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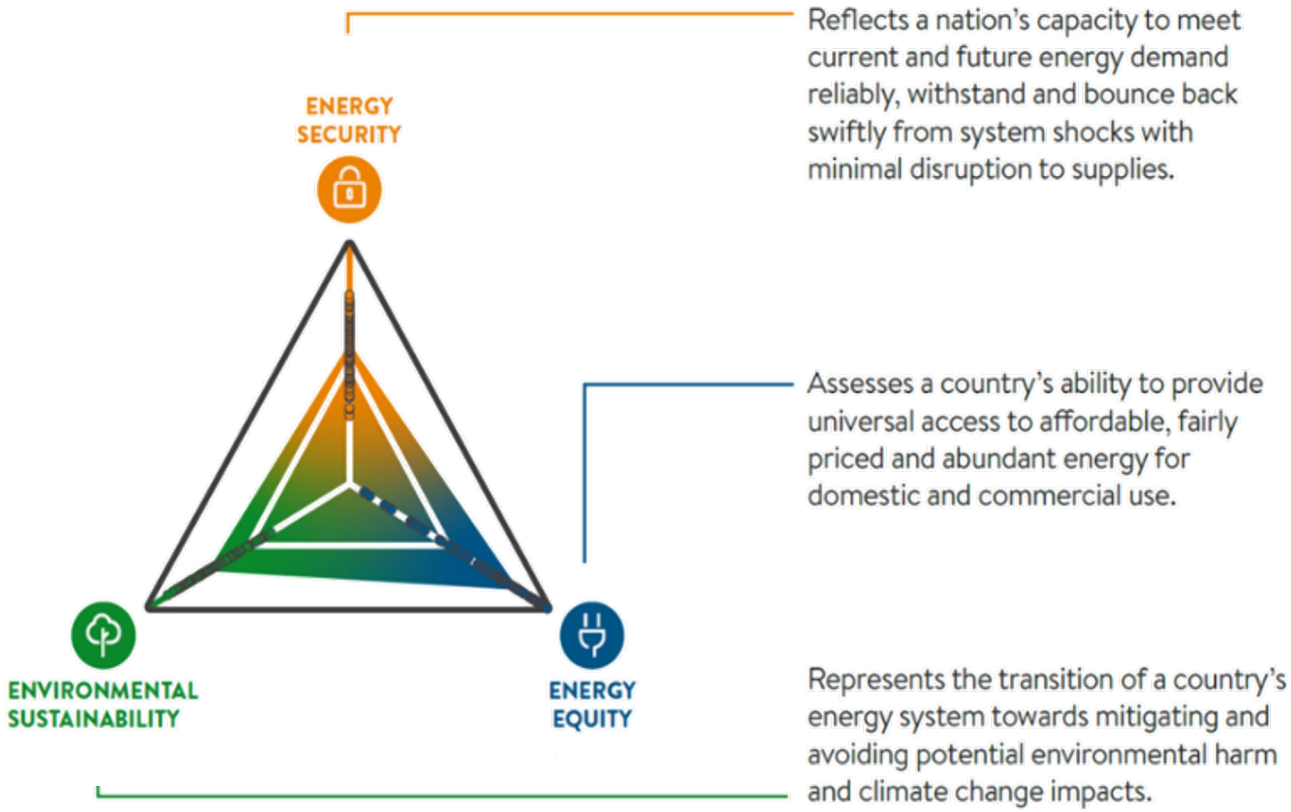
IRP Briefing

16th February 2024

Electricity is critical for development and the IRP is challenged by multiple policy objectives



"The IRP is a living plan that is expected to be regularly reviewed" focused on multiple policy objectives of "security of supply, energy affordability, and carbon emissions reduction" and that ultimately "final policy decisions must be taken on the basis of a long-term decarbonisation trajectory while improving South Africa's competitiveness, growing the economy through industrial renaissance as outlined in the NDP."

It therefore exists in and is influential on multiple policy documents including the National Development Plan, The Just Energy Transition Implementation Plan, the National Infrastructure Plan, and the Integrated Energy Plan.

