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Awareness key for oil and gas players looking to tap into South Africa's energy renaissance

South Africa must raise the profile of its oil and gas industry if the true potential of its massive reserves is to be realised, says Petroplan's Jaques Rautenbach

So the poll has been held, and the votes cast. On the 7th May 2014, South Africa successfully held its first 'born free' election, with the result marking a fifth successive victory for the ruling African National Congress (ANC) with upwards of 60 per cent of the vote.

Energy policy has been a hot button topic for the electorate during the campaign, and for good reason.

The country is poised to be a hotbed of activity for the industry over the next half-decade. Offshore, vast tracts along the South and East coasts, as well as within the Orange River Basin, have been licensed for exploration by major players including Petro SA, Forest Oil, Tullow Oil and BHP Billiton.

Onshore, the nation is in prime position to reap the benefits of the global shale revolution, given that South Africa is ranked highly in terms of recoverable shale gas reserves – estimated at approximately 390 trillion cubic feet. With numbers like this, it is little wonder that many talk of South Africa becoming a net exporter of energy within the next decade. Few disagree that future prosperity and energy security hinge on exploiting these abundant natural resources, but with the election now over, the practical quandary of just how these lofty ambitions can be met remains.

RISING COSTS, ROLLING BLACKOUTS

For most, rising fuel prices are a particular concern. Back in March, the cost of fuel went above R14 per litre for the first time in history. Import prices also hit record highs at the start of 2014, and remain far higher than they were just two years ago.

There is also concern over our ability to maintain a stable supply of electricity. A vulnerable power supply means that for many, outages remain a reality. 'Load shedding', whereby areas are taken off the power grid on a rotating schedule in order to cope with an imbalance of supply and demand to prevent a total blackout, was first introduced in January 2008 and continued intermittently for several months. This resulted in serious disruption to both our economy and our everyday lives, with people temporarily unable to cook, travel safely, charge their phones, or use household appliances.

Since then, the fear of mass power cuts has remained and, in a case of unfortunate pre-election timing for the ANC, this fear was realised in late February with a resumption of rolling blackouts. In a nation blessed with plentiful natural resources such as fossil fuels and huge economic potential within reach, clearly this situation is unacceptable.

Yet natural resources are not worth much without human resources – an adequate supply of the skilled labour required to find, extract and process the reserves. We face a critical shortage of skilled labour in this

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area at present, let alone with regard to the additional workers that will be needed to support the planned explosion of activity.

More than \$1 billion is to be spent on exploration, with more than 10 companies having been granted exploration licences over the course of the last 18 months. ExxonMobil and Anadarko acquired deep-water rights on the East Coast and BHP Billiton, Cairn India and Sunbird Energy on the West Coast.

South Africa has also been estimated to have the fifth-largest shale gas reserves in the world, and activity in this sector is ramping up significantly after the government lifted its moratorium on shale development in 2012. There is also the planned Mthombo Crude Oil Refinery project, which will be located in the Coega Industrial Development Zone near Port Elizabeth in the Eastern Cape. Once complete, the refinery will process 400,000bpd of crude oil and will be the largest in the continent.

PLENTY OF RESERVES, NOT ENOUGH EXPERIENCE

We are by no means an exception when it comes to having a limited pool of talent from which to draw. It is in part a symptom of a global skills shortage within oil and gas – an acute worldwide lack of staff with 10 to 15 years' industry experience thanks to a general freeze on recruitment during the '80s oil glut.

However, we face an added shortage given our status as an emerging

market for oil and gas that has not yet had the time to develop skills domestically. This is evidenced by the relative lack of specific oil and gas training programmes at university level. And while the industry certainly needs more highly skilled engineers, it also needs a lot more tool-pushers, welders, and pipe fitters. So it is clear that a rethink of vocational training is necessary if we are to sustain our anticipated level of development in oil and gas.

Idiosyncrasies in South African labour laws tend to exacerbate the issue. The constitution affords unions a large amount of power, and industrial relations have historically been volatile and frayed. Again, we are by no means the exception in this respect. The oil and gas industry does not have a union of its own at present (though this is likely to change) but the diversity of its supply chain means that it can easily be disrupted by industrial action elsewhere.

OVERCOMING HIRING RESTRICTIONS

While the skills shortage in the oil and gas industry is a global concern, the biggest difficulties faced in South Africa stem from the restrictions our firms face on hiring from abroad. The Black Empowerment Act places strict quotas on companies requiring them to hire from the domestic talent pool, specifically from groups considered to be disadvantaged in terms of ethnicity or gender. Even where a role is ultimately filled by, say, a Western ex-pat, the business must ensure they have advertised locally and that no local candidates are suitable for the role in question.

This is a problem for our oil and gas industry for two reasons. Firstly, we have a modest population (around 53 million) relative to our physical size and the scope of the exploration and development planned. Secondly, much of this future development lies in deep-water drilling, in conditions similar to offshore fields in the North Sea in Europe and in North America and Canada specifically. Much of the necessary technical skills and expertise we need will ideally have to be imported from these regions. Knowledge transfer, ideally, should be a priority.

Fortunately, there are certain projects in our industry where expats can be recruited, provided that a local recruitment drive has been conducted first. So while black empowerment poli-

cies are being implemented and more previously disadvantaged nationals are being recruited into roles, if expats have the necessary skills, they can be used. In addition, there is more training being provided in-country, so this will be less of an issue in the future. For now however, this should be regarded as more of a five year strategy for the country and our firms, than a short-term fix for our oil and gas industry.

The recently passed Mineral and Petroleum Resources Development Amendment Bill is a further consideration. While the intention behind the law – to ensure that the benefits of development filter through to the population at large – is noble and admirable, there is a danger that it will hamper foreign investment in our oil and gas industry at what is a critical juncture. In doing so, it may only end up hurting the prospects of the very citizens it is designed to protect.

Nevertheless, the Bill hasn't yet been signed off, and since it gives the state an automatic 20 per cent stake in new oil and gas exploration and production ventures, as well as the right to acquire an unspecified additional share at an 'agreed price', it could be a good Bill for South Africa's nationals.

FINDING A WAY FORWARD

The challenges faced by South Africa's oil and gas industry will need to be addressed if the country is to have any realistic hope of fulfilling its ambitions. There is no magic bullet but reform of labour laws aside, there are various things the Government and industry can do (and are doing) to mitigate the problem.

The first is to encourage more sideways hiring from sectors containing similar or related skills. As a nation, we are uniquely positioned to pursue this option thanks to our established, large and prosperous mining sector, which has plenty of overlap with oil and gas in terms of roles (e.g. heavy equipment specialists, hydraulic specialists). This means there are a lot of candidates out there that can make the jump across with relatively minimal training (e.g. an intensive three month programme as opposed to a two year one).

A potential barrier however, is that the oil and gas industry is not very well known in South Africa, so it is important that we look to build awareness of the opportunities on offer. Sideways hiring is happening elsewhere, and we have seen it happen already in South Africa,

so the more awareness the industry gets, the more sideways recruiting will happen – particularly as education and training picks up. At Petroplan, we are seeing a gradual transfer of talent from the mining and engineering industries, and we continue to encourage candidates to consider roles in oil and gas based on skills we identify as being transferable.

The second way in which we can address the skills shortage is to focus on improving and expanding training opportunities, both at entry-level and to ‘fast-track’ the development of existing junior workers. Progress has already been made on this front: the Government has made training a tax-deductible expense, and major companies are now recruiting 100-200 graduates a year. Students are once again being encouraged to pursue trade skills, and several of our universities are in talks with the UK’s Robert Gordon University with regards developing an oil and gas programme.

Furthermore, the South African Oil & Gas Alliance (SAOGA) established recently is working closely with businesses, schools, universities and Government to encourage training through its Skills Programme Office. This encompasses a variety of initiatives such as providing stipends to students training as welders, riggers, pipefitters, and other high-demand trade skills. It is also subsidising courses for those currently employed in the industry, and working with colleges and authorities to bring local qualification standards in line with global industry standards. In addition, SAOGA is working to develop a ‘training cluster’ in Cape Town, with a proposed ‘Oil & Gas Academy’ intended to provide a comprehensive package of training options.

These are all positive steps, but will take time to come into effect. In the meantime, oil and gas players looking to take advantage of South Africa’s renaissance will need to lean more heavily than usual on third-party workforce specialists able to draw on their global network of industry contacts, while similarly demonstrating a firm understanding of the local culture and labour market.

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Renewable energy and the 12L energy efficiency tax incentive

As an end-of-year bonus to the energy efficiency industry the long awaited “Regulations in terms of Section 12L of the Income Tax Act, 1962, on the allowance for energy efficiency savings” was promulgated and came into operation on 1 November 2013.

The allowance is for the purpose of determining the taxable income derived by any person from carrying on any trade in respect of any year of assessment ending before 1 January 2020. It stipulates that there must be allowed as a deduction from the income of that person an amount in respect of energy efficiency savings by that person in respect of that year of assessment.

Since the promulgation 12L has raised many questions due to the unknown territory our country is embarking on which is opening up new markets to stimulate energy efficiency. Only through participation and involvement will the market evolve and grow towards solid structures and processes that can support future similar incentives.

One of the most pertinent questions asked is:

‘Is renewables to be, or not to be allowed as part of the 12L energy efficiency tax incentive?’

The answer should quite logically be: Energy efficiency = demand side; renewable energy = generation side, therefore not part of energy efficiency, but part of alternative ways of generating energy – which by the way should also be used efficiently, like all energy resources.

12L is an incentive for using the energy which is generated from sources that are harmful to the climate more efficiently. However, renewables probably deserve such an incentive in its own right, but it is excluded from Section 12L.

REGULATION 6 EXCLUDES RENEWABLES

Regulation 6 of 12 L depicts that a person may not receive the allowance “in respect of energy generated from renewable sources or co-generation, which means energy from waste and combined heat and power, other than energy generated from waste heat recovery”. The renewable sources excluded are listed as biomass, geothermal, hydro, ocean currents, solar, tidal waves or wind. Waste heat recovery is defined as “utilising waste heat or underutilised energy generated during an industrial process”. Therefore only energy generated using waste heat recovery will be considered.

ONE EXCEPTION TO THE RULE FOR RENEWABLES

But 12L does make an exception through the inclusion of Captive Power Plants which encourages self-generation on a large scale. Generating energy for your own use is seen as a Captive Power Plant and an allowance can only be claimed should the “kWh or the equivalent kWh of energy output of the captive power plant” i.r.o. an assessment year is “more than 35% of the kWhs or the equivalent kWhs of energy input in respect of that year of assessment”.

The definition in the Regulation stipulates that “A captive power plant means where generation of energy takes place for the purposes of the use of that energy solely by the person generating that energy”. This is interpreted as the self-generated energy, albeit from whichever source, is not being fed into the grid, but used within the reticulation system of the respective project or plant for which the energy efficiency allowance is being claimed. It is an incentive to up the implementation of self-generation in excess of 35% of the requirements of a project or plant.

So in effect renewable energy that is generated for own use and which constitutes in excess of 35% of the kWhs of energy input in the year of claiming, will be allowed. Clarifying the matter, Barry Bredenkamp, Senior Manager: Energy Efficiency at SANEDI said “Captive Power Plants is the ONE exception to the rule where RE technology may be used”.

SANEDI is the body that evaluates energy savings reports and issues tax certificates to organisations for submission to SARS to claim section 12i and 12L tax incentives and invites organisations to pursue the energy efficiency tax incentive. Follow these steps to make use of the 12L incentive:

1. Appoint a Measurement & Verification Professional, from a SANAS accredited M&V Inspection Body, to compile a report containing a computation of the energy efficiency savings in respect of that person for that year of assessment. Inspection bodies are listed on the SANAS website.
2. Register with SANEDI for energy efficiency tax allowance claims at www.saneditax.org.za
3. Submit the M&V Professional's report to SANEDI.
4. SANEDI will furnish you with the approval for continuance.

On the successful completion of the tax allowance approval process, SANEDI will issue a formal energy savings certificate. The certificate is then submitted to the South African Revenue Service (SARS) together with the claim for the tax allowance as part of the customary tax returns.

The systems in place have been used over the last 4 years for the 12i tax incentive, and already over 60 projects are registered for 12L and being processed.

The Energy Training Foundation

(EnTF) has been training and Certifying Measurement and Verification Professionals (CMVPs) according to EVO and IPMVP under the licence of the Association of Energy Engineers (AEE) in South Africa for the past 8 years. It has provided the skills required to develop the local energy efficiency incentive industry where accurate, transparent and credible substantiation of energy savings claims can be validated through international best-practice measurement and verification.



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Get your 12L energy efficiency tax incentive process going

Veritek is one of the first SANAS Measurement & Verification (M&V) Inspection Bodies accredited to provide M&V services and issue certificates to claim a tax deduction for energy efficiency savings under the 12L Regulation released last year. The 12L Regulation is an energy efficiency tax incentive which was promulgated by the Department of Treasury and came into operation in November 2013. It will assist organisations, whom are tax paying entities, to receive a deduction on their taxable income due to the savings achieved through energy efficiency projects.

M&V is the vehicle that provides impartial, transparent and suitably accurate quantification of energy savings projects and their impacts. Most stakeholders in energy savings projects want to know and be certain how much energy is being saved, whether these savings are being sustained and if reported figures can be trusted.

By using an accredited M&V Inspection Body assurance is paramount as SANAS accreditation is subject to meeting strict guidelines with regular review:

- A requirement of impartiality, M&V teams must remain separate from the implementation team(s)
- A requirement of impartiality, M&V teams must remain separate from the implement Delivering services in accordance with SANS 50010:2011
- A requirement of impartiality, M&V teams must remain separate from the implement Compliance with SANS/ISO/IEC 17020:2012
- A requirement of impartiality, M&V teams must remain separate from the implement Additional Compliance with ISO 9001 Quality Management System standard is most beneficial

Typical M&V services delivered by M&V specialists include the measurement of project parameters, developing baselines and calculating the savings in accordance with SANS 50 010:2011 that was derived from the Efficiency Valuation Organisation's (EVO) IPMVP protocol, which is international best-practice. A key responsibility of M&V

services is to facilitate agreement between the stakeholders on the M&V evaluation outcomes through accurate reporting of results.

