



# Centre for Environmental Rights

Advancing Environmental Rights in South Africa

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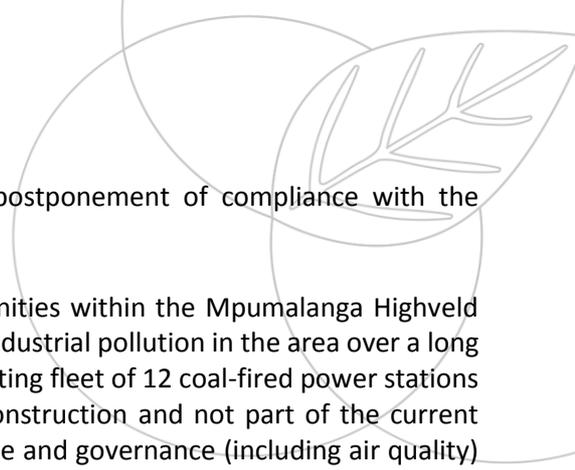
4 February 2019

Dear Ms Botha

## **SUBMISSIONS ON ESKOM'S APPLICATION FOR SUSPENSION, ALTERNATIVE LIMITS AND/OR POSTPONEMENT OF COMPLIANCE WITH THE MINIMUM EMISSION STANDARDS FOR 10 OF ITS COAL-FIRED POWER STATIONS**

1. We address you as the Life After Coal campaign, a joint campaign by the Centre for Environmental Rights (CER), groundWork (gW), and Earthlife Africa Johannesburg (ELA) that aims to: discourage the development of new coal coal-fired power stations and mines; reduce emissions from existing coal infrastructure and encourage a coal phase-out; and enable a just transition to sustainable energy systems for the people. We also address you on behalf of the Highveld Environmental Justice Alliance Network (HEJN), and the Vaal Environmental Justice Alliance (VEJA). CER, groundWork, Earthlife Africa, HEJN, and VEJA are all interested and affected parties (I&APs) in relation to

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Eskom's revised application for suspension, alternative limits and/or postponement of compliance with the minimum emission standards (MES).

2. Life After Coal, and HEJN, in particular, work with a network of communities within the Mpumalanga Highveld whose health and well-being continues to be detrimentally impacted by industrial pollution in the area over a long period time. A significant source of this industrial pollution is Eskom's existing fleet of 12 coal-fired power stations in the Highveld Priority Area (HPA) (which includes Kusile, still under construction and not part of the current applications). VEJA is an active role-player in various environmental justice and governance (including air quality) issues within the Vaal Triangle Airshed Priority Area (VTAPA), which is also home to Eskom's Lethabo coal-fired power station. We note that neither of the two stations within the Waterberg-Bojanala Priority Area (WBPA) form part of these applications.

## **Introduction and background**

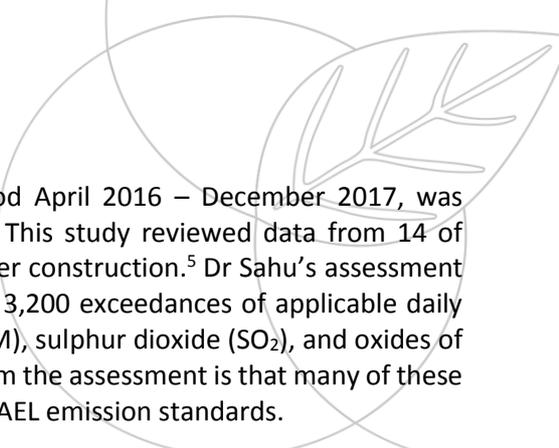
3. As you are aware, we have been persistent and consistent objectors against Eskom – as one of the country's largest polluters – applying for postponements of compliance with the MES; the first set being the multiple postponements Eskom applied for in 2013. Since then, it has also made two subsequent applications for postponement in respect of its Tutuka power station (2018), located in the HPA, and the Medupi and Matimba power stations (2017) located in the Waterberg-Bojanala Priority Area (WBPA). The application for postponement of compliance with the SO<sub>2</sub> existing plant MES at Medupi and Matimba was granted in October 2018 and the postponement application for Tutuka for existing plant and new plant MES was submitted to the National Air Quality Officer for consideration in November 2018.
4. These successive postponement applications have been entertained, and largely granted, by the NAQO despite the general legitimate government purpose of section 21 of the National Environmental Management: Air Quality Act, 2004 (AQA), which is to control and reduce atmospheric emissions from listed activities which have or may have a significant detrimental effect on the environment; including health, social conditions, economic conditions, ecological conditions or cultural heritage ("List of Activities"). This is in order to give effect to section 24 of the Constitution of the Republic of South Africa, 1996 ("the Constitution") and other fundamental rights.
5. The sequence of Eskom's previous postponement applications is recorded in our written objections submitted in September 2018, in response to the Background Information Document (BID) during the first round of public participation for this current application ("the BID submissions").<sup>1</sup> Aside from the approval of the Medupi and Matimba applications and the submission of the Tutuka application for consideration referred to above, the following relevant developments have since transpired:
  - 5.1. Amendments to the List of Activities and the prescribed MES were published on 31 October 2018,<sup>2</sup> following the publication of the updated 2017 National Framework for Air Quality Management in the Republic of South Africa ("the 2017 Framework") on 26 October 2018.<sup>3</sup> These amendments are outlined in section A below. The anticipated publication of the proposed amendments to the List of Activities was recorded in the BID submissions, as was the fact that it was not clear what Eskom plans to do in relation to the current postponement application when these amendments come into force, particularly given the option of a suspension of compliance, circumscribed by certain conditions. CER sent follow-up emails to Naledzi Environmental Consultants ("NEC"), on 26 October 2018 and 2 November 2018, to enquire about Eskom's approach in response to the 2017 Framework (to the extent it applies to the application) and the MES. NEC confirmed by email that Eskom had noted the regulatory changes and I&APs would be informed of any changes in Eskom's approach to the present postponement applications.

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<sup>1</sup> <https://cer.org.za/wp-content/uploads/2018/09/LAC-MES-Postponement-Submissions-11-September-2018.pdf>

<sup>2</sup> GG No. 42013, Government Notice 1207, 31 October 2018.

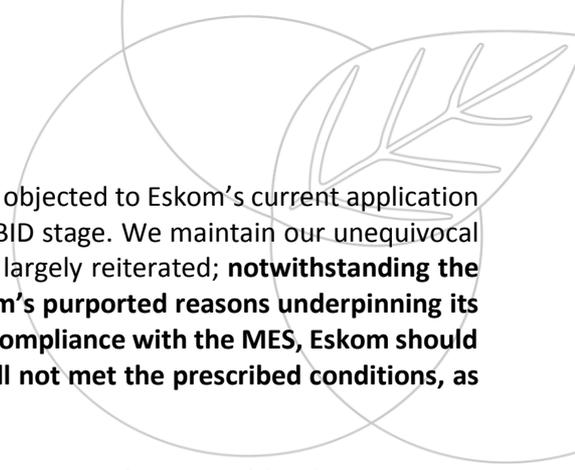
<sup>3</sup> GG No. 41996, Government Notice 1144, 26 October 2018.

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- 5.2. An assessment of Eskom's monthly emission reports for the period April 2016 – December 2017, was completed by energy and air quality specialist, Dr. Ranajit Sahu.<sup>4</sup> This study reviewed data from 14 of Eskom's coal-fired power stations, excluding Kusile which is still under construction.<sup>5</sup> Dr Sahu's assessment found that 13 of Eskom's coal-fired power stations reported nearly 3,200 exceedances of applicable daily Atmospheric Emission Licences (AEL) limits for particulate matter (PM), sulphur dioxide (SO<sub>2</sub>), and oxides of nitrogen (NO<sub>x</sub>), during a 21-month period. An aggravating finding from the assessment is that many of these reported exceedances were significantly greater than the applicable AEL emission standards.
- 5.3. The second round of public engagement for the application for postponement of the MES compliance timeframes for Eskom's coal and liquid fuel fired stations was announced in press advertisements on 9 November 2018, and in an email to I&APs on 12 November 2018. Documents were available for perusal and comment from 19 November 2018. It was confirmed that Eskom would apply to the NAQO for postponement or suspension or propose alternative emission limits of the respective emission standards for the following power stations: **Lethabo power station (Vaal Triangle – the VTAPA); Majuba, Camden, Kriel, Matla, Kendal, Duvha, Arnot, Hendrina and Komati power stations (Mpumalanga Highveld – the HPA)**. It was further confirmed in the notification that Grootvlei power station (Balfour), Acacia power station (Western Cape) and Port Rex power station (Eastern Cape) are excluded from this postponement application and would be dealt with through separate application processes. As indicated below, it remains unclear what the position is regarding future postponement and/or suspension and/or alternative emission limit applications for Medupi and Matimba power stations (WBPA).
- 5.4. Representatives of Life After Coal and Greenpeace Africa attended the public meeting in Midrand, held on 23 November 2018, and affected community members from Ogies and Emalahleni, assisted by gW, attended the respective public meetings on 21 November 2018. Comments submitted during these various meetings are referred to throughout these submissions.
- 5.5. On 16 November 2018, Life After Coal, VEJA, Vukani Environmental Movement and Khuthala Environmental Care Group requested, in writing, that the deadline for written submissions be extended from 16 January 2019 to 6 February 2019. In an email received from Naledzi Environmental Consultants Pty Ltd. on 21 November 2018, it was indicated that the review period for all I&APs would be extended to 31 January 2019. On 28 January 2019, the CER, on behalf of its clients and Greenpeace Africa sought an additional two days within which to make submissions. This was granted on 29 January 2019. As a result, these submissions are due on 4 February 2019.
6. It has been clarified that Grootvlei, Acacia, and Port Rex power stations are excluded from this current application; however, these stations are still referred to throughout the Summary Motivation Report, as are Medupi and Matimba power stations. In the BID submissions, we requested urgent confirmation regarding further postponement applications – if any - sought in relation to Medupi and/or Matimba. *It is requested, once again, that this is clarified as soon as possible.*
7. In our BID submissions, we reiterated the extensive comments and objections submitted in opposition to Eskom's previous applications to postpone compliance with the MES, dating back to the first set of wide-ranging postponements for multiple coal-fired stations (all but Kusile) sought in 2013. The objections pertained to the following:
- 7.1. the legal requirements of MES postponement applications;
  - 7.2. why the applications sought by Eskom do not comply with those legal requirements; and
  - 7.3. the illegality of the exemption/rolling postponement applications brought by Eskom.

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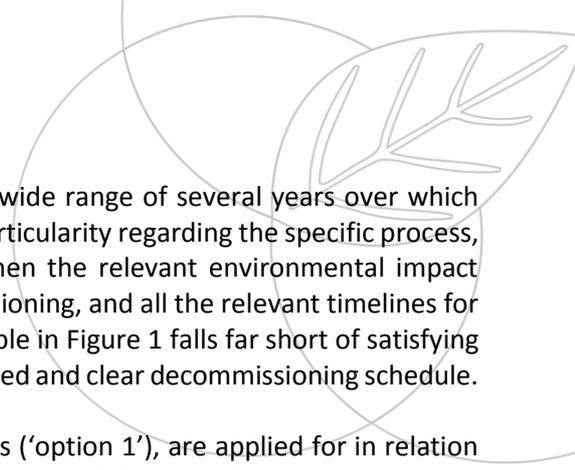
<sup>4</sup> <https://cer.org.za/wp-content/uploads/2018/12/Eskom-plant-exceedances-of-AEL-Limits-Ron-Sahu-15-November-2018.pdf>

<sup>5</sup> The gas-fired plants were also excluded from the analysis due to incomplete data being provided.

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8. It was on the basis of these submissions that we wholly and unequivocally objected to Eskom's current application for postponement of MES compliance at multiple power stations, at the BID stage. We maintain our unequivocal objection to Eskom's revised applications and the above submissions are largely reiterated; **notwithstanding the amendments to the List of Activities and the 2017 Framework and Eskom's purported reasons underpinning its applications for suspension, alternative limits and/or postponement of compliance with the MES, Eskom should not be permitted to apply for any of these three "options"**<sup>6</sup>, as it has still not met the prescribed conditions, as amended.
9. Substantiated further below, the reasons why this application should be summarily rejected by the NAQO are summarised as follows:
- 9.1 As contemplated in terms of paragraph 5.4.3.4 of the 2017 Framework, the law, as amended, is clear that only in such cases where the areas in which the power stations are based are in compliance with the national ambient air quality standards (NAAQS), can postponement, suspension, or alternative limit applications even be considered. Lethabo power station is located in the VTAPA and Majuba, Camden, Kriel, Matla, Kendal, Duvha, Arnot, Hendrina and Komati power stations are located in the HPA – based on the Department of Environmental Affairs (DEA)'s reports, neither the VTAPA or the HPA (or the WBPA) remain in compliance with NAAQS. Granting any of these postponement, suspension or alternative limit applications would be *ultra vires* the Constitution, the AQA, the amended List of Activities, the 2017 Framework, and the provisions of the National Environmental Management Act, 1998 (NEMA).
- 9.2 In addition to the requirement that the area's air quality must be in compliance with NAAQS, the 2017 Framework requires that Eskom must demonstrate that its air emissions are not causing direct adverse impacts on the surrounding environment. Eskom has wholly failed to demonstrate this. To the contrary, an updated health assessment by Mr Lauri Myllyvirta and the Greenpeace Global Air Pollution Unit, in response to Eskom's "Health impact focused cost benefit analyses", determined that once Medupi and Kusile are in full operation, it is estimated that air pollutant emissions from Eskom's coal-fired power plants will be responsible for a total of **2,400 premature deaths per year** and projected that, over time, the excess emissions allowed if Eskom's various applications are fully granted will result in approximately **23,000 premature deaths**. These premature deaths could be avoided by requiring full compliance with the MES, which would represent a 40% reduction in the cumulative health impact of air pollution from Eskom's power stations.
- 9.3 Eskom had knowledge of the direct health impacts of its coal-fired power stations, based on the 2006 studies it commissioned, providing sufficient reason for Eskom to ensure that it was implementing the necessary abatement measures to effectively mitigate the impacts of its coal-fired power stations. In other words, as an organ of state with constitutional obligations, Eskom was legally compelled to act to limit its pollution well before the MES were even published in 2010. Eskom had ample opportunity to take the necessary steps to ensure MES compliance. At the very latest, it became aware of this on 31 March 2010 – almost 9 years ago. We submit that Eskom's reasons for delay: planning, approval and commercial processes, is unacceptable – as a state-owned entity requiring government approval and compliance with the Public Finance Management Act, 1999, Eskom is experienced in the lead-time and process and expenditure required in order to install operating equipment at its power stations.
- 9.4 It is disputed that Eskom is in compliance with various emission limits contained in their relaxed AELs and therefore operating legally. The **3,200 exceedances of applicable AEL limits for PM, SO<sub>2</sub>, and NO<sub>x</sub>**, reported in Eskom's monthly emission reports over a 21-month period, is evidence of this. Urgent enforcement action should be initiated against Eskom as a result of its non-compliance with its relaxed AEL limits at a number of power stations, as opposed to considering this impermissible application to further delay and suspend compliance with the MES.

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<sup>6</sup> See pages 14-5 of the Summary Motivation Report.



- 9.5 Eskom’s decommissioning schedule is too broad – setting out a wide range of several years over which each power station is expected to be decommissioned; with no particularity regarding the specific process, per unit and date. For instance, no indication is given as to when the relevant environmental impact assessment (EIA) processes would commence for such decommissioning, and all the relevant timelines for each phase in the EIA process. Therefore the decommissioning table in Figure 1 falls far short of satisfying the List of Activities and 2017 Framework requirements for a detailed and clear decommissioning schedule.
- 9.6 Alternative limits, in the alternative to postponement applications (‘option 1’), are applied for in relation to Majuba, Kendal, Lethabo, Duvha and Matla stations. The majority of these applications request an alternative limit post-2025 “until decommissioning” that is weaker than the new plant MES – these are tantamount to an exemption from the MES and are unlawful. That much is clear from the List of Activities and the Framework. 1 April 2025 is the latest date for compliance with new plant MES.
- 9.7 Eskom otherwise provides no justifiable or acceptable reasons in support of its various applications. Stations that cannot comply with the MES should not operate and/or their decommissioning should be expedited. Applying for a ‘tailored’ set of limits that are weaker than the new plant MES through to decommissioning, in areas where there is chronic non-compliance with the NAAQS, cannot be permitted and undermines the Constitution, NEMA, the AQA, the List of Activities and the Framework.
10. We are instructed to focus our comments on the Summary Motivation Report,<sup>7</sup> the Summary (cumulative) Atmospheric Impact Report (Annexure B),<sup>8</sup> and “Health impact focused cost benefit analyses” (Annexure C).<sup>9</sup> The Summary Motivation Report includes an explanation of Eskom’s emission reduction plan, its compliance status with the new plant MES, the legal basis for the applications to be submitted and the reasons for its postponement, suspension and alternative limit applications. These submissions are also confined to the 10 stations identified above, namely, Lethabo, Majuba, Camden, Kriel, Matla, Kendal, Duvha, Arnot, Hendrina and Komati power stations. We submit that the content of these documents is sufficient to conclude that Eskom has not satisfied the prescribed conditions required for its various applications, and understood within the applicable legislative 2017 Framework, the applications should be rejected.
11. Our submissions below address the following items in turn:
- A. Summary of amendments to the Listed of Activities and the 2017 Framework;
  - B. Impact on ambient air quality in the Highveld Priority Area (HPA) and Vaal Triangle Airshed Priority Area (VTAPA);
  - C. Direct adverse health impacts attributed to Eskom’s coal-fired power stations and flawed cost-benefit analysis;
  - D. Eskom’s inadequate emission reduction plan and decommissioning schedule;
  - E. Eskom’s unlawful applications for alternative limits until decommissioning;
  - F. Impacts of flue-gas desulphurisation technology;
  - G. Attendance at public participation meetings;
  - H. Eskom’s defective air quality offsets programme; and
  - I. Conclusion and prayers.