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The PCC process on which these draft IRP2023 briefing and comments are based

Jul to Dec 2022

A series of technical sessions on key electricity and just transition concepts. This helped build the capacity of stakeholders.

Jan to March 2023

The initial research review and hypothesis document informed and extensive stakeholder engagement programme to inform recommendations.

April 2023

Electricity Recommendations Reports (technical, stakeholder and the recommendations) presented to the President

January 2024

IRP is released and PCC secretariate review IRP against the Commissioner recommendations

February 2024

Additional stakeholder sessions with experts and social partners; the DMRE team were extremely supportive.

March 2024

The PCC will review commissioner input, update the IRP2023 recommendations document and submit to the President and the DMRE

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There has been a useful innovation in the IRP2023 analytical approach

Horizon 1

IRP Prescription

Horizon 2

Conclusions

Scenarios and modelling to 2030

The DMRE develop 5 scenarios from which they extract several learnings and principles.

Energy Mix to 2030

The DMRE use the principles extracted in the Horizon 1 analysis to suggest an energy mix up until 2050 – expressed in table 2. There is no scenario from Horizon 1 that reflects the energy mix expressed in table 2.

Scenarios and modelling to 2050

Using table 2 as a fixed baseline from 2024 to 2030 the DMRE model 5 scenarios extending from this single line out to 2050.

General principles

The DMRE make a number of non-prescriptive recommendations, intended for national debate, resulting from the modelling exercises.

- This two-horizon analytical framework allows further detailed analysis and exploration of alternative future scenarios in both the short-term and the long-term
- The introduction of long term 2050 scenarios allows a far better analysis of climate compatible energy futures.
- The least cost mix proposed for horizon one and two is indicated as variable renewable energy plus peaking support plus storage. While the PCC disagree with quantum of each technology deployed the mix of technologies aligns with PCC expectations.

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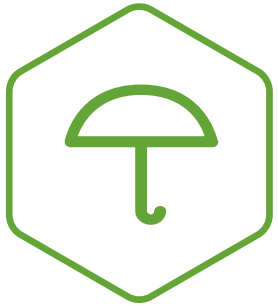
The PCC has several critical observations

Energy Security

The IRP does not address its primary energy security objective and does not provide any analysis to show how this might be achieved in the short term.



Developmental Context

The IRP does not acknowledge its developmental context. It is not a least cost solution and does not address energy access or energy efficiency. This combined with its vulnerability to private sector investment could drive long term inequality. The IRP2023 does not provide sufficient market signals (strength and consistency) to support developmental policies like the South African Renewable Energy Master Plan.

Incomplete Scenarios

The IRP's analysis is incomplete, and its analysis does not support the conclusions it makes. There is a significant mismatch between the IRP2023 and the benchmark studies reviewed by the PCC..

Emissions

The IRP does not effectively address the issues of climate change and air quality, putting it in direct conflict with the law and with international agreements.

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The analytical framework established by the DMRE allows for the further analysis needed to conclude on an electricity mix

Test More Scenarios

Further analysis is required to answer the basic questions that the IRP should address. At the very least a scenario to 2030 that more **aggressively addresses load shedding** is needed. This needs to be done in the context of **different electricity demand forecasts**, including demand scenarios aligned with NDP objectives. Further analysis and scenarios that don't constrain technology deployment are needed to fully establish system level costs.

Enhance Transparency

The lack of transparency and the limited time for consultation is problematic and not aligned with the principle of procedural justice. More detail on Table 2 and the proposed energy mix (which is not dealt with in Horizon One scenarios) on cost relative to least cost options needs to be published. The DMRE need to **release all the assumptions used in the modelling and to widen the breadth and duration of their consultations**.

Engage on Benchmark Differences

A review of the extent of the cost and emissions differences between the IRP2023 and the PCC review of benchmark studies needs to be undertaken. The PCC also have concerns about a **lack of learning curves in the models**, fixing 2021 costs for technologies that are evolving over the period of the study will disadvantage technologies whose prices are rapidly lowering – in particular for storage..

