

Preliminary comments on the Integrated Resource Plan, 2023

22 March 2024

Jacob Mbele

Director-General

Department of Mineral Resources & Energy

By email: irp.queries@dmre.gov.za

Dear Mr Mbele

Preliminary comments on the Integrated Resource Plan, 2023

1. Just Share is a non-profit shareholder activism organisation. We believe that responsible investment is necessary to create a just, inclusive and sustainable economy. We use engagement, advocacy and activism to drive urgent action to combat climate change and reduce inequality.
2. As the DMRE will be aware, Just Share requested a two month extension period for comment on the Integrated Resource Plan, 2023 (“the draft IRP”), as did numerous other stakeholders. Whilst the DMRE did extend the comment period on the draft IRP by a month, the period and the public consultation process followed remain inadequate to ensure procedurally fair and reasonable public participation. This is particularly the case for poor and marginalised communities, who are most directly affected by the consequences of the country’s electricity choices.
3. Given that the DMRE has indicated that it intends to remodel the data, Just Share’s comment on the draft IRP is preliminary. The DMRE must invite comment on an updated draft IRP once it has done the remodelling.
4. The DMRE has stated that it will remodel the draft IRP, in order to take account of various important aspects, such as the implications of curtailment on the availability of grid connectivity, and the fact that none of the 3000 MW of gas-to-power projects assumed in the draft IRP’s modelling has reached financial close.¹
5. The DMRE has confirmed that re-running the modelling to take account of curtailment assumptions would result in additional grid capacity to which renewables could be connected. Taking account of the fact that certain planned projects have not reached financial close also makes “space” for more renewable energy.² The draft IRP remodelling must also account for the additional grid capacity that becomes available as coal plants are decommissioned.

¹ See for eg: <https://www.engineeringnews.co.za/article/dmre-to-remodel-draft-irp-2023-in-light-of-new-information-curtailment-plans-2024-02-01>; https://www.news24.com/fin24/climate_future/energy/fate-of-karpowership-sa-projects-should-be-known-by-month-end-20240305

² Eskom has withdrawn grid access for the Karpowership projects, along with that of Mulilo Coega Gas to Power plant and the Gemsbok PV plant which all failed to meet their financial close deadline.





6. The draft IRP relies on an outdated Eskom Generation Capacity Connection Assessment (GCCA) and its Transmission Development Plan (TDP) to determine how much extra renewable energy capacity can be added to the system. The draft IRP makes provision for much less renewable capacity than is planned for in the latest iteration of Eskom's TDP, which, by 2032, anticipates that the total renewable generation capacity "added to the system (including units from inception) is 43 336 MW by 2032, excluding battery capacity, and 51 905 MW, including battery capacity.... The total renewable capacity that will be added in the TDP period is 38 044 MW, excluding battery storage".³ The draft IRP also fails to meaningfully consider accelerated grid construction. Eskom has since provided the Department with an updated GCCA, and remodelling is expected based on this new data.
7. Another crucial issue that must inform remodelling of the draft IRP (and *will*, according to the DMRE), is the vgbe consortium's August 2023 "Independent Assessment of Eskom's Operational Situation".⁴ This assessment – made public by National Treasury on 1 March 2024 - was one of the conditions of Treasury's R254 billion bailout of Eskom, and Eskom has since indicated that its new chief executive will "make sure that VGBE recommendations are implemented".⁵
8. If the vgbe recommendations are indeed implemented, this will have a significant impact on the draft IRP, which, *inter alia*, proposes to delay the decommissioning of Eskom's coal fleet. For instance, the consortium reports:

The [Eskom coal] plants have been forced to continue operating at the expense of their technical condition. The consequences are reflected in the high number of incidents, trips and partial load losses (PLL).

*This cycle has now gained so much momentum that it could lead to the collapse of plants or to further capacity losses. It must be stopped immediately by executing proper maintenance and outage work – even if this means a higher level of load shedding for a limited period of time.*⁶
9. The vgbe report also states that the energy availability factor (EAF) of Eskom's coal fleet is "currently at about 51% whereas international benchmarks are in the range of 78%. The only way to improve the EAF is to ensure the execution of thorough operation and maintenance practices and procedures". The consortium also warns that the "fixation on the EAF is a dead end and leads to poorer plant performance".⁷
10. Meridian Economics (Meridian), in its review of the IRP, states that, "Given the large impact of even small coal plant EAF improvements", it is important to "invest strategically and

³ https://www.eskom.co.za/wp-content/uploads/2023/11/Transmission_Development_Plan_2023%E2%80%932032_Rev2.pdf

⁴ https://www.treasury.gov.za/comm_media/press/2024/VGBE%20Eskom%20Report.pdf

⁵ <https://www.eskom.co.za/eskom-welcomes-vgbe-consortium-report-on-the-assessment-of-its-coal-fired-power-stations/>

⁶ Page 28.

