



Impact of Science Diplomacy in Privatization of Energy Sector in South Africa



Siphesihle Intelectual Manqele*

Introduction

The recent misgivings at South African sole electricity public utility company, Eskom, leaves everyone concerned on what South Africa should do for ensuring its return back to good old glory days. One of the methodologies was to rescue Eskom through full or in-part denationalization. Following this resulted in financial woes, which have triggered deliberation on the alternative viable approach in trying to solve conundrum of the South African state utility company, and the government is lately dealing with.

A 2016/17 report analyzing Eskom's financial position revealed that the State-owned utility was not generating enough cash from its operations and electricity sales to cover interest on its borrowings, which has been predicted to reach around R500 billion in the three forthcoming years. The utility company has been involved lately in a fight to counteract phenomenon through tariff hikes. However, it has been argued that a return to sustainability lies not in higher tariffs, but in eliminating unnecessary expenditure, reducing employee costs and extending short-term support to electricity intensive businesses at the risk of being forced to cut production owing to rising power costs (Creamer, 2017). An analyst at Eton Group Nicholas Saunders equates Eskom position as the position of using one credit card to pay off another. It also warns that there is a growing risk that government may have to provide future equity, or provide further debt guarantees.

The financial consequences of poor planning and management are pointed out as the causes underpinning protracted current financial trouble at Eskom. The unnecessary expenditure and

*Senior Policy Analyst, National Treasury, South Africa

implementation of political agendas have caused massive inefficiencies for the company that does not have the luxury of benevolence. To summarize the financial state at Eskom, employee head-count has increased by 45 percent since 2007/08, and has remained above 47 000 despite energy available for distribution being flat over the period. The total energy available for distribution, coupled with decline in sales, raises concerns regarding level of overstaffing at the utility. Although Eskom ended its 2016/17 financial year with a positive cash balance of R19.9 billion, but the situation would have been much worse if had not been supplemented through new borrowing of R51 billion. Therefore, this is a warning sign that the utility's debt repayment profile is poised to become massively unbearable in future.

Interestingly, this sustainability warning is also echoed in a macroeconomic scenario included by Eskom in its recent application to the National Energy Regulator of South Africa (Nersa) for a 19.9 percent tariff hike as from 1 April 2018. In one of the scenarios, produced for Eskom by Deloitte is if Eskom receives an 8 percent increase next year with the revenue shortfall being funded by raising additional government debt. The simulation shows that this would lead to a marked deterioration in government's Budget balance and that government's debt to gross domestic product (GDP) ratio would reach 75 percent by 2021 and 104 percent by 2030. By contrast, under the 19 percent tariff scenario, the debt to GDP ratio would stabilize at around 66 percent.

The essence of Eskom problems lies simply on the company being faced with a steadily increasing surplus supply of electricity, which is expected to grow even more over next five years; this would be compounded by erection of the new Medupi and Kusile power stations. The key financial problem that confronts Eskom is, therefore, stagnation in consumer demand, and a steady growing surplus of electricity. This growing supply would be produced by very expensive new power plants, which are financed through debt, and which need to be serviced. The total costs for Medupi and Kusile are R145bn and

R161bn, respectively; their completion is set to be in 2020 and 2022, respectively.

The financial consequences of poor planning and management are very clear in Eskom. A large surplus in electricity supply and much lower forecast demand over many years to come, together with mentioned financial issues, have hindered planned construction of new nuclear power stations for a very long time. With this, it is clear that a different model is needed to counter issues faced by energy utility company and the government as whole; hence, the exploration is of the idea of privatization for this state-owned entity.

Science diplomacy in energy sector privatization

Science diplomacy is defined as the use of scientific collaborations to address common problems and to build constructive international partnerships among willing sovereign countries. Science diplomacy can be furcated into three interrelated activities as follows:

- Science in diplomacy - Informing foreign policy objectives with scientific advice;
- Diplomacy for science - facilitating international science cooperation; and
- Science for diplomacy - using scientific cooperation to improve international relations between countries.

