



Proposed Yzermyn underground coal mine, greenhouse gas emissions and climate change
August 2016

1. “Fugitive emissions refer to the intentional and unintentional release of greenhouse gases (GHG) that occur during the extraction, processing and delivery of fossil fuels to the point of final use. Methane is the most important emission sourced from solid fuels fugitive emissions.”¹ Underground coal mines, such as the proposed Yzermyn mine, are a large direct contributor of GHG emissions, particularly methane gas, because ventilation causes significant quantities of methane to be pumped into the atmosphere. Methane is estimated to have a global warming potential 23 times higher than carbon dioxide.² Methane emissions from coal mining have been estimated to contribute 6-10% of total anthropogenic global methane emissions, with such emissions predicted to rise by 15% by 2020.³
2. EcoPartners identified that methane gas may be produced as a result of the coal extraction activities, without mitigation.⁴ However, the EIAR failed to assess or address this impact at all. The only other contexts in which methane release is mentioned in the EIAR, is noting methane presence as a characteristic that might affect the mining method used⁵ and further that the Gus seam, in the Utrecht Coalfield where the Yzermyn project is situated, has elevated methane gas levels, yet may also be identified in the target area.⁶
3. A GHG emissions assessment from coal mining, should have included two categories of emissions: (1) direct emissions associated with the production of coal and (2) reasonably foreseeable indirect or “downstream” emissions that occur as a result of the transportation, processing and end use of that coal (e.g. coal-fired power plant combustion).⁷ The latter

¹ *GHG Inventory for South Africa 2000 – 2010*, November 2014, at page 113

(https://www.environment.gov.za/sites/default/files/docs/greenhousegas_inventoriesouthafrica.pdf)

² See Center for Climate and Energy Solutions, *Environmental Impact of Coal*, www.c2es.org/energy/source/coal
see also Greenpeace, About Coal Mining Impacts,

<http://www.greenpeace.org/international/en/campaigns/climate-change/coal/Coal-mining-impacts/>.

³ See, e.g., Yiwen Ju, et al., *A new approach to estimate fugitive methane emissions from coal mining in China*, *Science of the Total Environment* 543 (2016) 514–523 (estimating that the contribution is between 8-10%; Global Methane Initiative, *Global Methane Emissions and Mitigation Opportunities*, available at http://www.globalmethane.org/documents/analysis_fs_en.pdf (estimated that coal mining contributes 6 % of global anthropogenic methane emissions in 2010).

⁴ EIAR page 495.

⁵ At page 70.

⁶ At page 145.

⁷ See, e.g., US Council of Environmental Quality, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (1 August 2016), available at

http://energy.gov/sites/prod/files/2016/08/f33/nepa_final_ghg_guidance.pdf; also Sabin Center for Climate Change Law, *Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review* (March

category should have included mining and processing, transportation, and use/combustion - often referred to as the coal life-cycle. The EIAR did not include any GHG emissions assessment.

4. In addition climate change-related phenomena can increase the vulnerability of the surrounding environment (human and natural) to the environmental impacts of a project. Regard should have been had to the Yzermyn mine's impact upon South Africa's resilience to climate change. This entails consideration of the extent to which specific components of the affected environment, namely natural systems, human systems and key resources, are vulnerable and/or resilient to the impacts of climate change. The EIAR did not include any assessment of the Yzermyn mine's impact upon South Africa's resilience to climate change.
5. It is proven that climate change impacts upon, and will continue to impact on, *inter alia*:
 - 5.1. water resources due to changes in rainfall and evaporation rates, which will consequently impact upon agriculture, forestry and industry due to an increased irrigation and water supply demand;⁸
 - 5.2. air quality, through the impacts upon weather patterns which will negatively influence criteria pollutants such as PM, SO₂, NO₂, ozone, carbon monoxide, benzene, lead;⁹
 - 5.3. human health, through bringing about an increase in, for instance, vector-borne diseases, heat stress, increased natural disasters;¹⁰
 - 5.4. biodiversity due to, for instance, loss of habitat resulting from increased temperatures and desertification;¹¹ and
 - 5.5. marine fisheries, due to changes in water flows and ocean temperatures.¹²
6. South Africa is a signatory to the United Nations Framework Convention on Climate Change and the Kyoto Protocol, international agreements which seek to address climate change and set internationally binding emission reduction targets.
7. Although South Africa does not, at this stage, have any set emission reduction obligations under the Kyoto Protocol, it has undertaken to make commitments for national contributions towards GHG emission reductions, it participated in the negotiations for the universal agreement on climate change entered into at the 21st Conference of the Parties ("COP21") in Paris in December 2015 ("the Paris Agreement"), and it acknowledges that *"the science is clear that action to address the causes and impacts of climate change by a single country or small group of countries will not be successful. This is a global problem requiring a global solution through the concerted and cooperative efforts of all countries"*.¹³

2016), available at http://web.law.columbia.edu/sites/default/files/microsites/climate-change/downstream_and_upstream_ghg_emissions_-_proper_scope_of_nepa_review.pdf.

