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South Africa's Alternative Energy Sources

1. Introduction

The National Development Plan of 2012 noted that South Africa has taken major steps to formulate and implement measures to adapt to and mitigate climate change. These steps are informed by the country's commitment to reduce its carbon dioxide emissions below a baseline of 34% by 2020 and 42% by 2025. This commitment is expected to present challenges for the fossil fuel-dependent economy, and will require the design of a more sustainable development path. There are differences of opinion on how South Africa should move to a low-carbon economy, at what pace, and how the costs and benefits should be apportioned. However, there are several significant areas where consensus has been reached.

One of the areas of agreement is that of immediately exploring alternative energy avenues to add more electricity to the national grid. One of the vehicles for this is the Renewable Energy Independent Power Producer Procurement Programme (REIPPP), which aims to take full advantage of South Africa's high level of renewable energy potential. It also aims to produce 10 000 Gigawatt hours (GWh)[1] of renewable energy in accordance with the capacity allocated to renewable energy generation in the Integrated Resource Plan (IRP) for the period of 2010-2030. There have been four rounds of submissions, the 4th round having been completed in August 2014 and approximately 60 bids have been selected throughout the process. The IPP procurement programme has been designed to contribute towards the target of 3 725 megawatts (MW) by 2030 and towards socio-economic and environmentally sustainable growth, and to activate and stimulate the renewable energy industry in South Africa[2].

2. Alternative Energy Roundtable

On 27 November 2014 the CPLO held a roundtable discussion on Alternative Energy Sources in South Africa. Ms Holle Linnea Wlokas from the Energy Research Centre at the University of Cape Town; Chairperson of the South African Photovoltaic Industry Association (SAPVIA), Mr Davin Chown; and Dr Manfred Dutschke from the South African Renewable Energy Training Centre were the speakers. Davin Chown commenced, calling for honesty and collaboration concerning the energy predicament in which the nation finds itself. He highlighted the importance of taking advantage of 'free' (renewable) fuels, as they are not subject to the volatility of fossil fuel prices, which adds risk to the economy. Mr Chown called for decentralised, dispersed energy generation, where energy is generated closer to load centres, thus enabling a decrease in transport costs and bringing economic benefits to local towns as IPPs become a local resource. A decentralised system promises energy security, with losses being limited even if one turbine or a few are off-line; as opposed to the case when a major power station goes off-line, as happened with the Majuba silo collapse. Mr Chown also shared insights on some existing renewable energy projects, including a wind farm in Jeffery's Bay, and the solar parks that have just been completed and now feed into the local grids in the Northern Cape, Bloemfontein and Rustenburg. It is worth mentioning that, in assessing IPPs, it should be borne in mind that most of the 1st phase REIPPP projects only came to fruition in 2014, so it is too early to measure the returns.

Holle Wlokas shared some of her research on economic development for local communities near renewable energy projects. She found the following:

- A lack of guidelines for design, implementation and co-ordination of economic spending in local communities;
- A lack of development expertise in project selection committees and project companies;
- That monitoring and reporting requirements apply solely towards monetary spending and not the impacts thereof;
- Unequal geographical distribution of projects and development spending encumbering on the success of the program and;
- Transparency would go a long way in helping local communities understand more about renewable energy and the kind of impact it can have on the nation.

Manfred Dutschke introduced the South African Renewable Energy Technology Centre (SARETEC), a national centre that delivers specialized training, education and services to the renewable energy industry, and which aims to lead the African continent into a more sustainable future. The creation of a renewable energy curriculum tailored to industry's needs is the institution's core business. One of the qualifications offered by SARETEC is that of becoming a wind turbine technician. These technicians inspect, diagnose, maintain, and adjust wind turbines, resolving electrical and mechanical malfunctions. They are able to work at heights in all-weather conditions and for extended periods. Dr Dutschke stressed that proper training and safety precautions are of utmost importance in the installation of wind turbines and solar parks because these tasks involve manoeuvring at great heights.