The nature of Veritek's experience ranges from Demand Side Management (DSM) projects of which over 400 have been completed successfully, 12i tax incentive projects, 12L tax incentive projects and numerous client-funded Energy Efficiency Demand Side Management (EEDSM) projects. M&V experience by Veritek personnel has been gained in various industries for hot water load control, space heater load control, lighting retrofits, mine pumping systems, thermal ice storage systems, irrigation pumping systems, furnace energy efficiency upgrades, solar water heating, compressed air systems, gas compressors, diesel usage, HVAC systems, fuel source changes, milling systems, PV system, building optimisation, to name but a few.

The first step for an organisation wishing to pursue the 12L energy effi-

ciency tax incentive is the appointment of an M&V entity accredited by SANAS, such as Veritek. Staff members are on hand to give guidance to whether projects will qualify for the incentive, and are familiar with the registration process and requirements for you to benefit from the 12L incentive.

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Caption: The Veritek team, one of the first SANAS Accredited M&V Inspection Bodies for 12L energy efficiency tax incentives.

Results of the 4th National Energy Barometer Survey

Benchmarking South African buildings' energy use

Each year building owners and facility managers enter their buildings in the National Energy Barometer Survey (NEBS) to compare how they have improved their energy use against others in a similar industry – hospitals, offices, car dealers, hotels and shopping centres. The latest results are out and the top performing buildings for the 2012 utility year are:

- *Head office:* The Clicks Group
- *General office:* No permission to disclose
- *Shopping centre:* Westgate Shopping Centre
- *Car dealership:* Barons CV N1 City, owned by Barloworld Group
- *Hotel:* Bantry Bay Luxury Suites

The National Energy Barometer Survey (NEBS) is an annual benchmarking service which Energy Cybernetics administers to compile an accurate database of building energy use information in the country. For the 4th

consecutive year, Energy Cybernetics has made its locally developed Energy Barometer tool available to building owners and facility managers to participate in NEBS. The Energy Barometer is a non-intrusive and cost-effective process to determine the energy consumption stance of a building in relation to others in a similar market and environment.

NEBS endeavours to compile an accurate database of building energy use information in the country and is supported by the Central Energy Fund (CEF), the National Energy Efficiency Agency (NEEA), the South African National Energy Development Institute (SANEDI) and the Energy Training Foundation (EnTF).

Participants use the service at no charge, and for that they receive their ranking result that indicates where they are in accordance with others in their respective industry. The results help them track their energy efficiency performance, they can see when energy savings investments have made a difference, and if there is potential for more savings - because if others in their industry have done better, it means there is opportunity for improvement. Every year, the top performers need to make sure they stay there. That way Energy Cybernetics is contributing to making South Africa energy efficient.

Teamwork makes energy efficiency happen, and it has to happen every day so that the energy savings can make a difference. NEBS helps to reward this teamwork by making the top performing buildings visible – and the staff know they made a difference.

The 5th NEBS is now open. It is an easy online process, just log onto www.energybarometer.com, mouse over the registration button and complete the required information such as: building size, energy consumption from your utility bill for the year January to

December 2013, the weather patterns to your area, etc.

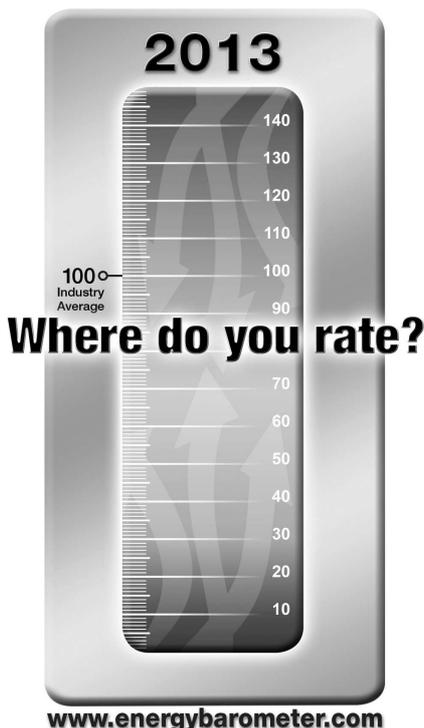
The 2013 Utility Year's categories that can be entered are:

- Bank branches
- Hospitals
- Shopping Centres
- Hotels
- Car dealerships
- Airports
- General offices
- Head quarters

Data will be analysed and audited upon which all participants will receive an emailed NEBS certificate of their results.

NEBS encourages companies to become aware of their energy consumption levels, how their buildings are being operated, and to encourage improvements that will bring economic benefits whilst providing a platform for comparison and learning. All data received through NEBS is treated with utmost confidentiality and results are only made public for participants who agree to allow publication of their ranking.

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Western Cape Renewable Energy Symposium held

A two day Renewable Energy Symposium was held on 10 and 11th March at the Protea Breakwater Lodge, Cape Town. The summary of discussions follows:

DAY 1

BIOFUELS

The current status of biofuels in South Africa

There has been considerable population growth in South Africa over the last decade (approximately 10% between 2004 and 2010) and this has led to a growth in energy demand and therefore marginal growth in the national CO₂ emissions. As South Africa is the biggest producer of CO₂ emissions in Africa, there is a need to address this challenge. Biomass currently only makes up 5% of the energy supply in South Africa.

Petrol consumption has increased over the last decade, but there has been a large increase in diesel consumption both in the transport sector as well as in the electricity sector (to cover peak electricity with the two open cycle gas turbines in the Western Cape). Petrol and diesel is mainly used for road transport (passenger and freight – predominantly passenger transport). The primary supply is from imported oil (it is the single largest import on the South African import account). Sasol provides approximately 40% of fuels from their coal to liquid plant, but this has more emissions associated with it.

Only 13.5% of land in South Africa

can be used for crop production, and only 3% of the land is high productivity land. The paper and pulp industry also utilises 1% of the total land area for forestry.

The current forms of biofuel available are Petrol (ethanol and methanol) and for Diesel (FTDiesel, Biodiesel), but there is a need to find alternative feedstocks (food vs fuel debates). Gasses can also be used in the form of LPG, methane and hydrogen.

The South African Biofuels Strategy will be mandating a 2% penetration of biofuels in the national liquid fuel supply. It has stipulated the following crops for bioethanol – sugar cane, sugar beet, grain sorghum – and for biodiesel – sunflower, canola, soya beans. This will be implemented from 2015. Although this policy has been in place for a long time, the industry has not been stimulated to create the appropriate sized industry to meet this 2% penetration.

Current research underway

Stellenbosch University

Stellenbosch is currently investigating technologies for cellulose conversion and looking at alternative development of enzymes that are required in the biomass conversion process. Through developing these enzymes as part of the process (instead of an additional additive) this can create a more cost effective process for the production of biofuels.

Stellenbosch University is undertaking research on chemicals, fuels and

electricity from fibrous plant material. There are a number of research areas, including ethanol and electricity from fibrous plants, integrated ethanol production from sugar/ starch and fibre. Bio-energy integration into existing industrial 3 facilities (paper and pulp, sugar and petrochemical) and multi-product bio refineries for improved economic viability.

Cape Peninsula University of Technology (CPUT)

CPUT is researching the catalytic conversion of bioethanol to fuels for petrochemical options. There is a need for alternatives to fossil fuels with reduced emissions and reduced demand on fossil fuel based fuels. Bioethanol is not a solution as a blend as there are still emissions associated with the blend. The research is focussed on converting hydrocarbons to fuel-rich hydrocarbons which can address the emission problems. They are planning to develop a pilot plant to develop this fuel option.

CPUT has also undertaken research into alternative transport fuels, with a focus on reducing transport sector emissions in the Western Cape. The transport sector is currently producing 3.8 million tonnes of CO₂ per year. The research included an evaluation of the transport system, the potential efficiency improvements (personal transport, integrated public transport systems). The examination of alternative fuels, including the implications on the national biofuels target of 2%. As an example, in order to meet this target the wind



greencape



BETTER TOGETHER.



industry would need to increase by 50% in order to meet this demand. This cannot be done by conventional biofuels. Landfill gas is a significant resource that can be used as an alternative fuel.

CPUT is also researching the optimisation of the Bioethanol production process, including what kind of raw materials are used for production, where the materials are found and what are the demand projections. This optimisation will be undertaken through modelling optimisation scenarios. This optimisation will also look at the impact on the economy, land use and job creation options. They have specifically undertaken the fermentation stage of the biofuels production process. They are planning to scale-up the optimisation from the laboratory level to the industrial scale.

GreenCape

A Special Purpose Vehicle under the Western Cape Government (WCG) is undertaking research to understand the biofuels potential in the Western Cape. There is a need to better understand the opportunities, potential for and benefits of biofuel production and use in the Western Cape. The National Strategy currently excludes subsidy support for a biofuel production process, which makes use of industrial and waste streams and non-food agricultural outputs, either in the form of non-food crops or agro processing by productions. This research will include the development of business case scenarios which maximise social, inclusivity, diversified and green economic activity and help to ensure social and economic sustainability.

Questions and answers

It was asked what role the WCG can play into developing funding instruments to take this research further, such as is the case in Sao Paulo, Brazil. The WCG has a different constitutional mandate, including no mandate for energy. The Universities are national institutions. The WCG partners with them, but does not have research funding systems with them.

It was suggested that the research being done at the tertiary institutions and stimulating this knowledge economy to seek to develop a biofuels industry in the SADC region. The WCG could play a limited role here, but fiscal constraints and mandates make this difficult. The mandate of WCG is to provide

an enabling environment to grow the economy – and renewables is a big priority for the WCG. Although there are pockets where this has happened, it is not an easy journey.

Research needs to be done into addressing the problems of household fuel. Work has included the replacement of paraffin with ethanol gel, which can have significant social considerations. Biofuels for cooking is a much more relevant issue, not just for transport. There are very real opportunities around using bioethanol for cooking, but there are social problems associated with it. By using pressurised liquid ethanol, some of the social concerns can be addressed (there is currently a stove available in India which uses pressurised liquid ethanol that is similar to LPG).

There are price considerations linked to the distribution of ethanol and a variety of things that need to be incorporated to get things happening. Universities want to demonstrate their technologies, but there is a need to develop their localised zones where these demonstrations can take place.

Quebec has focussed on waste stream and utilising municipal solid waste to develop ethanol and they are investing a lot in technology to take this forward. In the South African context, there are challenges to getting access to the municipal solid waste (e.g. procurement) and these needs to be addressed. The current processes in order to get energy from waste in South Africa, involve high cost and multi-year processes in order to get the projects started.

SOLAR

Status of solar power is South Africa

The world solar resources, measured according to Direct Normal Irradiance (DNI), shows that Southern Africa has one of the best solar potentials in the world. Projects in South Africa are based on DNI of 2800 – 3000 (per m²), which is 50% more than the projects in Spain and 20% more than the United States. There are a lot of opportunities for solar renewable technologies in South Africa. The ambitious Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has allocated 1.5GW of solar in the first three rounds. This is considered globally to be one of the best procurement programmes for renewable energy.

Stellenbosch University

Chairperson, Prof Wikus van Niekerk from the University of Stellenbosch, presented an overview of the work currently underway at the Centre for Renewable and Sustainable Energy Studies (CRSES). This is widely considered to be the front-door of renewable energy at Stellenbosch. The current flagship programmes include the South African Renewable Energy Training Centre (SARETC, previously devised as the SA Wind Energy Centre), which will be housed at Cape Peninsula University of Technology (Bellville Campus), the National solar map and database, the national solar training and testing centre in the Northern Cape and the South African Energy Modelling Alliance (including the Energy Research Centre at UCT).

The Solar Thermal Energy Research Group at Stellenbosch University is also undertaking research into concentrating solar power, through the testing of different technologies and they have developed a solar rooftop laboratory (optics and receiver facilities). They are researching Heat Transfer Fluids and storage options as well as process optimisation in terms of thermodynamics. They are also working with the SOLTRAIN solar water heater laboratory testing.

Cape Peninsula University of Technology

CPUT is working on a solar thermal energy demonstrator / test facility, which will test efficiencies with regard to flow rates, thermal conductivity, radiation material degradation and system pressures amongst others. They are planning to set up 6 units at the CPUT and are working with a company in China to invest in South Africa in putting up a big manufacturing plant at the CPUT.

They are also working on solar energy projects in controlling the environment for healthier aquaculture for low income communities, helping with poverty alleviation and reducing unemployment. They are working with a community centre in Belhar to see how the community could get involved with this project. By 2016, there should be a suitable prototype at the Belhar Community Centre.

University of Western Cape

UWC is working on silicon thin film research for photovoltaic cells, which should improve the efficiency and sta-

bility of the silicon cells. The research is also looking at the role of this non-technology and how to incorporate it into PV technology and understanding the cost implications associated with this new technology. They are also part of a National Nano-Technology Masters Programme (between the University of Western Cape, University of Johannesburg, Nelson Mandela Metro University and Free State University).

University of Cape Town

The Energy Research Centre (ERC) has done research into the livelihoods impacts of solar water heaters (SWHs). Their research analysed the livelihoods impacts of low pressure solar water heaters implemented in low households. 1 million SWH were rolled out, but limited work has been done on the social impacts of SWH. The outcomes of the research showed that SWHs are a cheaper source of heated water, that there are savings on household capital, households experience improved energy security and that the benefits of households are influenced by geographical factors and the implementers' approach and strategies.

A second research project looks to explore the contribution of skills development to opportunities for jobs in Kuyasa, Khayelitsha. The research showed that there is very little evidence of jobs in the areas in which training was received and that training was not comprehensive enough for employment. Job creation attempts were obstructed due to a lack of potential customers' ability to pay for the upgrading in surrounding areas, lack of access to transport and lack of access to materials. There were, however, cultural capital benefits, which included the credibility gained from working on the project. This resulted in trust amongst Kuyasa residents and allowed for opportunities in informal and infrequent maintenance jobs.

Questions and answers

It was asked what work is underway in terms of small scale PV systems. It was noted that work is underway both in terms of off-grid, remote systems and small scale embedded generation projects. There have been some subsidy schemes (Eskom), but these are quickly oversubscribed. The current debate is around the ability to feed into the grid, it is not about the technology, but rather about the implications of this for the municipalities and their revenue.

The rooftop PV market is quite small, it is rumoured that there are 100 installations in the City of Cape Town

A number of problems with the installation of solar water heaters for low income developments were raised. One of the key problems was the inconsistent programme of subsidies, which led to ad hoc

installation when funds were available. Some project developers stated that the communities did not want hot water, but rather water as well as other services like clinics and schools. It was felt by some that low pressure systems are not meeting the requirements for communities and that ceilings in low income houses would be more beneficial. Other examples showed that SWHs had significant improvements for women, by providing a better quality of life and requiring less time with cooking and cleaning.