⁸ Pages 6 – 9, Long Term Adaptation Scenarios: Summary for Policy Makers available at

<http://www.sanbi.org/sites/default/files/documents/documents/ltassummary-policy-makers2013high-res.pdf>.

⁹ Page 11, Long Term Adaptation Scenarios: Summary for Policy Makers.

¹⁰ Page 11, Long Term Adaptation Scenarios: Summary for Policy Makers.

¹¹ Page 15, Long Term Adaptation Scenarios: Summary for Policy Makers.

¹² Page 13, Long Term Adaptation Scenarios: Summary for Policy Makers.

¹³ Pages 8 and 9, Introduction, National Climate Change Response White Paper.

8. South Africa's Intended Nationally Determined Contribution ("INDC") "was formulated in the context of, *inter alia*, the environmental right set out in section 24 of the Constitution, and its National Development Plan ("NDP") (NPC, 2012), which provides a '2030 vision' to guide the country's sustainable development trajectory where poverty is eliminated and inequalities are reduced by 2030. The INDC commits to emissions in a range between 398 and 614 Mt CO₂-eq between 2025 and 2030 within the peak plateau decline ("PPD") trajectory.¹⁴ The INDC is indicative of South Africa's commitment to the global effort to tackle climate change and it outlines South Africa's international commitments in the context of the Paris Agreement.

9. Article 4 of the Paris Agreement provides:

"2. Each Party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve. Parties shall pursue domestic mitigation measures with the aim of achieving the objectives of such contributions.

3. Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."

10. In terms of article 13(7) of the Paris Agreement:

"7. Each Party shall regularly provide the following information:

(a) A national inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases, prepared using good practice methodologies accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement; (b) Information necessary to track progress made in implementing and achieving its nationally determined contribution under Article 4."

11. Parties to the Paris Agreement¹⁵ are obliged to submit new INDCs every 5 years and they can at any time adjust their INDCs, but only with a view to enhancing their commitments.¹⁶ The first global stocktake is due to take place in 2023 and every 5 years thereafter.¹⁷ The effect of this is that, South Africa can only commit to more stringent GHG emission reduction targets, meaning that concerted efforts will be required by the South African government to reduce its GHG emissions with a view to further reducing the country's GHG emissions. Authorising an underground coal mine without assessing its emissions flies in the face of this commitment.

12. It is incumbent on the state to ensure that its actions, laws and decision-making coincide with its evident intentions to address climate change and take into account its international obligations in this respect. As a party to the Paris Agreement has incurred the obligations as set out above.

¹⁴ SA INDC page 7 available at

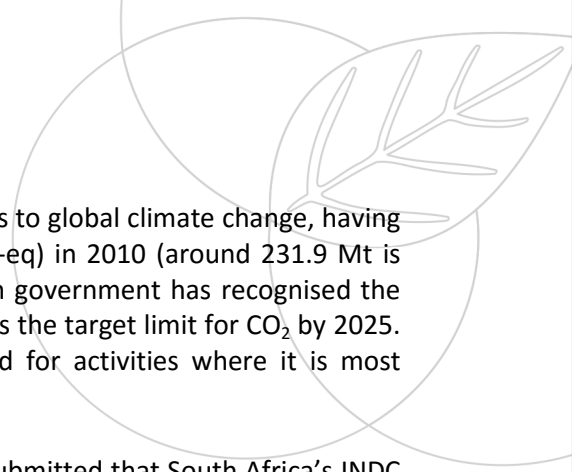
<http://www4.unfccc.int/submissions/INDC/Published%20Documents/South%20Africa/1/South%20Africa.pdf>.

¹⁵ South Africa signed the Paris Agreement on 22 April 2016. See

https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsq_no=XXVII-7-d&chapter=27&clang=en. In its INDC, South Africa has committed to a GHG emissions targets within the range of 398 and 614 megatonnes of CO₂ equivalent between the years 2025 and 2030. The Paris Agreement also places obligations on parties to, among other things, account for and report on their nationally determined contributions.

¹⁶ Paris Agreement article 4(9) and (11).

¹⁷ Paris Agreement article 14.

