

IN THE HIGH COURT OF SOUTH AFRICA  
GAUTENG DIVISION, PRETORIA

Case No: \_\_\_\_\_

In the matter between:

**AFRICAN CLIMATE ALLIANCE**

First Applicant

**VUKANI ENVIRONMENTAL JUSTICE  
MOVEMENT IN ACTION**

Second Applicant

**THE TRUSTEES FOR THE TIME BEING  
OF GROUNDWORK TRUST**

Third Applicant

and

**THE MINISTER OF MINERAL RESOURCES AND ENERGY**

First Respondent

**THE NATIONAL ENERGY REGULATOR  
OF SOUTH AFRICA**

Second Respondent

**THE MINISTER OF FORESTRY, FISHERIES  
AND THE ENVIRONMENT**

Third Respondent

**THE PRESIDENT OF THE REPUBLIC OF  
SOUTH AFRICA**

Fourth Respondent

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I, the undersigned,

**SARAH ROBYN FARRELL**

State under oath the following:

- 1 I am an adult working as the Director of the First Applicant, the African Climate Alliance.
- 2 The facts contained in this affidavit are within my knowledge, unless the context indicates otherwise, and are true and correct, to the best of my knowledge and belief.
- 3 Where I make submissions on the applicable law I do so on the advice of the applicants' legal representatives.

# **1 INTRODUCTION AND OVERVIEW**

- 4 This is a constitutional challenge to the state's plans to procure 1500 MW of new coal-fired power stations, which threaten the rights of present and future generations in South Africa.
- 5 On 25 September 2020, the Minister of Mineral Resources and Energy ("**Minister**") made a determination, with the concurrence of the National Energy Regulator of South Africa ("**NERSA**"), for 1500 MW of new electricity capacity to be generated from coal-fired power in the next decade, and to be procured from independent power producers.<sup>1</sup>

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<sup>1</sup> Determination, **FA36**.

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- 6 This followed the publication of the revised Integrated Resource Plan ("**2019 IRP**"), on 18 October 2019, which set out plans for 1500 MW of new coal-fired power capacity between 2023 and 2027.<sup>2</sup>
- 7 These decisions were taken at a time of impending climate catastrophe. President Ramaphosa has declared that climate change "*is the most pressing issue of our time.*"<sup>3</sup> Its effects on the people of South Africa are already being felt and will be catastrophic without urgent mitigation and adaptation.<sup>4</sup> These facts are not in dispute.
- 8 It also cannot be disputed that South Africa is among the 15 most significant contributors to the greenhouse gas emissions ("**GHGs**") which cause climate change. This is due, in substantial part, to our reliance on coal for electricity generation. Carbon dioxide ("**CO<sub>2</sub>**") is the primary GHG emitted from coal-fired power.<sup>5</sup>
- 9 The need for urgent action is clear. Recent reports published by the UN Intergovernmental Panel on Climate Change ("**IPCC**") show that radical emissions reductions are required in the next nine years before 2030, and "net zero" emissions by 2050, to achieve the Paris Agreement goal of less than 1.5°C of global warming above pre-industrial levels. The IPCC further confirms that every tonne of further CO<sub>2</sub> emitted into the atmosphere adds to global warming.<sup>6</sup>
- 10 While the difference between 1.5°C and 2°C may seem small, the consequences for present and future generations are vast. The world has already warmed by 1.1 °C

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<sup>2</sup> 2019 IRP, **FA24**.

<sup>3</sup> President Ramaphosa's speech at a Virtual Leaders' Summit on Climate Change in April 2021, **FA51**.

<sup>4</sup> Section IV D below.

<sup>5</sup> Section IV C below.

<sup>6</sup> Section IV B below.

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beyond pre-industrial levels, as a result of human activities, with a limited window of opportunity to keep within the 1.5°C warming.

