



## Enertis performs commissioning of the 94 MWp Acciona's Sishen PV plant in South Africa

- The company has also performed a Quality Control of the PV modules
- The inspection was initially performed at the manufacturer facilities in China, and finalised in Enertis' South African laboratory, in collaboration with the Port Elizabeth's Nelson Mandela Metropolitan University
- From its offices in Cape Town, Enertis is increasing its presence in the country and expanding its activities to other incumbent PV markets in Africa

Enertis has performed the commissioning of the 94.3 MWp Sishen plant, the second largest plant built in South Africa. The facility, located in the Northern Cape Province, features 319 600 PV modules mounted on 470 single-axis trackers. The production from the plant will be sent to the South African state-owned power utility Eskom under a long-term power purchase agreement.

According to Acciona, the Sishen plant will have the highest level of production of all the [PV] plants that are operational in Africa, delivering 216 GWh of electricity per year into the grid.

Enertis has carried out a comprehensive scope which includes an independent verification of the electrical and mechanical execution, coordination of the commissioning process, identification of construction defects, setting of communications, liaison for grid compliance tests, and performance of further acceptance tests such

as the thermography of the PV panels.

Enertis has also performed a complete Quality Control of the PV modules. The inspection was initially performed directly at the manufacturer facilities in China, and finalised in its South African laboratory, in collaboration with its partners at the Port Elizabeth's Nelson Mandela Metropolitan University. The tests included flash-test and Electroluminescence.

From its offices in Cape Town, Enertis is increasing its presence in the country and expanding its activities to other incumbent PV markets such as East Africa – Kenya, Tanzania, Uganda – and other areas of Southern Africa – Mozambique, Zambia, Namibia

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# Energy efficiency industry has been created to the detriment of entrepreneurship

At the risk of being controversial, and the proof of energy efficiency 'expecting a hand-out' epidemic, is becoming more prevalent day by day. Eskom DSM and similar energy efficiency 'assistance-type' programmes has created a culture of expectance before initiatives are taken to implement energy efficiency projects in a majority of companies. The DSM approach, whilst creating significant awareness and being overwhelmingly successful to ensure the lights stay on when needed - has not actually created a sustainable mind-shift. But it did what it had to do when it had to do it. Yes, an ESCO and energy 'expert' market quickly mushroomed when Eskom DSM started their programmes. Now that DSM is gone, most of these knowledgeable companies and skills that have been developed are virtually 'hanging in the air' so to speak and struggling to make ends meet.

Industry is just not as keen to embark on energy efficiency projects due to them not being able to 'get something out of it', other than the savings. ESCO's and other energy consulting-type firms and entrepreneurs that relied on the DSM programme have had to become very creative in changing their offerings to be able to successfully quote for jobs.

On a daily basis the Energy Training Foundation (EnTF), gets asked questions which have moved from mere, 'What is the course about?', followed by a booking or not, or, 'Where can I buy product 'X'?', or helping to find a Certified Professional for a project; to in the last few months, me feeling like a career guidance officer brainstorming with enquirers as to how they can use their training or qualification they received from the AEE to get business in.

Yes, there are some tenders out. Some emulating another 'assistance-type' solution to clients, but it's a tough energy industry, which is the backbone of the 'green skills' and environmental jobs the government wants to grow. Tenderers are finding that they have to tender and quote to the bone offering

lean quotations whilst having to cover increasing expenses to keep businesses afloat.

Is the problem not that the real benefits of sustainably implementing energy management to ensure continuous energy efficiency with all the related benefits have not been the focus, but rather project for project? Offering a client a properly constructed energy management plan is the only way one can make sure the project(s) that have been implemented remain optimal in delivering what the client needs, and more importantly, it gives the energy market a lot more credibility than just churning out one-off projects.

At the EnTF we are very in favour of, besides enabling South Africans to become internationally qualified as energy professionals through the Association of Energy Engineers (AEE), but also passionate about making sure companies get started correctly so that they can continuously benefit from optimal energy management. Which is why we believe ISO50 001:2011 Energy Management System standard is the only way to go, whether it is for Certification purposes or for merely ensuring continuous benefits from energy efficiency improvements are gained. We offer workshops where we have skilled staff to get you going towards ISO50 001 in three full days which includes all your key staff to take part and understand the journey your company needs to be on to become truly sustainable.

This approach provides the client with enough information to make informed decisions to implement an energy management policy and plan according to a standardized approach so that the maximum energy savings targets can be set, met and sustained in the long-term and that maximum return on any energy efficiency and renewable investments are achieved. After the session the client will have a clearer understanding of:

- What needs to be done on the site to achieve optimal energy management
- Where energy could be saved at significant energy use areas

- Estimates of what energy savings could be expected
- What needs to be further investigated for more accurate energy saving targets
- Who needs to be trained and to which level
- Which services would need to be outsourced
- Which services could be catered for in-house
- How much needs to be invested in the short, medium and long-term
- Which technologies and retrofits need to be considered
- Which incentives and rebates could be pursued
- What is required to continuously save energy.

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# ENERGIA Gender and Energy Programme

The ENERGIA Gender and Energy Programme, a research programme funded by DFID, is part of its commitment to the SE4All initiative.

The programme will be investigating the following five research areas with a strong gender focus:

1. RA1: Electrification through grid and decentralised systems, with a focus on impacts;
2. RA2: Productive uses of energy: looking at the benefits of energy access for income generation;
3. RA3: The political economy of energy sector dynamics; this is a relatively new approach to energy sector analysis, and studies decision-making while recognising that different actors will differ in their experiences and expectations of the advantages and disadvantages of choices made;
4. RA4: Energy sector reform; and
5. RA5: The role of the private sector in scaling up energy access.

The Energy, Poverty and Development Group, ERC, is part of a consortium led by the University of Twente's Department of Governance and Technology for Sustainability to investigate "RA2: Productive uses of energy: looking at the benefits of energy access for income generation". The other partners are ENDA ENERGIE based in Senegal and MARGE for research in Rwanda.

The ERC will host the next programme meeting in Cape Town from 18–20 November 2015.