#### **A. Summary of amendments to the List of Activities and the 2017 Framework**

12. Section 24 of the Constitution guarantees everyone the right to an environment not harmful to health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. As the Constitution is the supreme law, any law or conduct

<sup>7</sup> <http://www.naledzi.co.za/assets/documents/019dd09e24d4c389c3210ca8204e09f3.pdf>

<sup>8</sup> <http://www.naledzi.co.za/assets/documents/e83f793278fa68e913341ccab609bda9.pdf>

<sup>9</sup> <http://www.naledzi.co.za/assets/documents/20d9525bfb5bc884ea2d36fdb4c39a1.pdf>

inconsistent with it is invalid, and the obligations imposed by it must be fulfilled.<sup>10</sup> All law and conduct must be measured against the right to an environment that is not harmful to health or wellbeing. It is to give effect to the constitutional environmental right that environmental legislation - including air quality legislation - was enacted.

13. The overarching environmental legislation which gives effect to section 24 of the Constitution is NEMA,<sup>11</sup> and the National Environmental Management (NEM) Principles in NEMA's section 2, which must be adhered to by any organ of state in all decision-making and when exercising its functions. Some of these binding directive principles are as follows:
- a. the environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage ("public trust doctrine");<sup>12</sup>
  - b. a risk-averse and cautious approach must be applied, which takes into account the limits of current knowledge about the consequences of decisions and actions<sup>13</sup> ("precautionary principle");
  - c. negative impacts on the environment and on people's environmental rights must be anticipated and prevented, and where they cannot be altogether prevented, must be minimised and remedied ("preventive principle");<sup>14</sup>
  - d. pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied ("preventive principle");
  - e. environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons;<sup>15</sup>
  - f. responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its lifecycle;<sup>16</sup>
  - g. sensitive, vulnerable, highly dynamic or stressed ecosystems...require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure;<sup>17</sup>
  - h. the cost of remedying the pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment ("polluter pays' principle");<sup>18</sup>
  - i. use and exploitation of non-renewable natural resources must be responsible and equitable, and take into account the consequences of the depletion of the resource;<sup>19</sup> and
  - j. the participation of all interested and affected parties in environmental governance must be promoted.<sup>20</sup>
14. In the context of giving effect to section 24 of the Constitution and embodying the NEM Principles, AQA was promulgated and came into effect in 2005. The AQA aims to ensure that air pollution is not harmful to human health or well-being, and to enhance the quality of air in South Africa.<sup>21</sup> The AQA provides that its interpretation and application must be guided by the NEM Principles and accordingly, the National Air Quality Officer (NAQO), licensing authorities, and Eskom (an organ of state) must adhere to the NEM Principles and legal provisions of the AQA in its decision-making and exercise of their functions – including in considering Eskom's current applications.

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<sup>10</sup> Section 2 of the Constitution.

<sup>11</sup> Section 2(1) of NEMA.

<sup>12</sup> Section 2(4)(n) of NEMA.

<sup>13</sup> Section 2(4)(a)(vii) of NEMA.

<sup>14</sup> Section 2(4)(a)(viii) of NEMA.

<sup>15</sup> Section 2(4)(c) of NEMA.

<sup>16</sup> Section 2(4)(e) of NEMA.

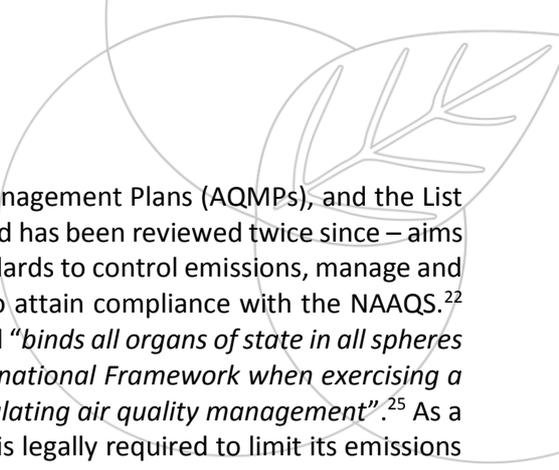
<sup>17</sup> Section 2(4)(r) of NEMA.

<sup>18</sup> Section 2(4)(p) of NEMA.

<sup>19</sup> Section 2(4)(a)(v) of NEMA.

<sup>20</sup> Section 2(4)(f) of NEMA.

<sup>21</sup> Section 2 of the AQA.

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15. More specifically, Eskom is bound by the 2017 Framework, Air Quality Management Plans (AQMPs), and the List of Activities. The 2017 Framework – which was first established in 2007, and has been reviewed twice since – aims to achieve the objectives of the AQA and provides various norms and standards to control emissions, manage and monitor air quality, and provide mechanisms, systems, and procedures to attain compliance with the NAAQS.<sup>22</sup> The 2017 Framework forms part of the definition of “this Act” in AQA,<sup>23</sup> and “binds all organs of state in all spheres of government”.<sup>24</sup> AQA requires that an organ of state “give effect to the national Framework when exercising a power or performing a duty in terms of [AQA] or any other legislation regulating air quality management”.<sup>25</sup> As a significant emitter and a major source of pollution in South Africa, Eskom is legally required to limit its emissions to help ensure NAAQS compliance.
16. On 26 October 2018, the 2017 Framework was published,<sup>26</sup> which reflected the material amendments made to the process of applying for the postponement or suspension of the MES.
17. Paragraph 5.4.3.4 of the 2017 Framework provides that: “given the potential economic implications of emission standards, and mindful that emission standard setting in South Africa was not based on comprehensive sector-based CBA (at least not for the initial group of Listed Activities), provision is made for specific industries to apply for possible extensions to compliance time frames for new plant standards. A proponent of a Listed Activity will be allowed to apply for a postponement or suspension of the compliance date and such an application will be considered based on the following conditions being met:
- an application is accompanied by a completed Atmospheric Impact Report (as contemplated in Section 30 of the AQA); and **demonstration that the industry’s air emissions are not causing direct adverse impacts on the surrounding environment;**
  - the application is accompanied by a concluded public participation process undertaken as specified in the NEMA Environmental Impact Assessment Regulations;
  - the application is submitted to the National Department on or before 31 March 2019;
  - ambient air quality in the area is in compliance with the applicable National Ambient Air Quality Standards;** and
  - other requirements as may be specified by the National Air Quality Officer” (our emphasis).<sup>27</sup>
18. Paragraph 5.4.3.4 of the 2017 Framework thus stipulates that compliance with MES may be postponed and a suspension of compliance may be granted, **provided NAAQS are in compliance and the air emissions are not causing direct adverse impacts on the surrounding environment.** The NAAQS compliance requirement holds particular significance in relation to the 3 air quality Priority Areas situated within the Highveld, Vaal Triangle, and the Waterberg-Bojona - all of which remain out of compliance with NAAQS, despite their status as a “Priority Area” and despite the fact that: the VTAPA was declared almost 13 years ago; the HPA more than 11 years ago; and the WBPA, more than 6-and-a-half years ago. We and our clients reiterate our view that no industries operating within these Priority Areas should be permitted to apply for postponement, suspension or alternative limits and submit that granting such applications will only exacerbate the high levels of air pollution, and its dire impact on human health, well-being, and the environment; which would in turn, make it even more difficult for the Priority Areas to meet their goals of ensuring compliance with NAAQS.
19. We note that in the section of the Summary Motivation Report that describes the legal basis for this application,<sup>28</sup> the conditions relating to compliance with NAAQS and direct adverse impacts on the surrounding environment,

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<sup>22</sup> Section 7(1) of the AQA.

<sup>23</sup> Section 1(1) of the AQA.

<sup>24</sup> Section 7(3)(a) of the AQA.

<sup>25</sup> Section 7(4) of the AQA.

<sup>26</sup> Document available here: <https://cer.org.za/wp-content/uploads/2018/10/National-Environmental-Management-Air-Quality-Act-39-2004-the-2017-National-20181026-GGN-41996-01144.pdf>

<sup>27</sup> Please refer generally to page 60 to 61.

<sup>28</sup> Summary Motivation Report at pages 12-3.

have been inexplicably omitted. The prospects of Eskom's applications hinge on these two conditions, which we submit it has not met, and it is critical that I&APs are aware of these requirements.

20. Paragraph 5.4.3.4 of the 2017 Framework also notes that: *“that the year 2020 marks 10 years since the publication of the 2010 AQA Section 21 notice. Therefore, sufficient time has been afforded to industry towards compliance with the initial MES by 2020. In upholding the objectives of the AQA, the Department provides certainty regarding postponement or suspension of compliance timeframes in the following order:*
- a. *Existing facilities may apply for a **once-off postponement of compliance timeframes for new plant standards**. A postponement if granted will be for a period not exceeding 5 years and **no postponement would be valid beyond 31 March 2025**;*
  - b. *Existing facilities that will be **decommissioned by 2030 may apply for a once-off suspension of compliance timeframes with new plant standards for a period not beyond 2030**. An application must be accompanied by a clear decommissioning schedule and no such application shall be accepted after 31 March 2019;*
  - c. *Existing facilities that will be granted a suspension of compliance timeframes shall **comply with existing plant standards during the suspension period until they are decommissioned**; and*
  - d. ***No postponement of compliance timeframes or a suspension of compliance timeframes shall be granted for existing plant standards.***
  - e. *An existing facility may submit an application regarding a new plant standard to the National Air Quality Officer for consideration, if **the facility is in compliance with other emission limits but cannot comply with a particular pollutant or pollutants**. An application must **demonstrate previous reduction in emissions of the said pollutant or pollutants, measures and direct investments implemented towards compliance with the relevant new plant standards**. The National Air Quality Officer, after consultation with the Licensing Authority, may grant an alternative emission limit or emission load **provided there is compliance with the national ambient air quality standards in the area for pollutant or pollutants applied for; or the Atmospheric Impact Report does not show increased health risk where there is no ambient air quality standard**”*
21. In short, the 2017 Framework sets out new requirements for the postponement of MES compliance and makes provision for suspensions of such compliance. The following is made clear:
- a. postponements of the 2015 MES are no longer permitted;
  - b. in limited circumstances, including demonstration of compliance with existing plant standards and NAAQS, only one postponement, per pollutant, is permitted for the 2020 MES, and such postponement may not extend more than 5 years (i.e. all plants must meet the 2020 MES by 31 March 2025; and
  - c. in limited circumstances, including demonstration of compliance with existing plant standards and NAAQS, facilities to be decommissioned by 31 March 2030 may receive for a once-off suspension of compliance with the 2020 MES, no later than 31 March 2030.
22. In light of the above, we reiterate that the 2017 Framework is the *“national Framework for achieving the objectives of [the AQA]”*<sup>29</sup> and it *“binds all organs of state in all spheres of government”*.<sup>30</sup> We therefore note that Eskom may not lawfully apply to postpone its compliance with the MES, or apply to suspend MES compliance, **unless and until the ambient air quality within the HPA and VTAPA is in compliance with the NAAQS**. This is not the case; and for this reason alone: the applications should be rejected.
23. In an effort to control 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, the Minister published the List of Activities, as well as associated MES,<sup>31</sup> in terms of section 21 of the AQA.

<sup>29</sup> See paragraph 1.3 of the 2017 Framework.

<sup>30</sup> Ibid.

<sup>31</sup> Amendments to the Listed Activities and Associated Minimum Emission Standards Identified in terms of Section 21 of the National Environment Management: Air Quality Act, 2004. GG No. 42013, Government Notice 1207, 31 October 2018.

24. The List of Activities was developed in a multi-stakeholder process over several years, in which Eskom was an active participant. In this regard, we refer to the following press statement published by the DEA on 4 December 2013, which states:

*“It is important to note that the development of the Section 21 Notice constituted an elaborate consultation and participation processes in terms of Section 56 and 57 of the AQA. All affected stakeholders (including Eskom) were part of these processes and they made contributions regarding limits that are achievable with the view of upholding the constitutional right of all people in the country to an environment that is not harmful to health and well-being.*

....

*An extensive consultation process was followed in setting these emission standards over a 5 year period. This process:*

- *continuously engaged with all stakeholders around the identification of listed activities and their associated minimum emission standards; and*
- *reviewed current national and international work related to the identification of activities and their related minimum emission standards.*

*Eskom participated directly in this process, and standards seek to balance the economic, social and environmental imperatives.”<sup>32</sup>*

25. The List of Activities came into force on 1 April 2010 and prescribes MES for various polluting activities, including those for combustion installations such as Eskom’s coal-fired power stations, for particulate matter (PM), sulphur dioxide (SO<sub>2</sub>), and oxides of nitrogen (NO<sub>x</sub>) for both new and existing plants. “Existing plants”, like all of Eskom’s stations (including Medupi and Kusile, still under construction), had to comply with more lenient standards by 1 April 2015 – a transitioning period – so that they could adhere to stricter new plant standards by 1 April 2020. In essence, since the List of Activities was published on 31 March 2010, older plants (although, as indicated, this includes Medupi and Kusile) were given a transitioning lead period of 5 years to come into compliance with a more lenient 2015 standard, and to come into compliance with a stricter standard by April 2020. Eskom was therefore well aware of this provision at least from April 2010, and was aware from several years before that that the MES would come into force, requiring the necessary emission control measures to ensure compliance with the law.
26. Like the 2017 Framework, the List of Activities has also been updated on a few occasions. Most recently, on 25 May 2018, the proposed amendments to the List of Activities were published for comment, which proposed, *inter alia*, that no further postponements of existing plant MES would be permitted and that no further postponements of new plant MES will be permitted beyond 31 March 2025. We submitted written comments on these draft amendments on 25 June 2018.<sup>33</sup>
27. The List of Activities was published on 2 November 2018,<sup>34</sup> provides as follows in relation to applications for postponement and suspension of MES compliance:
- “As contemplated in the paragraph 5.4.3.5 of the National Framework for Air Quality Management in the republic of South Africa, published in terms of Section 7 of this Act, an application may be made to the National Air Quality Officer for the postponement of compliance timeframes ...”<sup>35</sup>*
  - “An existing plant may apply to the National Air Quality Officer for a once-off postponement with the compliance timeframes for minimum emission standards for new plant as contemplated in paragraph (10). A once off postponement with the compliance timeframes for minimum emission standards for new plant*

<sup>32</sup> [https://www.environment.gov.za/mediarelease/atmospheric\\_emissionlicense\\_krielpowerstation](https://www.environment.gov.za/mediarelease/atmospheric_emissionlicense_krielpowerstation).

<sup>33</sup> [https://cer.org.za/wp-content/uploads/2018/06/CER-submission-on-proposed-amendments-to-MES-postponement-provisions\\_25-June-2018-1.pdf](https://cer.org.za/wp-content/uploads/2018/06/CER-submission-on-proposed-amendments-to-MES-postponement-provisions_25-June-2018-1.pdf)

<sup>34</sup> <https://cer.org.za/wp-content/uploads/2005/09/Section-21-Activities.pdf>

<sup>35</sup> Paragraph 10 of the List of Activities

may not exceed a period of five years from the date of issue. No once-off postponement with the compliance time frames will be valid beyond March 2025<sup>36</sup>

- c. "An existing plant to be decommissioned by 31 March 2030 may apply to the National Air Quality Officer before 31 March 2019 for a once-off suspension of compliance timeframes with minimum emission standards for new plant. Such an application must be accompanied by a detailed decommissioning schedule. No such application shall be accepted the National Air Quality Officer after 31 March 2019"<sup>37</sup>
- d. "An existing plant that has been granted a once-off suspension of the compliance timeframes as contemplated in paragraph (11B) must comply with minimum emission standards for existing plant from the date of granting of the application and during the period of suspension until decommissioning"<sup>38</sup>
- e. "No postponement of compliance timeframes or a suspension of compliance timeframes shall be granted for compliance with minimum emission standards for existing plant"<sup>39</sup>

28. The amended List of Activities also includes the following amendment specific to existing plants' compliance with new plant MES for SO<sub>2</sub>:

#### Amendment of Category 1 of the List

6. Subcategory 1.1 of Category 1 of the List is hereby amended by the addition of the following special arrangement under subparagraph (a):

"(iii) Existing plants shall comply with a new plant emission standard of 1000 mg/Nm<sup>3</sup> for sulphur dioxide (SO<sub>2</sub>)."

