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COMMENTS ON THE DRAFT INTEGRATED RESOURCE PLAN 2018

BACKGROUND

BUSA is a confederation of business organisations including chambers of commerce and industry, professional associations, corporate associations and unisectoral organisations. It represents South African business on macro-economic and high-level issues that affect it at the national and international levels. BUSA's function is to ensure that business plays a constructive role in the country's economic growth, development and transformation and to create an environment in which businesses of all sizes and in all sectors can thrive, expand and be competitive.

As the principal representative of business in South Africa, BUSA represents the views of its members in several national structures and bodies, both statutory and non-statutory. BUSA also represents businesses' interests in the National Economic Development and Labour Council (NEDLAC).

INTRODUCTION

BUSA welcomes the opportunity to submit comments on the draft Integrated Resource Plan (IRP) 2018 to the Department of Energy. BUSA thanks the Department for sharing the modelling on the CO₂ emissions, however, in light of the late receipt of this data, we have not been able to fully interrogate this and the implications thereof. BUSA therefore reserves the right to submit a supplementary position on this if required and would like the opportunity to engage with the Department further on the IRP 2018.

GENERAL

In November 2016, the Department of Energy released the draft Integrated Energy Plan (IEP) (2016) and the draft Integrated Resource Plan (IRP2016) for public consultation. The deadline for comment on these two documents was extended to 31 March 2017. BUSA, its members, and other social partners undertook extensive analysis and submitted detailed comments, particularly on the IRP. Our comments reflected a fundamental disagreement with the approach taken in IRP2016, in that the plan was not developed from a least-cost basis.

BUSA is pleased to note that the draft IRP (2018) appears to have considered these comments, addressing the majority of the key challenges with the previous version. In particular we are pleased to note that the draft IRP 2018:

- Recognises that an unconstrained renewable technology scenario is the least-cost option to 2030.
- Provides for flexibility, recognising that forecasts would need to be reviewed regularly.
- Provides some information on the policy adjustment scenarios allowing for a better understanding of their rationale.

Notwithstanding the above, BUSA is concerned that other significant energy-related plans have been written in isolation of the IRP and IEP. Policy misalignment has been recognised as a key impediment to investment. There is a risk that initiatives could fail because of this misalignment. For example, the recently released Green Transport Strategy which relies to a significant extent on the introduction of electric vehicles, which may in fact have an impact on demand for electricity in the latter years. The IRP also relies on a reliable source of gas as the required balance for a deeper penetration of renewable energy. In the absence of the Gas Utilisation Master Plan, all the scenarios are at risk.

Finally, as the overarching energy plan, the IEP should inform all sector plans and be informed by them in a regular planning cycle.

BUSA believes that these considerations must be considered as it is imperative for much greater integration of energy policies to be pursued.

DETAILED COMMENTS

INPUT PARAMETER ASSUMPTIONS

Electricity Demand

Electricity Demand Forecast for 2017 - 2050

BUSA is pleased to note that the revised demand forecasts are much more rational and conservative than used previously. However, we remain concerned that the median demand used for most of the scenarios (1.8%) is arguably still too high, given the real declining demand for grid electricity.



The demand forecast assumes a high economic growth scenario – average 4.26% GDP growth, including an adjustment which reflects the trend towards less energy intensive consumption patterns. However, South Africa's economy is currently in a technical recession and growth prospects are marginal. Further, considering that current trends show a decoupling of GDP growth to electricity usage, with lower electricity consumption relative to economic growth. In addition, electricity consumption has been stagnant over the last 8 years. The reference case (IRP1) and other scenarios should therefore rather assume the lower GDP forecast of 1.33% and the lower demand forecast of 1.21% by 2030.

The flexible approach proposed in the plan through frequent reviews of the IRP to manage the pace and scale of new capacity is supported. The frequency of the reviews must be specified; BUSA supports a biennial review of the IRP given the pace of change in this space.

Planning and building flexibility are required to ensure that we are not left with stranded assets. The pace and scale of all additional capacity must also be considered carefully in line with potential variation in demand.

Impact of Embedded Generation, Energy Efficiency and Fuel Switching on Demand

It is likely that the impact of these developments has been underestimated; indication from our members regarding embedded generation projects is that current pending applications for deviation from the current promulgated IRP2010 are already in excess of the 200MW/annum allocation in this document.

The document acknowledges that the data for these developments is lacking. It is also understood that there is no technical or rational basis for the 200MW/annum allocation for embedded generation. Furthermore, it is understood that the inclusion of these developments was done in recognition of the impact on overall electricity demand and intensity and must be therefore considered when projecting future demand and supply of electricity.