It was asked what the current costs of small-scale PV and the associated storage would be. Currently at utility scale (large scale), solar PV is costed at 99c/kwh. Smallish scale (500kw) will cost between R1 and R1.20 / kWh installed. It is difficult to say how much cost storage adds, particularly in terms of the maintenance costs associated with it.

WIND

University of Cape Town

UCT is involved in a Department of Science and Technology (DST) National Research Fund (NRF) funded Renewable Energy Spoke focussing on Wind Energy Technology. The objectives of the Wind Energy Technology Spoke are focussed on human capacity development, knowledge production, development of infrastructure for research institutions and collaboration with South African industries. The strategies focus areas include – small, medium-scale wind energy technology, particularly in low/medium wind regimes as well drive-train technology and grid-integration of utility scale wind energy systems. Other focus areas include condition monitoring or wind energy systems (including the failure of systems) and research into improved converters.

The Energy Research Centre (ERC) has undertaken research looking at the local content requirements for renewable energy in South Africa and Brazil. Local content requirements specify the amount of locally produced components in a technology either in the form of value, FDI, size, weight etc.

The differences and similarities between the two countries are highlighted in a detailed presentation.

Cape Peninsula University of Technology

CPUT will be housing a Renewable Energy Training and Education Centre (SARETC) at its Bellville Campus. This will serve as a training centre for renewable energy technicians and those who want to understand the renewable energy space better. The building will include a living renewable laboratory. A technician qualification for wind power has been developed and one is underway for solar technology – these need to be approved through the QCTO process. Training of technicians is already underway, with technicians being sent to Germany for wind energy training. They will also be developing short courses to provide general information.

Questions and answers

The presentation on local content raised a number of questions and comments, particularly around what is classified as local content. In some cases, manufacturers will state that the product is manufactured in South Africa when it is actually assembled here, with all the components imported from other countries. One of the key barriers to increased local manufacture of these products is linked to the much cheaper costs of imports (particularly from the Far East) and our local markets are unable to compete with these prices. However, this 'reckless' importing of products is affecting the levels of local innovation of products.

Questions were asked about the SARETC (Renewable Energy Training Facility), including how many students it would be able to train per year. The class size is of 20 – 30 students at a time, with a training period of 3 months, although the training will overlap with the classes. It is estimated that approximately 100 students per year could be trained as wind technicians and a similar number as solar technicians.

When asked about the renewable energy policy driving local content, it was stated that renewable energy has to deliver on social and economic development and this has been included implicitly in the policy. In a developing country like South Africa it would be irresponsible to motivate Renewable Energy purely on climate change or emissions reductions. There are a

number of other benefits associated with renewable energy. For example, in the National Biofuels Industrial Strategy, climate change is mentioned once. This strategy is driven by job creation.

ENERGY STORAGE / HYSA

This session focussed on presentations from the University of the Western Cape and the work that they are doing through Hydrogen SA (HYSA). HYSA has been running since 2012 and it is a national Cabinet approved programme that will run for 15 years. The programme focuses on PGM beneficiation and job creation and has an ambitious target around accessing the global fuel cell market. They are working in partnership with key players in the global market, but are also preparing South Africa for the hydrogen economy.

As the growth in renewable energy takes place, including small-scale embedded generation, there is a greater need to store power, particularly during the peak season (when residential consumption is at its highest). There are many different storage options available, including pump storage, which is currently the cheapest and most efficient storage option (99% of the world's energy storage is using pump storage). Pump storage needs a lot of water and South Africa doesn't have the water in the areas where large scale solar power will be taking place – it is not going to solve the problems associated with storage.

Research is currently underway into Lithium Ion (Li-Ion) batteries, which can be used for storage for small-scale generation projects. It is currently not feasible for large/ utility scale projects. This has a particular advantage for rural projects, as they require much less maintenance than lead acid batteries (currently used) and have a higher cycle life and discharge rate. A full pilot production plant is being developed at the University of Western Cape.

Other research

The final session for the day focused on 'Other research' with presenters from Stellenbosch University and the University of Cape Town discussing research into renewable energy themes that have not been covered by the other theme discussions.

CRSES at Stellenbosch University is researching renewable energy technology systems analyses, where their work is asking the questions about what technology is and looking at tech-

nology at it is embedded in the larger social environment / system. Technology can go wrong, if the context is not understood. The behaviour of people and society change once technology has been added. This research tries to understand how technology systems interact with one another and feedback loops associated with them.

The research focussed on understanding the real sustainability of these technologies and improving the uptake of these technologies.

Research underway at the Department of Chemical Engineering, University of Cape Town, is looking at a technology innovation system for waste-based bioenergy. The concept of Technical Innovation Systems is a promising way to understand and intervene in large-scale innovative programmes. They are also looking at opportunities for cleaner information production for food and drink. Roadside production of food and artisanal brewing are common in urban Africa. This is important for livelihoods, but is strongly polluting and is inefficient in its use of energy. The research will quantify the benefits of a cleaner production approach and examine whether a cleaner production approach could work. This research has not started yet and they are looking for opportunities to collaborate with other African institutions.

Questions and answers

It was asked about the academic institutions involvement with the development of the Integrated Resource Plan. Although many of the institutions were not directly involved with the IRP development, the research that has been done did feed into that process. There was a modelling network workshop with the academic institutions, Eskom and the Department of Energy. One of the key findings to come out of the workshop was the need to collaborate between the different modelling efforts in order to benchmark the IRP. The National Development Plan (NDP) had much more aggressive targets for low carbon by 2030 and this has created a debate about the assumptions and questions used in the development of the IRP. The updated IRP has started to address the NDP more strongly.

The question of trans-disciplinarity and working across disciplines was raised by a number of institutions. A lot of the working together is focussed on linking technical work with the social considerations. This is particularly

important in terms of field work and bringing in both technical and non-technical aspects. The University of Stellenbosch has a formal trans disciplinary PhD programme, where the candidates need to have at least two supervisors from different faculties.

The iShack programme came out of this programme, which looks at what technology can be provided to shacks, including solar home systems. A research centre has been established in the townships and the researchers are getting first-hand experience on what it is like to live in them. This experience should be shared with Brazil, in terms of how they are addressing the problems associated with the favelas.

The issue of lifecycle assessments were raised, giving Quebec as an example. They have put a lot of research and knowledge into Life Cycle Assessments (LCA), with some of the greenest electricity in the world and a very low carbon footprint. In South Africa, coal dominates the energy mix and the Western Cape sits at the end of a transmission line experiencing 12% losses. LCAs need to be included in our energy decisions in order to transition to a low carbon economy.

DAY 2

ENERGY EFFICIENCY

Cape Peninsula University of Technology

CPUT is running a Master's programme in energy efficiency and energy access, which is funded by the EU Edulink Fund. They stressed the importance that academics can't work in isolation, but need to work with the private sector and that jobs need to come out of the work that they are doing.

CPUT has also been running the Domestic Use of Energy (DUE) and Industrial and Commercial Use of Energy (ICUE) conferences for the last few decades, which are both focused on understanding and promoting energy efficiency best practice in all sectors.

University of Cape Town

The Energy Research Centre at UCT is a policy-based research centre, but the energy efficiency group have focused on technology and working on the ground with energy efficiency issues. They have played a strong role in the M&V of Eskom's Demand Side Management Programme. This programme came out of the electricity crisis which hit the country in the mid-2000s and focused on an urgent need

to manage the electricity demand better and to reduce demand. The M&V component of the DSM programmes is focused on counting the energy saved through the programmes and auditing the results. This has allowed for a good understanding of the potential and impacts of different technologies.

This work has, however, highlighted the lack of centralised energy and energy efficiency data. The data is fragmented with various groups and institutions collecting and storing the data. The ERC is drafting proposals to set up a national energy demand database that will serve as a centrally available energy database for South Africa. This will need to be funded continually, rather than being just a once off fund, which is making the sourcing of funding difficult.

Stellenbosch University

The energy efficiency work at Stellenbosch University has been driven by the M&V team, who are evaluating the impact of energy efficiency interventions over the past decade. Through this work they are looking at what is happening and has to happen in industry and are defining technical questions that will direct research in this field. They have determined that the way in which to save energy, most efficiently, is through behaviour change rather than technological. In order to support this, they are developing a web-based system that will provide the necessary information to users – this will not be static tool, but will rather allow people to understand the specifics of their buildings and what solutions are available to them.

City of Cape Town

Brian Jones reported that the City of Cape Town is currently looking at the regulatory challenges linked to implementing small-scale renewable energy in municipalities. Electricity is a regulated commodity and renewable energy is generally more expensive than Eskom electricity (although prices have decreased). This impacts on a municipality's ability to purchase electricity from providers at a higher price than what they would have purchased from Eskom. There are also technical considerations around reverse metering, which does not work on pre-payment meters and the investment costs required in order to change all the meters in the City of Cape Town area to allow for this in future. Energy efficien-

cy has an impact of municipal revenue and in many cases they are reluctant to promote energy efficiency because of this.

Questions and answers

The representatives from Sao Paulo raised the issue of the impact of energy efficiency and small-scale embedded generation on municipal revenue as a potential area of collaboration as they are experiencing similar problems.

The role of the public sector in implementing energy efficiency measures for their own buildings was raised and it was asked whether public building standards or building codes had been implemented. The WCG is implementing a number of energy efficiency measures for their own buildings, particularly through behaviour economics and retrofitting of buildings undergoing modernisation. The WCG is also linked with the Green Building Council using their star rating criteria as a benchmark to aim for. The Modernisation of the CBD buildings will include energy efficiency lighting, recycling of waste etc.

The City of Cape Town wanted to introduce a by-law around energy efficiency water heating (heat pumps/solar water heaters), but questions about their mandate were raised. This was, however, included in the revised National Building Regulations, where all new buildings need to ensure that 50% of their water heating comes from an efficient source. The City of Cape Town has set aspiration targets for its own operations and is retrofitting, based on a return on investment basis. They are commissioning a few small PV facilities on the city buildings.

It was asked about the role of Eskom in developing renewable energy facilities. The government policy is currently shirting generation to the private sector through the REIPPPP process, but Eskom has been designated the purchaser of all electricity. They are also developing their own facilities including a wind facility on the West Coast and the Concentrated Solar Thermal facility in the Northern Cape.

WESTERN CAPE GOVERNMENT RENEWABLE ENERGY INITIATIVES

Presentations from Fernel Abrahams, Gavin Kode, Helen Davies and Ilse Trautmann were detailed.

Questions and answers

It was asked whether the Department of Agriculture is promoting small hydro-

power (on-farm) through their engagements with farmers. Farmers have approached the CPUT to assist with setting up systems. It was acknowledged that farmers are implementing their own systems. The Department of Agriculture have not highlighted this as an area that they are looking at, but will share the case studies of best practice with the sector.

Questions were raised about emission reductions driving the climate change agenda and whether this is the most appropriate model in South Africa, as the impact of China and India and the developed world are so significant, the impact of changes in South Africa won't necessarily make an impact.

The issue of climate models was also raised and whether the climate is actually changing. In the Western Cape, work is underway to look at the global / regional models and to down-scale them to climate regions in the Western Cape in order to support decision-making. The Western Cape is experiencing increased temperatures, increased frequency of intensive events (fires, floods, drought) and work is being done with the climate scientists in order to understand these changes.

GreenCape Initiatives and Research

A detailed presentation can be distributed on request.

Overview of regional leaders research

A detailed presentation can be distributed on request.

Questions and answers

A question from Bavaria, where there are a large number of biogas plants on farms, asked why there is such a lack of biogas facilities in the agricultural sector. The South African farmers do not get a subsidy from the government, which is the case in Bavaria, and they therefore need to fund the investment themselves. The National REIPPPP does allow for small scale projects, which could include biogas, but the smallest is 1 MW. In most cases, on-farm projects are smaller than that, so they would not be able to access the national funding. A standard offer for small scale embedded generation has been developed (first round fully utilised), and this could be expanded to other offers. The focus on the Department of Agriculture is on food security and job creation and this currently does not include energy supply.

A point was raised about smart

grids and smart meters, because a lot of work is currently underway around this for municipalities. Currently smart grids are seen as a 'sexy thing', but there is no standard definition for what a smart grid is. There is a national process to define this, but until this is defined, it is difficult for municipalities to justify the cost in replacing meters without knowing what they should look like. Once a standard has been established, this means that a municipality will not be limited to a single supplier. It would cost the City of Cape Town R3 billion to replace all the meters in the municipal area, so they would need to be confident in what their replacement of the current meters is.

ENERGY POLICY

National Development Plan

There were detailed presentations both from Ashraf Kariem and Britta Rennkamp.

Questions and answers

The 2011 National Planning Commission has been really important in providing a credible and balanced voice in a debate that could have been polarised. The tensions and contradictions around coal when comparing to new and evolving electricity technologies, make for an interesting example. Coal as a big earner in terms of the export market, versus our need to reduce our emissions. It was stated that the South African economy is based on a balance of payment of trade and coal is one of the big earners. There would need to be increases in other exports in order to cover the loss should the country stop exporting coal.

When looking at South Africa's development objectives and addressing poverty and inequality, how does the country not utilise the resources that it has for the benefit of the country? It was highlighted that coal is not necessarily bad, and by using more advanced technologies, the emissions associated with coal can be reduced.

The representatives from Germany raised the fact that although Germany generated 25% of its electricity of renewables, it is still dependent on coal imports for its supply.

Western Cape Government: Economic Development and Tourism

Prof Jim Petrie gave a detailed presentation.

Questions and answers

Questions were raised about the provincial mandate around energy and what regulations, codes or taxes could be implemented by the regional government to encourage these changes. In South Africa, energy is a national government mandate so it will determine the energy choices and investment, but the ramifications of these choices will fall in the provincial and local government competency space. The WCG needs to maximise the contribution to the national economy and identify and engage with the opportunities that are available.

The WCG has strong knowledge, lobbying and awareness raising role and facilitates and aids the municipalities in taking action around these issues forward. As provincial governments do not have fiscal leavers, relationships and co-operative governance are essential.

Stellenbosch University

The Development and Rule of Law Programme (DROP) at Stellenbosch University, is an interdisciplinary programme at the water institution. Water is something that touches on everything. It serves as co-operative networking platform and investigates development law frameworks – understanding the tensions between environment, sustainability, economic development and human welfare in a holistic manner.

The presentation by Oliver Ruppel focussed on researching a legal and regulatory framework from a South African perspective – biofuels, climate change and development. Their research focuses on issues of sustainable development law. They are analysing existing legal and regulatory frameworks related to climate change, renewable and development and they are working closely with other chairs at Stellenbosch University.

