

Energy Management News



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MAPS emerges as an alternative approach for green growth strategising in Africa

The Third Annual Conference on Climate Change and Development in Africa (CCDA-III) took place from 21 – 23 October 2013 in Addis Ababa, Ethiopia. The theme of the conference was ‘Africa on the rise: Can the Opportunities from Climate Change Spring the Continent to Transformative Development?’

Anthony Dane presented a paper co-authored with Marta Torres Gunfaus. The paper drew from the work undertaken as part of the Mitigation Action Plans and Scenarios (MAPS) Africa feasibility study. The feasibility study is considering whether the MAPS approach can potentially deliver benefits in the African context and, if so, what the design of such programmes in Africa would need to be. The promising results of the study thus far, convinced Anthony and Marta to submit a paper to the conference. The paper proposed MAPS as a domestic approach to developing an evidence base, through a stakeholder-driven process, that supports desired transformative development in Africa.

THE CCDA-III CONFERENCE OBJECTIVES

The conference presented an opportunity for stakeholders to deliberate on Africa’s development in the context of climate change. It attracted influential experts and decision makers with experience in climate change and development. The key objective was to provoke debate on important issues, share knowledge and foster relationships for future collaboration.

Through high-level plenary sessions and smaller sessions allowing

interrogation of ideas and sharing of knowledge, participants focused on issues relating to climate science, data and services for Africa’s adaptation and mitigation, policy to build resilience, climate finance, green economy and Africa in the global climate change framework. A number of themes emerged with particular relevance to the MAPS approach.

Africa needs:

- to share successful experience in linking researchers and policy makers;
- to produce relevant knowledge generated in Africa;
- to promote South-South collaboration; and
- solutions that are tailored to support country-specific transformational development pathways.

Dr David Lesolle from the African Group of Negotiators (AGN) summarised the challenge well: ‘we need to sing our own song.’ Africa needs to do its own research, to identify the preferred development pathways that make sense for the continent. To use this information to inform African positions based on unique development needs and opportunities.

The MAPS approach could have the potential to meet some of these needs.

MAPS AS AN APPROACH TO INTEGRATE CLIMATE RESILIENCE INTO LONG-TERM DEVELOPMENT PATHS

Many African countries are grappling with the design and implementation of approaches to achieving desired long-term development paths that consider climate change and other

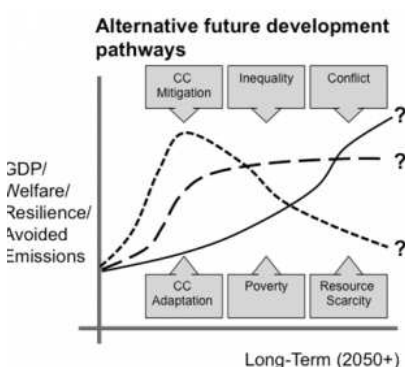
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green growth objectives. Which development paths should countries pursue to optimise a range of sometimes competing economic, social and environmental objectives?

To balance trade-offs, it is critical to establish the evidence base for a long-term transition to robust economies that enable socio-economic transformation and are both carbon efficient and climate resilient. MAPS was tested as an existing framework to support the desired transformative development.

Based on experience from South Africa and Latin America, the ERC and SSN team identified potential areas where MAPS could add value. These are shown in the accompanying figure.



An assessment was conducted on the potential to realise those benefits in Ghana, Mozambique, Rwanda and Zambia, as case study countries. The assessment drew on desktop research, engagements during country visits and outputs from a country-syndicate-based assessment of the value and proposed design of a MAPS programme, during a workshop held in Cape Town.

It was local researchers and participants who felt that a MAPS process



The MAPS Africa team: Marta Torres-Gunfaus, Constant Labintan, Anya Boyd and Anthony Dane

could be relevant and beneficial in their countries. The greatest benefit was seen to be in the potential to align climate and development-related policies, plans and programmes, to generate credible evidence and to build local capacity. Stakeholders also called for a MAPS programme that could generate evidence to substantiate existing development pathways or visions and to support implementation in the countries.

Although a common set of benefits was identified, each country has different needs and those needs also differ from those of South Africa and Latin American countries. Based on these needs, Anthony and Marta proposed a set of policy questions and potential approaches to generating the evidence needed to answer these questions. These could be different for each country and could include a combination of these questions and approaches.

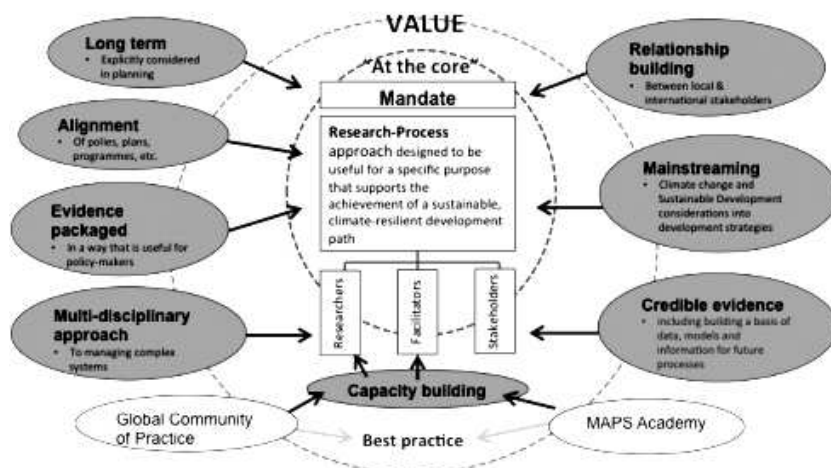
1. What are the different pathways to achieve developmental and sustainability goals?

2. What are the most cost-effective developmental choices in the context of climate change?
3. What evidence and knowledge base is needed to enable the implementation of plans?
4. What are the risks and opportunities of different policy options regarding the management of large fossil fuel reserves?

Various approaches to answer these questions are being considered, in collaboration with local researchers and facilitators.

Anthony Dane and Marta Torres-Gunfaus argued that the principles of objectivity (in the research) and inclusiveness (in the research process) prioritise different objectives and balance trade-offs to culminate in legitimate and robust options for low carbon development paths available to policy-makers. This approach is relevant to the African context and emerges as an alternative strategy for an African global climate change framework that has domestic assessments as its core.

