

Sustainable Energy Solutions for Southern Africa

Powering Growth and Prosperity

A Summary of the High-Level Roundtable



Prepared by

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8 July 2015, Park Place, Johannesburg

Co-hosted by The Brenthurst Foundation, ICEX (the Spanish Trade Development Institute) and the Konrad Adenauer Stiftung

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Published in August 2015 by The Brenthurst Foundation

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Layout and design by Sheaf Publishing, Benoni.

Introduction

The shortage of reliable and affordable energy is one of the biggest constraints on economic growth and prosperity in Africa. Only 20 per cent of the African population is connected to power distribution grids. The continent lags far behind all other regions of the world in electricity generating capacity. Even Africa's most advanced economy, South Africa, is likely to experience energy 'crises' for years to come due to poor planning and inadequate investment. And yet the continent's most populous country, Nigeria – three times the size of South Africa in population – generates only a tenth as much electricity.

For all this, Africa has enormous untapped energy resources. To mention only one, hydro-power in Africa is only at 20 per cent its potential, while in other regions of the world it's above 75 per cent. This seems to be the time to unlock Africa's power generation and distribution capacities and add to the region's improving economic performance. Investments in Africa's energy sector have risen sharply in recent years following three decades of little or no growth. This is evident across the energy picture, from new coal-fired power stations, oil and gas finds and nuclear power agreements to wind turbines, solar and hydro-power installations.

The Economist recently speculated that 'Africa has the potential to jump from being the world's electricity laggard to a leader in renewables'. Yet such enormous opportunities will not be realized unless governments and private sectors in Africa address serious challenges in capacity, bureaucratic effectiveness and leadership. And there are also grave concerns around environmental impacts and the long-term

wisdom of some of the energy policy choices and priorities of African governments.

The Southern Africa region, in particular, is at a crossroads and thus needs to secure good policy making at national and regional level, improved local and international private investor participation and adequate access to funding.

This was the backdrop and inspiration for a one-day High-level Roundtable in Johannesburg, co-hosted by the Brenthurst Foundation, ICEX (the Spanish Trade Development Institute) and the Konrad Adenauer Stiftung. Entitled 'Sustainable Energy Solutions for Southern Africa: Powering Growth and Prosperity', this Roundtable examined the current challenges and opportunities in Southern Africa as the region seeks to greatly enhance electricity generating capacity over the coming decade.

Drawing experts from government, the private sector and academics – both African and non-African – this Roundtable assessed the current energy picture in the region and examined where the future emphasis and investment – by whom, where and in what parts of the energy picture – is likely to generate the most sustainable development across the region.

In preparation for the Roundtable, a background paper by Professor Oliver Ruppel of the University of Stellenbosch was commissioned and circulated in advance to participants. It highlighted *inter alia* the numerous links between energy and poverty. It will be published in our Discussion Paper series along with this summary of the major findings and issues to emerge from the Roundtable.

Lessons from South Africa's Recent Experience – An Energy Role Model Under Strain

There was a strong consensus at the Roundtable on the need for a common pathway forward and a 'holistic and regional solution' to South Africa's current power crisis. South Africa still boasts the largest ratio of population power access in sub-Saharan Africa and, compared to the rest of the region, highly-sophisticated energy infrastructure. Though,

after nearly three decades without significant investments in its power generation capacity, South Africa is plagued by scheduled blackouts, its net power exports to neighbouring markets have nearly dried up and decision-makers appear trapped in crisis management.

Not surprisingly, much discussion centred on the powerful state-owned utility, Eskom, which monopolises generation and transmission. Power distribution, however, involves a number of different entities, including municipal administrations – many of whom are in deep financial straits and thus struggling to cope with distribution demands. Many questioned how some of the municipalities could perform so poorly in their distribution function without censure from the regulator or the national authorities for so long. Several participants also emphasized the need for a mindset change, not least the mentality of ‘energy projects for jobs’. This mindset has contributed to several potentially significant interventions in South Africa’s energy sector not going through because the immediate job-creation dividend was not great enough. Most participants agreed that, instead, South Africa needs a laser-like focus on energy production and availability. Also highlighted was the damaging fixation with having a positive cash flow from Eskom to finance other government projects, hence the deferred investments. Grave doubts were also raised about the financial capacity of Eskom to invest in transmission and grid expansion (its recent plans for 50 billion rand investment have been put on hold).

