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23 March 2024

To: The Director General of Department of Mineral Energy and Resources

ATT: Mr Jacob Mbele

Per email: IRP.Queries@dmre.gov.za

Dear Mr Mbele

COMMENTS ON THE DRAFT INTEGRATED RESOURCE PLAN 2023

1. Introduction

- 1.1. The Green Connection is a registered non-governmental organisation, that believes economic growth and development, improvement of socio-economic status and conservation of natural resources can only take place within a commonly understood framework of sustainable development. It aims to provide practical support to both the government and nongovernmental/ civil society sectors, which are an integral part of sustainable development.
- 1.2. The Green Connection submits these comments in response to an invitation by the Department of Mineral Resources ('DMRE') for written comments on the draft Integrated Resource Plan 2023 ('Draft IRP'). We further endorse the submission made by Centre of Environmental Rights.
- 1.3. Our submissions on the Draft IRP highlight key considerations that were not taken into account such as the impacts of climate change, the economic burden of using gas and South Africa's immense renewable energy potential. We reserve the right to make additional submissions if a revised draft of the IRP 2023 is published.

2. General Comments:

- 2.1. Energy is the life blood of the economy which impacts on all sectors as well as individual livelihoods. Integrated energy planning is required to ensure that current and future energy service needs can be met in the most cost effective, efficient and socially beneficial manner while also taking into account environmental impacts.



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- 2.2. Haphazard decisions continue to be made by government which affect the environment and communities so this plan would enable a progressive way at looking into energy development.
 - 2.3. The IEP aims to guide future energy infrastructure investments, identify and recommend policy development to shape the future energy landscape of the country through a just energy transition.
 - 2.4. The IEP is an umbrella plan which, amongst other factors should guide policy development in South Africa, set the framework for regulations and also inform the selection of technologies to meet future energy demand. The IEP in scope therefore covers the entire energy sector and considers all elements of the energy value chain.
 - 2.5. The Integrated Resource Plan (IRP) can therefore be viewed **as a subset of the IEP** in that:
 - 2.5.1. It considers only the future demand and supply of **electricity**; and
 - 2.5.2. It proposes capacity expansion plan to ensure that the energy demand needs are met in the most effective way.
 - 2.6. It is indeed correct that the IEP should have been developed before the IRP.
3. According to the latest [Intergovernmental Panel on Climate Change Report ⁴](#), human caused climate change is already affecting weather and has resulted in climate extremes in every region across the globe. This has led to adverse impacts on people and nature resulting in significant loss and damage. As illustrated by the impacts of climate change on South Africa, vulnerable communities who have contributed the least to climate change are the most impacted.¹ [South Africa has to plan and address the intersecting problems such as our need for development as well as our particular vulnerability to climate change](#). An IRP which flies in the face of the climate crisis will inevitably fail to address our developmental needs. The climate science is clear: in order to address the climate crisis, we urgent action to phase out fossil fuels and transition to low-carbon economies.
- 3.1. South Africa has abundant renewable energy potential, yet we see that the Draft IRP 2023 scales back on renewable energy in order to push gas, a potent fossil fuel. The costing estimates used to get to this modelling scenario are questionable as the consensus is that the costs of renewables will continue to fall, and the cost of gas is subject to volatility given geo-political instability of international commodities.² Whilst gas is technically less polluting than coal in its combustion, LNG methane gas which can escape from pipelines into the atmosphere as fugitive emissions. Methane is a

¹ Centre for Environmental Rights: "Climate impacts in southern Africa during the 21st Century" (2021). Available at: [Climate-impacts-in-South-Africa_Final_September_2021.FINAL_.pdf \(cer.org.za\)](#)

² [Renewable Power Generation Costs in 2022 \(irena.org\)](#)



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potent greenhouse gas and can cause 85% more climate damage than coal over a 20-year time period.³

