NSBE (SA)

NATIONAL SOCIETY OF BLACK ENGINEERS OF SOUTH AFRICA
"BRIDGING THE ENGINEERING SKILLS GAP"

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NSBE's position paper on the draft IRP 2018 issued by DoE for the supply of electricity

Introduction

The energy policy and energy long term planning drive the economy as other industries depend heavily on the quality, availability and reliability of electricity supply. The IRP ought to give context in which the plan is realized, the context in terms of South Africa and our responsibility to drive economic growth in the rest of Africa, especially in the SADC region. The IRP attempts to have the NDP as the context in which the plan was developed but it comes across as a cosmetic rather than a real consideration. The plan lost an opportunity to consider significant socio-economic issues facing South Africa today. Such problems include high youth unemployment, funding of free education, economic inequality between whites and blacks, the real threat of having ghost towns in Mpumalanga, high fuel prices, instability of the rand in relation to other currencies in the world and how that impacts our local economy, etc. Every problem must always be solved within context, if context is lost then the proposed solution may prove to be ineffective in the long run. A simple PESTEL analysis can go a long way to ensuring that context is not lost when drafting the IRP. Simply depending on an output of a mathematical model with high level assumptions and taking the least-cost will not necessarily yield the desired outcome. The results of the model must be sanitized by considering other important factors that are not taken into account by the model. In our country with the highest unemployment rate and biggest gap between the rich and poor, it is of utmost importance to have sustainable job creation and industrialization of the country with the view of the fourth industrial revolution as a major objective. The draft IRP in page 10 of 75 mentions the following as the main objectives (1) Security of supply, (2) Minimize electricity costs, (3) mitigate environmental impact (4) Minimize water usage. We propose that strict monitoring & enforcement of Broad Based Black Economic Empowerment ("BBBEE") compliance and supplier development in the various awarded contracts be included as an additional main objective. This will signal our government's unwavering commitment to facilitate local manufacturing of high technology components, systems, subsystems, etc. in order to create sustainable jobs and develop new technical skills in support of DTI's black industrialist program.

The IRP for electricity supply is a long-term strategy document which requires strong commitment with scientific reasoning as a main driver rather than politics of the day. Building a power plant requires upfront massive investment and can easily take in excess of 10 years from feasibility study, design, construction, commissioning and connecting to power grid for commercial operation. This is evident with Kusile and Medupi coal fired power stations which are currently undergoing construction work. Also, all the personnel that were trained both in the private and public sectors in anticipation of the nuclear new built program as envisaged in the IRP 2010 have now become redundant and some have subsequently migrated to overseas countries because our draft IRP 2018 has been revised with no inclusion of nuclear technology. The loss of our nuclear skills to countries like the United Arab Emirates is causing a huge risk to the continued safe operation of Koeberg Power Station and Pelindaba. Unfortunately, the fact that nuclear technology in South Africa has been tainted by allegations of corruption linked to state capture has exacerbated its negative publicity.

Primary Energy Transition

Energy transition, in particular baseload transition, ought to be implemented in a sustainable and responsible manner to ensure grid stability. Data collected from 3.8GW of Renewable Energy ("RE") in operation must be utilized to project power security and all lessons learned to be transparently shared with the public, i.e. information about reliability, availability, operability, maintainability, job creation, etc. The impact of experiments based on desktop studies ought to be properly managed by ensuring that baseload choice is based on tangible South African data rather than other case studies from elsewhere in the world. The current baseload from coal and nuclear has a proven track record in South Africa. The new baseload primary energy as envisaged by the revised IRP ought to be viewed with caution until the RE technology is proven to work seamlessly for the South African Economy. The revised IRP mentions the RE installed capacity and then anticipates even more without a frank reflection about the lessons learned from the current RE installed capacity. It has been widely reported in the media that the RE program is hailed as successful but South Africa has nothing to show for it in terms of localization, industrialization, jobs creation, BBBEE, etc. The program imported more jobs in manufacturing facilities from overseas countries than it created in South Africa. The jury is still out on the possible use of RE technologies - solar and wind energy used in conjunction with gas turbines during peak times – to supply reliable baseload power.

