INDEPENDENT HOMELANDS

1. Bophuthatswana
2. Ciskei
3. Transkei
4. Venda

POWER LINES

CURRENT PROJECTS

ESKOM IN ACTION

CONTENTS

NEW TARIFFS AND PRICING POLICIES

Eskom is constantly in touch with customers to find effective ways and means of using electricity. New tariffs are being designed to provide an incentive to reduce electricity consumption during peak hours and to increase consumption during off-peak hours or weekends. The energy charge for large consumers would then fluctuate depending on the time when energy is consumed. This tariff will enable Eskom to recover actual costs more accurately from consumers with different load factors. According to experience elsewhere, the net result after a few years is a flattening of the load curve, enabling Eskom to save on the construction of new power stations since the annual peak demand will grow at a slower rate.

ESKOM'S DRIVE TO INCREASE MARKET SHARE

Of an estimated 36 million people in South Africa, some 23 million or 65% are without electricity. This figure represents an enormous challenge to Eskom, one which it has readily accepted.

In 1989 marketing initiatives undertaken earlier in the decade either came to fruition or were significantly advanced. A major market research project was completed, providing a macro perspective of the market share of electricity compared with other energy sources in several sectors of the economy. The overwhelming conclusion of the survey was that steady long-term growth in electricity demand can occur as a result of existing energy users switching from traditional sources of energy such as oil, paraffin, gas and coal. The survey indicates that in unelectrified urban areas the cost of energy is the same as that which an average household would spend on electricity.

However, many obstacles stand in the way of this progress. The necessary technical and financial resources have to be found and rapidly mobilised.

Eskom has applied itself to overcoming these problems. Project teams have investigated more cost-effective ways of utilising existing expertise to speed up the electrification process and viable financial structures have been found. Technical innovations, such as a metering system suitable to the needs and budgets of low income users, and modified methods of reticulation and wiring of houses, have been developed in collaboration with suppliers.

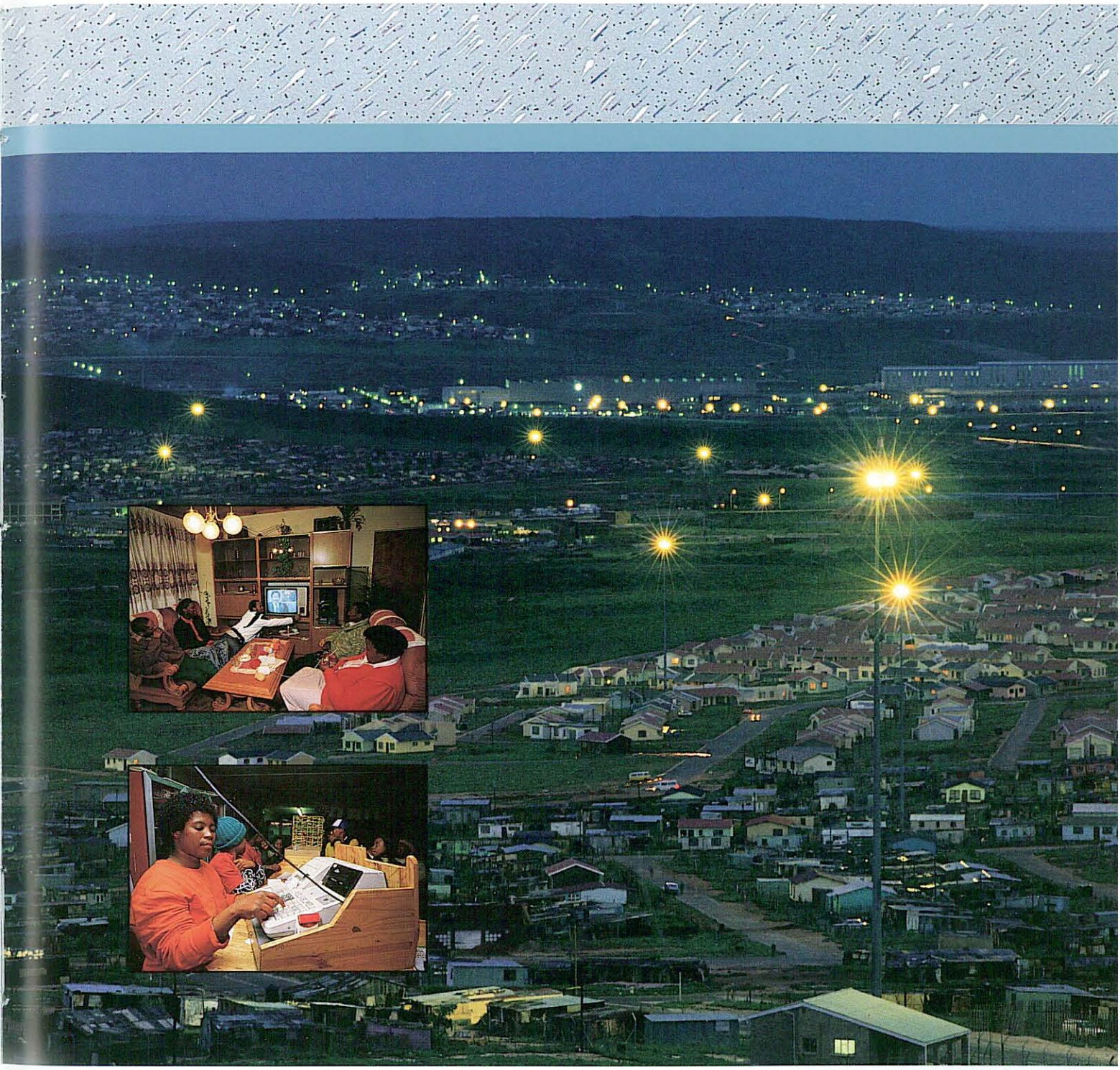
These developments show a significant change in Eskom's marketing strategy. In the past it largely supplied electricity in bulk, leaving reticulation to local authorities. Now it believes that a better approach would be to pool the technical know-how and financial resources of the supplier and the private sector to help with reticulation in specific areas.

Eskom was approached at the end of 1988 by the Transvaal Provincial Administration to assist in the normalisation of electricity supply to Soweto. Soweto is South Africa's fifth largest domestic user of electricity, with 125 000 supply points. It has been electrified for a number of years and administered by various bodies such as the Johannesburg Municipality and the West Rand Administration Board. The town is presently administered by a council which was elected during October 1988.

A report compiled under the chairmanship of Eskom's chief executive, Dr Ian McRae, identified various problems. A project team was established in April 1989 and has developed multiple negotiation platforms with various interest groups and community leaders to establish a common working base. Negotiations are in progress.

During the year Eskom has also given assistance to the Soweto City Council in repairing in record time two major substations serving 30 000 customers.

Opposite: The formation of joint ventures involving the utility, the supplier, private enterprise and the community is a viable way of accelerating the electrification process, making more people economically active.



ELECTRIFICATION PROJECTS

The formation of joint ventures involving the utility, the supplier, the community and local private enterprise, is a viable means of providing funding while at the same time combating the social and political barriers which stand in the way of electrification. The first of these has already been implemented at KwaNobuhle near Uitenhage in the Eastern Cape, where more than 1 000 households have been connected and more applications are being received daily.

At present Eskom is involved in 48 electrification projects which are in various stages of progress from negotiation to customer connections. These represent a major step towards the target of one million homes involving some ten million people which Eskom plans to electrify over the next five years. This can be achieved if the required capital is raised.

ENERGY AWARENESS

A number of electricity information centres were established during 1989 to advise and serve the various communities on the most effective way of using electricity. Advice ranges from the optimum use and care of domestic appliances, particularly for new users of electricity, to assistance for large energy users on how to use more modern, energy saving plant and equipment.

In Witbank in the eastern Transvaal, an area where most of Eskom's electricity is generated and major transmission and distribution networks originate, a centre called Elektri-Komm was opened in June 1989. Alexelek, an electricity information centre offering a free advisory service to householders, was opened in Alexandra near Johannesburg in September. Exhibitions and daily presentations focus on the safe use of electricity, the best use of appliances, the benefits of electricity, the use of card-operated meters, how to monitor household electricity consumption and how electricity payments should be made. Agrelek, aimed at the agricultural sector, was opened in November at Glen Agricultural College near Bloemfontein. It focuses on the use of electricity as an effective energy source for the farming community. There are now six such centres. The others are in Durban, Cape Town and Johannesburg. Some power stations also have their own information centres, providing a valuable information and educational service to the general public. Industralek, a centre to serve industrial users of electricity, will open in Germiston in 1990.

For the past three years, Eskom has also promoted the Energy Effective Design Awards, aimed at encouraging cost-effective electricity usage through innovative design in industry, mining and commerce. The 1989 awards were presented in five categories: mining processes, redesign and retrofit of processes, electricity consuming products, energy management systems and industrial processes.

Above: Agrelek, serving the farming community, is one of six information centres to advise the public on the most effective way of using electricity.

Programmes range from the correct and safe use of electricity in the home and in industry to educational services.

PLANT PERFORMANCE

A key factor in the effectiveness of Eskom is plant performance. With R21 598 million invested in generating plant, avenues for improving plant performance are continuously sought. Eskom has developed a series of indicators loosely based on international measures but modified to suit its operating conditions, particularly with respect to the grades of coal – some of the lowest in the world – which certain power stations burn. Plant performance is measured in terms of reliability, availability, forced outage rate, available plant load factor and overall thermal efficiency.

Reliability. Reliability measures the number of hours a unit operates without forced shutdowns or trips. Two reliability indices were developed, namely weighted mean time to trip (WMTTT) and weighted mean time to failure (WMTTF). These include failures of auxiliary plant requiring output restrictions.

In 1989 Eskom set itself the target of an average 770 hours for the year. Some stations performed well above this average and Matla power station returned figures of close to 1 000 hours, but overall only 500 hours were obtained. This was marginally lower than the reliability figure of 510 hours for 1988 but considerably better than the 1987 average of 400 hours. There is a coordinated action plan to improve reliability both at national and individual power station level.

Availability and forced outage rate. Plant availability is the proportion of time a generating unit is capable of giving service, whether it is required to do so or not. During the year a few major incidents brought the availability of Eskom plant down by 1% to 78,1%. At Camden a transformer fire on Unit 8 caused extensive damage. Operating practices at all stations have been adjusted to forestall similar incidents.

There was a boiler explosion on Unit 3 at Lethabo late in November, which is being investigated. By contrast, stations such as Matla at 86,7% and Tutuka at 87,2%, rank among the best in the world.

Forced outage rate increased to 10% overall from 8% in 1988. By contrast, Arnot achieved 5,4%, Duvha 7,4% and Tutuka 7,0%.

Available plant load factor. The available plant load factor or the ratio of energy used to the energy that could have been generated, has stayed the same as in 1988 at a level of 66%.

Overall thermal efficiency. This measures the success with which the heat energy in the fuel is converted to electrical energy in the generator. Overall thermal efficiency remained at 33,6%, as in 1988. The best performer was Tutuka with an outstanding 35,8%.

PLANT		
Sent-out capacity:		32 403 MW
Coal-fired power stations	(18)	28 233 MW
Nuclear	(1)	1 840 MW
Gas turbine	(3)	390 MW
Hydro-electric plant	(2)	540 MW
Pumped storage	(2)	1 400 MW

COAL AND WATER

Coal and water comprise some of Eskom's largest input costs. Every effort was made to control these costs, in many instances with significant results.

A focus of the cost control measures in 1989 was the Eskom tied collieries, which supply specific power stations. To find ways of reducing both short and long-term cost increases, Eskom and the mining industry joined forces. The immediate result has been that the average cost of coal increased by only 12,2%, 3% below the inflation rate as measured by the Producer Price Index.

Some collieries were affected by the mothballing or placing into reserve storage of certain power stations to counteract excess capacity. During 1989, two contracts were terminated, two were delayed, and two collieries closed down.

Understanding how colliery costs are influenced by varying demand situations, is essential in forecasting the cost of coal and optimising production costs. Computer models of individual colliery cost structures are therefore being developed to improve these aspects of Eskom's operations.

Eskom has been involved in the research, exploration and assessment of coal reserves for a number of years to quantify resources available for future power generation. Studies

show that South African reserves of coal will be fully committed by the middle of the next century, assuming a moderate growth in electricity demand. The option of buying coal or electricity from coal-rich neighbouring states is also being studied. With the mining houses, the data is being used to establish the viability of extending the lives of existing power stations for which adequate, accessible and economically priced coal is a prerequisite.

