



Ms Marissa Botha

Naledzi Environmental Consultants CC

By email: botham@naledzi.co.za

Copied to:

Dr Thuli Khumalo

National Air Quality Officer

Department of Environmental Affairs

By email: tkhumalo@environment.gov.za

Derick Makhubele

Department of Environmental Affairs

By email: dmakhubele@environment.gov.za

Ms. Nosipho Ngcaba

Director-General

Department of Environmental Affairs

By email: dg@environment.gov.za

nngcaba@environment.gov.za

GREENPEACE AFRICA SUBMISSION ON 'APPLICATIONS FOR SUSPENSION, ALTERNATIVE LIMITS AND/OR POSTPONEMENT OF THE MINIMUM EMISSIONS STANDARDS (MES) COMPLIANCE TIMEFRAMES FOR ESKOM'S COAL AND LIQUID FUEL FIRED POWER STATIONS

EXECUTIVE SUMMARY

1. South Africa has a severe air pollution crisis.
 - 1.1. Air pollution is a significant problem, particularly in the priority areas such as the Highveld, where air quality remains poor or has further deteriorated from “potentially poor” to “poor”.
 - 1.2. New satellite data shows that for the period between 1 June and 31 August 2018, Mpumalanga province had the worst NO₂ air pollution in the world.
 - 1.3. There is clear evidence that coal-fired power stations are having huge impacts on the air quality in the region and that they are not complying with emissions standards. For example, between April 2016 and December 2017 the 17 Eskom coal-fired power stations reported nearly 3,200 exceedances of applicable daily Atmospheric Emissions Licenses (AEL) limits for particulate matter (PM), sulfur dioxide (SO₂), and oxides of nitrogen (NO_x).
 - 1.4. Air pollution has devastating impacts on human health and well-being. Eskom significantly underestimates the health impacts of their coal-fired power stations and annual premature deaths by ignoring international research standards.
2. The National Environmental Management: Air Quality Act (NEM:AQA) was enacted to give effect to section 24 of the Constitution and to protect and improve air quality. The National Air Quality Framework, the declaration of High Priority Areas, and the establishment of national ambient air quality standards and minimum emission standards (MES) are all intended to improve air quality and realise the constitutional right to a healthy environment. Unfortunately, compared with many other countries, South Africa has very weak Minimum Emission Standards (MES), that allow coal-fired power stations to currently emit:
 - 2.1. close to 100 times more sulfur dioxide (SO₂) than allowed in China (key regions), 20 times more than existing stations in India and more than 45 times more than new plants in India, and more than 20 times more than current regulations in the European Union;
 - 2.2. about 6 times more particulate matters (PM) than is allowed in the EU and China (key regions) and almost 5 times what is allowed for new stations in India; and
 - 2.3. about 15 times more nitrogen oxides (NO₂) than allowed in India (new builds) and China (key regions) and more than 7 times more than currently in the EU.
3. Eskom has known for at least 9 years that it would be required to comply with the MES that it now seeks to postpone or suspend and was indeed one of the entities involved in the process developed to set the MES themselves. Despite this, the utility has not taken the necessary action to install pollution abatement equipment (such as Flue Gas Desulphurization equipment or "FGDs") to reduce its emissions in order to meet legal requirements. On the contrary, Eskom's euphemistically named "Emission Reduction Plan" would allow the utility to operate its entire existing fleet without even rudimentary controls for two of the most dangerous pollutants emitted from coal-fired power plants (SO₂ and mercury) and with substantial exemptions for controlling NO_x and

dust emissions. This would be completely irresponsible, particularly since the air pollution levels already exceed the maximum levels prescribed in the national ambient air quality standards.

4. Instead of implementing a plan to ensure that it meets air emission standards, Eskom has sought to evade its legal responsibilities by repeatedly applying for the postponement or suspension of its obligations to comply with the MES in respect of many of its power stations in some of the most polluted areas of the country.
5. Expert research by the Greenpeace Global Air Pollution Unit indicates that **an estimated 23,000 premature deaths** (95% confidence interval: 14,000 to 28,000 deaths) **could be avoided by requiring full compliance with the MES**. This represents a 40% reduction in the cumulative health impact of air pollution from Eskom's power stations. **The external social costs avoided by requiring Eskom to fully comply with South Africa's MES would be in excess of R230 billion.**
6. Eskom's explanations for why it cannot comply with the MES are unconvincing and are based on incorrect or misleading information.
 - 6.1. Contrary to Eskom's claims, it is technically possible to install Flue Gas Desulphurization equipment (FGDs) in all plants that intend to operate beyond 2030, by the 2025 deadline (as long as procurement is started in 2019-2020). For example:
 - 6.1.1. China retrofitted approximately 250 gigawatts of existing coal-fired capacity with FGD between 2005 and 2011, bringing share of capacity with SO₂ controls from 14.3% to 89.1% in six years; and
 - 6.1.2. India is aiming to bring its entire coal fleet to compliance with stricter standards than the MES by 2022, requiring retrofits in much of its 220GW of operating capacity and . according to India's Ministry of Power, the procurement, construction and connection of an FGD takes 30-36 months (according to the International Energy Agency 24-36 months is required)
 - 6.2. Eskom exaggerates the costs of compliance with the new source MES for SO₂ at least 5-fold. For example its costing of the installation of FGD equipment is based on outdated research from 2006: before China, India and other emerging countries started deploying FGDs at scale and the costs dropped.
7. Eskom cannot rely on a flawed cost benefit analysis to justify on-going violations of rights enshrined in the Bill of Rights. In circumstances where it is entirely reasonable and possible to install pollution abatement equipment and to procure electricity from non-polluting, renewable sources, it is legally impermissible to sacrifice human health and environmental quality in order to save a parastal money.
8. Greenpeace Africa submits that the National Air Quality Officer and the licensing authorities cannot consider Eskom's MES Applications because they do not meet the pre-conditions for consideration. In particular:
 - 8.1. Eskom has failed to demonstrate that the industry's air emissions are not causing direct adverse impacts on the surrounding environment;



- 8.2. As contemplated in the 2017 Framework, the law is clear that only in instances where the power stations are located in areas that are in compliance with the National Ambient Air Quality Standards (NAAQS) can postponement, suspension or alternative limits even be considered. Lethabo power station is based in the VTAPA and Majuba, Camden, Kriel, Matla, Kendal, Duvha, Arnot, Hendrina and Komati power stations are in the HPA – based on the Department of Environmental Affairs’ own reports, neither the VTAPA or the HPA remain in the compliance with that NAAQS. Thus, the ambient air quality in the relevant areas fail to comply with the applicable National Ambient Air Quality Standards and Eskom’s Application should therefore be dismissed; and
- 8.3. a number of Eskom’s Applications fail to meet the application requirements provided for in the National Framework.
9. Eskom’s MES Applications are fundamentally flawed and contain false and misleading information which cannot be relied upon.
10. Approving Eskom’s MES Applications would:
- 10.1. constitute an unlawful abrogation of the duties of the State under the Constitution, NEMA and NEM:AQA;
 - 10.2. infringe every persons right to an environment that is not harmful to their health or well-being and the rights of millions of South Africans to life and dignity; and
 - 10.3. perpetuate environmental and social injustice because the adverse environmental impacts of air pollution are distributed in a manner that unfairly discriminate against vulnerable people (including babies and elderly people) and disadvantaged persons.

Contents

1 Introduction and background	1
Greenpeace Africa	1
2. Legal framework for postponement and suspension applications.....	2
Constitutional duties.....	2
National Environmental Management Act.....	2
National Environmental Management: Air Quality Act	4
Purpose of NEM:AQA	4
Purpose of Minimum Emission Standards	5
Conditions that must be met before a postponement/ suspension application may be considered.....	6
Factors to be taken into account in considering a postponement/ suspension application	7
3. Grounds for objecting to Eskom’s applications.....	8
4. South Africa’s air pollution crisis.....	9
Health impacts due to coal-fired power stations	13
Premature deaths from air pollution	14
Eskom's under-estimate of premature deaths.....	14
Correcting bias in Eskom's modelling of health impacts	15
5 Inadequacy of responses to air pollution	17
Inadequate air pollution monitoring and data.....	17
Weak Minimum Emission Standards	18
Emission standards for operating coal-fired power plants compared	19
Eskom's ‘Emission Reduction Plan’.....	19
Inflated costs of installing pollution abatement equipment.....	20
Exaggerating time required to install pollution abatement equipment.....	20
Failure to commence installment of pollution abatement equipment	21
6 Why Eskom's MES Applications cannot be approved.....	21
Eskom's MES applications do not merit consideration	21
Cost Benefit Analysis cannot be used to justify violations of fundamental rights.....	22
Approval of Eskom's MES Applications would be unlawful	23
7 Conclusion.....	24



1 Introduction and background

Greenpeace Africa

Greenpeace Africa is an independent environmental campaigning organisation with a vision of 'an Africa where people live in harmony with nature in a peaceful state of environmental and social justice'. Our mission is to work with others to foster environmental consciousness where Africa's people can seek social and economic prosperity in ways that protect the environment for the benefit of humans, the planet and the future.