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## Africa Utility Week Industry Awards

### ENERGY/WATER EFFICIENCY PROJECT OF THE YEAR

Nominations were open for some well deserving companies for the Energy/Water Efficiency Project of the Year category at the African Utility Week Industry Awards to be held on 13 May 2015.

This award commends the efforts of any Energy and/or Water Efficiency Project by a large energy/water consumer - commercial buildings, industrial or manufacturing plants, mines, smelters and agriculture, etc. – with the biggest savings during the past financial year.

The criteria are as follows:

1. The project will be seen to have made a significant contribution to improving company operations whilst reducing energy and/or water expenditure.
2. The project should demonstrate sustainable practices using reuse, reduction or recycling strategies that have a positive impact on the company, employees and environment (carbon and water footprint).
3. The project should give evidence of incorporating green solutions such as co-generation, biomass, wind, solar or pica hydro schemes into business operations.
4. The project can be easily taken up by another company or transferred to a different industry.

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## Energy investment opportunities

### GLOBAL METHANOL FUEL CELL COMPANY LOOKING TO INVEST IN SOUTH AFRICA

This is a global leader in fuel cell technology which is looking to invest in South Africa and is inviting investors to help set up its African operation in South Africa. As will be evident from the company website:

- The technology has both rural and urban applications.
- Methanol is easy to manage and manufacture, and a very clear fuel.
- Methanol can assist households to maintain power during load-shedding.

The establishment in this industry in South Africa would not only create an export market to Africa but create employment opportunities in manufacturing, methanol production, system installation, and maintaining equipment and fuel cassettes logistics.

For a complete overview of the latest news in respect to fuel technology developments, fuel sales and the gen-

eration and application of methanol, please consult [www.fuelcellsworks.com](http://www.fuelcellsworks.com).

Among companies in cell fuel production and marketing are Verizon Communications, SunPower and ClearEdge Power, all on the website.

### ALTERNATIVE SUSTAINABLE ELECTRICITY/ENERGY

This is a unique solar system for rural development with a high return on investment. The intellectual property for this system is valued at around R30 million and the factory producing the products is situated in the Western Cape. It is intended to comply with a

government request to open various warehouse/manufacturing operations in different parts of South Africa in order to service the housing currently being built and future expansion of housing. An investment of R25 million is required for 50% of the business.

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## The latest trends in the South African CSP market

With South Africa emerging rapidly as the world's hottest CSP market, CSP Today have produced an exclusive free industry guide for you to view. In the guide you will get:

- Exclusive industry analysis focused solely on construction, supply chain management and regulation in the world's most exciting emerging market
- A view to the future of CSP with opinions on emerging countries, small scale deployment and O&M to guide your future CSP investment strategy
- A guide to the technical development of CSP with views on how to cut costs and drive up efficiencies to ensure future profitability.

This exclusive data and analysis is circulating the industry quickly, so make sure that you are one of the first to read it to help direct your resources.

Once you have read the guide please give us your feedback on it and let us know your opinions on the development of the industry.

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# The Power System Economics Centre, North West University

The Power Systems Economics Centre (PSEC) was formed in 2013 at the North-West University, Mafikeng Campus. The Centre is under the Department of Economics, Faculty of Commerce and Administration.

## MISSION

The mission of the Centre is to be recognized internationally and in region as a centre in power system economics sciences. The PSEC seeks to contribute to local and regional skills development in power system economics sciences through post graduate research, training and education programmes. The Centre's research programmes, also aim to develop an understanding of the problems that are relevant to electricity markets in Africa.

## OBJECTIVES

- To engage in both applied and strategic research for improved knowledge in electricity economics
- To develop capacity in power system economics.

The Centre core activity is high quality research that is relevant to society, the economy and the environment under the theme of sustainable energy development. The Centre research focus areas are:

### 1. Regulation and deregulation of electricity markets

Economic activities depend on electricity. Let's assume that a government has declared its commitment to energy sector reform, this research will focus on the steps involved in moving from a single regulated utility to a competitive market for electricity.

### 2. Rural electrification

Rural electrification in developing and develop countries is intended to serve both economic and social aims - that is to reduce poverty in rural areas. The research will focus on understanding the contribution of electricity to economic sectors.

### 3. Renewable energy

Access to grid electricity is not possible yet for many villages because of the distance that makes it too expensive. This has a direct impact on the quality of life of people that includes:

- Availability
- Accessibility
- Affordability

### 4. Economic planning

- Planning economically is to plan in such a way that the scarce means at our disposal yields us the greatest satisfaction.
- Integrated area planning, planning for all sectors or types of activity within a particular geographical area.
- National Development Plan (NDP) 2030 and vision for 2030.

### 5. Sustainable energy

#### Millennium Development Goal

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower woman
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, Malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

## MAIN GOAL

To build capacity and to deliver Energy Market Training skills transfer and

development through the PSEC, over a broad spectrum of economic disciplines in preparation for participation in the envisaged new reformed electricity industry in South Africa.

The PSEC offer two modules under the Department of Economics, on completion of these modules the student should be able to understand the background of the electricity industry, interpret different electricity markets and policy issues.

## NETWORKING

The Power System Economic Centre local linkages include:

- Eskom
- University of Cape Town
- National Electricity Regulator
- University of Stellenbosch
- Department of Energy
- THRIP/NRF.

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## 'Zero cost' renewables the shortest term supply solution to ease energy crisis

The South African Renewable Energy Council welcomes the conclusions of a recent CSIR report showing that the net cost of South Africa's renewable energy in 2014 was less than zero and reiterates that the industry is willing, ready and able to do much more to ease the country's electricity shortage, now predicted to lead to load shedding for the next 3 – 5 years.

The Council points out that the value of renewable energy in a constrained electricity system is clear and has previously been pointed out by The University of Stellenbosch Centre for Renewable and Sustainable Energy Studies.

The CSIR report 'Financial benefits of renewables in South Africa in 2014', released on 21 January 2015, demonstrates that the 1 600 MW of renewable energy installed by December 2014 has saved the country ZAR 5.3 billion in diesel, coal and avoided load shedding while costing the country only ZAR 4.5 billion in tariffs.