- 3.2. The inclusion of gas also poses the risk of 'stranded assets'. The new infrastructure that needs to be constructed to support the gas industry is capital intensive, inevitably prolonging our dependence on this fossil fuel. This further delays our energy transition to renewables, and we will continue to lag as the rest of the world divests from fossil fuels. As the costs of renewable energy continues to fall countries will stop using gas altogether making investment in gas infrastructure a waste of public money.
- 3.3. Gas extraction also poses a risk to harming local communities and the environment. The mining process for gas (both on-shore and off-shore) is destructive and has negative consequences for the ocean, air, human health and biodiversity. For these reasons the inclusion of gas in the draft IRP 2023 is flawed.
- 3.4. Impacts on Jobs: The existing livelihoods that depend on the ocean will be at risk and the local economy will be negatively impacted. The people working in fisheries and tourism industries are unlikely to have the skills that are needed for oil and gas work, and expanding such extractive industries will therefore increase unemployment in the country. Given that profits from such oil and gas will accrue to investors such as private companies, the continuation of the extractive oil and gas sector will also exacerbate inequality and increase poverty.
- 3.5. Furthermore, the polluting energy mix proposed by the draft IRP 2023, for the short-term horizon fails to address loadshedding in the next 6 years. This cannot be acceptable as it will be further detrimental to the economy and plunge more people into energy poverty.

4. DRAFT IRP FLAWS

- 4.1. The electricity plan has failed to provide detailed calculations about the costs of different types of electricity the model uses. While South Africa is a country with sufficient sun, wind and other potential renewable energy the draft Integrated Resource Plan has less of the above mentioned yet the plan which was published in

³ [Grasping-For-Gas-Report-22042021-1.pdf \(thegreenconnection.org.za\)](https://www.thegreenconnection.org.za/Grasping-For-Gas-Report-22042021-1.pdf)

⁴ https://report.ipcc.ch/ar6syrr/pdf/IPCC_AR6_SYR_LongerReport.pdf



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2019 included wind and solar. The plan is not providing solutions to loadshedding but proposes projects (coal, gas, nuclear) that will pollute and take time to construct.

- 4.2. The draft plan fails to consider renewable energy which will continue to decrease in terms of affordability in the next coming years.
- 4.3. South Africa is already experiencing effects of climate change as we have seen how communities have been hit hard by floods and droughts and the [International Panel of Climate Change](#) has also indicated that there is no need to invest in new oil and gas projects in our net zero pathway. In as much as burning of gas causes less carbon emissions however, gas (methane) emissions have greater impact than that of carbon dioxide as they are projected to be [82.5 times as impactful](#) as those of carbon dioxide. [Methane is more damaging and can cause 85%](#) more climate damage than coal over a 20-year period.
- 4.4. The draft IRP 2023 does not put forward clean affordable energy for everyone instead, puts forward a fossil-heavy electricity generation system at a time when the world is transitioning to low carbon economies and will come at a massive cost to human wellbeing, health and the environment.
- 4.5. The IRP 2023 process must be evidence based in its decision-making. The Meridian report is supported in principle by The Green Connection.⁴ Additionally, the demand projections need to be remodelled. We recommend that you approach the metro's directly in order to ascertain their energy demand and do not rely on Eskom's projections for this sector.⁵
- 4.6. The next round of the IRP2023/4 must provide detailed cost assumptions. It is not sufficient to provide a range of costs and not explain in which circumstances a particular value was used.

⁴ <https://meridianeconomics.co.za/wp-content/uploads/2024/03/IRP2023-Modelling-Submission-20240318.0.pdf>

⁵ Please find attached the submission to NERSA that we referred to in our bilateral conversation <https://safcei.org/wp-content/uploads/2018/11/2018-11-29-submission-to-Nersa-re-Eskom-MYPD4-application-.pdf>. This provides some indication of how Eskom's demand projections were incorrect in the past.