In South Africa, we campaign for a just transition away from coal and nuclear power, towards renewable energy and energy efficiency. We are funded by individuals and foundations who believe in our work, and do not accept any money from government or corporations in order to maintain our independence, which means that we work in the public interest; with environmental and social justice at the core of our work.

As a civil society organisation, and citizens, we work towards the achievement of environmental and social rights, environmental and energy justice in our communities across South Africa. We strive for the realisation of the constitutional environmental right to a healthy environment. We believe that climate change is an existential crisis, which acts as a threat multiplier and that urgent action is required to avoid catastrophic climate change.

Greenpeace Africa is making these submissions in response to the applications for suspension, alternative time limits and/or postponement of the Minimum Emissions Standards (MES) compliance Timeframes for Eskom's coal and liquid-fuel fired power stations (referred to below as "Eskom's MES Applications").¹

Greenpeace Africa was an Interested and Affected Party for Eskom's original applications for postponement from complying with Minimum Emission Standards in 2013/14, and we remain an Interested and Affected Party for Eskom's revised request for postponements. We strongly opposed the decision to allow Eskom to postpone complying with the MES in 2015, and we believe that the grounds for opposing Eskom's updated MES application are even stronger in 2019. We believe that these revised applications for postponements and/or suspensions from Eskom equate to rolling postponements, and in the interests of realising the constitutional right to an environment that is not harmful to health or well-being, absolutely no further postponements should be given to Eskom (or indeed, any other entity).

Our key position is that Eskom must either comply with the MES at the specified timeframes, or decommission all of its coal-fired power stations that do not comply with the MES at an accelerated pace. No further postponements or suspensions should be granted to the utility by the National Air Quality Officer. We take this position given the air pollution crisis in Mpumalanga, the length of time that Eskom has had available in which to prepare to comply, and the premature deaths and health impacts that will be caused if Eskom does not

¹ In making these submissions we have had the benefit of reading the submission made on behalf of the Life After Coal campaign and associate ourselves with those submissions, despite not repeating all of them in this document.



comply, and is granted postponements and/or suspensions. We note that Eskom has presented no evidence in its MES Applications or otherwise that indicates its commitment to decommissioning and find the *decommissioning table* included as Figure 1 by Eskom as completely inadequate to indicate the utility's commitment to decommissioning, or create certainty around timelines. We believe that Figure 1 does not meet the List of Activities requirements, as contemplated in the 2017 National Framework for Air Quality Management in the Republic of South Africa „*The 2017 Framework*“ for a detailed and clear decommissioning framework. No indication is given of Environmental Impact Assessment timelines, and no specific dates are given for any unit decommissioning. Neither is there an indication of what budget has been set aside for this process, leading us to believe that there is in fact no plan around decommissioning, nor any commitment to it.

2. Legal framework for postponement and suspension applications

This section gives a brief overview of the legal rights and duties which are relevant to the decision of the National Air Quality Officer (NAQO) and licensing authorities (i.e. the decision-makers) as to whether or not to approve Eskom's MES Applications.

Constitutional duties

The Constitution is the standard to which all law and conduct must align, and any law or conduct inconsistent with it, is invalid.² The State (which includes Eskom as an organ of state) must respect, protect, promote and fulfil the rights in the Bill of Rights.³ No law may restrict or limit the rights in the Bill of Rights except "to the extent that is reasonable and justifiable in an open and democratic society based on human dignity, equality and freedom, taking into account all relevant factors".⁴ All spheres of government and all organs of state must secure the well-being of the people of the Republic.⁵

Several of the fundamental rights enshrined in the Bill of Rights are directly relevant to a consideration of Eskom's MES Applications, including the rights: to dignity (section 10); to life (section 11); to an environment that is not harmful to their health or well-being, and to have the environment protected for the benefit of present and future generations (section 24); and to just administrative action (section 33).

Section 24 requires the State to take reasonable legislative and other measures that prevent pollution and ecological degradation, for the benefit of present and future generations. Significantly, although the duty of the State in relation to several other duties in the Bill of Rights is limited to taking reasonable legislative and other measures "within its available resources to achieve the progressive realization" of the right in question, that limitation is not included in section 24. The duty to take reasonable measures to protect the environment cannot be deferred.

² Constitution section 2.

³ Constitution section 7(2).

⁴ Constitution section 7(2).

⁵ Constitution section 36).



National Environmental Management Act

Several Acts have been enacted to give effect to the environmental right in section 24 of the Constitution, including the National Environmental Management Act, 107 of 1998 (NEMA) and the National Environmental Management: Air Quality Act, 39 of 2004 (NEM:AQA).

NEMA establishes a “duty of care” which requires every person who has caused or may cause significant pollution or degradation of the environment (such as Eskom) to take reasonable measures to prevent that pollution or degradation from occurring, continuing or recurring. If it cannot be avoided or stopped, or if the harm has been authorised (e.g. under an air emission licence) the duty of care still requires reasonable measures to be taken to minimise and rectify any pollution or degradation of the environment that occurs.⁶ This means that Eskom's duty to take reasonable measures to prevent air pollution extend beyond complying with the MES. As the name suggests, these are minimum emission standards and if there are reasonable measures which Eskom could take to reduce their emissions still further, they are obliged by law to take those measures.

When deciding whether or not to consider or approve Eskom's MES Applications, the decision-makers must consider the national environmental management principles set out in section 2 of NEMA.⁷ The principles:

- apply to the actions of all organs of state that may significantly affect the environment;
- serve as guidelines which organs of state must refer to when exercise any function or taking any decision in terms of any statutory provision concerning the protection of the environment; and
- guide the interpretation, administration and implementation of NEMA, and any other law concerned with the protection or management of the environment (including NEM:AQA).⁸

The following national environmental management principles are particularly relevant to the decisions on Eskom's MES Applications:

- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.⁹
- Sustainable development requires the consideration of all relevant factors including the following:
 - that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;¹⁰

⁶ NEMA section 28.

⁷ Section 2 of NEMA prescribes that these principles apply to the actions of all organs of state that may significantly affect the environment. Consequently they must be taken into account by government bodies and officials when deciding whether or not to grant a permit that authorises an activity that may significantly affect the environment. Section 5 of NEM:AQA states that the Act must be read with any applicable provisions of NEMA.

⁸ NEMA section 2(1).

⁹ Section 2(2) of NEMA.



- that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;¹¹
- that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.¹²
- 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.¹³
- Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.¹⁴
- 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.¹⁵
- The costs of remedying 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.¹⁶

National Environmental Management: Air Quality Act

The powers to consider and decide Eskom's MES applications are derived from the National Environmental Management: Air Quality Act, 39 of 2004 (NEM:AQA) which was promulgated in order to give effect to section 24 of the Constitution by protecting air quality. Consequently the role and responsibilities of the decision-makers must be within the context of the overall purpose of NEM:AQA.

Purpose of NEM:AQA

NEM:AQA was promulgated to give effect to section 24 of the Constitution. Its objects are:

- (a) *to protect the environment by providing reasonable measures for—*
 - (i) *the protection and enhancement of the quality of air in the Republic;*
 - (ii) *the prevention of air pollution and ecological degradation; and*
 - (iii) *securing ecologically sustainable development while promoting justifiable economic and social development; and*

¹⁰ Section 2(4)(a)(ii) of NEMA.

¹¹ Section 2(4)(a)(v) of NEMA.

¹² Section 2(4)(a)(vii) of NEMA.

¹³ Section 2(4)(c) of NEMA

¹⁴ Section 2(4)(e) of NEMA.

¹⁵ Section 2(4)(o) of NEMA.

¹⁶ Section 2(4)(p) of NEMA.



(b) generally to give effect to section 24 (b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.¹⁷

The Preamble to NEM:AQA (quoted below) explains the underlying rationale and purpose of this Act in more detail.