'The results of this study truly underline the economic value of renewable energy to the South African electricity consumer', said Mike Levington, board member of SAREC who has been participating in recent discussions between government and business. 'While Round 3 of the Renewable Energy Independent Power Producer Procurement Programme ('REIPPPP') has seen the prices for electricity from the major renewable technologies generally fall well below the likely cost for new Eskom power, the constrained grid and the very high costs for diesel/load shedding have meant that renewables built under Round 1 saved the country more in 2014 than they cost.'

The CSIR report noted that the country was saved ZAR 3.7 billion in diesel and coal fuel costs and a further ZAR 1.6 billion through the avoidance of 120 hours of load shedding. Government's far-sightedness in establishing REIPPPP in 2011 is now yielding dividends in making a measureable contribution to easing Eskom supply problems and will contribute even more as the plants presently under construction come online on a continuous basis through 2015 and beyond. Moreover, it

is expected that the preferred bidders for Round 4 will be announced soon, potentially putting another 1 100 MW of renewable energy into the pipeline to produce electricity. The CSIR report was done on conservative assumptions and did not factor in the job creation and socio-economic benefits of the REIPPPP programme, with more than ZAR 11 billion already pledged by the industry for investment into rural communities over the next twenty years.

Professor Wikus van Niekerk of Stellenbosch University is unequivocal in his response: 'We are electricity constrained as a country and using far more peaking power for mid-merit generation than we should', he asserted. 'Renewable Energy, particularly wind and PV, are 'fuel-savers' and could therefore make a significant contribution at this time, saving Eskom and the country money. There are, however, a number of barriers to particular for roof PV projects put in place by Eskom that need to be addressed to allow even Eskom-subsidised projects to connect to the grid. A reasonable feed-in tariff for rooftop PV – lower than at the Eskom generation cost at Medupi and Kusile – could facilitate a number of roof to PV projects to come online, still in this year.'

Pancho Ndebele, also of the SAREC Board, stresses that renewable energy is the most feasible supply option that can be deployed at scale within the timeframe of the severe electricity crunch. 'A total of 6 000 MW of renewable energy projects were bid in Round 4 of REIPPPP', he stressed. 'These are projects that have done all feasibilities, received environmental and all other regulatory approvals and have been assessed by lending institutions as being financially sound. They are ready for implementation and will be funded by private capital at very affordable rates. Importantly, a number of these projects can be constructed and connected to the grid in a 14-24 months' time frame. In light of the load shedding and fuel savings demonstrated in the CSIR study, these projects can take considerable pressure off diesel purchases and load shedding schedules. Other supply options, when large, tend to be ten or more years

away, and if smaller tend to be still more than five years away. Renewable energy is a viable part of the solution to the present supply crisis. With about ZAR 1 billion per month being spent on diesel and load shedding costing the country ZAR 87/kWh, we should aggressively increase our renewables ambition.'

Carryn Bateman, who represents SESSA on the SAREC Board, adds that the present crisis is one to which SESSA members have a lot to contribute. 'Rooftop Solar PV is perhaps the fastest supply side solution available', she points out. 'And it can be done at significant scale close to where the electricity is needed'. Her colleague James Green, who heads SESSA's Solar Water Heater Division, agreed and said that solar water heaters had the potential to significantly alleviate the electricity crisis. 'We can install about 50 000 high pressure units before year end', he predicted, 'saving the country a usage of 8 kW daily in each case, and also removing all peak from those electric geysers going solar. This is a fast-track for getting both GWh and peak off the grid, with pay-back to consumers in less than 5 years.'

Proponents of wind energy are equally enthused. Mark Tanton, SAREC Board member representing SAWEA, stressed that for wind, 0.6 GW of wind installed saved the system real cash on a net basis, because the pure fuel savings value of wind was 0.23 R/kWh higher than the cost of the wind power produced. 'If avoided load shedding is added, the value of wind power to the country is even more compelling', he asserted.

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# Extraction spending in sub-Saharan Africa is projected to increase at 8% annually over the next decade – PwC

## THE BULK OF SPENDING IS LIKELY TO TAKE PLACE IN SOUTH AFRICA AND TANZANIA

**G**lobal capital project and infrastructure spending is expected to grow to more than \$9 trillion annually by 2025, up from \$4 trillion in 2012, according to a report issued by PricewaterhouseCoopers (PwC), 'Capital project and infrastructure spending: Outlook to 2025'.

The report, for which Oxford Economics provided research support, analyses infrastructure spending across 49 of the world's largest economies, which account for 90 percent of global economic output. It covers five industry sectors - extraction, utilities, manufacturing, transport and social - and forecasts their impact on seven major world economic regions ((Western Europe, Latin America, Asia-Pacific, Middle East, sub-Saharan Africa, Former Soviet Union and Central and Eastern Europe). It estimates the scale of current infrastructure investment and assesses the prospects for future investment from now to 2025. Overall, close to \$78 trillion is expected to be spent globally between now and 2025 on capital projects and infrastructure.

The report finds that during 2011-12, the global infrastructure market rebounded from the global financial crisis, and will continue to grow between 6-7% yearly to 2025.

The report shows that the recovery will be geographically uneven, led mainly by Asia, as spending overall shifts from West to East. The Asia-Pacific market will represent nearly 60 percent of all global infrastructure spending by 2025, driven mainly by China's growth. Western Europe's share will shrink to less than 10 percent from twice as much just a few years ago.

Long term underlying trends in demographics, technology, natural

resources, urbanisation and shifting economic power will continue to have an enormous effect on which areas of spending will grow. These paradigm shifts, together with a return to global growth are projected to drive significant spend for infrastructure worldwide for decades to come.

Jonathan Cawood, PwC Head of Capital Projects and Infrastructure for Africa, says: 'Emerging markets, especially China and other countries in Asia, without the burden of recovering from a financial crisis, will see much faster growth in infrastructure spending.'

The pace of urbanisation is also on the increase, with the biggest shift in urbanised populations likely in China, India, Ghana, Nigeria, and the Philippines. Urbanisation drives the demand for water, power, transportation and technology infrastructure.

'Megacities in both emerging and developed markets- reflecting shifting economic and demographic trends - will create enormous need for new infrastructure. These shifts will leave a lasting, fundamental imprint on infrastructure development for decades to come.'