Explicitly Deal With Air Quality

A detailed review of **air quality** and its impacts on technology choices is needed. This is a legal requirement and modelling various options for responding to minimum emissions standards is essential information in making short-term and long-term decisions.

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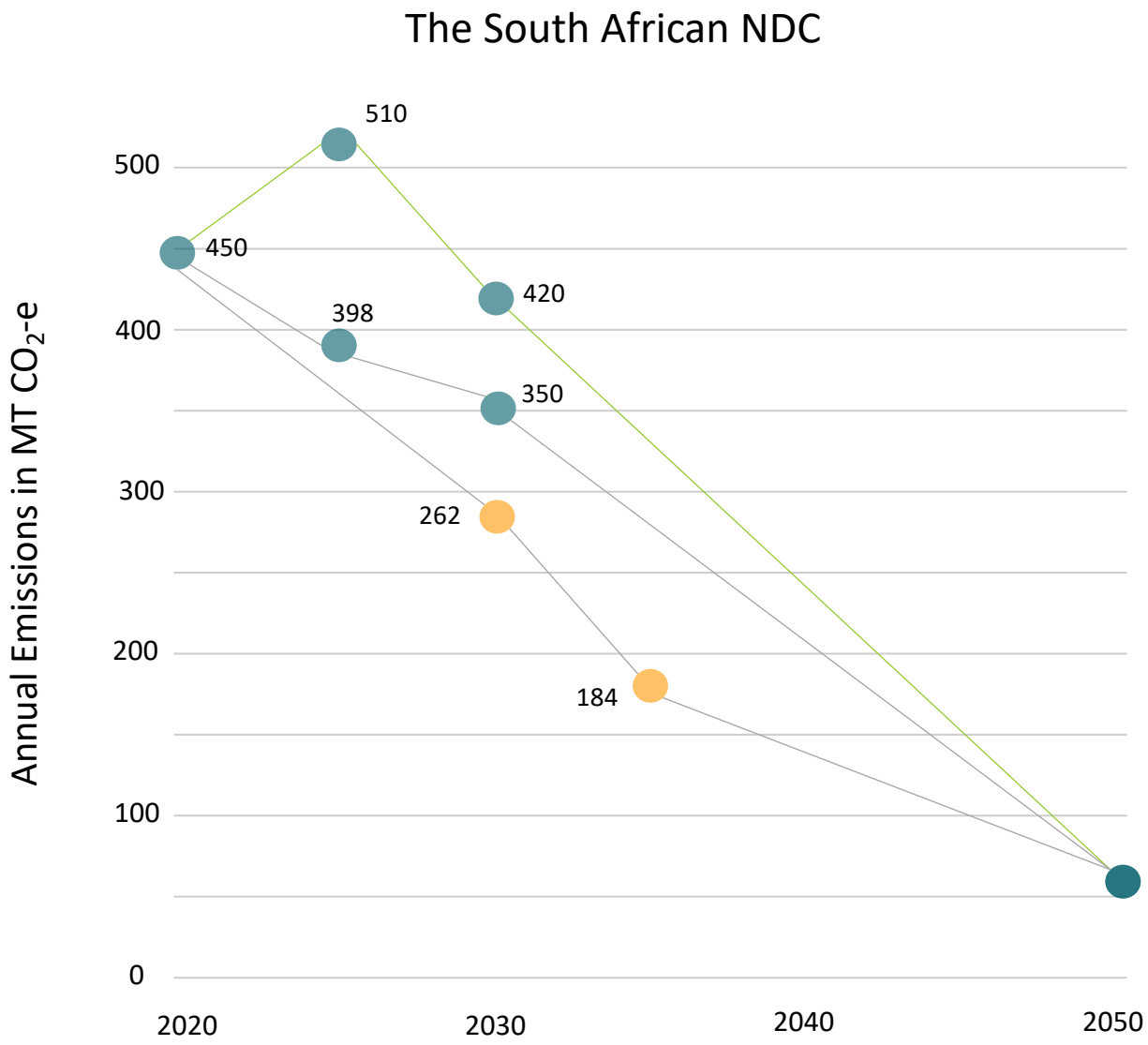
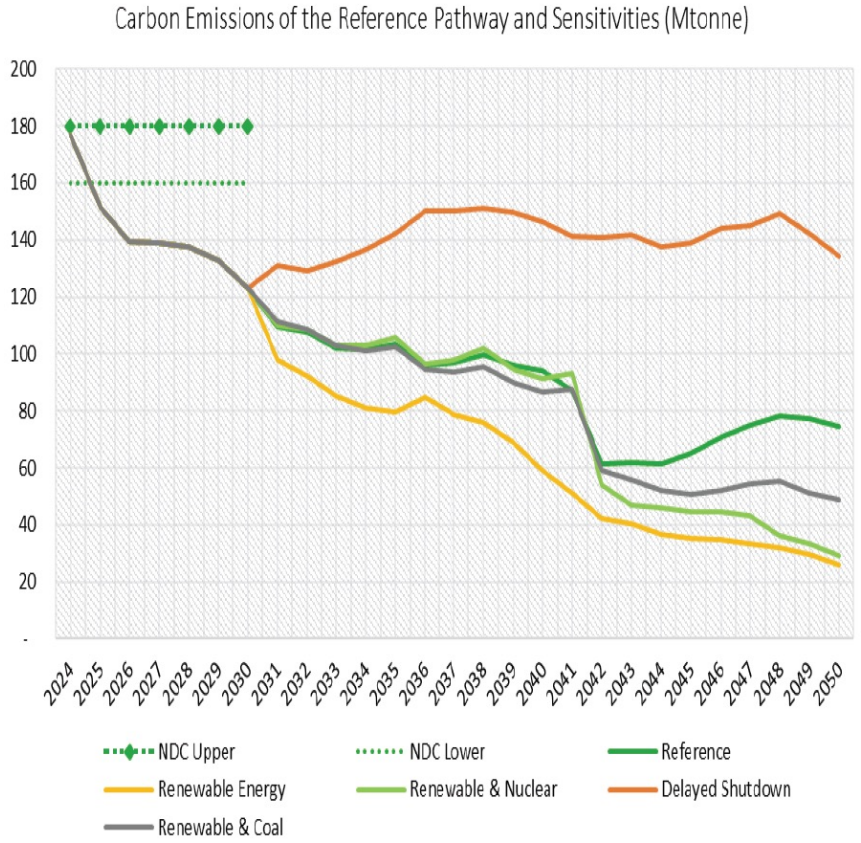
Emissions pathways need to be politically and scientifically credible and map a pathway aligned with science towards net-zero