- 11 Climate change and its catastrophic consequences are already a reality, but these consequences will continue to escalate throughout the 21<sup>st</sup> century if global average temperatures continue to rise unchecked. By the time that these consequences are truly felt, many of the adult decision-makers will be long dead. Children, young people and future generations will be left to deal with the consequences of extreme weather events, heatwaves, droughts, coastal flooding, famine, cyclones and social upheavals that will follow.
- 12 Coal-fired power is the single most significant contributor to global warming, with coal combustion accounting for at least a third of global temperature increases experienced to date.<sup>7</sup>
- 13 For this reason, the UN Secretary General António Guterres has urged states to cancel all global coal projects in the pipeline. In a speech given in March 2021, he called for the phasing out of coal from the electricity sector, as *"the single most important step to get in line with the 1.5-degree goal of the Paris Agreement."*<sup>8</sup>
- 14 The severe impact of coal-fired power on human health, in addition to the climate change impacts, is also well-documented and incontrovertible. Air pollution from existing coal-fired power stations is estimated to cause thousands of premature deaths

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<sup>7</sup> Section IV C below.

<sup>8</sup> UN Secretary General's speech in March 2021, FA59.

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each year, as confirmed in a series of reports that I describe in detail below, including a recent report by the Department of Forestry, Fisheries, and the Environment.<sup>9</sup> Coal production and burning has also caused widespread environmental devastation.

15 In these circumstances, the procurement of 1500 MW of new coal-fired power represents a severe threat to the constitutional rights of the people of South Africa, including the section 24 environmental rights, the best interests of the child, the rights to life, dignity and equality, among other implicated rights.<sup>10</sup>

16 These constitutional violations will disproportionately impact the poor and the vulnerable, including women, children and young people. Children are physically and psychologically more vulnerable to the shocks and disruptions caused by a polluted environment and climate change.<sup>11</sup> They will also have to live with the consequences of the government's decisions for decades to come.

17 South Africa has the opportunity to move away from its reliance on polluting fossil fuels and to protect constitutional rights. Over the last decade, the price of renewable energy has plummeted. It has been shown, incontrovertibly, that renewable solar and wind with flexible generation capacity, such as storage (even under circumstances where the sun does not shine and the wind does not blow), provide feasible and affordable replacement alternatives for coal power.

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<sup>9</sup> Described in Section IV G below.

<sup>10</sup> Section VI A below.

<sup>11</sup> UNICEF "The Climate Crisis is a Child Rights Crisis" Annexure FA68.

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17.1 Already in 2016, electricity produced by new solar and wind was almost half the price of electricity from new coal.<sup>12</sup>

17.2 These prices have continued to fall. In the Department of Mineral Resources and Energy's October 2021 announcement of preferred bidders for new renewable energy, the average tariff on new wind power stood at 49.5 cents per kilowatt hour ("kWh") and new solar photovoltaics ("**solar PV**") stood at 42.9 cents per kWh.<sup>13</sup> This is compared with an estimated cost of up to R2.07 per kWh for new coal-fired power.<sup>14</sup>

18 As a result, renewable energy as an alternative to coal is no longer merely an environmental and human-health imperative, but it is an economic imperative too. Recent modelling shows that the addition of 1500 MW of new coal capacity is projected to cost South Africa between R23 billion and R109 billion in comparison to an optimal "least cost" electricity system for the country.<sup>15</sup>

19 Recognising these rapid technological changes, government's 2018 draft IRP acknowledged that on a "*least cost*" model for future electricity generation, no new coal-fired power stations are required. On the government's own economic model, the bulk of South Africa's future electricity supply ought to be sourced from cheap and plentiful renewable energy.<sup>16</sup>

<sup>12</sup> Section VI B below.

<sup>13</sup> CSIR Analysis of the October 2021 Renewable Energy Independent Power Producer Programme (REIPPP) tariffs, Annexure FA91A.

<sup>14</sup> NERSA's concurrence in the Minister's determination, Annexure FA 34 para 5.5.23, figure 8

<sup>15</sup> UCT Energy Systems Research Group ("**ESRG**") Report, Annexure FA5.

<sup>16</sup> The 2018 draft IRP, Annexure FA19. Described in Section IV A below.

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20 However, the Minister and NERSA have turned their face against their own economic modelling and their constitutional obligations. They have instead endorsed the procurement of 1500 MW of new coal-fired power over the next decade, despite the harms and costs.