⁷ Pages 27-28.



systematically in improving the EAF of key mid-life and newer stations. This is likely to be a more effective and economic option than the alternative of attempting to life extend old, smaller stations”.⁸

11. Meridian also points out that the draft IRP “takes Eskom’s coal decommissioning schedule as given. Particularly given the environmental issues associated with coal use, earlier retirement of the coal fleet must be considered”.⁹
12. The draft IRP, in contrast, currently assumes an EAF range between 51-69% by 2030. It expresses the view that “the improvement of Eskom fleet EAF as per the Generation Recovery Plan is crucial and will make a significant contribution in restoring security of supply”. It also plans to “delay shutting down coal fired power plants to retain dispatchable capacity”.
13. Irrespective of what happens in relation to the vgbe recommendations, in its remodelling of the IRP, the DMRE must take into account not only feasible and realistic EAF assumptions, but a legally-compliant shutdown schedule.
14. Meridian recently published a report¹⁰ on the technology cost assumptions disclosed in the draft IRP, comparing these to assumptions used in other recent studies of the country’s power system, as well as several independent sources. In this report and its review of the IRP,¹¹ Meridian identifies a number of serious concerns with the DMRE’s modelling and with the draft IRP. These include:
 - 14.1. “There is no systematic evaluation of scenario performance against the planning objectives of security of supply, cost and environment”.¹²
 - 14.2. The draft IRP’s “unusual technology cost assumptions remain unmotivated”.¹³ The draft IRP failed to consider future costs changes in real terms (cost learning) for any technology to 2050, despite the 2021 EPRI Report: Supply-Side Cost and Performance Data for Eskom Integrated Resource Planning (on which the draft IRP relied) including cost learning assumptions. Meridian points out that ignoring cost learning significantly overstates the cost of newer technologies (wind, solar, batteries in particular) relative to more mature technologies (coal, nuclear, flexible) especially for medium- to long- term horizon planning. For instance, the draft IRP renewable energy costs are higher even than prices bid into the REIPPPP in 2016.¹⁴

⁸ <https://meridianeconomics.co.za/wp-content/uploads/2024/03/IRP2023-Modelling-Submission-20240318.0.pdf> page 73 (IRP review)

⁹ Page 7.

¹⁰ <https://meridianeconomics.co.za/our-publications/comparative-analysis-of-irp-2023-cost-assumptions-2/> (Comparative analysis of cost assumptions).

¹¹ <https://meridianeconomics.co.za/our-publications/review-of-the-irp-2023/>

¹² Page 6, IRP review.

¹³ Page 6, IRP review.

¹⁴ Pages 4, 6, 15, Comparative analysis of cost assumptions.



- 14.3. In general, the IRP 2023 levelized cost assumptions for wind, solar PV, CSP and batteries are significantly higher than other studies and sources.¹⁵
- 14.4. If equivalent fuel costs and capacity factors for dispatchable, fossil fuel-fired, generators (coal and gas) are assumed, the resulting levelised cost of electricity (LCOE) from the draft IRP falls broadly in line with other sources, although it is on the lower end for gas-fired generation.¹⁶
- 14.5. No detail is given in the draft IRP regarding the contracting realities of gas and how this is linked to the gas price based on offtake volumes.¹⁷ This is obviously a crucial consideration.
- 14.6. The draft IRP has not made diesel-fired peaking generation available as a competing alternative to lower capacity factor gas-fired generation.¹⁸ Meridian has previously suggested this alternative.¹⁹
- 14.7. Given recent cost over-runs and delays of international nuclear projects in the UK and US, and local cost overruns with respect to building mega-projects such as Kusile, Medupi and Ingula, Meridian takes the view that the draft IRP’s nuclear cost assumptions appear exceptionally optimistic.²⁰
- 14.8. The draft IRP fails to engage with the “significant uncertainty in the planning horizon (in demand, fuel prices, domestic and international carbon pricing, coal performance and technology advancements)... Planning in uncertainty requires understanding the implications of this uncertainty across parameters, and a focus on developing options and resilience, which is not considered”.²¹
15. The draft IRP’s “emerging plan” for Horizon One (2023 – 2030)²² provides for loadshedding to continue until 2028. In fact, according to analysis by Meridian on the draft IRP, the “Emerging Plan’ from Horizon 1 relies heavily on failed or failing Karpowership gas and REIPPPP BW5 projects, meaning loadshedding under the plan is in fact more than three times as severe as published in the IRP 2023”.²³ As set out below, this is a clear example of how the draft IRP fails to meet a primary objective of an IRP.

¹⁵ Page 7, Comparative analysis of cost assumptions. With the exception of the ATB 2023 solar PV estimates (which, Meridian indicates, are strongly influenced by USA import tariff protection in the short/medium term and not applicable to solar PV in South Africa).

¹⁶ Page 7, Comparative analysis of cost assumptions.

¹⁷ Page 7, Comparative analysis of cost assumptions; pages 30, 65 IRP review.

¹⁸ Page 7, Comparative analysis of cost assumptions.

¹⁹ See for example: <https://meridianeconomics.co.za/wp-content/uploads/2022/06/Hot-Air-About-Gas.pdf>

²⁰ Page 7, Comparative analysis of cost assumptions; page 88, IRP review.

²¹ Page 6, IRP review.

²² Table 2 of the draft IRP.

²³ Page 67, IRP review.