The water supply operating rules, designed by the Department of Water Affairs to ensure future availability of water from supply dams, were strictly observed by Eskom in 1989. These rules provide a scientifically based method to control the abstraction rates from the interconnected eastern Transvaal water systems.

In a drive to optimise Eskom's use of water, 13 new flow meters were installed in various sections of the Komati system which supplies Arnot, Hendrina, Komati and Duvha power stations. The metered results are analysed by computer to establish the water balance and identify areas of wastage. The close monitoring approach will be extended to the other major water supply systems.

COAL CONSUMPTION

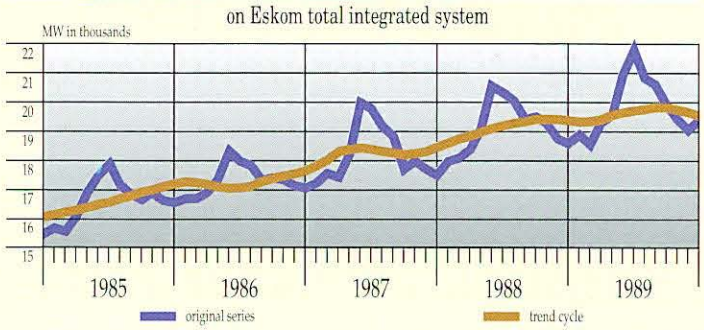
	1989	1988	% Change
Tonnage burnt by Eskom (million)	**67,5**	64,5	4,7
Average cost per ton (rands)	**20,94**	18,67	12,2

WATER CONSUMPTION

	1989	1988	% Change
Water consumption by coal-fired stations (Mm^3)	**259**	261	–0,8
Litres/kW.h	**2,02**	2,11	–4,3
Cost of water (million rands)	**108**	101	6,9

MAXIMUM DEMAND

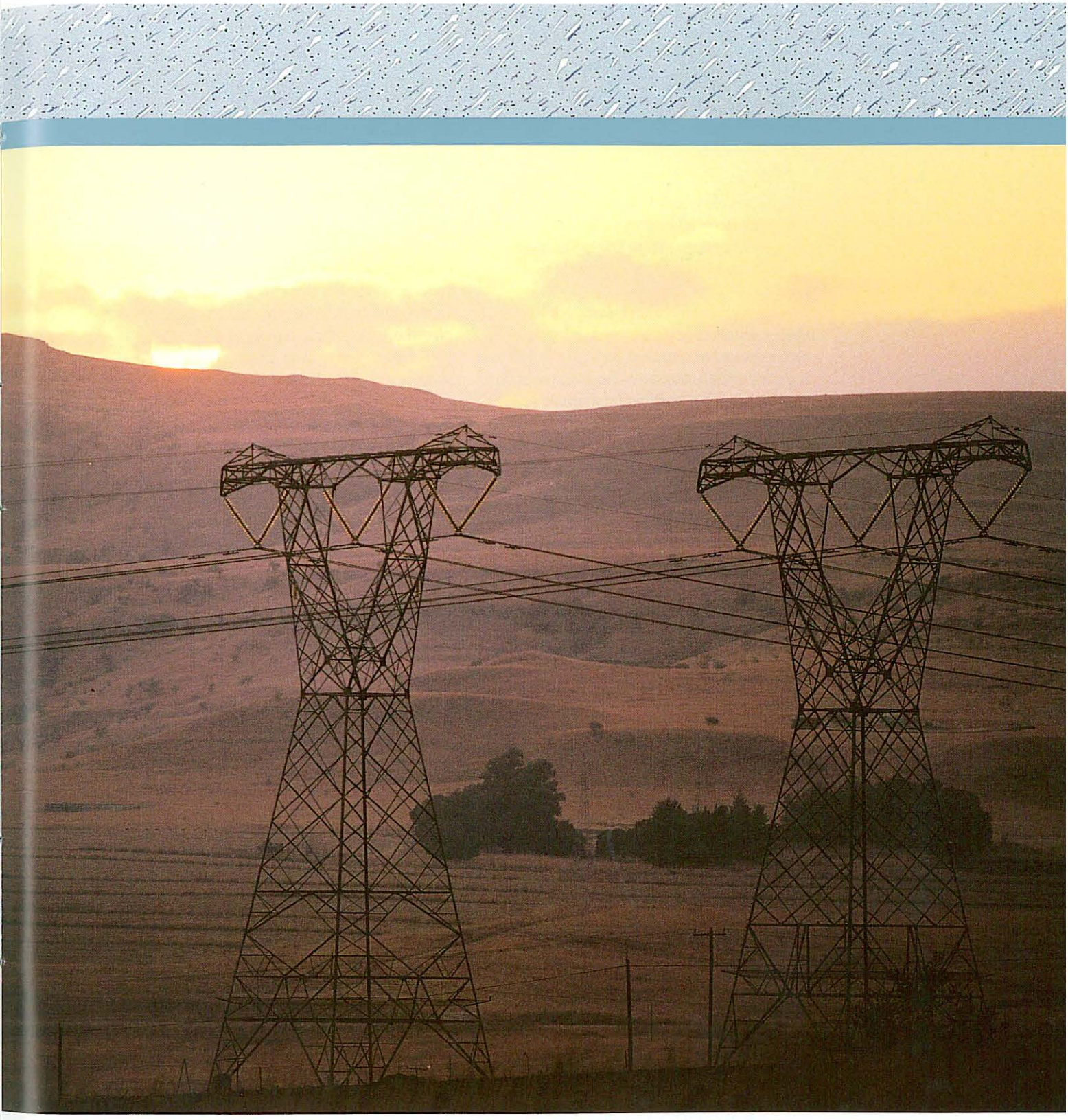
on Eskom total integrated system



INTERCONNECTED SYSTEM

The interconnected system consists of the substations and transmission lines conveying electricity from the power stations to Eskom's distribution regions. The steady rate at which electricity demand grows, necessitates continuous expansion of the system. It supplied 141 283 GW.h of electrical energy to the distribution regions in 1989, 3,4% more than in 1988. The peak demand of 21 871 MW on 21 July was 6,2% higher than in 1988. Thanks to the good inflows in the Orange River catchment area, more hydro-energy could be generated, saving about R4,5 million in energy costs.

Eskom's interconnected system serves 12 distribution regions. There are 21 874 km of transmission lines of which a total of 569 km of 400 kV and 227 km of 275 kV lines were added in 1989. New substations, shunt capacitors, line extensions and transformers are constantly being added to the system. In 1990 Kendal power station will be completely integrated into the system, involving eight transmission line projects.



QUALITY OF ELECTRICITY SUPPLY

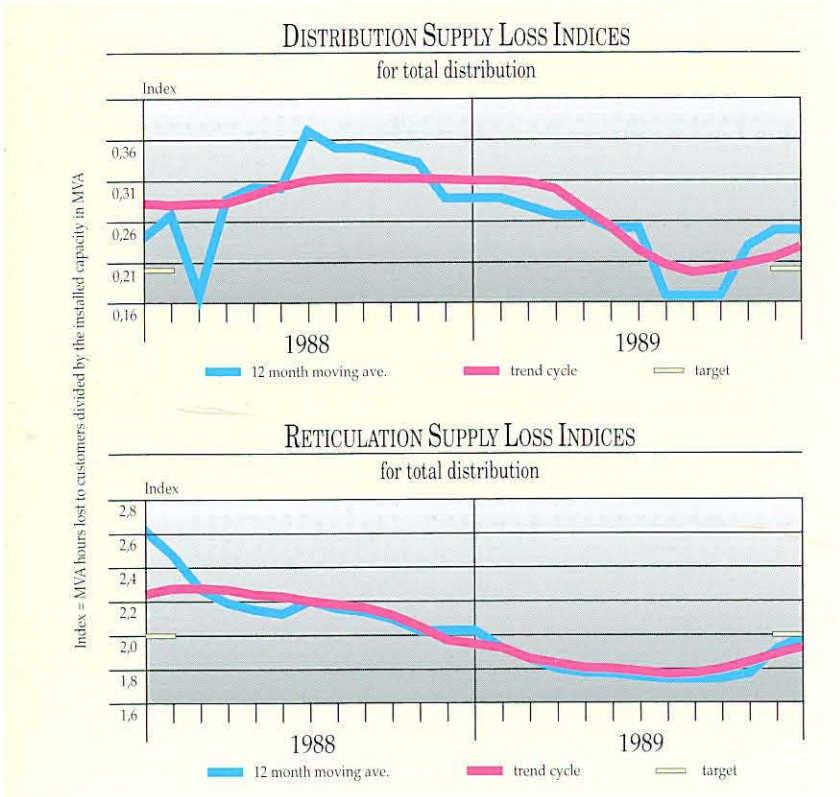
Steady progress was made in improving the quality of electricity supply in 1989, despite some setbacks. The problems are many and varied: from cane and veld fires, pollution and equipment failure to theft of overhead line conductors. In September, for example, uncontrolled veld fires caused the loss of 3 000 MW.

Nevertheless, there was an overall reduction in the number of low-frequency incidents, from 62 in 1988 to 55 in 1989. Supply interruptions on the main transmission system were fewer than recorded in 1988, but the impact was considerable. The number of major transformer

failures reduced from 13 in 1988 to 3 in 1989.

Supplies to neighbouring countries suffered some interruptions due to line faults, most of them on the Mozambique line inside that country.

Working groups within Eskom, often co-opting suppliers and customers, investigate problems and recommend corrective action to improve overall standards. An example of this was the insulator washing programme in eastern Natal after temperature inversions combined with pollution, resulting from cane burning and heavy mists, caused repetitive tripping of major lines. The problem was effectively solved.



EXCESS CAPACITY

Eskom currently has an excess capacity of 4 363 MW and has a comprehensive programme to manage it cost effectively. The excess capacity arose when in the late 1970s and early 1980s the high growth rate in electricity consumption was expected to continue. With an average annual growth rate between 6,2% and 7,4% the power station construction programme was accelerated. However, the average annual growth rate over the past five years was only 4,7%.

The time elapsing between the decision to construct a new power station and when it starts generating is of the order of 10–12 years. When growth dropped, Eskom had already placed contracts for a number of new coal-fired power stations and most projects had reached a stage where it would have been too costly to cancel them.

To reduce the excess capacity, the interval between the service dates of units 4, 5 and 6 at Tutuka and Lethabo was increased. Kendal power station was deferred by one year and Majuba power station was deferred by six and a half years. To retain the benefits of favourable exchange rates, the imported components of Majuba were delivered as stipulated in the original contracts. Vaal, Umgeni and West Bank power stations were decommissioned, having reached the end of their economic life. A number of generating units at inland stations were mothballed or placed in reserve storage to reduce operational and maintenance costs. They will be returned to service as needed.

The management of excess capacity also includes specific programmes aimed at large consumers, resulting in increased sales. This has so far reduced excess capacity by over 1 000 MW.

The rehabilitation and the extension of the economic life of generating sets not in service are being investigated. So far, a total of five stations – Komati, Camden, Grootvlei, Hendrina and Arnot – with a total net capacity of 7 400 MW are under investigation.

PLANT UNDER CONSTRUCTION

During 1989 two generating units with a total installed rating of 1 283 MW were placed in commercial service, one at Lethabo and one at Matimba.

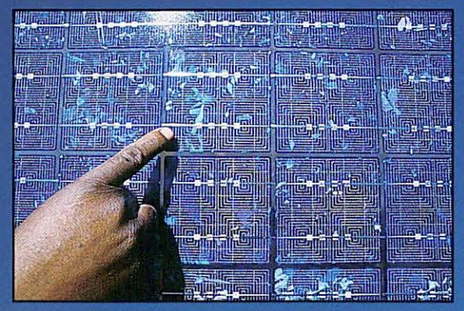
Lethabo power station near Vereeniging burns coal with a calorific value of 16 MJ/kg, the lowest for bituminous coal in the world. Eskom received recognition for its technical achievements in the form of the Premier Award from the Associated Scientific and Technical

Societies of South Africa (AS&TS) for Lethabo power station and the 765 kV powerline transmission system in 1989.

Lethabo unit 5, with a sent-out rating of 593 MW, came on line in July 1989. Construction continues on unit 6 which will be completed in 1990. The total installed rating of the station will be 3 708 MW.