The Global estimates are very clear: Africa is most vulnerable to climate change. The presentation was based on the opportunities around biofuels in addressing some of these challenges, including energy security, energy poverty and economic growth. Biofuels can contribute to climate change mitigation by reducing emissions associated with energy. Biofuels have high potential to generate income for poor communities. The food versus fuel debate was also raised, as well as the displacement rural communities. In

order to develop appropriate biofuels policies, the best practice from around the world needs to be identified and understood, including understanding the regional demands for the benefit of the people.

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national treasury

Department:
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REPUBLIC OF SOUTH AFRICA

Carbon offsets paper: Request for public comments

The National Treasury publishes the Carbon Offsets Paper for public comment. This paper outlines proposals for a carbon offset scheme that will enable businesses to lower their carbon tax liability and make investments that will reduce greenhouse gas (GHG) emissions.

The carbon offsets scheme is meant to complement the carbon tax that South Africa plans to introduce from 2016. The proposed design of the carbon tax policy has been outlined in the Carbon Tax Policy Paper: Reducing greenhouse gas emissions and facilitating the transition to a green economy that was released for public comment in May 2013.

PACKAGE OF MEASURES TO ADDRESS CLIMATE CHANGE

South Africa voluntarily committed at the 2009 UN Climate Change Conference in Copenhagen to reduce greenhouse gas emissions from projected 'business-as-usual scenarios' by 34 per cent in 2020 and 42 per cent in 2025. In 2011, South Africa adopted the national climate-change response policy which comprises a comprehensive package of measures to deal with both mitigation (reducing greenhouse gas emissions) and adaptation (ensuring climate-change resilience through public investments).

The carbon tax will be one of the key measures to mitigate climate change. The package also contains a set of climate change adaptation measures to ensure resilience to climate change-related extreme weather events.

THE CARBON TAX DESIGN AND INCENTIVES

The Minister of Finance announced the proposed carbon tax policy package in Budgets 2012 and 2013. Following

subsequent public consultation, the Minister announced revisions to the package in Budget 2014.

To ensure a relatively smooth transition to a low-carbon economy, the carbon tax design incorporates a number of relief measures and a gradual phased-in approach to protect households and the international competitiveness of local businesses. The proposed carbon tax policy comprises the following key elements:

- A basic tax-free threshold of 60 per cent below which the tax will initially not be payable.
- Z-factor formula to adjust basic tax-free threshold to reward companies that have taken voluntary actions to reduce their GHG emissions before the introduction of the carbon tax.
- Additional tax free allowances for sectors with limited potential for emissions reduction, i.e. industrial process emissions.
- An additional graduated relief for trade exposed and emissions intensive sectors.
- Carbon offsets that firms can use to reduce their carbon tax liability.
- The overall maximum tax-free threshold is limited to 90 per cent.

CARBON OFFSETS

A carbon offset is a measurable avoidance, reduction, or sequestration of carbon dioxide (CO₂) or other GHG emissions. Carbon offsets are sometimes described as project-based because they typically involve specific projects or activities that reduce, avoid, or sequester emissions.

Carbon offsets will enable firms to cost-effectively lower their carbon tax liability. They will also incentivise investment in least-cost mitigation options in the country, driving investment in GHG-mitigation projects that deliver carbon emissions reduction at a

cost lower than the carbon tax. Such projects can generate considerable sustainable development benefits in South Africa, including channelling capital to rural development projects, creating employment, restoring landscapes, reducing land degradation, protecting biodiversity, and encouraging energy efficiency and low carbon growth.

A number of principles must be fulfilled for a project to be awarded a tradable emissions reduction credit under a specific standard. The principles of additionality, real and permanence are pivotal to ensure the credibility of carbon offset projects.

- *Additionality* – GHG emissions reductions are additional if they would not have occurred under a 'business-as-usual' scenario.
- *Permanence* – GHG emissions are permanent and unlikely to be reversed.
- *Real* – GHG emission offsets originate within tangible physical projects with proof that they have occurred or will occur at a specific point in time.

The following eligibility criteria for carbon offset projects are proposed:

- Projects that generate carbon offset credits must occur outside the scope of activities of the entity subject to the carbon tax.
- Only South African based credits will be eligible for use within the carbon offset scheme.
- Carbon offset projects registered and / or implemented before the introduction of the carbon tax regime will be accepted subject to certain conditions and within a specific timeframe.

Initial analysis shows that the development and adoption of an eligible proj-

ect methodology could focus on the following areas:

- Energy and Energy Efficiency
 - Energy efficiency in the residential and commercial sector
 - Energy efficiency in buildings
 - Small scale renewable energy
 - Community based and municipal energy efficiency and renewable energy
 - Fuel switching projects
 - Electricity transmission and distribution efficiency
- Transport
 - Public transport
 - Transport energy efficiency
- Agriculture, forestry and other land uses (AFOLU)
 - Restoration of sub-tropical thicket, forests and woodlands
 - Restoration and management of grassland
 - Small scale afforestation
 - Biomass energy
 - Anaerobic biogas digesters
 - Reduced tillage
- Waste
 - Municipal waste projects

Specific carbon offset project types should be excluded from the scheme to avoid the potential for double counting of financial benefits from GHG mitigation. Projects benefiting from other government incentives should also be excluded. Disallowed projects would include:

- Energy efficiency in companies owned or controlled operations that are covered by the carbon tax.
- Energy efficiency for projects that benefit from the Energy Efficiency Tax Incentive.
- Cogeneration of renewable energy for companies owned or controlled operations that are covered by the carbon tax.
- Fuel switch projects in companies owned or controlled operations that are covered by the carbon tax.
- Renewable energy projects developed under the Renewable Energy Independent Power Producer Programme (REIPPP).

Projects under four different carbon offset standards have been developed in South Africa, including the Clean Development Mechanism (CDM), Verified Carbon Standard (VCS), Gold Standard (GS) and Climate, Community and Biodiversity Standard (CCBS). In order to facilitate the introduction of the carbon offset scheme, it is proposed

that carbon offsets developed under these standards will be considered for eligibility if they fulfil specific criteria. It is envisaged that the initial focus will be for projects approved along the lines of the Clean Development Mechanism (CDM).

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Over 50% of PV industry in South Africa believes future of market outside of REIPPP

In a recent survey by PV-Insider of those examined, over 51.4% stated that they thought the most credible prospect for growth in the next 5-10 years was 1-5MW industrial and commercial deployment.

The survey produced by PV-Insider was titled 'The commercial development and sustainability of the South African photovoltaic market' and was answered by over 100 industry professionals. It examined issues relating to business development in Sub-Saharan African markets as well as potential barriers to development.

Survey results revealed a thoroughly positive picture for recent activity in the South African PV market with 47.8% stating they had seen an increase in revenues in the past 12 months. With the continued roll out of REIPPP as well as an increase in private demand for PV projects, the stated revenue jumps were fully expected.

The survey also revealed, however, that in the next 5-10 years, only 21.5% of companies believed that REIPPP was the best means of developing their business. While industrial and commercial deployment was seen as the largest opportunity in the next 5-10 years, REIPPP was a distant second closely followed by opportunities for residential deployment.

The guide features full analysis and it was stated that, 'perhaps this is more indicative of the lack of faith in development of utility scale generation as a whole with only 10.3% of those surveyed identifying utility scale generation outside of REIPPP as something they viewed as the most credible area for growth'.

The guide was produced in conjunction with PV Project Development Africa 2014 on 9-10 September, Johannesburg. The event will be addressing in full detail the commercial evolution and sustainability of the South African PV market. The survey asked a range of questions relating to business development, sustainability and commercial evolution. PV Insider has produced the survey results with full analysis and conclusion into a single comprehensive guide free of charge.

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Koeberg Units set new records for uninterrupted operation

On 24 March 2014, Koeberg Unit 2, Cape Town, was shut down for its 20th refuelling outage, having been online for 484 days since 25 November 2012, when it was returned to operation after the previous outage. This bettered the Unit 1 record of 454 days of uninterrupted operation set between June 2000 and September 2001.

This is also the first time in Koeberg's history that one of the units completed an uninterrupted run from one refuelling outage to the next. This reflects the exceptional planning and execution of responsibilities by all Koeberg employees and should serve as inspiration to continue on this path of world-class performance going forward.

The unit operated with a load factor of 97.1% for this period, and sent out 10 490 917 MWh to the grid. The production cycle included a two-month period of coast-down at the end of the cycle. This results in the unit output slowly reducing from 100% to about 60% before shutdown, and hence the final load factor was below 100%.

On 23 October 2013, Koeberg Units 1 and 2 also achieved a new record of 184 days with both units operating simultaneously.

Koeberg has set the bar high and, as the only nuclear power station on the African continent, it has done Eskom as a whole proud. All Koeberg employees have contributed to this achievement, while at the same time also ensuring good nuclear safety performance and the safety of employees and contractors.

Koeberg's units currently hold the third and fourth places in Eskom's record books for continuous operation, following Matla and Majuba power stations whose records stand at 598 and 528 days of uninterrupted operations, respectively.

Eskom's top four generating units for continuous operation

- Matla Unit 3 – 598 days (14 February 2003 to 4 October 2004)
- Majuba Unit 1 – 524 days (19 August 2000 to 25 January 2002)
- Koeberg Unit 2 – 484 days (25 November 2012 to 24 March 2014)
- Koeberg Unit 1 – 454 days (10 June 2000 to 7 September 2001)

Construction of Koeberg began in 1976 and Unit 1 was synchronised to the grid on 4 April 1984, with Unit 2 following suit on 25 July 1985. It has a pressurised water reactor (PWR) design. It boasts the largest turbine generators in the Southern Hemisphere and is the most southerly-situated nuclear power station in the world.

Koeberg is surrounded by a 3000 ha private game reserve owned by Eskom, containing more than 150 species of birds and half a dozen small mammal species. Great care has been taken to conserve and restore the coastal landforms, wetlands and different vegetation of the area, as well as the animal life. Among the animals in the reserve are bontebok, duiker, grysbok, steenbok, African wild cat, genet and rooikat (also known as caracal).

Koeberg's outdoor education programme encourages visitors to hike or cycle through the reserve. The two hiking trails as well as the mountain bike trail will lead you through two naturally occurring veld types in the area – Sandveld and Duneveld.

Low and intermediate level waste from Koeberg is transported by road in steel and concrete containers to a remote disposal site at Vaalputs, 600 km away in the Kalahari Desert. High

level waste, the spent fuel, is stored on site in special pools equipped with high-density racking.

Koeberg ranks amongst the safest of the world's top ranking PWR's of its vintage and is the most reliable Eskom power station. It continuously strives to improve on its performance. Consequently, the station regularly undergoes peer reviews, which places it under scrutiny by international and local experts to benchmark its performance against international best practises. In its 30 years of safe operation, Koeberg has received numerous accolades, amongst others, becoming the first nuclear power station outside the United States to receive initial accreditation and retain accreditation for its Operator Training Programmes from the Institute of Nuclear Power Operations (INPO). In March 2001, Koeberg was awarded NOSCAR status for the 5th time by the National Occupational Safety Association (NOSA).

The station is also vital for grid stability in the Cape.

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Success story of solar energy for Southern Africa

HANDOVER OF SOLAR TRAILER BY AUSTRIAN AMBASSADOR

Given the intermediate results, which are described here, the SOLTRAIN project is the major project on solar thermal training and dissemination financed by a European country in Southern Africa.

The goal of the Austrian funded project 'SOLTRAIN' is to expedite the switch from a fossil fuel based energy supply to an energy supply system based on solar energy. Local jobs can be created and millions of Rands can be retained in the country by avoiding the import of fossil fuels.

The project is carried out in cooperation with six partners in South Africa, Lesotho Mozambique, Namibia and Zimbabwe. The first phase of the project started 2008, and the second phase reached its mid-term. This is a reason to present the interim results of this project.

Up to now 13 'Train the Trainer Courses' for professionals with a total of 624 participants were carried out in the partner countries. Besides the 'Train the Trainer' courses, 41 dissemination courses with a total of 925 participants were also organized by the project partners. In addition, 11 workshops for political decision makers and administration with a total of 292 participants were carried out.

In order to apply the knowledge gained at the training courses solar demonstration systems a total of 98 solar thermal systems were installed and handed over to social institutions. Universities and vocational training centres will be equipped with unique mobile training units – so called 'Solar Trailers'.

During the press conference on 3 June 2014 at the Saint George Hotel, Rietveldam, a Solar Trailer, produced by a South African company was handed over by the Austrian Ambassador HE Brigitte Oepfinger-Walchshofer to a representative of the Eduardo Mondlane University of Maputo in Mozambique.



Solar Trailer: 5 of these Solar Trailers are going to be handed over to educational institutions for training purposes. They can also be used for awareness rising. SOLTRAIN brings solar energy to the users'

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Left to right: Geraldo Nhumaio (beneficiary), Werner Sebastian (manufacturer of trailer), Ambassador Brigitte Oepfinger-Walchsdorfer, Werner Weiss (SOLTRAIN project leader) (photo: Ivan Yaholnitzky)

PV Project Development 2014

SEPTEMBER 9-10, JOHANNESBURG

Identify how a sustainable model for PV development can be built allowing for your projects to prosper within and beyond the REIPP Programme

Background

The government roll out of the Renewable Energy Independent Power Producer Programme (REIPPP) has been a tremendous success with over 3.3GW of allocation awarded to renewable energies. This has meant that the industry has boomed with both local companies and international companies entering the market to secure their share. This has however brought new challenges.