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- 4.7. In our bilateral, the nuclear cost which was chosen from the range of value available, was the least cost PWR, but the assumptions under that choice would be strongly critiqued by energy modelling experts and real life building programmes.
- 4.8. In our bilateral, we spoke about the CSP allocation in the long-term scenarios. It appears as if the model replaced gas with CSP rather than drawing on a systems approach where wind and solar pv could be expanded, and storage (battery and pumped storage) expanded to provide back up. Building out excess solar and wind enables additional power to be used to power up storage during the day and that would be cheaper than using gas to do that given that the fuel costs of diesel/gas far outweigh the fuel costs of solar (being zero). We do understand that there will be some maintenance costs but the principle is that we are looking for affordability.
- 4.9. We believe that geopolitical considerations should be minimised – we believe that it is highly unlikely that grand inga will materialise and it should be removed.
- 4.10. Distributed solar, particularly SSEG has made a significant impact on the energy system, where wealthier industrial, commercial and residential sectors are now increasing their solar roofs. However, poorer households could also benefit if there was investment in mini grids and solar home systems. Such solar home systems are much more affordable than extending the grid in certain areas and can then become an economic enabler rather than an added household expense for which households have no income to pay their electricity bills.
- 4.11. Any policy adjustments should be done with a focus on affordability to address the energy needs of the majority of South Africans particularly those who are poor and marginalised and those small businesses that need electricity as an enabler.
- 4.12. Policy adjustments need to focus on localisation potential and to also focus on the available skills in the country.
- 4.13. Similarly, the DMRE needs to acknowledge the climate crisis and any policy adjustment should be made to ensure technologies that avoid further fossil fuels. Health impacts due to air pollution must be included and externalities included in the modelling with the aim to reduce health impacts. The Green Connection rejects the notion that human health impacts can be traded off against economic wealth.



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- 4.14. The Green Connection supports the PCC report on the electricity sector in the main and particularly in its conclusion that there should be a significant increase in renewables and storage going forward.⁶
- 4.15. We have emphasised that while we appreciate that there is a renewables scenario which is part of the modelled scenarios, we believe that with the addition of technology learning for battery storage and renewables, the model should favour increased renewables. We would like that tested. And to run with CSP constrained unless its costs are reduced to the equivalent of solar pv.
- 4.16. We do want to ask that the model uses the correct equivalent carbon emissions for methane in all the gas scenarios.
- 4.17. Community benefits and local economic development should be emphasised and these potential added benefits from SSEG and a more distributed approach to solar pv at household and level should be adopted for both the short term and long-term planning horizon.
- 4.18. The IRP 2023 cannot be adequate if it still contains load shedding. The model should be allowed to run to ensure no load shedding. Constraints that are identified in terms of grid for example, should then be part of a second round of modelling where the reasons are laid out transparently. Where there are short term gaps, then scenarios to fill those gaps should be presented. For example. Incentivising municipality to install roof top solar and increasing the roll out of solar water heaters for poorer households could potentially alleviate the shortfall while creating jobs in installation and maintenance of such system.

5. Process issues:

- 5.1. The Green Connection believes that it is our responsibility to engage with Government on issues that concern our mandate. We also believe that the Government has the

⁶ https://pcccommissionflo.imgix.net/uploads/images/PCC-Electricity-Planning-Recommendations-Report_2023-06-01-143447_hccs.pdf.



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responsibility to ensure that we can engage meaningfully. The IRP2023 was released on 4 January 2024 with a 6-week comment period.