16. The draft IRP has also added the cost of loadshedding (unserved energy) to technology costs, with the result that its modelling results in very high loadshedding levels in the “renewable energy pathway”. This leads the draft IRP to conclude, incorrectly, that this is the highest-cost pathway.²⁴
17. This conclusion is not supported by any other credible analysis and modelling that has been done, including by the Presidential Climate Commission, the NBI, UCT Energy Systems Research Group and Meridian (to name just four). All of these exercises conclude that – even discounting the climate cost and other externalities – a least-cost electricity system predominantly comprises renewables, supplemented by storage (batteries or pumped hydro) and peaking support (such as, but not necessarily, gas).
18. For instance, the Presidential Climate Commission recommended that South Africa adopt a least-cost electricity pathway and “seek all opportunities to accelerate coal closure”. It expected a policy-adjusted IRP to include a rapid and large-scale build of 50 to 60 GW of variable renewable energy by 2030, supported by co-located storage, and between 3 and 5 GW of peaking support (for example gas, running at low utilisations). The PCC’s report calls for this to be done in parallel with investing in upgrading and expanding the national transmission grid.²⁵
19. One of Meridian’s “key recommendations” is to “Take the necessary steps to dramatically accelerate solar PV and battery roll-out by all players, at all scales and locations to accelerate the elimination of load shedding”.²⁶
20. By contrast, the draft IRP plans for new capacity of only 1500 MW of solar and 3000 MW of wind by 2030. In fact, its allocations to renewable energy are substantially lower than those in the current IRP, despite the overwhelming modelling supporting a renewables-dominated mix, and despite this being the least-cost pathway, with the lowest climate and environmental impacts. The draft IRP only considers capacity currently in development, and does not optimise the power system to evaluate potential additional new capacity to end loadshedding sooner.
21. This failure to plan for significant quantities of new renewable energy compromises the development and implementation of the South African Renewable Energy Masterplan, which “aims to leverage the rising demand for renewable energy and storage technologies, with a focus on solar energy, wind energy, lithium-ion battery and vanadium-based battery technologies, to unlock the industrial and inclusive development of associated value chains in the country”.²⁷ It also compromises the significant economic benefits that could result from

²⁴ This is because the DMRE assumed that loadshedding requires peaking stations to run longer to make up for unmet demand in a renewable energy pathway.

²⁵ https://pcccommissionflow.imgix.net/uploads/images/PCC_DRAFT_Electricity-Planning-and-Recommendations-Report_20230408.pdf pages 11-17 contain “key take-aways”.

²⁶ Page 73, IRP review.

²⁷

[https://www.dmr.gov.za/Portals/0/Resources/Renewable%20Energy%20Masterplan%20\(SAREM\)/South%20African%20Renewable%20Energy%20Masterplan%20\(SAREM\)%20Draft%20III.pdf?ver=2023-07-17-141604-137×tamp=1689596128318&utm_campaign=request-for-comment-from-department&utm_source=transactional&utm_medium=email](https://www.dmr.gov.za/Portals/0/Resources/Renewable%20Energy%20Masterplan%20(SAREM)/South%20African%20Renewable%20Energy%20Masterplan%20(SAREM)%20Draft%20III.pdf?ver=2023-07-17-141604-137×tamp=1689596128318&utm_campaign=request-for-comment-from-department&utm_source=transactional&utm_medium=email)



renewable industrialisation. This is despite the fact that the draft IRP appears to recognise that “renewable technologies also present huge potential for the creation of new industries across the value chain”, and that “the global renewable energy market is forecasted to grow significantly as decarbonisation efforts continue and new sources of demand, such as green hydrogen and New Energy Vehicles (NEVs), arise”.

22. In addition to reducing the procurement of renewables as compared to the 2019 IRP and failing to accelerate significant investment in wind and solar PV and battery storage, the draft IRP has also planned to ramp up gas procurement, counted on improving the performance of Eskom’s old, inefficient coal fleet, and intends to delay the decommissioning of these polluting and non-compliant plants.
23. The draft IRP states that the shutting down of coal-fired power plants should be delayed “where technically and commercially feasible” in order to “retain dispatchable capacity”. The “technical and commercial feasibility” of extending the lives of Eskom’s dirty and non-compliant coal fleet is but one of the very relevant factors to consider in making this decision.
24. In its remodelling, the draft IRP cannot treat – as it has in the current iteration – legal compliance as optional. For instance, in relation to the minimum emission standards (MES) published in terms of the National Environmental Management: Air Quality Act, 2004 (AQA), the draft IRP states that, “Resolving the challenges around compliance with the implementation of the Minimum Emissions (sic) Standards (MES) on coal fired power stations in terms of the National Environmental Management: Air Quality Act 39 (2004) is critical as it will drastically ensure capacity totalling 16 000 MW immediately and up to 30 000 MW in April 2025 is retained”. This is a misleading framing: unless facilities have received postponements or suspensions of MES compliance, they are legally required to comply with the MES (or any stricter emission standards in the facilities’ atmospheric emission licences (AELs)). This is not a “nice to have”. There are also legally-prescribed penalties for the violations of AELs.
25. Air pollution has devastating impacts of human health and human lives. The High Court has found that air pollution on the Mpumalanga Highveld (primarily from Eskom coal-fired power stations and Sasol’s Secunda operations) violates the constitutional environmental right.²⁸ Despite this, the draft IRP talks about the need to “balance ... energy security, the adverse health impacts of poor air quality and the economic cost associated with these plants shutting down”. This clearly demonstrates that the draft IRP had not made appropriate assumptions about compliance with the MES, and the impacts and consequences of non-compliance.
26. Quite apart from the severe climate and health impacts of the draft IRP’s approach and proposed energy mix, it fails to recognise that rapid and extensive scaling up of renewable energy generation is the most cost-optimal energy pathway, and affords the best opportunity to provide affordable, reliable energy for all people in South Africa

²⁸ *Trustees for the Time Being of Groundwork Trust and another v Minister of Environmental Affairs and others (United Nations Special Rapporteur on Human Rights and the Environment as Amicus Curiae)* [2022] JOL 53812 (GP).