'As economies develop, the types of infrastructure investment needed evolve, but not every country makes infrastructure spending a priority. If you don't invest when your economy is growing, you may find yourself very quickly at a point where your runways and roads and ports and rail lines are choked.'

Overall infrastructure spending in

the sub-Saharan region is projected to grow by 10% a year over the next decade - exceeding \$180 billion by 2025 - while maintaining its 2% share of the global infrastructure market. Nigeria and South Africa dominate the infrastructure market, but other countries like Ethiopia, Ghana, Kenya, Mozambique, and Tanzania are also poised for growth. Growth prospects in most of the region's economies look promising as they were not affected as much by the global financial crisis of 2008.

A substantial increase in spending in the basic manufacturing sector is expected in sub-Saharan Africa. Annual spending in the chemical, metals and fuels sector is forecasted to increase across the seven major African economies to \$16 billion, up from about \$6 billion in 2012.

The financial crisis of 2008 has not had a major effect on South Africa's infrastructure spending. From an estimated \$7 billion in 2001, investment in infrastructure grew relatively consistently to reach \$22 billion by 2012.

Transportation investment is also expected to grow rapidly in South Africa over the coming decade, in particular in the road and rail subsectors. Transportation investment will likely grow to just short of \$9 billion by 2025.

Infrastructure spending overall is forecasted to reach around \$60 billion by 2025 for South Africa, having grown by 10% on average a year. However, South Africa is likely to lose share of regional spending relative to Nigeria. Nigeria's better fiscal position and oil revenues will likely enable it to outperform South Africa over the coming decade, says the report.

Overall infrastructure spending in Nigeria is expected to grow from \$23 billion in 2013 to \$77 billion in 2025. A

more investor-friendly environment towards oil investment is also likely to boost this projection further.

In contrast to Asia-Pacific's success, investment in western economies has been constrained by the legacy of banking crises, fiscal austerity and a shallow economic recovery. CP&I spend is shifting to the emerging economies, particularly Asia. Asia's share of global CP&I spend is projected to increase from 28% in 2012 to 39% in 2018 and 47% by 2025.

The report also shows that spending on utility infrastructure is expected to be significantly stronger in countries that need to upgrade deficient energy, water, and sanitation services and in economies that are rapidly urbanising, such as China, Ghana and Nigeria. The greatest growth of spending for utilities is expected in sub-Saharan Africa where an annual rate of 10.4% between now and 2025 is forecasted. Spending for electricity production and distribution is expected to rise from \$15 billion in 2012 to \$55 billion, while expenditures for improvements in water and sanitation services are forecasted to increase from \$3.3 billion in 2012 to about \$10 billion by 2025.

According to the report, the extraction sector, driven by both oil and gas as well as non-oil and gas industries, will grow at an annual rate of 5%. Oil and gas extraction activity and infrastructure spending are expected to vary across countries and regions. Extraction spending in sub-Saharan Africa is projected to increase at 8%



*Jonathan Cawood, PwC Head of Capital Projects and Infrastructure for Africa*

annually over the next decade. The bulk of spending is likely to take place in South Africa and Tanzania.

Demographic shifts will play a major role in determining the type of social infrastructure a country requires. Aging populations, especially in Eastern Europe and Japan, will necessitate more healthcare facilities, while emerging markets are projected to increase investments in both healthcare, as well as education for their young people. The report shows that the annual growth rate for social infrastructure spending is expected to be particularly strong – about 12% in sub-Saharan Africa where both schools and healthcare facilities will be in high demand.

In addition, climate-related disasters are driving growth in preventative infrastructure spend and in post disaster recovery. Climate change is also spurring investments in water resources, renewable energy and clean technologies.

Cawood adds: 'Resources and consumer market potential coupled with trade, economic and political reforms, increasing urbanisation and shifts in demographics will drive the majority of investment in Africa. It is crucial for policymakers, citizens and businesses to understand the factors that unlock infrastructure investment and development and to act responsibly and strategically within a long term vision to create the right conditions for success.'

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## **Solar water heating industry and registered suppliers and installers**

As of 8 December 2014, Eskom and the Department of Energy (DoE) agreed that the future implementation, funding and management of the solar programme (both high and low pressure) would be managed by the Department of Energy (DoE). Eskom has been engaged with DoE in a handover process.

### **High pressure systems**

Eskom would process rebate claims for high pressure systems installed before or on 31 January 2015 via the Eskom rebate process. All solar suppliers who intended submitting high pressure system claims to Deloitte were requested to do so by Friday, 27 February 2015. Any claims received after 27 February by Deloitte would not be processed.

The DoE had advised that a revised high pressure rebate model, offered by DoE, would take effect as soon as the approval was granted. Consequently caution must be exercised about making commitments to system suppliers.

### **Changes on the solar programme**

Details of changes on the programme would be communicated by the DoE. Any queries on the solar programme both high and low pressure can be directed to the DoE directly.

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# Powering Africa:

## Summit advanced deals and partnerships for Africa's power industries in Washington D.C. in January

**POWERING AFRICA: SUMMIT HELD IN WASHINGTON DC, JANUARY 28-30TH 2015, WITH COMMITMENTS FROM 12 AFRICAN COUNTRIES TO FURTHER ADVANCE PRIVATE SECTOR PARTICIPATION IN AFRICA'S POWER SECTOR**

Over the last 20 years, EnergyNet has co-ordinated investor meetings with some of the most reliable and successful power developers operating on the continent of Africa. Symbion Power, GE, Siemens, Copperbelt, Goldwind, Azura Power, Aldwych, Karpowership, Globeleq, Schneider Electric, ESBi, Transcorp, Chint, China State Grid, Hanergy and others have all been companies that have made long term commitments to the sector and invested in sustainable solutions. These are powerful companies with strong balance sheets backed by some of the biggest banks.

Despite all this interest, knowledge and experience, billions of dollars has been spent on development over the last 20 years and many projects have not reached financial closure. Therefore, one key question is how sustainable is the current way of doing things?

How can investors take greater responsibility for the success and speed of the development of long standing projects? Ultimately, African governments and the public sector are the 'power in Africa' and it is their responsibility to build power stations and distribute power for the people. Electrification could lead to increased wealth for all, but equally importantly it could lead to increased stability in order to promote further private sector investment, creating more jobs and even more wealth.