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Nuclear outreach and demystification campaigns

The nuclear industry shows little interest in public communication. It was therefore a pleasure to be invited to speak at an event organised by the South African Young Nuclear Professionals Society (SAYNPS) to bring energy issues to the Humansdorp community in the Eastern Cape. Humansdorp is not far from Thuyspunt, the favoured site for the next coastal nuclear power station.

The event was billed as the *Energy Careers Focus Week*, 14–16 October 2013, with 'Presentations to learners, graduates, educators and community members'. As it turned out, the audiences consisted almost entirely of children in the 15 to 16 year-old age group bussed in from schools throughout the region. The six similar half-day sessions were attended by an impressive total of over 1 800 children and their teachers.

The event was the brainchild of the SAYNPS. It was funded by DoE and hosted in the Humansdorp Cultural Centre by the Kouga Municipality and the Matla-Ke-A-Rona NGO. The careers aspect was relevant not least because many of the staff required to build and operate Thuyspunt could well be drawn from local people now in the age group targeted. Speakers represented the SAYNPS, DoE, Eskom, NNR, NIASA, NRF, SAASTA, Cennergy, the Coega Development Corporation and the Nelson Mandela Bay Science and Technology Centre. It was a very good idea indeed.

It was also good from a public communications point of view. Experience shows that events such as this, even where concerns about nuclear power are being expressed, are largely ignored by the public. These children will have talked to their parents and will at least have raised awareness of plans for Thuyspunt – and the possibility eventually of business development and employment there.

Lessons can be learnt from the

exercise. The children were impressively attentive and well-behaved and, for the most part, bored out of their skulls. Slides enumerating the functions of an organisation, organisation charts and clever diagrams showing information flow or whatever will not do for 'learners'. They and perhaps their parents as well, must be entertained. Communications Departments must provide video clips showing simply how things work and, if careers are to be discussed, clips showing people at work explaining what they do. They must work at being informative and funny.

Young audiences must empathise with the speakers. Speakers must therefore themselves be young, of the right colour and able to engage a young audience.

The children were for the most part totally ignorant of the subjects discussed. I went prepared to talk about careers in health physics and what radiation protection staff do on and off-site. But no one had heard of radiation or radioactivity. No one had heard of Koeberg, let alone seen it. The children seemed not even to know what an

atom is. Talking to them, it became evident that at least one group had had a warm-up lesson on energy the day before, but they seemed to be the exception. Prior to future events, schools should be provided with material for several such lessons. The nuclear industry must seize the opportunity and must provide interesting material.

Only after the event, I learnt that this was the sixth such effort in 2013 run by SAYNPS. Three prior events have been held in North-West Province and one each in Limpopo and Mpumalanga. Nearly 1 200 children attended these earlier sessions. SAYNPS is to be congratulated.

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Renewable energy opportunities

European renewable energy company interested in a South African opportunity

A major European renewable energy company, probably the biggest in its country of origin, wishes to expand into Africa via South Africa. It wishes therefore to acquire or invest or joint-venture with a South African Wind Energy company.

Omega Investment Research has been mandated to identify a suitable company. It is important that it already be established.

Seriously interested companies should forward a brief outline to Debbie Bennett.

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Demand forecast programme

This article briefly explains the requirements for a demand forecast programme.

It is important that the following criteria is considered (based on HL Willis and CW Gellings):

- How much
- When
- Where
- What (Type of customer)
- Why (Informative – market intelligence supported)

Step 1: Develop a supply and demand model. From an Operations Research view, it reduces the complexity of the electrical networks – an assumed real world situation.

The demand flow (or energy) between generation and the customers and between areas and sector demands are modelled.

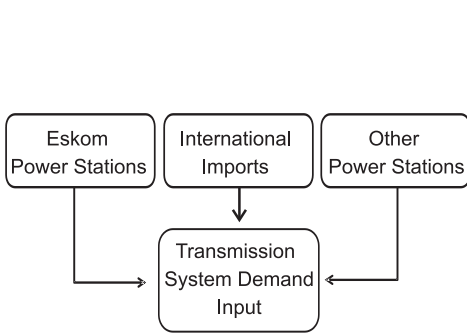
Each arc flow in the model represents the hourly demand data (energy

values) for a given measuring point or the sum of a number of measuring points.

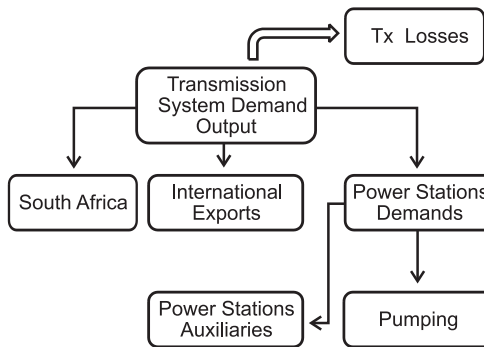
The 'how much' and 'when' are addressed.

Link the arc flow spatially and the 'where' is addressed.

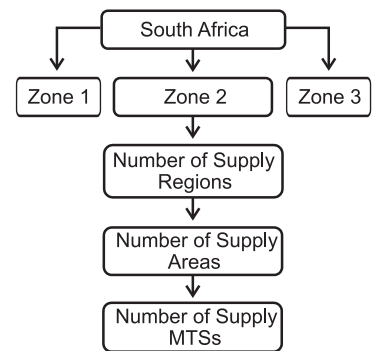
Step 2: The analysis section is to study the demand flows to understand the following using simple graphs, rules and algorithms:



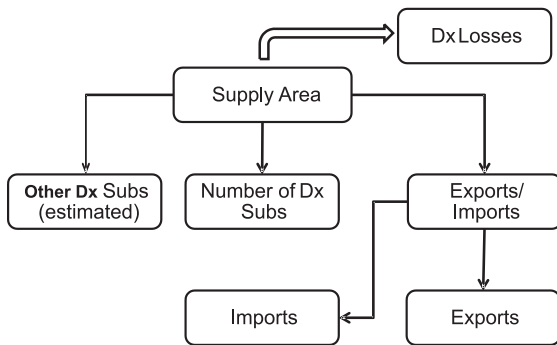
Mathematical model (1)