DMRE IRP2023 Figure 21

The UAE consensus pathway applied to South Africa

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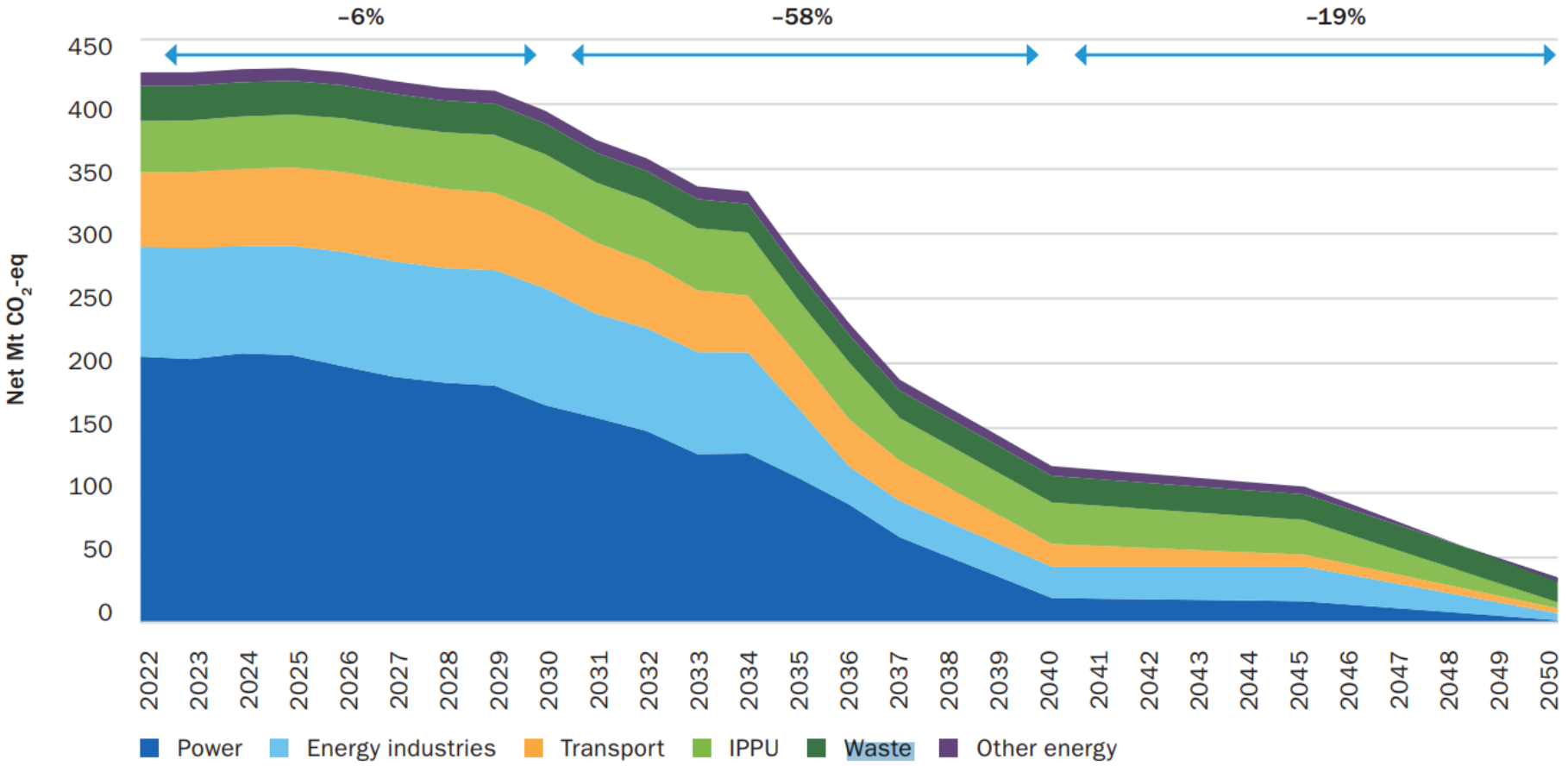
Most models show the bulk of South Africa's emissions reductions happen between 2030 and 2040

Figure 5: Net GHG emissions (CO_2-eq) by sectors to achieve net zero by 2050 (including percentage reductions required by decades)



Source: SATIM.
Note: IPPU = industrial processes and product use. Excludes AFOLU.

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The PCC has specific concerns with the IRP emissions trajectory, notably that it is not a trajectory aligned with the actual plans in place