It was noted that the expansion of the Independent Power Producer (IPP) program (NGSA decision on April 2015) to coal, cogeneration and gas is a significant step forward, but many advocated for additional measures to follow suit to allow Eskom to enter into joint ventures with private investors for refurbishment of old power stations and transmission lines. The IPP renewable energy program has created more

than 50 000 new jobs – four times more than construction of the Medupi and Kusile coal plants, and without any taxpayer funding.

Key questions

- How can South Africa encourage not just large-scale operations but also SME development to further enhance local community benefits via the power supply chain?
- What scope is there currently for private investors to come in through concession schemes, similar to the IPP, or under Public Private Partnerships, with Eskom?
- Is enough being done in policy formulation to differentiate between home usage solutions (eg small-scale renewable) and industrial usage solutions?
- What are the most affordable solutions to electrify rural areas – small and local IPP?
- How can bilateral investor treaties on energy be restored, without compromising BEE etc?
- Would an unbundled Eskom be able to go out and invest in other countries? Or at least, when its financial predicaments are over, provide management and technical support to smaller neighbors’ utilities?

Energy efficiency is key during crisis. Move from building and implementation and focus on efficiency.

The energy sector is undergoing change everywhere – from mindset and business models, the role of public and private sectors, new dynamic actors, new markets and technologies especially for transmission, storage etc.

Regional Challenges, Opportunities and Solutions

Energy could be a potential catalyst for much deeper regional integration in Southern Africa. There was a strong consensus that there is huge potential for power generation in SADC, from hydropower (especially river systems in the DRC, Zambia, Zimbabwe, Angola and Mozambique), coal, gas, wind (potentially, although more wind data is required), solar and biomass. Also generally accepted was that energy nationalism was anachronistic; despite the huge

differences and variations between the countries in the region, regional solutions are nevertheless the way forward. SADC had a strong advantage in that it already has the Southern Africa Power Pool (SAPP), which manages wheeling and purchase agreements in the Southern African region and it works well. As a region, Southern Africa needs to access global finance at competitive rates to invest in energy projects. Big regional projects need a lot of money, but

the international financial institutions (particularly, IBRD, AFDB, and EIB) have a special appetite for these kind of projects. In all this, cost is critical. The region needs cheap power and thus there is an urgency to determine where in the region it can be drawn and create the best conditions for its access to regional markets. Yet a number of constraints were highlighted:

- Sharp variations in population density (a constraint for provision of on-grid electricity).
- Paucity of information and data (on options, cost of new technology, etc).
- Lack of predictability of regulatory environments for investors.
- Lack of confidence in the Rand (meaning that, as Eskom is by far the main user of power in Southern Africa, and as Eskom will only sign PPAs in Rand, it is difficult to secure outside investors as the Rand weakens).

On the issue of the Southern African Power Pool (SAPP), and the dominant role played by Eskom, several points were highlighted:

- Is the Southern African Power Pool (SAPP) playing as effective a role as it could be?
- Do the terms under which Eskom is allowed to sell into other countries need to be reconsidered?
- Are power operators truly convinced about the need for deeper regional integration?
- What opportunities exist for off-grid-generation and local disaggregated grids, especially in sparsely populated areas (rural Botswana)?
- Theoretically SAPP has a mandate for regional strategies – but do all national governments understand and respect this mandate?

From a banking/financial perspective, large hydro projects (eg Inga in the DRC) have potential to attract major financing.

It will take a while for South Africa to recover from the current crisis, so we must re-look at the region as provider of alternatives to coal power.

Level of knowledge on energy issues in the region is low – we need more conversations like this Roundtable.

Growth Through IPPs?

In some respects, South Africa has a good story to tell in terms of its renewable energy IPP program, as many of the participants observed. The IPP program has decreased tariffs, the cost of bidding, introduced new players and entities into the market, has been transparent and competitive, and has reached its targets.

Spain is a major partner in South Africa, with more than one-third of the IPP renewable energy market share. Spain has also given technical assistance to design and develop the IPP program.

Unfortunately, however, the IPP project has been used to try to achieve social development but that is not its main objective, which was to try to increase the energy mix.

Key questions

- What is required to further liberalise the IPP market?
- Has the momentum of the early successes in the IPP renewable energy program stalled?

- How can we encourage the contribution of utilities in PPP schemes, if not with capital then with their long-standing experience at management level?
- How can we simplify regulatory frameworks around IPP, particularly to provide better access for smaller investors? (Currently, there are about '28' different departments that need to approve investors and contractors; Nersa has the tariff approval and licensing role, but the IPP Unit, formed by the Department of Energy and National Treasury, designs and manages the program.)
- How can the IPP program be geared to better help locals and municipalities?