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13. South Africa is already one of the world's largest contributors to global climate change, having produced around 547Mt of carbon dioxide equivalent (CO₂-eq) in 2010 (around 231.9 Mt is produced by the electricity sector alone). The South African government has recognised the need for climate action and has set 398Mt CO₂-eq per year as the target limit for CO₂ by 2025. It is important that our limited emission space is reserved for activities where it is most needed, such as agriculture.
 14. Even if the commitments in our INDC were to be met, it is submitted that South Africa's INDC commitments are insufficient to achieve the necessary reduction in global temperature increase.¹⁸ South Africa proposes to reduce its GHG emissions levels to between 398–614 MtCO₂e over 2025–2030. After accounting for land use, land-use change and forestry ("LULUCF"), this target is equivalent to emissions of 20–82% above 1990 levels - excluding LULUCF.¹⁹
 15. National legislation recognises the need to curb GHG emissions and address climate change. NEMAQA requires that an AEL specify GHG emission measurements and reporting requirements,²⁰ and the 2012 Framework for Air Quality Management acknowledges that "*in view of this, specialist air quality impact assessments must consider greenhouse gas emissions as well.*"²¹ In addition, public comment has been invited on draft National GHG Emission Reporting Regulations,²² the Draft Carbon Tax Bill,²³ the Draft Notice of Intention to Declare GHGs Priority Pollutants and the Draft Pollution Prevention Plan Regulations.²⁴
 16. The South African Government has acknowledged the risks of climate change by adopting the White Paper.²⁵ It confirms "*South Africa's commitment to a fair contribution to stabilising global GHG concentrations in the atmosphere and to protecting the country and its people from the impacts of inevitable climate change.*"²⁶ The White Paper includes a National Climate Change Response Strategy ("the climate change response strategy"), which has listed, as one of its strategic priorities, the need to "*prioritise the mainstreaming of climate change considerations and responses into all relevant sector, national, provincial and local planning regimes such as, but not limited to, the Industrial Policy Action Plan, Integrated Resource Plan for Electricity Generation, Provincial Growth and Development Plans, and Integrated Development Plans.*"²⁷ This White Paper, as a national policy document, speaks to and should direct decision-making in respect of authorisations for any developments.
 17. It can be concluded that, as part of the integrated EA process envisaged by the NEMA Principles read with chapter 5 of NEMA and requirement in section 24O(1)(b)(viii) of NEMA to consider relevant policy and other relevant information in deciding whether or not to grant an authorisation, the GHG emissions and climate change impacts of the Yzermyn mine should have been taken into account in deciding whether or not to grant the EA. They were not considered by the decision-maker in granting the Authorisation – either adequately or at all.

¹⁸ See <http://climateactiontracker.org/indcs.html>.

¹⁹ See <http://climateactiontracker.org/indcs.html>

²⁰ Section 43(1)(l) NEMAQA.

²¹ Paragraph 5.5.3.7, page 80, 2012 National Framework for Air Quality Management.

²² GN 541 GG 38857 of 5 June 2015.

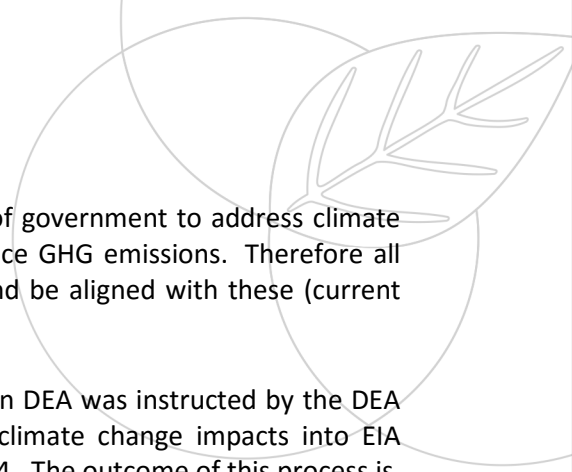
²³ The Draft Carbon Tax Bill was published by the Minister of Finance on 2 November 2015.

²⁴ GN 5 GG 39578 of 8 January 2016.

²⁵ Available at <http://www.sanbi.org/sites/default/files/documents/documents/national-climate-change-response-white-paper.pdf>

²⁶ Page 10, Introduction, National Climate Change Response White Paper.

²⁷ Page 15, National Climate Change Response Strategy, National Climate Change Response White Paper.