Risk

It is very important that a thorough understanding of the risks associated with the revised IRP is achieved. Going through the IRP gives an impression that decisions were made at the back of assumptions with risks that were not properly evaluated and quantified. Moreover, the document indicates how sensitive the model is to assumptions made that it was not plausible to project requirements beyond 2030. Hence, it is important to highlight the following risks which are not quantified:-

1. The socioeconomic impact of decommissioning coal power stations in Mpumalanga. The plan anticipates decommissioning approximately 12GW in Mpumalanga without proper understanding of the socioeconomic impact in towns that primarily exists because of these power stations. The mines supply the power stations with coal, the schools and local businesses all exist because of the power stations. Mothballing the power stations without understanding of the socioeconomic impact and a plan to ensure that the small towns do not turn into ghost towns seems too risky for the economy.
2. Pricing and foreign currency exposure risk for gas imports to compliment renewables have not been properly assessed according to the revised IRP on page 68 of 75. The impact on balance of payments for the country has also not been assessed yet RE requirement has been significantly ramped up. This appears to be putting a horse in front of a cart. If gas is going to play such a significant role with the revised IRP then the associated risks ought to be quantified first.
3. The only risks identified in the new IRP for hydro power imports from the DRC are construction delays and grid extensions. Other risks that are not taken into account such as political, social, economic, etc. are well documented in public-domain literature as DRC is known to be a politically unstable country. Also, the risks in other neighbouring countries where the power transmission lines are expected to cross between DRC and RSA ought to be factored in. Hydro power should form part of much needed baseload replacement, planning for a mega project such as this is critical, and the IRP mentions it in passing on page 68 of 75 as merely a desktop study.

Primary Energy Mix

Our country still has a large fleet of coal power stations supported by a considerable amount of coal deposits. Koeberg Power Station as the only nuclear power station on the continent has a solid track record, disposal of nuclear waste is well managed and uranium is readily available. Hence, it should be a reasonable expectation that RSA will continue to be dominated largely by coal and nuclear primary energy and augmented by RE. Coal is our core energy resource and should be protected as such. Nuclear - if proven affordable - should be rolled out as well without subjecting it to political prejudice.

We propose that IRP 2018 targets a power generation mix of nuclear and coal at 70%, gas at 5% and renewables at 25%. The ultimate objective is to slowly but surely increase the contribution of renewable energy in the electricity grid to reduce the negative impact of greenhouse gases to the environment for the benefit of future generations.

Costs

Technology costs comparisons employed in the revised IRP seem to be flawed. Comparing technologies based on overnight costs which does not consider the uniqueness of each technology and the advantages it brings to the stability of the national grid and economic development is fundamentally flawed. To compare like for like critical issues such as reliability, availability, dispatchability, maintainability, life-cycle cost and sustainability created by the technology, etc. must be considered. Also, the basis of the cost used to calculate the overnight cost is not standardized. The cost is taken from different sources and often taking a similar project without consideration of specifications in those projects, such specifications could include localization requirements, availability of skills, locations in terms of infrastructure availability, training requirements, etc. Costs for a project cannot be simply extrapolated as they are not linear and depend of many factors. It is only when a specification that can be priced is available that costing a project can be determined. We cannot base decisions on the best case scenario, instead, we should rigorously apply sensitivity testing and give more careful consideration to ensure that the costs are as accurate as possible. Our country ought to welcome the participation of IPPs into our energy sector but these must not burden the South African fiscus. Eskom is already financially distressed and must not be subjected to further undue pressure to fund the introduction of IPPs into the Grid. IPPs should find innovative ways to fund their inclusion into the energy market.

Deliberate government interventions ought to be made to put local black energy players from within the borders of South Africa at the forefront and external players to take a back seat. Funding for local energy players should be governed by BBBEE codes and ought to come from SOCs like PIC, DBSA and IDC.

Conclusion

The way forward should not be the outright rejection of renewable energy but to call on IPPs to stand on their own instead of relying on an already strained Eskom's balance sheet and RSA's fiscus. We have to exercise restraint and treat with skepticism the blanket rhetoric that renewables will result in job losses without quantifying and understanding the context in which some lobby groups are saying this. We ask that a balance be struck between Nuclear, Coal, Gas and Renewables backed by clear scientific evidence that they will benefit our beloved country - not opportunistic and selfish interests - in the short, medium and long term!