27. In addition, the draft IRP completely omits demand side management (DSM) and energy efficiency measures from its analysis. Since DSM is one of Eskom's strategies to manage supply and demand of power, it should influence the data and assumptions in the IRP. DSM can not only significantly reduce pressure on the power system, but also enables cost-savings for consumers. In addition, incentives offered by a DSM programme could motivate large electricity customers to voluntarily reduce their energy consumption during peak demand periods.
28. Had the draft IRP used accurate, updated data – including technology cost and price assumptions – to determine the least-cost combination of technologies to achieve South Africa's electricity requirements, a renewables-dominated electricity system would have been selected (as it was by other credible modelling). If the DMRE decides to deviate from the least-cost option, it is required to explain this decision in full so that its reasonableness and lawfulness can be assessed.
29. **The DMRE should remodel the draft IRP, taking the latest information into account, and then invite public comment on a draft that complies with the minimum requirements of an IRP**, as set out from paragraph 43 below.
30. As indicated in our joint 21 November 2023 letter sent to Ministers Mantashe and Ramokgopa, the impacts of electricity-related decisions – including in the draft IRP – include those for:
 - **energy poverty**, with the potential for irrational and expensive choices to exacerbate inequality, energy poverty and socio-economic hardship;
 - security and reliability of **electricity supply**, in that generation facilities that require long construction lead times, expensive ongoing maintenance or are reliant on fuels that are subject to price and supply volatility could exacerbate the current supply crisis instead of alleviating it;
 - **health**, as generation choices could maintain or even aggravate air quality conditions and the accompanying and extremely costly health crisis; and
 - **climate change**, and South Africa's particular vulnerability to climate impacts and the risks that these impose on people, the economy and the development of South Africa. With the electricity sector accounting for around 40% of South Africa's greenhouse gas (GHG) emissions, the IRP has an extremely powerful influence on the country's emissions reduction profile and its ability to meet its Nationally Determined Contribution (NDC) in terms of the Paris Agreement.
31. The consequences of electricity generation choices are far-reaching, and will have important implications for the protection and/or limitation of various constitutional rights. In other words, the nature of South Africa's electricity mix, including which sources are used, in which proportion, for how long, and subject to what conditions, has a material and direct impact on the rights of the people of South Africa.
32. An IRP also has a critical bearing on whether South Africa is able to transition justly to a low-carbon, climate-resilient economy and whether the country can attract climate finance and other



investment. It also affects the country's ability to comply with the National Development Plan 2030 (NDP), which aims to eliminate poverty and reduce inequality by 2030.

33. As it stands, and as explained below, the draft IRP does not comply with the purpose of an IRP, nor with the Constitution of the Republic of South Africa, 1996 ("the Constitution") or the requirements of other national legislation (including the Electricity Regulation Act, 2006 (ERA), the National Energy Act, 2008, and the List of Activities, 2013²⁹).
34. The draft IRP will exacerbate South Africa's deep injustice and will not address its dire energy security issues adequately. The draft IRP will not protect constitutional rights, nor will it meet what it describes as its "main purpose": "to ensure security of electricity supply necessary by balancing supply with demand, while considering the environment and total cost of supply". It does not reflect: the cheapest electricity source and lowest system cost; a system that provides reliable electricity and ends loadshedding; or an energy pathway in line with South Africa's GHG emissions reduction commitments (existing and future).
35. One of the primary reasons for these failures is that the draft IRP foresees not only a significant increase in electricity provided by fossil fuels, but also the delay of the decommissioning of the country's unreliable, non-compliant coal fleet. This does not and will not support electricity access or affordability, and will exacerbate socio-economic, climate, health, and environmental harm.

Minimum requirements of an IRP

36. The **Electricity Regulations on New Generation Capacity**, 2011, published under the ERA, indicate that the IRP shall be developed by the Minister after consultation with the National Energy Regulator of South Africa (NERSA) and published in the Government Gazette by the Minister.³⁰
37. According to the **ERA**, an IRP is a "resource plan established by the national sphere of government to give effect to national policy".³¹ The ERA provides that an applicant for a licence – for instance to operate a generation, transmission or distribution facility – must include in its

²⁹ The List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage, published in terms of the National Environmental Management: Air Quality Act, 2004.

³⁰ Regulation 4. The system operator, the National Transmission Company (NTC) and NERSA are required to timeously provide such assistance as the Minister may require for purposes of developing and monitoring the IRP's implementation. NERSA, after consultation with the Minister, the system operator and the NTC, must make rules relating to the keeping of relevant information, the submission of such information and the rendering of returns by licensees, as required in order to facilitate integrated resource planning.