It all sounds so simple.... Of course it does, but when a potential investor

works across the continent with ministries that lack IT infrastructure and any real depth of international experience across all departments, one starts to understand the challenge that governments and developers face when trying to reach agreements.

Over the last year we've seen a change in conversation and indeed a change in the right direction focused on capacity building and infrastructure support for public sector entities.

Symbion Power, Schneider, GE, Aggreko, and Norton Rose Fulbright among others have been investing in long term capacity building including providing grass roots level training. These companies, along with PwC and Deloitte are working with public sector corporations on additional development projects to support capacity development. One of the game change actions has of course been the launch of President Obama's "Power Africa" initiative designed to increase access to electricity in all of sub-Saharan Africa. Power Africa seeks to strengthen the institutional and human capacity needed to attract investment on a long-term, sustainable basis, and to effectively manage a growing power sector.

Since its launch in late June 2013, Power Africa has helped facilitate the financial close of private sector transactions which expect to produce over 3 100 Megawatts (MW) of new generation capacity. In addition, Power Africa has already mobilized more than \$20 billion in commitments from more than

80 private sector partners. Power Africa has also forged strategic partnerships with the World Bank, the African Development Bank and the Government of Sweden, which together have committed an additional \$9 billion.

At the 'Powering Africa: Summit' (n Washington in January, many of the challenges and opportunities were discussed, with many of the investors in the initiative present including those from the AfDB, World Bank, the United States Government and private sector partners.

With such powerful cooperation among international investors in play, we're sure that it's not so much an 'if' this will create opportunities, as 'when' those opportunities will impact the lives of those on the ground.

Having focused solely on Africa's power sector and frontier market power generation for 20 years, EnergyNet has had the privilege to witness the passion and long term commitment it takes to 'turn the lights on in Africa.' Today there is more enthusiasm and more 'expectation' about the potential of Africa's electricity market, and we're delighted to play [even] such a small role within such an important and exciting sector.

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# Tanzania's 2014-2025 energy reform roadmap to success

**MINISTRY OF ENERGY AND MINERALS HAS PUBLISHED AN ELECTRICITY SUPPLY INDUSTRY REFORM STRATEGY AND ROADMAP FOR 2014 TO 2025**

In its recent Investment Policy Review, the OECD cited energy in Tanzania as a “critical bottleneck” and that the problem of reliable energy was the top barrier to doing business in Tanzania. This view was echoed during the Tanzania panel at the Africa Energy Forum in Istanbul in June, 2014 at which TANESCO and EWURA specifically addressed this point.

It's clear that project developers are keen to participate and that a multitude of funds are available to support them, however, developers encounter the stumbling blocks of non-project financeable risk allocation in power purchase agreements and concerns with tariff structures. The issue of how to implement structural reform that would result in, rather than undermine, a streamlined project finance structure in Tanzania, providing predictable investment returns for investors and therefore confidence to funders is therefore hugely important to the market.

Against this backdrop, the Ministry of Energy and Minerals (MEM) has published an Electricity Supply Industry Reform Strategy and Roadmap for 2014 to 2025 (the Roadmap). The Roadmap seeks to respond to private sector concerns with its key focal points being TANESCO operational and financial transformation, strengthening of the governance and performance of the sector and attracting private investment. The Roadmap has attracted headlines due to its reference that the proposed reform would involve investment of US\$11.4 billion (US\$1.9 billion per annum) of which 73.5% is allocated towards generation. Further, the Roadmap acknowledges that such funds cannot be raised by the Govern-

ment of Tanzania (GoT) and development funds alone, and therefore that private sector involvement is required, particularly in respect of generation. This reference has been accompanied by clear statements of recognition across the GoT energy sector that private sector involvement is required and that such involvement entails credible financial and institutional reform.

Following the recommendations in a series of external consultants' reports, the Roadmap proposes the staged unbundling of TANESCO, provision for TANESCO paying off its current debts, and the retirement of costly emergency power producers (EPPs).

The Roadmap takes the long term view, focussing on an increase in installed power capacity to at least 10 000 MW by 2025, at which point the phased unbundling of TANESCO would be completed. The time periods are broken down into immediate term, short term, medium term and long term. In terms of structure, the electricity sector is set to transition from the current integrated monopoly model through to a single buyer model (with a separate state generation company and distribution companies), and thereafter, to a retail competition model which should ensure competition and cost efficiency.

We are currently in the immediate term (which expires in June 2015), and during this period can expect to see, amongst other reforms, establishment of a task force to monitor the implementation of the Road Map, a transition and change management team at TANESCO to manage the reform process, ring-fencing of TANESCO into strategic business units, valuation of TANESCO's assets and liabilities, a human capital needs assessment,

retirement of EPPs upon expiry of their contracts and development of a technology based standard power purchase agreement.

TANESCO's indebtedness is to be fixed by improvement of debt collection, prepaid revenue collection – the mass roll out of LUKU prepaid meters, including at governmental institutions – and the recent 39.92% retail tariff increase to ensure a cost-effective base. This is expected to enable TANESCO to pay its EPP and IPP creditors in the near term, with the further assistance of funds being drawn down through World Bank and AfDB disbursements.

The Roadmap states GoT will review the existing regulatory framework to create necessary conditions for participation of the private sector. Under the current legislative framework GoT is only permitted to guarantee TANESCO's liabilities in respect of its borrowings; it does not cover unpaid amounts under power purchase agreements. It was anticipated that the Public Private Partnership Act would deal with this, but this remains under development. Until these challenges are addressed and a strong track record for supporting IPPs is realised, developers will need robust additional support from GoT to really push investment forward.

The Roadmap nods to the diversification of energy sources, and in particular envisages large increases in gas and coal at 3 968 MW and 2 900 MW of additional capacity respectively. As for renewables, 200 MW of wind, 100 MW of solar and 200 MW of geothermal are contemplated. The point was well made by a renewables developer at the Africa Energy Forum that – as many of TANESCO's problems were caused by

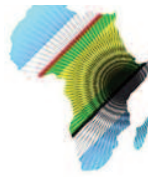
the dire effect of climate change on East Africa's previously predictable rainy seasons curtailing output of hydropower plants – it is right that renewable power is a strong feature of Tanzania's proposed energy portfolio.