Matimba is the world's largest direct dry-cooled station. Its fourth generating set, with a capacity of 665 MW, was taken into commercial operation in September 1989. Upon completion in 1991, Matimba will have an installed capacity of 3 990 MW. The entire dry-cooling installation was manufactured locally by GEA (SA). The direct air-cooled condenser and boiler support structures earned Eskom the 1988 Steel Construction Award from the SA Institute of Steel Construction. The dry-cooling system uses about 0,4 litres per kW.h, 80% less water than the approximately 2,0 litres per kW.h required by wet-cooling systems. Because of this, Matimba could be built in an area with limited water resources, yet close to the collieries which supply it, providing further savings in coal handling costs.

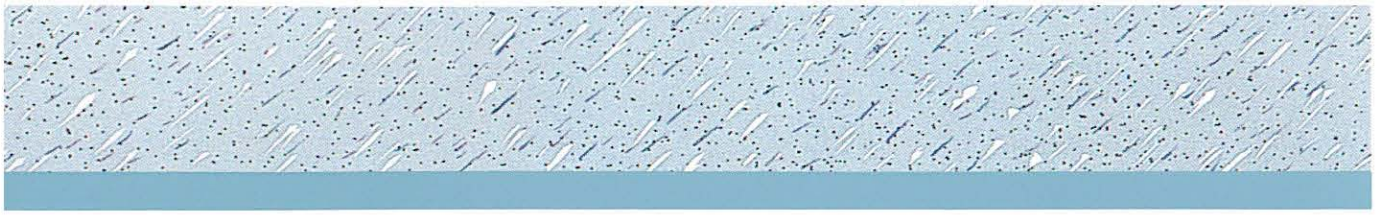
Generating plant with a total installed rating of 8 143 MW is also under construction at Tutuka, Kendal and Majuba, due for completion in 1990, 1993 and 2001 respectively.



Above: Eskom's policy is to consider all viable methods of electricity supply and to keep abreast of worldwide developments. For example, it applies state-of-the-art technology whenever it is appropriate for remote stand-alone applications where supply from the main Eskom electricity grid is uneconomical. Recently, in the Northern Cape, two containerised domestic photovoltaic power supplies were installed on farms as pilot units. Ongoing work is being done on the alternatives of wind power, small hydro projects and hybrid systems.

GENERATING SYSTEM

Under present conditions, the optimum plant mix comprises about 10% peak load and 90% base load plant. In South Africa, coal-fired or nuclear plant is used for base load and operates on a 24–hour basis to satisfy the average demand for electricity. Hydro-electric and pumped storage plant is mainly used for peak load, and is brought into service at short notice, usually when demand exceeds the base load capacity.



If the introduction of proposed new pricing structures is successful, the daily fluctuations of electricity demand will be reduced and about half the peak capacity, 5% of the total, will be saved. An extra 1% to 1,5% of base load plant should be installed and the net gain will be 3,5% to 4% of installed capacity. This gain will save R1,4 billion in capital expenditure.

With the projected growth rate, the spare capacity in hand, and life extension programmes, no new plant will be necessary during this decade. However, with the long lead times, a decision on new plant will have to be made soon. Studies show that coal-fired power stations will still dominate the generation mix in the foreseeable future. At present the most economic sources of coal are in areas where a number of environmental constraints will have to be resolved. Eskom is looking at new technologies involving combined cycle with coal gasification and fluidised bed boilers which have a reduced impact on the environment.

Apart from coal-fired plant, the only viable alternative is the nuclear route. With South Africa's coal reserves predicted to be fully committed towards the middle of the next century, bridging programmes with a limited number of nuclear units are being considered to assure a smooth transition to an increasing proportion of nuclear power generation in the next century. Eskom is already obtaining a number of suitable sites for future nuclear power stations and is studying the cost, size and type of nuclear units for these programmes.

South Africa's own hydro resources are limited and unreliable, but there is vast potential beyond South Africa's borders. Regional cooperation with other African utilities can in time mobilise this valuable resource once political constraints have been overcome.

It is Eskom's policy to consider all viable methods of electricity supply and to keep abreast of worldwide developments. For example, Eskom is applying state-of-the-art technology whenever it is appropriate for remote stand-alone applications where supply from the main Eskom electricity grid is uneconomical. Recently, in the northern Cape, two containerised domestic photovoltaic power supplies were installed on farms as pilot units. A number of photovoltaic water pump systems have also been installed on farms where a dedicated electricity supply for pumping is not feasible. Ongoing work is being done on the alternatives of wind power, small hydro projects and hybrid systems.

STANDARDISATION

During 1989 a division was established to oversee the standardisation of technical specifications throughout Eskom as well as other institutions involved in electricity generation, supply and usage. The work is being undertaken in collaboration with the Department of Trade and Industries. The division will manage a national project for the rationalisation of technical specifications among all major users of power equipment, especially in the heavy electrical engineering field. This project will benefit local manufacture by reducing the number of design variations called for, and improve export potential by standardising on international specifications wherever possible. Standardisation of the type of equipment used by such a large organisation as Eskom can effect substantial cost savings. Not only initial costs, but also inventory, operating and maintenance costs will be reduced.

NEW BUYING POLICY

Since 1986 Eskom has been improving its inventory management by providing better staff training, education and processes, and the disproportionate growth in inventories which prevailed before 1985 has been arrested. Less inventory volume is now being used to support more assets in service.

Centralised bulk purchasing has led to substantial savings compared with one-off market prices. Decentralised buying is also being supported, enabling operating business units to obtain goods and services they need in an environment that is entirely under their control. This blend of centralised and decentralised purchasing is in Eskom's overall interests while satisfying the operating business units' requirements.

In September Eskom received a bronze National Productivity Institute (NPI) award for reducing inventory while maintaining a service level in excess of 95%.

MANAGEMENT INFORMATION

An advanced management information system enabling executives to take better decisions more quickly was introduced late in 1989.

The Executive Information System (EIS), as it is known, delivers and focuses on information relevant to a manager's critical success factors (CSFs) in an electronic automated format. The introduction of EIS has already paid dividends in the definition of and focus on CSFs, the clarification of information definitions and sources, the establishment of an information base, the improvement in production system data and in the management information process.

ENSURING NO POTENTIAL IS LOST

A key factor in Eskom's continued ability to meet the electricity demands of South Africa is the development of an appropriate skills base. Eskom realises that it forms part of the macro-environment in South Africa and that it cannot operate in isolation. The educational, political, economic and social realities in South Africa have a direct impact on it and on the communities and educational institutions with which it is involved.

In 1989 Eskom launched an integrated approach to address the challenge of the macro-environment. It is a broad-based, holistic strategy aimed at the identification and utilisation of human potential for economic development and an improved quality of life. The strategy encompasses existing and future employees as well as suppliers, customers and the broader community.

Interventions included – amongst others – bridging programmes, career guidance, industry networking and cooperation, a social involvement programme and intercultural awareness programmes.

Through Eskom's social investment strategy, financial aid in the form of secondary school scholarships, as well as support to outreach programmes and teaching and training equipment, is made available to pupils and teachers, scholars and students from disadvantaged communities. The emphasis is on the upgrading of mathematics, science and language skills and to increase the flow of technologically orientated pupils into tertiary education. More than 6 700 teachers and students were reached by this programme in 1989.

The Eskom Top Students Awards recognise academic excellence by students of technikons, technical colleges and universities, both from within Eskom and from outside. The rationale behind the awards is to encourage students to pursue technological careers which will be to the advantage of Eskom and the South African economy in the next century. All these initiatives are aimed at increasing the pool of human potential from which Eskom, in common with all South African industries, draws its talent.

HUMAN RESOURCES

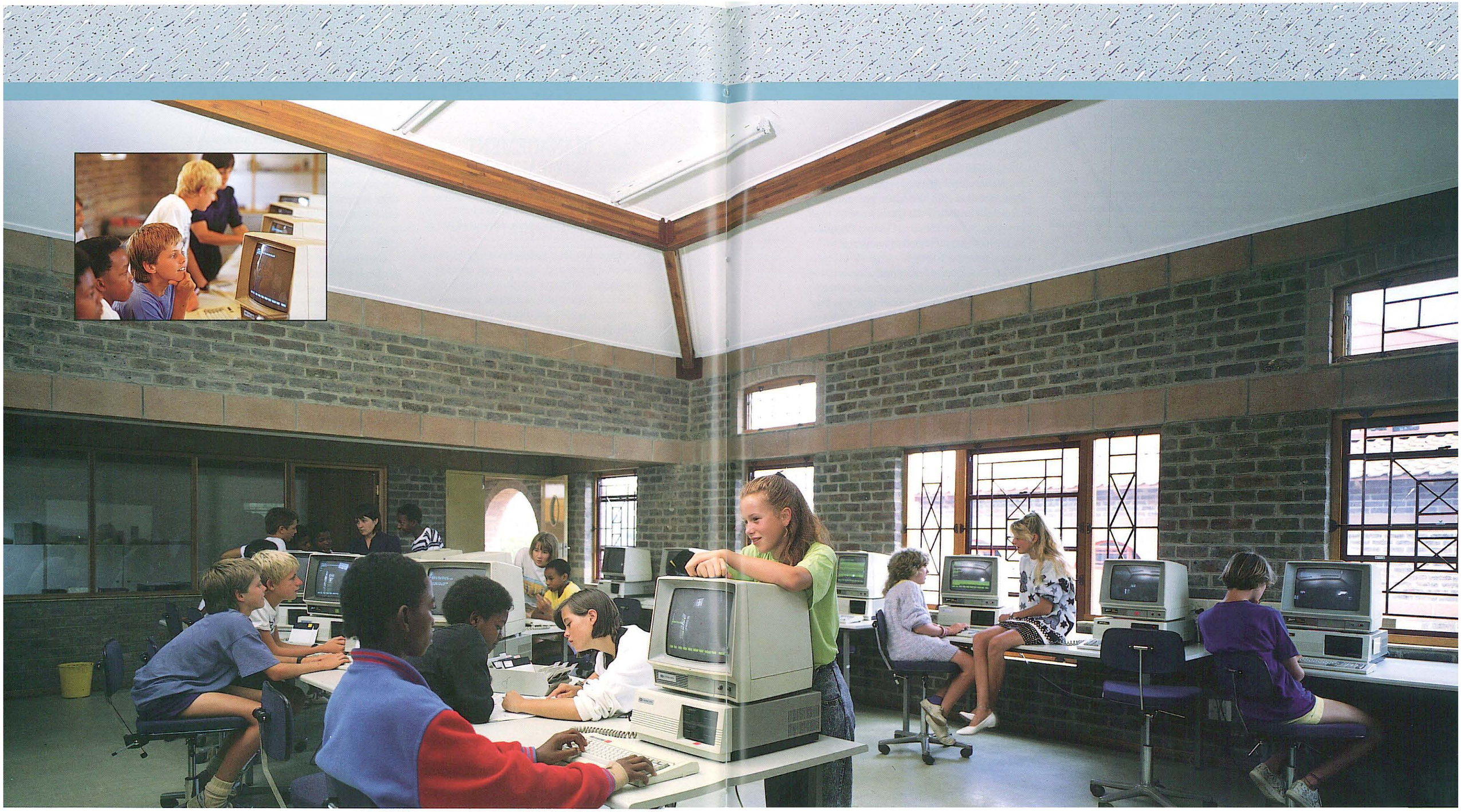
	1989	1988
Number of employees at 31 December	**51 554**	56 726
GW.h sold per year /employee	**2,61**	2,28
Employees/MW installed	**1,51**	1,71
Disabling injuries per million manhours	**2,08**	2,16
Fatalities per 5 million manhours	**0,77**	0,50

As part of the "No Potential Lost" philosophy a high premium is placed on the formal training and development of future skills in line with Eskom's long-term manpower requirements. The total number of trainees/bursars exceeded 2 300 in 1989. The number of black trainees/bursars increased significantly and averaged 17% of all new trainee/bursar intakes in 1989, compared with less than 3% in 1988.

TRAINEES/BURSARS

Apprentices	644
Pupil technicians	460
University students (bursars)	895
Graduates-in-training	367
	2 366

ESKOM IN ACTION 1989



Above: A key factor in Eskom's continued ability to meet the electricity demands of South Africa is the development of an appropriate skills base. Through Eskom's social investment strategy to ensure that no human potential is lost, financial aid in the form of secondary school scholarships as well as teaching and training equipment is made available to schools, teachers and pupils. The emphasis is on upgrading mathematics, science and language skills and to increase the flow of technologically orientated pupils into tertiary education.