Deep penetration of embedded generation that is not accounted for could lead to over building of other capacity, therefore BUSA proposes that the allocation be increased to at least 500MW/annum to provide for current and possible additional projects, which may be in excess of 10MW each. BUSA further proposes that work to capture accurate and current information is urgently undertaken reduce uncertainty in the next IRP review in two years.

Technology, Fuel and Externality Costs

Overall, the technology costs used are more accurate and rational than the previous version of the plan and clearly indicate that the least-cost energy mix is one of Wind, Solar PV and Gas. BUSA accepts that for the period modelled, this mix is least-cost

The technology costs for renewable technologies have been updated to reflect the more recent Renewable Energy Independent Power Producer Programme (REIPPP) published costs (Bid Window 4). It is accepted that these costs continue to decline, and it would be impractical to

continue updating the IRP as costs change. Biennial reviews of the IRP should be able to capture the trend.

Section 3.2.3 refers to GHG emissions, however the section actually only deals with air pollutants, such as nitrogen oxide (NO_x), sulphur oxide (SO_x), particulate matter (PM) and Mercury (Hg)... These are air pollutants, not greenhouse gases (GHG). Furthermore, it is stated later in the section that the costs associated with carbon dioxide (CO₂) are not included as the CO₂ emissions constraint imposed during the technical modelling indirectly imposes the costs to CO₂ from electricity generation. In fact, the emissions constraint deals with all six main GHG emission as CO₂ equivalents.

This section should therefore be amended to reflect that it deals with the externality costs associated with air pollution and that all GHG emissions are dealt with as part of the CO₂ emissions constraint under section 3.4. Section 3.4 should also be clear that it includes all GHG emissions as a CO₂ equivalent.

Installed and Committed Capacity

The Eskom New Build Projects (Medupi and Kusile) have been plagued with delays and cost overruns. This has had a significant impact on the reliability and security of supply of electricity and contributed to load shedding, as well as to steep tariff increases.

Though Eskom has demonstrated improvements in the management of the programme with respect to the commercial operation dates of the new units, caution must be exercised with these assumptions.

Contingency scenarios ought to be modelled considering the implications of Medupi and Kusile units being commissioned earlier or later than assumed, or if it is decided not to complete the remaining units of these stations.

Existing Eskom Plan Performance

As correctly stated in the plan, Eskom's plant availability has been declining steadily and is below optimum levels (currently at around 72%). The draft IRP2018 assumes a medium plant performance in line with Eskom's Shareholder Compact of 2017 and Corporate Plan targets at around 80% Energy Availability Factor (EAF).

BUSA acknowledges and supports Eskom's efforts to improve the EAF of its fleet, however a scenario ought to be modelled addressing the event that the load availability is less than assumed and closer to the current plant availability.

In addition, it would be useful to model a scenario that considers the expected Eskom Medium Term System Adequacy Outlook as this will have more current information regarding the adequacy of Eskom's plant.

Existing Eskom Plant Life (Decommissioning)

BUSA notes that the full impact of decommissioning the existing Eskom fleet was not studied fully as part of the IRP Update, and that the socio-economic impact of the decommissioning of these



plants were not quantified. BUSA further notes that the plan recommends a detailed socio-economic impact analysis be undertaken for the post-2030 period.

BUSA has consistently argued for a long-term price trajectory to be included in the IRP and therefore requests that a socio-economic impact analysis be undertaken on the next iteration of the IRP – in two years' time. There will be plants decommissioned before 2030 (12600MW) and this will have impacts on communities which must be understood.

Decommissioning of coal-fired power stations linked to the Air Quality Act (NEMAQA) requirements is mentioned for at least 6 stations, however these stations are not reflected in the decommissioning schedule in Appendix B, table 8. The revised NEMAQA Framework is also likely to have a more significant impact on the life of current coal fleet than the current framework. The costs of compliance ought to be modelled. In addition, a scenario must be run to address the event that Eskom's plants are decommissioned earlier than planned due to technical and/or environmental compliance requirements and the possible impact of this also must be understood.

There are several issues that may affect supply, including potential further delays in the commissioning of Medupi and Kusile or a decision not to proceed with the commissioning of all the remaining units of these facilities; lower than assumed energy availability factors; earlier than planned decommissioning due to technical or environmental compliance imperatives. The revised document should address these issues.

CO₂ Emissions Constraints

The inclusion of a policy constraint on greenhouse gas emissions, is welcomed and supported.