The role of the regulator, EWURA, will be unchanged during the unbundling process except for naturally transitioning its realm of responsibility to cover the proposed unbundled entities and preparing the necessary licensing regime and other documentation to support the Roadmap. However, we note that EWURA's role on the proposed REFIT policy is not specifically mentioned in the Roadmap, and the position of this policy within the energy sector must not be forgotten. The Rural Energy Agency will also continue its role in facilitating installation and maintenance of rural grids and has similarly unveiled its strategy in this respect.

From Norton Rose Fulbright's engagement with the private sector and stakeholders, what they wish to see going forward are mechanisms to back up the Roadmap, together with a clear statement of mid to long term changes. The Roadmap is encouraging in stating that GoT is committed to ensuring its timely implementation, and also recognises that delays in improving TANESCO's financial performance would jeopardise reform.

Furthermore, the Roadmap's reference to increased communication and participation by MEM and TANESCO at conferences is encouraging – they were part of a key session at the Africa Energy Forum in Istanbul and they had a strong presence at the EnergyNet Powering Africa: Tanzania meeting on 13 - 14 November 2014 in Dar es Salaam.

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event/powering-africa-tanzania*



**POWERING  
EAST AFRICA**

25-27th March 2015 • Nairobi, Kenya

## Is transmission the cancer of Africa's electricity market?

**100 KEY DECISION-MAKERS IN KENYA FROM 25-27TH MARCH FOR THE POWERING EAST AFRICA MEETING**

**A**s we witness utilities across the continent struggling to acquire and evacuate electricity sufficient enough to reach a base-load, transmission is fast-proving the biggest barrier to energy access across Africa.

Presently, there are never-before-seen levels of investment into the power sector- no longer is it simply the poor cousin of exploration. Investors today view power as an opportunity quoted by some as so vast it will make the returns of the African telecoms giants insignificant by comparison.

However, despite over US\$8bln of project investments in greenfield projects in South Africa alone, transmission continues to collapse, significantly impacting the social and political landscape of the continent. In addition, this threatens the bankability of future generation projects already under development.

After over 20 years in development, the EAPP, SAPP, African Development Bank, China Development Bank and World Bank together with their public sector partners in Ethiopia, Kenya, Zambia, Tanzania, Mozambique, Zimbabwe and South Africa are starting to make headway which could finally see an end to the transmission crisis.

These projects could be the start of incredible opportunities for East and Southern Africa, promoting everything from township electrification to major industrial development. This outcome is only possible if these countries can maximise the capacity of the presently elusive manufacturers and industrialists looking to take advantage of the export zones currently under development.

You only have to see what the UAE has achieved to see how a resource-based economy can transform a country's riches if the right investments in infrastructure are made. On the flip side, there are examples where these critical investments were not made –resulting in economic and social turmoil.

The question therefore is this – which president will rise to the challenge and build a legacy on the continent that reads, 'I truly brought electricity to Africa, I truly made a difference?'

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## Oil and gas explorers need to rethink their capex on exploration activity in Africa due to global oil price drop: PwC analysis

According to PwC's 'Fit for \$50 oil in Africa' analysis, Africa has seen substantial successes in the exploration for hydrocarbons over the last decade

Oil & gas explorers must rethink their capital expenditure on exploration activity across the African continent in the wake of the significant drop in the global oil price, according to an analysis on the oil & gas industry in Africa released by PwC in February. 'Oil & gas explorers will be relooking at their budgets and deciding where to allocate their limited capital spend given the substantial decline in the oil price. Overall, low oil prices could have an impact on production undermining certain players in the market,' warns Chris Bredenhann, PwC Africa Oil and Gas Advisory Leader.

The WTI price for crude oil recently plunged below US\$49 per barrel, following wide-scale reports of oversupply in the US. Current reserves are reported in the press to be at their highest level in the past 80 years.

According to PwC's 'Fit for \$50 oil in Africa' analysis, Africa has seen substantial successes in the exploration for hydrocarbons over the last decade including the entry of new country players with East Africa, joining the ranks of their West African neighbours. In 2013 alone, six of the top 10 global discoveries by size were made in Africa – including some of the largest discoveries in the last decade in East Africa. The key to surviving the ups and downs of the cyclical oil & gas market is to learn how to adapt quickly – be more agile! 'Oil & gas companies now need to plan for the upturn that is sure to follow to ensure that the potential boom does not go bust,' adds Bredenhann.

The drop in oil prices is expected to have a significant impact on Africa, which has been grappling with the

effects of long-term poverty, food shortages, HIV/AIDS, and more recently the outbreak of the Ebola virus in West Africa.

The challenges facing Oil & Gas companies in Africa continue to be diverse and numerous fuelled by regulatory uncertainty, fraud and corruption, poor infrastructure, and a lack of skilled resources, among others. Furthermore, Africa has one of the highest average finding costs in the world at a massive \$35.01 per barrel in 2009 surpassed only by the US offshore fields which came in at \$41.51 per barrel, according to the US Energy Information Administration.

Africa also holds a number of technically challenging hydrocarbon prospects. Examples include deep-water sub-salt exploration activity in West Africa, waxy oil in Uganda as well as offshore exploration leases in South Africa.

Bredenhann says: 'While oilfield service companies will venture to cut

back on spending, they will also be under extreme pressure by the oil companies to drop their prices.'

According to the analysis, the following oil & gas players in the market are expected to be most likely at risk from the drop in the oil price: frontier areas, host governments, major gas projects and oilfield service companies.

Frontier areas around the world are expected to suffer from delayed development in the near-term. These include technically difficult projects that require more spend than conventional production such as deep-water, sub-salt, shale gas and enhanced oil recovery ventures. Countries that may see frontier project delays include offshore South Africa, sub-salt Congo and Angola, offshore Tanzania and shale gas in South Africa. Shale gas, in particular, could move forward if the gas price was not 100% fully-indexed to oil. It should be noted that oil companies do not make their investment decisions based on short-term, cyclical price changes but rather on wider price trends given the long-term nature of these investments.