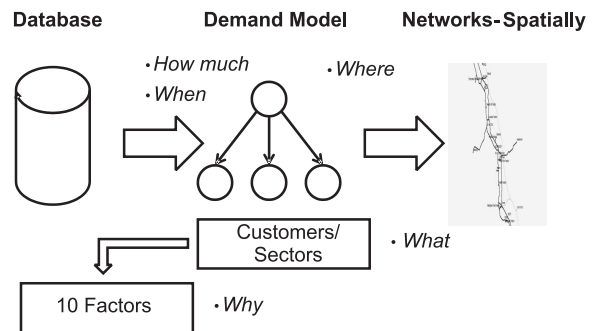
Mathematical model (2)



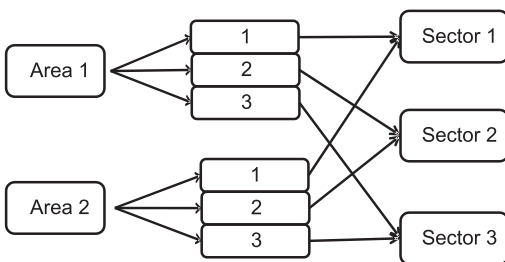
Mathematical model (3)



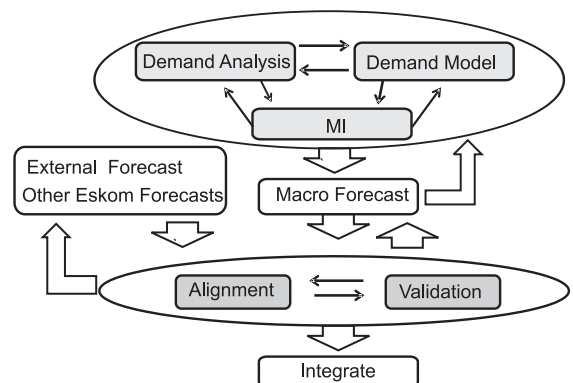
Mathematical model (4)



Criteria



Matrix – sectors per area



Interaction

Grid risks

- The impacts of new networks, different network operations and different generation patterns
- The impact of the customer behaviours
- The impact of the external environment
- The impact of the external of the environment and the customers – interaction concept.

Step 3: Using market intelligence to develop scenarios how the external environment will develop to compare with the different demand forecasts or energy forecast. Market intelligence addresses the what and why and reduces the uncertainty and complexity of future demand growth predictions

Step 4: Use different forecasts to model the supply and demand model for future expected demand flows.

Step 5: The supply and demand model is actually a transshipment problem, model the different arc flows between ranges based on the forecasts.

If a solution exists then the forecasts are 'aligned'.

Step 6: The validation is very similar to stats to see whether the results are trustworthy, etc – the classical definition.

Step 7: Finally the results are submitted to Transmission Grid Planning for strategic network expansion studies.

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What happens in dealing with the intermittent input from wind turbines? It is not too much of a problem at present with the relatively small wind generation programme planned. Beyond that, there could be problems.

Potentially one has an unpredictable power swing of about 1 485 MW (wind) and predicable power swing of 2 415 MW (solar). Only the unpredictable swing matters.

WESTERN CAPE PEAK LOAD

The peak load in the Western Cape that is supplied by Eskom is 3 860 MW (this excludes the load that is being supplied by Steenbras pump storage.) The peak demand South of Hydra is 6 035 MW (Western Cape 3 860 MW, Eastern Cape 1 414 MW, Northern Cape 760 MW) The transfer limit of the Eskom transmission system to the Western Cape with no Koeberg generation is 2 900 MW, and supplying into Hydra it is 4 000 MW. The 2 900 MW transfer limit is a secure limit that allows for another worst contingency. This is a requirement of the Koeberg off-site supply reliability criteria.

RESTRICTIONS ON WESTERN CAPE ELECTRICITY SUPPLY

The present loading on the network is therefore such that when two Koeberg units are out, or when one Koeberg unit and one line is out, a portion of the load in the Western Cape cannot be supplied except by gas turbines. Some loads may need to be switched off under these conditions to protect the transmission network from overloading. Thus, having renewable power running the worst case is a drop of wind at about 19h00 on a weekday in winter with Koeberg off or Koeberg and a line out and no gas turbines which will lead to load shedding.

Since the gas turbines can do 900 MW they are effectively one Koeberg unit and so the most likely operating scenario is to be ready to ramp up the turbines on sudden wind loss, with two Koeberg units out or one Koeberg unit out and a line out ... so all contingencies will be catered for. Technically it is

very unlikely that the wind turbine facilities will ever run much above 60% of nameplate capacity and thus the contingency of gas turbine standby for wind loss is very small.

There is a local restriction dependent on the serviceability of the Koeberg units 1 and 2 and/or the serviceability of the major lines feeding the Western Cape. This restriction has partly been eliminated by the construction of a 900 MW gas turbine station (Ankerlig, near Atlantis). In addition, an additional transmission line upgrade to the Western Cape will relieve the line restriction.

Unusual condition: Islanding of Western Cape Electricity Supply System

Because the transmission network is heavily loaded and the Western Cape is at the end of a very long radial network, the possibility exists that this area, with Koeberg as a generating source, can go out of synchronization with the rest of the network. In order to protect against such an event, 'out-of-step' protection is installed at strategic points in the network. This will isolate the Western Cape system from the main network by opening the transmission line circuit breakers towards the Western Cape.

The result would be the operation of the Western Cape on an islanded network, with no supply being received from the rest of the network. It is probable that under this condition a number of major loads will be shed, including the Saldana Bay industrial complex and ore terminal. The wind turbines will trip on overload under this condition.

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As South Africans we are making major strides in renewable energy in many avenues and technological terms like solar water heating, photovoltaics, wind energy and biomass are amongst the terms that we are now familiar with. Major IPP projects are on the way and the optimal choices of renewable energy for our country are now confidently being pursued from all avenues. It seems we are starting to feel very well informed. Over 60 delegates attending the launch of the Certified Renewable Energy Professional (REP) training course during November in Gauteng learnt that there are many more ways energy can be generated in alternative and renewable methods.