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18. The above serves to indicate a clear intention on the part of government to address climate change, and record a national stance to take steps to reduce GHG emissions. Therefore all decisions, including the current EA, should give effect to and be aligned with these (current and proposed) legislative provisions.
 19. Furthermore, it is noted that the EIA Chief Directorate within DEA was instructed by the DEA to develop a process for the inclusion of assessments of climate change impacts into EIA authorisations before the end of the financial year 2013/2014. The outcome of this process is, to date, unknown, other than that such assessment is not yet included as a requirement within EIA processes. Nevertheless, it is submitted that the EIA process should include climate change considerations in full as part of the assessment process, otherwise referred to as 'climate change screening'. Such screening must include both mitigation - potential contribution to further GHG emissions - as well as adaptation measures. In other words, every development decision must be based on its contribution to both mitigation and adaptation. In this regard, it is submitted that the assessment and proposals of all developments should provide for, *inter alia*:
 - 19.1. maximising reduction in direct and indirect GHG emissions;
 - 19.2. maximising potential for further mitigation, including 'sequestration offsets', ideally seeking a negative GHG balance;
 - 19.3. optimising adaptation to impacts over the full life of the development, using best available knowledge and modelling projections of future impacts, which will become more extreme over time;
 - 19.4. ensuring that such adaptations are not misdirected 'maladaptations', which will fail and/or exacerbate impacts/increase vulnerability over time; and
 - 19.5. contributing to restoration of ecological infrastructures to better enable ecosystem-based adaptation, namely building improved resilience in people, infrastructure and ecosystems.
 20. It is submitted that water availability, amongst other things, is a severe climate change concern for South Africa, in particular in times of drought such as those currently experienced. The White Paper confirms that "*based on current projections South Africa will exceed the limits of economically viable land-based water resources by 2050. The adequate supply of water for many areas can be sustained only if immediate actions are taken to stave off imminent shortages.*"²⁸
 21. The Long Term Adaptation Scenarios ("LTAS")²⁹ aim to respond to the White Paper by developing national and sub-national adaptation scenarios for South Africa under plausible future climate conditions and development pathways. The LTAS reports acknowledge that impacts on South Africa are likely to be felt primarily via effects on water resources.³⁰ The LTAS report on implications for the water sector states that "*(a)t present, specific provisions*

²⁸ Page 17 section 5.2: Water, National Climate Change Response White Paper.

²⁹ Long Term Adaptation Strategies: Summary for Policy-Makers. Available at <http://www.sanbi.org/sites/default/files/documents/documents/ltassummary-policy-makers2013high-res.pdf> https://www.environment.gov.za/sites/default/files/docs/ltasphase2report7_longterm_adaptationscenarios.pdf and https://www.environment.gov.za/sites/default/files/docs/implications_waterbookv4.pdf.

³⁰ Page 6, Long Term Adaptation Strategies: Summary for Policy-Makers. Available at <http://www.sanbi.org/sites/default/files/documents/documents/ltassummary-policy-makers2013high-res.pdf>

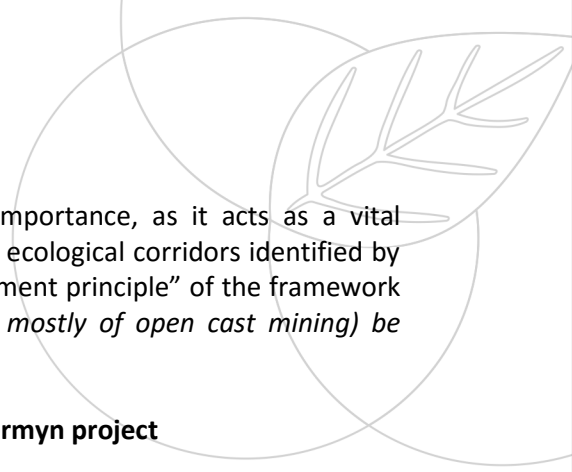
- for climate change adaptation have been made in very few of the water resources planning tools. There are some early attempts that have simulated simple scenarios of changed surface water supply in reconciliation studies*³¹
22. The LTAS records that *“development aspirations in South Africa will likely be influenced by opportunities and constraints that arise from climate change impacts on the water sector. Key decisions would benefit from considering the implications of a range of possible climate-water futures facing South Africa.”*³²
 23. The LTAS acknowledges that *“under a drier future scenario, significant trade-offs are likely to occur between developmental aspirations, particularly in terms of the allocation between agricultural and urban industrial water use, linked to the marginal costs of enhancing water supply. These constraints are most likely to be experienced in central, northern and south-western parts of South Africa, with significant social, economic and ecological consequences through restricting the range of viable national development pathways.”*³³
 24. The Yzermyn Project will have significant implications for both the water quantity and quality in the area.
 25. The failure to consider climate change implications shows a lack of policy coherence with the national climate change response policy, INDC and Paris Agreement and a disregard for the provisions of NEMAQA and NEMA which require consideration of international obligations and GHG emissions as set out above. Furthermore, this shows a failure to consider the anticipated and fast-approaching impacts of climate change, including diminishing of water resources, which will, no doubt, have a significant impact on the Yzermyn project, other projects, human health and the environment.
 26. Additionally, the failure to consider climate change implications is in conflict with the Environmental Management Framework for the Dr Pixley Ka Isaka Seme Local Municipality – Volume 3: Environmental Management Framework Report (June 2011) which provides that *“the consideration of land use changes ideally needs to take climate change implications into account given the importance of the ecosystem services that natural habitats provide in both mitigating and adapting to the impacts of climate change”* and which records *“[t]he opportunity to remain a critical area for the maintenance of water security in the region and further afield in South Africa. The opportunity to optimise the chances of being able to adapt to climate change (intact unfragmented and well-functioning ecosystems with adequate natural areas are more resilient to change and offer more opportunities for species movements and dispersal, a factor that will become increasingly important in the face of climate changes.”*³⁴
 27. Moreover, the Gert Sibande Spatial Development Framework notes that the Gert Sibande District Municipality incorporates some of South Africa’s most precious wetlands, nature reserves and conservation areas with wetlands that not only play a crucial role in maintaining the ecological integrity of an area, but acts as landscape amenities that help with hydrologic management, flood attenuation, etc. Consequently, wetland areas have a high conservation value. The Gert Sibande Spatial Development Framework notes further that the sensitive