The envisioned privatization of state-owned South African utility or Energy Company falls within the ambit of the first form of science diplomacy, Science in diplomacy. This proposed initiative infers for government policy shift, and thus it requires proper research and feasibility studies to be undertaken in assuring proper decision-making and implementation. To contextualize, the above has exhibited lengths and depths of the SA utility company current financial problems, which has triggered a different approach in the sector. The question, therefore, is about how science diplomacy can be of use assuming the approach undertaken?

Science in diplomacy

The scientific advice, especially through partnering with foreign countries which have been in a similar situation, can advise SA on how better to go about in ensuring that no rush or haphazard decision is taken with regard to proposed denationalization. Moreover, such sought-out scientific advice can be further used in making sure that terms of reference (TOR) and other guidelines to implement the privatization process are all inclusive and cover all requirements that the government as shareholder wants and expects from a potential business partner poised to take over furnishing of this very important task of generation, transmission and supply of electricity to people of the country.

Countries to partner with

From the global perspective, the principal driving force of energy sector privatization reform as described by many authors comes from, poor performance of state run electricity sector and inadequate expansion of access to electricity service for population, inability of state sector to finance needed expenditures on new investment and or maintenance, the need to remove subsidies to the sector to release resources for pressing public expenditure needs, and desire to raise immediate revenue for the government through sale of assets from the sector.

The evidence points out that the energy privatization reforms have had largely been experienced in Europe, Asia and to a lesser extent to South America. Countries such as Chile, England and Norway are seen as pioneers of energy sector reform; these are the countries which initiated the move and successfully implemented it.

Nature of scientific advice

Privatization has been one way of helping government deal with its ailing state owned entities such the ones in the energy sector. However, sudden interest recently in renewable energy makes everyone wonder whether this still is a viable solution. Renewable energy is among

the top emerging technologies; being considered by to help address power and cooling costs, according to a Mortenson survey of corporate data center executives. Eighty-four per cent of respondents felt that there is a need to consider renewable form of energy, such as wind and solar, to manage future needs, according to the survey (Snyder, 2014: online)

Therefore, as much as privatization is a supposed approach of resurrecting ailing state-owned entities, it appears at same time a short-term solution to energy sector woes, hence an interest to renewable energy. There are a number of promising technologies, which will drive energy efficiency forward in the next few years; and renewable energy increasingly makes economic as well as environmental sense for the energy supply chain. With costs dropping and operating efficiency rising, renewable energy is rightly an attractive venture. For example, Snyder (2014) mentioned that cost for producing energy from wind has decreased by 58 percent and solar power by 40 percent in the past five years, and they would continue to fall, making renewable sources more cost-competitive compared to traditional fuel sources in many of the markets. At the same time, availability is steadily improving. Wind farms, for example, generate power 50 percent of the time lately, up from 35 percent in 2007. Therefore, consultation with countries or international agencies advocating renewable energy needs to be undertaken while implementing privatization process in the energy sector; as pointers are visible that the future of coal-generated electricity is certainly dwindling, and thus a strong energy mix looks to be a long-term solution.

Literature review on the privatization of the utility sector

In broader context, literature reveals a widespread existence of privatization in the energy sector, dating back as early as 1980s; identifying Chile, England and Norway as pioneers. However, it is starkly clear that science diplomacy was not

considered in such initiatives, perhaps, owing to causes of unsatisfactory outcomes on cited below literature reviews. It was all based on curtailing financial defiance's without integrating element of scientific solutions. Vlahinic (2011) alluded that privatization in developing countries of the electricity sector has been undertaken as a final modification step that was not necessarily connected to liberalization process and the most controversial one was due to the huge economic and strategic importance of electricity sector for national economy. The results reveal the relationship between privatization and improved performance, and it was clear for industries operating in competitive markets, but evidence was vague for natural monopolies, like electricity that operates in non-competitive markets.

Developing countries with high budget deficits, and high public and external debts when decided to privatize loss-making electricity enterprises to decrease imbalances, the results were far worse; resulting in output losses such as increased unemployment and high economic and social costs.