Dr Stephen Roosa, the course presenter from the USA, dug deep into what alternative and renewable energy is and defined it as "alternative energy is when you substitute one form of energy for another, and renewable energy is the forms of energy that are derived from and replaced rapidly by natural processes." The options discussed included ground source heat pumps, developments and alternative uses of fuel cells and the types, various options of biofuels from waste oils, algae, gasification in fuel production, various hydropower technologies and systems, tidal power, ocean thermal

An explosion of renewable energy options presented in REP

energy, wave energy systems, solar cooling systems, solar hot air systems, solar water heating, the various concentrated solar technologies like parabolic trough, central tower receivers, linear Fresnel reflectors, hybrid renewable energy systems, energy storage options like chemical storage, thermal storage the various battery types, telecom flywheels, LEED versus Green buildings, the economics and feasibility

of the various systems and much more. The content of the course was a lot to take in and presented a fairly non-technical training forum which accommodated a range of delegates; from those that are new to the industry, to those that have been working in the industry presenting them with an opportunity to put their knowledge and experience gained during the years forward in the examination and have the opportunity to obtain an international qualification.

The Energy Training Foundation (EnTF), sole approved training partner of the US-based Association of Energy Engineers (AEE) in the Southern African region, and the affiliated training provider of the Southern African Association for Energy Efficiency (SAEE), brought Dr Roosa to South Africa for the launch of the REP course in November 2013. Dr Roosa is a highly qualified expert on the subject and has his PhD in Planning and Urban Development and has completed energy studies on over 3 500 buildings. In addition, he holds Certified Sustainable Development Professional, Certified Energy Manager, a Certified Indoor Air Quality Professional, a Certified Measurement & Verification Professional, a Certified Energy Monitoring and Control System Designer, a Certified Demand Side Management Specialist, a Certified Building Energy Management Professional, and a LEED Accredited Professional qualifications.

REP will be held again in Cape Town on 14-17 October 2014.



Over 60 delegates attending the launch of the Certified Renewable Energy Professional training course from 18-21 November 2013 at Emperors Palace in Gauteng. REP is an international qualification of the US-based Association of Energy Engineers and offered in South Africa by the Energy Training Foundation



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The impacts of wind turbines near communities and measuring sound

One has to understand how sound is measured. Once you understand this, you should be able to appreciate that:

a. Environmental noise measurements are done with precision sound level meters which have a filter called an A-Weighting filter which is supposed to mimic the way humans hear.

b. A weighting was developed for low noise level and pure tones. At low frequencies, the weighting reduces amount measured by a meter by the amount in the table below, centre column:

Frequency in Hz	Reduction due to A weighting in dB	Reduction due 468 weighting in dB
10	-60	-38
20	-50	-30
30	-40	-28
40	-35	-26
50	-30	-25
100	-20	-20

c. The threshold of human hearing is about 20 dB at 20 Hz. Due to the deficiencies in A-weighting, industrial firms and the BBC use 468 weighting (right column) which does not reduce the amount measured by a meter as much as A weighting. Basically what this means is that using A weighted meters you can prove that at 70 dB at 20 Hz you can't hear the noise but using 468 weighted meters you can prove that the noise of 50 dB at 20 Hz can be heard - a 20 dB difference. Since 20 dB is a factor of about one hundred three times you can see that you can prove to anybody, using an A-weighted meter, that the noise they say they can hear is in fact what they can't hear.

d. Large wind turbines rotate at between 8 rpm and 16 rpm. They have three blades. One blade passes the tower every 0.8 sec so the blades give off a frequency of 1.25 Hz. This is below human hearing.

However, since the blade movement is not sinusoidal, the blades give off harmonic frequencies, in odd multiples: 3 x, 5 x, 7x, 9x, 11 x, 13 x and so on and thus turbine noise becomes audible at about 32 Hz upwards. A 2000 kW turbine is about 45% efficient and thus 55% of input wind energy is not captured or is lost due to inefficiency. According to Betz's law, no turbine can capture more than 59.3 per cent of the kinetic energy in wind and the best capture about 80% of 59.3 % or about 48%. Some losses are mechanical losses, drive inefficiencies and importantly, some is given off as sound power. Sound power in watts and real power in watts relate exactly. Thus, of the losses it would be reasonable to assume that about 0.1% of turbine input power is given off as sound power or about 2 500 watts. This will mostly be given off as ultra-low frequency sound but, using a square law relationship about 10 watts will be given off at 32 Hz and above. For frequencies of 200 Hz and higher air will absorb most sound and the infra sound harmonics are small magnitude above 80 Hz so what will be audible lies between 32 Hz and about 80 Hz.

e. If we take a rural area as having a night time noise level of about 40 dBA, then the noise of a wind turbine becomes inaudible at 9 km from the turbine. Naturally if one measures with an A weighted sound level meter then the meter will not register more than 40 dBA when you are no more than about 100 m from the turbine and even standing under the turbine, if it is 100 m tall, the meter will not register over 40 dBA. If

you have multiple turbines then they will be more audible as a group; for example, six turbines can be heard at 14 km line of sight.

f. Noise per se does not hurt people. There are numerous studies which show that low frequency sound causes anxiety, uneasiness, extreme sorrow, nervous feelings of revulsion or fear, chills down the spine, and feelings of pressure on the chest.

g. The following: for a wind farm of six turbines, the minimum distance should be 15 km from domestic dwellings. For twelve turbines, 27 km.

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African Business Advisors

Omega Investment Research events are not typical. Their events have strong investment foci and are aimed to develop sustainable interest in both certain sectors and geographic centres and produce deals which Omega then passes on to its sister company African Business Advisors (Pty) Ltd. Driven by Ram Barkai, Lyndon Worrall (based in London) and Denis Worrall, and several experienced deal-makers, African Business Advisors undertakes to raise capital to finance business projects and developments and also offers advisory business services where they help match their clients' needs for technical assistance with providers of free or heavily subsidised technical assistance.