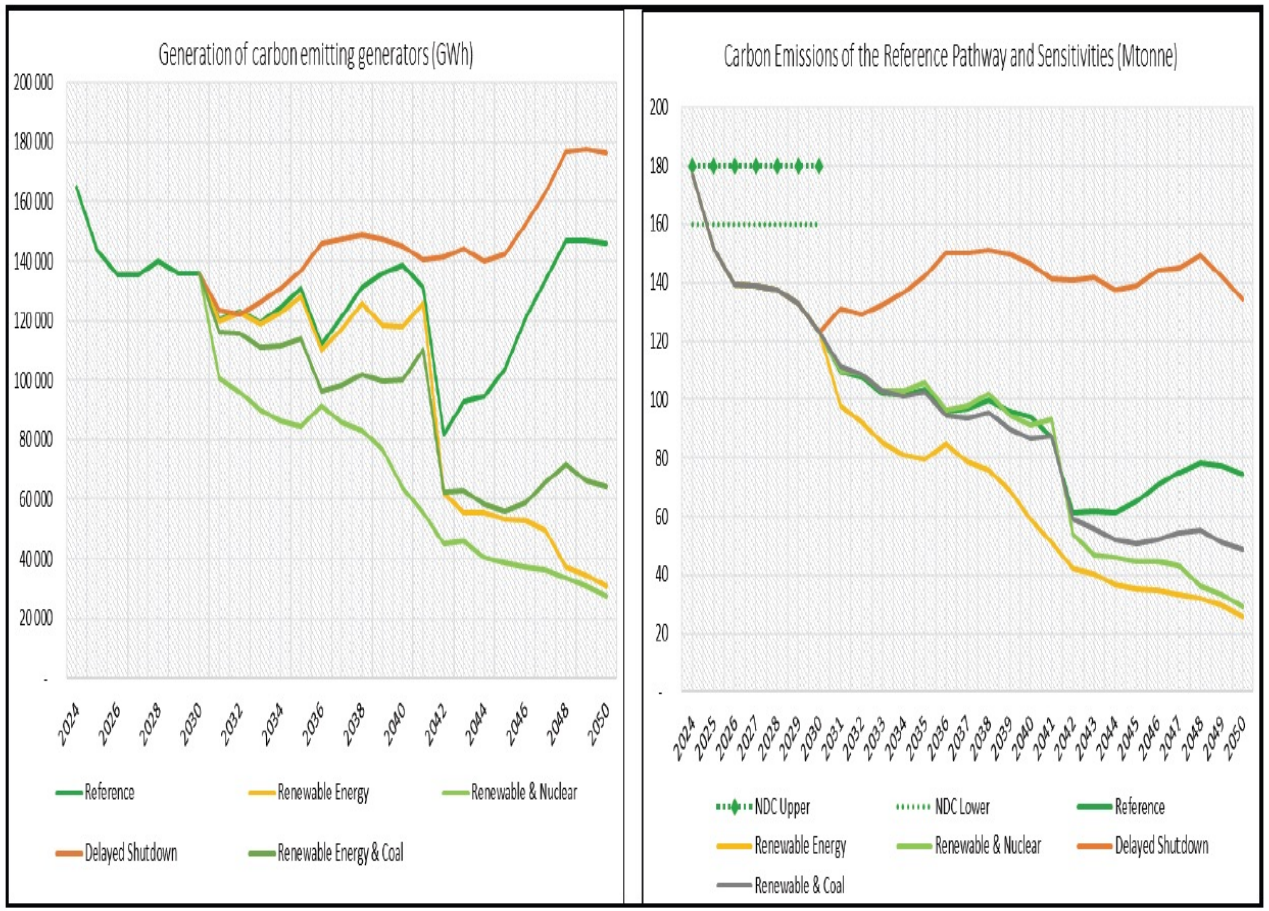

Figure 21: Carbon Emissions Analysis for both Horizons

1. **The starting point** at the end of 2023 is 180 MT CO_2e, below modelled expectations of 185 to 190. Eskom's annual report for 2020 lists roughly 200 MT, with the difference explained by load shedding. The planned reduction of load shedding would suggest an increase in emissions, which is not reflected in the chart.
2. **The reduction in GHG emissions appears disproportionate to the reduction in energy output**. Figure 21 shows a reduction in roughly 23 000 GWH but 40 000 MT CO2e. The grid GHG emissions factor published by DFFE is roughly 1 to 1. The emissions reductions seems high, and we have not been able to replicate it in modelling.
3. **It is expected that the electricity will contribute a significant portion of South Africa's emissions reductions**. The NDC range identified by the DMRE as 160 to 180 MT CO2e by 2030 is different to benchmark modelled expectations.
4. **The NDC range needs to be enhanced overtime**. While ostensibly the DMRE modelled scenarios are below the 2030 NDC range it must be kept in mind that the NDC levels will change each 5-year period (aligned with science and the Paris Agreement and UAE Consensus).

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Our Thanks