29. We point out that no amendments to sub-category 1.1 of the List of Activities (which sets out the MES for solid fuel combustion installations, including all of Eskom's coal-fired power stations), were included in the proposed amendments to the List of Activities for comment. We note further that the effect of this amendment doubles the permissible SO<sub>2</sub> emissions - from 500mg/Nm<sup>3</sup> to 1000mg/Nm<sup>3</sup> - in respect of existing plants that are solid-fuel combustion installations.
30. We have disputed – and continue to dispute - the legality of this amendment which was not the subject of public participation as required by section 57(2)(b) of the AQA, which specifically requires that any amendment made available for comment must "contain sufficient information to enable members of the public to submit meaningful representations or objections". In the circumstances, we have called upon the Minister of Environmental Affairs to withdraw this unlawful amendment, or face legal action.
31. Even before the unlawful amendment, South Africa's MES were already very weak, even compared to other developing countries. For instance, the previous SO<sub>2</sub> existing plant/2015 MES were 17.5 times weaker than those in China, Germany, and the European Union (EU), nearly 6 times weaker than India's, almost 5 times weaker than Indonesia's, and almost double as lax as Thailand's.<sup>40</sup> The recent amendments would only serve to deepen this inequality and worsen the impacts of air pollution in South Africa, through effectively "doubling" the SO<sub>2</sub> MES limit (and making it twice as weak).

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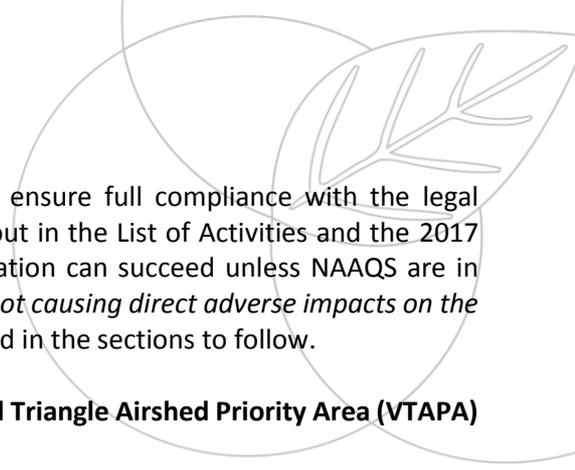
<sup>36</sup> Paragraph 11A of the List of Activities

<sup>37</sup> Paragraph 11B of the List of Activities

<sup>38</sup> Paragraph 11C of the List of Activities

<sup>39</sup> Paragraph 11D of the List of Activities

<sup>40</sup> See <https://www.iea-coal.org/library/emission-standards/>. Comparisons and ratios are approximate due to differences between jurisdictions with respect to: a) the reference oxygen content (for example, the MES reference value is 10% oxygen; the EU and China reference value is 6% oxygen); b) the averaging period (for example, the MES is based on daily averages; shorter averaging periods may apply in other jurisdictions; and c) applicable boiler size. Due to these factors, the calculated ratios are generally conservative or understated.



32. Should Eskom persist in making such applications, we call upon it to ensure full compliance with the legal requirements for such postponement and suspension applications, set out in the List of Activities and the 2017 Framework. These include that no postponement or suspension application can succeed unless NAAQS are in compliance and it is demonstrated “*that the industry’s air emissions are not causing direct adverse impacts on the surrounding environment*”. It is clear that this is not the case, as presented in the sections to follow.

**B. Impact on ambient air quality in the Highveld Priority Area (HPA) and Vaal Triangle Airshed Priority Area (VTAPA)**

33. Eskom has 12 coal-fired power stations located in the Mpumalanga Highveld. The application seeks to either postpone compliance with the new plant MES to 2025, request alternative limits for 4 of these coal-fired power stations (Majuba; Kendal; Duvha; and Matla), or apply for suspension of compliance until decommissioning by 2030 for the other 5 coal-fired power stations (Kriel; Arnot; Hendrina; Camden; and Komati). As an alternative to the suspension applications, Eskom also applies for alternative emission limits per station until decommissioning. The application for Lethabo station, located in the VTAPA, is to postpone compliance with the new plant MES to 2025, or meet alternative limits “until decommissioning”.

34. Due to the significantly-polluted air in the Highveld, the then Minister had declared the Mpumalanga Highveld as a priority area in 2007. The declaration of a priority area is possible in terms of section 18 of AQA, if the Minister believes that NAAQS are being or may be exceeded in the area, or any other situation exists which is causing, or may cause, a significant negative impact on air quality in the area, and this requires specific air quality management action to rectify the situation.<sup>41</sup> In terms of section 19, a priority area air quality management plan (AQMP) is required to be prepared and approved. A priority area’s declaration can only be withdrawn if the area is in compliance with NAAQS for more than 2 years,<sup>42</sup> and the AQMP lapses when the declaration is withdrawn.<sup>43</sup> Section 19 sets out the requirements for an AQMP, which must: (a) be aimed at coordinating air quality management in the area; (b) address issues related to air quality in the area; and (c) provide for the implementation of the plan by a committee representing relevant role-players.<sup>44</sup>

35. The HPA AQMP has been in place since 2012, and its primary objective is to bring the air quality in the Highveld in line with all NAAQS. Among other goals, by 2020, it aims to reduce industrial emissions in order to achieve compliance with NAAQS and dust fallout limit values.<sup>45</sup> It is submitted that continued MES postponements will render compliance with this goal impossible. It is not disputed that the deteriorating air quality within the HPA has a devastating effect on people living within the area. Indeed, this is acknowledged in the Preamble of the AQA. It is submitted that the ongoing air pollution is a perpetuation of environmental injustice, unfairly discriminating against vulnerable and disadvantaged persons, in particular.

36. Unfortunately, more than 11 years since the declaration, air quality in the HPA has not improved, and remains non-compliant with the NAAQS,<sup>46</sup> despite the fact that South African standards are weaker than the World Health Organisation (WHO)’s 2005 guidelines (which are themselves outdated and under review). The continued NAAQS non-compliance is reflected in the DEA’s own annual State of the Air reports, the reports presented at the HPA multi-stakeholder reference group meetings, and the DEA mid-term review of the HPA AQMP. The DEA’s 2018 State of the Air report states that “*many South Africans may be breathing air that is harmful to their health and well-being especially in the priority areas*”, and a 10 year trend of pollutants indicates that the air quality has not improved. The dire air pollution situation in the HPA, and its implications for human health and for the environmental right is extensively reported in the “*Broken Promises*” report, which was submitted to the DEA in October 2017.<sup>47</sup>

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<sup>41</sup> Section 18 of the AQA.

<sup>42</sup> Section 18(5) of the AQA.

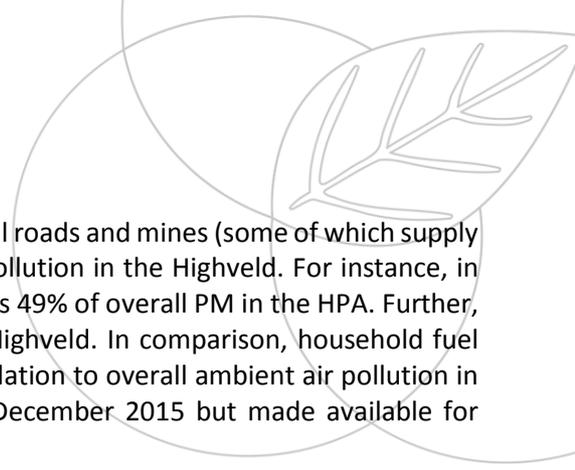
<sup>43</sup> Section 19(7) of the AQA.

<sup>44</sup> Section 19(6) of the AQA.

<sup>45</sup> HPA AQMP, page xvi.

<sup>46</sup> [http://www.airqualitylekgotla.co.za/assets/2018\\_1.3\\_2018\\_state\\_of\\_air\\_report.pdf](http://www.airqualitylekgotla.co.za/assets/2018_1.3_2018_state_of_air_report.pdf)

<sup>47</sup> <https://cer.org.za/news/broken-promises-the-failure-of-south-africas-priority-areas-for-air-pollution-time-for-action>



37. The HPA AQMP also states that power generation, followed by mining haul roads and mines (some of which supply the power generating plants), are by far the largest contributor to air pollution in the Highveld. For instance, in respect of PM<sub>10</sub>, power generation accounts for 12%, and mine haul roads 49% of overall PM in the HPA. Further, power generation accounts for 73% of all NO<sub>x</sub> and 82% of SO<sub>2</sub> in the Highveld. In comparison, household fuel burning accounts for a mere 6% of PM<sub>10</sub>, 1% of SO<sub>2</sub>, and 1% of NO<sub>x</sub> in relation to overall ambient air pollution in the Highveld. The DEA's mid-term review of the HPA AQMP,<sup>48</sup> dated December 2015 but made available for comment in February 2016, indicates that:

37.1. *“industrial sources in total are by far the largest contributor of SO<sub>2</sub> and NO<sub>x</sub> in the HPA, accounting for approximately, 99.57 % of SO<sub>2</sub> and 95.97% of NO<sub>x</sub>, while mining is the largest contributor of PM<sub>10</sub> emissions”;*<sup>49</sup> and

37.2. *“there has not been a significant decrease in emissions of industrial and mining sources... Nonetheless, industrial sources are still the largest contributors of SO<sub>2</sub> and NO<sub>x</sub> in the HPA with mining being the main contributor of PM<sub>10</sub>.”*<sup>50</sup>

38. Similarly, despite the declarations of the VTAPA (home to Lethabo power station) in 2006,<sup>51</sup> and the WBPA (home to Medupi and Matimba power stations) in 2012, both remain in non-compliance with NAAQS,<sup>52</sup> and granting further MES postponements will only exacerbate this position and worsen the health impacts. Based on the evidence before us, none of the 3 priority areas has any reasonable prospect of being withdrawn in the foreseeable future.

39. As contemplated in terms of paragraph 5.4.3.4 of the 2017 Framework, the law, as amended, is clear that only in such cases where the areas in which the power stations are based are in compliance with NAAQS (which the HPA, VTAPA, and WBPA are not), can postponement, suspension, or alternative limit applications even be considered. In terms of section 1(a)(ii) of the Promotion of Administrative Justice Act, 2000 (PAJA), the powers to exercise administrative action are derived from and only extend insofar as the legislation allows. Therefore, we submit that granting any of these applications for coal-fired power stations in the HPA or the VTAPA would be *ultra vires* the Constitution, the AQA, the amended List of Activities, the 2017 Framework, and the provisions of NEMA.

40. As such, Eskom's application for postponement, suspension, and/or alternative limits for Majuba, Kendal, Duvha, Matla, Kriel, Arnot, Hendrina, Camden, and Komati must be denied because the requisite demonstration of the areas being in compliance with the NAAQS has not been satisfied.

41. In the Summary Motivation Report, Eskom acknowledges its current and continued impact on ambient air quality in the HPA, in particular, in which residents are still exposed to dangerous levels of air pollution, despite its declaration in 2007. It states the following:

*“It is common cause that the Minimum Emission Standards (MES) serve to ensure that there is compliance with the National Ambient Air Quality Standards (NAAQS). It is also common cause that there are many areas in South Africa in which NAAQS are not met consistently, exposing people and the environment to pollutants at concentrations that are above those considered to be protective of human health as seen in the state of air report for the Highveld Priority Area (HPA).*

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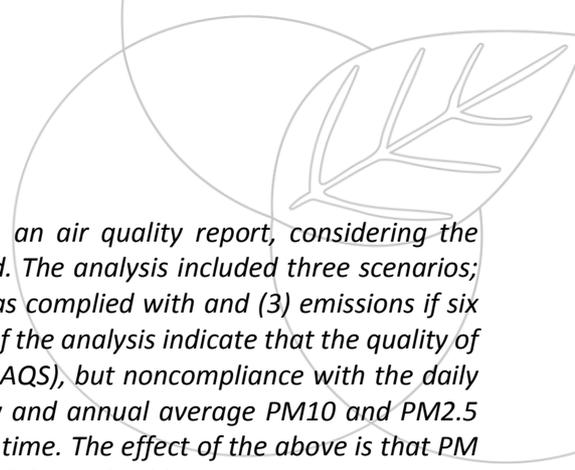
<sup>48</sup> [https://cer.org.za/wp-content/uploads/2016/07/HPA-AQMP-Midterm-review-Draft-Report\\_February-2016.pdf](https://cer.org.za/wp-content/uploads/2016/07/HPA-AQMP-Midterm-review-Draft-Report_February-2016.pdf).

<sup>49</sup> Page 2 of Broken Promises Report.

<sup>50</sup> Page 85 of Broken Promises Report.

<sup>51</sup> Data from December 2016 to May 2018 shows exceedances for PM<sub>2.5</sub> & PM<sub>10</sub> exceeded in Kliprivier, Sharpeville, Sebokeng, Zamdela, and O<sub>3</sub> exceeded in Sharpeville, Sebokeng and Three Rivers. The VTAPA MSRG meeting on 28 June 2018 confirmed that ambient air quality in the VTAPA is not in compliance with the NAAQS.

<sup>52</sup> Data from December 2016 to May 2018 shows exceedances for PM<sub>10</sub>, PM<sub>2.5</sub> and O<sub>3</sub>. The WBPA MSRG meeting on 27 June 2018 confirmed that the ambient air quality in the WBPA is not in compliance with the NAAQS.



*In addition to the individual AIR completed for each power station, an air quality report, considering the cumulative impact of the Eskom stations over the HPA was completed. The analysis included three scenarios; which considered (1) the actual emissions, (2) emissions if the MES was complied with and (3) emissions if six power stations are decommissioned by 2030. The general conclusions of the analysis indicate that the quality of air will be in compliance with NO<sub>2</sub> National Air Quality Standards (NAAQS), but noncompliance with the daily and annual SO<sub>2</sub> standards in several areas across the Highveld. Daily and annual average PM<sub>10</sub> and PM<sub>2.5</sub> concentrations could be in noncompliance and for extended periods of time. The effect of the above is that PM ambient levels currently result in increased health risk for a large part of the Highveld.*

*Dispersion modelling results based on individual and combined power station emissions, excluding all other sources; indicate a negligible contribution to PM pollution. In addition the diurnal pattern in PM concentrations based on monitored ambient data clearly indicate a morning and early evening peaks, typical of low level source contributions. However, a combination of SO<sub>2</sub> and NO<sub>x</sub> emissions from all the Highveld power stations is predicted to form a significant component of the PM<sub>2.5</sub> load especially over Emalahleni area, which is in noncompliance with PM standards, is a cause for concern.*

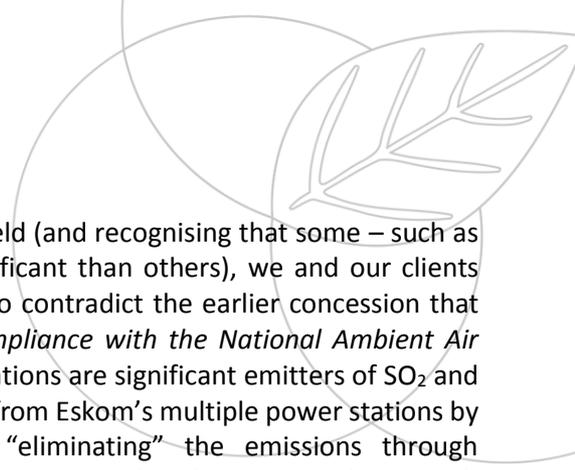
*In addition, the combined SO<sub>2</sub> emissions from all Eskom power stations are predicted to contribute a significant amount to the pollution in and around the Emalahleni and Middelburg areas and even extending south towards Komati Power Station. However analysis indicates that the non-compliance is not only due to Eskom Power Stations but a function of a multitude of sources in the Highveld.”*

42. In our previous objections, we have consistently noted that Eskom’s power stations emit very significant volumes of SO<sub>2</sub> and NO<sub>x</sub>, in addition to PM. Indeed, it is highlighted above in paragraph 37 that power generation accounts for 73% of all NO<sub>x</sub> and 82% of SO<sub>2</sub> in the Highveld. This is due to the fact that SO<sub>2</sub> and NO<sub>x</sub>, as primary pollutants, are also transformed through chemical and physical processes in the atmosphere, to secondary PM<sub>2.5</sub>. This formation contributes significantly to total ambient PM<sub>2.5</sub>. We have therefore repeatedly recommended that the dispersion model selected to assess the air quality impact must be capable of modelling both dispersion and chemical transformation (photochemical) processes, and should include the modelling of SO<sub>2</sub> and NO<sub>x</sub> emissions.
43. The finding that a combination of SO<sub>2</sub> and NO<sub>x</sub> emissions from all the Highveld power stations is predicted to form a significant component of the PM<sub>2.5</sub> load, has, we submit, vindicated our recommendations and submissions made over the course of several years. We strongly contend that this is more than a mere “cause for concern”.<sup>53</sup> We submit that, notwithstanding the condition that NAAQS must be in compliance, Eskom’s cumulative contribution to the formation of PM<sub>2.5</sub> and the severe health impacts associated with PM<sub>2.5</sub>, is fatal to Eskom’s applications. It is recognised above that the effect of this accumulation will be an increasing health risk for a large part of the Highveld, and, we submit, this will more than likely only sustain the state of non-compliance with NAAQS in the HPA and the continued breach of section 24 of the Constitution. This is unacceptable. The health impacts attributed to Eskom’s coal-fired power stations, caused by PM<sub>2.5</sub> alone, are addressed in the section below.
44. To conclude this section, we note the observation that “analysis indicates that the non-compliance is not only due to Eskom Power Stations but a function of a multitude of sources in the Highveld” and “ambient air quality monitoring data indicate that the elevated pollution levels in the Highveld require a holistic approach, addressing all identified and potential sources. Therefore, a single approach, targeted at only eliminating Eskom power station emissions will not result in acceptable ambient air quality levels that are not harmful to human health and the environment.”