While African Business Advisors will entertain enquiries from all sectors, they tend to focus on areas where Omega has a strong client-base and concentrated conferencing activity. These include:

- **Agriculture and Food Security:** Agribusiness and food production and distribution are areas where there are numerous projects relating to product beneficiation, commercialisation of agriculture, etc.
- **Renewable Energy:** African Business Advisors experience is that there are lots of South African companies looking to acquire products for application in South Africa and foreign companies looking for joint ventures with African companies.
- **Intellectual Property:** South Africa is a leader in many areas with products which need to be registered off-shore.
- **Microfinance:** Providing advice and finance to microfinance institutions. This reflects the fact that Omega Investment Research is probably the biggest organiser of microfinance conferences in Africa.
- **Technology Generally:** Of particular interest in this regard is that ABA clients have benefited from Omega's connections in Germany and Central and Eastern Europe.

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OFFICIAL EVENTS ATTENDED BY ERNEST BAI KOROMA,
PRESIDENT OF THE REPUBLIC OF SIERRA LEONE

LUKOIL starts exploration drilling in Sierra Leone

Official events attended by Ernest Bai Koroma, President of the Republic of Sierra Leone, Gennady Gatilov, Deputy Minister of Foreign Affairs of Russia, and Andrey Kuzyaev, President of LUKOIL Overseas, have been held in Sierra Leone on the occasion of the launch of drilling on the SL-5-11 block in the deepwater shelf of the West Africa.

The official launch took place in September at the Eirik Raude drilling rig which started with spudding a deepwater well in the Savannah prospect. The target depth of the wildcat to be drilled within, will exceed 4 700 meters, the water depth at the drilling location is more than 2 000 meters.

Eirik Raude is the largest 5th generation self-propelled offshore drilling rig in the world. The rig has a height of 122 m, width of 85 m, deadweight of 52 500 tons and transit speed of 7 knots, crew – 120 people.

LUKOIL Overseas, operator of LUKOIL's international upstream projects, has entered into the PSA for exploration and development of block SL-5-11 in June 2011 as an operator with a 49% share. The other project partners are Oranto (30%) and PanAtlantic (21%).

Block SL-5-11 covers an area of 4 022 square kilometres on the shelf and continental slope of the Atlantic Ocean with water depth ranging from 100 to 3 300 meters. 2D and 3D seismic data was acquired on 1 500 square kilometres leading to the identification of several prospects. From the geological point of view, the block

belongs to the Sierra Leone-Liberia basin where a number of sizable oil discoveries have recently been made.

A standard contract for exploration and development of the block was concluded for the term of 30 years. The exploration program for the block includes re-interpretation of historical seismic data, an electric exploration survey and drilling of one exploration well.

The current exploration period will expire on December 31, 2013. Obligations of the next exploration period will depend on the drilling results.

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Petroplan opens regional hub in South Africa

INTRODUCTION

Petroplan is a global organisation which delivers tailored recruitment, contractor management and support services throughout the energy, oil and gas industry.

It has regional offices and a global in-house team located across Europe, the Middle East, Africa, North America, Asia Pacific and Australasia. Petroplan's aim is to deliver value across its global personnel and client network via tailored services which are delivered locally. Their service delivery is determined by a set of values – optimal health and safety, global consistency, specialist expertise, integrity, sustainability and corporate social responsibility, quality services, and a positive team spirit. The testimonials Petroplan receives illustrate how these values impact its day-to-day operations. Petroplan's sole focus is serving the oil, gas and energy industry.

CAPE TOWN OFFICE

Petroplan, as the global recruiter for the oil and gas industry, is opening a new South African office. The office – Petroplan's first in Africa – is located in Century City, a business development within the suburbs of Cape Town. It will act as a regional hub for Petroplan's activities in Sub-Saharan Africa, covering various territories including Ghana, Kenya, Mozambique, South Africa, Namibia, Angola, Cameroon, and Tanzania. This move will enable Petroplan to further expand its operations and better service clients across an important growth region for the oil and gas sector.

The opening came just in time for the 20th Africa Oil Week, which, started on the 25th November, saw the industry descend on Cape Town to discuss the continent's prospects and challenges at a key point in its development. African proven onshore oil reserves stand at around 124bn barrels, with another 100bn estimated offshore, while its proven reserves of natural gas amounts to around 509tn cubic feet. Recent discoveries highlight the significant upwards potential of these figures; South Africa alone is home to the 8th largest technically recoverable shale

gas resources in the world.

The new office will benefit from excellent data infrastructure, and good transport links with both Cape Town and the rest of the country. Jacques Rautenbach has been brought in to head the new hub as Regional Director for Sub-Saharan Africa. Having joined Petroplan in September 2012, Jacques brings 14 years of oil and gas sector experience to the role, having worked in a HR and Business Development capacity for drilling and resources companies such as Transocean, Enasco, Total, Shell, and Sasol across a variety of locations in America, Asia, Europe and Africa. Primarily responsible for business development, Jacques will oversee the overall office with a team that will initially include four recruiters, with this number expected to rise to ten – including two recruiters for permanent positions – by the second quarter of 2014.

Jacques Rautenbach, as Regional Director for Sub-Saharan Africa at Petroplan, comments: 'Establishing a permanent presence in South Africa is

a very natural step for Petroplan, given the number of clients and relationships we have in the Sub-Saharan region, and considering the region's promising future in terms of drilling and exploration. There is no doubt that Africa will play a central role in the industry's future growth. The location couldn't be a better fit; South Africa remains the continent's strongest economy, and Century City is fast emerging as an energy hub. For example, Chevron recently moved its headquarters here, and Tullow Oil is headquartered just down the road in Cape Town – the new office puts us closer to our clients, and will enable us to deliver a truly African service in terms of business culture.'

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aspectus^{PR}

Bowman Gilfillan helps bring solar power to the grid

For the first time a small portion of South African's electricity will be generated through solar power. The 75 MW Kalkbult solar PV station, linked to the national grid, was officially opened on 12 November in a ceremony attended by Patrick Hirsch, a project finance partner at Bowman Gilfillan and one of several Bowman Gilfillan lawyers involved in the deal that brought the plant to life.

Kalkbult, near De Aar in the Northern Cape, is one of many private renewable energy plants the government has authorised to provide green electricity over the next 20 years.