WHEREAS the quality of ambient air in many areas of the Republic is not conducive to a healthy environment for the people living in those areas let alone promoting their social and economic advancement;

AND WHEREAS the burden of health impacts associated with polluted ambient air falls most heavily on the poor;

AND WHEREAS air pollution carries a high social, economic and environmental cost that is seldom borne by the polluter;

AND WHEREAS atmospheric emissions of ozone-depleting substances, greenhouse gases and other substances have deleterious effects on the environment both locally and globally;

AND WHEREAS everyone has the constitutional right to an environment that is not harmful to their health or well-being;

AND WHEREAS everyone has the constitutional right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—

(a) prevent pollution and ecological degradation;

(b) promote conservation; and

(c) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development;

AND WHEREAS minimisation of pollution through vigorous control, cleaner technologies and cleaner production practices is key to ensuring that air quality is improved;

AND WHEREAS additional legislation is necessary to strengthen the Government's strategies for the protection of the environment and, more specifically, the enhancement of the quality of ambient air, in order to secure an environment that is not harmful to the health or well-being of people,"

¹⁷ NEM:AQA section 2.

Purpose of Minimum Emission Standards

Under NEM:AQA, the Minister of Water and Environmental Affairs established the MES¹⁸ and the National Framework for Air Quality Management (National Framework),¹⁹ both of which have been through various iterations. The MES are one of the means of pursuing NEM:AQA's objectives. Section 21 states that:

The Minister must, or the MEC may, by notice in the Gazette— publish a list of activities which result in atmospheric emissions and which the Minister or MEC reasonably believes have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.[emphasis added]

Despite this objective and the acknowledgement that the listed activities have or may have a significant detrimental effect on the environment, section 21(3)(b) provides for "transitional and other special arrangements in respect of activities which are carried out at the time of their listing" to be included in the MES. These transitional and other special arrangements were included in the 2013 MES²⁰ in the form of provision for the postponement of compliance timeframes. This must be read together with the provisions of the National Framework.

Conditions that must be met before a postponement/ suspension application may be considered

In terms of the National Framework, a proponent of a Listed Activity will only be "allowed to apply for" a postponement or suspension, and an application can only be considered, if the following conditions are 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*

¹⁸ List of Activities which Result in Atmospheric Emissions which have or may have a Significant Detrimental Effect on the Environment, Including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage GN 248 in GG 33064 of 31 March 2010.

¹⁹ Various iterations of the National Framework have been published, with the most recent being the 2017 National Framework for Air Quality Management in the Republic of South Africa.

²⁰ List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage GN 893 in GG 37054 of 22 November 2013.

- Other requirements as may be specified by the National Air Quality officer²¹

This means that if an applicant for a postponement or suspension cannot demonstrate that the industry's atmospheric emissions are not causing a direct adverse effect on the environment (including the health and well-being of all persons), there is no lawful basis on which the application can be further considered. Similarly, the decision-makers cannot consider any application for the postponement or suspension of compliance with the MES for a facility if the ambient air quality in the area where the applicant's facility is situated does not meet the National Ambient Air Quality Standards (NAAQS).

The National Framework only makes provision for postponement and suspension applications in the following circumstances:

- “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;
- 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;
- 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;
- No postponement of compliance timeframes or a suspension of compliance timeframes shall be granted for existing plant standards; and
- 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.”²²

Applications which fall outside the scope of the above cannot be considered, and if the decision-makers did so, that action and any decision to approve the application would be *ultra vires* and consequently unlawful.

²¹ Above.

²² Paragraph 5.4.3.4 of the National Framework.

Factors to be taken into account in considering a postponement/ suspension application

If an application for the postponement or suspension of compliance with MES meets the conditions for consideration, then the NAQO must consider the application and decide whether or not to grant the application. The NAQO must take account of the following factors and principles (among others) when exercising his or her discretion as to whether or not to grant the application:

- (a) The Constitutional duties of the State, particularly the environmental right in section 24.
- (b) The purpose of NEM:AQA and the general duty of the State, when applying NEM:AQA (which includes its subordinate legislation and the National Framework)²³, to seek to protect and enhance the quality of air in the Republic and to apply the Act in a manner that will achieve the progressive realisation of the environmental right.²⁴
- (c) The duty of care and the national environmental management principles prescribed in NEMA (discussed above).²⁵

The decision-maker must consider all relevant considerations and must make a decision that is reasonable and rationally connected to the information before the decision-maker.

For the reasons set out below, the NAQO must refuse to consider Eskom's MES Applications on the basis that they do not meet with the mandatory legal requirements for consideration. Even if the NAQO were to consider Eskom's MES Applications, they must be refused because an approval based on the information that is currently contained in the application documents would be unreasonable and irrational and consequently unlawful and **liable to be set aside on review.**

3. Grounds for objecting to Eskom's applications

It is Greenpeace Africa's submission that Eskom's MES Applications should not be considered by the National Air Quality Officer and the licensing authorities, because:

1. Eskom has failed to demonstrate that the industry's air emissions are not causing direct adverse impacts on the surrounding environment;
2. the ambient air quality in the relevant areas fail to comply with the applicable National Ambient Air Quality Standards; and
3. a number of Eskom's applications fail to meet the application requirements provided for in the National Framework.

In addition, Greenpeace Africa submits:

1. that Eskom's application documents are fundamentally flawed and contain false and misleading information which cannot be relied upon;²⁶

²³ Section 1 states that "this Act" includes—

(a) the national framework;
(b) any regulation made in terms of this Act; and
(c) any other subordinate legislation issued in terms of this Act.

²⁴ Section 3 of NEM:AQA.

²⁵ Section 5 of NEM:AQA requires the Act to be read with any applicable provisions of NEMA.



2. that approving Eskom's MES Applications would constitute an unlawful abrogation of the duties of the State under the Constitution, NEMA and NEM:AQA and would infringe every persons right to an environment that is not harmful to their health or well-being and the rights of millions of South Africans to life and dignity;
3. that approving Eskom's application will fail to place people and their needs at the forefront and serve their interests equitably;
4. that permitting Eskom to continue emitting such high levels of pollution would perpetuate environmental and social injustice because the adverse environmental impacts of air pollution are distributed in a manner that unfairly discriminate against vulnerable people (including babies and elderly people) and disadvantaged persons;
5. that the use and exploitation of non-renewable natural resources is neither responsible nor equitable;
6. that if a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions, the only responsible decision is to reject the application; and
7. that Eskom must bear the costs of remedying and preventing further pollution, environmental degradation and consequent adverse health effects by being held to comply with the NAAQS.

In the commentary that follows, we deal with Eskom's application documents and supporting reports, which are fundamentally flawed in their methodology and conclusions. These reports cannot justify any postponement or suspension of compliance with the MES. We also consider the available science and our own scientific assessments to support our conclusions that the emissions from coal-fired power stations are causing and will continue to cause direct adverse impacts on the surrounding environment and human lives, and on the health and well-being of those persons.

4. South Africa's air pollution crisis

Almost 13 years since NEM:AQA was promulgated, and nearly 12 years since the 2007 Framework was established, many of NEM:AQA's aims continue to be largely unrealised. Air pollution, with its devastating impacts on human health and well-being, remains a significant problem in our country, particularly in the high priority areas.²⁷ This means that all of the steps that have been taken to date are inadequate.

Despite the fact that the Vaal Triangle Airshed was declared 12 years ago, and the Highveld Priority Area more than ten years ago - for the purpose of reducing pollution so that it no longer exceeds the National Ambient Air Quality Standards (NAAQS) - regular, significant exceedances of the NAAQS are common in these areas. The third priority area, Waterberg-

²⁶ NEM:AQA makes the submission of misleading information to the National Air Quality Officer or licensing authority, a criminal offence .

²⁷ Center of Environmental Rights (2018): PROVISIONAL SUBMISSIONS REGARDING THE REVIEW OF THE 2012 NATIONAL FRAMEWORK FOR AIR QUALITY MANAGEMENT IN THE REPUBLIC OF SOUTH AFRICA



Bojanala, declared six years ago, is also fails to comply with the NAAQS.²⁸ This is despite the fact that South African NAAQS are weaker than the outdated 2005 World Health Organisation (WHO) guidelines.

Lack of compliance and new proposed coal-fired power stations

A new report from Dr. Ron Sahu from November 2018²⁹ describes the number of exceedances of point source emission standards at Eskom's power stations. Between April 2016 and December 2017, the utility's 17 coal fired power stations reported nearly 3,200 exceedances of applicable daily Atmospheric Emissions Licenses (AEL) limits for particulate matter (PM), sulfur dioxide (SO₂), and oxides of nitrogen (NO_x). We therefore dispute that Eskom is in compliance with various emission limits contained in their relaxed AELs, and the assertion that Eskom is operating legally.

Notwithstanding this non-compliance with NAAQS in the priority areas (and the numerous adverse impacts of coal in general) it is important to remember that there are proposals for new, independent power producer (IPP) coal-fired power stations within these priority areas, in addition to Eskom's Medupi (Waterberg) and Kusile (Mpumalanga) power stations. Thabametsi and Khanyisa power stations are both preferred bidders in the coal baseload IPP procurement programme, and are proposed to be based in the Waterberg-Bojanala and Highveld Priority Areas, respectively.