³¹ Section 1. We are aware that the definition of the IRP in the Electricity Regulation Amendment Bill [B 23B - 2023] (ERAB), currently before the National Assembly, is "an indicative, forward-looking plan for electricity generation, which reflects national policy on electricity planning, which plan specifies the types of energy sources and technologies from which electricity may be generated and indicates the amount or electricity that is to be generated from each of such sources or technologies". We are also aware that various other important amendments, very relevant to the IRP, are proposed in ERAB, including to section 34 – which deals, *inter alia*, with determinations for new generation capacity.



application to NERSA evidence of compliance with any applicable IRP or provide reasons for any deviation for the approval of the Minister.³²

38. In its glossary, the draft IRP defines an IRP as a “generation capacity expansion plan based on a least-cost electricity supply and demand balance in the long term and incorporates government policy”. In its conclusion, the draft IRP states that it aims to meet “three distinct but not mutually exclusive aspirations, namely, security of supply, energy affordability and carbon emissions reduction”. It fails to meet any of those aims individually, let alone in combination.
39. In section 1, the draft IRP states that the “main purpose of the IRP is to ensure security of electricity supply necessary by balancing supply with demand, while considering the environment and total cost of supply. South Africa continues to pursue a diversified energy mix that will provide security of supply while ensuring compliance with its emission reduction plan. South Africa’s approach to energy security is in line with international trends and developments”. This is strongly disputed. The draft IRP does not comply with its self-described “main purpose”.
40. The explanation in the current, 2019 IRP is more explicit about “the environment”, stating that the IRP is:

“an electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimise negative emissions and water use)”.³³

41. Despite identifying the need to “ensure security of supply” as its main purpose, the plan does not envisage ending loadshedding until 2028, demonstrating a serious failure to address this issue urgently. The draft IRP will also not result in environmental sustainability or a safe climate. It will, in addition, make energy increasingly unaffordable.
42. Nor does the draft IRP ensure security of supply, or compliance with national policy. It fails to limit water use (and pollution), and neither ensures the limitation of negative emissions, nor compliance with the country’s emission reduction plan (which is required to become increasingly ambitious in terms of the Paris Agreement).
43. In the 21 November 2023 letter, we and our co-signatories set out eleven key principles that the IRP should adhere to, at a minimum:
 - 43.1. The **Base Case scenario**, or its equivalent, should be the **least-cost combination of technologies to achieve South Africa’s electricity requirements**. After that, policy adjustments and constrained scenarios can be run, but any deviation from the least-cost should be made public and fully explained, so that policy-makers and the public are able to make a value-for-money assessment of the deviation.

³² Section 10.

³³ Page 8.



- *The draft IRP has deviated from other modelling exercises in that, instead of evaluating the least-cost pathway, it has opted for a so-called “low system cost” evaluation.*
- *In any event, because it does not use the latest, credible data, and relies on incorrect assumptions, the draft IRP’s base case is neither least-cost nor low system cost. Decisions to favour unnecessary fossil fuel electricity over renewables will result in more expensive electricity. This will not only have a negative impact on economic development but will lead to particularly unjust outcomes for poor and marginalised communities.*
- *According to Meridian, “Unrealistic technology cost assumptions together with the undisclosed inclusion of extremely low renewable energy build [limits] mean that the analysis does not establish a credible least cost benchmark against which to consider trade-offs between planning objectives”.³⁴*
- *Meridian points out that although the DMRE has stated that the draft IRP will still be ‘policy adjusted’, no provision is made for public comment on this critical aspect of any IRP.³⁵*

43.2. It must take **full account of the external costs of the different technologies**, ensuring that all external costs to human health, the environment, and the climate are factored into cost calculations in respect of different technology options.

- *The impacts of fossil fuels on people - including their health and wellbeing - on the climate and on the environment more broadly, far exceed the impacts of renewable energy. That is not controversial. The draft IRP fails to reflect this reality, as is indicated in some examples below.*
- *The draft IRP appears to conduct no analysis of its environmental sustainability, despite claiming that its “main purpose” is to “ensure security of electricity supply necessary by balancing supply with demand, while considering the environment and total cost of supply” (our emphasis).*
- *The draft IRP envisages delaying the decommissioning of coal-fired power plants, exacerbating climate harms, health harms, water security, security of electricity supply (due to the aging and unreliable coal fleet) and other negative impacts. These negative externalities are not accounted for.*
- *Local air pollution is ignored by the draft IRP in its evaluation of coal expansion scenarios. The dire human health impacts of electricity generation choices are largely discounted and compliance with the MES treated as “optional”. The draft IRP takes the view that a “balance will have to be found between energy security, the adverse health impacts of poor air quality and the economic cost associated with these plants shutting down”. There is no meaningful analysis of the costs and implications of this “balancing” in the draft IRP or the underlying Socio Economic Impact assessment.*

³⁴ Page 67, IRP review.

³⁵ Page 6, IRP review.



- *In addition, the Socio Economic Impact assessment published in support of the draft IRP is wholly inadequate. For instance, health impacts and air pollution are not even mentioned.*
- *The draft IRP fails to account for the enormous global warming potential of methane and the significant impact of gas leaks throughout the value chain. As also pointed out by Meridian (and set out above), the draft IRP does not address “the contracting realities of gas and how this is linked to the gas price based on offtake volumes”. The gas price is extremely volatile. As a global commodity, the price and supply of gas can be impacted by a myriad of factors, which makes it extraordinarily volatile.*

43.3. It must be based on only the **latest, accurate projections and input data**, including data on South Africa’s GDP, electricity demand (with proper consideration of improved energy efficiency, DSM and grid defection), and technology cost and price comparisons. In this regard, electricity demand projections and their modelling must explicitly include the effect of grid defections in the last few years, local government demand reductions and an analysis of price elasticity.

- *Some of the draft IRP’s multiple failures to do this are set out above. The DMRE has committed to remodel the draft IRP with updated information. It should thereafter be made available again for comment.*

43.4. It must **clearly indicate and explain all assumptions on which all modelling is based**, and it must **verify and reference** all sources of information, findings and conclusions; including those regarding job creation; GDP forecasts; energy-intensity; learning rates; and costs of different technology options.