Consider the Southeast European countries as reference that have undertaken privatization in electricity sector with the same goal of encouraging foreign direct investment into the sector and for allowing market liberalization and increasing competition thereby optimizing efficiency. Hashini *et al.* (2015) talked on the lesson learned on Kosovo privatization in the energy sector. They said that success of electricity privatization was found mostly dependent upon the other prior sectors restructuring such as a transparent and effective regulatory framework and appropriate market conditions for investors to enter the market. Kosovo, Bulgaria, Romania and Macedonia have privatized complete distribution network, while Croatia, Serbia and Bosnia and Herzegovina are still in the initial phases of privatization process. All these countries are small economies, and they face significant economic constraints related to their limited market size and capacity. The systemic constraints are related to physical size of their electricity systems as they are too small to be divided up into several competing firms.

Privatization in South Africa

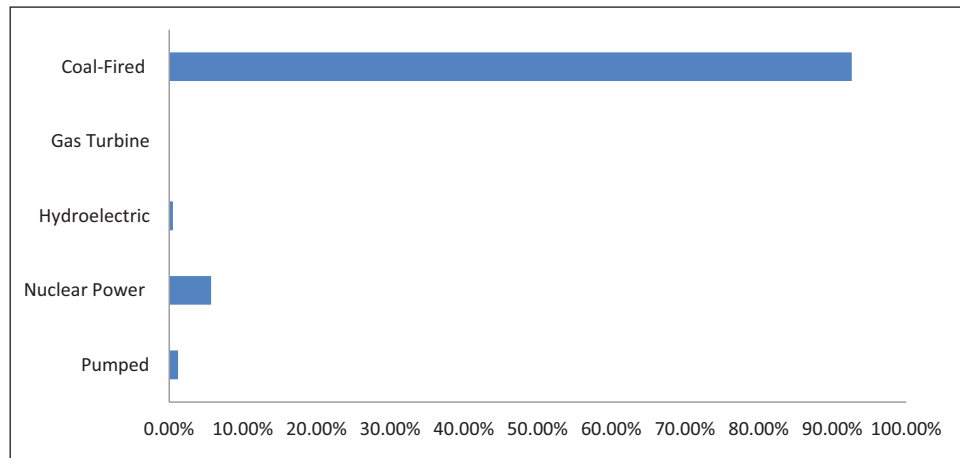
The idea of the proposal as outlined at the beginning is rooted on consistent difficulty of maintaining the financial health of the country's sole electricity provider. It has been mentioned that lack of planning and mismanagement of funds, inefficiencies, alleged fraud and lack of good governance are the issues compounding the financial woes in the entity. However, problems seemed too deeper. The prognoses of the state of affairs at the country's electricity provider are seemingly by privatization, but by proper diagnosis of the problem faced by the country as far as energy is concerned.

The other element that has been cited as an incremental factor into Eskom problems is the lack of proper energy mix in South Africa; for instance many countries have recently invested heavily on renewable energy as another option to energy or electricity generation. Research has provided that renewable energy tends to be cheaper and practical to implement (Snyder, 2014: online). In addition to that, in the beginning it was mentioned that other challenge faced by country's electricity provider is the shrinking electricity demand, especially from the corporate sector. The insinuation is that corporates lately prefer to operate in countries which are offering other forms of cheaper sources of energy, such as renewable energy. With that said, it appears that it is clear to everyone including South African government that the current situation in the electricity sector requires many innovative interventions, for example moving with times by investing in other avenues other than the traditional coal generated electricity. Currently, the South African government is in the process of implementing nuclear energy programme.

Energy distribution in SA

At present, the country produces 250 TWh – 229 TWh from coal, 12 TWh from nuclear, 4 TWh from solar and wind, and 4 TWh from hydro. In 2017, the country imported 13 TWh and exported 15 TWh. Consumption was 198 TWh, or about 3600 kWh per capita.², Eskom supplies about 95 percent of South Africa's electricity and approximately 45 percent of Africa's. Of its total installed net

Figure 1: Electricity Production in SA



capacity of 40.5 GWe (44.2 GWe gross), coal-fired stations account for 34.3 GWe and nuclear for 1.8 GWe.