It is clear that Thabametsi and Khanyisa power stations – which will be amongst the most greenhouse gas emissions intensive plants in the world – will not only exacerbate climate change, but will also contribute to the ongoing air pollution crises in these areas. This is particularly concerning, since, in the Waterberg, Limpopo, the air quality since the 2012 Framework has deteriorated from “potentially poor” to “poor”. Using the precedent of the other two priority areas, and bearing in mind the plans to develop the Waterberg, air pollution can only deteriorate further.

Similarly, in Mpumalanga, two out of three district municipalities' air quality remains poor, and the third (District Ehlanzeni), has further deteriorated from “potentially poor” to “poor”. This non-compliance with NAAQS is reflected in the Department's own reports presented at priority area meetings, as well as in its mid-term review of the Highveld Priority Area (HPA) air quality management plan (AQMP), and in the State of Air report presented at the 2017 Air Quality Lekgotla.

Principle sources of air pollutants responsible for the poor air quality in Mpumalanga

Analysis of monitoring data, wind speed and wind direction can reveal the principal sources of air pollutants responsible for the poor air quality in Mpumalanga. Figure 1 shows the

²⁸ “2017 State of the Air Report and National Air Quality Indicator”. Dept. of Env. Aff.

http://www.airqualitylekgotla.co.za/assets/2017_1.3-state-of-air-report-and-naqi.pdf

²⁹<https://cer.org.za/wp-content/uploads/2018/12/Eskom-plant-exceedances-of-AEL-Limits-Ron-Sahu-15-November-2018.pdf>

location of air quality monitoring stations and coal powered power plants in Mpumalanga and the surrounding area.

Figure 1: Location of monitoring stations and coal fired power plants in Mpumalanga

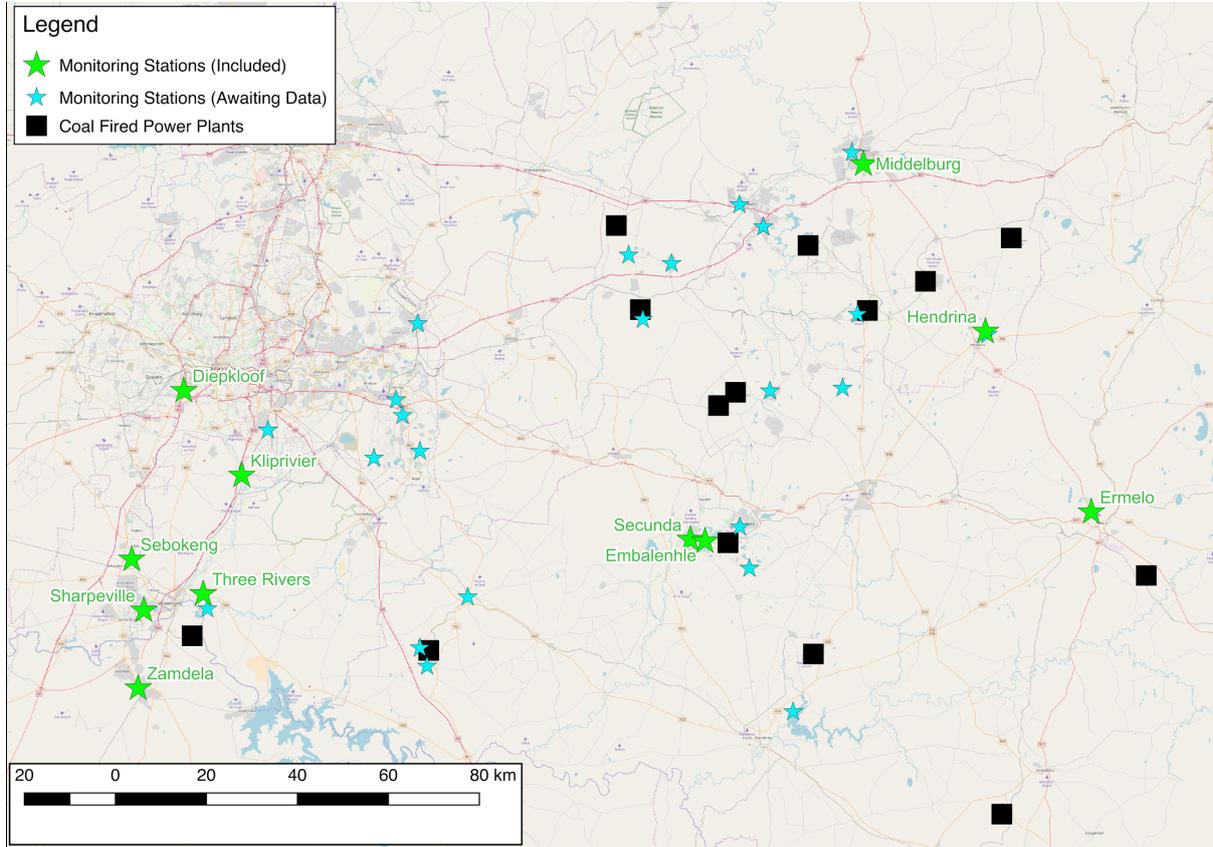


Figure 2 shows pollution polar plots derived using wind speed, wind direction and NO₂ concentration in relation to coal power plants in the Mpumalanga area. Figure 3 shows pollution polar plots derived using wind speed, wind direction and SO₂ concentration. Monitoring data from 2015-2018 was used to generate each plot to provide a sufficient number of observations. Each polar plot is shaded to indicate pollutant concentration, the distance from the center indicates wind speed and the radial position indicates wind direction.

Figure 2: NO₂ (ppb) pollution polar plots in the Mpumalanga area (2015-2018)