21 In these circumstances, there is no reasonable and justifiable basis for the limitation of constitutional rights resulting from the government's plans for new coal.

22 The applicants and their attorneys have made repeated attempts to engage with the Minister and NERSA through detailed correspondence, urging them to reconsider their stance. These efforts have been largely ignored.<sup>17</sup>

23 Accordingly, the applicants seek orders declaring invalid and setting aside the Ministerial determination, NERSA's concurrence, and the 2019 IRP to the extent that they provide for the procurement of 1500 MW of new coal.

24 This application is brought on two legal bases:

24.1 First, a constitutional challenge to the impugned decisions, as these decisions unjustifiably limit basic constitutional rights.

24.2 Second, a review application, based on the Promotion of Administrative Justice Act 3 of 2000 ("**PAJA**"), alternatively, the constitutional principle of legality.

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<sup>17</sup> Section IV A below.

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25 This application is supported by affidavits deposed to by children and young people who have been affected by climate change and are concerned about the future impact of climate change throughout their lives. The deponents include:

25.1 Anelisa Mgedezi, a 14-year-old learner who lives in Khayelitsha, Cape Town.

25.2 Yola Mgogwana, a 14-year-old learner who also lives in Khayelitsha.

25.3 Lulama Jolobe, a 13-year-old learner who lives in Mowbray, Cape Town.

25.4 Ms Lisakhanya Mathiso, an 18-year-old student who lives in Khayelitsha.

25.5 Ms Michelle Mhaka, a 21-year-old student and environmental activist living in Cape Town.

25.6 Gabriel Klaasen, a 23-year-old activist living in Cape Town.

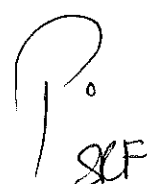
25.7 Ms Mbali Mathebula, a 25-year old living in Emalahleni, Mpumalanga.

25.8 Ms Beatrice Sibabela, a 25-year old living in Lephalale, Limpopo.


26 It is also supported by affidavits from people who live near coal mines and coal-fired power stations and explain the devastating effects of coal on their health and wellbeing. They include:

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- 26.1 Mr Goodman Mashiya, a resident of Emalahleni, Mpumalanga and father of three children, who describes the impact of nearby coal-fired power stations and coal mining on his community and his family.
- 26.2 Ms Musawenkosi Dlamini, a student living in Emalahleni, who describes how coal-fired power stations have impacted her health and her community.
- 26.3 Ms Nonhlanhla Ngwenya, who is also from Emalahleni and has experienced the health impacts of coal first-hand.
- 26.4 Ms Helena Greyling, who lives in Lephalale, Limpopo, and has experienced the impact of the Matimba and Medupi power stations on her children's health and her community.
- 27 This application is further supported by the following expert reports and accompanying affidavits:
- 27.1 A report by Prof Robert Scholes and Prof Francois Engelbrecht of the Global Change Institute at the University of Witwatersrand on 'Climate Impacts in southern Africa during the 21st Century', attached as "FA1".
- 27.2 A report by Prof Nicholas King, titled 'Climate Change Implications for SA's Youth: What will basic lifestyles and services look like in 2030, 2040 and beyond for today's children and future generations?', attached as "FA2".



- 27.3 A report by Dr Garret Barnwell on 'The Psychological and Mental Health Consequences of Climate Change in South Africa' attached as "FA3".
- 27.4 A report by Dr Ranajit (Ron) Sahu, titled 'Comments on Potential Impacts of Proposed New Coal Generation under the South Africa 2019 Integrated Resource Plan' attached as "FA4".
- 27.5 A report by the University of Cape Town's Energy Systems Research Group, titled 'Assessment of new coal generation capacity targets in South Africa's 2019 Integrated Resource Plan for Electricity' attached as "FA5".
- 27.6 A report by Climate Equity Reference Project, 'New Coal Power Generation in South Africa in Light of South Africa's Climate Fair Share' attached as "FA6".
- 28 Affidavits from each of the experts, confirming the contents of their expert reports, will be filed together with this affidavit. Where it has not been possible for experts to depose to their affidavits in time, these will be filed as soon as they become available.
- 29 In this affidavit, I will make further reference to reports and studies by leading international organisations, climate researchers, and the South African government itself. Where it has not been possible to source confirmatory affidavits from the relevant authors, the applicants request leave to introduce this evidence in the interests of justice, under section 3(1)(c) of the Law of Evidence Act 45 of 1988.
- 30 At the outset, I emphasise that the relief sought by the applicants would not impact on the remaining portions of the determination and the 2019 IRP, particularly those portions