³¹ Page 6, Long Term Adaptation Strategies: Summary for Policy-Makers. Available at <http://www.sanbi.org/sites/default/files/documents/documents/ltassummary-policy-makers2013high-res.pdf>.

³² Page 6, Long Term Adaptation Scenarios: Summary for Policy Makers. Available at <http://www.sanbi.org/sites/default/files/documents/documents/ltassummary-policy-makers2013high-res.pdf>

³³ Page 6, Long Terms Adaptation Scenarios: Summary for Policy Makers, October 2013.

³⁴ Page 38, 67-68



Wakkerstroom wetland specifically, is of high ecological importance, as it acts as a vital catchment area for the Vaal and Pongola Rivers.³⁵ Given the ecological corridors identified by the Mpumalanga Biodiversity Conservation Plan, a “development principle” of the framework is that it is “*essential that mining activity (which consists mostly of open cast mining) be concentrated within already affected areas*”.³⁶

The Failure to Assess the Climate Change Impacts of the Yzermyn project

28. Consistent with the approaches followed in the USA, the EU and many other jurisdictions, the state should consider three aspects of the relationship between the proposed mine and climate change: (1) the mine’s direct and indirect impacts on climate change; (2) the ways in which the effects of climate change will impact on the mine; and (3) how the mine’s impact on South Africa’s environment and society will be affected further by climate change.
29. The EIAR fails to assess the costs associated with the direct and indirect greenhouse gas emissions from the proposed mine.
30. The EIAR notes that a healthy and productive environment is recognised as a prerequisite for the success of New Partnership of Africa’s Development (NEPAD), together with the need to systematically address and sustain ecosystems, biodiversity and wildlife; and that combating climate change in Africa is one of six areas have been identified.³⁷ However the reference is gratuitous as the EIAR fails to assess the impacts of the Project on climate change adequately, or at all.
31. The EIAR glibly reflects that landscape corridors provide the best landscape connectivity to support and enable biodiversity to adapt to the impacts of climate change; and that local corridors represent “*fine scale connectivity pathways that contribute to connectivity between climate change focal areas.*”³⁸ The fact that the target area is important for biodiversity conservation, and both the National Protected Areas Expansion Strategy and the Mpumalanga Protected Area Expansion Strategy identify this area as important for protected area expansion is referred to but the project’s impact on this landscape corridor is falsely assessed.³⁹ This is aggravated by the fact that the focus areas for land-based protected area expansion were identified through a systematic biodiversity planning process, specifically to contribute to climate change resilience.⁴⁰ The Yzermyn’s impact on climate change resilience measures is not assessed in the EIAR.
32. The EIAR fails to take into consideration the international stance on climate change and national law and policy which necessitates the consideration of climate change.
33. It fails to consider the impacts that the project will have on natural resources such as water and biodiversity – which will undermine any adaptation measures.

³⁵ Page 44

³⁶ Page 130

³⁷ EIAR page 52.

³⁸ Page 222

³⁹ See, Brownlie, 2016 at page 23

⁴⁰ *Mining and Biodiversity Guideline*, 2013, page 41