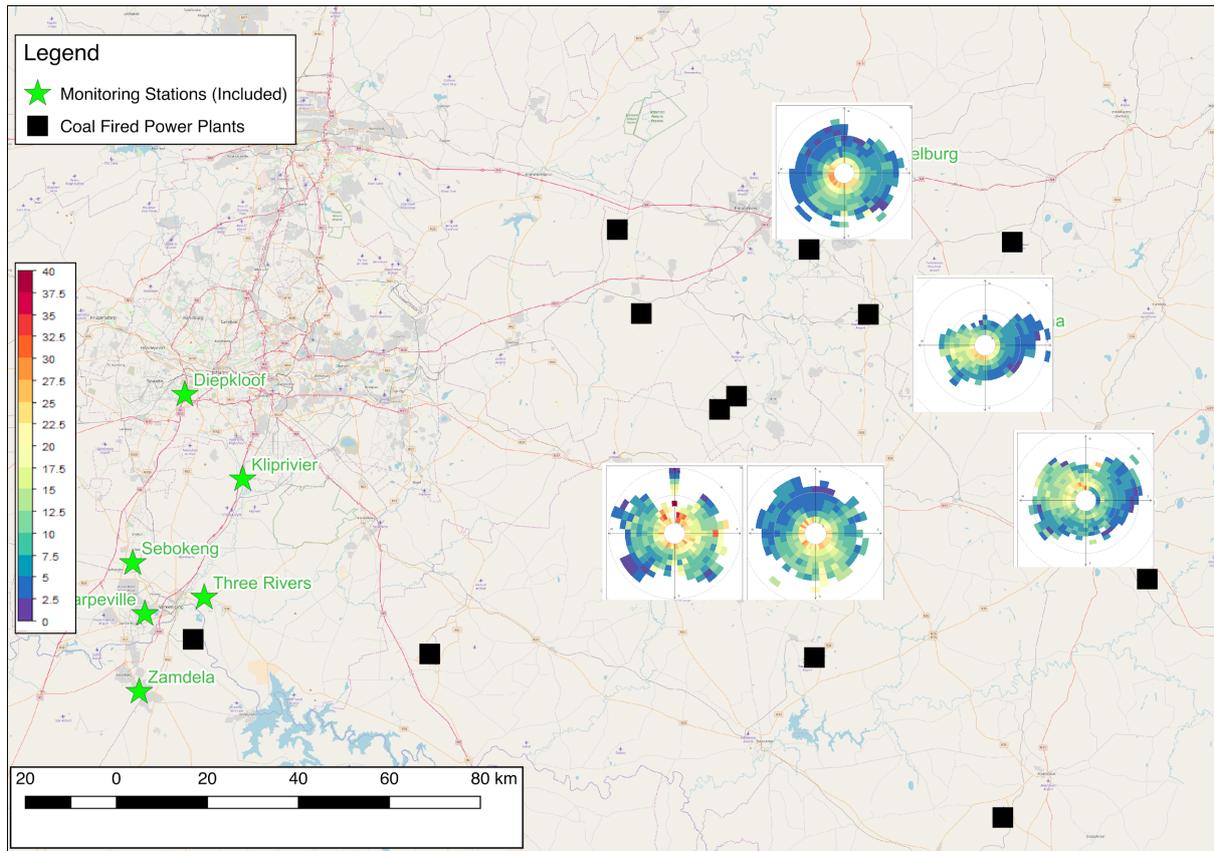
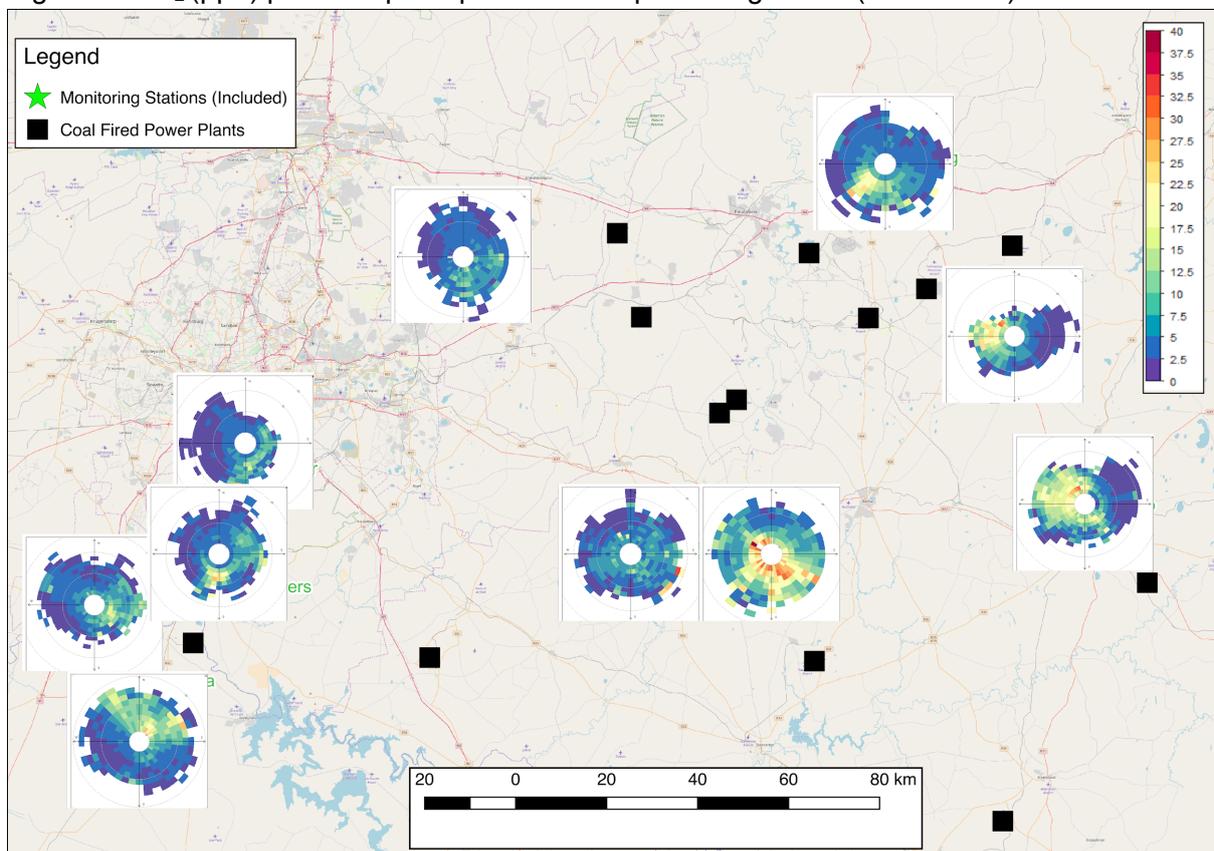


Figure 3: SO₂ (ppb) pollution polar plots in the Mpumalanga area (2015-2018)



The polar plots at Secunda and Embalenhle (Centre of Figure 2 and 3) show that highest pollutant concentrations occur when wind speeds are low. This suggests that a local source is the primary driver of high pollution levels. The monitoring sites are located within 10 km of the Sasol power plant complex.

The polar plots at Middleburg, Hendrina and Ermelo (Upper right of Figure 2 and 3) show that highest pollutant concentrations occur when the monitoring sites are down-wind of the nearest power plants in the Mpumalanga power plant cluster. Furthermore, the polar plots at Three Rivers, Sharpville and Zamelda (Lower left of Figure 2 and 3) surround the Lethabo Coal power plant. In each case the highest pollutant concentrations occur when the monitoring sites are down-wind of Lethabo Coal power plant.

These observations provide evidence that the highest concentrations recorded at these monitoring stations are linked to emissions from coal power plant activity in the region. Compliance with the NAAQS described above is only likely to be achieved by reducing emissions from industrial coal combustion processes in Mpumalanga. This must include strict enforcement of emission standards for PM₁₀ as well as SO₂ and NO₂ which are pollutants in their own right but also contribute to the formation of secondary pollutants such as O₃ and particulate matter.

NO₂ pollution hotspot in Mpumalanga

Groundbreaking satellite data from 1 June to 31 August 2018 analysed by Greenpeace reveals the extent of the air pollution crisis by mapping the world's NO₂ air pollution hotspots across six continents in the most detail to date. The world's largest NO₂ air pollution hotspot in that period of time was Mpumalanga province in South Africa.³⁰ The satellite data further reveals that the cities of Johannesburg and Pretoria are also affected by NO₂ pollution which blows across from Mpumalanga and into both cities due to close proximity and regular eastwinds. This means that plumes of dangerous NO₂ pollution regularly cover these cities and their 8 million people. Nitrogen Dioxide (NO₂) is a dangerous pollutant in and of itself and also contributes to the formation of PM_{2.5} and ozone, two of the most dangerous forms of air pollution.

Health impacts due to coal-fired power stations

Air pollution is a major problem in South Africa, stemming from various sources including transportation and agriculture, but largely from industry and the country's large dependence on fossil fuels as a source of energy and electricity. The burning of coal is associated with heavy releases of pollutants and airborne toxins such as fine particulate matter (PM), nitrogen oxides (NO_x), including nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead, mercury, and other heavy metals. The health, economic, and environmental impacts of the resulting

³⁰https://storage.googleapis.com/planet4-africa-stateless/2018/10/3ce9a5c3-sa-briefing_-global-air-pollution-map-no2-5-1.pdf



air pollution are dire. Health impacts related to coal in South Africa include lung cancer, heart disease, pulmonary disease, stroke, asthma, and respiratory infections³¹.

Premature deaths from air pollution

A 2016 report by the World Bank estimates that roughly 20 000 South Africans die from air pollution related causes every year³². A different study by the International Growth Center at the University of Cape Town estimated an even higher cost of 27 000 deaths and over 300 billion Rand (6% of the country's GDP), using the United States Environmental Protection Agency's Environmental Benefits Mapping and Analysis Program (BenMAP)³³. The Johannesburg-Pretoria metro area suffers the highest losses of life, followed by other densely populated areas such as Cape Town and Durban.

Eskom's underestimation of premature deaths

For the first time Eskom presented its own assessment that admits that there are premature deaths caused by their coal-fired power stations.³⁴ But this research still significantly underestimates impacts by ignoring international research standards, in at least the following ways:

- The analysis excludes most of South Africa's population (an estimated 70%) by artificially limiting the geographical area covered by the study.
- 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 noted above, this does not cover all of South Africa). The method for extrapolation is unclear and unsubstantiated. 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 better approach would have been to model directly on the scale of the larger domain for all scenarios.
- 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 (their 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.
- 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 (SO₂, NO_x and PM_{2.5}). The final selection of functions excludes those for effects of PM_{2.5} on cardiovascular and

³¹<https://cer.org.za/wp-content/uploads/2017/04/Annexure-Health-impacts-of-coal-fired-generation-in-South-Africa-310317.pdf>

³²<http://documents.worldbank.org/curated/en/781521473177013155/pdf/108141-REVISED-Cost-of-PollutionWebCORRECTEDfile.pdf>

³³ <https://www.theigc.org/blog/the-cost-of-air-pollution-in-south-africa/>

³⁴ Naidoo et al (2018): Health impact focused cost benefit analyses.

respiratory mortality, instead adopting functions based on SO₂ and NO₂ exposure. However, the relationships with PM_{2.5} are significantly stronger and should thus have been preferred. Using the PM_{2.5} based functions would more than double the estimates for mortality.