calling for the procurement of new renewable energy. The applicants fully endorse the development of renewable energy capacity, as the cheapest and most sustainable way to fix the current energy crisis in South Africa.

31 In focusing this challenge on the 1500 MW of new coal-fired power, the applicants do not ignore or downplay the harms of other forms of fossil-fuel generated power. Nor do the applicants concede that other forms of fossil-fuel power, such as gas or diesel, are necessary for the energy mix or compatible with the government's constitutional and international obligations. The focus of this application on coal-fired power is warranted due to the incontrovertible harms, the availability of cheaper alternatives, and the ruinous consequences that would follow from the addition of new coal-fired power. The applicants specifically reserve their rights to challenge the procurement of other forms of fossil fuel-generated power in future and/or concurrent litigation.

32 In what follows, I demonstrate the applicants' entitlement to the relief sought by addressing the following issues in turn:

32.1 In Section II, I set out the parties and the applicants' standing;

32.2 In Section III, I outline the relevant legal framework;

32.3 In Section IV, I address the factual background to this application;

32.4 In Section V, I explain the legal bases of this application;

32.5 In Section VI, I address the constitutional challenge to the impugned decisions;

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32.6 In Section VII, I set out the grounds for review;

32.7 In Section VIII, I explain the remedies sought by the applicants; and

32.8 In Section IX, I address procedural matters and condonation.

## II PARTIES

### A APPLICANTS

33 The first applicant is **AFRICAN CLIMATE ALLIANCE NPC** ("ACA").

33.1 ACA is a registered non-profit company with registration number 2020/079857/08, with its registered address at 37 Royce Road, Bryanston, Sandton, Gauteng, 2191. A copy of a Searchworks Company and Intellectual Property Commission ("CIPC") record for ACA is attached marked "FA7".

33.2 It is a youth-led, grassroots organisation acting and advocating for climate justice (social, environmental and climate change). The group was born out of the school-youth-led 2019 climate protests in line with Fridays for Future and now focuses on Afrocentric climate literacy, action and advocacy with youth at the centre. The organisation has a number of networks including a youth network of more than 150 youth, a network of civil society partners, and a network of activists across 9 different African countries.

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33.3 I attach a copy of ACA's Memorandum of Incorporation and a resolution by ACA's Board of Directors authorising the institution of this application as "FA8" and "FA9" respectively.

34 The Second Applicant is **VUKANI ENVIRONMENTAL JUSTICE MOVEMENT IN ACTION ("VEJMA")**.

34.1 VEJMA is a registered non-profit company with registration number 2016/514989/08, with its registered address at 6157, Extension 10, Kwaguqa, Emalahleni, Mpumalanga. A copy of a Searchworks CIPC record for VEJMA is attached marked "FA10".

34.2 The members of VEJMA are individuals or group organisations that are based or are operating in the Highveld and who seek directly and indirectly to promote environmental justice for individuals residing in the Mpumalanga Highveld. A number of the members of VEJMA and their families are directly and daily affected by the air pollution in the Highveld due to their close proximity to a number of coal mines, coal-fired power stations and other industrial activities in the area.

34.3 VEJMA was established with the vision of promoting awareness of and advocating for environmental justice within the Highveld and more broadly the country.

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34.4 I attach a copy of VEJMA's Constitution and a resolution by the Management Committee of VEJMA authorising the institution of this application as "FA11" and "FA12" respectively.

34.5 A confirmatory affidavit of **THEMBISILE MBETHE**, of VEJMA will accompany this affidavit.

35 The Third Applicant is the body of **TRUSTEES FOR THE TIME BEING OF THE GROUNDWORK TRUST** ("groundWork").

35.1 groundWork is a trust, with its main objective being to promote increased, sustained, and more effective civil society-driven environmental justice action.

