

annual report 2005/6

The Power Institute for East and Southern Africa (PIESA)

The PIESA is a voluntary regional electricity technology sharing association with a particular focus on the distribution industry. It aims to improve electrification in East and Southern Africa through sharing information, research, technology, skills and experiences for the benefit of customers and suppliers in the electricity distribution industry.

Benefits to members include:

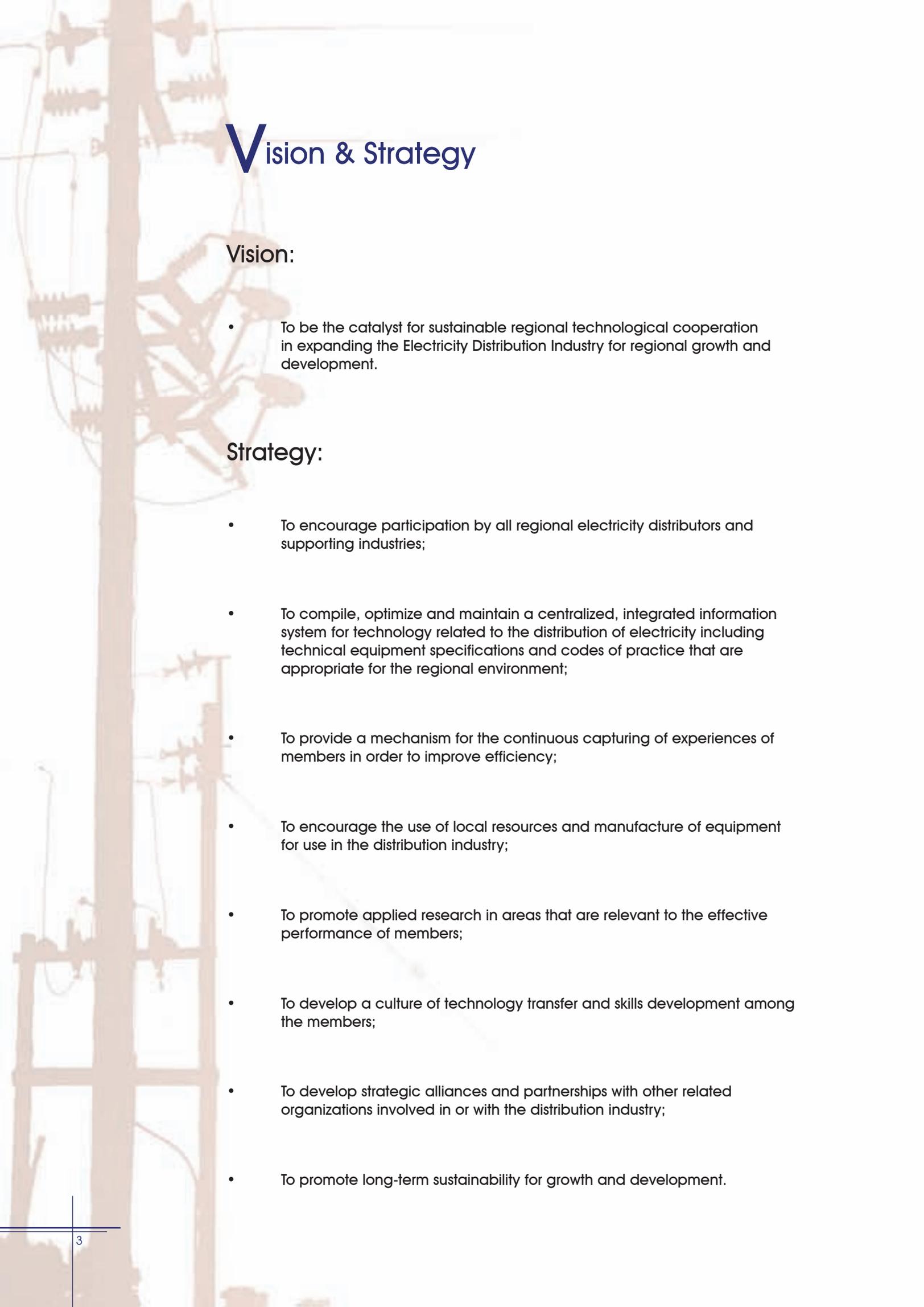
- Access to and participation in the development of standards for the distribution sector;
- Sharing information, technology and skills in particular experiences gained from distribution pilot projects;
- Joint research activities and access to information from international research organizations;
- Participation in training, exchange programmes and development projects;
- Participation in regional workshops and conferences;
- Opportunities for market growth and economies of scale for regional manufactures and suppliers of equipment; and
- Networking with like-minded international and regional organizations focusing on distribution and electrification.



PIESA members gathered on the terrace of the Sarova Panafric Hotel, Nairobi, Kenya (April 2006)

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Vision & Strategy

Vision:

- To be the catalyst for sustainable regional technological cooperation in expanding the Electricity Distribution Industry for regional growth and development.

Strategy:

- To encourage participation by all regional electricity distributors and supporting industries;
- To compile, optimize and maintain a centralized, integrated information system for technology related to the distribution of electricity including technical equipment specifications and codes of practice that are appropriate for the regional environment;
- To provide a mechanism for the continuous capturing of experiences of members in order to improve efficiency;
- To encourage the use of local resources and manufacture of equipment for use in the distribution industry;
- To promote applied research in areas that are relevant to the effective performance of members;
- To develop a culture of technology transfer and skills development among the members;
- To develop strategic alliances and partnerships with other related organizations involved in or with the distribution industry;
- To promote long-term sustainability for growth and development.

Chairman's Statement



Mr Greg Tosen
PIESA Board Chairman
Eskom, South Africa

I am pleased to report that the membership of PIESA is continuing to gain strength particularly with affiliate members. This year we welcomed our newest affiliate member LineGear 2000 at the PIESA Regional Workshop in October. It is unfortunate however that we understand that Uganda Electricity Distribution Company Ltd will no longer participate as a member due to it being operated under a management contract. We hope that their discontinued membership will not remain a permanent decision.

Each member of PIESA provides representation on the five working groups dealing with Standardisation, Low Cost Electrification, Non-technical Loss Reduction, Power Systems Analysis and the Environmental Management. Affiliate Members participation in these working groups enables them to make non-propriety contributions. The tangible outputs from the working groups are the production of PIESA Standards.