- The analysis excludes several further pathways of health impacts from PM_{2.5}, including effects on morbidity (illness) and cancer mortality linked with PM_{2.5}.
- 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 for increased valuation of mortality as a consequence of economic growth in future years. The extended (and over-estimated, as pointed out in this submission) timescales for retrofit further reduce benefits relative to costs.
- The report fails to compare Eskom's so-called emission reduction plan to an alternative of complying with the Minimum Emission Standards without further delay (after the five-year postponement already granted).
- The report also excludes the impact of reductions in mercury emissions that would result from the installation of Flue Gas Desulfurization to comply with the SO₂ standards - failure to comply means substantially higher mercury emissions.

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 of compliance would exceed costs for at least three of the four scenarios considered and quite possibly the fourth. However, given the nature of several of the deficiencies and errors in methodologies identified in the report, a better understanding of effects requires new modelling, which is presented in the following paragraphs.

Correcting bias in Eskom's modelling of health impacts

Compared against a scenario of full compliance with the MES after the 5-year delay to 2025, excluding units set to retire by 2030, the various postponements, variations and exemptions sought by Eskom would allow the company to emit an estimated 19 million tonnes more SO₂, 1 million tonnes more NO_x, and 190,000 tonnes of particulate matter. The failure to install SO₂ 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.

To assess the health impacts of these excess emissions, the Greenpeace Global Air Pollution Unit carried out CALPUFF dispersion modeling closely following the methodology of the modeling used in Eskom's Cost-Benefit Analysis, 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 SO₂, NO_x and primary PM_{2.5} emissions to ambient PM_{2.5} and NO₂ levels were isolated for each station and each pollutant. The resulting avoidable health impacts were projected following the Global Burden of Disease



methodology for PM_{2.5} health impacts³⁵ and a risk function for acute NO₂ exposure selected to avoid double counting with PM_{2.5} health impacts³⁶. Once Medupi and Kusile are in full operation, we estimate that air pollutant emissions from Eskom's coal-fired power plants will be responsible annually for:

- 170 premature deaths due to increased risk of lower respiratory infections in children
- 900 premature deaths due to increased risk of stroke
- 140 premature deaths due to increased risk of lung cancer
- 610 premature deaths due to increased risk of ischaemic heart disease, and
- 220 premature deaths due to increased risk of chronic obstructive pulmonary disease associated with chronic PM_{2.5} exposure, as well as
- 390 premature deaths due to increased risk of death associated with acute NO₂ exposure,

for a total of **2,400 premature deaths per year** (95% confidence interval: 1,500 to 3,000 deaths).

The detailed modeling for individual power plants allowed us to project the reductions in ambient air pollution levels at each location of the modeling domain over time, as emission reductions from meeting the MES or implementing Eskom's "Emission Reduction" plan are realized. The projections take into account expected population growth³⁷ and epidemiological transition associated with improved health care and aging population³⁸.

We project that, over the remaining lifetime of Eskom's coal-fired power plants, the excess emissions allowed if Eskom's requests for non-compliance with the MES are fully granted will lead to the following avoidable health impacts:

- 1,100 premature deaths due to increased risk of lower respiratory infections in children;
- 9,700 premature deaths due to increased risk of stroke;
- 2,200 premature deaths due to increased risk of lung cancer;
- 7,100 premature deaths due to increased risk of ischaemic heart disease;
- 2,500 premature deaths due to increased risk of chronic obstructive pulmonary disease associated with chronic PM_{2.5} exposure; and
- 500 premature deaths due to increased risk of death associated with acute NO₂ exposure.

³⁵ <https://ehp.niehs.nih.gov/doi/full/10.1289/ehp.1307049>

³⁶ <https://www.ahajournals.org/doi/full/10.1161/CIRCRESAHA.116.305060>

³⁷ UN DESA: World Population Prospects 2017. <https://population.un.org/wpp/>

³⁸ WHO: UPDATED WHO PROJECTIONS OF MORTALITY AND CAUSES OF DEATH 2016-2060. https://www.who.int/healthinfo/global_burden_disease/projections/en/



In total, an estimated **23,000 premature deaths** (95% confidence interval: 14,000 to 28,000 deaths) **could be avoided by requiring full compliance with the MES**. This represents a 40% reduction in the cumulative health impact of air pollution from Eskom's power stations.

This health impact assessment is an update of the report "Health impacts and social costs of Eskom's proposed non-compliance with South Africa's air emission standards" published in 2014³⁹. In that report, we estimated that the external social costs avoided by requiring Eskom to fully comply with South Africa's MES would be ZAR230 billion. Since the health impact estimates have increased with the more detailed atmospheric modeling and epidemiological projections used for our updated assessment, the avoided social costs will also be higher, showing that the costs of retrofitting Eskom's coal fleet with basic emission controls technologies are justified and will make South Africa as a society better off.

The 2014 report was reviewed⁴⁰, among other similar studies on health impacts of power plant emissions in South Africa, by scientists 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 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.

We are willing to submit the full study and the recommendations of the review of the previous study, and reserve our rights to supplement this submission with both of these.

Inadequacy of responses to air pollution

Inadequate air pollution monitoring and data

Transparency and public accountability are both lacking in terms of the availability of up to date air quality information. Although the South African Air Quality Information Systems (SAAQIS) claims to provide daily updates on air quality monitoring for various pollutants at monitoring stations in the priority areas, this information is not available for dates prior to November 2018 for any station and later in December 2018 for several stations. Some stations are also still completely offline and are not reporting data, as has been confirmed by the National Air Quality Officer.⁴¹ Data reports on air quality in the Highveld Priority Area are not available past July 2017, and for other stations the latest written report is from March 2018. This sudden halt in the release of written reports is increasingly concerning as time goes on.^{42 43}

³⁹ https://cer.org.za/wp-content/uploads/2014/02/Annexure-5_Health-impacts-of-Eskom-applications-2014-final.pdf

⁴⁰ <https://journals.co.za/content/journal/10520/EJC-1324683d18>

⁴¹ <https://saaqis.environment.gov.za/home/map>

⁴² <http://www.saaqis.org.za/AQDownloads.aspx?type=HPA>

⁴³ <http://www.saaqis.org.za/Downloads.aspx?type=AQ>



There are also gaps in monitoring of all major pollutants, and most monitoring stations only report data for one or two pollutants (i.e. only O₃, NO₂, PM, or SO₂, instead of comprehensive data). Transparency and data availability for public accountability are crucial in ensuring that SAAQIS and the Department of Environmental Affairs are providing accurate information on the state of the air. Claims that NO₂ levels have been below standards for the year 2018 cannot be corroborated without such transparency.

Weak Minimum Emission Standards

Compared with many other countries South Africa has very weak MES that allow coal-fired power stations to currently emit:⁴⁴

- close to 100 times more sulfur dioxide (SO₂) than allowed in China (key regions), more than 20 times more than existing stations in India, and more than 45 times more than new plants in India, and 20 times more than current regulations in the European Union;
- about 6 times more particulate matter (PM) than allowed in the EU and China (key regions) and almost 5 times what is allowed for new stations in India; and
- 15 times more nitrogen oxides (NO₂) than allowed in India (new builds) and China (key regions) and more than 7 times more than currently in the EU.

Nonetheless, the majority of Eskom's coal-fired power stations do not even comply with these comparatively weak MES.

Once new MES come into place in South Africa in 2025, coal-fired power stations in South Africa will still be allowed to emit higher pollution levels than many other coal-producing nations. Under the 2025 MES, coal-fired power stations will be allowed to emit:

- 10 times more NO₂ than key regions in China and new builds in India;
- 5 times more NO₂ than plants in the EU;
- 3 times more PM than key regions in China and plants in the EU; and
- more than double the PM as new build coal-fired power stations in India.

In addition, even if the 500 *mg/Nm³* MES for SO₂ starting in 2025 remains in place, and is not unlawfully doubled by the Department of Environmental Affairs to 1000 *mg/Nm³* as has been recently reported⁴⁵, South African coal-fired power stations will be able to emit:

- 13 times more SO₂ than key regions in China;
- almost 7 times more SO₂ than new build coal-fired power stations in India; and

⁴⁴https://www.environment.gov.za/sites/default/files/gazetted_notices/nemaqa_listofactivities_g33064gon248_0.pdf

⁴⁵<https://www.iol.co.za/saturday-star/dea-secretly-doubles-so2-emission-levels-18283922>



- 3 times more SO₂ than power stations in the EU.

In our view the MES do not meet the standard of "reasonable measures" required by section 24 of the Constitution and should in fact be made substantially more stringent in order to protect human health and the environment.