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<sup>53</sup> The Summary Atmospheric Report available at

<http://www.naledzi.co.za/assets/documents/e83f793278fa68e913341ccab609bda9.pdf> concludes that the predicted 24 hour concentrations of secondary PM<sub>2.5</sub> are seen at some 75% of the NAAQS limit value and at 50% of the NAAQS limit value for most of the Highveld. In addition, the combined SO<sub>2</sub> emissions from all Eskom power stations are predicted to contribute some 56% of the NAAQS limit value in and around the Emalahleni Middelburg areas and extending southwards to Komati power station where non-compliance with the 24 hour NAAQS is evident in the monitoring data.

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45. With the exception of the multitude of sources of pollution in the Highveld (and recognising that some – such as Eskom’s power stations and Sasol’s Secunda complex – are more significant than others), we and our clients otherwise oppose this proposition. The latter suggestion also appears to contradict the earlier concession that “*Minimum Emission Standards (MES) serve to ensure that there is compliance with the National Ambient Air Quality Standards (NAAQS)*”. It is common cause that Eskom’s power stations are significant emitters of SO<sub>2</sub> and NO<sub>x</sub> and, consequently, secondary PM<sub>2.5</sub>. Therefore, reducing emissions from Eskom’s multiple power stations by enforcing compliance with the new plant MES, or alternatively, “eliminating” the emissions through decommissioning, is very much a central element in a ‘holistic approach’ to ensure that there is compliance with the NAAQS. In the circumstances, doing otherwise - by granting Eskom’s applications for postponement, suspension and/or alternative limits - would, we reiterate, be *ultra vires* the Constitution, the object of the AQA and List of Activities, the 2017 Framework, and the provisions of NEMA.
46. We submit that Eskom’s reliance on the contribution of other less significant (by percentage) sources of emissions - which must, of course be reduced and, where possible, eliminated through other appropriate policy and legal means - is, however, an obfuscation of the immediate issue of compliance with the law and should be dismissed.

**C. Direct adverse health impacts attributed to Eskom’s coal-fired power stations and cost-benefit analysis**

47. We reiterate that one of the amendments to the List of Activities, to paragraph 11, is the following:

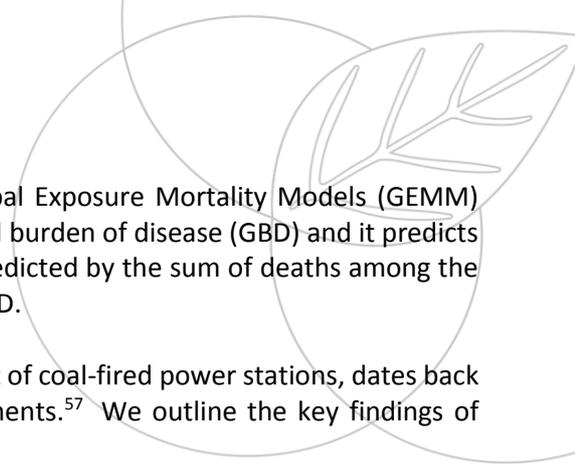
*“As contemplated in paragraph 5.4.3.5 of the National Framework for Air Quality Management in the Republic of South Africa, published in terms of section 7 of this Act, an application may be made to the National Air Quality Officer for the postponement of the compliance time frames in paragraph (9) and (10) for an existing plant”*

48. In addition to the requirement that the area must be in compliance with NAAQS, the 2017 Framework requires that Eskom must demonstrate that its air emissions are not causing direct adverse impacts on the surrounding environment. Furthermore, the NAQO, in concurrence with the competent licencing authorities, is also bound by the applicable legislative framework outlined in Section A above. In considering Eskom’s applications and the surrounding circumstances, the NAQO must be guided by the NEMA principles and apply the AQA in accordance with section 24 of the Constitution to ensure that air pollution is not harmful to human health or well-being, and to enhance the quality of air in South Africa.
49. The World Health Organisation has confirmed that air pollution, both ambient and indoor, is one of the largest causes of death worldwide. About a quarter of all heart attack deaths, and about a third of all deaths from stroke, lung cancer, and chronic obstructive pulmonary disease are due to air pollution exposures. Health impacts are largest among women, children, older people, and the poor.<sup>54</sup>
50. The purpose of the health-based NAAQS is for the Minister of Environmental Affairs to establish the permissible amount or concentration of each such substance or mixture of substances in ambient air, in order to minimise the risk of fatal health impacts caused by ambient air pollution. In addition to the fact that all three of South Africa’s priority areas are out of compliance with the NAAQS, as reported by DEA,<sup>55</sup> and that our comparatively weak NAAQS are in urgent need of review, it is critical to note that there are no safe levels of exposure to several pollutants. This includes PM<sub>2.5</sub>, and as confirmed above, a significant component of the PM<sub>2.5</sub> load in the HPA is formed by Eskom’s coal-fired power stations. Exposure to ambient PM<sub>2.5</sub> as a major health concern cannot be underestimated – recent research (September 2018) into global estimates of mortality associated with long-term exposure to outdoor fine particulate matter, has revealed that outdoor particulate air pollution is an even more

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<sup>54</sup> See, for example: [http://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](http://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health); <https://ehp.niehs.nih.gov/ehp299/>.

<sup>55</sup> See Section B above.



important population health risk factor than previously thought.<sup>56</sup> Global Exposure Mortality Models (GEMM) were constructed for five specific causes of death examined by the global burden of disease (GBD) and it predicts 8.9 million deaths in 2015 due to PM<sub>2.5</sub>, a figure 30% larger than that predicted by the sum of deaths among the five specific causes and 120% larger than the risk function used in the GBD.

51. Eskom's knowledge of the extent of the health impacts caused by its fleet of coal-fired power stations, dates back to at least 2006, when it commissioned its own health impact assessments.<sup>57</sup> We outline the key findings of Eskom's respective reports below:

51.1 The Mpumalanga Highveld study<sup>58</sup> focused on the emissions from Eskom's then-existing fleet of 10 coal-fired power stations, and concluded that Eskom stations were cumulatively calculated to be responsible for 17 non-accidental mortalities and 661 respiratory hospital admissions per year. What is even more striking, however, is the study's finding that future Eskom's emissions, including increased releases from existing stations and the commissioning of 3 new and 3 return-to-service (RTS) stations, were cumulatively calculated to be responsible for 617 non-accidental mortalities and 24 842 respiratory hospital admissions annually. It is therefore clear that, at least from 2006, Eskom was already well aware that commissioning new coal-fired stations and bringing the RTS stations back online, without installation of SO<sub>2</sub> abatement equipment at all of the stations, would result in a large and disproportionate increase in mortalities and respiratory illnesses.

51.2 The Eskom Limpopo Health Study<sup>59</sup> analysed the health risks of its Matimba power station and planned Medupi power station and concluded that *"emissions from existing Matimba Power Station operations are estimated to be responsible for 80% of the premature mortality and 50% of the respiratory hospital admissions" and that Medupi "would result in health risks being doubled from 1.5 to 3 premature deaths and from 144 to 300 respiratory hospital admissions per year"*.

52. Given the absence of the health assessment as a supporting document, our objections in 2014 to Eskom's first round of MES postponement applications place detailed reliance on a research study by Lauri Myllyvirta<sup>60</sup> – a coal and air pollution specialist – which concluded that atmospheric emissions from Eskom's coal-fired power stations were then causing an estimated 2,200 premature deaths per year, due to PM<sub>2.5</sub> exposure. This included approximately 200 deaths of young children. The economic cost to society was estimated at USD2.37 billion per year (at the time).

53. Using the data from Lauri Myllyvirta's study, UK-based air quality and health expert Dr Mike Holland assessed the health impacts and associated economic costs of current emissions from Eskom's coal-fired power stations in 2016. The assessment especially focused on the role PM<sub>2.5</sub> formed in the atmosphere following release of other pollutants, particularly SO<sub>2</sub> and NO<sub>x</sub>. His report, entitled *"Health impacts of coal fired power plants in South Africa"*,<sup>61</sup> estimates that the following impacts are attributable to these emissions:

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<sup>56</sup> Published by Proceedings of the National Academy of Sciences of the United States of America, available at <https://doi.org/10.1073/pnas.1803222115>.

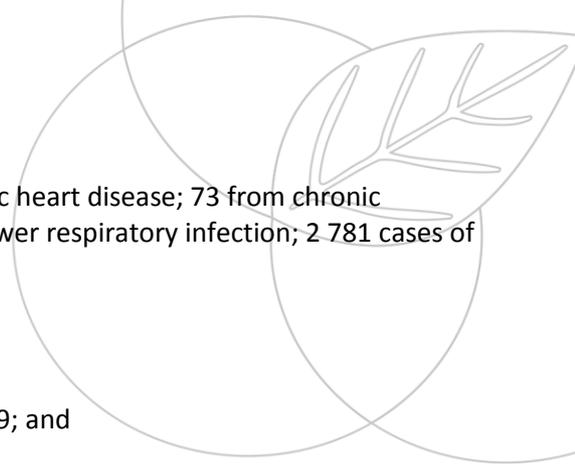
<sup>57</sup> See "Eskom health studies" at <https://cer.org.za/programmes/pollution-climate-change/key-information>; <https://mg.co.za/article/2014-06-19-power-stations-are-deadly-internal-report-reveals>.

<sup>58</sup> See generally: Airshed Planning Professionals (Pty) Ltd, "Air Pollution Compliance Assessment and Health Risk Analysis of Cumulative Operations of Current, RTS and proposed Eskom Power Station located within the Mpumalanga and Gauteng Provinces", October 2006.

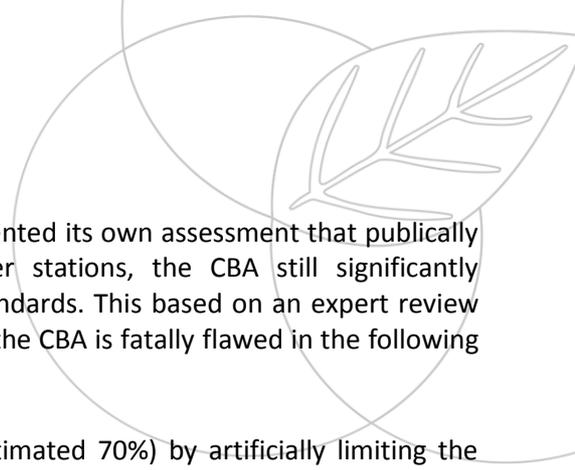
<sup>59</sup> [https://cer.org.za/wp-content/uploads/2017/09/Broken-Promises-full-report\\_final.pdf](https://cer.org.za/wp-content/uploads/2017/09/Broken-Promises-full-report_final.pdf)

<sup>60</sup> [https://cer.org.za/wp-content/uploads/2014/02/Annexure-5\\_Health-impacts-of-Eskom-applications-2014- final.pdf](https://cer.org.za/wp-content/uploads/2014/02/Annexure-5_Health-impacts-of-Eskom-applications-2014- final.pdf).

<sup>61</sup> <https://cer.org.za/wp-content/uploads/2017/04/Annexure-Health-impacts-of-coal-fired-generation-in-South-Africa-310317.pdf>.

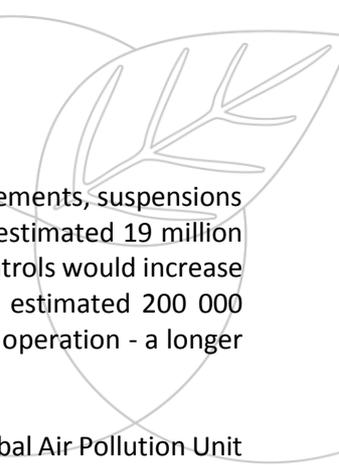


- 53.1. 2 239 deaths per year: 157 from lung cancer; 1 110 from ischaemic heart disease; 73 from chronic obstructive pulmonary disease; 719 from strokes; and 180 from lower respiratory infection; 2 781 cases of chronic bronchitis per year in adults;
  - 53.2. 9 533 cases of bronchitis per year in children aged 6 to 12;
  - 53.3. 2 379 hospital admissions per year;
  - 53.4. 3 972 902 days of restricted activity per year;
  - 53.5. 94 680 days of asthma symptoms per year in children aged 5 to 19; and
  - 53.6. 996 628 lost working days per year.
54. We continue to submit that these serious and direct health impacts make it clear that Eskom's applications cannot succeed, as this would be contrary to the Constitution, NEMA, AQA, the Listed Activities, and the 2017 Framework. On a proper consideration of this issue, consistent with the Constitution, these impacts – quite apart from the fact that there is NAAQS non-compliance – are fatal to Eskom's applications to postpone or suspend compliance with the MES and/or request alternative limits.
55. In our BID submissions, we anticipated that even on the basis of a cost-benefit analysis (CBA) to be conducted by independent consultants, including "health impacts", we could not conceive of a scenario where DEA could justifiably approve Eskom's applications, in light of the health effects attributed to Eskom's stations. Contrary to Eskom's intentions, its "Health impact focused cost benefit analyses", only affirms our conclusion, if not weakening Eskom's position even further.
56. In its Summary Motivation Report, Eskom' states the following:
- "The basis of the assessments of the impact of power stations emissions on human health and the environment is a comparison of the measured and predicted air quality concentrations with the NAAQS. Stakeholders have argued correctly that the NAAQS cannot be interpreted to imply no health risk at all but the counter argument is that the NAAQS express a 'permissible' level of risk. To manage air quality to a point that it is completely free of risk is to invoke such significant financial and non-financial costs that those costs will in themselves result in severe potential economic and social consequences. In these terms it is necessary to present here some perspectives on the cost-benefit of full MES compliance."*
57. Firstly, we vehemently dispute that a CBA, irrespective of the findings, can serve as a justification for avoiding compliance with the MES in a constitutional democracy founded on the rule of law, human dignity, the achievement of equality and the advancement of human rights and freedoms. In its motivations, Eskom has not set out a legal basis to support the CBA, and we submit that it is because there is none. This includes the following Summary Motivation Report reference: *"the 2017 National Air Quality Framework for Air Quality Management provision is made for suspensions and alternative emission limits due to the potential economic implications of emission standards on existing plant. The provision is provided because a sector specific CBA was not completed prior to setting standards"* – the once-off postponement and suspension application provision is provided on condition that the requirements listed in the List of Activities and the 2017 Framework are satisfied. In this case they are not.
58. In any event, based on the health impact studies outlined above, there are already severe and indefensible social and economic consequences caused by the operation of Eskom's coal-fired power stations.
59. Secondly, in direct response to the "to manage air quality" point above, Eskom has conceded that *"it is common cause that the Minimum Emission Standards (MES) serve to ensure that there is compliance with the National Ambient Air Quality Standards (NAAQS)."* It is submitted that at the core of this application, is an attempt by Eskom, on the basis that it is not financially feasible, to postpone and suspend compliance with the MES, the very purpose of which, is to control and reduce atmospheric emissions from listed activities 'which have a significant detrimental effect on the environment; including health, *social conditions, economic conditions, ecological conditions or cultural heritage*'.

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60. Thirdly, notwithstanding the fact that, for the first time, Eskom has presented its own assessment that publically admits that premature deaths are caused by their coal-fired power stations, the CBA still significantly underestimates all health impacts by ignoring international research standards. This based on an expert review conducted by Dr Mike Holland, referred to above, in which he finds that the CBA is fatally flawed in the following respects:
- 60.1. The analysis excludes most of South Africa's population (an estimated 70%) by artificially limiting the geographical area covered by the study;
  - 60.2. The modelling of changes in ambient pollution levels is based on short-range (60km) assessment around each power station. Relative changes in pollution levels are then extrapolated to a larger area (though as just noted, this does not cover all of South Africa). The method for extrapolation is unclear. The range of 60km is inadequate for quantifying changes in concentration of secondary particles that form in the atmosphere following release of other pollutants. A more credible and accurate approach would have been to model directly on the scale of the larger domain for all scenarios;
  - 60.3. The authors use a 'pollution interval' based approach to link pollution data to response functions. This discounts some part of exposure from analysis, considering it 'insignificant'. Elsewhere in the world, analysis uses continuous relationships between exposure and effect. It is unclear how much the Eskom approach underestimates total damage, but as demonstrated in the Eskom report (Figure 21), the effect can be substantial, in the order of 50% or more. The approach used is certainly not conservative, as claimed by the authors;
  - 60.4. Underestimation also arises from the way that response functions are selected. The Eskom report recognises that there is potential for double-counting when applying response functions separately for a series of pollutants (SO<sub>2</sub>, NO<sub>x</sub> and PM<sub>2.5</sub>). The final selection of functions excludes those for effects of PM<sub>2.5</sub> on cardiovascular and respiratory mortality, instead adopting functions based on SO<sub>2</sub> and NO<sub>2</sub> exposure. However, the relationships with PM<sub>2.5</sub> are significantly stronger and should thus have been preferred. Using the PM<sub>2.5</sub> based functions would more than double the estimates for mortality;
  - 60.5. Analysis excludes several further pathways of health impacts from PM<sub>2.5</sub>, including effects on morbidity (illness) and cancer mortality linked with PM<sub>2.5</sub>;
  - 60.6. Estimates of benefits are significantly reduced by assumptions on discounting. The rate used (8.5%) is significantly greater than that considered appropriate for socio-economic assessment in, for example, Europe. No account appears to have been taken of increased valuation of mortality as a consequence of economic growth in future years. The extended timescales for retrofit further reduce benefits relative to costs;
  - 60.7. The report fails to compare Eskom's so-called emission reduction plan to an alternative of complying with the MES without further delay (after the five-year delay already granted); and
  - 60.8. From review and analysis of the various biases to underestimation in the health impact assessment, basing analysis only on information presented in the Eskom report, it is concluded that central estimates of benefits would exceed costs for at least three of the four scenarios considered - and quite possibly the fourth too.
61. As a result of the significant underestimation of the health impacts, the 'health cost' or quantification is also significantly higher than Eskom's CBA presents. A more detailed report setting out Dr Holland's findings will be available during the course of February 2019. We reserve our right to supplement these submissions with this report, once available.
62. In response to Eskom's CBA, Lauri Myllyvirta has conducted a further health impact assessment, which is effectively an update of his 2014 assessment, referred to above.<sup>62</sup> Compared against a scenario of full compliance with the

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<sup>62</sup> The 2014 report was reviewed, among other similar studies on health impacts of power plant emissions in South Africa, by authors from University of Johannesburg and The Nova Institute, who concluded that the study "appears to be a reasonable quantification of the health risk in remote areas, but is probably a large over-estimation of the health risk in more polluted areas," because the exposure-response relationships used "may well not be" applicable in industrialized areas due to the high



MES after the 5-year delay to 2025, excluding units set to retire by 2030, the various postponements, suspensions and alternative limits sought by Eskom would allow its coal-fired power stations to emit an estimated 19 million tons more SO<sub>2</sub>, 1 million tons more NO<sub>x</sub>, and 190 000 tons of PM. The failure to install SO<sub>2</sub> controls would increase mercury emissions over the remaining operating life of the power plants by a total of an estimated 200 000 kilograms. These estimates are based on the assumption that all units retire after 50 years of operation - a longer operating life would mean larger excess emissions.

