WITS SCHOOL OF GOVERNANCE

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SA Future Economy

Policy Brief:

Energy Transition for Post Covid-19 South Africa

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Key Recommendations

South Africa needs to separate the energy sector to its various segments and deal with power supply differently in the diverse segments. For example, solar and other forms of power generation can credibly and reliably deal with households and commercial outlets power needs. By relieving Eskom from roughly 40% of national demand which comes from households and commercial outlets, Eskom can then focus on baseline energy and ensure that its power supply is reliable and cost-effective. Critically, with rapid developments in battery and energy storage technologies, the very notion of "baseline" generation needs careful re-examination.

With appropriate and competent planning and coordination across SOEs and the banking sector, within 24 months, it is possible to change the dynamics of South Africa's energy sector so as to make it a pivotal player in promoting:

i. *Industrialisation via the manufacturing of the required accessories for the solar sector;*
ii. *Large scale investments of over R5 billion within the first 12 months;*
iii. *Job creator with a large potential for employment creation;*
iv. *Opportunities for upskilling, reskilling of many young job seekers;*
v. *A considerable improvement in aligning the country's energy sector with the emerging global trade paradigm focused on environment sustainability- something that is critical for underpinning SA's export competitiveness over the next decade.*
vi. *A more objective and feasible notion of "just energy transition" with a view to optimize economic development and social welfare.*

There needs to be careful coordination and appropriate funding of the required manufacturing operations for South Africa to further increase growth. When renewable sector manufacturing is ramped up, through solar panels and all related accessories, the country has much potential to generate growth and create jobs. Importantly, such enterprises and their associated benefits could be spread across the land. Seen in this light, this sector has considerable potential for underpinning the growth revival.

Rapid liberalisation of the power generation sector is a must. The generation technologies have made it feasible to adopt solar energy options for households and for the majority of small and medium production to enterprises and commercial firms. This has the potential to create large number of jobs in manufacturing and service/maintenance segments of this industry. The manufacturing segment of this industry relates to the manufacturing of solar panels, cabling, and all related accessories.

To maximize impact, Eskom and the Industrial Development Corporation of South Africa (IDC) need to collaborate with regard to coordination and policy consistency for the establishment of 3 to 5 manufacturing outlets for the production of solar panels and associated fittings. This is a critical piece of an integrated energy policy.

Technically, the production of such items needs to precede the policy transition. If not, there is every risk that a material and avoidable pressure on the balance of payment would arise due to a sharp spike in imported items. At the same time, opportunities for industrialisation and job creation in this segment of the market would be lost for good. If liberalisation of the energy generation sector is not suitably coordinated with the prior establishment of the associated industrial production, all the benefits of such a liberalisation in the form of job creation, GDP growth, and a more stable macroeconomic environment would be lost to the country.

The financial sector, specially the banking system need to provide the required asset financing facilities to enable willing households, manufacturing enterprises, farming and commercial firms to install solar and other generation and storage facilities.

1. Introduction

A lack of adequate and reliable electricity has crippled South Africa's economy for at least the past decade, and has thus been a key contributing factor to the weakened state the economy was already in when the effects of the Covid-19 pandemic took hold. As South Africa emerges out of the Covid-19 induced economic crisis, the most strategic objective would be to relieve the economy and its growth path from the stranglehold of access to sustainable and competitive power generation. Unless the energy constraint issue is resolved in a credible and effective manner, the country will fail to revive growth and create jobs in the short term, and will continue to underperform its potential in the medium to long-term.

South Africa's transition to renewable sources of energy will not only form a major and important part of the country's ability to generate sufficient and competitive energy, but will also ensure a meaningful move towards environmental sustainability. This requires the right policies to be put in place and executed.

The Importance of Electricity to the South African Economy

Electricity is vital to modern economies, and empirical evidence suggests that it has a material and positive causal effect on economic growth and development – this is also the case for South Africa. In addition, as economies develop and average per capita incomes rise such as in South Africa's case since the advent of democracy, there is an inclination to use energy carriers that are of higher quality, more productive, flexible and cleaner, particularly electricity. Studies highlight that electricity provides more advantages over other energy carriers, allowing for more productive organisation of

manufacturing, while there are various high-value uses for which electricity has no substitutes such as telecommunications and computing. This is particularly significant in the age of 4th Industrial Revolution (4IR) and the rising digitalisation of the economy.

Yet, despite commendable progress made in electrifying the nation especially since 1994, there are still poor households that are without electricity, and this lack of access exacerbates inequality of the quality of life of the citizens. There needs to be a concerted effort to ensure that all households have access to reliable and affordable electricity so as to get closer to attaining the NDP 2030 goals of reducing poverty and inequality, while at the same time supporting the country's productive capacity.