- *The draft IRP lacks adequate detail regarding the assumptions made in modelling the proposed future energy mix. Various of its disclosed assumptions are incorrect.*
- *Assumptions and their consequence are not always clear from the resultant pathways in the draft IRP.*
- *As stated by Meridian in its IRP comments: “Alternative pathways based on alternative assumptions are essential for consideration – especially in light of the inherent uncertainty in forecasting key parameters such as technology cost, demand, build limitations, grid constraints, coal fleet performance, fuel prices and future carbon emission consequences.”³⁶*

43.5. It must **not arbitrarily constrain or limit renewable energy** projections and investments.

³⁶ Page 4, IRP review.



- *That the draft IRP has done this is clearly demonstrated by the fact that all other credible modelling recommends vastly more renewable energy than is proposed in the draft IRP. The draft IRP’s assumptions have resulted in the renewable energy allocations being much smaller and much later than is required. For instance, the first new renewable capacity indicated in the draft IRP is only 500 MW in 2028.*
- *Meridian’s IRP review addresses the significant renewable energy constraints in detail. For instance, it states, inter alia, that “Excessively stringent (and undisclosed) annual build limits are applied to Solar (capped at 900 MW) and Wind (capped at 1720 MW) in the Horizon 2 analysis, significantly constraining their deployment. There is no rational basis for such binding constraints, with 2.5 GW of rooftop Solar PV added in SA in 2023 alone (and 5GW of panels imported)”.*³⁷

43.6. It must be based on the **latest scientific information and international best practice**, including the latest scientific conclusions on climate change, which clearly indicate that keeping the global temperature rise to below 1.5 degrees Celsius is critical to avoid catastrophic climate change.

- *The draft IRP’s proposal to substantially increase gas power and to delay the decommissioning of the coal fleet makes clear that it has not taken climate science into account.*
- *The inclusion of “clean coal” in Horizon Two (2031-2050) is another stark demonstration of the fact that the draft IRP has not properly considered the latest scientific information. All credible evidence makes clear that there are no realistic and cost-effective solutions to neutralise all – or even most – of the dire environmental, health, and climate change impacts caused by the mining, production, supply, use and disposal of coal.*
- *The draft IRP also calls for the consideration of small modular reactors. Like “clean coal” technology, this has not been demonstrated to be a realistic and cost-effective solution. (As Meridian points out, the draft IRP does not include nuclear in Horizon One nor the Reference Pathway to 2050, but a large nuclear request for proposals (RFP) will soon be published. This, Meridian points out, leaves the credibility of either the draft IRP or the RFP in question).*³⁸
- *Despite the draft IRP’s recognition that South Africa has “several advantages in the pursuit of the hydrogen economy”, and its reference to the “Green Hydrogen Commercialisation Strategy (GHCS) which seeks to operationalise the Hydrogen Society Roadmap”, it fails to include the significant electricity requirements of green hydrogen.*

³⁷ Page 7, IRP review.

³⁸ Page 6, IRP review.



- *As stated by Meridian, “Predetermined technology mix pathways in Horizon 2 together with the effect of its inappropriate technology cost assumptions obscure the options available to South Africa and produce fatally flawed conclusions”.³⁹*

43.7. The **electricity sector carbon constraint must be derived from integrated, full sector energy planning**. It must, at a bare minimum, take into account South Africa’s mitigation commitments in its NDC under the Paris Agreement and be consistent with South Africa’s obligations under the Paris Agreement and the United Nations Framework Convention on Climate Change, as well as South Africa’s National Climate Change Response Policy. The NDC commitments must not be modelled as a potential future scenario, but as an existing commitment, with which South Africa has undertaken to comply. It must also take into account that South Africa will need to submit stricter and more rigorous mitigation commitments in its NDC every 5 years – with an update due in 2025. It should take into account that decarbonising the electricity sector is the lowest-cost mitigation option for the country to meet these international commitments.

- *The draft IRP claims that it is aligned with South Africa’s current NDC (350-420 Mt by 2030), but does not acknowledge that the NDC’s upper range is well above a 1.5°C trajectory,⁴⁰ and that even if there were compliance in 2030, the draft IRP will not result in NDC compliance thereafter.*
- *The draft IRP assumes that the power sector’s share of South Africa’s emissions will remain constant at about 44% - i.e. 160-180 Mt⁴¹ - until 2030.*
- *The draft IRP shows emissions declining from the top of the NDC range in 2024 to well below the bottom of the range in 2030. The draft IRP assumes that power sector emissions will be about 125 Mt by 2030, i.e. well below its self-attributed share of the NDC.*
- *It is not at all clear how this decline is credibly achieved, since Horizon One relies on an optimistic increase in plant EAF and a delayed shutdown for all coal plants. The draft IRP also ignores upstream gas emissions, despite their significance.*
- *All five IRP scenarios are in the range 25-135 Mt/a by 2050, 20 years later. None of the scenarios results in the achievement of net zero in the electricity sector by 2050. This demonstrates that the draft IRP has failed to properly consider the carbon constraint.*
- *In any event, as addressed in paragraphs 52-56 below, it is premature to have published the draft IRP without knowing what the electricity sector’s sectoral emission target (SET) will be. It is easiest and cheapest to reduce power sector emissions.*
- *The draft IRP also fails to account for the fact that NDCs are required to become stricter every 5 years – with an update due next year – in order to reach a net*

³⁹ Page 67, IRP review.