63. To assess the health impacts of these excess emissions, Mr Myllyvirta and the Greenpeace Global Air Pollution Unit carried out CALPUFF dispersion modeling closely following the methodology of the modeling used in Eskom's CBA, with the modeling domain expanded to cover most of South Africa's population. Separate model runs were carried out for each of the 15 Eskom power stations, and contributions of SO<sub>2</sub>, NO<sub>x</sub> and primary PM<sub>2.5</sub> emissions to ambient PM<sub>2.5</sub> and NO<sub>2</sub> levels were isolated for each station and each pollutant. The resulting avoided health impacts were projected following the Global Burden of Disease methodology for PM<sub>2.5</sub> health impacts and a risk function for acute NO<sub>2</sub> exposure selected to avoid double-counting with PM<sub>2.5</sub> health impacts. Once Medupi and Kusile are in full operation, it is estimated that air pollutant emissions from Eskom's coal-fired power plants will be responsible **total of 2,400 premature deaths per year (95% confidence interval: 1,500 to 3,000 deaths):**

- 63.1 170 premature deaths due to increased risk of lower respiratory infections in children;
- 63.2 900 premature deaths due to increased risk of stroke;
- 63.3 140 premature deaths due to increased risk of lung cancer;
- 63.4 610 premature deaths due to increased risk of ischaemic heart disease;
- 63.5 220 premature deaths due to increased risk of chronic obstructive pulmonary disease associated with chronic PM<sub>2.5</sub> exposure; and
- 63.6 390 premature deaths due to increased risk of death associated with acute NO<sub>2</sub> exposure.

64. Furthermore, the detailed modelling for individual coal-fired power plants allowed the Greenpeace Global Air Pollution Unit to project the reductions in ambient air pollution levels at each location of the modelling domain over time, as emission reductions from meeting the MES or implementing Eskom's emission reduction plan are realised. The projections take into account expected population growth and epidemiological transition associated with improved health care and aging population.

65. It is projected that, over time, the excess emissions allowed if Eskom's various applications are fully granted will result a total estimation of **23,000 premature deaths (95% confidence interval: 14,000 to 28,000 deaths):**

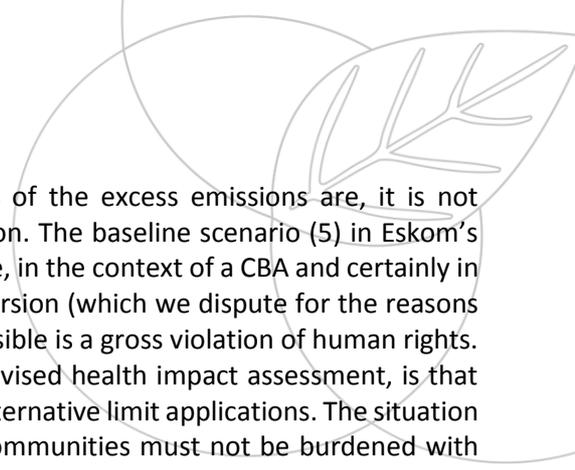
- 65.1 1,100 premature deaths due to increased risk of lower respiratory infections in children;
- 65.2 9,700 premature deaths due to increased risk of stroke;
- 65.3 2,200 premature deaths due to increased risk of lung cancer;
- 65.4 7,100 premature deaths due to increased risk of ischaemic heart disease;
- 65.5 2,500 premature deaths due to increased risk of chronic obstructive pulmonary disease associated with chronic PM<sub>2.5</sub> exposure; and
- 65.6 500 premature deaths due to increased risk of death associated with acute NO<sub>2</sub> exposure.

66. These premature deaths could be avoided by requiring full compliance with the MES, which would represent a 40% reduction in the cumulative health impact of air pollution from Eskom's power stations.

67. Similarly, an updated health impact assessment report detailing these findings will be available during the course of February 2018 and we reserve our right to supplement these submissions with this report, once available.

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overall pollution levels. For this update of the results, the recommendations of the authors for exposure-response relationships better suited to these conditions were adopted.

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68. We emphasise that, notwithstanding how alarming the health impacts of the excess emissions are, it is not necessarily the *number* of deaths that is the most important consideration. The baseline scenario (5) in Eskom's CBA of an "*additional 320 premature mortalities in 2018*" is not acceptable, in the context of a CBA and certainly in the context of the Constitution. In other words, even on Eskom's own version (which we dispute for the reasons set out in these submissions), the number of deaths for which it is responsible is a gross violation of human rights. The only reasonable conclusion, we submit, especially considering the revised health impact assessment, is that there is no justification to permit Eskom's postponement, suspension or alternative limit applications. The situation in which Eskom finds itself is completely self-inflicted, and vulnerable communities must not be burdened with these fatal costs through to 2030 and beyond.
69. The CBA aside, Eskom has failed to demonstrate that its emissions are not causing direct adverse impacts on the surrounding environment. To the contrary. It has failed to meet the conditions prescribed in the Listed Activities and the 2017 Framework. The CBA demonstrates that the cost of any further delays in compliance with the MES cannot be authorised, and to do so, would be a gross dereliction of constitutional duty.

#### **D. Eskom's inadequate emission reduction plan and decommissioning schedule**

70. We re-emphasise that it is our primary objection that Eskom's current applications – and any forthcoming applications for Grootvlei, Medupi, and Matimba stations – should be rejected on the basis that they do not satisfy the pre-requisites as contemplated in the 2017 Framework and List of Activities. The consequential premature fatalities attributed to Eskom's coal-fired power stations cannot be justified in terms of the Constitution, NEMA, and the AQA.
71. The Summary Motivation Report states the following:

*"Eskom has an emission reduction plan (described further in this report), and in addition to the contribution that Eskom's current Emission reduction plan will have on future air quality improvement, six power stations will be decommissioned by 2030, as per the Integrated Resource Plan (IRP). Two more power stations will be decommissioned by 2035, and a further three will be decommissioned by 2043. The progressive decommissioning along with the planned retrofits/upgrades significantly reduces Eskom's environmental footprint and the impact on air quality. As such, the ambient air quality going forward will be better than what it has historically been. In addition, in 2017/18 eleven (11) units at Eskom's most costly and oldest plants have been shut down and placed on extended cold reserve, which has already yielded some benefit.*

*While Eskom is committed to implementing the technology elements of its emission reduction plan it has identified this need to submit suspensions, postponements and alternate limit requests to ensure the continued legal operation of its plant where the MES compliance time frames cannot be met or the decommissioning of the plant will occur before 2030.*

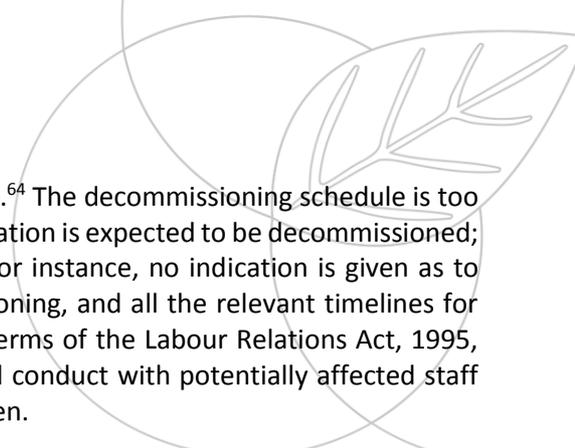
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*The updated planned retrofit schedule is depicted in Figure 1. The decommissioning dates for a 50-year power station life are shaded grey. Currently the Integrated Resource Plan is based on a 50-year life for all power stations however the actual shut down and decommissioning dates of power stations are determined based on economic, supply and demand side criteria."<sup>63</sup>*

72. Further to our main objections substantiated above, we submit that Eskom's emissions reduction plan, its proposed decommissioning schedule, and its current shut-down strategy is neither a justifiable 'compromise' to compliance with the MES, nor is the decommissioning schedule "detailed" or "clear", as required by the List of Activities and 2017 Framework. We place on record that the actual shut-down and decommissioning dates of the power stations

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<sup>63</sup> See page 5.



are also, and we argue more importantly, determined by legal compliance.<sup>64</sup> The decommissioning schedule is too broad – setting out a wide range of several years over which each power station is expected to be decommissioned; with no particularity regarding the specific process, per unit and date. For instance, no indication is given as to when the relevant EIA processes would commence for such decommissioning, and all the relevant timelines for each phase in the EIA process; which procedures would be followed in terms of the Labour Relations Act, 1995, and when, for each station; which other internal processes Eskom would conduct with potentially affected staff members and when; and the associated expenditure, per station, and when.

73. Eskom portrays its plan as beneficial because, it says, it would reduce its total emissions of SO<sub>2</sub>, NO<sub>x</sub>, and PM in comparison to a 2020 baseline in which the company does nothing to reduce emissions from their current levels.<sup>65</sup> But that do-nothing baseline ignores the fact that, in the absence of Eskom's requested postponement, suspension, or alternative limits, the company would have to reduce its emissions in order to comply with the 2020 MES. This, we submit, is misleading and inappropriate.

73.1. The proper frame of reference for evaluating Eskom's postponement, suspension, and alternative limits plan is by comparing it to the full compliance with the 2020 MES that would otherwise be required. Such a comparison would properly show that what Eskom is actually proposing here is not an "emissions reduction plan" but, instead, substantially higher emissions than the law would otherwise allow.

73.2. By way of an example, for SO<sub>2</sub>, the 2020 MES requires each coal plant to reduce its emissions from 3,500 mg/Nm<sup>3</sup> to 1,000 mg/Nm<sup>3</sup> starting in 2020. Eskom seeks suspension of such reductions until 2030 at five of its coal plants, and postponement of any SO<sub>2</sub> reductions until 2025 at seven of its coal plants.<sup>66</sup> And for after 2025, Eskom seeks emission limits that are 2.5 to 3.5 times higher than the new plant MES that it is otherwise supposed to comply with by 2020 (and 5 to 7 times higher than the 500 mg/Nm<sup>3</sup> new plant MES that should apply). In short, what Eskom is proposing here has nothing to do with emission reductions but, instead, is a "continued excessive emissions plan."

#### Delays with the emission reduction plan and non-compliance with atmospheric emission licences

74. In relation to Eskom's "*updated planned retrofit schedule*", we take issue with the statement that Eskom is "*committed to implementing the technology elements of its emission reduction plan*" and "*to ensure the continued legal operation of its plant[s]*". A condition of the first set of multiple postponements granted to Eskom, which, we submit, still did not justify the decision to approve the majority of the applications, was to comply with the emission reduction plan submitted to DEA. It is clear from Figure 1 in the Summary Motivation Report that it has been unable to do so.

75. Eskom concedes that "*some of Eskom's previously committed timelines for technology installation have moved back by 1-3 years. Delays in planning, approval and commercial processes have caused delays in the dates originally outlined for abatement retrofits at Medupi, Majuba, Tutuka and Matla*", and "*the retrofit schedule and projected emission reduction above clearly illustrates Eskom has been and remains committed to implementing emission reduction technologies to improve air quality in South Africa. Though there are delays in the implementation of the retrofit plan Eskom remains committed to ensuring these planned technology installations are completed.*" This point was reiterated during the public meeting in Midrand, and that Eskom will "*manage any foreseen delays but the current ERP is the aim for implementation. Yet there is always a risk.*"<sup>67</sup>

76. Eskom has failed to install adequate abatement retrofits to meet the required timeframes and limits under the first round of multiple postponement applications, yet it now applies for further postponements and suspension of compliance on the basis that it will implement its updated emission reduction plan. We submit that Eskom's

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<sup>64</sup> See paragraphs 138 - 140 of CER's comments on the Integrated Resource Plan, 2018, submitted to Parliament available at <https://cer.org.za/wp-content/uploads/2018/11/CER-IRP-Comments-PCE-5-10-18.pdf>

<sup>65</sup> Summary Motivation Report at 18, Table 1.

<sup>66</sup> Summary Motivation Report at 14-15, Table 5.

<sup>67</sup> See discussion item 2.6.5.1 on page 8.

reasons for delay: planning, approval and commercial processes, is unacceptable – as a state-owned entity requiring government approval and compliance with the Public Finance Management Act, 1999, Eskom is experienced in the lead-time and process and expenditure required in order to install operating equipment at its power stations. If Eskom does implement a “*rigorous planning and approval process*” to ensure compliance, this process should anticipate possible delays and put contingencies in place. This is Eskom’s responsibility and its continued deflection is unreasonable. We also note Eskom’s apparently largely-unperturbed attitude in relation to such non-compliance. It is clear that it does not take compliance with the emission reduction plants seriously; and sees no threat of action against it for non-compliance. This conduct is, we submit, unacceptable, and does not inspire any confidence of Eskom’s future commitment to legal compliance. This history of non-compliance is evidenced by constant compliance action described in DEA’s annual National Environmental Compliance and Enforcement Reports,<sup>68</sup> and the ongoing exceedances of its AELs, set out below.

77. Save for the recent unlawful amendment in November 2018, we reiterate that the MES in respect of coal-fired power stations have not changed since 2010. As indicated above, the process of putting together the List of Activities commenced in about 2004 and over an approximate 5 year period, a multi-stakeholder process was convened to determine appropriate MES for the List of Activities. Eskom was integral to this process. It should, therefore be made clear in the Summary Motivation Report, as well as in the public participation process, that Eskom knew of the compliance limits and timeframes as far back as 2004 – or at least by 2010, giving it many years’ advance warning that it would need to make the necessary plans and investments to come into compliance with MES.
78. Aside from the impending obligations of the MES (at the time), Eskom had knowledge of the direct health impacts of its coal-fired power stations, based on the 2006 studies referred to above; these provided sufficient reason for Eskom to ensure that it was implementing the necessary abatement measures to effectively mitigate the impacts of its coal-fired power stations. Indeed, as an organ of state, it had and continues to have a duty to respect, protect, promote and fulfill the rights in the Constitution; in particular, but not limited to, section 24.<sup>69</sup> In other words, Eskom was legally compelled to act well before the MES were even published in 2010.
79. In the circumstances, Eskom provides no reasonable explanation as to why it has waited more than 8 years since the List of Activities came into force, or more than 3 years from when the 2015 postponement application was granted, to begin – and/or adequately progress and plan for - the abatement equipment installations. This issue was raised during the public meeting in Midrand and Eskom responded with the following:
- “Eskom was involved in setting the MES. But originally it was not planned for the MES to have existing plants / power stations to comply with the new plant standards. This was only included very late in the setting of the MES. Existing plants should have met existing plant standards.”<sup>70</sup>*
80. We dispute that the 2020 new plant MES requirement for existing plants arbitrarily arose only at the latter stage of setting the MES or came as a surprise to Eskom. We also dispute that for the MES to be legitimate and enforced was, or is, dependent on some form of consent from Eskom. The law applies irrespective of whether Eskom agrees with it. We reiterate the above contention that Eskom, as an organ of state, already had a constitutional duty to mitigate its severe atmospheric impact through abatement technology, yet Eskom still failed to prepare for and install retrofits to meet the 2015 standards, irrespective of the new plant MES requirement for existing plants by 2020.
81. In any event, even if Eskom did not know until the publication of the List of Activities that its existing plants would have to meet new plant MES (which is denied), Eskom had ample opportunity to take the necessary steps to ensure MES compliance. At the very latest, it became aware of this on 31 March 2010 – almost 9 years ago. We reiterate that it is not for Eskom to dictate whether; and if so, when and how they wish to comply with the law, and when

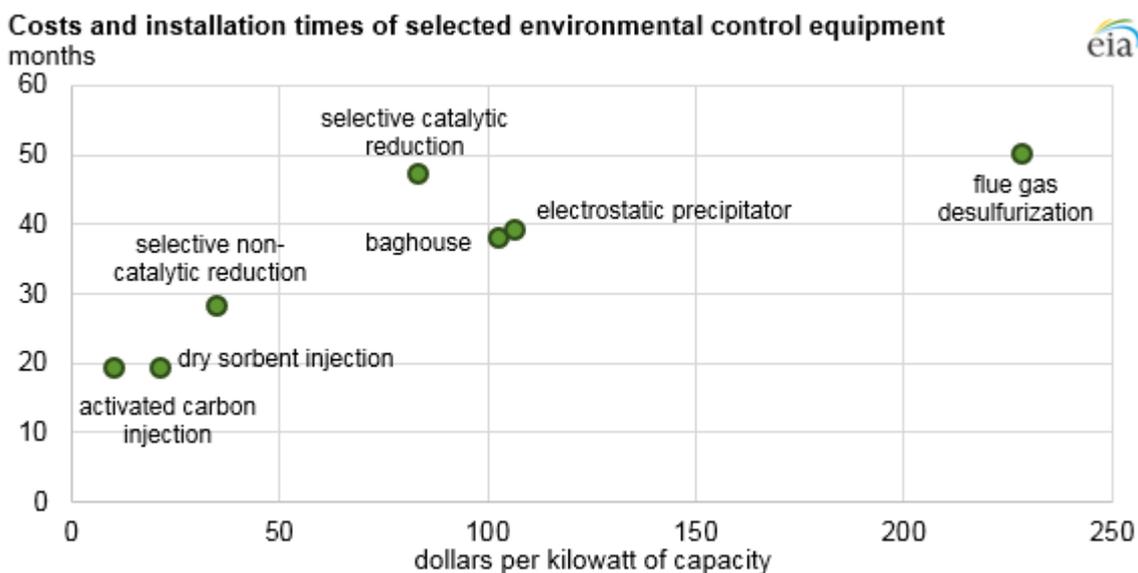
<sup>68</sup> <https://www.environment.gov.za/mediarelease/deareleases2017-18necereport>

<sup>69</sup> Section 7 of the Constitution.