Bowman Gilfillan has been party to a large number of the successful bids in each of the three bidding rounds and continues to act for both sponsors and lenders on the Department of Energy's Renewable Energy Independent Power Producer Programme (REIPPP).

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Geothermal development in East Africa boosted by the AfDB

ADF AND SEFA PROVIDE USD 7.5 MILLION TO SUPPORT GEOTHERMAL POTENTIAL IN DJIBOUTI

A new project supported by the African Development Group (AfDB) plans to exploit the geothermal potential in the Lake Assal region to enable the Djiboutian population's access to a reliable, renewable and affordable source of energy.

Currently Djibouti relies mostly on fossil fuels and some hydropower imports from Ethiopia. The majority of the country's current generation capacity is situated in Djibouti City. The existing power stations are old, polluting and expensive to operate. In addition, fuel imports are expensive and require important foreign-currency expenditure.

As a consequence, only half the population of the country has access to electricity due to high tariffs. Djibouti is, however, blessed with substantial geothermal potential, capable of meeting the country's energy needs and possibly exports to neighbouring countries, while reduce CO₂ emissions from thermal electricity generation.

The geothermal exploration project in the Lake Assal region is structured as a Public Private Partnership, where the government of Djibouti is taking the lead on the first exploration and appraisal drilling phase. The private sector will be responsible for the production drilling, steam gathering system and electricity production and evacuation to the national grid.

In collaboration with the World Bank, the African Development Bank Group has structured the financing of this project. The first phase will cost approximately USD 32 million. The AfDB Board approved a USD 7.5 million financing from the African Development Fund and the Sustainable Energy Fund for Africa (SEFA), a Danish funded initiative implemented by the AfDB.

The AfDB and the World Bank have

jointly mobilized different donors to co-finance the project: the Global Environment Facility (GEF), OPEC Fund for International Development (OFID), Agence Française de Développement (AFD) and the Global Geothermal Development Plan (GGDP) through Energy Sector Management Assistance Program (ESMAP).

The AfDB alone has mobilized from its own resources: USD 5.31 million grant from the African Development Fund (ADF), USD 0.4 million loan from the African Development Fund (ADF), and (iii) USD 1.8 million from SEFA. The government of Djibouti will also make a contribution.

The contribution from the AfDB and SEFA will be used to continue to raise more financing and will serve as a catalyst to rally independent geothermal electricity producers. Specifically, SEFA funds will finance the recruitment of a geothermal consulting company that will be responsible for the technical management of the project and for preparing the power plant's feasibility study.

Through this intervention, SEFA will play a catalytic role by supporting the structuring of a bankable project that will ultimately leverage private investment and deliver a sustainable energy solution with strong economic, environmental and social returns.

The current project seeks to replicate the innovative model adopted in Kenya where the AfDB approved in 2011, the Menengai Geothermal Development Project. For this project, concessional funds were provided by development financing institutions, such as the AfDB and the Climate Investment Funds (CIF) hosted by the AfDB, to finance the drilling exploratory phase of the project.

Drawing from the Menengai experi-

ence and tapping into the East African Rift Valley geothermal potential, the AfDB has also been working on a series of small-scale geothermal units, adapted to the specific context of each country. In Ethiopia, the AfDB is playing a leading role in defining a geothermal roadmap. In Tanzania, it is leading the Scaling Up Renewable Energy Program which includes the financing of a geothermal development project. In the Comoros, the AfDB is also working to develop a 20 MW geothermal plant matching the needs of the archipelago.

SEFA is a joint initiative between the African Development Bank and the Government of Denmark comprising of resources of up to USD 56 million for unlocking investments in small and medium-scale renewable energy generation and energy efficiency projects. It operates through two components: (i) project preparation grants for pre-investment activities up to financial close and (ii) equity investments to infuse capital and managerial capacity in energy projects and companies. SEFA is structured as a flexible multi-donor/multi-purpose platform to support the access to sustainable energy agenda in Africa, and one of Africa's instruments under the UN-championed Sustainable Energy for All (SE4All) initiative.

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Sub-Saharan renewable energy boom: Investment opportunities

On-grid, commercial renewable energy in South Africa grew by more than 20,000% in 2012 (Bloomberg New Energy Finance). This unprecedented growth has seen tens of billions of Rands flowing into long term infrastructure investment in sub-Saharan Africa.

Simultaneously, the United Nations' "Sustainable Energy-4-All" initiative has been gathering pace internationally, targeting the electrification of the 690 million Africans living without electricity.

Both on-grid and off grid applications in a variety of renewable energies including wind, solar PV, Hydro, Solar Thermal and Geothermal energy are set to experience sustained growth in the sub region.

Omega Investment Research has a number of investment opportunities on its books.

For details regarding costs, frequency and procedures, etc. of this investment marketing and facilitative service please contact Debbie Bennett.

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aggreko

Aggreko secures 50 MW Interim Power Project in Guinea

Aggreko, the world leader in the provision of temporary power and temperature control services has signed contracts with Electricité de Guinée (EDG) to deliver a 50 MW temporary power package to help alleviate power shortages currently affecting the capital Conakry.

The Aggreko installation will bring much needed additional capacity to the local grid and will ensure a more robust and reliable power supply is delivered to the commercial heart of the country in order to help keep business and industry up and running and keep the lights on in the city.

'We are happy to be assisting EDG, the national utility of Guinea in this important project, commented Christophe Jacquin, Managing Director, Aggreko North and West Africa. 'By delivering this large-scale, fast-track power solution, we are helping to provide a more consistent and reliable power supply to the people of Conakry while EDG work on addressing the issues facing the power infrastructure.'

'The Aggreko power plant will provide us with the time and space needed to address the power supply issues affecting the capital,' commented Nava Touré, Managing Director, Electricité de Guinée. 'Their proven track record in providing similar power solutions across Africa gives us the confidence that they are the right partner for this vital project.'

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The intangible nature of the global carbon trading markets puts them at risk for exploitation by criminal networks, according to a new law enforcement guide produced by Interpol.

The Interpol Guide to Carbon Trading Crime examines the areas within the industry which have the potential to be manipulated by criminals, through securities fraud, insider trading, embezzlement, money laundering and cybercrime. It also assesses the current vulnerabilities of the carbon market and provides information to support national authorities in establishing adequate policing measures.