PARTICIPATIVE MANAGEMENT

Participative management has become a watchword in South Africa and Eskom has taken giant steps towards introducing this at all levels of the organisation.

A suggestion scheme was implemented throughout Eskom in October 1989. During a trial run in some SBUs it produced an annualised saving of R2,3 million in a four month period.

Quality circles are well established in Eskom, based on the Japanese model of a small group of workers identifying and solving problems within their area of operation. The quality circle process is assisting in the development of people, problem solving and the improvement of the quality of work life. There are more than 600 registered quality circles in Eskom.

Special efforts by individuals or teams are also rewarded. In an annual event hosted by the chairman of the Electricity Council, Dr John Maree, the Chairman's Awards in various categories are made to employees who show innovative thinking and perform "beyond the call of duty".

The effectiveness of existing systems is also being challenged. The concept of special cross-functional teams of top managers, based on the Japanese Jishuken model, was introduced in 1989. Once a system to be analysed has been identified, an ad hoc team of specialists, who can include external consultants or suppliers' representatives, is appointed. Each member of the team will personally analyse a part of the system looking for ways to improve on it. In 1989 eleven such projects were undertaken, and considerable savings can be achieved over the next two years. A high proportion of the savings will be ongoing in the years ahead.

QUALITY

The drive to promote a quality culture in Eskom has been intensified. A quality advisory board was formed to assist and advise the Management Board and the organisation on quality related issues. Numerous presentations were made and lectures delivered by senior general manager Lood Rothman to internal and external audiences on the Eskom Quality Improvement Process (EQIP). General managers have accepted the responsibility for leading Eskom on the road to quality. Each group determined different approaches to the implementation of EQIP and the process was successfully launched at a Quality Management Convention in October 1989. Quality has been identified as one of the strategic priorities for 1990.

Eskom has achieved recognition for its efforts. It was elected affiliate member of the South African Society for Quality and was also awarded a silver NPI award and five other awards for its quality/productivity improvement programmes.

In Eskom the definition of quality is conformance to requirements, driven by a system of error prevention, with a standard of zero deviations from requirements and measured by the cost of non-conformance.

EMPLOYEE WELL-BEING

In order to improve the quality of life of all Eskom employees a family enrichment and pre-retirement planning programme was developed during 1989.

Eskom has now been accredited with the South African Medical and Dental Council, enabling it to provide training opportunities for intern psychologists to do their practical work within Eskom.

An Eskom programme to supply facilities for disabled workers was awarded the Amtronix trophy for awareness and concern for the disabled.

SAFETY RISK MANAGEMENT

During 1989 Eskom received more than 50 of some 500 national awards presented by the National Occupational Safety Association (NOSA). In addition, the Terry trophy for the longest continuous exposure without a disabling injury was awarded to Matla power station for its world record of 11 million manhours without disabling injuries.

Eskom's disabling injury frequency rate showed a further downward trend in 1989 and currently stands at 2,08 disabling injuries per million manhours worked. This compares very

favourably with other electricity supply utilities around the world. The loss of life within Eskom, however, stood at 0,77 employees fatally injured per five million manhours worked. About 90% of the SBUs have achieved a four star or better NOSA grading.

Safety videos developed by Eskom were awarded the Sartes trophy for video productions. They were described as "the perfect accident/incident reducing educational tool". These have also received international acclaim and have been marketed worldwide.

In 1989 Eskom embarked on an extensive campaign to combat accidents involving members of the public coming in contact with Eskom equipment. The Eskom programme developed to monitor and control asbestos during the decommissioning of power stations is being used by the SABS as the model for the development of a South African Standard for accredited asbestos test facilities.

INDUSTRIAL RELATIONS

Eskom and the 14 trade unions which represent 69% of its employees, have maintained sound relations throughout 1989 by a process of constructive negotiation and dialogue.

The 1988 amendments to the Labour Relations Act have resulted in an increase in the number of applications for the establishment of conciliation boards.

The constructive climate existing between Eskom and trade unions was evidenced in November 1989 by the agreement in principle to establish a trust scheme, financed by an Eskom contribution, to facilitate self-help projects for retrenched employees. It will be managed jointly by Eskom and the trade unions. The scheme will offer assistance through money grants and loans and technical, educational and managerial advice. It is primarily applicable to groups of ex-employees and each application will be investigated for its economic viability. It is envisaged that the fund could be expanded through additional financing.

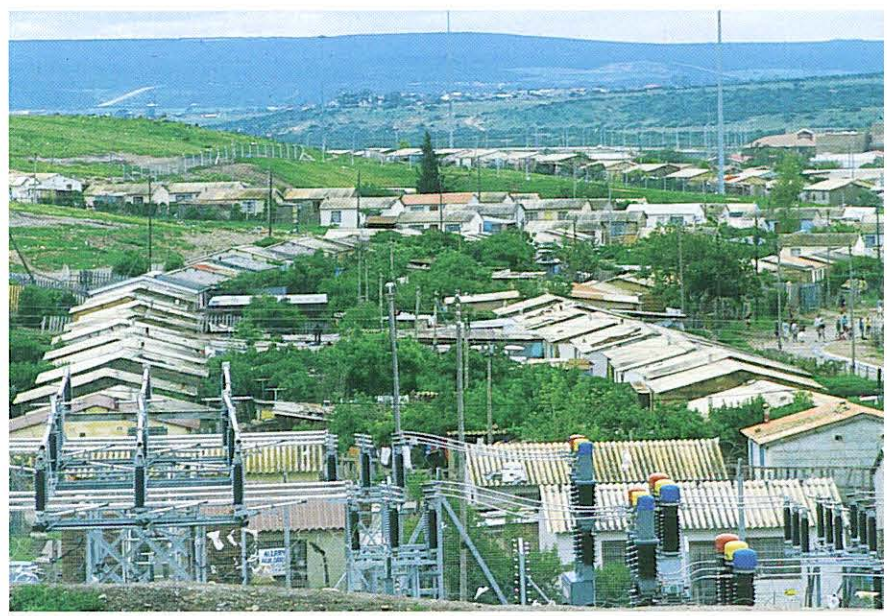
ENVIRONMENTAL IMPACT MANAGEMENT

The year saw many developments on the environmental front. Global environmental concerns such as the greenhouse effect, ozone depletion and acid rain captured the attention of society. Locally, the promulgation of the Environment Conservation Act, the quality of air in the eastern Transvaal Highveld, water quality in major river catchments and pledges to curb environmental degradation became areas of attention.

For many years Eskom has accepted the importance and necessity of high standards of environmental performance and practice as part of its business management and strategic portfolio.

Eskom's immediate priority is air quality which is being tackled on many fronts, including research into emission cleaning, alternative methods of generating power, enhanced combustion, flue gas conditioning (on which approximately R100 million will be spent over the next five years) improved monitoring of emissions and ambient air quality. The Electricity for All programmes

Below: At present there are 48 electrification projects under way which will bring electricity to about three million people in the near future.



Above: Eskom's Electricity for All programme will ensure cleaner urban areas. Most fuels burnt for cooking and heating are major causes of atmospheric pollution.

will ensure cleaner air in the urban areas and improve quality of life.

Eskom's efforts and contribution to atmospheric pollution monitoring and modelling were recognised in the form of the 1989 National Association for Clean Air (NACA) Corporate Award, presented in November 1989. A major factor in the NACA Council's decision was Eskom's willingness to place the results of its investigations in the public domain. The research programme is the largest and most intensive air quality monitoring programme ever undertaken in the Southern Hemisphere. Its scientists are nationally recognised in the field of air quality and meteorology, and play a major role in advising and assisting in national air quality and impact research programmes. "All these contributions are both unique and remarkable in that they transcend Eskom's immediate needs and the bounds of their legal mandate, and address issues of larger national and scientific significance," said the citation.

In order to improve the removal of ash from flue gas to 99,8%, seven power stations are to be fitted with flue gas conditioning equipment over the next four years. They are Kriel, Duvha, Matla, Hendrina, Grootvlei, Arnot and Komati. In flue gas conditioning equipment the electric charge imparted to the dust particles is increased to ensure better agglomeration and collection. Equipment to monitor the effectiveness of flue gas conditioning is being located in the stacks.

Research on monitoring of air pollutants such as nitrogen oxides and sulphur dioxide, acid rain monitoring, ashdam and ash dump rehabilitation, as well as electric and magnetic fields emanating from power lines, is ongoing.

Eskom has also researched, investigated and monitored a host of environmentally sensitive aspects embracing solid, liquid and gaseous contamination. Sewerage processes are optimised over and above the legal requirements by means of reedbeds which take up nutrients which might otherwise cause algal blooms in the downstream water - making nature work for Eskom at minimum cost.

Extensive ground water monitoring programmes have been developed at all major power stations. All systems were in place in January 1990.

Numerous environmental impact assessments were conducted for major transmission projects. These included the Matimba-Midas, Majuba-Venus and Groenkop-Tugela lines. Public meetings and participation formed an integral part of the decision and information process.

Eskom is also involved in the effects of high extraction coal mining on the agricultural potential of the areas being mined. The disposal of ash into the mine's open pit with very careful environmental impact control and rehabilitation at Lethabo power station is a first in South Africa.

As part of its commitment to nature conservation Eskom has already published a bird identification guide and has now issued a guide for protected plants and trees. The company is in the process of compiling a publication on historical and archaeological resources to prevent destruction when routing and constructing installations.

Eskom takes an active part in conjunction with government, environmental experts, voluntary groups, schools, professions, institutes, universities and the media in

identifying and encouraging more effective ways of meeting environmental needs and managing Eskom and society's impacts on resources. Eskom personnel are also receiving training in environmental impact management.

Industry has the expertise and resourcefulness to lead the fight against environmental degradation. Through a process of continuous auditing, self-regulation and open communication, Eskom strives to achieve the correct balance between environmental quality and the provision of electricity. This is accepted as an exciting challenge to which Eskom is enthusiastically committed.

SUB-SAHARAN GRID

The economic sense of a regional network is slowly overcoming political constraints and over the past year visits between utilities in the subcontinent have been more frequent.

Towards the end of 1992, 1 355 MW of power from Cahora Bassa should be available to Eskom. Cahora Bassa is regarded as the first step towards establishing a regional electricity grid. The station itself is well maintained and in a fully operational condition. The effort is now being directed at repairs to the powerlines and, in particular, the approximately 1 400 pylons which need to be rebuilt.

The Permanent Joint Committee (PJC), made up of representatives of the South African, Mozambique and Portuguese governments and chaired by chief executive Ian McRae, held regular meetings during 1989 to examine the costs and the difficulties involved in rebuilding the powerline. The three governments accepted the PJC's recommendations to restore the damaged towers, and these are being carried out.

INTERNATIONAL COOPERATION

Eskom maintains extensive contact with the rest of the world, and during the course of the year it participated in various international conventions, conferences and symposia. Papers on Eskom's achievements were presented in Germany, the USA, Scotland, Brazil, South Korea, Hungary and Thailand. Topics covered were the centralised electrical engineering database scheme (CEEDS), Eskom's major power station projects, advanced protection technology and integrated control systems for material handling. In 1989 Eskom also hosted the second international conference on reliability.

Eskom staff members are receiving training at utilities in Taiwan and the UK, while two visited an Australian utility as consultants.

An ongoing relationship and exchange of information is also maintained with utilities and universities worldwide. Representatives of foreign utilities continue to visit Eskom plant and discuss operational and design aspects. Of particular interest to these visitors are the dry ashing systems at four new stations (Tutuka, Lethabo, Matimba and Kendal), the two dry-cooling systems at Matimba and Kendal, and the SF_6 gas insulated switchgear.

WORLD ASSOCIATION OF NUCLEAR OPERATORS

In 1989 Eskom became a full member of WANO, the World Association of Nuclear Operators. WANO was founded in Moscow in May 1989. Its charter was signed by delegates from 134 electricity utility companies from all over the world. This brought together every single nuclear power generating country in the world, except Bulgaria.

The mission of WANO, as formulated in the charter, is to maximise the safety and reliability of the operation of nuclear power plants by exchanging information and by encouraging comparison, emulation and communication among its members.