Sustainability – Profitability – Bankability

At the 3rd PV Insider South Africa event you will be focusing on ‘sustainability’. We know that you understand the REIPPP process now and don’t need to be bombarded with instructions of how to develop a project

The PV sustainability summit 2014 is your chance to join 200 senior level attendees to discuss:

- The financial models which will allow you to have lower project development costs
- Potential for PV deployment on an industrial and commercial scale looking into how you can work with Municipalities to ensure you have constant projects and long term profitability
- How you can be part of Sub-Saharan African project development which will have South Africa as its centre of excellence

Past delegates said:

- ‘Excellent and intimate venue with top level networking opportunities and realfeedback from the field’ – Siemens
- ‘Great networking. Excellent opportunity to meet O&M colleagues in the industry’ – SunPower Corp
- ‘Well organized conference with speakers selected from industry leading companies’ – Belectric

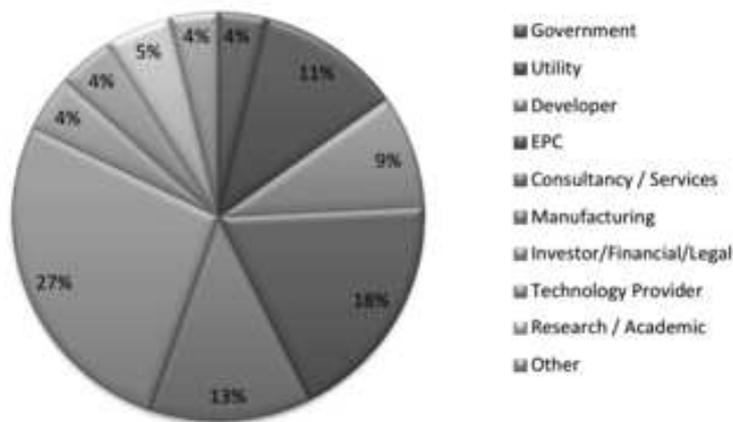
Speakers already confirmed

- Giorgio Mauro – Enertronica
- Lydia Cape-Ducluzeau – CSIR
- Vincenzo Bellini – Soitec Solar
- Pervelan Govender – Eskom
- Rainer Nowak – Webber Wentzel

- Elvin Fredericks – Amatola Greenpower
- Frank Spencer – Emergent Energy
- Kasief Isaacs – Pwc Energy Consulting
- Coenraad Krige – Kensani Capital
- Robert Futter – Creco Project Financing

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Breakdown of 2013 attendees by company type



New task force on alternative transport fuels

The World Energy Council’s community of Future Energy Leaders have launched an exciting new Taskforce on alternative transport fuels. This Taskforce is designed to help better understand consumer attitudes to (and awareness of) alternative transportation fuels across different regions. The outputs of this Taskforce will be used to inform the Scenarios debate with a more ‘real-world’ understanding of consumer attitudes and behaviours. It will also serve to highlight the implications of consumer preferences on future markets, business models and mobility/town planning – serving to inform decision-makers and investors across industry and government sectors.

The Taskforce developed a short survey for completion. It targeted 10 000 consumers’ responses across all regions. The results of this survey will be used to inform the World Energy Scenarios debate as well as the broader public debate, informing consumers, businesses, policymakers, NGO’s, academic institutions and households – which will mean more informed choices about investments in alternative transport fuels in the future.

Terms of Reference for this Taskforce are available on request.

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North West University boasts solar PV installation at Solar Training Centre of SA

The North West University (NWU) at Potchefstroom campus boasts a campus grid-tied PV solar installation system which comprises a 5 x 3kW solar PV system that feeds directly into the engineering faculty's grid. In addition, a 1 x 3kW island system was installed close to the main entrance of the faculty with the main purpose of charging three electric scooters and an electric bicycle used as transport on the campus.

This system was installed as a partnership project between SUNfarming Germany and SUNCybernetics in South Africa to provide practical training opportunities at the NWU for persons at the faculty and in the region who require a comprehensive theoretical and practical understanding of PV solar systems. The Solar Training Centre of South Africa is supported by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and is financed by the NWU, SUNfarming GmbH and KfW DEG.

SUNCybernetics has already facilitated training for over 120 candidates using a generic training module and the NWU's PV installation as the practical example to showcase the preparation, planning, project execution, installation techniques and commissioning of PV-plant installations on different roof areas.

The PV training course also covered the possibilities of PV technology and using solar radiation as an energy source whilst addressing the various technical considerations like fuse choices, overvoltage and EMF-protection, monitoring, metering, the electrical circuits as well as troubleshooting PV-plants. In addition, an understanding of the basic functionality of PV systems and the different types of applications and their potential is discussed.

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Campus grid-tied PV solar installation system at the North West University



SUNCYbernetics (PTY) LTD | Clark Street 06 | PO Box 1465 | Potchefstroom | South Africa | 2520

Leading CSP companies network at Franschhoek Wine Valley

Leading international and South African companies and institutions networked on Monday 7th April at the Franschhoek Wine Valley to discuss the future of the Concentrated Solar Power (CSP) market.

Southern Africa is seen by multiple analysts as one of the most important regions to develop renewable energies globally. Recently, the CSP Today Markets Report 2014 highlighted the small size of the market and the uncertainty of MW capacity allocated to CSP as the most important barriers to market entry in South Africa, as determined by stakeholders.

The new IRP dissipates doubts on these issues opening a whole new window of opportunities for local and international companies to develop business throughout the value chain as it provides the market certainty of a continued demand for CSP in the long-term.

Attendees of CSP Today South Africa 2014 (8-9 April, Cape Town) were given a unique opportunity to visit the breath-taking Franschhoek Wine Valley on 7th April. During the wine tour at the Haute Cabrière vineyard, attendees took advantage of an exclusive networking opportunity with other high-level executives, including Eskom, Emvelo, ACS Cobra and BrightSource Energy, visit the cellar with a demonstration of sabrage, taste the distinguished wines and 'methode Champenoise' sparkling wines.

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Dutch Consulate General in Cape Town hosts TedX Binnenhof viewing party with live connection to The Hague

The Dutch Consul General in Cape Town, Ms. Bonnie Horbach, hosted a TedX Binnenhof event on 31 March 2014 at the Cliffe Dekker Hofmeyr Building in Cape Town. Fifty-five people attended the live event in Cape Town; many more thousands watched through live streaming and at 53 Dutch embassies and consulates throughout the world.

During the Cape Town event, Rashiq Fataar, CEO of Future Cape Town, announced the contribution of the Netherlands in the WDC 2014.

Rashiq Fataar: 'The Dutch Consulate is taking a new and exciting approach to make sure Dutch and African design can meet, so listen closely. It's called Department of Design, a platform for sharing, participating, and building real relationships between the Dutch and South African organisations, based on design thinking and innovation. An inspiring exhibition is being design by Droog, the famous Dutch designers, which will be housed in a building in our city centre. Department of Design will be that real space for collaboration between both Dutch and South African ideas. We welcome everybody to join us here in Cape Town in July!'

The Netherlands are going all out with a 4.5 million Rand programme, called NL@WDC2014. The main event is Department of Design (DoD), a strategic incubator for Dutch-South African trade relations within the context of WDC2014. From 8 July onwards, for several weeks, the Department of Design offers a platform for 'best practices' of Dutch innovation and design thinking, and for encounters with South African counterparts. A programme of workshops, lectures and matchmaking will take place in a spectacular presentation designed by Droog: a 'landscape' built from locally sourced, recycled materials, and including examples of Dutch creative

innovation selected for their relevance and convincing appeal.

'TEDX Binnenhof' is an annual TedX event with a Dutch flavour, hosted at the Dutch political headquarters in The Hague. This year's theme was 'Global Challenges, Dutch solutions'. Ten inspiring innovators offered their creative solutions on global challenges as pollution, climate change and scarcity of natural resources, food and energy in a short spoken presentation. Three of them were highlighted during the Cape Town event; Mike Eman, Prime-Minister of Aruba, Heleen Hebert from construction company Heijmans N.V., and Onno van Schayk, professor at Maastricht University. They spoke about making Aruba a complete sustainable island, generating electricity from sewerage pipes and how chimneys in informal settlements can bring real health benefits respectively.

The Cape Town programme featured a moderated panel discussion on the talks of the three highlighted TedX speakers, and an expose of South African innovations in the same sectors. Cape Town being World Design Capital (WDC), the city was selected as one of two diplomatic posts to send a signal back to all the viewers around the world.

The panel included Bulelwa Ngewana, CEO of Cape Town Partnership, Brian Wilkinson, CEO Green Building Council of South Africa, Frederik Groos, CEO of Butterfly Housing and partner of Dasuda, Fernel Abrahams of Renewable Energy Technologies and the Green Economy department of Western Cape Government, Mike Mulcahy of Green Cape, and Shannon Royden Turner of Informal South.



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Akhani Group merger bolsters energy and resource sector workforce efficiencies

Mine Procurement Solutions (MPS), which comprises MPS South Africa, MPS Tanzania and MPS Mozambique, announced the sale of 100% of its controlling shares to Vhaselwa Engineering & Management Consulting (VEM) on 13th May 2014. A new entity, known as the Akhani Group, has been formed. The Akhani Group is a 51% black female owned private company and a B-BBEE level 3 company.

The merger of the two leading service providers for mining, oil and gas, and energy management corporations creates a comprehensive offering of workforce effectiveness and productivity, and operational performance excellence for the broader energy and resources industries. Akhani serves public, government and private market sectors.

'We look forward to the difference that we can make as a unified team to the African economies in which we

work,' said Fulu Mphuthi, Akhani Group CEO. Her executive team includes Deon Fuhri (Chief Operating Officer) and Ntaoleng Kunene (Chief Information Officer).

While serving existing customer needs, Akhani will focus on entering new markets. With existing operations in South Africa, Mozambique and Tanzania, the company will enter Zimbabwe and Kenya in the next year with a long-term strategy to increase its African and international footprint. The combined service offering creates opportunities for new business development and local job creation.

The strength of Akhani lies in its approach to customer service. The company provides a one-stop-shop service and customised solutions cost-effectively. Akhani's most valuable asset is its talented workforce that includes more than 400 infrastructure design and supply, operational efficiency, energy management, transformation and change management professionals. 'Our specialists focus on enhancing productivity for our customers, while bringing down operational costs without shedding jobs unnecessarily,' she added. Existing partnerships in the supply chain, procurement and energy management arena allows Akhani to offer product

solutions at reduced rates.

'The way a company treats its people, particularly those who work on remote sites should not be overlooked,' explained Mphuthi. 'Akhani fills this critical gap in organisational performance. Today's labour environment in particular holds significant opportunities for growth of a business such as ours.'

'Akhani means 'building the future together', concluded Mphuthi. 'This is a 'directive' that we take personally as we pursue value creation through improved business performance and enhanced quality of life for employees. Our merger will benefit the industries we serve while putting us in a position to make a difference for the better where it matters most.'

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Mine Procurement Solutions and Vhaselwa Engineering & Management Consulting merge to establish Akhani – a new brand entity, pictured from left to right Deon Fuhri – Akhani Group COO, Fulu Mphuthi – Akhani Group CEO, Ntaoleng Kunene – Akhani Group CIO

Two SA companies join to identify RE and EE opportunities in sub-Saharan Africa

Local infrastructure solutions group, Akhani, and South African energy management services company Energy Cybernetics, have joined forces to identify renewable energy and energy efficiency opportunities in Sub-Saharan Africa.

Akhani Group, a B-BBEE level 1 company, provides turnkey solutions of support infrastructure for the mining, oil, gas, energy sector and related industries and is based in South Africa, Mozambique and Tanzania. The Group consist of Mine Procurement Solutions (MPS) and Vhaselwa Engineering & Management Consulting (VEM).

Energy Cybernetics is an energy services company with a 16 year track record in the industrial, commercial and mining sectors. Energy Cybernetics delivers services to clients in Southern Africa and Australia.

The supply and availability of reliable and cost-effective energy to sites in remote locations is an important business driver for any mining operation. In many African countries, lagging infrastructure development means that many sites have to rely on diesel fuel as the primary source of energy. The cost of electricity generated from the combustion of diesel fuel is very high in comparison with other sources of energy. One alternative and viable source of energy to such sites is electricity generated by solar Photo-Voltaic (PV) technology.

Energy Cybernetics' recent venture into the PV market by establishing its renewable energy arm SUNCybernetics, with the backing of international knowledge transfer and skills development, places the company in a position to supply turnkey PV plants of the magnitude required in applications such as mining.

Combining Akhani and Energy Cybernetics' strengths will allow the identification and development of opportunities where solar PV can substantially reduce the overall cost of



Akhani and Energy Cybernetics joined forces to identify renewable energy and energy efficiency opportunities in Sub-Saharan Africa: (L-R) Deon Fuhri – Akhani Group COO, Fulu Mphuthi – Akhani Group CEO, Gustav Radloff – Energy Cybernetics MD, Ntaoleng Kunene – Akhani Group CIO, Frikkie Malan – Energy Cybernetics Operations

energy of a site. An initial target is to reduce the monthly energy cost of such sites by between 15 and 20%. By implementing energy efficiency projects in conjunction with the supply of solar PV generated electricity, monthly energy cost savings become possible.

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Visiongain Energy Reports 2013–2023

1. THE FLOATING PRODUCTION, STORAGE AND OFFLOADING MARKET 2013-2023

Energy report

Floating production, storage and offloading (FPSO) vessels are a competitive solution for the development of offshore oil fields. This is especially the case when E&P operations are performed in challenging environments and marginal fields where alternative infrastructure, such as oil pipelines, are insufficient or would require excessive capital investment in order to be completed. With the rate of new onshore discoveries at an historic low, consistently high oil prices and technology enabling exploration in unprecedented depths, production in deep and ultra-deep waters has gained the spotlight in the oil industry. Demand for new-build and converted FPSO vessels is benefiting from this trend. Visiongain calculates that CAPEX on purpose-built and converted floating production, storage and offloading (FPSO) units will be \$8 332m globally in 2013.

The South American and West African regions will see the highest investments due to their recent ultra-deep water discoveries in the so-called pre-salt basins. However, other regions will experience solid growth rates throughout the forecast period, such as South-East Asia, as more countries strive to balance diminishing onshore output with the development of new offshore reservoirs.

What makes this report unique?

Visiongain consulted widely with industry experts and the full transcripts of exclusive interviews with Yasuhiro Takano, General Manager of Corporate Planning & Strategies at MODEC, and David Munday, Director of Business Development at Rubicon Offshore International, are included in the report. As such, their reports have a unique blend of primary and secondary sources providing informed opinion. This approach allows insight into the key drivers and restraints behind market developments, as well as identify-

ing the leading companies. The report also presents a unique blend of qualitative analysis combined with extensive quantitative data including global and regional production forecasts from 2013-2023 – all highlighting strategic business opportunities.