The highlight of the year was the three day PIESA Regional Workshop in October 2005 of which one day was combined with the Cigré colloquium forming part of the 5th Cigré Regional Conference held in Cape Town. At the workshop the Working Group's gave feedback on their activities and progress to date, and developed detailed short and medium term work plans. The Cigré Conference attracted over 400 delegates from all corners of the world, and provided wonderful opportunity to showcase the PIESA Working Groups, their work and their concerns. In all nine papers were presented on disbursed generation and electrification by PIESA member Utilities.

The next big regional event will be the combined Regional Workshop with the International Electric Research Exchange (IERE) planned for September 2007 at Victoria Falls, Zambia.

It is with great sadness that we learnt in December 2005 that Simon Mhaville, our Board member representing the Lesotho Electricity Corporation (LEC) passed away while on holiday with his family in Dar es Salaam. His wisdom, insight and participation at Board meetings will be sadly missed.

The head of the PIESA Secretariat since 2001, Arnot Hepburn announced that he would retire at the end of 2005. It is largely due to Arnot's tireless efforts over the past five years that the PIESA Working Groups have become so active. Most probably the highlight of his time with the Secretariat was to see his enjoyment at the thought-provoking presentations by the Working Group members to the Cigré assembly in Cape Town.

A new activity started in June 2005 by the Secretariat has been the publication of the PIESA Quarterly Newsletters. This together with the improved management of the web-site, is a good way of keeping everyone informed of the benefits of PIESA membership.

Finally, I would like to thank everyone who assisted in helping PIESA to achieve its objectives in the year. My particular thanks go to the Board Members, the Membership of the five Working Groups for their valuable contributions and commitment to the objectives of PIESA, to the Secretariat for their administrative support and a special thanks to Arnot Hepburn for his great contributions to the development of the PIESA over the past five years.

Greg Tosen
PIESA Chairman

Profile of the PIESA

The PIESA is a voluntary regional power utility association established on 28 February 1998. It aims to improve electrification in the region through sharing information, experiences, skills, technology and research to improve the electricity distribution industry. PIESA's main focus is on technical rationalisation to achieve economies of scale with local manufacturers in an effort to enhance electrification in the region.

Funding of the PIESA is primarily obtained from membership fees, voluntary contributions, grants, and loans. The cost for participation in Working Groups is carried by the member utilities and organisations.

PIESA has the following three categories of membership: Full Member, Affiliate – Corporate, and Affiliate – Individual. A Full Member is defined as an organization that generates, transmits or distributes electricity. An Affiliate Member is defined as an organisation or an individual, and includes, inter alia, manufacturers and suppliers of equipment, associations, academics, researchers or financiers with an allied interest to the PIESA.

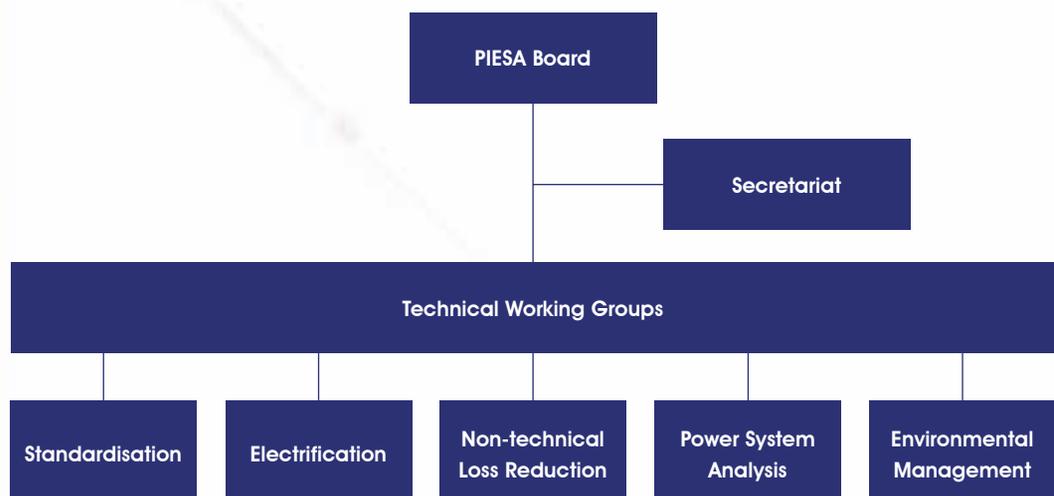
Full Members have:

- Full voting rights at every level of the PIESA;
- Right to participate in Technical Working Groups;
- Access to all outputs of the PIESA unless otherwise determined by the PIESA Board;
- Participation of staff in training initiatives;
- Primary influence in defining activities and priorities of the PIESA; and
- Access to information and websites of leading international and regional organizations.

Affiliate Members have:

- Voting rights for Technical Working Groups in which affiliate members have participated;
- Right to participate in Technical Working Groups;
- Access to appropriate outputs of PIESA, as decided by the Board; and
- Participation of staff in training initiatives as decided by the Board.

Organisation Structure:



Members of the PIESA Board



Mr Greg Tosen
Board Chairman,
Eskom, South Africa



Mr Bhukosi Siso
ZESA, Zimbabwe



Mr David Mwangi
KPLC, Kenya



Mr Alvin Monga
ZESCO, Zambia



Mr Alex Kabata Okien
SNEL, DR Congo



Mr Howard Whitehead
Association of Municipal
Electricity Undertakings
(AMEU)



Dr Alexon Chiwaya
ESCOM, Malawi
*(Board member
to October 2005)*



Mr Simon Mhaviile
LEC, Lesotho
*(Board member
to December 2005)*



Mr Trensio Chisale
ESCOM, Malawi
*(Board member
from October 2005)*



Mr Mbele Hoohlo
LEC, Lesotho
*(Board member
from May 2006)*

Highlights of the Year

Regional Workshop

The PIESA Regional Workshop was held on 21–24 October 2005 in the Strand – near Cape Town, South Africa. The Working Groups gave feedback on their activities and progress to date, and developed detailed short and medium term work plans. The joint Workshop was particularly useful for identifying important interfaces and highlighting areas where Working Groups will need to engage in consultation to ensure alignment between their outputs. The Environmental Management Working Group also took the opportunity to visit Koeberg Power Station, and convened after the Workshop to review a proposed policy on PCB destruction.



The hard work was interspersed with a number of social functions. Nu-Lec (South Africa) hosted a cocktail evening on Friday 21 October, and tables flowed with delicious food prepared by the excellent catering staff of the Strand Beach Hotel. On 23 October, an Affiliate Member, Aberdare Cables, hosted a splendid dinner, accompanied by rousing music from a visiting band.