Eskom chief executive Ian McRae, as the representative of South Africa's only nuclear operator, also signed the WANO charter, putting Eskom on a par with other major utilities worldwide.

With WANO the cause of international cooperation between the operators of the world's 370 nuclear power plants has taken a major step forward. In WANO it is not countries that are joining forces but power utilities. The strength of the organisation is that it functions outside the realm of politics.

Following page: Steady progress was made in improving the quality of electricity supply. Working groups investigate problems and recommend corrective action to improve overall standards.

FINANCIAL RESULTS 1989

CONTENTS

FINANCIAL REPORT

INCOME STATEMENT AND BALANCE SHEET

Electricity sales produced revenue of R9 271 million (1988: R8 159 million). Operating expenditure was R5 644 million (1988: R4 858 million) and net interest and finance charges were R2 899 million (1988: R2 485 million), leaving a surplus of R728 million (1988: R816 million). Accumulated reserves stood at R8 755 million at the end of 1989 (1988: R8 127 million).

Total operating costs rose by 12% in 1989, from 3,75 cents to 4,20 cents per kW.h. This is an impressive performance against an inflation rate of 15,2% for the year, as measured by the Producer Price Index.

Total finance charges for the year rose by 26%. Eskom has reduced the extent of its borrowings in recent years, but it remains vulnerable to rises in interest rates. Even at this reduced level the substantial increases in short-term interest rates late in 1989 added R143 million to finance charges.

Compared with budget, Eskom performed well. Revenue exceeded budget by 0,4%. Contribution (i.e. sales less primary energy) was in line with budget whilst operating expenses exceeded budget by 3%. The major reason for this variance is the higher than budget self-insurance costs resulting from a few significant incidents in the latter part of the year. However, it was offset by a favourable variance of some R207 million on interest and finance costs. This resulted in an overall favourable contribution to net income of 0,54 cents per kW.h, which is in line with budget.

Operating income covers finance charges 1,25 times with a debt equity ratio of 2,81. An interest cover of between two and three times is considered more appropriate. The norm for the debt equity ratio of most foreign utilities is 1,0. Eskom's interest rate exposure will have to be reduced by increasing its reserves. This will accentuate the need for improved levels of internally generated funds requiring higher surpluses in the income statement. Eskom plans to move towards these targets gradually over the next few years.

Tighter financial control, better asset management, and improved productivity have enabled Eskom to offset some of the inflationary pressures on operating costs. Unfortunately, many suppliers have not managed their own costs to the same extent and Eskom has had to absorb increases in input costs well in excess of the inflation rate. It obviously cannot continue to do so indefinitely.

Eskom's pricing strategy has been to maintain price increases below the ruling rate of inflation. It further aims for consistent price adjustments from year to year. During the past three years, increases in the price of electricity were kept to between two and five percent below the rate of inflation. If a major adjustment in excess of the inflation rate is to be avoided, future price increases will have to be nearer the inflation rate. The 14% increase effective from January 1990 is higher than the 12% of 1987, 10% of 1988 and 10% for 1989, but still below the expected rate of inflation for the year. During the next few years it is Eskom's intention to improve its balance sheet and income statement ratios through greater cost effectiveness and realistic price increases. The reducing capital expenditure programme will assist in achieving this target.

FUNDING REQUIREMENT

Eskom's funding requirement is at the moment relatively low compared with previous years and will reduce even further as the capital expenditure programme declines. The situation will change towards the end of the 1990s when a major borrowing programme will be required to fund the next major expansion programme.

The gross funding requirement in 1989 was R3 271 million (1988: R2 291 million) and little difficulty was experienced in raising these funds. R952 million was obtained from the local capital market, R1 517 million from the local money market and foreign loans and extended credit facilities. Swap cash flows of R802 million were also used for funding purposes.

Developments in the domestic capital markets, subsequent to the March 15 announcement of a revision in the prescribed asset requirements of institutional investors, led to a much lower institutional demand for fixed interest securities accompanied by a sharp increase in yields to a high of 17,56% per annum for the benchmark E 168 stock. However, a salient feature of funding in the domestic capital market during 1989 was the increased participation by smaller investors domestically and in the latter part of the year from foreign investors via the financial rand.

This resulted in a sharp decrease in yields during December. Eskom obtained most of its capital market funding from these sources during 1989.

Much of the potentially adverse impact of the reduction in prescribed asset requirements was avoided by prefunding during January and February 1989 and option hedging strategies in anticipation of such an event. Eskom then responded further during March by changing its planned funding mix for the remainder of the year. The result was an increased utilisation of shorter term funding instruments in the domestic money market. With the inverse yield curve ruling at the time it meant that Eskom was willing to pay more for its funding requirements in the short term, which was viewed as bridging finance in anticipation of declining long-term rates.

Positive swap cash flows provided a certain amount of funding during 1989 whilst the balance of some R800 million was invested to provide liquidity for the ultimate settlement of liabilities. The swap cash flows are the result of forward cover contracts extended in an environment of a depreciating rand and cannot be regarded as a profit but represent a shift in liquidity. The investment of such funds is therefore merely a provision for the future repayment of foreign debt.

Although no reliance had been placed on foreign funding in the original 1989 funding plan, an amount of R250 million was obtained from foreign sources. This was mainly due to Eskom being successful in negotiating the conversion of foreign loans affected by the second interim arrangement into longer term facilities outside the standstill net. Extended credit facilities to the value of R207 million were also utilised during 1989.

Eskom positioned itself so as to make maximum use of a favourable change in the term structure of forward cover made available by the South African Reserve Bank for certain categories of foreign exchange exposure. Notwithstanding this, a significant increase in forward cover costs was experienced due to a doubling in the rand/dollar forward premium for the cover provided by the private banking sector. This was brought about by a simultaneous decline in short-term interest rates in the USA and a sharp rise in domestic money market interest rates.

FUNDING REQUIREMENT FOR 1990

Eskom's funding requirement for 1990 amounts to R3 139 million. R2 300 million will be raised on the capital market and R444 million investments will be utilised for funding purposes. An amount of R527 million will be funded offshore of which R244 million will be through the utilisation of extended credit facilities and the balance from other foreign sources.

Funding from the domestic markets will have to be obtained in the new environment which has arisen after the revision of the prescribed asset requirements. More volatile markets can be expected as institutional investors, who now have more freedom to manage their portfolios, reposition themselves to utilise market opportunities across the whole investment spectrum. The commitment of the monetary authorities to positive real interest rates will also prove to be a challenge to Eskom in that it will be required to stay one step ahead of the market in order to effectively manage financing costs. Another important influence to be borne in mind must be the impact of future political developments on the perceptions of foreign investors and the resultant effect on capital market rates.

FINANCIAL RISK MANAGEMENT

In order to best manage such uncertainties Eskom will continue to place increased emphasis on financial risk management. The focus will be on appropriate hedging strategies to protect its activities in the domestic as well as international markets. A significant proportion of the 1990 funding requirement was prefunded in the domestic market during the last quarter of 1989. Further provision was made to protect Eskom against higher interest rates by the purchase of a series of put options at favourable levels.

Eskom treasury manages its funds as a single pool consisting of debt and investments. To more clearly show the economic reality of this operation, investments have been offset against borrowings and disclosed on the balance sheet as net interest bearing debt. Investments represent funds received from swap cash flows and prefunding activities which have been invested pending

their use for repayment of loans and for funding operating and capital expenditure.

Eskom's total gross borrowings amounted to R27 871 million at the end of 1989, of which 71% is in fixed rate instruments, a ratio which is suitable to the current environment but which may be adjusted in line with future changes in the yield curve. Of this amount 61% is from domestic sources while the maturity structure for all debt indicates that 29% matures within the first three years. In order to better manage the longer term financial risks on an integrated basis an asset/liability committee will be established early in 1990. This body will oversee a number of disciplines exposed to financial decision making and will lay down the broad parameters within which Eskom's financial risks should be managed.

From a liquidity perspective Eskom regards itself well placed to service the demands for foreign debt repayments in the coming years. Although an increased outflow of funds is expected during 1991 and 1992, due to the maturity of foreign bond and note issues, sufficient provision has been made to meet these requirements.

FUNDING SOURCES

	PLANNED 1990	ACTUAL 1989	PLANNED 1989
Local capital market	2 300	952	1 500
Local money market	(132)	1 060	981
Foreign loans	283	250	0
Extended credit facilities	244	207	211
Investments utilised	444	0	0
Swap cash flows	0	802	1 122
TOTAL	3 139	3 271	3 814

INSURANCE

Eskom continues to pursue a policy of managed risk and self-insurance of selected risks. Cost, benefit and risk information relating to self-insurance is continually updated and reviewed in accordance with the latest assessments of asset values and risk exposures. Certain risks, such as political riot and nuclear, are insured to the extent that cover is available in the commercial insurance market. For construction projects and public liability, insurance is arranged which covers Eskom and all its contractors, subcontractors and suppliers on site.

Considerable effort is employed to ensure that the risk of loss or damage is minimised. There is a safety and risk management programme directed at staff and contractors in order to avoid industrial accidents and occupational diseases. This risk management awareness extends beyond the pure brick and mortar approach to assets and includes greater emphasis on environmental awareness.

In all instances, assets are valued on a replacement basis for insurance and risk management purposes and management is satisfied that there is no significant unprotected risk exposure.

UNLISTED INVESTMENTS

A group of private companies was formed under a holding company called Rotek Industries (Pty) Limited which is a wholly-owned subsidiary of Eskom.

One of the main objectives was the commercialisation of some of Eskom's peripheral activities. Through the greater freedom to attract work from customers other than Eskom, better utilisation of assets is achieved.

The Rotek Group consists of four companies.

Rosherville Properties (Pty) Limited is a wholly-owned subsidiary of Rotek Industries and has five divisions: Clinker Dumps, Horticultural, Property Development and Management,

Catering/Accommodation and Financial and Administrative Support.

Rosherville Engineering (Pty) Limited is a wholly-owned subsidiary of Rotek Industries and provides strategic maintenance and repair facilities. This is the former Central Maintenance Services and offers its services to other generators and distributors of electricity like Sasol, Iscor and municipalities. It consists of turbogenerator, electrical, general engineering and transport divisions.

In Rovec Services (Pty) Limited, a wholly-owned subsidiary of Rotek Industries, Rotek has embarked on a professional service for the rebuilding of heavy trucks and four-wheel drive vehicles.

Ash Resources (Pty) Limited has four shareholders, each owning 25% of the company. They are Rotek Industries (Pty) Limited, Pretoria Portland Cement Co. Limited, Blue Circle Cement (Pty) Limited and Anglo Alpha Portland Cement (Pty) Limited. Ash Resources uses pulverised fuel ash for blending with cement as a cement extender. Eskom currently produces about 20 million tons of fly ash per annum.

No assets or personnel have been transferred from Eskom to the Rotek Group as yet. The assets will only change ownership once the transfer becomes economically viable.

KwaNobhule Electricity Supply Co. (Pty) Limited is a joint venture, formed to electrify the town of KwaNobuhle near Uitenhage. Eskom holds 50% of the shares.

Natal Navigation Collieries and Estate Co. Limited was acquired in 1989 and is the owner of Kilbarchan Colliery. It is 100% owned by Eskom.

These investments are recorded at cost in the Financial Statements and are not consolidated due to the fact that these operations are not similar to that of Eskom and at this stage they are not a material part of Eskom's assets.

PRIVATISATION

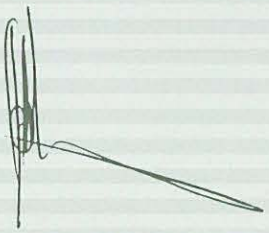
The investigation into the possible privatisation of Eskom is well advanced. Consideration has also been given to the possibility of the privatisation of activities in certain other areas of the electricity supply industry by means of joint ventures involving Eskom, where this is to the benefit of all concerned. Regulatory concepts are receiving attention with the primary objective being to control costs and maintain efficiency.

Apart from work on the question of Eskom's privatisation in respect of which the final decision rests with the Government, Eskom has given attention to the likely financial implications of the organisation becoming a corporate tax payer in terms of the Income Tax Act 1962. The consequences of the introduction of value added tax and its application to Eskom's activities are being considered.