<sup>70</sup> See discussion item 2.6.15.1.

to begin retrofitting. In 2015, Eskom obtained numerous postponements of compliance with the MES, to allow it more time to come into compliance. Since it has failed to do so, it must give a detailed explanation as to why it has delayed in commencing the necessary retrofitting process, what issues or challenges were experienced during the retrofit programme, and what actions were taken – and when - to remedy the delay. We submit that the vague explanation in this regard during the public meeting in Midrand, that “*Eskom has implemented remedial action in instances where it has had delays in the past, thus the aim is to avoid delays. Eskom has stated that delays have been owned to approval and commercial challenges and these have been addressed in more detail in the individual AIRs*”,<sup>71</sup> is completely inadequate. The explanation is substantially the same in the individual atmospheric impacts reports, and again, as a state-owned entity and South Africa’s long-standing power utility, Eskom management is very familiar with the time associated with these standard regulatory processes.

82. On this note, we also dispute Eskom’s process outline that requires “12 or more years”, from start to finish, for abatement technology to be installed at a power station.<sup>72</sup> This claim is contrary to the fact that coal-fired plants in other countries are regularly brought into compliance with industry emission standards through the installation of flue gas desulphurisation (FGD), selective catalytic reduction technology, electrostatic precipitators, and other pollution controls. For example, as shown in the following chart from the United States (US) Energy Information Administration, the lead time for pollution controls in the US has been **around 1-5 years**. The emission control technology with the longest lead time - FGD – is typically installed within 50 months.



83. These prescribed lead times are reflected in compliance deadlines set in emission standards in the US and with which there is regular and consistent compliance. These include:

83.1. The Mercury and Air Toxics Standard (2012), gave existing plants 4 years from the date of the standard to comply. Environmental Protection Agency (EPA) studies showed that **3 years** would be sufficient to comply, but the EPA gave States the power to grant an extra **1 year** for installing pollution controls. Between January 2015 and the April 2016 compliance deadline, 87 gigawatts (GWs) of coal-fired plants installed pollution control equipment.<sup>73</sup>

<sup>71</sup> See discussion item 2.6.5.1.

<sup>72</sup> Summary Motivation Report at 16-7.

<sup>73</sup> <https://www.eia.gov/todayinenergy/detail.php?id=32952>.

- 83.2. In the US, between 2001 and 2005, the power generation industry successfully installed more than 96 GWs of Selective Catalytic Reduction (SCR) systems in response to NOx requirements.<sup>74</sup> In response to the Clean Air Interstate Rule (CAIR), issued in 2005, about 60 GW of scrubbers and an additional 20 GW of SCR were brought on line from 2008 to 2010, during the course of **3-5 years**.
- 83.3. The Cross State Air Pollution Rule came into effect in the US in 2011. The Homer City Generating Station east of Pittsburgh, Pennsylvania is a 2 GW coal-fired power plant.<sup>75</sup> It had to either shut down or install \$US 750 million in pollution controls to remove 100 000 tons of SO<sub>2</sub>.<sup>76</sup> Within **5 years**, this power station was able to go through the process of responding to the new legislation, planning, and building pollution controls.<sup>77</sup>
84. In the memo attached as Annexure “1”, Dr Sahu benchmarks the timeframes associated with the installation of the relevant emission control technologies, based on his 30 years of energy and air quality consulting experience.
85. Eskom states that the “*reason for these applications in most cases is due to design-related limitations*” and that “*existing power stations will not be able to comply with the MES*” due to the “*original design of the plant, [and] age of the power station,*” among other reasons.<sup>78</sup> These claimed justifications for non-compliance are undermined by the fact that coal-fired power plants of similar ages and design in other countries have readily achieved compliance with far more stringent emission limits.
86. Eskom has failed to articulate any specific design-related limitation or age-concern that would make it infeasible to comply when other countries have overcome similar hurdles. Experience elsewhere shows that the overwhelming majority of older plants can be retrofitted. If this is not possible for some of the oldest plants, they must then be decommissioned. Eskom has on several occasions produced capital cost estimates for retrofitting its fleet of coal-fired power stations, implying that retrofitting is in fact possible.
87. The examples below demonstrate that many operators in other countries have installed emissions controls to achieve emissions limits, and Eskom should be no exception:

#### 87.1. Europe

- a. A high percentage of European coal plants use emissions control technology. Regarding PM controls, around 91% of coal plants in Europe have electrostatic precipitator systems (EPS), and just under 5% have either baghouses or baghouses in conjunction with cold-side EPSs.<sup>79</sup> For SO<sub>2</sub> controls, around 88% of plants have FGD in place and 86% of these plants use limestone-based FGD.<sup>80</sup> Data on NOx controls are more limited, but the majority of EU plants have low NOx burners and/or “over-fire air systems”,<sup>81</sup> which cause coal to burn at a lower temperature that, in turn, reduces the amount of NOx produced.<sup>82</sup> SCR technology is used in about 31% of

<sup>74</sup> Northeast States for Coordinated Air Use Management, Control Technologies to Reduce Conventional and Hazardous Air Pollutants from Coal-Fired Power Plants (March 31, 2011) <https://www.nescaum.org/documents/coal-control-technology-nescaum-report-20110330.pdf>.

<sup>75</sup> [https://web.archive.org/web/20060507084758/http://www.edison.com/files/2005\\_factsheet\\_homercity.pdf](https://web.archive.org/web/20060507084758/http://www.edison.com/files/2005_factsheet_homercity.pdf)

<sup>76</sup> <https://www.pri.org/stories/2016-01-30/us-coal-plants-are-preparing-comply-new-epa-rules>.

<sup>77</sup> Ibid.

<sup>78</sup> Summary Motivation Report at page 4.

<sup>79</sup> Dr. M. Wiatros-Motyka, IEA Clean Coal Centre, *An overview of HELE technology deployment in the coal power plant fleets of China, EU, Japan and USA* (2016) at page 28. Available at

<https://www.usea.org/sites/default/files/An%20Overview%20of%20HELE%20technology%20deployment%20in%20the%20coal%20power%20plant%20fleets%20of%20China,%20EU,%20Japan%20and%20USA%20-%20ccc273.pdf>.

<sup>80</sup> Dr. L. L. Sloss, IEA Clean Coal Centre, *Emerging markets for pollution control retrofits* (2017) at page 56. Available at <https://www.usea.org/sites/default/files/Emerging%20markets%20for%20pollution%20control%20retrofits%20ccc274.pdf>.

<sup>81</sup> Ibid.

<sup>82</sup> E-on energy, *Boosted Over Fire Air*, [https://www.eonenergy.com/~media/PDFs/Generation/Boosted\\_Over\\_Fire\\_Air.pdf](https://www.eonenergy.com/~/media/PDFs/Generation/Boosted_Over_Fire_Air.pdf).

plants and only 4% use flue gas recirculation as a method for controlling NOx emissions.<sup>83</sup> Only one plant in Europe is reported to have an advanced multi-pollutant control technology in place (SNOX), although there are trials of newer systems at some plants.<sup>84</sup>

- b. The current European Union emission limits sit at between 200 and 400 mg/m<sup>3</sup> for SO<sub>2</sub>, 200 and 300 mg/m<sup>3</sup> for NOx, and 20–30 mg/m<sup>3</sup> for PM, depending on plant size (and some derogations remain for older plants running for a limited number of hours before closure). Proposed changes could bring these limits down even further, to as low as 80 mg/m<sup>3</sup> for SO<sub>2</sub> and 50 mg/m<sup>3</sup> for NOx at newer, larger plants.<sup>85</sup>

## 87.2. China

- a. China now has among the strictest emissions limits in the world.<sup>86</sup> China's coal plants are retrofitted with PM and SO<sub>2</sub> controls and 95% have NOx controls.<sup>87</sup> In recent years, China has replaced its EPSs (dropping from 95% use in the fleet in 2010 to 69% in 2015) with fabric filters or pulse-jet bag filters, which have increased from 5% to 31% across the fleet.<sup>88</sup> Desulphurisation systems are installed on 92.8% of the existing fleet and the remaining plants are Circulating Fluidised Bed Combustion (CFBC) systems with in-built sulphur reduction.<sup>89</sup> At least 65% of the desulphurisation systems are FGD technologies.<sup>90</sup>

## 87.3. Japan

- a. Japan's coal fleet is just under 35 GW.<sup>91</sup> 90% of this fleet uses wet FGD.<sup>92</sup> 75% of the fleet uses both low NOx burners and SCR systems, with the remaining 25% using either one or the other.<sup>93</sup> Only 3% of Japan's coal plants use *no* flue gas treatment technology for sulphur control.<sup>94</sup> 92% of Japan's coal-fired power plants have PM controls in place, and of these plants 23% have the most advanced control technologies such as low temperature electrostatic precipitators and wet electrostatic precipitators.<sup>95</sup> All of Japan's power plants have some form of SO<sub>2</sub> control, including an advanced multipollutant control system called ReACT™ (described below).<sup>96</sup> Over 81% of Japan's plants have wet limestone scrubber FGD.<sup>97</sup> Japan's dominant NOx control technology is SCR, which 71% of Japan's plants use either alone or in combination with a low-NOx burner.
- b. Japan's coal plants have reached very low emission rates - the average emissions for the Isogo coal-fired power plant are 16.5 mg/m<sup>3</sup> for NOx, 15 mg/m<sup>3</sup> for SO<sub>2</sub>, and 7.5 mg/m<sup>3</sup> for PM, with

<sup>83</sup> Dr. L. L. Sloss, at page 56. See footnote 80.

<sup>84</sup> Ibid.

<sup>85</sup> X. Zhang X IEA Clean Coal Centre, *Emission standards and control of PM2.5 from coal-fired power plants* (2016) at page 20-21. Available at

<https://www.usea.org/sites/default/files/Emission%20standards%20and%20control%20of%20PM%202.5%20from%20coal%20fi%20red%20power%20plant%20-ccc267.pdf>.

<sup>86</sup> Q. Zhu, IEA Clean Coal Centre, *China – policies, HELE technologies and CO2 reductions* (2016). Available at <https://www.iea-coal.org/china-policies-hele-technologies-and-co2-reductions-ccc-269/>.

<sup>87</sup> Dr. L. L. Sloss at page 60, see footnote 80.

<sup>88</sup> Ibid.

<sup>89</sup> Ibid.

<sup>90</sup> Dr. M. Wiatros-Motyka, at page 16, see footnote 79.

<sup>91</sup> Ibid at page 64.

<sup>92</sup> Dr. M. Wiatros-Motyka, at page 42, see footnote 79.

<sup>93</sup> Ibid.

<sup>94</sup> Ibid.

<sup>95</sup> Ibid.

<sup>96</sup> Ibid.

<sup>97</sup> Ibid.

one of its units emitting single-digit levels of pollutants.<sup>98</sup> This plant achieves these low emissions through emission controls that use a combination of SCR and ESP with ReACT™.<sup>99</sup> ReACT is a regenerative activated coke dry-type capture technology that captures SO<sub>2</sub>, NO<sub>x</sub> and mercury while only using 1% of the water required by conventional wet FGD.<sup>100</sup>

#### 87.4. United States

- a. The U.S. has over 400 coal-fired power plants that are 300 MW or larger.<sup>101</sup> 63% of these are subcritical plants and 50% are over 40 years old.<sup>102</sup> Of the 279 GW's of installed coal-fired capacity in the US, 81% has some form of FGD technology installed (169 GW's-wet FGD; 42 GW's - dry FGD scrubber; 11 GW's - dry sorbent injection).<sup>103</sup> Between 2001 and 2005, the power generation industry successfully installed SCR systems covering more than 96 GW's of capacity in response to NO<sub>x</sub> requirements.<sup>104</sup>
88. Such real-world experience with the installation of pollution controls further demonstrates the unreasonableness of Eskom's failure to meet the timeframes for MES compliance and its attempt to even further delay any such compliance.
89. In light of the above, it is reasonable to conclude that Eskom has been anything but "committed" to reducing its cumulative emissions, but rather continually attempted to delay, postpone, suspend, or undermine the purpose and object of the Listed Activities and AQA. We therefore submit that these applications should not be considered, not only because it is legally impermissible as explained above, but also because Eskom has failed to provide justifiable reasons for not meeting the timeframes granted in the previous 2014 postponement application. We have no reason to believe that it will comply with additional conditions granted should any of its applications succeed.
90. Eskom's claims that the emission reduction plan, in addition to this application for MES compliance postponement, suspension and/or alternative limits, is to ensure the "continued" legal operation of its stations. We continue to vigorously dispute that Eskom is in compliance with various emission limits contained in their relaxed AELs, at a number of the coal-fired power stations included in this application.
91. In order to verify the reasonable suspicion of Eskom's consistent non-compliance with its AEL conditions, following a similar assessment conducted by Professor Cairncross assessing Eskom's compliance with its AELs over the period 1 April 2015 to 31 March 2016,<sup>105</sup> the CER commissioned energy and air quality specialist, Dr Ranajit Sahu,<sup>106</sup> to assess Eskom's monthly emissions reports for the period April 2016 – December 2017 ("The Exceedance Report"). The Exceedance Report is attached as Annexure "2". Dr Sahu reviewed Eskom's own hardcopy monthly monitoring reports from 14 Eskom coal-fired power stations over this 21 month study period (April 2016 through December 2017), counting the number of days where reported emissions exceeded the corresponding AEL limit value. Conclusions in the report are conservative and under-estimate the true scope of the problem due to a lack of availability of clear and comprehensive data. In summary, the Exceedance Report reveals the following, based on Eskom's own data:

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<sup>98</sup> Ibid at page 43.

<sup>99</sup> Ibid.

<sup>100</sup> Ibid.

<sup>101</sup> Dr. L. L. Sloss, at page 54, see footnote 80.

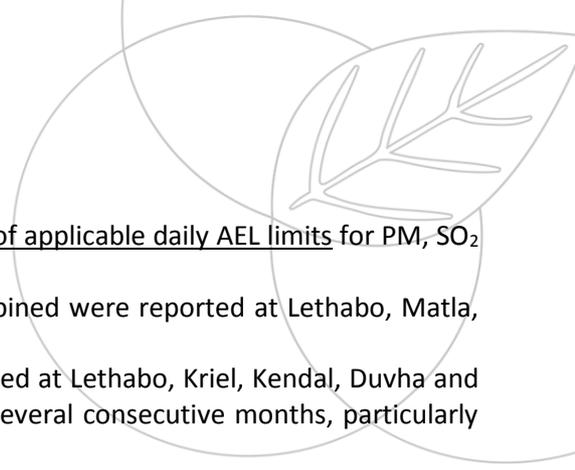
<sup>102</sup> Ibid.

<sup>103</sup> Ibid at page 54.

<sup>104</sup> Northeast States for Coordinated Air Use Management, Control Technologies to Reduce Conventional and Hazardous Air Pollutants from Coal-Fired Power Plants (2011), available at <https://www.nescaum.org/documents/coal-control-technology-nescaum-report-20110330.pdf>.

<sup>105</sup> [https://cer.org.za/wp-content/uploads/2016/07/AEL-Compliance-Assessment-of-Eskom-CFPPs-final-19-May-2017\\_final.pdf](https://cer.org.za/wp-content/uploads/2016/07/AEL-Compliance-Assessment-of-Eskom-CFPPs-final-19-May-2017_final.pdf)

<sup>106</sup> Dr Sahu's review and opinions are based on his education, professional training, and twenty-eight years of experience in air pollution consulting and engineering.