Various outings were also arranged to Robben Island, Cape Town, and the Stellenbosch wine-growing district. Special thanks must go to the resourceful Eskom members of the Environmental Management Working Group for going that 'extra mile' to ensure that there were lots of options for everyone!

5th Cigré Regional Conference

The three day 5th Cigré Regional Conference took place from 25 to 27 October 2005 near Cape Town, South Africa. The Conference attracted over 400 delegates from all corners of the world, and provided wonderful opportunity to showcase the PIESA Working Groups, their work and their concerns. Nine papers were presented, all by non-South African utilities, on disbursed generation and electrification:



- Rural electrification – a Zambian case study and the ZESCO experience (C Kaputu, ZESCO);
- Pre-payment – the Zambian experience (C Mubemba, ZESCO);
- The introduction of prepayment metering in a Zambian township and its impact on electricity consumer behaviour (K Kasonkomona, ZESCO);
- Installation of statistical meters as part of ZEDC's loss reduction programme (L Chisina, ZESA);
- Vandalism of pole-mounted distribution transformers (D Sichela, ZESCO);
- Theft of ground and pole mounted transformer oil (W Madzikanda, ZESA);
- ZESA-CAFCA 100mm² ACRS re-design (C Muzamwese, ZESA);
- Technology sharing and standards development (C Chingumbe, ZESCO);
- Distribution system operation challenges – an ESCOM perspective (A Kaponda, ESCOM).

The presentations resulted in very lively discussions and many questions from the international assembly, and PIESA presenters made a passionate plea for modification of pole mounted transformers to meet the special needs in our region.

Power System Training Course

The PIESA has continued to initiate specialist training to ensure that knowledge transfer is gained by all the members.

A five-day computer-based course on the Protection of Power Distribution Systems was made available to member utilities. The PIESA covered the costs of the prepared course material, software and a highly competent lecturer. The member utilities bore the cost of travel and accommodation for the engineers they had selected to participate in the training course.

Joint Board and Working Groups' Meetings: October 2005 and April 2006

The first Joint meeting was held in conjunction with the Regional Workshop that took place in October 2005 near Cape Town in South Africa. This first Joint meeting proved very fruitful and the decision was made to make this a regular event.



The second Joint meeting was held in conjunction with meetings of all five Working Groups as well as the Annual General Meeting held in Nairobi, Kenya, and were hosted by KPLC. Following their individual meetings, each Working Group presented its progress report and business plan to the Joint meeting, and participants were able to deliberate issues concerning interfaces and key requirements for ensuring productive investment of time and effort by the Working Groups.

KPLC ensured that arrangements and facilities were well prepared to make the meetings both successful and highly enjoyable.

The visit to the Olkaria geothermal plant was made particularly interesting by the insights gained from the excellent overview presentation provided by Dr Simiyu, who also readily responded to the many questions that were raised.



KPLC hosted a splendid dinner and delightful entertainment by Kayamba Afrika - a leading group of musicians - at the Sarova Panaftric Hotel.



KPLC also arranged visits to places of interest such as KenGen's Olkaria geothermal plant -unique in Africa.



The visit to Olkaria was followed by lunch in the serene setting of the Naivasha Club.

Tributes

Simon Mhaville Passed Away

It was with great sadness that we learnt that Simon Mhaville, our Board member representing the Lesotho Electricity Corporation (LEC), passed away in December 2005 while on holiday in Dar es Salaam.

As the Managing Director of LEC, he headed the team on the World Bank-financed SAD-ELEC Management Contract for the revitalisation of LEC. Prior to this, he had been the Managing Director of TANESCO for many years. As a key member of the Southern African utility community he will be sorely missed by us all.



Arnot Hepburn Retires

The Head of the PIESA Secretariat since 2001, Arnot Hepburn retired at the end of 2005. It is largely due to his tireless efforts that the Working Groups have become so active, and he was immensely proud of the thought-provoking presentations by the Working Group members to the Cigré assembly held in October 2005.

The Board and the Secretariat are deeply appreciative of his dedication and his great contributions to the development of the PIESA, and hope that he will be available as a technical advisor to support future activities.

Technical Working Groups

During the year, several members revised their representation in order to achieve better alignment between individuals' functions in their organisations and their responsibilities in the Working Groups. Consequently, several Working Groups experienced some discontinuity and delays in progress.

However, the AMEU increased its active participation by nominating a representative to each of the Working Groups. Their practical experience and pragmatic approach has already proved to be a welcome addition.

Environmental Management Working Group



Convenor: Mr Samuel Ndirangu (KPLC, Kenya)

"There is no greater asset for humans than the long-term health and wellbeing of our planet. There can be no goal more crucial to our survival than the protection and nurturing of our environment". (Schalkwyk, M. V, 2004).

The Environmental Management Working Group is aware of this fact and uses it to guide the actions, policies and undertakings in all its endeavors. During the period under review, the Working Group continued to:

- Promote open communications on environmental issues amongst its utility members;
- Establish an environmental management system with a view to ensuring continual improvement in appropriate business activities, including prevention of pollution where economically viable and sustainable;
- Contribute toward sustainable development through the efficient production, distribution and use of energy; and
- Educate, train and motivate the utility members about the environment.

The Working Group prepared and forwarded to the PIESA Board for approval PCB guidelines for the handling and disposal of electrical equipment and materials contaminated with PCBs, as well as environmental impact assessment (EIA) guidelines to assist members in conducting EIAs. The development of Environmental Management Programme (EMP) guidelines was also commenced to assist utility staff and contractors in their compliance with PIESA environmental standards for the operation and maintenance of all new and existing distribution power lines. Further, the Working Group also commenced the development of a brochure on integrated environmental management and ISO 14001.

A further 'rolling' two-year work plan was developed. Some of the activities included in the work plan are:

- Integration of Environmental Quality and Safety Management Systems for utilities;
- Development of PCB inventories by all member utilities;
- Identification and assessment of environmental issues relating to electrification (to be undertaken in conjunction with the Electrification and the Standardisation Working Groups);
- Research on Climate Change impacts for utility operation; and
- Skills development in the member utilities.



Environmental Management Working Group member Mr Troy Govender (Eskom) and Convenor Mr Samuel Ndirangu (KPLC), Nairobi, Kenya, April 2006

Power System Analysis Working Group



Convenor: Mr Julius Kampamba (ZESCO, Zambia)

The Power System Analysis Working Group was not very active during the period under review due to changes in representation by the members. However, in the second half of the year, the Working Group was able to gain stability such that it could review and reconsider its medium-term (2-year) priority activities to be as follows:

- Develop two codes of practice or procedures relevant to member utilities;
- Compile a report on industry experiences that have impacted positively on delivery of electricity;
- Compile and maintain a catalogue of credible regional manufacturers of distribution equipment / materials;
- Compile a list of equipment failure reports and research activities within member countries;
- Identify training needs and implement training programmes ;
- Create a systems parameter / information data bank;
- Research possibilities for a standardized simulation package for distribution system analysis / planning;
- Compile a status report on ongoing key pilot projects in member utilities.