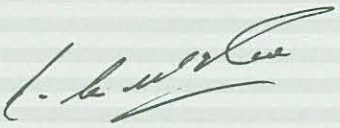
Irrespective of privatisation it is clear that the present privileges enjoyed by Eskom and its consumers, as provided for in various legislative enactments, will be whittled away. An example of this is the abolition of the legal requirement obliging certain institutional investors to invest a significant proportion of their funds in prescribed assets such as Eskom bonds.

ANNUAL FINANCIAL STATEMENTS

The annual financial statements for the year ended 31 December 1989 set out on pages 43 to 51 have been approved by the Electricity Council and the Eskom Management Board and were signed on its behalf on 8 March 1990 by



Dr J. B. Maree
Chairman of the
Electricity Council



Dr I. C. McRae
Chief Executive
of Eskom

REPORT OF THE AUDITORS

To the members of the Electricity Council

We have examined the annual financial statements set out on pages 43 to 51.

In our opinion these statements fairly present the financial position of Eskom at 31 December 1989 and the results of its operations for the year then ended, in the manner required by the Eskom Act of 1987 and in conformity with generally accepted accounting practice.

Aiken & Peat

Aiken & Peat
Chartered Accountants (S.A.),
Auditors

Deloitte Haskins & Sells

Deloitte Haskins & Sells

Johannesburg
8 March 1990

ACCOUNTING POLICIES

BASIS OF PREPARATION

In terms of the Eskom Act, and as determined by the Electricity Council, the financial statements are prepared in accordance with the applicable requirements of the Companies Act in conformity with generally accepted accounting practice. The financial statements are prepared on the historical cost basis, except for short-term investments held for trading purposes. The following principal accounting policies are consistent in all material respects with those applied during the previous year. Certain 1988 figures have been reclassified to present appropriate comparisons.

INSURANCE RESERVE

The insurance reserve is held to cover abnormal losses. The reserve is increased annually by the excess of internal premiums, at market related rates, over claims not covered by external insurance.

DECOMMISSIONING OF GENERATING PLANT

Provision is made for the estimated costs of decommissioning nuclear plant over its estimated useful life.

Provision is not made for the costs of decommissioning other plant unless it is expected that decommissioning costs will exceed the net proceeds from the sale of associated land and the salvage value of the plant.

LOAN DISCOUNT

Discounts and premiums on local registered stock in issue are amortised over the period of each loan using the yield to redemption method.

INVESTMENTS

Long-term investments are stated at cost and profits or losses are recognised on realisation.

Short-term investments held for market making and trading purposes are stated at market value and profits or losses are accounted for on revaluation.

OFF-BALANCE SHEET FINANCIAL INSTRUMENTS

The premiums received and paid on financial instruments designated as hedges for future funding requirements are amortised over the lives of the instruments. Where they are not designated as hedges they are stated at their market value and the resultant profits or losses are included in interest and finance charges in foreign and other debt.

FOREIGN CURRENCIES

Transactions in foreign currencies are recorded at the spot rates ruling when the initial forward cover contracts were established or at the spot rates ruling at transaction date.

Assets, liabilities and commitments in foreign currencies are translated to South African Rand at the spot rates of the underlying forward cover contracts or at the rates of exchange ruling at year end.

Forward cover costs are recognised over the periods of the related forward cover contracts and are included in interest and finance charges.

Gains and losses on foreign exchange are included in interest and finance charges in foreign and other debt.

FIXED ASSETS AND DEPRECIATION

Fixed assets in commission are stated at cost of acquisition or construction, less depreciation thereon.

Works under construction are stated at cost, which includes all costs necessarily incurred to bring plant to the condition and location essential for its intended use. Costs include related interest and finance charges, overheads and research and development costs.

Construction materials are stated at weighted average cost.

The cost of renewal and maintenance of assets is expensed as incurred. Where the life of an asset is extended, such costs are capitalised and depreciated over the adjusted useful life of the asset.

Land is not depreciated. Rights are fully depreciated on acquisition.

Other fixed assets in commission, equipment and vehicles are depreciated on the straight line basis over their estimated useful lives.

Depreciation is charged on the full cost of power stations placed partially in reserve storage.

LEASED ASSETS

Assets subject to finance lease agreements are capitalised at their cash cost equivalents and the corresponding liabilities are raised. The assets are depreciated on the straight line basis over their estimated useful lives. Lease finance charges are included in interest and finance charges in foreign and other debt.

FUTURE FUEL SUPPLIES

Certain long-term supply contracts require advance payments to suppliers of fuel for pre-production costs. These payments, together with interest capitalised thereon, are deferred and amortised on the basis of quantities of fuel purchased.

FUEL AND STORES

Nuclear fuel is valued at cost on the first-in-first-out basis. The charge to operating expenditure is based on estimated fuel consumption.

Other fuel and stores are valued at weighted average cost. Provision for obsolescence is made where appropriate.

ELECTRICITY REVENUE

Revenue is recognised at the time customers are billed.

RETIREMENT BENEFITS

Contributions to the Eskom Pension and Provident Fund are based on a percentage of salaries and are expensed in the period in which they are incurred. Gratuities paid to retiring employees are expensed in the period in which they are paid.

BALANCE SHEET

At 31 December 1989

(in R million)

	Notes	1989	1988
Capital employed			
Accumulated reserves		8 755	8 127
Other reserves and provisions	1	302	177
		9 057	8 304
Net interest bearing debt	2		
Long term		21 876	20 142
Short term		2 754	2 637
		24 630	22 779
		33 687	31 083
Employment of capital			
Fixed assets	3	31 728	29 169
Non-current assets	4	2 185	2 244
		33 913	31 413
Current assets			
Fuel and stores	5	1 259	1 176
Debtors		920	796
		2 179	1 972
Interest free liabilities			
Creditors		1 952	1 886
Interest payable		453	416
		2 405	2 302
		33 687	31 083

INCOME STATEMENT

For the year ended 31 December 1989

(in R million)

	Notes	1989	1988
Electricity revenue		9 271	8 159
Industrial		2 794	2 566
Bulk		3 633	3 025
Mining		2 309	2 072
Traction		384	337
Domestic and lighting		151	159
Operating expenditure	6	5 644	4 858
Operating income		3 627	3 301
Net interest and finance charges	7	2 899	2 485
Net income		728	816
Accumulated reserves at beginning of year		8 127	7 311
		8 855	8 127
Transfer to insurance reserve	1	100	—
Accumulated reserves at end of year		8 755	8 127

CASH FLOW STATEMENT

For the year ended 31 December 1989

(in R million)

	Notes	1989	1988
Cash generated from operations			
Net operating income		**3 627**	3 301
Non-cash items	11.1	**1 419**	1 328
		5 046	4 629
Cash released from working capital	11.2	**60**	284
		5 106	4 913
Net financing charges	11.3	**(2 884)**	(2 372)
Net cash flow from operations		**2 222**	2 541
Loans and facilities raised			
Local registered stock		**1 825**	865
Foreign and other		**2 023**	1 356
Net proceeds on maturity of forward cover contracts		**1 289**	1 348
Total raised		**5 137**	3 569
Total cash generated		**7 359**	6 110
Cash applied			
Loans and facilities repaid			
Local and registered stock		**(181)**	(42)
Foreign and other		**(1 454)**	(759)
Total repaid		**(1 635)**	(801)
Investments and deposits		**(1 731)**	(1 340)
Capital expenditure	11.4	**(3 993)**	(3 969)
Total cash applied		**(7 359)**	(6 110)

NOTES TO THE FINANCIAL STATEMENTS

For the year ended 31 December 1989

(in R million)

	1989	1988
1. Other reserves and provisions		
Insurance reserve	100	—
Provision for decommissioning costs	202	177
	302	177

The insurance reserve was set aside to absorb abnormal losses not covered by external insurance policies.

2. Net interest bearing debt		
2.1 Long term		
Eskom local registered stock	17 097	14 632
Loan discount	(3 116)	(2 546)
	13 981	12 086
Foreign and other	8 703	8 779
	22 684	20 865
Less: Investments		
Republic of South Africa, Municipal and other stock – at cost	808	723
Market value R801 million (1988: R717 million)		
	21 876	20 142
2.2 Short term		
Eskom local registered stock	68	249
Loan discount	(2)	(11)
	66	238
Foreign and other	5 121	3 186
	5 187	3 424
Less: Investments		
Eskom local registered stock – at market value	54	37
Deposits	2 379	750
	2 433	787
	2 754	2 637

2.3 The authorised nominal value of local registered stock is R26 893 million (1988: R24 443 million). (Refer Schedule 1)

2.4 Investments and liabilities with similar maturity dates are offset as disclosed above so as to accurately reflect Eskom's interest and liquidity risk profile.

2.5 All significant foreign currency exposures were hedged by forward cover contracts at 31 December 1989.

2.6 The average rate of interest and finance charges during the year amounted to 14,4 per cent per annum (1988: 13,6 per cent per annum).

2.7 Short-term debt includes credits and short-term advances totalling R3 117 million (1988: R1 900 million) which are of a revolving nature.

For the year ended 31 December 1989

(in R million)

3. Fixed assets

	Cost	Accumulated depreciation	Book value
1989			
Land and rights	**309**	**62**	**247**
Buildings and facilities	**2 134**	**545**	**1 589**
Plant – Generation	**21 598**	**4 081**	**17 517**
– Transmission	**3 090**	**725**	**2 365**
– Distribution	**3 878**	**903**	**2 975**
Test and telecommunication equipment	**190**	**132**	**58**
Total in commission	**31 199**	**6 448**	**24 751**
Works under construction	**6 480**		**6 480**
Construction materials	**158**		**158**
Equipment and vehicles	**686**	**400**	**286**
Leased equipment	**112**	**59**	**53**
	38 635	**6 907**	**31 728**
1988			
Land and rights	287	65	222
Buildings and facilities	2 299	515	1 784
Plant – Generation	19 735	3 211	16 524
– Transmission	2 784	601	2 183
– Distribution	3 415	793	2 622
Test and telecommunication equipment	160	111	49
Total in commission	28 680	5 296	23 384
Works under construction	5 359		5 359
Construction materials	153		153
Equipment and vehicles	643	370	273
	34 835	5 666	29 169

Fixed assets subject to finance leases have been capitalised with effect from 1 January 1989. The effect of this change in policy is not material and accordingly comparative figures have not been restated.

4. Non-current assets

	1989	1988
Future fuel supplies	**1 757**	1 808
Housing loans to employees	**368**	411
Debtors for reticulation systems	**55**	22
Unlisted investments	**5**	3
	2 185	2 244
Housing loans to employees are secured by first mortgages. Certain mortgages have been ceded to financial institutions as security for loans included in foreign and other debt	**129**	190

For the year ended 31 December 1989

(in R million)

		1989	1988
5.	**Fuel and stores**		
	Fuel	818	777
	Maintenance and consumable stores	441	399
		1 259	1 176
6.	**Operating expenditure**		
	Operating expenditure includes:		
	Depreciation		
	Assets in commission	1 225	1 065
	Equipment and vehicles	112	85
	Leased equipment	27	—
	Lease charges on equipment		
	Operating leases	4	9
	Net (profit)/loss on disposal of fixed assets	(7)	25
7.	**Net interest and finance charges**		
	Interest paid and discount amortised		
	Local registered stock	1 792	1 586
	Foreign and other debt	1 286	1 080
	Forward cover costs	836	441
		3 914	3 107
	Interest received	(528)	(143)
		3 386	2 964
	Amounts capitalised	(487)	(479)
		2 899	2 485
8.	**Commitments**		
	8.1 Estimated capital expenditure contracted for, excluding future contract price adjustments and general sales tax This expenditure will be financed from borrowings and internally generated funds and is expected to be incurred as follows: within one year 1 900; thereafter 3 700	5 600	6 000
	8.2 Undrawn amounts in respect of housing loans granted to employees	20	35
	8.3 Ex gratia pensions payable	35	—
	8.4 Call options written at an average rate of 16,33%, expiring during 1990, on local registered stock with a nominal value of	795	—

9. Contingent liabilities

9.1 An Appeal Court hearing is pending regarding the raising of assessments for general sales tax on certain capital expenditure contracts. Provision has not been made as Eskom is of the opinion that the General Sales Tax Act has been complied with and has objected to the assessments raised.

9.2 Guarantees issued to financial institutions as security for housing loans granted to employees amount to R115 million (1988: R27 million).

9.3 Eskom has indemnified the Eskom Pension and Provident Fund against any loss resulting from the negligence, dishonesty or fraud of the Fund's officers or trustees.