- 5.2. It has been disappointing to find that when the draft IRP was released, there was inadequate information with which to engage. We raised this at the Zoom meeting on 18 January and we are appreciative that thereafter further costing tables were released.
- 5.3. However, it was still not clear how these numbers were used. We requested a bilateral with DMRE and we express our appreciation for that opportunity. This opportunity (13th March 2024) enabled us to have a frank discussion and to highlight many of the issues that we are raising here.
- 5.4. The DMRE also shared how the model used the data supplied, particularly with regard to costing but it was also clear that many stakeholders with more expertise than ourselves have also been raising significant technical issues and it seems clear that the model needs to be rerun with some major assumption revisions.
- 5.5. We appreciate that the DMRE extended the deadline to 23rd March 2024. However, we believe that the next step is to rerun the model and to then release it for further comment. However, we do wonder if the team shouldn't rather park the IRP process and focus on the IEP which needs to be finalised by March 2025. And once the IEP is finished, then the IRP can be revised with a more robust overall energy context within which to examine the extent of electricity generation supply needed.
- 5.6. Should the DMRE continue with the current IRP process, then we assume that there would be a further round of public comments. In our view, given our comments as well as the substantive and significant inputs made by other stakeholders, there is no doubt that a revised IRP would be significantly different to the current draft released for comment.
- 5.7. We would also submit that once the IEP is produced, there would be a need to review the IRP again, in order to fit it within the IEP. Failure to do that could result in an IEP which is at odds with an IRP and this could lead to confusion amongst all stakeholders including those who are trying to plan their investment decisions based on government policy direction.
- 5.8. We would also recommend that in person meetings, and space for robust and meaningful debate should also be created. Sometimes it is necessary to sit around the table and understand how the needs of multiple stakeholders can be acknowledged and addressed. Transparency and Agreement on the methodology up front, and agreement on the assumption enables most of the people to be satisfied with the results. This has not taken place in this IRP round. We hope that this will be different going forward.



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- 5.9. Given that section 6 of the National Energy Act requires annual updating of the IEP with the IRP as a subset of the IEP, we assume that additional capacity will be added to the planning and policy unit to enable future comprehensive energy planning in the public interest.

We refer you to appendix A for some technical comments specifically with reference to the IRP2023 document itself.

6. Endorsements:

- 6.1. Given that our energy system is in transition, we endorse SAFCEI's submission as it relates to nuclear and its cost and time to build.
- 6.2. We also endorse SAFCEI's submission with regard to the grid. A grid that is focused on a decentralised variable renewable based system is very different from a centralised system with a few large generators.

A power network for a system reliant on a small number of very large nuclear power plants would look totally different to one designed for a large number of renewable sources. Hence if the grid is built for large scale nuclear power generation and then the reactors cannot be built, the money on the system will have been wasted and the system will be ill-suited to renewables entailing further cost. (Prof. S. Thomas, SAFCEI submission to the irp2023)

7. Concluding comments

- In the absence of an IEP that will deliver secure, affordable and clean energy, the Draft IRP 2023 is not anchored in a sustainable energy future. however, as a basic assumption, the electricity mix for south Africa should be such that:
- Electricity generation that will not increase the pollution of our air, water or deprive us of our land.
- Electricity that is affordable – for all marginalised and vulnerable communities.
- Electricity generation options that create sustainable, safe and healthy jobs.



- Electricity that will address our climate change crisis.

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Appendix A.

Technical submission:

Definitions:

Green hydrogen gas - The definition should include the word renewable energy sources instead of clean. “clean” is not identical to renewable and this definition must be amended to reflect the true definition. green does not include nuclear (pink hydrogen) or gas (grey or blue)

JET – the definition in the IRP does not include the justice element, so this needs to be amended to reflect the need for an energy transition that is socially equitable.

For example:

Achieving a “Just Energy Transition” is central to the work of the Presidential Climate Commission, ensuring that the lives and communities that are tied to high-emitting energy industries (e.g., coal) are not left behind in the shift towards a low emissions economy. Indeed, the energy transition must be fair and perceived to be fair. (<https://www.climatecommission.org.za/just-energy-transition>)

The effects of the climate crisis have worsened over the past few decades. As hurricanes become stronger, droughts become more frequent, and global hunger increases, advocates have argued fiercely for the end of fossil fuels.