In addition to the above, the Working Group set a number of short-term objectives for the period under review:

- Submit to the Board a summarized report on practical experiences that produced positive impacts on delivery of electricity in member countries;
- Develop a catalogue of credible regional manufactures of electricity distribution equipment;
- Compile a list of equipment failure reports (in summary form);
- Identify and submit to the Board a list of training and skills development needs of member utilities;
- Implement at least one training / skills development intervention in each calendar year; and
- Identify the requirements and facilitate the development of a standard software package acceptable for use and readily available to regional utilities at a nominal maintenance fee.

It should be noted that several of the above activities were at an advanced stage towards the end of the review period and will be finalised in the next cycle.

Non-Technical Loss Reduction Working Group



Convenor: Mr Wiseman Kabwazi (ESCOM, Malawi)

Working Group members continued to share information and experiences on ways and means of identifying, analysing and minimising non-technical losses experienced by member utilities.

Improvements by the utilities have been made in the quality, accuracy and timely meter readings and billing through recruitment of qualified staff, subcontracting of meter reading, use of hand-held meter reading devices and use of advanced meters for large customers. The introduction and expansion of prepayment metering has also complemented this effort by eliminating meter reading and billing losses. Inspection of premises has also been increased to check meters and work on faulty meters.

Large customers - though fewer in number, account for most of the electricity sales in the utilities. Regular inspections, investment in new metering technologies (with more security features, high accuracy and ability to keep audit trails against tampering) are being adopted by most utilities. The use of automatic meter readings to access and monitor meters remotely - especially for large customers - is also at an experimental stage. However, the Working Group has identified that there is a need to standardise and harmonise some of the features and software, and will continue to seek optimal ways to achieve this.

The Working Group continues to identify areas that make metering and meters less vulnerable to tampering and bypassing. In a bid to reduce losses resulting from failure to collect revenue from billed customers, most utilities are switching to prepayment and expanding the prepayment base. Identifying and analysing the causes of non-technical losses in prepayment metering are becoming the main focus, and intensified inspections and monitoring of customers' purchase patterns appear to be the key for minimising such losses.

Further, the use of prepayment split meters (pole mounted) in areas with high losses has been introduced on an experimental basis, and the Working Group is monitoring results. The recommendations will be submitted to the Standardisation Working Group to assess whether better standards could be set for suppliers of equipment and meters such that more robust and tamper proof designs may result.

Other areas that can further reduce losses have been identified, e.g. the provision of public information, civic education, improved access to meter reading / billing / payment services, and the availability to bill-enquiry response services. Some member utilities are already using service providers such as banks, retail shops and gas station facilities, as well as e-mail, websites, and cell phone messages.

The increased number of utility representatives in the Working Group is likely to add further fresh approaches to share and, ultimately, adopt as standards to adopt by the PIESA members.



Loss Reduction Working Group members Mr Henry Njenga (KPLC), Mr Edison Makwarela (Eskom) and Mr Mohlomi Seithoko (LEC), Nairobi, Kenya, April 2006

Electrification Working Group



Convenor: Mr Cyprian Muzamwese (ZESA, Zimbabwe)

This Working Group was formerly known as Low-cost Electrification, but it has become evident that its scope is much broader, and encompasses a wide spectrum of issues concerning electrification.

The vision and objectives of the Electrification Working Group are that standards and practices be recognized by electricity distribution utilities, their suppliers, as well as funding agencies, as the best practices for electricity distribution in PIESA member countries.

The re-focused Electrification Working Group is gradually getting full support, with a sizeable number of members being represented. Work on specific Electrification projects is now in progress, and in particular the Group is using the NRS 033 and NRS 034 series of standards as guides in developing appropriate Electrification standards.

In particular this involves the inclusion of the following:

- Updated structures;
- All technologies used in electrification;
- Latest industry accepted structures;
- Alignment with planning processes;
- Latest loading criteria; and
- ABC, bare wire, SWER, bi-phase and non-grid.

This will make the Electrification Standard more adaptable and applicable to PIESA members, as well as many other utilities in Africa.



Vandalism: an ever-present challenge in the region

Standardisation Working Group



Convenor: Mr Paul Johnson (Eskom, South Africa)

The Standardization Working Group continues to be fully supported, with all members represented in the Working Group. In reviewing its vision and objectives, the Working Group confirmed that its vision was still valid: "In Africa, PIESA standards are recognized by electricity distribution utilities, their suppliers, and their funding agencies, as the preferred standards for electricity distribution"; however, it was agreed that this should be extended to include any standards endorsed by PIESA.

Working Group's aim of establishing a credible process of consensus for developing standards for PIESA has been achieved, and the objective of co-operation and commitment of utilities and their suppliers for the use of PIESA standards is developing and on-going.

A further objective is to ensure co-operation with other stakeholders to avoid duplication. In this regard the cooperation agreement between SADCSTAN and PIESA was formally recorded at the SADCSTAN meeting in Maputo in May 2005. Two standards covering power quality measurements have been proposed to SADCSTAN by PIESA for adoption as harmonised regional standards.

Work on specific standardization projects has been devolved to task teams, with the aim of sharing the work load and give more technical staff in PIESA member organisations some experience in standards development. The direct participation of PIESA Affiliate members in specific projects is enriching the work and producing practical results. Specifically, the drafting of PIESA 1106 was completed. This standard, which is expected to be published in 2006, covers alternative applications of a standardized prepayment meter passive base, with options for the use with a modular socket outlet extender to accommodate the various national standards for socket outlets.

Work continues on three other significant projects:

- A standard for preferred sizes and types of overhead conductor, with a view to aligning the standards used in the region with the international standards;
- A standard for medium voltage underground cables; and
- The quality of supply standard PIESA 1048, which in cooperation with the Southern African Power Pool and regulators in the region, should provide a firm foundation for common agreement on the assessment of power quality parameters in the exchange of electricity among member utilities and in their supply agreements with customers.

The Working Group has also concluded that the increasing incidents of theft of oil from installed transformers in most member countries require the consideration of alternative standards for the design and installation of distribution transformers. A project has been proposed to fully investigate alternatives.