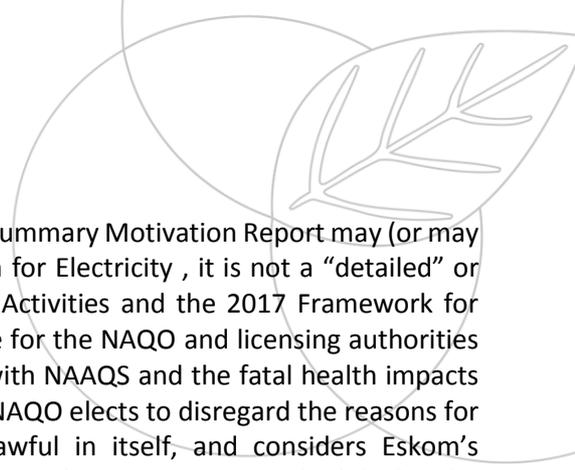
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- 91.1. the coal-fired power stations reported nearly 3,181 exceedances of applicable daily AEL limits for PM, SO<sub>2</sub> and NO<sub>x</sub>;
- 91.2. the highest number of exceedances for all three pollutants combined were reported at Lethabo, Matla, Matimba, Kriel and Duvha;
- 91.3. the highest number of exceedances of PM AEL limits were reported at Lethabo, Kriel, Kendal, Duvha and Matla. Many plants reported chronic PM limit exceedances for several consecutive months, particularly Kendal, Lethabo, Kriel, and Duvha;
- 91.4. the highest number of SO<sub>2</sub> exceedances were reported at Matimba, Tutuka, Medupi, Camden and Grootvlei. Many plants have chronic SO<sub>2</sub> limit exceedances many months in a row, particularly Matimba, Matla and Camden;
- 91.5. the highest number of exceedances of NO<sub>x</sub> were reported at Matla, Lethabo, Duvha, Camden and Komati. Many plants have chronic NO<sub>x</sub> limit exceedances, particularly Matla, Lethabo, and Duvha; and
- 91.6. in addition to the number of exceedances reported, it is stated qualitatively that many of these exceedances were significantly greater than the applicable AELs. For example, PM exceedances reached at least 500 mg/Nm<sup>3</sup> at Duvha and Lethabo, and 600 mg/Nm<sup>3</sup> at Kriel (the PM MES is 100mg/Nm<sup>3</sup>)
92. This report was submitted to both DEA and Eskom on 31 October 2018, for consideration. Although the DEA initially responded and we are in the process of trying to arrange a meeting between DEA officials and Dr Sahu, Eskom is yet to formally respond at the date of these submissions. During the public meeting in Midrand, Mr Brian McCourt, on behalf of Eskom, did state that *“In terms of Section 30 of the NEMA and Eskom’s power station licenses (sic), the start-up and shutdown period of power stations are excluded from general compliance periods.”* We acknowledge this clause in Eskom’s various AELs; however we dispute that all 3,181 exceedances could have resulted from start-up or shutdown periods. This is especially considering that many of the exceedances were significantly greater than the AEL limits.
93. Considering these alarming findings, we submit that it is misleading for Eskom to refer to the “continued” legal operation of its power plants. Urgent enforcement action should be initiated against Eskom in terms of its compliance with its relaxed AEL limits at a number of power stations, as opposed to considering this impermissible application to further delay and suspend compliance with the MES. Based on the National Enforcement and Compliance Report for 2017/8, we are aware that DEA has issued either enforcement notices or pre-compliance notices to Kendal, Lethabo and Camden, related to AEL non-compliance. Compliance action against Majuba appears to address waste issues only. We are concerned, however, that these enforcement activities do not seem to correlate to the extent and magnitude of the regular exceedances across 13 power stations scrutinised in the Exceedance Report.
94. We remain eager to meet with both DEA and Eskom to understand its plan of action in relation to Eskom’s apparent rampant state of non-compliance with the majority of its AEL limits.

#### Eskom’s vague decommissioning schedule and irrational ‘shut-down’ strategy

95. As set out above, existing facilities applying for a once-off suspension of compliance timeframes with new plant MES for a period not beyond 31 March 2030, must provide a *detailed* decommissioning schedule.<sup>107</sup> If an existing facility is granted a suspension of the compliance timeframes, which we reiterate Eskom should not be, it is required by the List of Activities to comply with existing plant MES during the suspension period until decommissioning at latest by 31 March 2030.
96. As part of this current application, Eskom seeks to apply for suspension of compliance until decommissioning by 2030 for 5 coal-fired power stations (Kriel; Arnot; Hendrina; Camden; and Komati). Eskom notes that in 2017/18 11 units at Eskom’s *“most costly and oldest plants”* have been shut down and placed on extended cold reserve.

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<sup>107</sup> The 2017 Framework stipulates a “clear decommissioning schedule”.



97. We submit that although the “decommissioning dates” in Figure 1 in the Summary Motivation Report may (or may not) suffice for the purposes of the draft 2018 Integrated Resource Plan for Electricity, it is not a “detailed” or “clear” decommissioning schedule, as is legally required by the List of Activities and the 2017 Framework for applications for suspension. It is our firm stance that it is not permissible for the NAQO and licensing authorities to consider the suspension applications, based on the non-compliance with NAAQS and the fatal health impacts associated with Eskom’s coal-fired power stations. In the event that the NAQO elects to disregard the reasons for our objections, which we would argue would be irrational and unlawful in itself, and considers Eskom’s decommissioning dates, we submit that it is not a “detailed” or a “clear” decommissioning schedule for the following reasons:

97.1 The decommissioning information in Figure 1 is limited to approximate decommissioning dates, as opposed to a precise schedule presenting the key actions and timelines to enable the decommissioning of at least the 5 stations included in the suspension application.

97.2 As a minimum, Figure 1 and/or the explanatory text around it should specify the commencement date/planned commencement date of the necessary regulatory requirements to authorise the decommissioning process, including, *inter alia*:

97.2.1 As a Listed Activity,<sup>108</sup> the decommissioning of an Eskom coal-fired power station must conduct a basic impact assessment in accordance with the Environmental Impact Assessment Regulations, 2014 (the “EIA Regulations”).<sup>109</sup> This should include details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts, particularly the coal ash dumps.

97.2.2 Considering the social impact of decommissioning an Eskom power station, and Eskom’s duties as an organ of state, we submit that it is both necessary and appropriate that an inclusive and transparent social and labour closure plan is developed for the decommissioning process. This should account for, among other critical issues, the redeployment of staff employed at the station.

97.3 The processes identified above require both lead-time and budget – Eskom’s decommissioning table addresses neither. In fact, in its 2017/8 Integrated Report, Eskom’s Corporate Plan “*does not include any specific costs or impacts of the decommissioning of power stations, although it does include cost reductions associated with the extended cold reserve strategy*”.<sup>110</sup> Hendrina power station was supposed to commence with decommissioning from 2018 and Camden power station from the beginning of 2020, yet there appears to be no decommissioning schedule, plan, or financial resources allocated to these processes.

97.4 In relation to Camden power station, we further note that “\*Possible delay of decommissioning” – there is no explanation, reasonable or otherwise, for the cause of this possible delay or a revised decommissioning period.

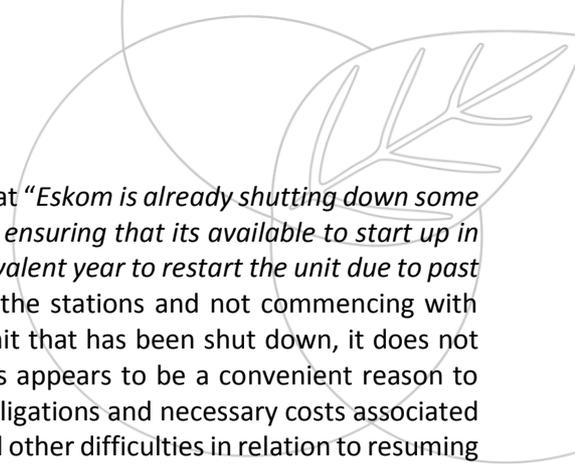
98. In the Summary Motivation Report, it is confirmed that Grootvlei (excluded from this application), Hendrina and Komati power stations will be shut down by 2022. We, and our clients, oppose Eskom’s approach of shutting down stations instead of initiating the decommissioning process – especially for Hendrina power station, which has

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<sup>108</sup> See Listed Activity 30, Environmental Impact Assessment Regulations: Listing Notice 1 of 2014. GN R983 in GG 38282, 4 December 2014.

<sup>109</sup> Regulations 19-20 read with Appendix 1 in the Environmental Impact Assessment Regulations. GN R982 in GG 38282, 4 December 2014.

<sup>110</sup> Page 62 of the Eskom Integrated Report, dated 19 July 2018 available at <http://www.eskom.co.za/IR2018/Documents/Eskom2018IntegratedReport.pdf>. There does appear to be provisioning for ‘power station-related environmental restoration – other power plant’ of 13 375 million on P105 of the Report, but it is not clear which closure/rehabilitation activities this would cover per station.



reached its end-of-life. At the public meeting in Midrand, Eskom stated that “Eskom is already shutting down some power station units early and taking them out of the daily operations yet ensuring that its available to start up in emergencies” . . . “For every year a station is shut down it will take an equivalent year to restart the unit due to past electricity constraints.”<sup>111</sup> We submit that the motive for shutting down the stations and not commencing with decommissioning is irrational – given the start-up time required for a unit that has been shut down, it does not provide a realistic contingency plan for supply emergencies. Rather, this appears to be a convenient reason to avoid both the installation of emission abatement technology and the obligations and necessary costs associated with the decommissioning process. Eskom should explain the time lag and other difficulties in relation to resuming operations at stations that have been shut down.

99. We therefore submit that the decommissioning table in Figure 1 does not satisfy the List of Activities and 2017 Framework requirements for a detailed and clear decommissioning schedule. Notwithstanding the NAAQS non-compliance requirement and the health impacts attributed to Eskom’s power stations, the suspension applications should be dismissed on this basis. Alternatively, we submit that Eskom should provide a detailed and clear decommissioning schedule that at least reflects the plans and process referred to above, on the following conditions:

- 99.1 the detailed decommissioning schedule, as updated, is available for public comment as part of this application process and every 6 months through to 2030 for the purposes of progress monitoring;
- 99.2 the 5 “most costly and oldest plants” – Kriel, Arnot, Hendrina, Camden and Komati (and Grootvlei which is excluded from this application) – should immediately commence with decommissioning arrangements, required by law or otherwise, and provide evidence of these initiatives to the NAQO, competent licensing authorities and all I&APs; and
- 99.3 The social impact of decommissioning is clearly outlined in an inclusive and transparent social and labour closure plan developed for the decommissioning process.

#### **E. Eskom’s unlawful applications for alternative limits until decommissioning**

100. The List of Activities and the 2017 Framework requires that the NAQO, after consultation with the licensing authority, may grant an alternative emission limit or emission load, provided there is compliance with NAAQS in the area for pollutant or pollutants applied for; or the AIR does not show increased health risk where there is no ambient air quality standard. We submit that, like the provisions that apply to postponement and suspension applications, the overriding condition is compliance with NAAQS in the area, despite the demonstration of previous emission reductions and compliance with other emission standards. We also dispute that there is “material” NAAQS compliance, as required by the List of Activities, considering the non-compliance figures for PM, PM<sub>2.5</sub> and SO<sub>2</sub> in the cumulative AIR referred to from paragraph 41 above. In any event, granting the multiple applications for alternative limits would, we submit, be inconsistent with the Constitution.

101. Alternative limits (‘option 3’), in the alternative to postponement applications (‘option 1’), are applied for in relation to Majuba, Kendal, Lethabo, Duvha and Matla stations. We note, with concern, that the majority of these applications request an alternative limit post-2025 “until decommissioning” that is weaker than the new plant MES. We refer, for example, to the alternative limit for SO<sub>2</sub> at Majuba, for PM and SO<sub>2</sub> at Kendal, and for all three pollutants at Lethabo and Duvha. We submit that these applications for limits through to decommissioning that are weaker than the new plant MES are tantamount to an exemption from the MES and are unlawful. That much is clear from the List of Activities and the Framework. 1 April 2025 is the latest date for compliance with new plant MES.

102. We reiterate that stations that cannot comply with the MES should not operate and/or their decommissioning should be expedited. Applying for a ‘tailored’ set of limits that are weaker than the new plant MES through to decommissioning (based on a table that is deficient in detail) in areas where there is chronic non-compliance with

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<sup>111</sup> See discussion item 2.6.3.1.

the NAAQS, cannot be permitted and undermines the Constitution, NEMA, the AQA, the List of Activities and the Framework. As foreshadowed in our email correspondence of 28 January 2019, we reserve our right to supplement these submissions to include a report from the Energy Research Centre, currently being completed. We understand that this report will, among other things, demonstrate the rationale for the early decommissioning of Duvha and Matla stations, as opposed to retrofitting for their remaining lives, respectively.

## F. Impacts of flue-gas desulphurisation technology

103. Eskom states that *“the only technology which would enable Eskom’s coal-fired power stations to achieve the new plant SO<sub>2</sub> limit is flue gas desulphurisation (FGD)”*.<sup>112</sup> The Summary Motivation Report then proceeds to describe the environmental impacts associated with the operation of FGD installations. Based on Eskom’s assessments, the methodology and calculations for which are not available to I&APs for scrutiny, these impacts include:

103.1. *The water demands of FGD are significant across the power stations and will increase Eskom’s water demand by some 59 million m<sup>3</sup>/annum – a 20% increase in the combined water consumption of Eskom’s power stations. . . The argument is also not just one of having water available in the catchment, it is also one of determining whether FGD is a judicious use of what is an extremely scarce resource in South Africa in the face of multiple competing demands for that same resource”*;

103.2. *“FGD across the generating fleet to meet full compliance of the MES would require 5.2 million tonnes of sorbent (limestone or lime) per annum, and 1.5 million tons/annum for Eskom’s emission reduction plan. . . The transport of the sorbent would result in environmental impacts, notably greenhouse gas emissions, and fugitive dust emissions. An increase in truck traffic would also result in an increase in driver mortalities, as has been observed in association with coal transport in Mpumalanga. New mines would also need to be opened to supply sorbent to all Eskom’s power stations. . .”*; and

103.3. *“If wet FGD is installed on all power stations, an additional approximate 3 million tons per annum of CO<sub>2</sub> would be produced if Eskom has full compliance to the MES. An additional 435 000 tons/annum would be produced from the implementation of Eskom’s emissions reduction plan”*.<sup>113</sup>

104. In relation to water availability and the mining and transport of limestone, Eskom’s reasons are substantially the same as the motivation for postponement in 2013.<sup>114</sup> Our overarching objections to Eskom falling back on these impacts as justifications for this application for the postponement and suspension of compliance or alternative limits in 2018/9, are three-fold:

104.1. We reiterate that while the availability of water, sorbent consumption and CO<sub>2</sub> emissions are clearly real issues, what is not at all clear is why Eskom raises these issues as barriers to its compliance with the MES when it has known about the compliance standard for many years and was part of the multi-stakeholder process of setting the MES. It is clear that any such issues do not entitle Eskom to fail to comply with its obligations in terms of the AQA. FGD is used worldwide, as illustrated in section D above, as the Best Available Technology to control SO<sub>2</sub> emissions, because of its high degree of SO<sub>2</sub> removal. Eskom’s reasoning in this case is merely self-serving.

104.2. Except for the reference to semi-dry FGD, which *“typically uses lime as a sorbent [and] does not produce CO<sub>2</sub> directly in the FGD process, but the CO<sub>2</sub> is produced instead through the manufacture of lime from limestone”*, Eskom does not discuss SO<sub>2</sub> removal technologies such as dry sorbent injection (DSI) which can

<sup>112</sup> Summary Motivation Report at page 17.

<sup>113</sup> Summary Motivation Report at pages 17-9.