Consequences of Unreliable Electricity Supply

South Africa still relies heavily on Eskom for electricity supply (over 90%), and the utility company's many challenges especially since end of 2007 have had a profoundly negative effect on the South African economy. In addition to the substantial financial burden the state-owned entity (SOE) has been placing on the fiscus (Budget 2020 indicates that over the past 12 years, the state has allocated R162 billion to financially distressed SOEs, with the bulk of it – 82% allocated to Eskom), Eskom's infamous scheduled power cuts (normally referred to as "load shedding") have become a major disruptor of economic activity. At the same time, the inadequate power supply has been a major source of the plunge in South Africa's business confidence, which in turn has negatively affected investments.

Quantifying the impact of load shedding on the economy is a complex and multi-faceted exercise in terms of economic impact, social impact and the effects on the country's brand and governance competency. Nonetheless, analysis showcases that the power cuts have an adverse effect on economic growth, and that the impact varies depending on the severity of the power cuts, i.e.: the more severe the load shedding, the worse dampening effect on GDP it has (SARB, 2019). Moreover, frequent and intense load shedding has been cited as one of the significant contributors to the dip in business confidence during surveys.

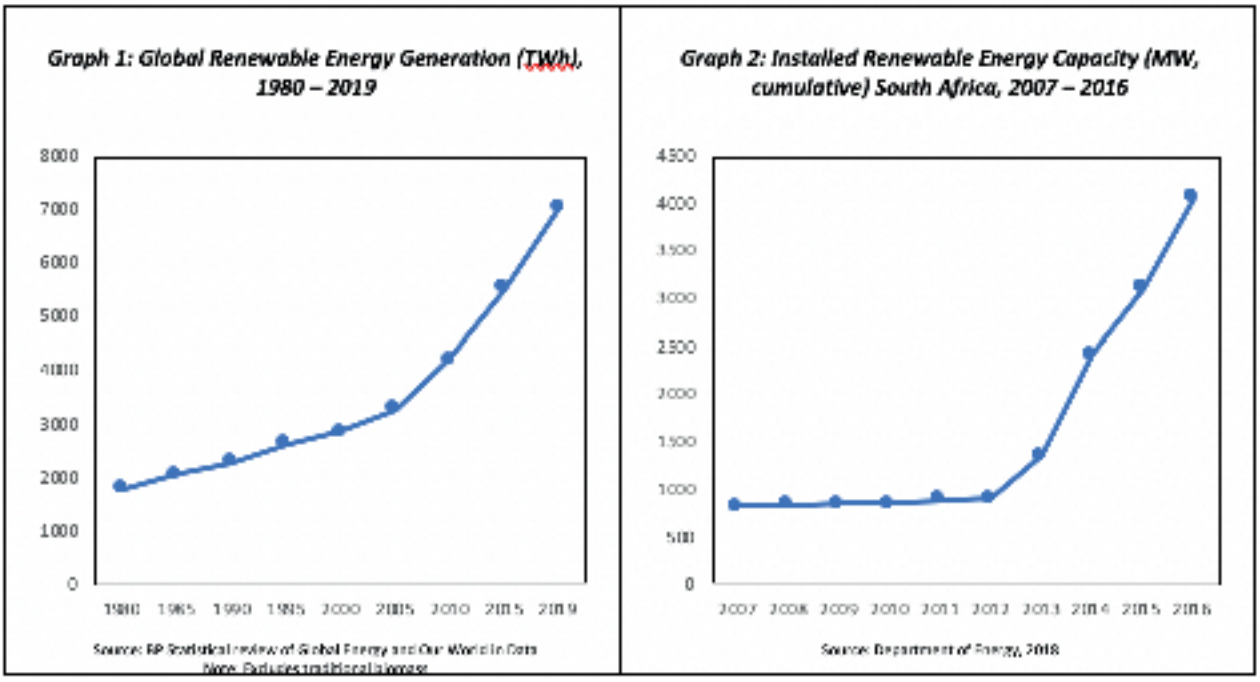
Finally, even though the share of gross value added (GVA) to the total economy coming from the 'electricity, gas and water' sector is relatively small in comparison to most other sectors, its influence on other sectors is significant. Studies suggest that electricity's production multiplier on sectors such as manufacturing is significantly greater than one. In effect, this is an enabling contributor to all other sectors within the economy.