PIESA Affiliate Members



ABERDARE manufactures and markets a wide and diverse range of cables. These include paper cables, cross-linked polyethylene cables, rubber trailing cables, non-halogen cables, overhead line conductors, aerial bundle conductors, housewires, surfix, twin and earth cables.

Established in 1946, a half-century of experience has enabled Aberdare to strive for the continuous development of a sophisticated, yet cost-effective product range that is particularly innovative in meeting African needs.

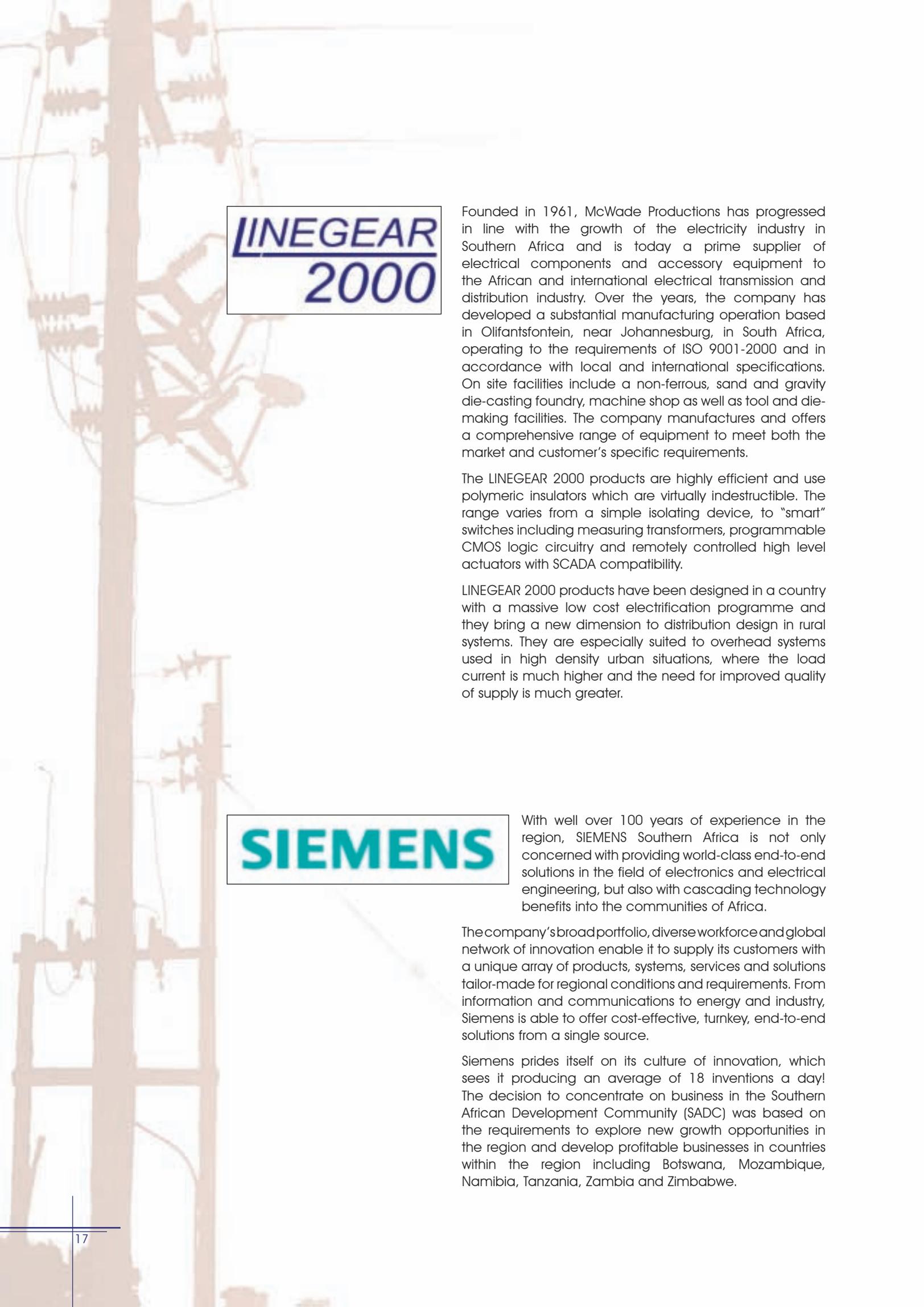
Aberdare has been actively involved in assisting local and national authorities in developing affordable cabling systems for low cost, mass housing. A wide range of innovative new products, called the Electrodac range, has been developed and introduced to assist the drive to provide affordable electricity for all. However, the new range still performs to stringent control standards and absolutely no compromise on quality has been made: Aberdare's factories and plants operate according to internationally recognised quality assurance standards. Manufacturing plants are located in Port Elizabeth, Cape Town, Pietermaritzburg and Johannesburg in South Africa, as well as in Maputo in Mozambique.



Circuit Breaker Industries (CBI), located near Johannesburg, South Africa, is a major manufacturer of electrical distribution and protection components for low voltage electrical distribution systems. CBI is the only African manufacturer of circuit breakers and residual current devices. From the early 1960s CBI began to invest in its own product development, resulting in locally developed sensitive residual current devices, circuit breakers for equipment, miniature circuit breakers and, more recently, moulded case circuit breakers utilising the hydraulic-magnetic operating principle. Internationally recognised quality standards ensure that products meet the most demanding requirements. All operations within the company are certified to ISO 9001 and EN 29001.

CBI has the only private testing facility of its kind in the Southern Hemisphere - comprising a control room and one 10kA and one 65kA fully computerised test bays. Circuit breakers up to 65kA can be tested to local and international standards for overload, endurance, and vibration, thereby reducing the time required to develop a product from inception to completion.

CBI has achieved international recognition for its competence and continues to represent the South African Bureau of Standards on the technical committees of the International Electrotechnical Commission (IEC), thus being instrumental in the development of international electrical safety standards.



LINEGEAR 2000

Founded in 1961, McWade Productions has progressed in line with the growth of the electricity industry in Southern Africa and is today a prime supplier of electrical components and accessory equipment to the African and international electrical transmission and distribution industry. Over the years, the company has developed a substantial manufacturing operation based in Olifantsfontein, near Johannesburg, in South Africa, operating to the requirements of ISO 9001-2000 and in accordance with local and international specifications. On site facilities include a non-ferrous, sand and gravity die-casting foundry, machine shop as well as tool and die-making facilities. The company manufactures and offers a comprehensive range of equipment to meet both the market and customer's specific requirements.