For the year ended 31 December 1989

(in R million)

10. Retirement benefits

Eskom employees are members of the Eskom Pension and Provident Fund which is a defined benefit plan governed by the Pension Funds Act. The Fund is valued at intervals of not more than three years. Any deficit will be funded by the payment of actuarially determined lump sums or by future contributions. The last actuarial valuation was performed as at 31 December 1987 when the actuaries reported that the Fund was in a sound financial position. No events have taken place since this valuation which have had a significant effect on the Fund. The next valuation will be performed as at 31 December 1989.

	1989	1988
11. Cash flow information		
11.1 Non-cash items		
Depreciation	1 364	1 150
Other	55	178
	1 419	1 328
11.2 Cash released from working capital		
Fuel and stores	16	(160)
Debtors	(22)	(157)
Creditors	66	601
	60	284
11.3 Net financing charges		
Interest and finance charges	(3 427)	(2 628)
Interest received	528	143
Net interest	(2 899)	(2 485)
Local registered stock discount amortised	79	61
Net interest payable	(65)	20
Other	1	32
	(2 884)	(2 372)
11.4 Capital expenditure		
Expenditure on land, buildings and plant	(3 813)	(3 634)
Expenditure on equipment and vehicles	(212)	(120)
	(4 025)	(3 754)
Proceeds from disposals	95	74
	(3 930)	(3 680)
Expenditure on future fuel supplies	(106)	(279)
Housing loans to employees	43	(10)
	(3 993)	(3 969)

LOCAL REGISTERED STOCK

At 31 December 1989 **Schedule 1**

(Figures in R million)

Loan	Authorised nominal value 1989	%	Repayment date/s	Issued Nominal value 1989	1988
58	30	6,5	1989/91	11	13
60	35	6,75	1991	13	13
61	35	6,875	1992	14	14
64	12	6,5	1992	8	7
65	37	6,875	1992	19	19
70	10	6,5	1993	8	7
71	70	6,875	1993	28	29
75	22	6,5	1993	18	17
76	48	6,875	1993	39	25
78	20	6,5	1994	16	16
79	30	6,875	1994	23	21
81	10	6,5	1994	9	9
82	25	6,875	1994	23	14
83	18	7,5	1995	16	14
84	3	7	1995	2	1
85	35	8,75	1995	20	10
86	10	8,5	1995	5	1
87	45	9,25	1996	21	23
88	10	8,75	1996	5	5
89	20	9,25	1996	7	7
90	30	9,25	1996	9	11
91	10	8,75	1996	3	3
92	20	9,25	1997	14	15
93	22	9,125	1997	6	5
94	5	8,75	1997	1	1
95	25	8,5	1997	6	6
96	28	8,25	1997	15	14
97	7	8	1997	4	3
98	45	8,25	1997	36	30
99	30	8,25	1998	10	10
100	20	8,375	1998	7	8
101	5	8	1998	2	1
103	24	8	1998	19	19
104	6	7,625	1998	3	2
106	45	8	1998	6	5
107	27	9	1999	16	14
108	3	8,5	1999		
110	30	9,5	1999	13	10
111	9	10,75	2000	3	2
112	29	10,75	2000	19	21
113	40	10,75	2000	35	26
114	25	10,75	2000	18	18
115	5	10,25	2000	3	3
C/fwd	1 015			553	492

(Figures in R million)

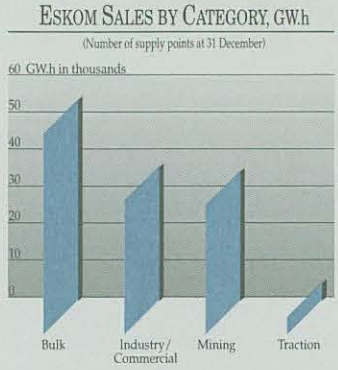
Loan	Authorised nominal value 1989	%	Repayment date/s	Issued Nominal value 1989	1988
B/fwd	1 015			553	492
116	30	10,75	2000	25	10
118	55	11	2000	49	26
119	6	10,75	1995	1	1
121	40	11,4	2001	28	10
122	2	11,1	1986/96	1	1
123	40	12,75	1996	40	33
126	40	12,5	2001	36	38
127	150	12,6	1999	146	111
130		11,5	1989		27
131	250	11,15	2002	12	12
132	250	11,75	2002	71	72
134	170	10,75	2003	12	12
135	270	11,3	2003	58	28
138	150	9,7	2003	13	3
139	340	10,25	2003	37	40
141	130	8,65	2004	18	18
142	350	9,15	2004	66	66
144	130	9,05	2005	10	10
145	270	9,55	2005	73	23
147	100	9,05	1992	45	40
148	100	9,05	2005	48	50
149	230	9,55	2005	46	46
150	150	10,25	1990	68	88
151	275	10,95	2004	9	9
152	100	12,8	1993	94	90
153	400	12,95	2006	243	190
154	220	10	2007	209	207
155	170	13,2	2007	161	155
157	415	14,25	2008	411	405
158	905	9,25	1994	658	601
159	325	12	2008	265	266
160	350	11	2009	281	299
161		14	1989		221
162	600	14,25	1991	328	212
163	125	10,5	2004	112	119
164	700	14	1992	567	263
165	1 000	11	1995	450	367
166	1 000	11	1993	599	457
167	1 000	12	1996	821	527
168	12 040	11	2008	10 262	9 236
169	3 000	15	1998	239	
	26 893			17 165	14 881

How Eskom Performed in 1989

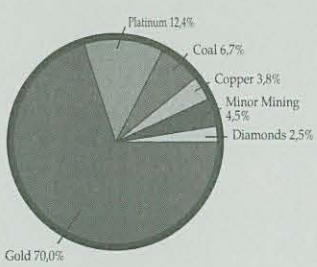
Performance Measure	Target for 1989	Actual Achieved
Increase on total costs per kW.h compared with increase in Producer Price index	*13,2 %	12,14 %
Increase in total generating cost per kW.h	*13,2 %	11,15 %
Increase in primary energy cost per kW.h	*13,2 %	17,20 %
Increase in distribution cost per kW.h	*13,2 %	11,47 %
Capital expenditure	R 4 081 million	R 3 993 million

** 2% below 1989/1988 increase in PPI. Provisional PPI at time of printing: 15,2%*

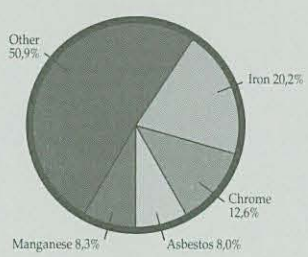
Eskom Sales by Category, GW.h



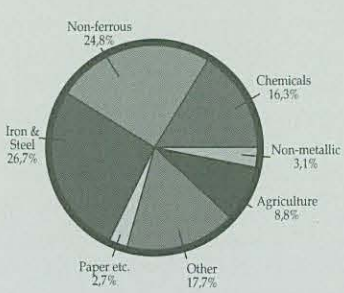
Major Mining Sales



Minor Mining Sales

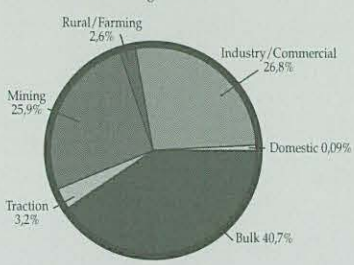


Sales to Industry

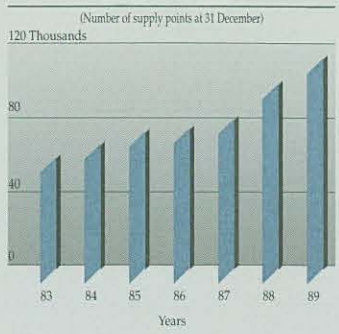


Sales per Category

(excluding own use)

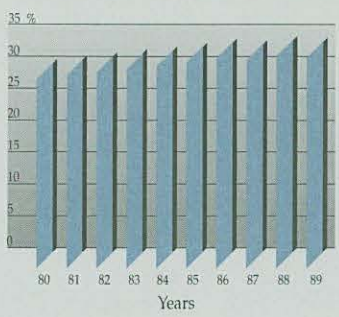


Rural Supplies



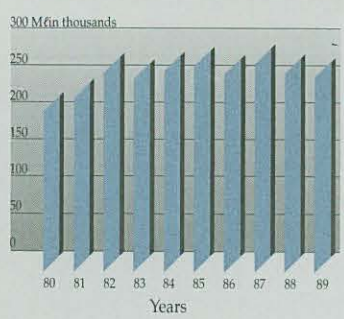
Performance Measure	Target for 1989	Actual Achieved
Number of rural supply points provided	8 203	8 378 (1988: 11 014)
Plant availability	79,6	78,1 (1988: 79,1)
Planned outages	10,5	11,9 (1988: 12,8)
Forced outages	9,9	10,0 (1988: 8,1)
Plant reliability (base load)	770	508 (1988: 510)
Plant efficiency for coal-fired power stations	33,6	33,6 (1988: 33,6)
Number of low-frequency incidents (less than 49,2 Hz)	5	1 (1988: 1)
Hours without operating reserve	100	164 (1988: 67)
Coal burnt in Eskom power stations	69,02	67,06 (1988: 64,48)

Thermal Efficiency

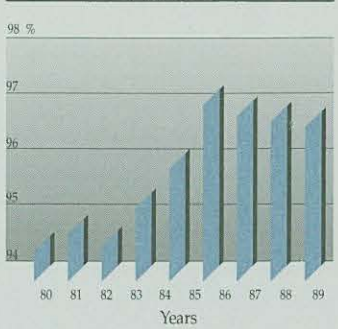


Sent-out Capacity

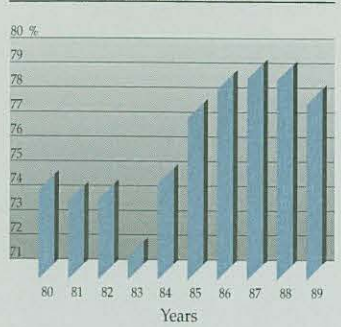
Water Consumption



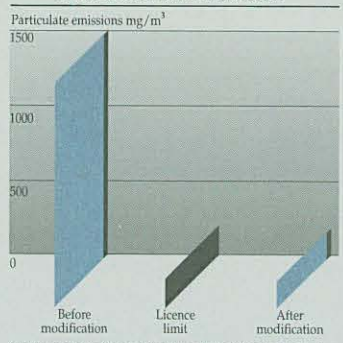
Reliability



Plant Availability



Smoke Emission at Hendrina Power Station



Smoke emisions from chimneys at Hendrina power station before and after installation of SO_2 gas conditioning equipment emission as low as 50 mg/m³ are being achieved.