But a transition away from polluting energy and towards clean, renewable energy must be done in a way that’s fair for everyone. Right now, the people who suffer the worst impacts of the [climate crisis](https://www.oxfamamerica.org/explore/stories/what-is-a-just-energy-transition/) are not those most responsible for it. (<https://www.oxfamamerica.org/explore/stories/what-is-a-just-energy-transition/>)

It is a shift from our current energy system to one that is better in terms of sustainability, environmental impact, climate change, human health, economics, employment and social equity(<https://90by2030.org.za/just-energy-transition/>)

Long term operation. This appears to be related to Koeberg as it is specific to nuclear but is it not something that relates to other power stations that attempt to run beyond their economic lifespan. It is not clear why this definition is necessary, but it should either be amended to apply to all technologies or removed.



NECC this definition is very loose. The NECC is established in the presidency and should have a lifespan.

Net zero – this definition should be aligned with the UN and related to the Paris Convention. Net zero means cutting carbon emissions to a small amount of residual emissions that can be absorbed and durably stored by nature and other carbon dioxide removal measures, leaving zero in the atmosphere. To keep global warming to no more than 1.5°C – as called for in the [Paris Agreement](#) – emissions need to be reduced by 45% by 2030 and reach net zero by 2050.

Renewable IPP programme. Either the Renewable word must be removed, or the definition must be changed to reflect only Renewable. But it can't be labelled renewable and include non-renewable energy sources.

Context page 10

There should be a reference to energy poverty and would be important to acknowledge international trends which would drive increased electrification, and the state of our current Eskom fleet.

It is also important to refer to international obligations such as the Paris Agreement and CBAM.

1.3.1 – Reject CCUS as a strategy as it is unproven.

1.3.2 Nuclear – refer to world nuclear status report (<https://www.worldnuclearreport.org/-World-Nuclear-Industry-Status-Report-2023-.html>) – “WNISR2023 contains a special focus chapter on *Nuclear Power Economics and Finance* that assesses how persistent competitive pressures force the nuclear sector to rely on increasing state support. Further focus chapters include an expanded analysis of U.S. nuclear policy, including its multiple new subsidy mechanisms, as well as an assessment of the struggling South African nuclear program amidst a continued electricity crisis. The report also looks at the history of Germany's phased-out nuclear fleet until its last three reactors were closed in April 2023, and scrutinizes the difficulties that neighbouring France has been facing in a historically catastrophic year of nuclear performance. The situation of the Russian nuclear industry, as well as complex implications of the international interdependencies with nuclear players in other countries, are subject to closer scrutiny. A United Kingdom Focus looks at the many challenges of operation, decommissioning, ongoing construction, and future prospects.”

Externalities need to be included, and the costs of long-term waste disposal.

SMRs – still no commercially viable reactors. –

Koeberg extension of life not really been approved so this statement appears to be a leap of faith that has yet to be proven and could be very costly.



1.3.3 Gas (page 11)

Gas is supposed to complement renewable energy in the short term, but this paragraph envisages SA scaling up and becoming dependent on gas and encouraging the development of more fossil fuels through the extraction of ocean gas resources. As well as fracking and coal bed methane. This paragraph is in direct conflict with climate change obligations and should be amended to reflect the national climate change position.

Offshore oil and gas exploration and shale gas have both significant environmental negative impacts and Green Connection believes that this section should be constrained to the first paragraph, possibly the last paragraph and the rest to be deleted, possibly to be interrogated into the IEP.

There is no reference to climate change.

1.3.4. Renewables

This section does not seem to be carried through into the modelling which results in less renewables than the IRP 2019.

1.3.5 Hydro

Hydro needs to be related to climate change. Droughts in countries to the north of us reliant on hydro are experiencing power shortages due to drought.

It might be possible to increase run of river (or off channel) or pumped storage in the east of the country as that is predicted to be wetter in future due to climate change. But the grand inga should be excluded from any energy modelling at this point.

The reference to trade and infrastructure could easily be applied to renewable energy.