The LINEGEAR 2000 products are highly efficient and use polymeric insulators which are virtually indestructible. The range varies from a simple isolating device, to "smart" switches including measuring transformers, programmable CMOS logic circuitry and remotely controlled high level actuators with SCADA compatibility.

LINEGEAR 2000 products have been designed in a country with a massive low cost electrification programme and they bring a new dimension to distribution design in rural systems. They are especially suited to overhead systems used in high density urban situations, where the load current is much higher and the need for improved quality of supply is much greater.

SIEMENS

With well over 100 years of experience in the region, SIEMENS Southern Africa is not only concerned with providing world-class end-to-end solutions in the field of electronics and electrical engineering, but also with cascading technology benefits into the communities of Africa.

The company's broad portfolio, diverse workforce and global network of innovation enable it to supply its customers with a unique array of products, systems, services and solutions tailor-made for regional conditions and requirements. From information and communications to energy and industry, Siemens is able to offer cost-effective, turnkey, end-to-end solutions from a single source.

Siemens prides itself on its culture of innovation, which sees it producing an average of 18 inventions a day! The decision to concentrate on business in the Southern African Development Community (SADC) was based on the requirements to explore new growth opportunities in the region and develop profitable businesses in countries within the region including Botswana, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe.

PIESA Associations

IERE

The International Electric Research Exchange (IERE) is a voluntary international research development organisation aimed at facilitating technology exchange with a present focus on sustainability and renewable energy. PIESA is an Executive Member of the IERE which has its Central Office in Japan. The IERE is willing to promote research and development activities with global co-operation as a means to solve medium and long term issues facing the electrical service industries of the world and bridge the gap between developing and developed economies, and PIESA benefits from this association in leveraging via research projects, funding and skills transfer for the region. The PIESA member at the IERE also serves on the Editorial Board of the IERE Newsletter.

The planned PIESA/IERE Africa Forum, to be held in September 2007 at Victoria Falls, Zambia, is expected to further strengthen the links between the two organizations.

SAPURAB

PIESA is a Board member of the South African Power Utilities Research Advisory Board (SAPURAB) which aims to: identify research opportunities of relevance to electricity producers, transmitters, distributors and end users; promote the development of electricity industry research; and facilitate local, regional and international research co-operation. As such, the PIESA members gain access to technology and research experience.

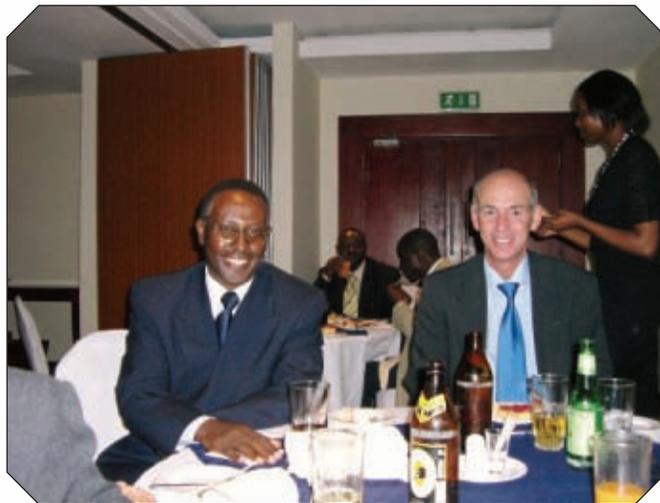
SADCSTAN

The Southern African Development Community Co-operation in Standardisation (SADCSTAN) is a committee of SADC with the aim of harmonising standards in the SADC region through co-operation among national standards bodies and other stakeholders. SADCSTAN has been sensitised to the standardisation activities of PIESA.

A cooperation agreement between SADCSTAN and PIESA was formally recorded at the SADCSTAN meeting in May 2005, held in Maputo, Mozambique.

UPDEA

The membership of the Union of Producers, Conveyors and Distributors of Electrical Energy in Africa (UPDEA) is made up of most of the national electricity utilities of Africa. PIESA values the synergy between it and the UPDEA Scientific Committee and believes that PIESA can provide technical support to guide the planning, design and standardization of the most economic solutions for electrification not only in the East and Southern regions but possibly throughout Africa. Cooperation between PIESA and UPDEA was formalised in 2001, and recent dialogue has concerned strengthening exchange of information and technologies with a focus on standardisation.



PIESA Chairman Greg Tosen and Mr Eddy Njoroge President of the UPDEA Scientific Committee (Nairobi, Kenya, April 2006)

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
 (Registration number 2002/031747/08)
ANNUAL FINANCIAL STATEMENTS
for the year ended 28 February 2006

The reports and statements set out below comprise the annual financial statements presented to members:

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The financial statements which appear on pages 20 to 24 were approved by the board on 31 March 2006 and signed on their behalf by:



G. R. Tosen

Rivonia

31 March 2006

**REPORT OF THE INDEPENDENT AUDITORS TO THE MEMBERS OF
 PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)**

We have audited the annual financial statements of PIESA (Association Incorporated Under Section 21) set out on pages 20 to 24 for the year ended 28 February 2006. These financial statements are the responsibility of the company's directors. Our responsibility is to express an opinion on these financial statements based on our audit.

Scope

We conducted our audit in accordance with statements of South African Auditing Standards. Those standards require that we plan and perform the audit to obtain reasonable assurance that the financial statements are free of material misstatement. An audit includes:

- examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements;
- assessing the accounting principles used and significant estimates made by management, and
- evaluating the overall financial statement presentation.

We believe that our audit provides a reasonable basis for our opinion.

Audit opinion

In our opinion, the financial statements fairly present, in all material respects, the financial position of the company at 28 February 2006 and the results of its operations and cash flows for the year then ended in accordance with South African Statements of Generally Accepted Accounting Practice, and in the manner required by the Companies Act in South Africa, 1973.

Supplementary information

The supplementary schedules set out on page 21 to 24 do not form part of the annual financial statements and are presented as additional information. We have not audited these schedules and accordingly we do not express an opinion on them.



Russell James and Company Incorporated
 (Incorporating Core Chartered Accountants (SA))
 Chartered Accountants (S.A.)
 Registered Accountants and Auditors

31 March 2006
 Johannesburg

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
REPORT OF THE DIRECTORS
for the year ended 28 February 2006

The directors present their report for the year ended 28 February 2006. This report forms part of the audited financial statements.

1. General review

The company carries on the business of an electricity technology sharing association.

2. Financial results

The results of the company and the state of its affairs are set out in the attached financial statements and do not, in our opinion, require further comments.