Why you should buy The Floating Production, Storage and Offloading (FPSO) Market 2013-2023

- 190 pages
- Exclusive Visiongain interviews with industry experts informing the analysis
 - Yasuhiro Takano, General Manager of Corporate Planning & Strategies at MODEC, Inc.
 - David Munday, Director of Business Development at Rubicon Offshore International Pte Ltd.
- 148 tables, charts, and graphs quantifying the market in detail
- 28 Contract tables listing the specifications of all existing FPSO projects worldwide, divided by country of destination
- Global FPSO market capital expenditure forecasts between 2013 and 2023
- An in-depth analysis of the FPSO submarkets, with comprehensive CAPEX forecasts for 2013-2023
- Ten-year CAPEX forecasts and analysis for the regional FPSO markets from 2013-2023 including Africa, Asia, Europe, North America, Oceania and South America
- Ten-year CAPEX forecasts and analysis for the 9 leading national FPSO markets from 2013-2023 with detailed tables detailing the major FPSO projects in each region such as Angola, Brazil, Ghana and Nigeria
- Ten-year market outlooks for 9 other national markets such as the Congo, Gabon, Tunisia and India
- Profiles of the leading 5 companies such as Total S.A, Petrobras and MODEC Inc. in the FPSO market, with market share data, information on 2012 CAPEX in the sector, cur-

rent projects and future outlook.

- A PEST analysis
- Analysis of the drivers and restraints of the FPSO market for the global market, the new-build and conversion submarkets and each regional and leading national segment.

2. THE COALBED METHANE (CBM) MARKET 2013-2023

Energy report

Coalbed Methane (CBM) has been a notable part of the US natural gas market for decades. Today, Australia, China, India and Indonesia are all poised to embark on CBM development that will establish CBM industries of a similar scale. The less well known unconventional gas, CBM – from a cost and expertise perspective – is more than ready to take advantage of very strong natural gas prices in India and across East and South East Asia.

Today, natural gas markets have regional price dynamics. This is most clearly illustrated by the arbitrage opportunity between North America and East Asia. The drivers for CBM are also localized:

Australia, as the second CBM market established in the world, has a head start on the Chinese, Indian and Indonesian development. Capital expenditure on CBM in Australia is already very high to support the three CBM-LNG export projects under construction on the Queensland coast.

In China, the government is aiming to double the percentage of its primary energy supply that is natural gas. To do this will require action on all possible fronts; and, with difficulties developing shale assets, the Chinese are looking to their very significant CBM reserves to contribute substantially to their domestic gas production. However the State will need to support the industry with a range of subsidies if the output targets set for CBM are to be met. This will require capital expenditure to increase rapidly over the coming 10 years.

India and Indonesia are the last two

hot spots for capital expenditure on CBM development. India has conducted four CBM block licensing rounds thus far and will conduct a fifth in 2013.

The country began commercial production of CBM in 2007 and the companies involved in the market are consolidating. The geology of Indonesia, as well as its domestic natural gas demand, makes CBM development a very appetizing prospect: 2013 sees the development of more pilot production than ever before and will be a crucial year for the nation's CBM future.

As natural gas prices have fallen in North America – thanks to the shale gas boom – the amount of CBM wells drilled in the US market has plummeted.

Visiongain has determined that the value of the CBM market in 2013 will reach \$5.3bn.

What makes this report unique?

Visiongain consulted widely with industry experts and full transcripts from these exclusive interviews are included in the report. As such, the report has a unique blend of primary and secondary sources providing informed opinion. The report provides insight into key drivers and restraints behind the CBM market, identifying future growth areas and analyses leading companies. The report also provides a unique blend of qualitative analysis combined with extensive quantitative data including global, submarket and national market forecasts from 2013-2023 – all highlighting key business opportunities.

Why you should buy the Coalbed Methane (CBM) Market 2013-2023

- 176 pages of comprehensive analysis
- 3 Exclusive Visiongain interviews with industry experts
- 95 tables, charts, and graphs
- Global CBM market forecasts between 2013-2023
- 6 ten year regional CBM market forecasts for:
 - Americas
 - Asia
 - Australasia
 - Eurasia
 - South East Asia
 - Sub-Saharan Africa
- 6 ten year national CBM market forecasts for:
 - Australia
 - China
 - India
 - Indonesia

- New Zealand
- UK

Within the regional market forecasts, analysis is conducted regarding the future outlook for capital expenditure on CBM in a total of 30 different countries

- A PEST analysis
- Analysis of 30 companies active in the CBM market

3. THE ENERGY STORAGE TECHNOLOGIES (EST) MARKET 2013-2023

Energy report

Energy storage technologies (EST) are becoming increasingly important for improving the efficiency of electricity grid systems. With an ever larger share of power generation coming from intermittent renewable energy sources, rising commodity prices and escalating energy peak demand in high-growth economies, ESTs are under the spotlight as potential game changers in the management of power transmission and distribution. At present, only some ESTs are commercially viable; yet, Visiongain expects the market to see exponential growth in the next ten years, led by technological, economic and political factors already in action.

Visiongain calculates that the 2013 global EST market will be worth \$4 033m in sales value, project CAPEX and RD&D funds. This includes the market estimates for pumped hydro storage, grid-scale battery, compressed air energy storage (CAES), thermal storage, flywheel, ultracapacitor systems and other niche EST currently at their early development stage.

Why you should buy The Energy Storage Technologies (EST) Market 2013-2023

What is the future of the energy storage technologies (EST) market? Visiongain's comprehensive analysis contains highly quantitative content delivering solid conclusions benefiting your analysis and illustrates new opportunities and potential revenue streams helping you to remain competitive. This definitive report will benefit your decision making and help to direct your future business strategy.

Avoid falling behind your competitors, missing critical business opportunities or losing industry influence. In their new report you will discover forecasts from 2013-2023 at the global, submarket, and national level. The

report also assesses technologies, competitive forces and expected product pipeline developments.

They guarantee that you will receive key information which will benefit you in the following way

- View global energy storage technologies (EST) market forecasts and analysis from 2013-2023 to keep your knowledge ahead of your competition and ensure you exploit key business opportunities
 - The report provides detailed CAPEX (USD) projections for the market, the competitors, and the commercial drivers and restraints allowing you to more effectively compete in the market. In addition to market forecasts from 2013-2023, their new study shows current market data, and market shares for each technology submarket and 11 leading national markets.
- You will also discover original critical analysis, revealing insight into commercial developments
- Why struggle to find key market data? Why miss crucial information? Their comprehensive report provides instant market insight
 - Their 252-page report provides 174 tables, charts, and graphs. Let their analysts guide you with a thorough assessment of the current and future energy storage technologies (EST) market prospects.
- Understand what thought leaders are thinking. These leaders hold critical knowledge. Be part of this knowledge
- Learn about the market prospects for the leading technology types from 2013-2023

How will individual technology types perform over the forecast period? Discover how high CAPEX can go, from 2013-2023, learning about products and years with the highest predicted growth and revenues. You will also be provided with capacity forecasts (GW) for each technology over the next ten years. You will be able to assess each technology's future, seeing progress and finding what it means, including emerging trends for those technologies. These forecasts will also reveal the competitive landscape. You will see what is happening, explaining the challenges, trends, competitors, and market opportunities. Their report reveals forecasts for the 6 leading key product

types as follows:

- Pumped hydro storage market and capacity forecast 2013-2023
- Grid-scale batteries market and capacity forecast 2013-2023
- Compressed air energy storage (CAES) market and capacity forecast 2013-2023
- Thermal storage market and capacity forecast 2013-2023
- Flywheel market and capacity forecast 2013-2023
- Ultracapacitor market and capacity forecast 2013-2023
- Other EST market and capacity forecast 2013-202
- Understand the prospects for the 11 leading national EST markets – where will the highest revenues and opportunities occur?
 - Learn about the market potential for EST companies in the developed and developing countries, from 2013 onwards. You will see where and how opportunities exist with revealing individual market and capacity forecasts and analysis from 2013-2023 for 11 leading national markets, plus the market for the rest of the world.
- Explore the factors affecting product developers, and everyone within the value chain. Learn about the forces influencing market dynamics.
 - Explore the political, economic, social, and technological (PEST) issues assessing product advances. Discover what the present and future outlook for businesses will be. Learn about the following business critical issues
 - Technological issues and constraints
 - Supply and demand dynamics
 - Competition from new product types
 - Increasing industry consolidation
 - Advances in product quality
 - Analysis of barriers to entry
 - Main policies influencing the market environment
- Identify who the leading companies are in the energy storage industry
 - Their report reveals the technologies and companies which hold the greatest potential. In particular, exploring and analysing the activities of these companies: See where the expected gains will be. Prospects for advances in the

EST industry are strong, and from 2013 the sector holds many opportunities for revenue growth. View Visiongain's assessment of the prospects for established competitors, rising companies, and new market entrants.

Discover Information found nowhere else in this independent assessment of the energy storage technologies market

The Energy Storage Technologies (EST) Market 2013-2023 report provides impartial EST sector analysis. With the independent business intelligence found only in their work, you will discover where the prospects are for profit. In particular, their new research provides you with key strategic advantages: Their informed forecasts, independent and objective analysis, exclusive interviews and revealing company profiles will provide you with that necessary edge, allowing you to gain ground over your competitors.

With this report you are less likely to fall behind in knowledge or miss crucial business opportunities. You will save time and receive recognition for your market insight. See how this report could benefit and enhance your research, analysis, company presentations and ultimately your individual business decisions and your company's prospects.

What makes this report unique?

Visiongain consulted widely with leading industry experts and full transcripts from these exclusive interviews with Deeya Energy, EnerVault and Maxwell Technologies are included in the report. Visiongain's research methodology involves an exclusive blend of primary and secondary sources providing informed analysis. This methodology allows insight into the key drivers and restraints behind market dynamics and competitive developments. The report therefore presents an ideal balance of qualitative analysis combined with extensive quantitative data including global, submarket and national market forecasts from 2013-2023.

How The Energy Storage Technologies (EST) Market 2013-2023 report can benefit you

Visiongain's report is for anyone requiring analysis of the energy storage technologies market. You will discover CAPEX and capacity forecasts, technological trends, predictions and expert

opinion providing you with independent analysis derived from our extensive primary and secondary research. Only by purchasing this report will you receive this critical business intelligence revealing where revenue growth is likely and where the lucrative potential market prospects are.

4. THE THERMAL ENHANCED OIL RECOVERY (EOR) MARKET 2013-2023 ENERGY REPORT

Growth in the thermal EOR market will be driven primarily by increasing production from the Albertan oil sands, though heavy oil developments in several global locations will also be seen. Many thermal EOR projects have been around for a long time and the more established national markets are now looking to maintain production and improve existing technologies. Strong growth is expected in the emerging markets of the Middle East as tertiary recovery methods are applied to various large fields over the coming years. High oil prices, increasing global energy demand and the development of new technologies will all help to drive the thermal EOR industry over the coming decade as the market enters a period of strong growth. Visiongain's analysis indicates that the thermal EOR market will see production of 2.259 million barrels per day in 2013.

Why you should buy The Thermal Enhanced Oil Recovery (EOR) Market 2013-2023

What are the prospects for the thermal EOR market? Find out with Visiongain's comprehensive analysis which contains highly quantitative content delivering solid conclusions benefiting your analysis and illustrating new opportunities and potential revenue streams helping you to remain competitive. This definitive report will benefit your decision making and help to direct your future business strategy.

In their new report, you will discover forecasts from 2013-2023 at the global, submarket, and national level. The report also assesses technologies, competitive forces and expected project developments.

They guarantee that you will receive key information benefitting you in the following way:

- View global thermal EOR market forecasts and analysis from 2013-2023 to keep your knowledge ahead of your competition and

ensure you exploit key business opportunities

- The report provides detailed production (bpd) projections of the market, the competitors, and the commercial drivers and restraints allowing you to more effectively compete in the market. In addition to market forecasts from 2013-2023, their new study shows current market data, and market shares.
- You will also discover original critical analysis, revealing insight into commercial developments.
- Why waste time trying to find key market data? Why miss crucial information? Their comprehensive report provides instant market insight
 - Their 166 page report provides 130 tables, charts, and graphs. Let their analysts guide you with a thorough assessment of the current and future thermal EOR market prospects.
 - This analysis will allow you to achieve quicker, easier understanding. You will also gain from their analyst's industry expertise allowing you to demonstrate your authority on the thermal EOR sector.
- Understand what thought leaders are thinking. Industry leaders hold critical knowledge. Be part of this knowledge base
 - By reading the exclusive expert interviews contained in the report you will keep up to speed with what is really happening in the industry. You will gain a thorough knowledge of the thermal EOR sector finding strategic advantages for your work and will learn how your organisation can benefit.
 - Read the full transcripts of exclusive expert opinion interviews from leading industry specialists informing your understanding and allowing you to assess prospects for investments and sales.
- Discover barrels per day production forecasts for the key thermal EOR submarkets from 2013-2023
 - What are the secrets of the thermal EOR industry's progress? How will these markets expand? Which submarkets will see the greatest growth? Use their forecasts and expert insight to grow your business and give your company more influence. Find where you can gain and how your organisation can succeed. Avoid falling behind.
 - Stay informed about the potential for each of these thermal EOR submarkets with individual forecasts and analysis from 2013-2023, as well as information on the leading projects within each category:
 - Steam Injection submarket forecast 2013-2023
 - View forecasts revealing the leading 8 steam injection thermal EOR national markets from 2013-2023
 - Steam Assisted Gravity Drainage (SAGD) submarket forecast 2013-2023
 - View forecasts revealing the leading 6 SAGD thermal EOR national markets from 2013-2023
 - Other Thermal EOR Technologies submarket forecast 2013-2023
 - View forecasts revealing the leading 4 other thermal EOR national markets from 2013-2023
- Understand the prospects for the leading national thermal EOR markets – where will the greatest bpd production and growth opportunities occur?
 - Learn about the market potential for thermal EOR companies in the developed and developing countries, from 2013 onwards. You will see where and how opportunities exist with revealing individual market forecasts and analysis from 2013-2023 for 10 leading national markets with further submarket forecasts within these regions.
- Find out about the market dynamics & opportunities in 10 leading countries
 - Understand industry activity with detailed project data revealing where companies are currently producing through thermal EOR methods and with which technologies.
- Explore the factors affecting product developers, and everyone within the value chain. Learn about the forces influencing market dynamics.
- Explore the political, economic, social, and technological (PEST) issues affecting the thermal EOR industry today and moving forward. Discover what the present and future outlook for businesses within this sector will be. Learn about the following business critical issues:
 - The strength of the oil price determinant
 - The development of new thermal EOR technologies
 - Competition from other resources and EOR methods
 - Supply and demand dynamics
 - Analysis of barriers to entry
 - The outlook for future projects
- Identify who the leading companies are with exclusive market share data for the 10 leading thermal EOR companies
 - Gain a thorough understanding of the competitive landscape of the thermal EOR market. Their report profiles the 10 leading companies in the thermal EOR market, revealing 2013 market shares and barrels per day production. Maps showing the location and technologies being used for each company's thermal EOR projects are also included, as well as an assessment of the future growth areas for each company.
- Discover Information found nowhere else in this independent assessment of the thermal EOR market
 - The Thermal Enhanced Oil Recovery (EOR) Market 2013-2023 report provides impartial analysis of the thermal EOR sector. With the independent business intelligence found only in their report, you will discover where the prospects are for profit. In particular, their new research provides you with key strategic advantages: Their informed forecasts, independent and objective analysis, exclusive interviews and revealing company profiles will provide you with that necessary edge, allowing you to gain ground over your competitors.
 - With this report you are less likely to fall behind in knowledge or miss crucial business opportunities. You will save time and receive recognition for your market insight. See how this report could benefit and enhance your research, analysis, company presentations and ultimately your individual business decisions and your company's prospects.