⁴⁰ <https://cer.org.za/news/cabinets-more-ambitious-climate-target-a-step-in-right-direction>

⁴¹ Figure 21 of the draft IRP assumes 160-180 Mt as the power sector’s share of the NDC (350-420 Mt) in 2030. 160 is 45% of 350 and 180 is 43% of 420.



zero by 2050 target. As the NDC is progressively strengthened, the draft IRP will increasingly become problematic and non-compliant.

- *The climate impacts of the draft IRP will be severe and will not enable the country to reach net zero emissions by 2050.*

43.8. It must be **consistent with South Africa's other international obligations**, including the Convention on Biological Diversity, the international law obligations to avoid transboundary air pollution, and regional water treaties.

- *There is no indication that the draft IRP has assessed its compliance with these obligations. Fossil fuels result in severe impacts for biodiversity, air quality, and water.*

43.9. It must take into account the **global intentions and commitments to move away from fossil fuels** and the **financial implications of future stranded assets and of nuclear decommissioning costs** – including the implications of managing the long-term risk of nuclear waste – as a result of proceeding with plans for future new coal, gas and nuclear projects. It must also take into account the **implications of tightening climate regulation, carbon taxes** and mechanisms such as the EU Carbon Border Adjustment Mechanism (CBAM) on goods produced in South Africa - a highly carbon-intensive economy for export and trade.

- *The draft IRP fails to give consideration to the fact that the world is transitioning away from fossil fuels and towards lower carbon-intensive energy production and usage. Instead it plans for more fossil fuels and extending the lives of Eskom's coal fleet.*
- *The draft IRP does not appear to have considered the impacts of carbon tax (phase 2 of which will apply from 2026) nor the EU CBAM on South African exporters (the transitional phase of the EU CBAM started in October 2023).*
- *The potential negative impacts of the draft IRP on climate financing, such as the CIF ACT (Climate Investment Fund – Accelerating Coal Transition) and the JETP (Just Energy Transition Partnership), have not been properly considered. Since much of this funding has decarbonisation as a key objective, a climate-harmful IRP could certainly compromise access to climate finance and investment.*

43.10. It must be **consistent with the requirements and objectives of national legislation**, including ensuring that the interests and needs of present and future electricity customers and end users are safeguarded and met, and promoting the use of diverse energy sources and energy efficiency.



- *The draft IRP also fails in this regard. The National Energy Act,⁴² for example, aims (inter alia): to “ensure uninterrupted supply of energy to the Republic”; to “provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development”; and to “facilitate energy access for improvement of the quality of life of the people of Republic”.*
- *The ERA,⁴³ for example, aims (inter alia): to “achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa”; to “ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic”; to “facilitate investment in the electricity supply industry”; and to “facilitate universal access to electricity”.*
- *Quite apart from its negative impact on electricity access and affordability, the climate, human health and the environment, the draft IRP does not propose to end loadshedding until 2028.*
- *It also, for example, treats compliance with the legally-prescribed MES as if it is an issue to be “balanced” against energy security considerations.*

43.11. It must **promote the realisation of the fundamental human rights in the Constitution** of the Republic of South Africa, 1996; in particular the rights: to an environment not harmful to health or well-being, and to have the environment protected for the benefit of present and future generations (section 24); to equality (section 9); to human dignity (section 10); to life (section 11); to access to food and water and access to healthcare (section 27) and the right to have the best interests of children made paramount (section 28). In this regard, there must be a **full assessment into the impacts of different technology and energy source choices** on these constitutional rights.

⁴² The objects of the National Energy Act are to: “(a) ensure uninterrupted supply of energy to the Republic; (b) promote diversity of supply of energy and its sources; (c) facilitate effective management of energy demand and its conservation; (d) promote energy research; (e) promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; (f) ensure collection of data and information relating to energy supply, transportation and demand; (g) provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; (h) provide for certain safety, health and environment matters that pertain to energy; (i) facilitate energy access for improvement of the quality of life of the people of Republic; (j) commercialise energy-related technologies; (k) ensure effective planning for energy supply, transportation and consumption; and (l) contribute to sustainable development of South Africa’s economy”.

⁴³ The objects of the ERA Act are to: “(a) achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa; (b) ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic; (c) facilitate investment in the electricity supply industry; (d) facilitate universal access to electricity; (e) promote the use of diverse energy sources and energy efficiency; (f) promote competitiveness and customer and end user choice; and (g) facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public”.



- *The draft IRP provides no meaningful assessment of its electricity choices on constitutional rights. By its heavy reliance on fossil fuels – with all of their attendant impacts and consequences – the draft IRP fails to promote the realisation of constitutional rights.*

44. **The draft IRP fails to comply with these minimum requirements. It does not promote energy equity. It does not provide energy security. And it does not have any meaningful regard to environmental sustainability.**

45. It also fails to reflect what is in the best interest of all in South Africa; including by its failure to give adequate consideration to the negative impacts of fossil fuels on human health, the environment (including our scarce water resources), global climate change, and the economy.