3. Events subsequent to the year end

There have been no facts or circumstances of a material nature that have occurred between the accounting date and the date of this report.

4. Directors

The directors of the company during the accounting period and up to the date of this report were as follows:

G.R. Tosen	
A.A.W. Chiwaya	Resigned 22 October 2005
A.K. Okien	
B.S Balaba	Resigned 22 October 2005
M.A. Chibulu	
B. Siso	
S.L. Mhaville	Deceased 19 December 2005
G. Lehloanya	Appointed 19 December 2005
T. Chisale	

5. Secretary

The company had no secretary during the year.

Rivonia

31 March 2006

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
BALANCE SHEET
as at 28 February 2006

	2006	2005
	R	R
ASSETS		
Current assets		
Trade and other receivables	87,962	74,092
Cash and cash equivalents	535,539	460,849
Total assets	<u>623,501</u>	<u>534,941</u>

EQUITY AND LIABILITIES

Reserves	417,175	302,156
Accumulated surplus	206,326	232,785
Current liabilities		
South African Revenue Service	26,662	18,394
Trade and other payables	18,256	27,473
Contingency fund	161,408	186,918
Total equity and liabilities	<u>623,501</u>	<u>534,941</u>

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
INCOME STATEMENT
for the year ended 28 February 2006

	2006	2005
	R	R
GROSS REVENUE		
Membership fees received	832,175	867,777
OTHER INCOME	34,756	62,054
Investment income	31,971	25,562
Surplus on foreign exchange	2 785	36 492
TOTAL INCOME	866,931	929,831
EXPENDITURE	743,644	691,596
Administration fees paid	74,952	71,868
Advertising	51,907	37,254
Auditors' remuneration	15,188	8,000
Bank charges	3,272	3,297
Finance costs	409	236
Printing and stationery	26,435	25,000
RSC levies	1,172	1,288
Secretarial fees	537,456	505,666
Travel - local	16,242	
Travel - overseas	16 611	38 987
SURPLUS BEFORE TAXATION	123,287	238,235
TAXATION	8,268	6,962
SURPLUS FOR THE YEAR	115,019	231,273

Notes

	2006	2005
	R	R
GROSS REVENUE		
Membership fees received	832,175	867,777
OTHER INCOME	34,756	62,054
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Travel - overseas	16 611	38 987
SURPLUS BEFORE TAXATION	123,287	238,235
TAXATION	8,268	6,962
SURPLUS FOR THE YEAR	115,019	231,273

**Accumulated
surpluses**

	R
BALANCE AS AT 01 MARCH 2004	70,883
RESTATED SURPLUS FOR THE YEAR	231,273
BALANCE AS PREVIOUSLY STATED AT 01 MARCH 2005	302,156
SURPLUS FOR THE YEAR	115,019
BALANCE AS AT 28 FEBRUARY 2006	417,175

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
STATEMENT OF CHANGES IN EQUITY
for the year ended 28 February 2006

(Registration number 2002/031747/08)
CASH FLOW STATEMENT
for the year ended 28 February 2006

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
NOTES TO THE FINANCIAL STATEMENTS
at 28 February 2006

1. BASIS OF PREPARATION

The financial statements are prepared in accordance with the South African Statements of Generally Accepted Accounting Practice. Statements of Generally Accepted Accounting Practice in South Africa are not intended to apply to immaterial items. The financial statements are prepared on the historical cost basis.

The following are the principal accounting policies adopted by the company which are, unless otherwise specifically stated, consistent in all material respects with those of the previous year:

1.1 Revenue recognition

Revenue from membership fees is recognised when invoiced.

Interest is recognised on a time proportion basis.

1.2 Borrowing costs

Borrowing costs are recognised as an expense when incurred.

1.3 Taxation

Deferred taxation is provided at legislated future rates using the balance sheet liability method. Full provision is made for all temporary differences between the tax base of an asset or liability and its balance sheet carrying amount.

No deferred tax liability is recognised in those circumstances where the initial recognition of an asset or liability has no impact on accounting profit or taxable income.

Assets are not raised in respect of the deferred taxation on assessed losses unless it is probable that future taxable profits will be available against which the deferred tax asset can be realised in the foreseeable future.

1.4 Financial instruments

Financial instruments carried on the balance sheet include cash and bank balances, trade receivables, trade creditors. The particular recognition methods adopted are considered appropriate.

It is the policy of the company not to take out forward cover in respect of foreign currency transactions to which the company is party to. The company's exposure to foreign exchange fluctuations is disclosed in note 7 to the annual financial statements.

	Notes	2006	2005
		R	R
CASH FLOWS FROM OPERATING ACTIVITIES			
Cash receipts from members and sponsors		832,175	867,776
Cash paid to suppliers		(789,047)	(607,326)
Cash generated by operating activities	12.1	43,128	260,450
Investment income		31,971	25,562
Finance costs		(409)	(236)
Net cash from operating activities		74,690	285,776
Increase in cash and cash equivalents		74,690	285,776
Cash and cash equivalents at beginning of the year	12.3	460,849	175,073
Cash and cash equivalents at end of the year	12.3	535,539	460,849

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
NOTES TO THE FINANCIAL STATEMENTS
at 28 February 2006

2. TRADE AND OTHER RECEIVABLES

Debtors for subscriptions
Value added taxation

	2006	2005
	R	R

	66,321	53,809
	21,641	20,283
	<u>87,962</u>	<u>74,092</u>

3. TRADE AND OTHER PAYABLES

Accruals
Overpayments - debtors

	13,952	9,233
	4,304	18,240
	<u>18,256</u>	<u>27,473</u>

4. CONTINGENCY FUND

Opening balance
Fees (repaid)/raised during the current year
Foreign exchange adjustment
Closing balance

	186,918	203,201
	(36,694)	54,102
	11,184	(70,385)
	<u>161,408</u>	<u>186,918</u>

The contingency fund represents monies held by the company on behalf of its members. The fund has been established by the members to pay certain expenses on their behalf when attending the company's working group meetings.

The amounts held by the company on behalf of the members can be split into the following currencies;

US Dollar (2006 - \$20,976 (2005 - \$26,500))
Rands

	129,172	154,682
	32,236	32,236
	<u>161,408</u>	<u>186,918</u>

5. GROSS REVENUE

Gross revenue comprises turnover, which excludes value added tax and represents the invoiced value of services supplied.