Emission standards for operating coal-fired power plants compared ⁴⁶

Country/Scope	SO ₂	Nox	PM
China - by 2020	26	37	7
China - key regions	37	73	15
China - others	147	73	22
India, new builds	73	73	22
India, existing	147	440	73
South Korea	105	75	7
EU	147	147	15
EU, from 2023	95	110	6
South Africa, current	3500	1100	100
South Africa, by 2025*	500 (1000)	750	50

Unit: mg/Nm³ @10% O₂; most other countries use 6% reference oxygen so values have been converted to South African standard.

⁴⁶ China:

<http://www.mep.gov.cn/gkml/hbb/bwj/201512/W020151215366215476108.pdf>

http://www.chinafaqs.org/files/chinainfo/China%20FAQs%20Emission%20Standards%20v1.4_0.pdf

India:

Central Pollution Control Board. Environmental Standards - Thermal Power Plants. 2015.

<http://www.cpcb.nic.in/divisionsofheadoffice/pci2/ThermalpowerPlants.pdf>

South Korea:

<http://www.law.go.kr/%EB%B2%95%EB%A0%B9/%EB%8C%80%EA%B8%B0%ED%99%98%EA%B2%BD%EB%B3%B4%EC%A0%84%EB%B2%95%20%EC%8B%9C%ED%96%89%EA%B7%9C%EC%B9%99>

EU: Industrial Emissions Directive <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075>
COMMISSION IMPLEMENTING DECISION establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants. 28 Apr 2017.

http://ec.europa.eu/transparency/regcomitology/index.cfm?do=search.documentdetail&Dos_ID=14177&DS_ID=50159&Version=1

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



Eskom's 'Emission Reduction Plan'

Eskom's euphemistically named "Emission Reduction Plan" would allow the utility to operate its entire existing fleet without even rudimentary controls for two of the most dangerous pollutants emitted from coal-fired power plants: SO₂ and mercury; and with substantial exemptions for controlling NOx and dust emissions. This would be completely irresponsible, particularly since the air pollution levels in High Priority Areas already exceed the maximum levels prescribed in the national ambient air quality standards.

Inflated costs of installing pollution abatement equipment

Eskom uses claims of extremely high costs of installing emission controls, particularly Flue Gas Desulphurization (FGD) equipment, as an argument against compliance with the MES. These claims are based on a study prepared in 2006 by a European consultant, before China, India and other emerging countries started deploying FGDs at scale. Installation of FGDs at eight power stations with a total of 31.6GW generating capacity is claimed to cost R140 to R175 billion overnight, implying an astronomical cost level of R4 400 to R5 500 per kW of capacity. For comparison, costs in China are reported at R400 per kW⁴⁷ and in India at R950 per kW for wet FGD and R670 per kW for semi-dry FGD.⁴⁸ There is accordingly no reasonable basis for Eskom to rely on vastly outdated information to exaggerate the costs of compliance with the new source MES for SO₂, at least 5-fold. This exaggeration also contributes to its claims that costs of compliance exceed benefits. Eskom's cost-benefit analysis is accordingly flawed, and incorrectly inflates the cost of compliance.

Exaggerating the amount of time required to install pollution abatement equipment

Another area where Eskom is dramatically exaggerating the difficulty of compliance is the amount of time required to carry out emission control retrofits. Experiences from other emerging countries (and please note here that we are specifically and consciously not referring to developed countries here as a point of comparison, but rather to other emerging countries) demonstrate that it is entirely feasible to achieve compliance by 2025. For example, China retrofitted approximately 250 gigawatts of existing coal-fired capacity with FGD between 2005 and 2011, resulting in an increase in the proportion of capacity with SO₂ controls from 14.3% to 89.1% in six years. These installations were in response to its national emission standards introduced in 2004. Similarly, after its emission standards were updated in 2011 to levels that required selective catalytic NOx controls (SCR), these retrofits were carried out on approximately 480 GW of capacity by 2015, raising penetration from 18.2% to 84.5% in four years.⁴⁹

⁴⁷ http://acs.engr.utk.edu/publications/2014_sun_1_ep.pdf

⁴⁸ <http://shaktifoundation.in/wp-content/uploads/2018/07/Benefit-cost-analysis-of-emission-standards-for-coal-based-thermal-power-plants-in-India-1.pdf>

⁴⁹ Data summarized from annual editions of China Association of Environmental Protection Industry: Annual Report on China Desulfurization and Denitrification Industry. See e.g. 赵雪,程茜,侯俊先 (2018): 脱硫脱硝行业2017年发展综述. 中国环保产业, 2018(07):10-24.
<http://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFQ&dbname=CJFDLAST2018&filename=ZHBY201807006&v=MTE2NThSOGVYMUx1eFITN0RoMVQzcVRyV00xRnJDVVJMT2ZadVJtRkNybVdyM0IQeVhKZDdHNEg5bk1xSTIGWW8=>



Currently India has targeted 2022 as the year by which its entire coal fleet will comply with stricter standards than the MES by 2022, requiring retrofits in much of its 220GW of operating capacity.

According to India's Ministry of Power, the procurement, construction and connection of an FGD takes 30-36 months⁵⁰, and according to the International Energy Agency 24-36 months.⁵¹ As long as procurement is started in 2019-2020, there is sufficient time install FGDs by the 2025 deadline in all plants that intend to operate beyond 2025.

Failure to commence installment of pollution abatement equipment

It remains unclear why it has taken Eskom so long to get started on retrofitting their fleet, and has overestimated the time that it would take to carry out the retrofit at each site. It appears that Eskom has simply taken a figure of five years for retrofitting anything (FGD, PM filters etc). This stretches the time between investment and benefit, and so skews the Cost-Benefit-Analysis. The National Framework itself recognises that "sufficient time has been afforded to industry" to make the necessary changes.

6 Why Eskom's MES Applications cannot be approved

Eskom's MES applications do not merit consideration

We have set out that the national air quality officer, together with the licensing authorities, may only consider postponement and suspension applications where the binding minimum requirements for consideration, as set out in the National Framework, have been met. It would be *ultra vires* for a decision maker to decide such an application because the law does not provide for such an application to be made.

We have demonstrated above that the industry's air emissions are currently causing, and will continue to cause, direct and severe adverse impacts on the surrounding environment, including the health and well-being of persons of all ages. We have also described how the ambient air quality in Eskom's application areas, being the Highveld, Vaal Triangle and the Waterberg-Bojona Priority Areas, currently exceed the limits of the National Ambient Air Quality Standards.

In addition, we submit that Eskom is attempting to apply for postponements and suspensions outside of the conditions mandated by the Framework. For example, the Kendal power plant will only be decommissioned after 2030. Eskom is applying for the following with regards its Kendal plant:

⁵⁰<http://cpcb.nic.in/openpdf.php?id=UHVibGljYXRpb25GaWxlLzE2MzBfMTUyMzg3MjM0Ni9tZWVpYXBob3RvMjIwODAwGm>

⁵¹<https://www.usea.org/sites/default/files/Emerging%20markets%20for%20pollution%20control%20retrofits%20ccc274.pdf>

- postponement of the new plant standard for PM between 1 April 2020 to 31 March 2025 and an alternative daily limit of 100 mg/Nm³ and an alternative daily limit of 85 mg/Nm³ for PM from 1 April 2025 until decommissioning (2038 - 2043);
- postponement of the new plant standard for SO₂ and an alternative daily limit for SO₂ of 3000 mg/Nm³ from 1 April 2025 until decommissioning (2038 - 2043);
- postponement of the NOx new plant limit and an alternate limit daily limit of 1100 mg/Nm³⁵²; and
- from 1 April 2025 Eskom requests a monthly limit of 750mg/Nm³ until decommissioning (2038-2043).

Section 5.4.3.4 of the Framework provides that plants being decommissioned after 2030 may only apply for a postponement (not a suspension) and that such a postponement “*will be for a period not exceeding 5 years and no postponement would be valid beyond 21 March 2025.*” Eskom is applying for a postponement and alternative daily limits from 2025 until decommissioning which is estimated to occur between 2038 – 2043. According to the Framework, no applications for postponement after 2025 will be valid. The Framework does not provide for such an application, and therefore it should be dismissed.

As the applications made by Eskom do not fall within the scope of the legal requirements for postponement and suspension applications, it would be *ultra vires* for any decision-maker to decide to grant such an application.

Cost Benefit Analysis cannot be used to justify violations of fundamental rights

Eskom seeks to rely on a (deeply flawed) cost-benefit analysis (CBA) as a basis for avoiding compliance with the MES and continuing to cause thousands of premature deaths and severe health and environmental impacts. We agree with the submission made by Life After Coal that a CBA cannot be a justification for avoiding compliance with the MES and there is no legal basis for doing so.