SA government announced in 2006 that it was considering building further a conventional nuclear plant. And in 2007, the Eskom board approved a plan to double generating capacity to 80 GWe by 2025, including construction of 20 GWe of new nuclear capacity so that nuclear contribution to power rises from 5 percent to more than 25 percent and coal's contribution falls from 87 percent to lesser than 70 percent. The new programme would start with up to 4 GWe of PWR capacity to be built as from 2010, with the first unit commissioned in 2016.

New and Renewable Energy

Government is committed to diversifying its energy mix, and this includes introduction of renewable energy at a large scale. SA is relatively in infancy in its renewable energy industry. The renewable energy is forecasted to contribute a total of 18.2 GW by 2030: Wind – 8.4 GW; Solar PV – 8.4 GW; CSP – 1 GW ;Other – 0.4 GW

Recommendations

They are from reviewing past experiences of the countries that have implemented privatization in the energy sector.

- The past experiences show that there is a greater need to take cognizance of science diplomacy in trying to find solutions especially where science is involved. The literature above

exhibited failures in attempt to privatize utility/energy companies as the result of narrow focus on the financial inefficiencies while broader issue was on finding science-related solution to deal with ailing state-owned companies;

- What we have learned is that by working with other countries through science diplomacy, the solution would have been looking at other tried and tested alternatives of energy generation rather than focusing solely on privatization; and
- Lastly a proper study needs to be undertaken first and foremost to determine a proper root cause of the problems within the existing methodology used by the country in electricity generation and its distribution; for example the proposed privatization might not yield anticipated benefits as it is not compatible with the problems faced, i.e. the root cause might have been the inadequate energy mix in the country.

Conclusion

To conclude we can deduce that privatization is one of the methodologies that have been used as a turnaround strategy, both in public or private sector. With no exception many sovereign countries have used the aforementioned in trying to turnaround their ailing state-owned entities; specifically to their monopolized state owned utility or electricity companies. Looking at the empirical evidence before us, it is clear that there

is correlation between privatization and improved performance (efficiency); however, there is no clear correlation in businesses operating within natural monopolized sectors such as electricity or energy.

To reiterate the point that has already been made about Eskom is that, the position the entity is facing is underpinned mostly by their poor planning and mismanagement of funds; unnecessary spending and implementation of political agendas have caused massive inefficiencies for the company. Therefore, in another sectors we have to be sure that privatization shall bring new leaf of life that is sought in the state- owned entity as evidence proves that it has an ability to convert an inefficient business to a well run and self –sustaining one. But as mentioned, there is a doubt of that effect in monopolized industries or sectors that similar results can be yielded. In many developing countries, such as South Africa, it turned out that privatization improved microeconomic efficiency to the selected few related parties, for example the government. In addition, the developing countries with high budget deficits, high public and external debts, who have decided to privatize loss-making electricity enterprises to decrease or rectify the mentioned phenomenon, the results were far worse; output losses such as increased unemployment and high economic and social costs.

With that said what we have learned to see as a caution for South Africa in insuring that same fate is not experienced should it go ahead with the privatization process. This is where the role of science in diplomacy is needed the most, meaning tackling science related problems with informed scientific advice through a collaboration with science diplomacy partners or countries. Especially considering that the evidence before us reveals that inefficiencies are not the only obstacles that Eskom needs to overcome to return to its old glory days. This is because figures are showing a dwindling electricity demand of a traditional coal generated power as opposed to other sources such as renewable energy for simple reason of being much affordable; which is provided by the aforementioned company.

The alarming fact that other countries are investing in other sources of energy such as renewable energy and such sources seem to be affordable indicates that maybe South Africa should also start investing heavily on them rather than pushing to bail-out the ailing state owned entity all the time. With no empirical evidence, it is fair to say that Eskom has significantly crippled the country's fiscus and is expected to do so in future if strong forward looking innovative interventions are not put in place.

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