Carbon trading is the world's fastest growing commodities market, with its current value estimated by the World Bank at around USD 176 billion. Differing from traditional markets in that there are no physical commodities, only 'credits' for offsetting the output of carbon dioxide, it is this unquantifiable market combined with the large amounts of money invested and a lack of oversight which make it vulnerable to criminal activity.

'It is imperative that the carbon trading markets remain secure from fraud, not just to protect financial investment, but also because the global environment depends upon it,' said Andrew Lauterback, Senior Criminal Enforcement Counsel at the US Environmental Protection Agency and Chair of the Interpol Environmental Crime Committee.

'The Interpol Guide to Carbon Trading Crime is an important resource for all organizations and agencies committed to protecting our environment and developing a cohesive global response to this crime,' concluded Mr Lauterback.

An initiative of the Interpol Pollution Crime Working Group, the Interpol Carbon Trading Guide was produced with contributions from partners including Environment Canada, the Norwegian Agency for Development Cooperation, the Netherlands Government and the US Environmental Protection Agency. The Pollution Crime Working Group held its 18th meeting during the Interpol Environmental Compliance and Enforcement Events in Nairobi, Kenya from 4 to 8 November 2013.

The guide includes several case studies from around the world where greenhouse gas accounting firms, national authorities operating in under-regulated jurisdictions, and individuals

Interpol report warns carbon trading at increased risk of criminal exploitation

or companies claiming to offset emissions in return for investment have cut corners, falsified information or received bribes.

'Crimes that harm our environment have a wider impact on the health and safety of society as a whole, and therefore must be investigated and the perpetrators punished,' said Interpol Secretary General Ronald K. Noble.

'Interpol will continue to fight the criminal networks which endanger our precious environmental resources and use their ill-gotten proceeds to fund other criminal activities,' concluded the Interpol Chief.

With eight carbon credit trading companies operating on the European Union Emission Trading Scheme recently shut down for malpractice, the Interpol guide seeks to generate an international law enforcement response to these crimes.

'It is sad to see criminals using fraud and other crimes to make profit out of a commodity that was created to protect the environment. It is not just the financial harm it causes investors, but this criminal activity risks seriously undermining the environmental integri-

ty of the carbon markets globally,' said David Higgins, Manager of Interpol's Environmental Crime Programme.

'Interpol is supporting governments which are in the process of establishing or regulating the carbon markets to put an end to these types of crimes,' he added.

Interpol also assists law enforcement agencies in policing the carbon market across borders and jurisdictions, in particular by identifying inconsistent regulations between countries and other legal loopholes which can be exploited by criminals.

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CSP South Africa

3RD CONCENTRATED SOLAR THERMAL POWER CONFERENCE AND EXPO APRIL 2014, CAPE TOWN

Reduce CSP costs & risk through international experience and investor insight to prove your competitiveness

Now in its 3rd year, CSP South Africa 2014 is the definitive meeting point for developers, investors and CSP players interested in one of the most attractive CSP markets worldwide.

As the market matures and plants come into construction, the 2 day event combines the perfect mix of local and international experts to help you overcome key financial and technological challenges, addressing the most critical topics in order to achieve cost reduction and mitigate risk perception to boost confidence and reliability on CSP.

Your business will return from the conference with the following take-aways:

- Lower your LCOE with R&D developments and international know-how to improve competitiveness against competing technologies
- Overcome the risks associated with CSP by understanding the investor's criteria to guarantee your project gets funded
- Meet rising local content requirements and fight higher costs through streamlined project procurement and supply chain management techniques
- Hear the roadmap for the CSP in South Africa through top-level official input to help plan your growth strategy
- Increase your operational value and capacity for the latest advances in storage to meet South Africa's peak energy demand

You will hear and learn how to ensure your projects end up in the field, meet with official decision makers to roadmap your strategy and business plan in the country and get insight details on the lessons learned in international markets.

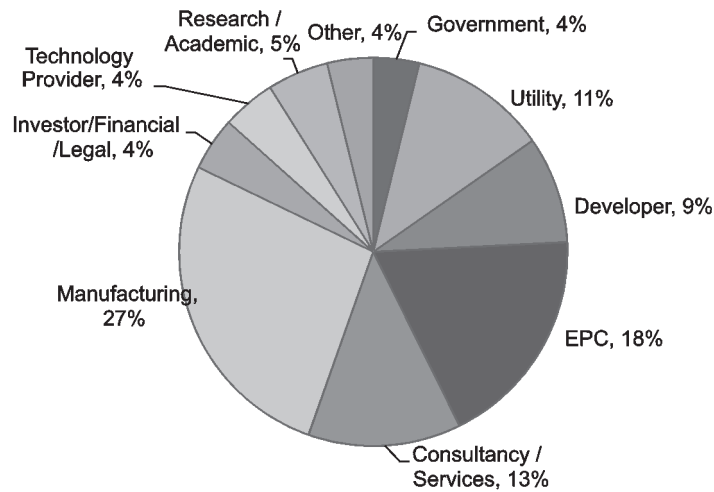
Who should attend?

At CSP South Africa you will be able to network with the decision-makers from the companies you want to

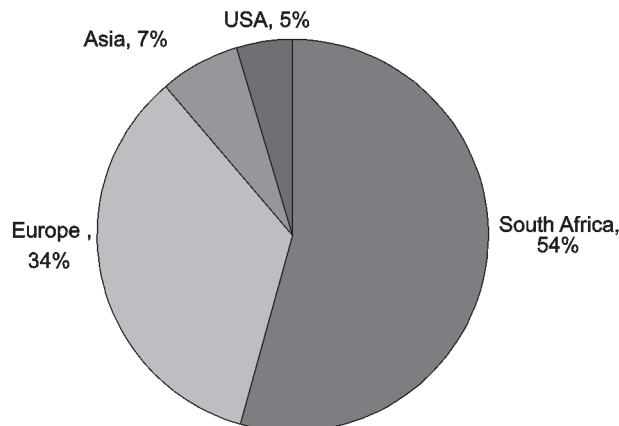
meet. The seniority of the audience guarantees that you will make meaningful connections with the companies vital to your business. Last year, over 27% of all attendees were from Developers and EPCs, 15% from Government and Utilities and 17% from Investor, Financial and Consultancy services.