Applying such an approach amounts to trading off fundamental human rights enshrined in the Bill of Rights against the financial expenditure of a parastatal. Allowing anyone, but particularly an organ of state, to infringe human rights on the basis of a CBA is unacceptable in a constitutional democracy founded on the rule of law, human dignity, the achievement of equality and the advancement of human rights and freedoms. Approving Eskom's MES applications would amount to an impermissible limitation of rights enshrined in the Bill of Rights.

Compliance with the MES is a minimum obligation. Eskom is required by the Constitution and by NEMA to take all reasonable measures to avoid contributing to air pollution and climate change. Instead of preparing a CBA that purports to justify continued inaction in

⁵² See page 7 of the Kendal application available at <http://www.naledzi.co.za/assets/documents/Oaa31441166bff1ced87fdca1278f941.pdf>



installing pollution abatement equipment, and the continuation of severe health and environmental impacts, Eskom should have undertaken a CBA to evaluate (on a unit-by-unit basis) whether it was preferable to install FGD equipment in order to comply with the law, or to decommission the unit and if necessary, procure replacement electricity from renewable energy sources. Such a CBA should also take into account the very substantial benefits arising from the reduction of greenhouse gas emission associated with the early decommissioning of coal-fired power units or stations. A failure to take the climate change implications of allowing coal-fired power stations to continue operating biases the analysis against adopting accelerated decommissioning as an emissions reduction strategy.

Intalling pollution abatement equipment at all coal-fired power stations is a feasible measure that Eskom could and should already have implemented in compliance with its duties under the Constitution and NEMA. Approval of Eskom's MES applications would simply make the decision-makers complicit in this unlawful behaviour and its severe human and environmental consequences.

Approval of Eskom's MES Applications would be unlawful

It is clear from the above that approving Eskom's MES applications would be a violation of the Constitutional duties of the State to respect, protect, promote and fulfil the rights in the Bill of Rights. These include the right to life and to an environment that is not harmful to their health or well-being. In fact there is no basis in law for approving Eskom's MES applications.

Eskom, as an organ of State, is also bound to take reasonable measures to prevent pollution and ecological degradation. Importantly, section 24 does not qualify the State's obligation to protect the environment based on available resources. We have provided clear evidence that emissions from coal-fired power stations pose a major environmental and health risk and cause disease and death. We have also shown that full compliance with the MES would avoid an estimated total of 23,000 premature deaths and reduce the health impacts of air pollution from Eskom's power stations by 40%. Purporting to authorise Eskom to postpone compliance with the MES would amount to condoning the Eskom's ongoing breach of its legal duties under the Constitution and NEMA, and would be unlawful.

Even if Eskom's MES Applications met the pre-conditions for consideration (which they do not) the decision-makers must refuse them because evidence before the decision-makers makes it clear that:

- there is no basis in law for approving them;
- Eskom's (flawed) CBA cannot justify infringing the Bill of Rights;
- the application is misleading in several material respects (e.g. Eskom's estimates of how much it would cost to comply with the new source MES for SO₂ is at least five times higher than the actual costs, and it has exaggerated the time necessary to procure and install FGDs);
- approving Eskom's MES applications will result in the premature and avoidable deaths of thousands of people combined with significant environmental harm; and



consequently would be wholly inconsistent with the Bill of Rights, NEMA and NEM:AQA.

In line with the NEMA section 2 principles, the State must place the burden of the costs of remedying and preventing further pollution on the polluter – Eskom. It must place people and their needs at the forefront and serve their needs and interests equitably, and therefore cannot justify further pollution on economic grounds. Particularly with due consideration of the lengthy period of time that Eskom has had to meet the MES, the only reasonable conclusion is that Eskom must be held to the MES, without any further postponement or suspension.

Provision of false and/or misleading information

We have described above the number of false, exaggerated and misleading statements that are contained in Eskom's application documents. These statements have the effect of skewing the cost-benefit analysis to inflate the cost of compliance, to Eskom's favour in the present applications.

We note further that Eskom has also failed to refer to the conditions required for application consideration, and in particular, the requirements that the application must demonstrate no adverse environmental impact and that the ambient air quality for the application area cannot currently exceed the ambient standards.

There is accordingly at least a *prima facie* case to say that the information contained in the application documents contains false and misleading information. Provision of false and misleading information to an air quality officer constitutes a criminal offence in terms of section 51(1)(f). This should at the very least have the consequence of the information not being relied upon and the application being rejected. Any decision knowingly based on false information cannot be sustained.

7 Conclusion

Greenpeace Africa strongly objects to allowing Eskom any further postponements or suspensions for multiple coal-fired power stations from complying with the Minimum Emission Standards. Instead, where coal-fired power stations cannot even meet South Africa's comparably lax emission standards, they should not operate/should be decommissioned on an accelerated timeline. We have laid down here that:

- Constitutional rights and air pollution legislation in South Africa are violated by the current operation of Eskom coal-fired power stations. Air pollution, with its devastating impacts on human health and well-being, remains a significant problem in our country, particularly in the priority areas such as the Highveld, where air quality remains poor or has further deteriorated from "potentially poor" to "poor" against all intentions of the law.
- Mpumalanga province in South Africa is the largest NO₂ air pollution hotspot in the World, as new satellite data assessed by Greenpeace showed for the period

between 1 June to 31 August 2018. There is clear evidence of the huge impacts of coal-fired power stations on the air quality in the region, and that the highest concentrations recorded at monitoring stations are clearly linked to emissions from coal-fired power plants operation.

- Between April 2016 and December 2017 the 17 Eskom coal-fired power stations reported nearly 3,200 exceedances of applicable daily Atmospheric Emissions Licenses (AEL) limits for particulate matter (PM), sulfur dioxide (SO₂), and oxides of nitrogen (NO_x).
- Compared with many other countries South Africa has very weak MES, that allow coal-fired power stations to currently emit:
 - Close to 100 times more sulfur dioxide (SO₂) than allowed in China (key regions), 20 times more than existing stations in India and more than 45 times more than new plants in India and more than 20 times more than current regulations in the European Union;
 - About 6 times more particulate matters (PM) than allowed in the EU and China (key regions) and almost 5 times what is allowed for new stations in India; and
 - 15 times more nitrogen oxides (NO₂) than allowed in India (new build coal-fired power stations) and China (key regions) and more than 7 times more than currently in the EU.
- Eskom significantly underestimates the health impacts of their coal-fired power stations and annual premature deaths by ignoring international research standards.
- An estimated total of 23,000 premature deaths could be avoided by requiring full compliance with the MES. This represents a 40% reduction in the health impacts of air pollution from Eskom's power stations.
- Eskom's "Emission Reduction Plan" would allow the company to operate its entire existing fleet without even rudimentary controls for two of the most dangerous pollutants emitted from coal-fired power plants: SO₂ and mercury, and with substantial exemptions for controlling NO_x and dust emissions.
- Compliance to MES by Eskom should technically be possible in time as other countries have already shown:
 - China retrofitted approximately 250 gigawatts of existing coal-fired capacity with FGD between 2005 and 2011, bringing share of capacity with SO₂ controls from 14.3% to 89.1% in six years; and
 - India is aiming to bring its entire coal fleet to compliance with stricter standards than the MES by 2022, requiring retrofits in much of its 220GW of operating capacity. According to India's Ministry of Power, the procurement, construction and connection of an FGD takes 30-36 months, and according to the International Energy Agency 24-36 months. As long as procurement is started in 2019-2020, there is sufficient time install FGDs by the 2025 deadline in all plants that intend to operate beyond 2030.



- Eskom uses claims of extremely high costs of installing emission controls, particularly Flue Gas Desulphurization (FGD) equipment, as an argument against compliance with the MES. These claims are based on outdated research from 2006, before China, India and other emerging countries started deploying FGDs at scale.
 - Eskom exaggerates the costs of compliance with the new source MES for SO₂ at least 5-fold, completely invalidating claims that costs of compliance exceed benefits.

For the reasons set out in this submission the National Air Quality Officer and the licensing authorities are required by law to refuse to consider Eskom's MES Applications because they do not meet the minimum requirements for considering applications.

In the (unlawful) event that the applications are considered, the decision makers must, in accordance with their legal duties, place people, their needs and their health, together with the health of the environment, at the forefront and refuse Eskom's multiple postponement and suspension applications.

Greenpeace Africa is willing to provide further expert evidence in support of its submissions should it be required by the National Air Quality Officer or the licensing authorities in deciding on these applications.

Greenpeace Africa reserves its rights to amend or update this submission.