Environmental Requirements and Technological Changes Taking Place in the Electricity Sector

As the world still grapples with the effects of the Covid-19 pandemic, there have been calls for governments to invest further into renewables as part of the recovery that will ensure more sustainable economies. Overall, the drive towards more renewable sources of energy is intensifying globally,

with increasing investment going towards these technologies. This too is the case for South Africa where the Department of Energy has announced that the goal is to improve South Africa's energy mix by having 30% clean energy by 2025, all within a transformed and sustainable energy sector. This is in line with the National Strategy for Sustainable Development and Action Plan (NSSD 1), 2011 – 2014. Priority 5 of the Action Plan states that the priority is to cut the country's greenhouse gas emissions in line with targets approved by Cabinet, with emphasis particularly on the energy sector as it accounts for over 70% of the country's emissions.

Renewable energy technologies are those technologies that provide energy, making use of energy sources that are as benign as possible on the environment and do not exhaust the earth's natural resources. Overall, global demand for energy has grown with the advancement of economies and increasing population. At the same time there has been a shift in the energy mix – with movement more towards sustainable sources. Graph 1 illustrates the rapid rise in the global generation of renewable energy, while Graph 2 shows the cumulative increase in installed renewable energy in South Africa, which has also experienced a more rapid increase since 2013, i.e.: following the introduction of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) by the Department of Energy in 2011.



In addition to the growing need for environmental consideration regarding energy generation, improvements in technology as well as the decline in costs of renewables have been the driving factors in the growth in renewables. To illustrate the extent to which the installation costs of renewables are declining – in 2019, new renewable power capacity added (excluding large hydro) was 20GW more than that in 2018. Yet, investment in renewable energy capacity was only 1% higher than in 2018 (Frankfurt School-UNEP Centre, BloombergNEF, 2020). This indicates that due to rapidly falling renewable energy technology costs, the marked growth in the sector is being achieved with less investment.

In South Africa, led by the Department of Energy, the Integrated Resource Plan (SA's National Energy Plan) is intended to drive all new development of generation capacity. Up to 2016 and in four separate ministerial determinations, the Minister had determined that 14 725 MW power from renewable energy be procured. The determinants have been implemented in rolling bid windows (BW). During October 2020, the Minister gazetted amendments to the Electricity Regulations on new generation capacity, which are to open a number of BW including Bid Window 5 of renewable energy. Of the determined capacity, over half of the total 11,813 MW of power will be generated from renewables.

Key Macroeconomic Considerations as the Country makes its Energy Transitions

South Africa has been largely self-sufficient in terms of energy due to coal being the chief source of energy, and the country has an abundance of coal reserves. South Africa's energy sector is therefore not import intensive, and this dynamic has benefited South Africa's balance of payments. Throughout the implementation of the REIPPPP in 2011, government has sought to drive sustainability by encouraging local ownership and local manufacturing. This is important because having a strong renewables sector, manufacturing base will help South Africa's developmental goals and help to drive a healthy balance of payments. Besides availability of resources and prices, technological availability and expertise are other important factors to consider when making decisions regarding a country's national energy mix. So far, South Africa appears to have an advantage in manufacturing related to solar energy; the country's exports of solar (photovoltaic) PV modules have started offsetting their imports according to the Department of Energy (2018), meanwhile the Department of Trade Industry and Competition (dti) (2015) shows that local manufacturing of main wind turbine components is still limited, while the value chain in South Africa is dominated by global industry players.

Finally, there has been a significant rise in investments directed towards renewables globally. REN21 (2020) shows that investment in renewables in 2019 was three times that of investment in coal, nuclear and natural gas combined. South Africa, especially with its highly developed financial sector is well-placed to benefit from these funds for the development of its renewable industrial networks. Nonetheless, data from the Independent Power Producer Procurement Programme (IPPPP, 2015, 2017 and 2020) clearly indicates that although the initial growth in investment was robust, it eventually slowed down markedly on account of the slowing pace of the Programme. Investments increased by over R56 billion from R145.5 billion as at March 2015 to R201.8 billion in the programme, but increased by only close to R8 billion from March 2017 to June 2020. This points at the need to keep the momentum of the programme in order to ensure adequate investments in the sector.

Socioeconomic Benefits to be Derived from the Energy Transition

Better socioeconomic outcomes are expected from more electricity generated through renewable sources, which will especially benefit South Africa as it emerges out of the Covid-19 pandemic. The scourge of unemployment continues to plaque the country. Unemployment was still worsening pre

Covid-19 pandemic, with the unemployment rate having surpassed the 30% mark when it reached 30.1% in Q1 2020 following 29.1% during Q4 2019. Meanwhile 2.2 million people lost their jobs in Q2 2020.