Major classes of revenue comprise:

Subscriptions from members
Corporate membership fees

	790,031	828,777
	42,144	39,000
	<u>832,175</u>	<u>867,777</u>

6. INVESTMENT INCOME

Interest income
- Interest received

	31,971	25,562
--	--------	--------

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
NOTES TO THE FINANCIAL STATEMENTS
at 28 February 2006

7. FINANCE COSTS

Bank overdraft

	409	236
--	-----	-----

8. TAXATION

South African normal tax

	8,268	6,962
--	-------	-------

- Current tax

	%	%
--	---	---

Reconciliation of rate of taxation

South African normal tax rate

	29.00	30.00
--	-------	-------

Adjusted for:

- Exempt income

	(39,48)	(27,08)
--	---------	---------

Net reduction

	(39,48)	(27,08)
--	---------	---------

Effective rate

	(10,48)	2,92
--	---------	------

Although the company is exempt from current taxation in terms of Section 10 of the Income Taxation Act of 1968, on the membership fees received from its members, it is however liable for taxation on the investment income received.

9. SURPLUS FOR THE YEAR

Surplus is stated after:

Income

Profit on foreign exchange

	2,785	36,492
--	-------	--------

Expenditure

Auditors' remuneration

	15,188	8,000
--	--------	-------

- Audit fee

	8,538	8,000
--	-------	-------

- Taxation services rendered

	1,950	-
--	-------	---

- Secretarial fees

	1,200	-
--	-------	---

- Consulting fees

	3,500	-
--	-------	---

10. FOREIGN CURRENCY EXPOSURE

Total foreign currency

	Closing rate	Current Fair Value
		R

Debtors for subscriptions - US Dollar

	R6,158 = \$1	66,321
--	--------------	--------

2006 - \$10,769

	R5,837 = \$1	53,809
--	--------------	--------

2005 - \$9,218.00

	R6,158 = \$1	161,408
--	--------------	---------

Contingency fund - US Dollar

	R5,837 = \$1	154,682
--	--------------	---------

2006 - 20,976 US Dollar

	R6,158 = \$1	161,408
--	--------------	---------

2005 - 26,500 US Dollar

	R5,837 = \$1	154,682
--	--------------	---------

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
NOTES TO THE FINANCIAL STATEMENTS
at 28 February 2006

PIESA (ASSOCIATION INCORPORATED UNDER SECTION 21)
(Registration number 2002/031747/08)
Tax registration number 9101/504/15/8
TAX COMPUTATION
28 February 2006

2006
R

2005
R

11. FINANCIAL INSTRUMENTS

Credit risk

The company only deposits cash surpluses with major banks of high quality credit standing.

12. NOTES TO THE CASH FLOW STATEMENT

12.1 Cash generated by operating activities

Surplus for the year	123,287	238,235
Adjustments for:		
Investment income	(31,971)	(25,562)
Finance costs	409	236
	<u>91,725</u>	<u>212,909</u>

Movements in working capital

(Increase)/decrease in trade and other receivables
Decrease in trade and other payables

	<u>(13,871)</u>	<u>48,367</u>
	<u>(34,726)</u>	<u>(826)</u>
	<u>43,128</u>	<u>260,450</u>

12.2 Reconciliation of taxation paid during year

Charge in income statement	(8,268)	(6,962)
Movement in taxation balance	8,268	6,962
Amount paid	-	-

12.3 Cash and cash equivalents

Cash and cash equivalents consist of cash on hand and balances with banks. Cash and cash equivalents included in the cash flow statement comprise the following balance sheet amounts:

Bank and cash balances	<u>535,539</u>	<u>460,849</u>
------------------------	----------------	----------------

Net income per income statement	123,287	29.00%
Permanent differences	(94,777)	(22.29%)
Section 21 Co. Profits not subject to tax	(123,287)	(29.00)%
Section 21 Co. Investment income subject to tax	31,971	7.52%
Section 21 Co. Expenses incurred in the production of investment income	(3,461)	(0.81)%
Taxable income for 2006	<u>28,510</u>	
Taxation thereon @ 29c in the Rand	<u>8,268</u>	6.71%

Tax liability

Amount owing/(prepaid) at the beginning of year	18,394
Tax owing/(prepaid) for the current year	
Normal tax	8,268
Per calculation	8,268
1st provisional payment	-
2nd provisional payment	-
Amount owing/(prepaid) at the end of year	<u>26,662</u>

This statement does not form part of the financial statements and is unaudited

Utility Customer Connections Development

Number of Customers and Access to Electricity														
	BPC	CEB	EDM	ENE(1)	ESCOM	Eskom	KPLC	LEC	NamPower (2)	SEB	Tanesco	UMEME	ZEDC	ZESCO
Domestic	134,178	319,523	250,953	208,683	120,934	3,628,260	600,161	38,911	101	43,233	522,742	263,262	455,438	279,745
General	13,747	30,555	30,792	13,259	29,622	43,572	130,137	4,907	199	7,924	1,245	27,838	45,531	25,760
Industrial	6	6,759	1,312	1,154	784	3,043	3,426	159	16	797	201	813	1,974	3,700
Other	231	759	1,510	195	53	82,172	1,709	12	3,087	870	3	324	11,380	976
Population (M)	2	1	18	14	11	42	32	2	2	1	34	12	14	10
Est. Access	38%	72%	7%	10%	8%	70%	13%	12%	39%	28%	11%	8%	23%	19%

[Source: SAD-ELEC]

Note: The above access to electricity figures are national figures. In most instances the above utilities are the sole distributors of electricity and their customer figures therefore also represent the access to electricity for those countries. Notable exceptions are Namibia and South Africa where distribution is also undertaken by other entities such as local authorities.

(1) No. of customers represents both ENE and EDEL (the Luanda distribution utility). Statistics are for Year 2003/2004.

(2) NamPower is a bulk supplier and hence has a very small customer base.

Utility Names: Abbreviations and Acronyms

BPC	Botswana Power Corporation
CEB	Central Electricity Board, Mauritius
EDM	Electricidade de Mocambique
ENE	Empresa Nacional de Electricidade, Angola
ESCOM	Electricity Supply Corporation of Malawi Ltd.
Eskom	Eskom Holdings, South Africa
KPLC	Kenya Power and Lighting Company Ltd.
LEC	Lesotho Electricity Corporation
NamPower	NamPower, Namibia
SEB	Swaziland Electricity Board
TANESCO	Tanzania Electricity Supply Company Ltd.
UMEME	UMEME Limited, Uganda
ZEDC	Zimbabwe Electricity Distribution Company
ZESCO	ZESCO Limited, Zambia

Map of PIESA's Area of Focus





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