1.3.6 Storage.

There are a number of negative statements about renewable energy that need challenging. – timing of production low during peak periods – not necessarily true for wind. Also industry and commerce peak in day. And increased solar would allow increased storage of such energy for evening peaks.

Also, power system doesn't have storage or flexibility should be updated – there is existing pumped storage which enables Cape Town to be one stage lower than rest of country as one example – battery power stations are being built currently. Examples from other countries should be researched. Australia seems to have got this right. This section suggest that the writer has not researched up to date information. The concern is that this attitude might then informed the modelling taking incorrect assumptions into the modelling.



1.3.7. Hydrogen

This section reflects a clear technology bias. There is no green hydrogen electricity generating facility in South Africa at the moment. There is various paragraphs referring to benefit of renewables as relates to hydrogen production.

There is also no discussion about the critical minerals that South Africa has for the renewable energy industry, but these appear only in the hydrogen section. This bias needs to be corrected and rewritten to reflect the positive aspects of renewables and storage in relevant renewable and storage sections.

Given that the hydrogen section specifically refers to renewables, and the hydrogen roadmap is focused on renewables. Then it should be clear that the only hydrogen referred to is “green” hydrogen.

There is no mention of the SAREM but mention of a hydrogen roadmap. Again, the document reflects a bias against renewable energy.

1.4 – Latest developments. Page 15.

1.4.5 – Technology agnostic has been challenged by energy experts – and this RMIPPP has not yielded the most affordable electricity as it included Karpowerships which are currently under legal challenge due to serious governance issues.

2. IRP methodology – Page16

Plexos etc.

2..1 The sources of the data were not clear and the actual numbers which were used were not transparently explained. Some clarity was only obtained after a bilateral with the DMRE and further iterations need to present exact details of which characteristics the model chose and why

2.2 – Climate change needs to be a key determinant.

2.4 Shouldn't long term policy choices be the role of the IEP and then the IRP would be developed in response? For example, until we know what we are doing in the transport sector, we don't know how much electricity to plan for.

2.5 – In our view, we should determine the electricity demand and then plan to meet it. A subsequent analysis would then enable a plan to meet the shortfall over the next 6 years.



2.6 Reference case is not useful without the actual numbers and assumptions regarding learning rates for example – why was the gas case used as we have very little gas, and our prices are internationally linked. An Improved EAF is not likely so why only those 2. Why was there not an expanded renewable energy scenario which is more practical in the next few years?

2.8 – Reference case least cost – did it include technology cost reductions due to learning, for renewable and battery storage – and what were the assumptions for the rand/dollar and international gas price.

Factors considered in IRP review page 18.

3.2 Extension of coal – no mention of the cost to keep them going or the health impacts on surrounding communities. These costs need to be factored into the calculations – it might be cost effective to close them and reap the positive health benefits and the building of renewable generation and storage would create jobs and add to the economy.

3.3 New build challenges – Government stopped the renewable energy build in Zuma years and ran the Eskom fleet beyond what it was supposed to without sufficient maintenance – causing major energy security risk. Eskom also failed to build the CSP plant despite this being a condition of the world bank loan.

3.4 – This section does not present a full information picture. The final IRP2019 said that there should be a feasibility studies and the life extension decision would depend on the safety case. The NNR has not made its decision.

3.5 – The sentiment expressed in this paragraph is of concern. It appears that people's health is to be sacrificed rather than DMRE applying its mind to an electricity solution that would ensure energy security for the country – even if that means shutting down coal plants that don't comply and building renewable plants. Coal based workers at Eskom need a just solution that ensures that they are still able to feed their families and support the local economy.

3.6 New capacity – it might be instructive to distinguish between which projects have failed or delayed.

3.7 Positive outlook for transmission – while acknowledging failure to invest. The grid constraints should not be used as input parameters for the modelling. Should the model proposed 60GW of renewable energy, then the DMRE would then examine how this could be achieved given the current grid constraints and where other solar or wind resources could be harnessed. Possibly this might mean building solar generation in Botswana or Zimbabwe and wheeling the power through existing power pool arrangements.