Importantly this sector contributes the highest of GHG emissions to South Africa's emissions profile (approximately 40%), and it is clear that a policy intervention such as the IRP is the most appropriate instrument to reduce GHG emissions of the electricity sector and contribute positively to the Nationally Determined Contribution (NDC) and to the global efforts to reduce the carbon intensity of the environment.

The contribution of the IRP to the overall achievement of the NDC is therefore a critical consideration when undertaking a review of the plan.

The scenarios in the current draft comprise an energy mix which though a combination of solar PV, wind and balancing with gas or storage, results in 53 -76% of electricity generated from these technologies across all the scenarios. The least cost scenario or base case includes unconstrained solar PV and wind until 2030.

The recommended plan however is the least-cost base case, plus some policy adjustments until 2030. These adjustments include:

- 1 000MW of coal as a result of the IPPs for which bids have already been received.
- 2 500MW Inga Hydro
- 200MW/annum for own use generation
- Annual build limits for 1 000 MW and 1 600 MW respectively for solar PV and wind.

Based on a preliminary review of the CO₂ emissions constraints data, although the draft is silent on constraints from 2030 onwards, it appears that the annual build constraints on solar PV and Wind are retained in the policy adjusted scenario. This policy adjustment would force in more coal from 2030 onwards and thereby increases GHG emissions, which does not align with South Africa’s international commitments under the Paris Agreement.

South Africa’s NDC, aims to achieve a GHG emissions range between 398 and 614 Mt CO₂-eq. by 2030. The peak, plateau and decline (PPD) trajectory on which the NDC is based is projected to achieve a range between 212 and 428Mt CO₂-eq.by 2030.

In a world that is becoming increasingly aware of anthropogenic climate change, South Africa is facing pressures to decarbonise its economy, and clearly electricity is part of this. The recent IPCC report states that for 1.5°C warming - net CO₂ emissions must be zero by 2050, and for 2.0°C warming – net CO₂ emissions must be zero by 2075. Therefore, a plausible scenario is that as the Paris Agreement commitments ratchet up, South Africa will be pushed towards the lower end of the PPD, i.e. 212 total Mt CO₂-eq by 2050.

An analysis of the projected emissions at 2050 as a result of implementation of the recommended policy adjusted plan, in combination with South Africa’s carbon constraint under the PPD of 212Mt CO₂-eq is depicted in the chart below.

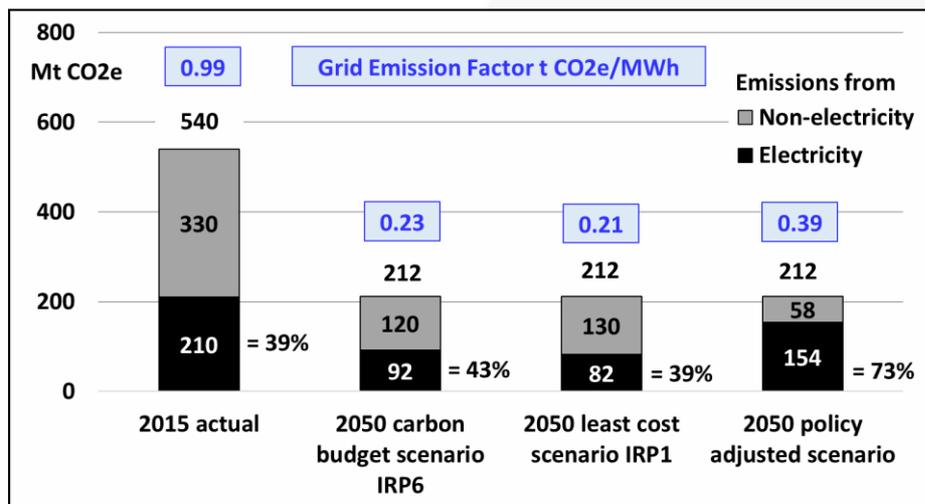


Figure 1: Electricity emissions within total SA emissions of 212 Mt CO₂e in 2050

This means that the recommended plan (policy adjusted IRP) allocates 73% of the carbon space available within the lower limit of the projected NDC to the electricity sector. Consequently, non-electricity sectors are left with only 27% of the carbon space by 2050, which would require a reduction from current emission levels of 82%.

This is concerning for the impacted industrial sectors. Technology price reductions for the electricity sector have reduced as has been acknowledged by the introduction of the least cost pathway but it appears that the sector is not maximising the opportunity that we are presented.