What makes this report unique?

Visiongain consulted widely with leading industry experts and full transcripts from these exclusive interviews with Birchwood Resources Inc. and Glass-Point Solar Inc. are included in the report. Visiongain's research methodology involves an exclusive blend of primary and secondary sources providing informed analysis. This methodology allows insight into the key drivers and restraints behind market dynamics and competitive developments. The report therefore presents an ideal balance of qualitative analysis combined with extensive quantitative data including global, submarket and regional markets forecasts from 2013-2023.

How The Thermal Enhanced Oil Recovery (EOR) Market 2013-2023 report can benefit you

Visiongain's report is for anyone requiring analysis of the thermal EOR market. You will discover market forecasts, technological trends, predictions and expert opinion providing you with independent analysis derived from our extensive primary and secondary research. Only by purchasing this report will you receive this critical business intelligence revealing where revenue growth is likely and where the lucrative potential market prospects are.

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Mozambique's Minister of Energy gives exclusive insight into investment opportunities in Mozambique's power sector

3 RD ANNUAL POWERING AFRICA MOZAMBIQUE MEETING:
8-9 MAY 2014 - MAPUTO

Mozambique's discovery of the 4th largest gas reserves in the world, coupled with an estimated US\$12 billion worth of power projects in the pipeline and steady economic growth of 8% a year, makes the country one of the most exciting and lucrative power investment destinations in the world.

Most recently, ACWA Power Moatize Termoelétrica announced the development of a thermo-electric power station in Mozambique's Tete province with an estimated cost of US\$1 billion, and the Japanese government announced it is to grant Mozambique a loan of 17.27 billion yen (167 million US dollars) to build a gas fired power station in Maputo. The 3rd Annual Powering Africa Mozambique Meeting brought together senior decision-makers representing such projects.

Public sector participants who attended include:

- Hon Salvador Namburete, Minister of Energy, Republic of Mozambique
- Laura Nhancale, Director of Studies and Planning, Ministry of Energy, Republic of Mozambique
- Antonio Osvaldo Saide, Director, New and Renewable Energy, Ministry of Energy, Republic of Mozambique
- Pascoal Bacela, National Director of Energy, Ministry of Energy, Republic of Mozambique
- Carlos Yum, Business Development Director, Electricidade de Moçambique (EDM)
- Isaque Chande, Commissioner, CNELEC
- Maduna Ngobeni, Project Officer: IPP Renewables, Department of Energy, South Africa

Private sector participants included:

- Willem Theron, General Manager: New Business Development, Southern African Energy Unit, Eskom

- Manoj Gupta, Country Head Mozambique, Jindal Africa
- Kribs Govender, General Manager SNE, Low Carbon Electricity, Sasol
- Sean Friend, Portfolio Manager, Infrastructure, Developmental and Environmental Assets Old Mutual Investment Group (Pty) Limited
- David Humphrey, Global Head of Power and Infrastructure, Standard Bank Group
- Pedro Pereira Coutinho, Managing Partner, Eaglestone

A combination of roundtables and workshops allowed participants to question and engage in dialogue with government officials and private sector developers to explore solutions and help shape policy for some of the most critical issues facing the development of the power sector in Mozambique, including: the electrification of gas for domestic and international use, the funding of hydro power projects, the funding of grids, solving the off taker issues and lack of government guarantees. The 3rd Annual Powering Africa Mozambique Meeting was hosted in partnership with the Mozambican Ministry of Energy.

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Philips reiterates commitment to sustainable lighting solutions during its fifth pan-African roadshow

- More than 600 million people in Africa currently have no access to electricity
- Philips has committed to installing 100 'light centres' to off-grid communities by 2015
- Philips will introduce its latest LED and solar innovations during the roadshow

Royal Philips announced its fifth consecutive pan-African Cairo to Cape Town roadshow from 14 April to 3 September 2014 continuing to focus on key challenges facing Africa today - the need for energy-efficient lighting and the revitalization of African healthcare infrastructure.

With an Africa-relevant product portfolio and a strong historical presence on the continent, Philips is committed to significantly expand its business footprint in Africa in the coming years and enhance life in Africa with meaningful innovations. The annual pan-African Cairo to Cape Town roadshow is an important vehicle in Philips' approach to enhance understanding of local needs and growing the market.

'As investment demand continues

to grow in most of Africa (1), we are very positive about expanding our business footprint on the continent. In the past decade (2), 6 of the 10 fastest growing economies in the world were in Africa; Philips is therefore aiming for double digit growth in the coming years', states JJ van Dongen, Senior Vice President and CEO Philips Africa. 'Local entrepreneurship and talent development continue to be key in addressing the complexities of the African market and in developing local-

ly relevant innovations that meet the needs of Africa's growing middle class.'

Focus on Post-2015 Development Agenda and non-communicable diseases

Philips remains committed to reducing child mortality and improving maternal health, linked to the current UN Millennium Development Goals 4 and 5 (MDGs). In contribution to the Post-2015 Development Agenda, Philips calls for improving universal access to healthcare and reducing the double-disease burden of communicable and non-communicable diseases (NCDs) as additions to the current MDGs.

Figures from Philips' latest Fabric of Africa Trends Report) show that in 2008, nearly three million African deaths were attributable to preventable or treatable NCDs. That figure will rise by more than 25 percent in the next decade. This year's roadshow will have an increased focus on non-communicable diseases in addition to Mother and Child care.

21st century technology to highlight iconic city monuments

Next to healthcare solutions, Philips will introduce its latest LED and solar innovations during the roadshow. More than 600 million people in Africa currently have no access to electricity; Philips' off-grid LED solar powered solutions illuminate the most remote areas and provide energy-efficient lighting. Philips has committed to installing 100 'light centres' to off-grid communities by 2015, over a third of these 'light centres' have already been installed and more will be inaugurated during the upcoming roadshow.

Additionally, Philips has committed to lighting up and illuminating one iconic monument in every city visited during the roadshow with the latest LED technology. As the number one lighting company in the world, Philips has transformed iconic city landmarks around the globe and will now provide a stunning lighting makeover of historic, well-recognized monuments in African cities.



Ghana - Clinical Trainings - Ridge Hospital

Scaling innovations in technology and education

Research and innovation are central to Philips' activities in Africa. The recently launched Philips Africa Innovation Hub in Nairobi, Kenya, will be the centre for developing innovations 'in Africa-for Africa'. To increase the impact of newly developed solutions, Philips continues to combine the introduction of new innovations with dedicated focus on clinical education and training. Since 2011 Philips has trained over 2 500 healthcare professionals during the Cairo to Cape Town roadshow and clinical education and healthcare training continues to remain a priority.

Addressing aspirational needs of the African consumer

Philips' consumer lifestyle portfolio, through innovation and localization, will focus on the continent's desire for healthier cooking as well as beauty and grooming solutions by introducing new products to meet the aspirational needs of the rising middle class in Africa.

Cairo to Cape Town Roadshow 2014

The roadshow brings together key stakeholders including governments, NGO's, professional associations, and research institutions to exchange best practices, collaborate and develop public-private partnerships aimed at addressing key challenges in Africa.

'We have been in Africa for many years and have a strong installed base of our equipment, but we strongly acknowledge the benefits of dialogue during this roadshow and the need for our company to listen to the local market and understand how we can adapt our products to better serve this continent', summarizes JJ van Dongen.

The roadshow kicked-off in Cairo on 14th April 2014 and made its next stop in Algiers on 12th May, and concludes in Cape Town on 3rd September.

PHILIPS

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Willingness to accept local wind energy development: Does the compensation mechanism matter?

Dr Jorge Garcia, Senior Research Fellow, Centre for International Climate and Environmental Research (CICERO), Oslo, Norway, spoke about his article with co-authors, Todd Cherry, Steffen Kallbekken and Asbjørn Torvanger at the *ACDI Seminar Series – Responding to Climate Change*, at UCT on 14 May.

Earlier studies have concluded that most stakeholders accept the normative case for providing benefits as a means of compensation to communities that are negatively affected by wind power development. However, the exact mechanisms for providing such benefits remains unclear. This article quantifies local attitudes towards two compensation mechanisms, namely individual payments and the provision of a local public good. To investigate individual preferences, they implemented a Choice Experiment that recreated the siting of a hypothetical wind park in western Norway. Individuals chose among alternative interventions where each alternative was characterized by three characteristics, visual impact of the wind farm, a deduction of the electricity bill or private compensation and the provision or not of a public sports facility. To recreate the hypothetical wind farm, Photoshop visualizations were used. In total, 802 respondents completed the survey and the response rate was 41%.

Survey results show that those living closest to the wind farm and those who use the intervention site for recreational purposes demanded relatively higher compensation levels. Preliminary statistical analyses using a Random Utility Model (RUM) framework indicate that local residents would trade lower levels of private compensation for higher levels of the local public good. This result is, they be-

lieve, an important one for a number of reasons: 1) No systematic analysis of private versus public compensation to overcome local opposition has been undertaken before. 2) From the developers view point provision of a local public good as opposed to the use of individual payments may be a cost effective way to ease opposition for deployment plants. 3) Renewable energy developers may serve as possible facilitators in the process of coordinating contributions to the provision of a public good that is important for local communities.

Dr Garcia was holds a PhD in Economics from the University of Gothenburg (2007) and has been working as a Senior Research Fellow at the Centre for International Climate and Environmental Research in Oslo, Norway since 2011. Prior to this he was an Assistant Professor in the Economics Department at Pontificia Universidad Javeriana. His research interests include environmental economics, environmental regulation, micro-economics, behavioural economics and complexity (exploratory)

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US \$870m financing agreements get signed as biggest clean power energy project in Africa

LAKE TURKANA WIND POWER - AFRICA'S BIGGEST WIND POWER PROJECT REACHES KEY MILESTONE

The Lake Turkana Wind Power Project meant to add an existing 300MW of reliable, low cost wind energy to the national grid of Kenya and reached a critical milestone following the signing of the financial agreements in Nairobi, Kenya.

The signing of the over US \$870m financing agreements represents a major breakthrough to actualizing the biggest clean power energy project in Africa, spanning years of negotiations and fundraising, says Tshepo Mahloele, CEO of Harith General Partners. The project will be financed with a mixture of equity, mezzanine debt and senior debt.

The Lake Turkana Wind Power project is the first of its kind in East Africa and will be the largest wind project on the continent to date, says Mahloele. The Project will benefit Kenya, and specifically the Turkana area where unemployment is high, with jobs, economic development and, most importantly, electricity which is a vital element in any economy.

LTWP has signed a 20 year Power Purchase Agreement with the government of Kenya through its electricity entity, Kenya Power.

The parties at the signing ceremony were represented by lead developer and independent power producer, Aldwych, which is majority owned by the Pan African Infrastructure Development Fund (PAIDF). LTWP is primarily responsible for the financing, construction and operation of the wind farm and comprise a grouping of investors and lenders with extensive financial and technical capabilities and experience on the African continent. They include FMO, Vestas, Finnfund, IFU and a strong local sponsor KP&P on the equity side. The syndicate of banks is led by the African Development Bank and comprises Standard Bank, Nedbank, EIB, DEG and Proparco.

The project will be located on one of the best sites for a wind farm in the world. Not only are the wind speeds exceptionally high but the wind is only from one direction, is not seasonal, and is low in turbulence. The project site is situated on the southeast border of Lake Turkana between two high ranging mountains in the Turkana Corridor where a low level jet stream originating in the Indian Ocean creates favourable wind conditions.

Mahloele says the LTWP will essentially assist diversify Kenya's energy mix and reduce the country's reliance on power production from oil and diesel power generators. The Kenya government will save millions per year on importing fuel. The LTWP tax contribution to Kenya alone will be approximately \$27m annually and \$548m over the life of the investment.

Mahloele says the combination of international financial and technical expertise has ensured that the project is structured in a bankable and sustainable form in accordance with international standards. This project also forms part of Harith's commitment to the United States backed Power Plan announced last year by the US President Barack Obama to bring more than 10 000 MW of electricity to sub Saharan Africa. Through Power Africa, Harith has committed \$70m for wind energy in Kenya and \$500m across the African power sector through a new fund.

Mahloele says the investment is the result of the forward thinking and planning on the part of the Kenyan leadership who had undertaken comprehensive power sector reforms over the past decade. In Kenya, electricity is mainly generated from hydro, thermal and geothermal sources. Wind generation accounts for less than six megawatts of the installed capacity. Currently, hydro power comprises over 52 percent of the

installed capacity in Kenya and is sourced from various stations managed by the Kenya Electricity Generating Company (KenGen).

It is our assertion that the Lake Turkana Wind Project will greatly reduce Kenya's over reliance on hydro-power which is playing a critical role in ensuring security of electricity supply but is however vulnerable to periodic draught seasons, says Mahloele.

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Oliver Kinross Africa Oil & Gas Awards focuses on best practice and achievements made within Africa's booming energy industry

On 9th of October 2014 Oliver Kinross will be hosting the 2nd Annual Africa Oil & Gas Awards. The awards are taking place at the world class Sandton Convention Centre, Johannesburg, as part of the Africa Oil & Gas Expo.

The awards ceremony is an initiative of Oliver Kinross to reward achievements made by African and International companies operating across Africa. Oliver Kinross has built a very strong reputation in the last six years establishing itself as a global name in oil & gas through providing high level workshops, conferences and unique networking opportunities across the world.

The first edition of the Africa Oil & Gas Awards saw operating companies such as Tullow, OMV and Oando Plc pick up awards for demonstrating continued excellence in HSE, Local Content and Corporate Social Responsibility (CSR). There were 8 awards for the solutions and services industry. Last year's winners included Halliburton, Maersk Drilling, GNPC-Technip and Drillmec.