Major African gas projects are also expected to be under increased scrutiny, as oil-linked LNG prices have dropped significantly. 'While we don't envisage that the major LNG projects in Mozambique and Tanzania will be cancelled outright, costs are a major concern for investors,' Bredenhann says.

At this time, governments would do well to place regulatory, legislative and fiscal policies in order so that they are seen as attractive regimes when the price recovers.

Oilfield service companies will be hit hard globally, but Africa may be an especially vulnerable portion of their portfolios, states the analysis. Africa could pose further challenges due to difficult logistics and the lack of infra-



*Chris Bredenhann, PwC Africa Oil and Gas Advisory Leader*



structure. Overall exploration costs have already decreased significantly due to cost pressures, in particular seismic surveying and drilling. This is expected to lead to idle rigs as well as delayed and potentially cancelled projects.

However, not all is doom and gloom. There are still numerous opportunities to invest in the industry within Africa. The greatest opportunity seems to lie within onshore exploration. There are still risks, but onshore exploration is also significantly cheaper. Tullow Oil has certainly taken note of this opportunity as it has announced that it plans to drill six basin openers in onshore Kenya during 2015.

Aside from exploration, some players are moving ahead with development programmes, even though they have no plans to expand with exploration drilling. 'We also see that there could be significant potential for firms that are strong in R & D,' adds Bredenhann. Lastly, there is opportunity for new players with strong balance sheets to enter the African market, potentially at a low cost.

A number of issues must, therefore, be addressed. This can be done by starting with an organisational stress test including strategic, financial, operational and commercial elements. In situations of low commodity prices, many companies respond with knee-jerk cost reduction programmes. This could be more effective if they took the time to understand what specific costs are, how they compare to peers and what reductions are truly possible. Cost reduction programmes need to be targeted and realistic,' concludes Bredenhann.

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# Air Energi sets its sights on Africa

**FORD GARRARD APPOINTED AS VICE PRESIDENT FOR AFRICA TO SPEARHEAD REGION'S DEVELOPMENT**

**A**ir Energi, the global workforce solutions provider for the energy, process and infrastructure sectors, has appointed Ford Garrard as Vice President for Africa. Garrard will lead the organisation's growth across the continent and establish a number of regional service bases to support operators' local projects.

Garrard started his career at Air Energi 10 years ago, and now returns with an extensive breadth of experience spanning Europe, Africa and the Americas. He re-joins the company from NES Global Talent, where he was Divisional Director for Africa since 2011. Garrard's understanding of the continent's energy landscape and knowledge of local content regulations will be invaluable as Air Energi raises the profile of its capabilities in the region.

Over the next 12 months, Garrard will focus on developing Air Energi's brand and business infrastructure in East Africa, establishing the offices, immigration capabilities and personnel required to deliver its services in the region. Garrard will also be responsible for evolving and strengthening Air Energi's existing partnerships in the West Africa region.

'Air Energi is diversifying its service offering and expanding globally. It's an exciting time to be returning,' said Garrard. The East Africa region in particular presents a significant opportunity to introduce Air Energi's leading workforce solutions to a completely new market.

'Operators are investing heavily in Kenya, Mozambique, Tanzania and Uganda – my goal is to build sustainable business hubs to support their operations.'

With a number of major development projects underway in East and West Africa, skilled professionals are currently in high demand. Air Energi's global service offerings, including global mobility and integrated project solutions, will provide vital workforce support to operators in areas such as personnel compliance, mobilisation and risk mitigation.

Duncan Gregson, Group CEO, Air Energi, echoes Garrard's enthusiasm: 'Ford brings a significant range of local knowledge and expertise that will really benefit the organisation as we set our sights on this new market. Air Energi is already a trusted partner for operators all over the world. This, combined with Ford's experience, will offer clients unrivalled support in addressing their workforce challenges in Africa.'

With more than 30 years' experience, Air Energi is the people services partner for clients, consultants and candidates engaged in the global energy, process and infrastructure sectors. It provides contract, project and permanent hire personnel and expertise to projects and clients worldwide.

Headquartered in Manchester, UK, Air Energi has offices in 40 locations and serves more than 50 markets worldwide. It has regional hubs in Doha, Qatar; Houston, US; Brisbane, Australia; and Singapore.

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Website: www.airenergi.com



*Ford Garrard, Vice President for Africa, Air Energi*



## Short courses in renewable and sustainable energy studies

**D**evelop and enhance your knowledge in renewable and sustainable energy in support of accelerated and shared economic growth in South Africa while earning CPD points

Stellenbosch University will present a number of short courses in renewable and sustainable energy studies to enhance the capacity in the country to implement projects in this area. These courses form part of the taught master's programmes but each module's week of contact is also registered with ECSA so that participants from industry can typically earn 4.0 CPD points in category 1.

The dates for 2015 are as follows:

	<i>Course Date</i>	<i>Final Registration Date</i>
Renewable Energy Policy	18 – 23 May	4 May
Introduction to Solar Energy	8 – 13 June	22 May
Advanced PV Systems	13 – 18 July (tbc)	26 June
Renewable Energy Finance	27 July – 1 August	13 July
Ocean & Hydro Energy	10 – 15 August	24 July
Bioenergy	24 – 29 August	10 August
Wind Energy	7 – 12 September	21 August
Thermal Energy Systems	28 September – 3 October	11 September

All the courses will be presented in English by specialists in their field and will include group-work and interaction with other professionals. The venue is the Sustainability Institute based at Lynedoch, near Stellenbosch. Accommodation is available at Lynedoch or in Stellenbosch.

For further details, brochures and registration forms, please visit our website.