BUSA believes that it is imperative to have a comprehensive discussion on this aspect of the IRP before finalisation. Essentially the IRP is not only an electricity plan but a greenhouse gas emissions reduction plan for the electricity sector, and accordingly cannot be seen in isolation of other emitting sectors of the economy.

RECOMMENDED PLAN

Applied policy adjustment and considerations in the final proposed plan:

Even with the policy adjusted annual limits to provide for a “smooth roll out of RE, which will help sustain the industry.”, there is no new capacity from wind or solar in 2022,23, and 24. This gap may be detrimental to this industry as already shown in the delay of signing the expedited round of REIPPP. The REIPPP has been identified as providing significant opportunities for localisation. However, experience has shown that a stop-start approach to the projects has a negative impact on investment, which can be improved with a smoother procurement trajectory, that gives greater certainty to prospective investors in the inputs to renewable projects.

Only one of the seven IRP Scenario’s removes the annual build limit on renewables, however it is acknowledged that this unconstrained path is the least-cost energy mix and will also result in approximately 60Mt less CO₂ emissions by 2050 than the policy adjusted recommended plan.

Inclusion of 1 000MW of coal-to-power in 2023-2024 is based on two already procured and announced projects and is understood to be motivated in part by an intention to mitigate job losses resulting from the decommissioning of the older coal-fired power stations and continued utilisation of skills developed under the Medupi and Kusile build programmes. It is further understood, based on engagements with the DoE that these were included because the IPP process for coal must be honoured, as was the expedited round of REIPPP (27 projects).

However, the two coal IPPs are currently facing legal and financial challenges which are expected to delay or halt the projects entirely. This could have an impact on the pace and scale of the proposed capacity programme.

In addition, the inclusion of the two coal IPPs increases the total discounted system cost of up to R27.99billion (CCP)¹.

Any additional capacity will add to the already high electricity tariffs, it is therefore vital that the pace and scale of any additional capacity is only commissioned as required and that the cost is kept as low as possible to mitigate the impact on the end consumer.

¹ An assessment of new coal plants in South Africa’s electricity future (ERC 2018)

Regional Planning

Regional planning and programmes are supported as they provide benefits to all, however -

- On Gas:
 - The Gas Utilisation Master Plan (GUMP) is crucial. This is the only plan that will clearly state where the gas will come from and the costs.
- On Hydro - Grand Inga:
 - Assumptions related to the commercial operation date for this project must be clarified, as well as aligned to transmission planning required.
 - Details of additional studies to be done over the medium term, considering the challenges related to risks associated with executing the operation must also be clarified.

Given the uncertainty in relation to the timing and implementation of the coal IPP's, Gas and Hydro, scenarios ought to be modelled where this capacity is delayed or halted.

SCENARIO ANALYSIS OF ELECTRICITY TARIFF PATH COMPARISON

The inclusion of the results of the Price Path Model is noted. However, the assumptions used are limited:

- The inclusion of 3x Regulatory Clearing Account (RCA) applications are not specified.
- The Multi-Year Price Determination (MYPD4) is not specified.
- The RCA for 2017/18 is not specified.

It is accepted that this information may not have been available for the modelling of the IRP update, however it is not clear from the graphs whether this information, in any form was included. The underlying data has not been provided for interrogation.

The document states that the following assumptions have been used:

- From FY 2017/18 the tariffs will move to cost-reflective... This assumption is flawed as the tariffs are not cost-reflective.
- No change in Eskom's current level of performance and efficiency. – This assumption is flawed, as per the comments above, Eskom's EAF is lower than assumed in the IRP and there is concern that it may not recover to the 80% assumed.
- “*Eskom will build Nuclear...*” there is no new Nuclear in any of the scenarios, therefore this assumption should be removed.

It is unclear whether the assumptions used reflect current tariff applications and claw-backs. Further, the assumptions specified are flawed and do not accurately reflect the current state.

The document further states that:

The policy adjusted scenario will result in about 5% higher tariff by year 2030 compared to the least-cost scenario. This is the result of the smoothing out RE rollout plan which commissions plants earlier than they are actually required by the system, as well as the introduction [of] coal and hydro power...

It is noted that the economic benefits of a consistent and predictable rollout of RE has not been considered etc.



Notwithstanding this, and as stated above, any additional capacity will add to the already high electricity tariffs, it is therefore vital that the pace and scale of any additional capacity is only commissioned as required and that the cost is kept as low as possible to mitigate the impact on the end consumer.

Accordingly, and in line with suggestions above in relation to alternate scenarios for the pace and scale of additional capacity, the price path should be modelled to show the concurrent impact on tariffs.