The spirited discussion that followed saw questions about the disappearance of water turbines in the KZN region, as well as inequality and affordability issues surrounding access to electricity in remote regions of South Africa. The need to increase the number of women being trained in the renewable energy sector and the fact that the gender aspect of training in this field is not incentivised was another contentious factor. Electrician and installer training should be further encouraged, and a move towards demystifying maths and science must be made. Concerns about how the current IPPPP structure prevented areas such as Limpopo, with its abundant sunlight, from optimally partaking in solar projects were raised and debated[3].

3. Closer to Home

The environmental movement and the science of ecology deal with the way in which the environment has often been exploited by virtue of the anthropocentric view that humans are the central figures in the environment and that their needs are to be met first and always, regardless of the cost to the environment. Ultimately, the eco-centric view is often ignored and acknowledgement that the environment is a living organism that requires protection is often second on the list of priorities, with consumption at the top.

In line with this, there is a need to understand that our use of energy must focus not only on the self-centred needs of humans; and on the 'needs' of those who over-consume the planet's natural resources. The harmful effects of the use of coal, and the reality that our over-consumption is exhausting the limited capacity of Eskom, mean that alternative energy sources have to be found.

Most of the initiatives for the production of alternative energy have come from the state and the NGO community – for example, solar, wind, hydrothermal energy installations – but there are all sorts of ways for individuals to benefit. Apart from becoming more environmentally conscious, there are the numerous products available that use solar energy – heaters, geysers, light bulbs and battery chargers, to name a few. At present, many of these products cost more than their traditional mains-connected counterparts, which makes it very difficult for people who live below the poverty line to even consider using alternative energy methods. Alternative energy in the home is therefore often restricted to middle-income homeowners as they have the means to access these products. On the other hand, some alternative energy products, such as solar cookers (which use reflection to focus the sun's heat on a pot) cost less than a conventional oven.

South Africa has adopted certain large-scale initiatives such as the Gauteng Department of Human Settlements' project to build subsidized housing that is eco-friendly and uses alternative energy sources. Energy efficient products are fitted into houses so that in the end, the cost is easier to bear for low-income earners, and the environment sustains less damage. In Bothlabela-Alexandra, government developed 520 rental units with communal ablution, solar water geysers and reduced lighting in public spaces. There is also a storage facility for storm water which will be

used to irrigate gardens using a water pump supplied with electricity from a photo-voltaic solar panel[4]. With projects like these, the Department has had to increase its spending, as the cost of a subsidized house has now gone from R63 000 to R110 000[5] due to the steps taken to make the house energy-efficient. Nevertheless, this is a good example of a government initiative that will ease the burden of high electricity costs for the low-income earner.

4. Conclusion

The roundtable discussion illuminated some of the inner workings of endeavours to effectively add alternative energy to the mix. Issues such as the influence of powerful lobby groups with interests in fossil fuel technologies; the absence of co-ordination and capacity at policy-making level; and the observation that social priorities other than the deployment of renewable energy technologies are given preference, also resurfaced. The national quest for a low carbon-intensive energy source that can adequately meet the country's energy needs is of paramount importance, for the implications are far reaching. In the meantime, it is the responsibility of every individual to find ways of being efficient in their utilisation of power – sooner rather than later.

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[1] A Gigawatt is a unit of electrical energy equal to one billion (10^9) watt hours, one thousand megawatt hours.
[2] Department of energy. (2013). Integrated Resource Plan For Electricity (IRP) 2010-2030. http://www.doe-irp.co.za/content/IRP2010_updatea.pdf
[3] CPLO. (2014). The state of Alternative Energy Sources. Presentations at the CPLO roundtable discussion held on 27 November 2014.
[4]Housing, Settlements & Infrastructure in Southern Africa. (2014) Gauteng's Eco housing http://www.gpf.org.za/Portals/0/Docs/2014/HISA-APRIL-2014-p1-44.pdf
[5] Housing Settlements and Infrastructure in Southern Africa (2014). Op Cit.