This conference guarantees that you will meet the right people who you can share ideas, network and do business with. If your company is looking to build and develop projects in the region, meet with official policy makers or meet the local players taking significant steps in South Africa, this forum is one you should attend.

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Breakdown of 2013 attendees by company type



Breakdown of 2013 attendees by region



Addressing Africa's power challenges – POWER-GEN Africa and DistribuTECH Africa set for 2014 event

Top power industry players and government officials from across Africa and abroad are set to converge in Cape Town from 17 – 19 March 2014, for the second POWER-GEN Africa and inaugural DistribuTECH Africa exhibition and conference.

Presented by PennWell International, POWER-GEN Africa 2014 and DistribuTECH Africa feature the best of the international POWER-GEN and DistribuTECH events, combined with an in-depth focus on Africa's unique challenges and opportunities.

Key developments changing the face of the power sector in sub-Saharan Africa are ongoing challenges with stability and growing demand; US President Barack Obama's new \$7 billion Power Africa initiative; and new solutions making larger scale renewable energy generation a more attractive option for utilities, says PennWell. In addition, new smart metering and grid management present a range of potential benefits for African utilities grappling with the need to expand their grids on restricted budgets.

Aiming to address the challenges and analyse the trends, high-level panels and expert speakers will examine power policies, strategies and technologies in dedicated tracks. Among the topics to be addressed during POWER-GEN Africa will be emissions control, renewable energy policy and finance, gas turbines and combined cycle, a wind powered Africa, harnessing Africa's hydropower potential, and bioenergies and waste to energy.

The DistribuTECH conference will include sessions covering smart grid development and communication,

smart metering, data intelligence, substation automation and smart grid cyber security.

Over 100 exhibitors are set to participate in the event.

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CSP storage in South Africa driving down LCOE

Researchers at CSP Today have completed work on their brand new guide focused on the benefits and challenges when integrating thermal energy storage into CSP plants in South Africa.

Hours of research has resulted in the general release of this resource, which provides data and information on how CSP and storage technology can benefit the South African energy mix.

The guide also provides an introduction to the different thermal energy storage technologies that are commercially operating and under-development. In addition, it examines the impact of the new Time of Day (TOD) tariff, recently introduced by the Department of Energy, and how this will make CSP with storage the leading technology choice.

In summary, this guide will provide exclusive insight into:

- Support for storage: understand how the new Time Of Day tariff introduced by the Department of Energy (DoE) as mentioned, will make CSP with storage the leading technology choice;
- Technology update: get the very latest on storage R&D and identify the technologies that will reduce costs for years to come;
- The impact on cost: see the effect that storage will have on your plant, giving it the edge over other renewable energy sources.

CSP with thermal storage can reduce peak demand, maintaining a high operational and capacity value. With energy supply a critical issue for South Africa, CSP's thermal storage capability can offer dispatchable energy that will stabilize the grid for years to come. Therefore, gaining an understanding of storage technology is the next step for this market.

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Linking climate information to decisions through games

How can we accelerate the integration of climate-related forecasts into humanitarian work for risk management?

The Red Cross/Red Crescent Climate Centre has been working with academic partners through an innovative approach: participatory games that simulate complex system dynamics, allowing players to understand probabilistic information and vividly learn how their forecast-based decisions will have consequences - whether they are subsistence farmers, disaster managers, government officials or donors.

An intensely interactive session was held through the African Climate and Development Initiative (ACDI), UCT, where the trade-offs involved in real-world decisions, and exploring options for linking academic requirements with humanitarian needs were looked at.

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Energy events 2014

FEBRUARY 2014

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SMETHERMAL 2014

Berlin, Germany

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Mobile: +49 (0) 176 810 28224
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MARCH 2014

4 – 6

9TH ANNUAL WORLD BIO MARKETS

Amsterdam, The Netherlands

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E-mail: Samantha.Coleman@green-powerconferences.com
Website: www.worldbiomarkets.com

10 – 12

5TH INTERNATIONAL MINING AND INDUSTRIAL WASTE MANAGEMENT CONFERENCE

Orion Safari Lodge, Donkerhoek Road, Rustenburg, South Africa

Contact: Yolande Oosthuizen, RCA Conference Organisers
Tel: +27 11 487 3819/ 2260
Fax: 086 653 7108
E-mail: register@rca.co.za
Website: www.rca.co.za/SAICE/index.html

11 – 12

POWER ELECTRICITY WORLD AFRICA 2014

Sandton Convention Centre, Johannesburg, South Africa

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APRIL 2014

10 – 12

BREG-MES 2014 SYMPOSIUM, INNOVATING ENERGY ACCESS FOR REMOTE AREAS: DISCOVERING UNTAPPED RESOURCES

UC Berkeley, USA

Website: www.microenergysystems.tu-berlin.de/conference/berkeley2014/

22 – 24

POWER & ELECTRICITY WORLD ASIA

Resorts World Convention Centre, Singapore

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JUNE 2014

1 – 31 August

YOUNG SCIENTISTS SUMMER PROGRAM

Laxenburg, Austria

Websites: www.iiasa.ac.at/yssy and www.iiasa.at/postdoc

4 – 6

UNESCO CHAIR IN TECHNOLOGIES FOR DEVELOPMENT: WHAT IS ESSENTIAL?

Lausanne, Switzerland

Website: <http://cooperation.epfl.ch/2014Tech4Dev/Sessions>

18 – 19

POWER & ELECTRICITY WORLD PHILIPPINES 2014

SMX Convention Centre, Manila, Philippines

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Visit www.erc.uct.ac.za for further events and details

Energy Management News

The newsletter is published quarterly by the Energy Research Centre (ERC) of the University of Cape Town. (ERC is an amalgamation in 2004 of two organisations at the University: the former Energy Research Institute and the Energy and Development Research Centre.)

Energy Management News is available free of charge. The articles do not necessarily reflect the views of the editor or of the ERC.

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

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

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Cheques should be made payable to the University of Cape Town and sent to the address given below.

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