<sup>114</sup> See the Background Information Document available at [https://cer.org.za/wp-content/uploads/2014/08/1\\_-Eskom-BID-11-June-2013.pdf](https://cer.org.za/wp-content/uploads/2014/08/1_-Eskom-BID-11-June-2013.pdf) and our 2013 comments at paragraphs 107-116 available [https://cer.org.za/wp-content/uploads/2014/02/CER-submissions-on-Eskoms-postponement-applications\\_12-Feb-2014\\_final1.pdf](https://cer.org.za/wp-content/uploads/2014/02/CER-submissions-on-Eskoms-postponement-applications_12-Feb-2014_final1.pdf)

remove SO<sub>2</sub> from the exhaust gas stream using no water at all. Using reagents such as trona, lime, or sodium bicarbonate, in dry powder form, DSI can remove as much as 50% of the SO<sub>2</sub>, which would go a long way towards achieving compliance with the MES. Further, the capital costs of DSI are substantially lower (less than 10%) of the capital cost of wet-FGD and DSI can be installed in less than 12 months, including design time.<sup>115</sup>

- 104.3. Eskom's discussion of wet-FGD use may mislead a reader to think that significantly more water is required to meet the MES than Eskom actually needs. Eskom states that "*Wet FGD approximately triples the water consumption of a dry-cooled power station.*" However, Eskom's calculations assumes that semi-dry FGD will be installed on most of its fleet of coal-fired power stations, and most of the fleet is wet-cooled. This is important because Eskom's actual plan to use semi-dry FGD, rather than wet-FGD, will result in less water consumption for most of its coal-fired power plants. Eskom acknowledges that although its 20% increase in water assumes that wet-FGD will be installed at 5 of its newest stations, "*it may be possible to meet the limit using semi-dry FGD at the 5 newest stations.*"
- 104.4. There are factors under Eskom's control to reduce its water demand, while meeting the MES. For example, Eskom's own 2018 Technology Selection Study Report for FGD options at the Medupi power station showed that a wet-FGD system with an inlet gas cooler would use about 30% less water compared with a system without the inlet gas cooler.<sup>116</sup> The overall life-cycle cost of such a system would also be approximately the same as that of a wet-FGD system without the cooler. However, Eskom refused to adopt this option for Medupi for reasons we still do not understand or accept. Eskom should also reduce the use of water-inefficient stations and/or expedite the decommissioning of these stations. Eskom has not stated that it would be impossible to improve the water efficiency of its stations, and it may be possible for Eskom to offset some of the water used by semi-dry FGD processes through gains in efficiency.
- 104.5. Eskom's apparent, and rather belated, concern about the environmental impacts of FGD is disingenuous, when one considers its continued reliance on coal-fired power stations and the environmental, health, land, water and climate change impacts associated with the coal cycle,<sup>117</sup> that services these stations. These include:
- 104.5.1. the significant number of coal mines, in particular in the HPA, that supply Eskom's power stations cause the loss of arable land, pollution from the spontaneous combustion of discard coal stockpiles, water pollution and dust emissions generated by coal mining operations, including transport, being the largest source of PM<sub>10</sub> emissions in the HPA;
  - 104.5.2. the production of 250 million tons of coal per year (Eskom used 114 million tons of coal in 2016/7)<sup>118</sup> requires between 42.5 million m<sup>3</sup> (*enough to fill 17 000 Olympic-sized swimming pools*) and 147 million m<sup>3</sup> (*enough to fill 58 800 Olympic-sized swimming pools*) of water. In addition, it results in the deposit of about 60 million tons of discard coal;
  - 104.5.3. the fact that Eskom landfilled 32.6 million tons of ash in 2016/7;
  - 104.5.4. that fact that, on 2017, Eskom consumed approximately 307 million m<sup>3</sup> of water (*enough to fill 122 800 Olympic-sized swimming pools*) for power generation, amounting to 10 m<sup>3</sup> of water (*125 bathtubs*) per second; and

<sup>115</sup> See Dr Sahu's memo attached as Annexure "1".

<sup>116</sup> Eskom's integrated environmental authorisation process for the Medupi Power Station Flue Gas Desulphurisation Retrofit Project.

<sup>117</sup> Coal cycle activities include mining, production, supply, and waste disposal.

<sup>118</sup> Eskom Integrated Report, 2017 available at

[http://www.eskom.co.za/IR2017/Documents/Eskom\\_integrated\\_report\\_2017.pdf](http://www.eskom.co.za/IR2017/Documents/Eskom_integrated_report_2017.pdf)

104.5.5. the fact that the annual CO<sub>2</sub>e emissions generated by Eskom's coal-fired power stations (emissions factor of 1.00kg CO<sub>2</sub>e /kWh) was 215.6 million tons of CO<sub>2</sub>e in 2015, or 40% of South Africa's total CO<sub>2</sub>e emissions (529.82 million tons of CO<sub>2</sub>e in 2015).<sup>119</sup>

105. FGD installation will certainly be a factor that contributes to Eskom's total water demand, but it should not be viewed as prohibiting Eskom's obligation to comply with the MES. While it is true that water is an extremely scarce resource, emission controls will require less water than Eskom's Summary Motivation Report implies and will yield significant benefits in terms of health impacts, in particular. The magnitude of water that semi-dry FGD controls require cannot be grounds to excuse compliance with the MES – either timeously or at all.

#### **G. Attendance at public participation meetings**

106. The Summary Motivation Report confirms that the public participation process for this application must follow the process specified in the EIA Regulations. The Summary Motivation Report states that *“Further effort to meet with stakeholders including those missed due the challenges in round 1st is being made in the round 2nd public participation process.”*

107. Paragraph 5.9.1.1 of the 2017 Framework provides that *“. . . Active participation and contributions from individual citizens and citizen groups is of utmost importance in developing, implementing and enforcing air quality management decisions within the context of the AQA. The potential benefits of public participation are numerous. If well-planned and managed, public participation can bring new and important knowledge to the table, mediate between conflicting perspectives early in the process and facilitate more efficient air quality governance. Equally important, public participation in air quality management plays a vital role in strengthening and deepening democracy in South Africa and in giving effect to the constitutional right to an environment which is conducive to health and well-being. Section 4(2) of the NEMA, which is the overarching environmental law in South Africa embodies a number of principles aimed at ensuring effective and equitable public participation.*

108. In light of the above and the environmental injustice experienced by many vulnerable and disadvantaged communities, especially those surrounding many of Eskom's power stations in the HPA, the need to promote community attendance through assistance with transport to meeting venues was reiterated during the public meeting in Emalahleni.<sup>120</sup> Many of these concerns community members have sick children, largely as a result of the chronic ambient air pollution and they are desperate to participate meaningfully and exercise their democratic rights.

109. We submit that both Eskom and the Environmental Assessment Practitioners managing this public participation process must recognise this limitation and arrange public meetings within disadvantaged communities affected by Eskom's power-stations, alternatively, where meetings are arranged in towns, provide transport to and from the venue.

#### **H. Eskom's defective and ineffective air quality offsets programme**

110. In the Summary Motivation Report for these current applications, Eskom states that:

*“Eskom is of the view that in many cases, household or community emission offsets are a more effective way of reducing human exposure to harmful levels of air pollution, than is retrofitting power stations with emission abatement technology at exorbitant costs. Emission retrofits at power stations also increase the cost of electricity,*

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<sup>119</sup> See South Africa's 2nd Biennial Update Report (2014-2016) to the UNFCCC available at [https://www.unfccc.int/files/national\\_reports/nonannex\\_i\\_parties/biennial\\_update\\_reports/application/pdf/south\\_africa\\_2nd\\_bur.pdf](https://www.unfccc.int/files/national_reports/nonannex_i_parties/biennial_update_reports/application/pdf/south_africa_2nd_bur.pdf)

<sup>120</sup> See discussion items 2.1.10 – 2.1.15 at <http://www.naledzi.co.za/assets/documents/c32af80fb1d5db58f85f2474678214c0.pdf>

*which may make electricity unaffordable for more people, resulting in an increase in the domestic use of fuels and deterioration in air quality in low income areas.”*

111. This is verbatim from Eskom’s Summary Motivation Report in its 2013 postponement application.<sup>121</sup> We reiterate that we and our clients do not agree with the principle of air quality offsetting, especially as a means to avoid legal compliance, as is the case here. We reiterate that, in the absence of an overarching framework, policy, and legislation properly developed to regulate air quality offsets, Eskom’s offset proposal should not have been permitted in the first instance. The Air Quality Offsets Guideline published in March 2016,<sup>122</sup> which, without explanation, replaced the 2014 Draft Air Quality Offset Policy,<sup>123</sup> does not provide the necessary framework, policy or legislation required to legitimise air quality offsets, but rather suffers from fundamental shortfalls.<sup>124</sup> In any event, there is no credible evidence that Eskom’s air quality offsets have, to date, offset the impacts of its non-compliance with the MES. In other words, the condition of the postponements granted in February 2015 has not been met. This is one of the reasons that the postponements previously granted should be withdrawn – or, at the very least, reviewed.
112. We further reiterate the issues raised in our objections to Eskom’s 2013 postponement application,<sup>125</sup> in particular the following points of concern:
- 112.1 As stated by the WHO, indoor air pollution is a complex socio-economic problem which can only be addressed by an integrated programme which creatively incorporates a range of measures appropriate for a particular society, with targeted interventions regarding: the pollution source; the living environment; and user behaviour. The State must therefore take action to address the air pollution problem and to protect the constitutional rights of those affected by formulating a comprehensive programme which includes different categories of interventions for different aspects of the problem;<sup>126</sup>
- 112.2 The DEA – together with other relevant departments – published a “Draft Strategy to Address Air Pollution in Low Income Settlements” in June 2016, in an attempt to improve air quality at household level. Although the draft Strategy is currently inadequate and there is a significant delay in finalising the document, such document has the potential to incorporate the coherent programme of interventions essential to effectively reduce household emissions.<sup>127</sup> Except for the effect of outsourcing government’s responsibility toward human settlements in need of alternative forms of clean energy, which is unacceptable, it is unclear how Eskom’s pilot project relates to this draft Strategy;
- 112.3 If Eskom does not meet the MES, it is unclear how offsets can rectify this situation. If Eskom does not meet the NAAQS, offsets would have to demonstrate that the required changes in air quality have, in fact, been met, i.e. the specific variables that would be exceeded by granting Eskom’s applications have been reduced to acceptable levels. Offsets must result in a balancing of losses and gains in the same attribute or variable of concern. A true offset would be a ton-for-ton offset for each of the pollutants. Therefore air pollution/emissions exceedance of local or regional SO<sub>2</sub> standards by Eskom must be counterbalanced by equivalent reductions in SO<sub>2</sub> in the same receiving environment; the public and affected communities or the environment affected by the exceedance must benefit from the reductions, too, so that they are no worse off;

<sup>121</sup> See our 2013 comments at para 225 available at [https://cer.org.za/wp-content/uploads/2014/02/CER-submissions-on-Eskom-postponement-applications\\_12-Feb-2014\\_final1.pdf](https://cer.org.za/wp-content/uploads/2014/02/CER-submissions-on-Eskom-postponement-applications_12-Feb-2014_final1.pdf)

<sup>122</sup> <https://cer.org.za/wp-content/uploads/2010/03/National-Environmental-Management-Act-107-1998-Air-quality-offsets-guideline-20160318-GGN-39833-00333.pdf>

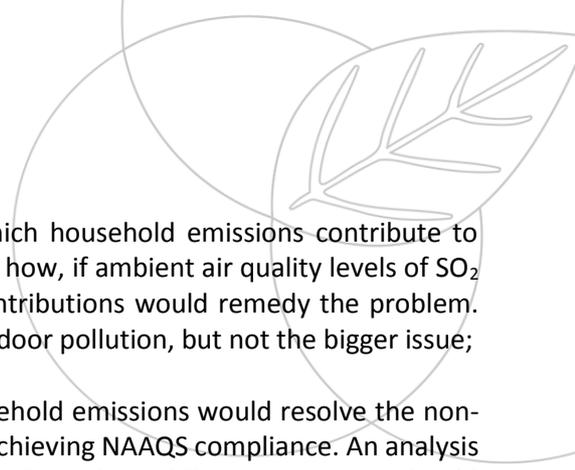
<sup>123</sup> [https://cer.org.za/wp-content/uploads/2016/08/CER-submissions-on-Draft-AQ-Offset-Policy\\_21-Feb-2014\\_final.pdf](https://cer.org.za/wp-content/uploads/2016/08/CER-submissions-on-Draft-AQ-Offset-Policy_21-Feb-2014_final.pdf)

<sup>124</sup> [https://cer.org.za/wp-content/uploads/2016/08/Offsets-AQ-Gdline-CER-27-July-2015\\_final.pdf](https://cer.org.za/wp-content/uploads/2016/08/Offsets-AQ-Gdline-CER-27-July-2015_final.pdf)

<sup>125</sup> See paras 225-251.

<sup>126</sup> <http://www.who.int/indoorair/interventions/en/>

<sup>127</sup> See our comments available at <https://cer.org.za/wp-content/uploads/2016/08/CER-Submissions-on-the-Draft-Strategy-to-Address-Air-Pollution-in-Dense-Low-Income-Settlements-29-August-2016.pdf>

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- 112.4 Eskom has not provided detailed findings of the extent to which household emissions contribute to local/regional air pollution levels and it is difficult to understand how, if ambient air quality levels of SO<sub>2</sub> and PM<sub>10</sub> are already over the NAAQS, reducing household contributions would remedy the problem. Offsets would, if successfully implemented, principally reduce indoor pollution, but not the bigger issue;
- 112.5 It is also not clear how offsetting tall stack emissions with household emissions would resolve the non-compliance by Eskom of the MES, and how this would result in achieving NAAQS compliance. An analysis of the environments and parties that bear costs of and/or benefit from these different emissions should be conducted. Even though households could benefit, what effect would this have on local and regional air quality as a whole?
- 112.6 While some proposed interventions at domestic level would be beneficial (e.g. better insulation reducing the need to heat houses using solid fuels), the reach of those benefits would be limited. In effect, therefore, the offsets could endorse higher levels of regional pollution while reducing pollutants at a localised level, implying that areas and parties at a regional level would be worse off, and effectively subsidising improvements in a specific area only. In other words, those households in which offsets are implemented could benefit from improved health and wellbeing impacts; and other households would not. This has enormous implications for equity and justice and the potential for conflict within and between neighboring communities; and
- 112.7 The offset pilot projects fail to take into account broader environmental health effects, for example, impacts on soil, plants, animals and agricultural productivity.
113. 4 years have passed since the 2013 postponement application was granted and Eskom advises that implementation of the air quality offset projects in the 'selected' KwaZamokuhle and Ezamokuhle communities are planned for mid-2019. It is striking that over this period of time, Eskom has got no further than the pilot stage. This is while Eskom continues to operate with, and exceed, its relaxed AEL limits, which are supposedly offset by this programme to reduce indoor household emissions.
114. Furthermore, the conclusion of the pilot project in no way alleviates or provides clarity in relation to our concerns listed above. In fact, despite Eskom's "initial assessment" that "indicates a significant reduction in exposure to indoor air pollution", evidence on the ground illustrates that recipients from the pilot interventions have not benefitted and regional air pollution remains dire. In August 2018, representatives from gW and other coal-affected community representatives visited the KwaZamokuhle community to assess the effectiveness of the intervention projects. As presented in the brief report attached as Annexure "3", the visit revealed a number of challenges experienced by the community, including the way the project was presented and communicated, the financial implication of replacing coal stoves with electric ones, poor workmanship and promises that were never fulfilled.
115. The fundamental purpose of conducting a pilot study is to examine the feasibility of the approach that is intended to be implemented on a larger scale. This means that if the pilot study fails the approach is not feasible for a larger project. In Eskom's case, particularly in the KwaZamokuhle community, where Eskom admitted that there were many concerns raised by the project recipients, which we submit were not adequately attended to, it clearly indicates that the offset pilot study was not effective in its objective.
116. In addition to the finding that the pilot interventions in selected communities appear to be failing, we reiterate our major concern with how Eskom has determined the impact zone and which households would qualify for the offsets. This issue was revisited during the public meeting in Midrand, and Eskom's response was that the "most significant reduction in emissions will be addressed by installation of the ERP emission reduction equipment and decommissioning of power stations. That is the high level plan that Eskom will implement. The air quality offset program is targeted to areas/communities where a high number of exceedances of the NAAQS are recorded." The

insurmountable problem Eskom faces, however, is that despite its emission reduction plan, it remains the most significant contributor to ambient levels of PM<sub>2.5</sub>, which directly (and in many cases fatally) impacts a large portion of the Mpumalanga Highveld - a much larger number of communities and individuals than those selected for the air quality offset programme.

117. In the circumstances, Eskom's failing offset interventions to date and its proposed implementation plan cannot justify its applications to postpone or suspend compliance with the MES or apply for alternative limits.

## I. Conclusion and prayers

118. As set out above, given that air quality in the HPA and VTAPA (and WBPA) is not in compliance with the NAAQS, postponement applications should be summarily rejected. The NAQO, in concurrence with the competent licensing authorities needs to go no further in arriving at a rational and reasonable decision. Granting any of these postponement, suspension or alternative limit applications would be *ultra vires* the Constitution, the AQA, the amended List of Activities, the 2017 Framework, and the provisions of the NEMA.

119. Alternatively, in the event that the NAQO elects to consider the suspension applications, despite the non-compliance with NAAQS and the fatal health impacts caused by Eskom's coal-fired power stations, we submit that Eskom should provide a detailed and clear decommissioning schedule that at least reflects the plans and process referred to in this submissions, on the following conditions:

119.1 the detailed decommissioning schedule, as updated, is available for public comment as part of this application process and every 6 months through to 2030 for the purposes of progress monitoring;

119.2 the 5 "*most costly and oldest plants*" – Kriel, Arnot, Hendrina, Camden and Komati (and Grootvlei which is excluded from this application) – should immediately commence with decommissioning arrangements, required by law or otherwise, and provide evidence of these initiatives to the NAQO, competent licensing authorities and all I&APs; and

119.3 The social impact of decommissioning is clearly outlined in an inclusive and transparent social and labour closure plan developed for the decommissioning process.

120. We and our clients oppose, and will continue to oppose, Eskom's postponement, suspension and alternative limit applications. We call upon the relevant decision-makers to reject all of Eskom's applications in order to protect constitutional rights and the realisation of environmental and social justice in South Africa.

121. We reserve our right to supplement these submissions with the specialist reports referred to above and any other evidence relevant to Eskom's applications.

122. Please contact us should you have any queries.

Yours faithfully

**CENTRE FOR ENVIRONMENTAL RIGHTS**

per:



**Timothy Lloyd**

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