46. We also submit that it is premature to have published the draft IRP without an Integrated Energy Plan (IEP), and before SETs have not been published. This is especially so in circumstances where the draft IRP will continue not to be regularly updated. Although the IRP describes itself as a “living plan that is expected to be regularly reviewed as necessitated by changing circumstances”, there have been long delays between IRP iterations – notwithstanding crucial “changing circumstances” in the interim – and the most recent IRP was published four years ago. The IRP that preceded the current, 2019 IRP, was published eight years before that. As a result, it is unlikely that the IRP will be timeously reviewed and updated once the IEP is published and SETs are finalised.

The Integrated Energy Plan (IEP)

47. The National Energy Act requires the Minister to establish mechanisms to, *inter alia*, collect, collate and analyse energy data and information; and to annually publish an analysis: reviewing energy demand and supply for previous year; forecasting energy supply and demand for no less than 20 years; and of plausible energy scenarios of how the future energy demand and supply landscape could look like under different demand and supply assumptions. The Minister is also required to publish the models used for data and information analysis and all the assumptions that underpin the models.⁴⁴

48. Section 6 of the National Energy Act – which commences on 1 April 2024 – requires the Minister to develop and, on an annual basis, review and publish the IEP in the Gazette. The IEP must, *inter alia*, inform and be informed by plans from all supply, production and demand sectors whose plans impact on or are impacted by the IEP; and be based on the results of the annual energy analysis.

49. The IEP must have a planning horizon of not less than 20 years and:

⁴⁴ Section 3.



- serve as a guide for energy infrastructure investments;
- take into account all viable energy supply options; and
- guide the selection of the appropriate technology to meet energy demand.

50. It must deal with issues relating to the supply, transformation, transport, storage of and demand for energy, and its development must take into account:

- sustainable development;
- optimal use of indigenous and regional energy resources;
- balance between supply and demand;
- economic viability;
- environmental, health, safety and socio-economic impacts; and
- developmental requirements of the Southern African region.

51. There has only ever been one completed IEP to date, and that was some 21 years ago, in 2003. Given the delay in putting the empowering section of the National Energy Act into effect (which requires its annual review); the next IEP is only due to be published before 1 April 2025. There is no doubt that the IEP is hugely relevant to the decisions made about South Africa's electricity future and it should have been published ahead of the IRP.

Sectoral emission targets

52. The Climate Change Bill [B 9B - 2022] (currently before the National Council of Provinces) makes provision for sectors and sub-sectors to be subject to SETs, guided by the national GHG emissions profile. These are defined as “quantitative or qualitative goals informed by sectoral policies and measures that may lead to greenhouse gas emission reductions, for the sector or sub-sector, over a defined time period”. The SETs must include quantitative and qualitative GHG emission reduction goals for the first five years, the subsequent five to 10 years, and for a 10 to 15 year period thereafter.⁴⁵

53. The SETs are to be implemented by the Ministers responsible for the administration of each sub/sector, who must adopt policies and measures towards the achievement of the SETs. The relevant Ministers must: implement those policies and measures; monitor the effectiveness of their implementation in achieving the relevant SETs; and annually report to the Presidency on progress towards achievement of the relevant SETs. The Minister of Forestry, Fisheries and the Environment must submit annual progress reports to Cabinet on implementation of the SETs.

54. The emissions allocated to the electricity sector in its SET would clearly determine its carbon emissions profile. IRP decisions as to electricity sources and contributions determine the volumes of GHGs produced by the sector. The draft IRP appears to assume that some 44% of emissions will be allocated to the electricity sector. According to Meridian, as well as UCT's ESRG, this is too high. The power sector is much more cost-effective to decarbonise than other

⁴⁵ Section 22.



sectors of the economy. In the World Bank's 2022 South African Country Climate and Development Report (CCDR), 160 Mt is associated with the upper limit of the NDC range.⁴⁶ South Africa's JETP IP suggests the upper limit to be closer to 125 Mt.⁴⁷

55. In any event, it is premature to prepare the IRP without confirmation of the GHG emissions that will actually be allocated in the electricity sector SET. As explained in 43.7 above, the draft IRP's emissions will result in South Africa's failure to comply with its climate commitments, particularly as these become stricter, from 2025 onwards.
56. In our view, the draft IRP's high reliance on fossil fuels materially exceeds the GHG emissions that should be allocated to the electricity sector. In other words, it will take up too much of South Africa's carbon budget. If the SETs are appropriately allocated (once the Climate Change Act is in force), the draft IRP's emissions will quite likely exceed the electricity SET. Given that the electricity sector is also the cheapest and easiest to decarbonise, this will inevitably also compromise mitigation and just transition considerations across other sectors.

Conclusion

57. For the reasons set out above, the draft IRP does not adequately comply with the minimum requirements for a credible and lawful electricity plan; nor does it meet its self-described "distinct but not mutually exclusive aspirations, namely, security of supply, energy affordability and carbon emissions reduction".
58. The draft IRP should be substantially revised to take all of these issues into account and then re-advertised for comment.
59. Let us know should you have any questions or require any further information in relation to these submissions.

Yours faithfully

JUST SHARE

Per:

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⁴⁶ <https://openknowledge.worldbank.org/server/api/core/bitstreams/52409ffd-96f7-58d4-be7f-c8114abbd4c5/content>
Modelling and analytical results for the low-carbon transition were provided by ESRG.

⁴⁷ <https://pccommissionflo.imgix.net/uploads/images/South-Africas-Just-Energy-Transition-Investment-Plan-JET-IP-2023-2027-FINAL.pdf>