4. Input assumptions. Pg 21



The range of stakeholders did not as far as we are aware, include civil society organisations that work in this sector. This is an omission and has resulted in a weaker IRP than if all stakeholders had been able to input.

4.1 Energy demand

There is a need to halt the assumption that economic growth will lead to matching energy demand.

References: <https://www.sciencedirect.com/science/article/pii/S0306261919309638>

<https://www.sciencedirect.com/science/article/pii/S0301421518300570>

<https://www.sciencedirect.com/science/article/pii/S0959652620308155>

Attached are previous submissions to NERSA showing how Eskom predictions for increased demand from local metropolises were incorrect.

4.2 EAF

There are high and low scenarios but unlikely that high will be reached with current Eskom fleet – not clear if EAF for 2040's still includes coal fleet.

4.3 Eskom shut down – what were the assumptions behind shutting down or extending – the cost of keeping going needs to include the health impacts and environmental impacts of water and other pollution. The cost of unserved energy is not the cost of shutting down as there are alternatives to fill the generation gap.

4.4 Transmission

Unclear if transmission assumption only included current plans – or also included annexure B – important as Northern Cape grid expansion would mean best solar resources could be exported to Gauteng.

4.5 Private Generation

This seems very conservative in assuming that anything that is not already in the pipeline won't materialise yet. New projects are happening every day. The latest actual rooftop solar build shows that increased capacity can be built at speed. This needs to be modelled and possibly this might reduce the amount of solar that Eskom needs to build but then increased storage might be needed. Additional factors that could be looked at:

There are additional factors that could change the electricity demand and could be modelled. If the price of electricity rises at night when coal plants are mostly being used, then customer behaviour might switch – industry might install their own battery storage and use the solar during the day to charge their batteries.



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Time of use tariffs and use of solar water heaters could all reduce the evening peak – and that would direct the energy system to be more efficient and effective in providing energy security to South Africa.

5.results

Table 2: Emerging Plan from Horizon One Analysis

	Coal	Gas - IPP Programme	Gas - Eskom	Dispatchable Capacity	Nuclear	Hydro	Pumped Storage	CSP	Solar PV	Wind	Hybrid IPP Programme	Distributed Generation ^a	BESS - IPP Programme	BESS - Eskom	Unserved Energy (TWh)
Current Base (MW)	38 800	1 005	2 825	-	1 860	1 600	2732	500	2 287	3 443	-	5 000	-	20	
2024	720							100			150	900		199	13.06
2025	720	1 220							2 115	644	476	900	513	141	7.63
2026										140		900			7.66
2027		1 000								684		900	2 000	615	4.55
2028		1 000	3 000						500			900	615		0.22
2029									500	1 500		900			0.25
2030		1 000		1 376					500	1 500		900			0.27
Additional New Capacity (MW)	1 440	4 220	3 000	1 376				100	3 615	4 468	626	6 300	3 743	360	

Installed Capacity
 Capacity under construction
 Capacity procured
 New Capacity
 Distributed Generation Capacity for own use
 Unserved Energy, preferred as low as possible

5.1 – Seems to have taken only those that are already in the pipeline and then used expensive peakers –.

The scenarios seem staged as the only new supply which increases is gas to power.

The 5th scenario assumes Eskom recovers.

There is no scenario where renewable energy is incentivised or that demand is reduced through energy saving or behavioural interventions such as time of use tariffs or time zones for example or the roll out of swhs.

The assumptions for emissions for the gas scenario do not include methane fugitive emissions (according to the bilateral discussion). In the rerun of the model, please include fugitive emissions for this scenario.

Why would solar rooftop only be 900 a year? These needs revising.

Why is there no BESS brought on in 2026? This needs to rerun to include additional storage.

Why is there no solar pv in 2026 or wind in 2028? In order to create a steady demand for renewable energy industrialisation, it would be important to rerun the model with continuous increases every year.