Getting the Energy Mix Right

There was a strong consensus that reliable energy was all about getting the energy mix right. All options merited serious consideration, but all agreed that limiting the long-term use of coal made sense economically, environmentally and otherwise (though it was still worth investigating clean coal options).

For many, gas will become increasingly important for the Southern African region as it will contribute to diversifying the energy mix and is a firm power complement to renewables. There has been much reliance on gas in Mozambique and in the coming years demand for gas will grow, and not just from Asian investors who have been first movers in this sector. LNG supply is in surplus in world markets and will be even more after 2016, when USA LNG exports from its eastern coasts are available.

Nuclear power is, for some, the best source of base load power for South Africa in the future. Its proponents at the Roundtable argued that its advantages are clear: safest, most sustainable (uranium and thorium are abundant); reliable; you can situate it where you like; smallest waste with very little carbon emission; and South Africa has considerable extant nuclear expertise. While some participants disputed the 'case for nuclear', it was generally observed that timelines are a significant concern: it takes more than a decade to develop a new nuclear power plant, in a best-case scenario without technical setbacks, which will do nothing to resolve South Africa's current energy crisis.

The combination of renewables (hydro, wind and solar) and gas, supported by the development of new

designs and technologies which could have a major impact in the short- to medium-term, was advanced by several participants.

Key questions

- How can we better accommodate the needs of SMEs, who could prove very effective at municipal grid and off-grid units, as well as waste management, provided competitive procurement legislation was put in place?
- South Africa could raise the money for nuclear plants but currently it's dealing with financial backlogs and serious concerns over the vast potential for corruption around the muted deals (eg Russia) – does South Africa have the fiscal and governance capacity at present?
- Has sufficient attention been given to power storage options and the technology required?

Sustainable solutions require us to consider everything – we shouldn't exclude things a priori from the energy mix.

In terms of getting projects off the ground efficiently and effectively, there is much to learn from other regions – and the successes and potential of renewables is a key takeaway.

Capital and technology are available, but technical skills are in much shorter supply. We need to think about human development and skills transfers and training.

Smart Grids and Smart Cities

Smart grids provide devolved solutions. They allow for more controls and there is better reliability and availability. The impact on consumers – managing consumption, cost, usage time and putting in place the idea of smart meters. Smart grids also help with distribution. If they are not connected to the grid then they are connected into other systems (eg roof top solar). In terms of storage, it was argued that they could push

renewables to the next level of affordability (in a community or estate, you could have community storage initiatives forming a network storage of sorts).

It was also noted that smart grids are a means of becoming intelligent with the use of new facilities: people can manage what they consume, store their energy and use real time pricing.

But smart grids need smart cities, where the municipality controls the distribution networks. This requires smart service delivery that is reliable and cheap and considers waste services, waste management and recycling. Within the smart city, smart, on-time and energy efficient transport services are a must.

Key questions

- Will people be able to afford smart grids and smart city initiatives?
- What are the socio-political consequences of smart solutions?

Let's give people an opportunity to manage what they use.

Some Tentative Conclusions

- The South African power crisis has brought the SADC region into structural changes, with a much stronger focus on regional solutions to satiate power needs. Both top-to-bottom solutions, around a reinforced SAPP with an Integrated Resource Plan (IRP) design and development mandate, and bottom-up initiatives, through regional projects supported by abundant IFI financing, are necessary.
- Debates around an optimal energy mix have to take into account regional and local scenarios, to result in improved policy-making.
- Assistance to smaller SADC countries to upgrade their sector investment frameworks and digest South Africa's changed role into a major power market opportunity should allow for bigger and commercially-viable generation and transmission power projects.
- Decentralised local power systems and off-grid solutions for rural areas are needed to complement large-scale regional and national projects.
- SMEs have a growing role, both at these local market niches and as beneficiaries of localisation, cluster initiatives and added value chain policies.
- Smart grids and smart cities are the spatially integrated version of demand management programs, which should operate at all administrative levels.

In conclusion, each of the above presents opportunities for further – and more focused – discussions between the Roundtable participants and other stakeholders in South Africa and the region. The hope is that our initial expansive discussion around sustainable energy solutions for Southern Africa at the 8 July Roundtable, will be the first step leading to concrete interventions that will help power economic growth and prosperity in Southern Africa.