Furthermore, NERSA has now made its decision regarding the implementation of the 3x RCA applications, as well as published the 2017/18 RCA application and MYDP4 application. As this information is now in the public domain, the assumptions should reflect this to ensure a more accurate current status.

SOCIO ECONOMIC IMPACT ASSESSMENT SYSTEM REPORT

BUSA welcomes the SEIAS report on the IRP but is concerned that the report is superficial in that it fails to address a number of issues that are critical to the overall cost of implementation of the plan.

Examples of issues that should have been dealt with more comprehensively include:

- The report states that the IRP is an electricity infrastructure plan. However, the draft document only addresses generation infrastructure.
- Cost and other impacts of the decommissioning plan are not adequately addressed.
- While it is agreed that a decentralised approach to delivering electricity would be beneficial to rural households, the SEIAS does not appear to acknowledge that the IRP does not address this issue.
- It is not possible to make the claim that the IRP will provide affordable electricity to the manufacturing and mining sector in the absence of a long-term price trajectory.
- Although the report identifies groups that will incur costs as a result of the plan, there is no attempt to present mitigation of these costs, particularly for vulnerable groups.
- The risks of a transition from coal to renewable energy is recognised, but no details are provided of how these risks will be mitigated.
- While the introduction of a carbon constraint is welcomed, there is no attempt to determine the risks for other greenhouse gas emitting sectors posed by allocating a significant amount of available future carbon space to the electricity sector.

BUSA recommends that these shortcomings in the SEIAS report be addressed in time for the review, which in BUSA's view should be held within 2 years.

CONCLUSION

BUSA welcomes IRP 2018 as useful basis for a final electricity plan to be developed but believes that there are a number of areas where the document could be improved.

BUSA therefore recommends that the final draft of the IRP should contain the following:

- Due to the actual declining demand for electricity and suppressed economy, the IRP should therefore rather assume the lower GDP forecast of 1.33% and the lower demand forecast of 1.21% by 2030.
- BUSA supports a biennial review of the IRP given the pace of change in this space. Planning and building flexibility are required to ensure that we are not left with stranded assets. The pace and scale of all additional Megawatts (MW) must also be considered carefully in line with potential variation in demand.
- BUSA proposes that the allocation for Embedded Generation, Energy Efficiency and Fuel Switching on Demand be increased to at least 500MW/annum to provide for current and possible additional projects, which may be in excess of 10MW each.
- BUSA further proposes that work to capture accurate and current information is urgently undertaken to reduce uncertainty in the next IRP review in two years.
- Contingency scenarios ought to be modelled considering the implications of Medupi and Kusile units being commissioned earlier or later than assumed, or if it is decided not to complete the remaining units of these stations.
- BUSA acknowledges and supports Eskom's efforts to improve the EAF of its fleet, however a scenario ought to be modelled addressing the event that the load availability is less than assumed and closer to the current plant availability.
- BUSA has consistently argued for a long-term price trajectory to be included in the IRP and therefore requests that a socio-economic impact analysis is undertaken on the next iteration of the IRP – in two years' time. There will be plants decommissioned before 2030 (12 600MW) and this will have impacts on communities. In addition, BUSA recommends that the shortcomings in the current SEIAS report be addressed in time for the review.
- A scenario must be run to address the event that Eskom's plants are decommissioned earlier than planned due to technical and/or environmental compliance requirements.
- BUSA believes that it is imperative to have a comprehensive discussion on the CO₂ emissions constraints and their impact before finalisation of the IRP. Essentially the IRP is not only an electricity plan but a greenhouse gas emissions reduction plan for the electricity sector, and accordingly cannot be seen in isolation of other emitting sectors of the economy.
- The impact of delays in proposed capacity projects must be modelled as this will impact of the pace and scale of new capacity.

- The costs of new capacity must be modelled as any additional capacity will add to the already high electricity tariffs, it is therefore vital that the pace and scale of any additional capacity is only commissioned as required and that the cost is kept as low as possible to mitigate the impact on the end consumer. This is in line with the overall government imperatives of growing the economy and creating jobs.
- The gas utilisation master plan (GUMP) and further studies on the timing and feasibility of regional hydro must be completed and published before the next revision of the IRP and should inform and update of the Integrated Energy Plan. These inputs will have an impact on the pace and scale of the plan in the medium to long-term.
- The price path should be remodelled to reflect the current status and the impacts of the alternate suggested scenarios should also be modelled.

BUSA looks forward to further engagement with the Department on the IRP and other crucial energy plans.