Globally, employment in renewables has been rising, and similar trends have emerged in South Africa; only 2,545 individuals were employed in the sector during Q1 of FY2013/14, but this had increased to 31,207 of South African citizens employed in the construction and operation of REIPPs during Q4 of FY2016/17 (Department of Energy, 2018). An important feature of the renewables sector that could lead to a sizable positive impact on South Africa's socio-economic dynamics is the fact that, unlike the current electricity generation system dominated by Eskom and coal, which is highly centralised, renewable electricity generation has the potential for significant decentralisation. Because economic activity related to electricity generation can be spread more across the country, this means that those areas in which new generation capacity will be installed will benefit economically. Furthermore, jobs related to the sector will also be spread more evenly across the country, creating more employment opportunities in places that might have not previously benefited from the sector.

To revive the economy and also help create employment, President Ramaphosa has embarked on an investment drive, including an infrastructure investment initiative that has largely involved attracting private capital through initiatives such as the Sustainable Infrastructure Development Symposium of South Africa (SIDSSA). Selecting to invest in renewable energy infrastructure will not only assist South Africa in exiting the current economic slump, but is bound to lead to more sustainable economic growth over time, and generate the much-needed jobs.
Importantly, with the growing and irreversible emphasis on environmental consideration, global trade is moving towards a new paradigm where international competitiveness of any country's exports will be materially affected by the carbon footprint of the exporting enterprises. In this light, it is critical that South Africa effectively and proactively protects its mineral, manufacturing and agriculture exports in the medium to long term.

Impact on the Fiscus

South Africa's fiscal status has been deteriorating for the past decade, and the response to the Covid-19 pandemic has caused further and substantial deterioration. Eskom's inability to supply the country with adequate electricity and the resultant negative impact on economic growth, both before and following the pandemic, has had a profoundly adverse effect on the tax base. Secondly, the constant bailouts that government has provided the SOEs have had a direct negative impact on the fiscus. Diversifying South Africa's energy base further by including more renewable energy generation can lead to a positive impact on the fiscus through at least two channels. The first is by positively impacting economic growth and development and hence the growing tax base. The second is by the mere fact that investment in renewable energy plants is largely undertaken by the private sector. It has been shown that investments in the IPPPP programme have been funded through project finance, equity, and corporate finance (Eberhard and Naude (2017), i.e.: there is no

reliance on government funding.

Municipalities and Energy Transition

With Eskom responsible for the bulk of electricity generation and transmission in the country, municipalities are largely responsible for electricity distribution in their areas. The move towards more renewable energy generation would mean a shift in this generation to distribution dynamic. This will of course present both opportunities and challenges for municipalities, with challenges especially stemming from the fact that municipalities' income would be impacted. Given this dynamics, municipal tariff structures will have to be amended. Suggested solution include amongst other undertakings such as 'cost of supply' studies as required by the National Energy Regulator of South Africa (NERSA) in order to adequately set SSEG tariffs (Shumba, Radebe, Dippenaar and Euston-Brown, 2019), and implementing an energy charge as well as a fixed charge that would cover distribution costs (Sustainable Energy Africa, n.d.).

To further gain widespread support from municipalities, there has to be a focus on opportunities associated with renewable energy – opportunities that would help drive sustainable growth and development at local government levels. South African Local Government Association (SALGA) (2014) for one, shows that there is potential to increase municipalities' tax base through participation in renewables. Ultimately, with effort and the right policies, revenue from sales can be protected, while at the same time increasing economic opportunities for municipalities. At the same time, it is a reality that municipalities, much like all other service providers, need to restructure their operations, their revenue streams, and service delivery strategies taking the transformation in the energy sector as a permanent structural change.

Regional Energy Dynamics and Opportunities

South Africa's long-term prosperity is closely linked with the continent's development and integration. Despite the Southern African Development Community (SADC) efforts to increase energy security in the region through corporation via the Southern African Power Pool (SAPP), analysis indicates that the efficiency of the organisation has been limited. Montmasson-Clair and Bhavna (2017), for instance, show that the share of electricity traded regionally was only 14% during 2014/15 as opposed to bilaterally traded electricity at 86%. Major hinderances highlighted include those related to policies and regulations, inadequate infrastructure, while coordinated implementation is deemed inadequate.

South Africa needs to actively pursue opportunities to expand the regional energy pool, and many prospects are available. As an illustration of potential prospects: an immediate and much-needed opportunity is the case of establishing an energy-petrochemical complex between Angola and South Africa – this could establish a sub-continental hub of petrochemical and related industries. World Oil (2019) points out that South Africa, sub-Saharan Africa's largest refiner, has additional refining and petrochemical units planned, and as such, these would require crude oil and natural gas supplies that are not available domestically. Ultimately, this is an opportunity that would further drive regional integration while benefiting the region's power pool.

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