The awards are judged by a prestigious panel consisting of oil & gas operators and government representatives. Amongst those on the panel last year were Anadarko, Afren, Marathon oil, NOC Kenya as well as ministerial representatives from Namibia, South Africa and Ethiopia. The judges for 2014 will be reviewing submissions and giving their individual verdict on 14 awards. This year there are 10 award categories for solutions and service providers and 4 awards for oil & gas operators.

The exhibition will feature over 100 exhibitors, in excess of 4000 visitors.



As part of the exhibition Oliver Kinross will be running 10 complimentary workshops over the two days. Topics include Contract Negotiation, Local Content, Project Financing, HSE and LNG Logistics. Entry to the Africa Oil & Gas Expo is complimentary along with all the workshops on offer.

Running alongside the exhibition is the 5th Africa Oil & Gas Summit 2014. This year's event has over 50 top level speakers. Oliver Kinross holds this event biannually once in London and once in South Africa. VIP speakers at the event include Mr. Immanuel Mulunga, Petroleum Commissioner within the Ministry of Mines and Energy of Namibia, Mr. Muzi Mkhize, Director General

from the Department of Energy for South Africa and the Director of Hydrocarbons from the Ministry of Mines Mauritania, Mr. Ahmed Salem Tekrou. Keynote speakers representing oil companies include Engr. Simbi Wabote the Global Local Content Manager for Shell and Gilbert Yevi, Jubilee Asset Manager at Tullow Ghana.

Quotes from 2014 Speakers

'Mozambique is on the cusp of a natural gas boom and it is time for a reality check. Greater clarity is needed on all aspects of Mozambique LNG, from timelines and the scale of development costs through to gas sales agreements and prospects for associated mega-projects. The Africa Oil and Gas Summit will be an important step along this path.'

– Adriano Nuvunga, Program Director, CIP Mozambique

'Africa holds the largest untapped hydrocarbon potential in the World. With the right enabling socio-economic, political and business environment, these resources can propel the continent to great heights and get its people out of poverty. I am looking forward to discussing these developments at The Africa Oil and Gas Summit'

– Gilbert Yevi, Jubilee Asset Manager, Tullow Ghana

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NUFU solar oven project

The NUFU solar oven project finishes in June 2014. Its aim is to investigate the potential of solar cooking with heat storage at high temperatures. After six years of project, five PhDs and some masters have been completed on this subject, some others are finishing this year. The project is led by the Norwegian University of Science and Technology and concerns in addition five universities in Africa.

The project areas of interest to the research community include:

- Performance of rock-bed heat storage for solar cooker;
- A heat transfer model for packed bed heat storage system;
- Air-based solar oven with heat storage;
- Design of an optimized receiver for an air-based solar collector;
- Design, optimization and performance evaluation of solar ovens for injera baking;
- Experimental and numerical studies of solar thermal energy storage unit using phase change material;
- A solar cooker with heat storage and self-circulating liquid;
- Social constraints of solar energy and solar cooking; and
- Acceptance of solar cookers in South Africa.

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SOLRICO'S INTERNATIONAL PROJECTS

Solrico's growing network now counts 13 solar thermal experts from around the globe. They have recently finalised a number of international projects which include:

WORLD MAP OF SOLAR PROCESS HEAT COLLECTOR INDUSTRY

In cooperation with magazine Sun & Wind Energy, solrico carried out a global survey among solar process heat collector manufacturers and published the first World Map of the Solar Process Heat Collector Industry. The world map shows 36 manufacturers from ten different countries – among them 19 parabolic trough, 9 dish and 4 Fresnel collector manufacturers, as well as 1 ultra-high evacuated flat plate collector producer. What's special about the world map is its listing: A company's rank is based on its technology's stage of development (prototype, pilot/demonstration and commercial) and includes the number of commercial projects already realised.

SMETHERMAL DISCUSSED TRANSPARENT PRICES

Once again, solrico chaired the international industry conference SMETthermal, which attracted more than 130 industry professionals from 20 different countries. An international industry panel discussed the need for transparent solar heat prices and yields and looked at new global business strategies.

CHECKLIST: HOW TO DESIGN A SUCCESSFUL SUPPORT SCHEME?

solrico contributed the global overview of incentive schemes to an Austrian study carried out by AEE Intec on behalf of the Austrian Ministry for Transport, Innovation and Technology (bmvit). The overview, which is based on five years of research for the database of incentive programmes on solarthermalworld.org, lists the pros and cons and explains best practice examples of seven different types of demand-side support schemes: direct capital subsidies, performance-based incentives, low-interest loans, VAT reductions, Renewable Energy Certificates, Clean Development Mechanisms and Energy Service Companies. solrico also developed a checklist called 'How to design a successful support scheme?'

NEW AND ADVANCED SEARCH TOOL FOR AROUND 1 000 NEWS

solrico has contributed almost 1 000 news to web portal solarthermalworld.org since its creation in 2008. Altogether, the database offers around 3 500 news articles, scientific papers, studies and presentations on a wide range of topics. Now, a new and advanced search tool in the left column helps visitors to quickly find relevant topics, projects, technologies, markets and trends. The tool combines the keyword search box and the tag-based filter, which had so far been used independently to search the database.

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West Africa's future requires new solutions in power technology and investment to improve energy access

The World Economic Forum (WEF) notes that the insufficient amount and quality of infrastructure is one of the major impediments to developing growth in West Africa

West Africa's future as a competitive economic bloc requires new solutions in power technology and investment to improve energy access and enable the implementation of an ambitious infrastructure programme according to Standard Bank

Policymakers, regional governments and investors are grappling with methods to de-risk investment in new business models. They are also looking at the technological, regulatory, financial and geopolitical factors that change the game and replicate the energy access success stories.

'The challenge for these growth markets is to find viable funding mechanisms and create an enabling environment to literally power the future of a continent that holds 15% of the world's population,' says Mr David Humphrey Head of Power and Infrastructure, Standard Bank. 'Coupled with funding, financial services institutions are also giving more attention to interest rate risk management and hedging products; foreign exchange, and fuel hedging; and local currency funding on a corporate, structured or project basis,' added Mr. Humphrey

The World Economic Forum (WEF) notes that together with border administration slowing inter-regional trade, the insufficient amount and quality of infrastructure is one of the major impediments to developing growth in West Africa and improving its competitiveness. Closing this deficit is part of the solution.

While over half of Africa's improved growth performance can be attributed to improve-

ments in infrastructure, the WEF says an estimated USD93-billion is needed annually until 2020 to fund infrastructure development. Increased urbanisation, growing consumer markets and broader ties to the global economy are putting additional pressure on the need for African economies to steam ahead with these investments.

These challenges cannot be viewed in a silo and without a broader economic context. Global economic activity remains subdued, and despite signs of strengthening in high-income countries, significant downside risks persist. This affects factors such as intra-trade flows, the cost of capital equipment, and rising energy costs.

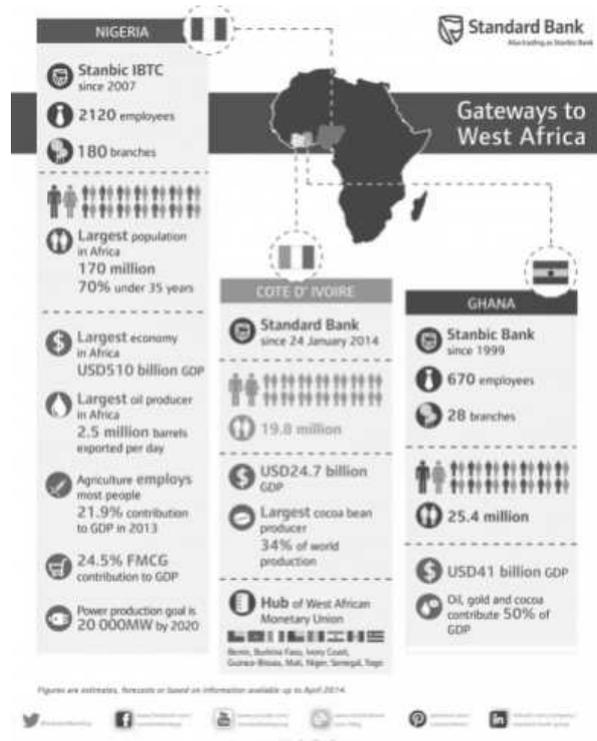
In West Africa, the surge of regional players and multinationals into the region's finance, retail, FMCG, oil, energy and mining sectors, is opening up key economic opportunities for

Africa's fastest growing region. Foreign direct investment (FDI) flows to African countries increased by 5 per cent to USD50-billion in 2012 even as global FDI fell by 18 per cent, according to UNCTAD's annual survey of investment trends reported in 2013. FDI flows to West Africa declined by 5 per cent to \$16.8 billion, the report revealed. Of investment channelled to the two major oil-producing countries of the region, FDI to Ghana remained stable at \$3.3 billion, but inflows to Nigeria declined by 21 per cent to \$7.0 billion, accounting for much of the diminished flows to the region. However, Nigeria is reacting by liberalizing its power sector, with the state owned distribution and generating companies sold into the private sector in October 2013. The sector is poised for substantial investment pending the first five year regulatory review which will be announced in the near future.

This review will have to balance the need for investment to drive better efficiency and reliability of service against the price the sector will be allowed to charge consumers. But if the price is investment conducive and correct incentives are put in place, rapid improvement should be expected over the next 2-3 years.

While natural resources are still the mainstay of FDI flows to Africa, FDI in consumer-oriented manufacturing and services is beginning to climb, reflecting the growing purchasing power of the continent's emerging middle class. Between 2008 and 2012, the share of consumer-related industries in the value of greenfields investment projects in Africa grew from 7% of the total to 23%.

These encouraging trends bode well for regional integration around infrastructure investments. The general sentiment



around infrastructure in the region is one of unprecedented collaboration. Accordingly the continent's infrastructure projects over the next decade or so are set to be even more co-operative. Launched in 2010, the Programme for Infrastructure Development in Africa (PIDA), headed by the African Development Bank (AfDB), aims to implement infrastructure projects of \$68 billion by 2020. These projects are all aimed at galvanising Africa's economic development by removing the infrastructure impediment. The areas of critical interest in African infrastructure are roads, railways, ports, water and energy.

For the Pan-African agenda, the development of cross-border projects, such as transport corridors and transnational water and power supplies is required. An estimate of Africa's current road coverage is 34 percent, while its electricity access average is at only 30 percent. Regional collaboration is particularly critical to landlocked nations, which can pay almost double to export their goods compared with coastal nations.

Some of the top 10 infrastructure projects currently underway or under

negotiation in Africa include the Abidjan-Lagos Motorway. It will connect five West African countries (from west to east they are the Ivory Coast, Ghana, Togo, Benin and Nigeria) along a predominantly coastal route. The total cost of the motorway is expected to be \$8 billion, and construction should begin in 2015. Ghana, Africa's second largest gold producer, is launching a range of large-scale infrastructure projects, aimed at boosting the economy's growth potential. These projects address the large infrastructure gaps present in the economy, a focus point of the Ghana Shared Growth and Development Agenda (GSGDA).

Nigeria, Africa's most populous country, is one of the continent's strongest agricultural markets, enjoying reforms and capital investment; Senegal is pinning growth on further exploration of its deep sea oil blocks; Ivory Coast is working with the International Monetary Fund (IMF) and World Bank

to implement technical and institutional reforms to reduce the electricity sector's burden on the budget and in Cameroon the government's long-term development strategy aims to address shortfalls in transport and energy infrastructure.

Standard Bank looks forward to playing its part in helping drive West Africa's economic success as it continues to expand and develop its franchise in West Africa, as demonstrated by the recent opening of its representative office in Abidjan in Cote d'Ivoire.

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Standard Bank

Also trading as Stanbic Bank

Managing power sector reform and regulation

13 - 17 OCTOBER 2014

This five day course is aimed at managers and professionals in government, regulatory authorities, utilities, civil society and the private sector working in the electricity or water sectors.

The course is offered by the Management Programme in Infrastructure Reform and Regulation (MIR) at the UCT Graduate School of Business. MIR is a leading centre of excellence and expertise in Africa and emerging economies. The course is run in association with the African Forum of Utility Regulators and the Regional Electricity Regulators Association of Southern Africa.

Leaders, managers and professionals in infrastructure sectors around the world are facing new and complex challenges. State-owned, vertically integrated, monopoly industries are being restructured to improve

performance, and private sector participation is frequently on the agenda. New regulatory regimes are being put in place and reformed utilities need to deliver expanded and affordable services for the poor, while underpinning and supporting economic growth. This programme, focused on Africa's needs, exposes participants to the frontiers of international experience and to best practice in managing these changes and the new regulatory environment effectively. A number of case studies from Africa are presented. Participants will also be given a thorough grounding in the fundamentals and practice of economic regulation of utilities.

For further information and online applications go to www.gsb.uct.ac.za/e.asp?c=739.

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FULL COLOUR THINKING



Brainwave stage submission invitation

The Green Building Council is hosting their annual Green Building convention which features a brief (10 minutes) speaking opportunity to interested parties on their 'Brainwave Stage'. As the name suggests, this 'smart' stage is modelled on Pecha Kucha and TED talks and is a platform to disseminate fresh ideas that are challenging the way we do business and contributing to thought leadership in the green building and sustainability industry making this a very well-received convention activity.

The convention is set to take place from 10 – 12 September 2014 and would like to extend an invitation to academic role-players to share their research in accordance with this year's focus – 'It's time for Africa, bringing it home'.

On a more intimate stage in their exhibition hall, Brainwave speakers have ten minutes to convey their thinking. If researchers have something they would like to share, they are to submit a proposal to them and they will make the necessary contact. The deadline for submissions is Friday August 1st 2014.

At the convention, they plan to challenge both local and international professionals to ensure valuable and meaningful sessions to gain pioneering insight for the sustainable African context.

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GREEN BUILDING CONVENTION
10-12 SEP 2014 • CAPE TOWN



Principal Sponsor

Innovate the Cape

Innovate South Africa has had an exciting year so far preparing for its next group of finalists for Innovate the Cape. This year they have expanded to running a national competition called innovateSA. They hope to involve more high schools students from around the country to help them solve local challenges through innovation.

As a programme in the World Design Capital 2014, they recently launched a crowd funding campaign to help support more of their finalists and increase their operations.

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- *Contact: Rochelle Alexandra*
International Marketing Co-ordinator
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Cape Town International Conven- tion Centre, Cape Town, South Africa

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E-mail: Kirsten@windaba.co.za

3 - 31 JANUARY 2015

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