TABLES

1. Statistical overview

	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980
Financial, R million										
Revenue	**9 271**	8 159	7 046	5 845	4 625	3 832	3 302	2 695	2 141	1 772
Net income[1]	**728**	816	702	781	738	732	744	671	507	414
Fixed assets in commission, at cost	**31 199**	28 680	24 986	19 907	15 496	12 058	9 218	7 689	6 323	5 604
Works under construction	**6 638**	5 512	6 075	7 753	8 552	7 271	6 434	5 198	3 854	2 644
Capital expenditure	**3 993**	3 969	3 895	3 755	4 757	3 719	2 757	2 741	1 951	1 447
Total net borrowings	**24 630**	22 779	21 475	19 462	17 621	13 861	10 686	8 534	6 334	5 013
Plant performance										
Total power station capacity, installed rating, MW	**34 141**	33 176	31 261	28 086	25 716	24 514	22 949	21 749	20 049	18 349
Total power station capacity, assigned sent-out rating, MW	**32 403**	31 465	29 618	26 682	24 359	23 168	21 673	20 523	18 989	17 339
Peak demand on integrated Eskom system, MW	**21 871**	20 589	20 001	18 278	17 852	17 296	15 639	15 532	14 674	13 668
Average station availability[2]	**78,1**	79,1	79,2	78,5	77,5	74,9	71,9	74,3	74,2	74,7
Station load factor, per cent[3]	**51,1**	52,3	54,3	55,5	58,0	58,1	55,6	59,3	62,2	57,8
Integrated Eskom system load factor, per cent	**73,7**	75,5	73,9	77,3	76,2	75,0	76,9	75,3	77,6	77,5
Coal burnt, thousands of tons	**67 529,3**	64 489,6	65 787,0	58 915,9	59 488,6	58 703,6	55 010,2	55 198,4	53 903,7	46 755,0
Coal burnt, kg/kW.h sent out	**0,523**	0,521	0,535	0,515	0,522	0,533	0,546	0,551	0,563	0,568
Average heat rate of coal-fired stations, MJ/kW.h sent out	**10,72**	10,71	11,00	10,95	11,26	11,45	11,57	11,82	12,01	12,16
Average heat content of coal (as received), MJ/kg	**20,20**	20,44	20,48	21,19	21,52	21,38	21,11	21,39	21,25	21,34
Overall thermal efficiency, sent-out basis	**33,6**	33,6	32,7	32,9	32,0	31,4	31,1	30,5	30,0	29,6
Average coal cost, R/ton	**20,9**	18,67	17,11	14,87	13,25	12,55	12,44	11,75	9,71	8,12
Average coal cost, c/kW.h sent out	**1,1023**	0,9727	0,9155	0,7665	0,6916	0,6692	0,6793	0,6471	0,5473	0,4614
Electricity output										
Total electricity sent out in South Africa, GW.h[4]	**146 161**	140 802	134,751	130 056	126 206	120 835	112 366	109 536	106 135	99 905
Eskom electricity sent out as percentage of South African total	**96,7**	97,0	96,1	95,1	94,5	94,3	93,8	93,6	93,9	93,0
Total electricity sent out on Eskom system (Eskom stations and purchased), GW.h[5]	**143 548**	139 197	132 774	126 766	122 494	117 086	108 321	104 920	100 425	93 021
Total sent out from Eskom stations, GW.h	**143 204**	138 837	132 507	126 511	121 987	116 581	103 295	102 769	97 824	83 362
Subtotal from coal-fired stations, GW.h	**128 304**	123 777	122 947	114 298	113 941	110 094	100 738	100 217	95 675	82 342
Subtotal from hydro-electric stations, GW.h	**2 759**	3 162	1 617	1 623	624	560	595	1 016	1 653	992
Subtotal from pumped-storage stations, GW.h	**1 039**	1 403	1 774	1 785	2 107	1 994	1 957	1 519	415	—
Subtotal from diesel and gas-turbine stations, GW.h	**3**	2	2	2	0	8	5	17	81	28
Subtotal nuclear power station, GW.h	**11 099**	10 493	6 167	8 803	5 315	3 925	—	—	—	—
Total purchased by Eskom and sent out on Eskom system, GW.h	**344**	360	267	255	507	505	5 026	2 151	2 601	9 659
Total consumed by Eskom, GW.h[6]	**2 265**	2 567	3 229	3 018	3 265	3 188	2 917	2 404	712	71
Total available for distribution, GW.h	**141 283**	136 630	129 545	123 748	119 229	113 898	105 404	102 516	99 713	92 950
Total sold, GW.h[7]	**134 347**	129 493	122 524	117 353,0	112 305,9	106 904,1	98 251,1	96 135,9	93 844,0	87 539,3
Growth in GW.h sales, per cent	**3,7**	5,7	4,4	4,5	5,1	8,8	2,2	2,4	7,2	8,6
Employees										
Total number at 31 December	**51 554**	56 726	56 830	60 800	66 000	64 560	62 420	58 850	52 080	47 490
Ratio number/GW.h sold	**0,384**	0,438	0,464	0,518	0,588	0,604	0,635	0,612	0,555	0,542
Sales to countries in southern Africa, GW.h										
Bophuthatswana	**2 231,9**	2 194,8	2 124,5	1 805,9	1 750,4	1 490,1	1 242,9	1 181,5	1 324,8	1 213,1
Botswana	**57,8**	53,4	77,5	232,3	222,4	185,7	159,7	87,4	11,2	—
Ciskei	**353,8**	299,8	250,7	191,4	164,5	133,7	104,4	84,1	4,8	—
Mozambique	**307,1**	340,4	329,2	303,8	227,8	283,5	293,2	293,2	235,1	24,9
Lesotho	**181,9**	170,9	156,2	134,6	123,7	116,8	110,9	123,6	117,4	100,2
Swaziland	**274,0**	290,3	253,5	277,1	227,2	250,2	333,4	308,9	211,0	200,4
Namibia	**556,6**	452,9	613,6	411,1	223,8	186,9	422,2	160,1	173,9	193,2
Transkei	**109,7**	126,9	110,6	84,9	99,8	138,7	160,2	120,8	106,9	99,1
Venda	**92,7**	73,8	59,8	54,0	45,0	35,0	27,1	24,1	20,1	16,2
Zimbabwe	**14,6**	16,5	16,5	15,6	11,5	12,5	13,1	13,2	11,2	10,4
	4 180,0	4 019,7	3 992,0	3 510,6	3 096,0	2 833,0	2 867,1	2 396,9	2 216,3	1 857,5

1. Certain adjustments had to be made to make figures comparable with current figures, which are presented in terms of the Eskom Act of 1987. 2. Capacity hours available x 100/total capacity hours in year. 3. kW.h sent out x 100/(average assigned sent-out rating x hours in year). 4. Electricity sent out by Eskom, some industries and municipalities which generate all or part of their electricity requirements. 5. Includes Eskom electricity sent out to neighbouring countries.

6. In respect of pumped storage facilities and synchronous condenser mode of operation. See Table 2, Note 7. 7. Difference between electricity available for distribution and electricity sold is due to transmission losses.

TABLES

2. Power stations in service at 31 December 1989

Name of station	Type	Location	No. and rating of generator sets MW	Total installed rating MW	Total sent-out rating MW[1]
Acacia	Gas turbine	Cape Town	3 x 57	171	171
Arnot	Coal fired	Middelburg, Tvl	6 x 350	2 100	1 955
Camden	Coal fired	Ermelo	8 x 200	1 600	1 520
Drakensberg	Pumped storage	Bergville	4 x 250	1 000	1 000
Duvha	Coal fired	Witbank	6 x 600	3 600	3 450
Grootvlei	Coal fired	Balfour	6 x 200	1 200	1 130
Hendrik Verwoerd	Hydro-electric	Norvalspont	4 x 80	320	320
Hendrina	Coal fired	Hendrina	10 x 200	2 000	1 900
Highveld	Coal fired	Sasolburg	8 x 60	480	412
Ingagane	Coal fired	Newcastle	5 x 100	500	465
Kendal	Coal fired	Witbank	1 x 686	686[2]	640[2]
Koeberg	Nuclear	Cape Town	2 x 965	1 930	1 840
Komati	Coal fired	Middelburg, Tvl	5 x 100; 4 x 125	1 000	891
Kriel	Coal fired	Bethal	6 x 500	3 000	2 850
Lethabo	Coal fired	Sasolburg	5 x 618	3 090	2 965
Matimba	Coal fired	Ellisras	4 x 665	2 660[2]	2 460[2]
Matla	Coal fired	Bethal	6 x 600	3 600	3 450
Palmiet	Pumped storage	Grabouw	2 x 200	400	400
Paratus	Gas turbine/diesel	Walvis Bay	1 x 22,4; 4 x 6,4	48	48
Port Rex	Gas turbine	East London	3 x 57	171	171
Salt River	Coal fired	Cape Town	4 x 30; 2 x 60	240	228
Taaibos	Coal fired	Sasolburg	8 x 60	480	440
Tutuka	Coal fired	Standerton	5 x 609	3 045	2 925
Vanderkloof	Hydro-electric	Petrusville	2 x 110	220	220
Vierfontein	Coal fired	Viljoenskroon	12 x 30	360	336
Wilge	Coal fired	Witbank	2 x 30; 3 x 60	240	216
Total in service, 26 Eskom stations[3]				34 141	32 403[8]
Subtotal coal fired (18 stations)[4]				29 881	28 233
Subtotal gas turbine (3 stations)[5]				390	390
Subtotal hydro-electric (2 stations)[6]				540	540
Subtotal pumped storage (2 stations)[7]				1 400	1 400
Subtotal nuclear (1 station)				1 930	1 840
Total in service, 26 Eskom stations				34 141	32 403

1. Differences between generator rating and total station rating, and installed and sent-out rating reflect auxiliary power consumption and reduced capacity caused by age of the plant and/or low coal quality. 2. Dry-cooled unit specifications are based on design back-pressure and ambient air temperature. 3. In addition to its own installed capacity, Eskom also has a firm contractual capacity of 1 355 MW from Cahora Bassa, which was not available during 1989. It also has agreements to purchase electricity from Swawek, Tescor and some municipalities. 4. Base-load stations, except in the case of older, uneconomical plant, which are used only for peak demands or in emergencies. 5. Used only for peaking or in emergencies. 6. Use restricted to peaking and emergencies and availability of water in Hendrik Verwoerd and P.K. le Roux dams. 7. Pumped storage facilities are net users of electricity and are used for peaking. Water is pumped during off-peak periods to generate electricity during peak periods. 8. Of these 3 093 MW capacity was in reserve storage or mothballed.

3. Generating sets taken into service during 1989

	Total installed rating MW	Total sent-out rating MW
Lethabo, set 5	618	593
Matimba, set 4	665	615
Total	1 283	1 208

TABLES

4. Generating sets on order at 31 December 1989

Name, type and location of power station	No. and installed rating of set MW	Sent-out rating of set MW	Total installed rating of station MW	Total sent-out rating of station MW	No. of sets in service (on order)	Total installed rating of sets on order	Total sent-out rating of sets on order	Year of completion first (last) set
Kendal, coal fired, Kendal	6x686	640	4 116	3 840	1 (5)	3 430	3 200	1988 (1993)
Lethabo, coal fired, Vereeniging	6x618	593	3 708	3 558	5 (1)	618	593	1985 (1990)
Majuba, coal fired, Volksrust	3x657 3x711	3x612 3x668	4 104	3 840	0 (6)	4 104	3 840	1996 (2001)
Matimba, coal fired, Ellisras	6x665	615	3 990	3 690	4 (2)	1 330	1 230	1987 (1991)
Tutuka, coal fired, Standerton	6x609	585	3 654	3 510	5 (1)	609	585	1985 (1990)
Total generating sets on order						10 091	9 448	

Dates on which sets on order will be taken into commercial service may change, depending on growth in electricity demand.

TABLES

5. Transmission and distribution equipment in service at 31 December 1989

		1989	1988	Change
Main transmission system, km	765 kV[1]	**871**	871	0
	533 kV DC	**1 030**	1 030	0
	400 kV	**11 789**	11 220	569
	275 kV	**6 945**	6 718	227
	220 kV	**1 239**	1 239	0
Distribution lines, km	165 – 132 kV	**16 107**	15 923	184
	88 – 33 kV	**20 824**	20 579	245
Reticulation lines, km	22 kV – lower	**153 309**	144 222	9 087
Total all lines, km		**212 114**	201 802	10 312
Cables, km	165 – 132 kV	**67**	67	0
	88 – 33 kV	**345**	393	–48
	22 kV – lower	**4 257**	3 929[2]	328
Total all cables, km		**4 669**	4 389	280
Transformers	Capacity MVA	**142 352**	141 475	877
	Number	**122 680**	117 496	5 184

1. Although two lines are constructed at 765 kV, only one runs at this voltage, and the other at 400 kV.
2. Adjusted figure.

TABLES

6. Sales of electricity to categories of customers

Category	Number of customers	GW.h sold 1989	GW.h sold 1988	Increase % 88 – 89	Average yearly% increase 85 – 89	Average price c/kW.h sold 1989	Average price c/kW.h sold 1988
Bulk	625	**54 423**	49 433	10,1	8,9	**6,675**	6,118
Domestic and street lighting	103 098	**1 221**	1 341	–9,0	1,3	**12,376**	11,914
Industrial/commercial	14 526	**35 820**	34 660	–2,1	–0,2	**6,550**	5,968
Mining	565	**34 661**	34 341	0,9	3,3	**6,663**	6,035
Rural/farming	110 121	**3 438**	3 163	8,7	—*	**12,562**	11,672
Traction	34	**4 229**	4 120	2,7	–1,6	**9,076**	8,171
Own usage	168	**556**	520	6,8	—*	**2,872**	2,599
	229 137	**134 347**	129 493	3,7	4,7	**6,901**	6,300

** Basis of sales to the industrial category has changed, which distorts comparisons.*