Without such adjustments, the impression is created that the model has designed its outcomes to result in a shortfall and lead to load shedding or more gas. We were reassured by the modelling team in our meeting that this was not the case, but it is important to ensure that the model is transparent and robust to avoid such perceptions.

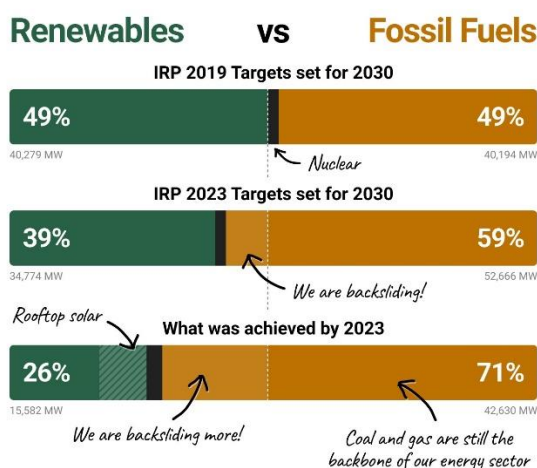
5.2.1 Horizon one

The interventions are business as usual and fail to take into account the reality of climate change, people's health or other externalities.

The graphics inserted here were created to show how the IRP 2023 is actually worse for reducing climate change that the irp2019 and that we are going backwards.

2030 plans vs 2023 reality

In 2019, the IRP put forward plans that acknowledged the need for South Africa to invest in renewable electricity and lower our reliance on fossil fuels by 2030. In 2023, the amount of renewables in our electricity mix was still well behind our 2030 target, and the Department of Minerals and Energy (DMRE) backslid on their planned commitments to renewables.



What you can do about it?
Reject the 2023 IRP and demand a more transparent and sustainable peoples electricity plan!

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We would urge the DMRE to examine their assumptions and update their research in order to ensure that the IRP becomes business unusual.

8. Horizon 2. 2031 to 2050.

Path one - Reference was least costs and with no implementation constraints.

In future iterations, it would be important to share the actual numbers in different years, the learning rates etc.

Also why is gas brought in later in the scenarios? This seems odd if the dollar/rand exchange and other cost assumptions such as CBAM are factored in.

Path 2 -

Renewables – still has gas and then nuclear and the other path2 excludes gas.

If expense is due to high costs of storage, failure to look at learning rates or failure to include all emissions for gas, then the rerun must be adjusted to include all of these.

The idea that costs are compared to the cost of unserved energy might then lead to a false result where anything is better than having unserved energy. That cannot be valid as there must be other incentives that could be used to save energy, reduce demand and therefore eliminate load shedding.

For the rerun, we need all the numbers to back up any claims. For example, the claim that the RE pathway is the highest cost. RE pathway highest cost – other models do not agree and transparency is needed. Also important to increase solar pv not csp or run two scenarios if csp is more expensive.

Delayed coal shut down. This might appear cheaper but we would need breakdown of coal power plant costs of keeping them going to compare.

<https://www.sciencedaily.com/releases/2020/03/200323125603.htm>

https://energyinnovation.org/wp-content/uploads/2019/04/Coal-Cost-Crossover_Energy-Innovation_VCE_FINAL2.pdf

<https://www.sciencedirect.com/science/article/pii/S266668392200089X>

Cleaner coal should be completely rejected as non-commercially feasible. – claims of least build but not sure of least cost – unlikely as CCUS not commercially viable.

6.2 Overall observations – the impression gained by the read is that decarbonising the energy system is somehow a choice.

Given the climate crisis, we do not believe that we have a choice and we should be looking at the necessary build programme for renewables and that fossil fuel phase out includes gas.

Replacing coal with gas is to be rejected.



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References for the IRP are 9 documents the majority of which are Eskom documents. There is no reference to other independent studies. We have provided additional references for the interest of the modellers, and these are not intended to be a comprehensive list.