- **Contact Jos Liebenberg**  
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# Energy events 2015

## MAY 2015

### 4 – 6

#### FUNDAMENTALS FOR ENERGY MANAGEMENT TRAINING

**Cape Town, South Africa**

Contact: Thieda Ferreira

Tel: 041 582 2043/ 087 942 551314

E-mail: [info@entf.co.za](mailto:info@entf.co.za)

Website: [www.entf.co.za](http://www.entf.co.za)

### 5 – 8

#### CERTIFIED ENERGY AUDITOR

**Cape Town, South Africa**

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Website: [www.entf.co.za](http://www.entf.co.za)

### 6 – 7

#### BIOCHEMICALS & BIOPLASTICS

**Denver, Colorado, USA**

Tel: +44 (0) 203 141 0606

Fax: +44 (0) 207 593 0071

E-mail: [mahsan@acieu.co.uk](mailto:mahsan@acieu.co.uk)

### 7 – 8

#### IMPROVING CONDITIONS FOR DEVELOPMENT IN THE WESTERN CAPE

**Crystal Towers Hotel, Century City, Cape Town, South Africa**

Contact: Natalie Smit, Conference Secretariat

Tel: 021 914 2888

Fax: 021 914 2890

E-mail: [registrar@sbs.co.za](mailto:registrar@sbs.co.za)

Website: [www.sbs.co.za/wcpdf2015](http://www.sbs.co.za/wcpdf2015)

### 16

#### MEASUREMENT & VERIFICATION STANDARD OF SOUTH AFRICA

**Johannesburg, South Africa**

Contact: Thieda Ferreira

Tel: 041 582 2043/ 087 942 551314

E-mail: [info@entf.co.za](mailto:info@entf.co.za)

Website: [www.entf.co.za](http://www.entf.co.za)

### 25 - 28

#### CERTIFIED ENERGY MANAGER

**Cape Town, South Africa**

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Website: [www.entf.co.za](http://www.entf.co.za)

### 25 – 29

#### ENERGY MANAGEMENT FOR A SUSTAINABLE SOUTH AFRICA

**Pretoria, South Africa**

Website: [www.tut.ac.za](http://www.tut.ac.za)

### 26 – 28

#### CERTIFIED MEASUREMENT & VERIFICATION PROFESSIONAL

**Cape Town, South Africa**

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E-mail: [info@entf.co.za](mailto:info@entf.co.za)

Website: [www.entf.co.za](http://www.entf.co.za)

### 29

#### SUNCY PV SOLAR INTRO

**Cape Town, South Africa**

Contact: Thieda Ferreira

Tel: 041 582 2043/ 087 942 551314

E-mail: [info@entf.co.za](mailto:info@entf.co.za)

Website: [www.entf.co.za](http://www.entf.co.za)

## JUNE 2015

### 3 – 5

#### 3RD AFRICAN PUBLIC OFFICIALS ENERGY AND ENVIRONMENT CONFERENCE & WORKSHOP 2015

**Pretoria, South Africa**

Contact: Professor Josiah Munda & Olawale Popoola

APOEEC 2015 Secretariat

Centre for Energy & Electric Power,

Faculty of Engineering & the Built

Environment, Tshwane University of Technology, Pretoria, Gauteng, South Africa.

Tel: 27(0) 12 382 5266 / 5195

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[popoolao@tut.ac.za](mailto:popoolao@tut.ac.za)

#### SASEE THIRD BIENNIAL CONFERENCE

**Durban, South Africa**

E-mail: [SASEE2015@ikzn.ac.za](mailto:SASEE2015@ikzn.ac.za)

## AUGUST 2015

### 17 – 19

#### INDUSTRIAL AND COMMERCIAL USE OF ENERGY CONFERENCE 2015

**Cape Town, South Africa**

Tel: 021 460 3660

E-mail: [icue@cput.ac.za](mailto:icue@cput.ac.za)

E-mail: <http://energyuse.org.za/>

## SEPTEMBER 2015

### 15 – 17

#### LIMPOPO COAL & MINERALS INDABA AND TRADE SHOW

**Polokwane, Limpopo Province, South Africa**

Contact: RCA Conference Organisers

Tel: +27 11 483 1881/2

E-mail: [events@rca.co.za](mailto:events@rca.co.za)

Website: [www.rca.co.za](http://www.rca.co.za)

### 16 – 17

#### EUROPEAN BIOMASS TO POWER

**Berlin, Germany**

Contact: Dimitri Pavlyk

Tel: +44 (0) 203 141 0627

E-mail: [dpavlyk@acieu.co.uk](mailto:dpavlyk@acieu.co.uk)

### 30 – 2nd OCTOBER

#### LIMPOPO COAL & MINERALS INDABA AND TRADE SHOW

**Meropa Conference Centre, Polokwane, Limpopo Province, South Africa**

Contact: RCA Conference Organisers

Tel: +27 11 483 1881/2

E-mail: [events@rca.co.za](mailto:events@rca.co.za)

Website: [www.rca.co.za](http://www.rca.co.za)

## OCTOBER

### 12 – 16

#### MANAGING POWER SECTOR REFORM AND REGULATION IN AFRICA

**Cape Town, South Africa**

Contact: Ann Wium

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Website:

[www.gsb.uct.ac.za/e.asp?c=739](http://www.gsb.uct.ac.za/e.asp?c=739)

## NOVEMBER 2015

### 4 – 5

#### WINDABA

**Cape Town, South Africa**

E-mail: [info@windaba.co.za](mailto:info@windaba.co.za)

Website: [www.windaba.co.za](http://www.windaba.co.za)

### 16 - 20

#### ENERGY MANAGEMENT FOR A SUSTAINABLE SOUTH AFRICA

**Pretoria, South Africa**

Website: [www.tut.ac.za](http://www.tut.ac.za)

# Energy Management News

The newsletter is published quarterly by the Energy Research Centre (ERC) of the University of Cape Town.

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Enquiries, comments, articles, and information on energy events are welcome, and should be sent to:

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## JOURNAL OF ENERGY IN SOUTHERN AFRICA

The *Journal of Energy in Southern Africa (JESA)* has been running for 22 years, and has proved to be of a consistently high standard and to have a widening subscription base. The key receivers of this quarterly journal are researchers, consulting engineers, energy producers, energy consumers and decision makers.

The publication is balanced, representative, up to date and authoritative. It is becoming increasingly known in other countries especially in Africa.

The JESA is a successful vehicle for the dissemination of information on the latest results and activities in the Southern African energy field, publicising results achieved and stimulating future activities. The potential impact in terms of distribution is the whole of sub-Saharan Africa. It covers matters of local and regional interest as opposed to the internationally high technology content of other journals serving energy interests.

JESA is now an online publication only, and available freely on the website of the Energy Research Centre, University of Cape Town: [ww.erec.uct.ac.za](http://ww.erec.uct.ac.za)