35.2 I attach a copy of groundWork's Trust Deed marked "FA13" and the trustees' resolution authorising the institution of this application marked "FA14".

35.3 groundWork operates as a non-profit environmental justice service and developmental organisation with NPO-number 045-235-NPO, with its principal place of business at 8 Gough Road, Pietermaritzburg, 3201.

35.4 It works with South and Southern African communities and organisations on environmental justice and human rights issues, focusing on coal, climate and energy justice, waste, and environmental health.

35.5 A confirmatory affidavit of **ROBBY MOKGALAKA**, of groundWork will accompany this affidavit.

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**B RESPONDENTS**

36 The first respondent is the **MINISTER OF MINERAL RESOURCES AND ENERGY** ("the Minister").

36.1 The Minister is cited in his official capacity as the member of the national executive responsible for developing the IRP and with the power to make determinations for new generation capacity in terms of the Electricity Regulation Act, 2006 ("**ERA**"). The Minister promulgated the IRP in October 2019 and the determination of September 2020, which are the subject of this application.

36.2 Service will be effected on the Minister at 192 Visagie Street Corner Paul Kruger & Visagie Street, Pretoria in accordance with Rule 4(9) of the Uniform Rules of Court as well as on the office of the State Attorney at 316 Thabo Sehume Street, Pretoria Central.

37 The second respondent is the **NATIONAL ENERGY REGULATOR OF SOUTH AFRICA** ("**NERSA**").

37.1 NERSA is cited in its capacity as an organ of state established under the National Energy Regulator Act, 2004, and undertaking the functions of the National Electricity Regulator as set out in section 4 of the ERA. NERSA is the concurrent decision-maker in respect of determinations issued under section 34 ERA, including the determination which is the subject of this application.

37.2 Service will be effected on the NERSA at its offices at 526 Madiba Street, Arcadia, Pretoria in accordance with Rule 4(9) of the Uniform Rules of Court.

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38 The third respondent is the **MINISTER OF FORESTRY FISHERIES AND ENVIRONMENT** ("the Environment Minister").

38.1 The Environment Minister is cited in her official capacity as the member of the national executive responsible for environmental affairs in South Africa and leading the department particularly in supporting, informing, monitoring and reporting efficient and effective international, national and significant provincial and local responses to climate change.

38.2 Service will be effected on the Environment Minister at Environment House, 473 Steve Biko Road, Arcadia, Pretoria.

38.3 The Environment Minister is cited for such interest that she may have in the matter. No relief is sought against the Environment Minister, except for costs in the event of opposition.

39 The fourth respondent is the **PRESIDENT OF THE REPUBLIC OF SOUTH AFRICA** ("the President").

39.1 The President is cited in his official capacity as the head of the national executive with overall constitutional responsibility for coordinating the functions of state departments and administrations and for developing and implementing national policy.

39.2 The President is cited for such interest as he may have in this matter. No relief is sought against the President, save for costs in the event of opposition.

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39.3 Service will be effected on the President at the Union Buildings, situated at Government Avenue, Pretoria.

**C STANDING**

40 The applicants bring this application in terms of section 38 of the Constitution and section 32 of the National Environmental Management Act 107 of 1998 ("**NEMA**") in:

40.1 their own interest,

40.2 the interests of their members,

40.3 the public interest, and

40.4 the interest of protecting the environment.

41 The applicants, their members and the public have a direct and substantial interest in the resolution and outcome of this matter. The impugned decisions amount to a breach of constitutional rights and obligations that will have far reaching consequences for present and future generations.

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### III RELEVANT LEGAL FRAMEWORK

#### A CONSTITUTIONAL RIGHTS

42 Section 7(2) of the Constitution makes it clear that the state bears an obligation to respect, protect, promote and fulfil the rights contained in the Bill of Rights. This requires that its actions must be reasonable and effective, assessed both in light of our own Constitution but also in terms of international law.

43 Section 24 of the Constitution provides essential context for this application. It provides that:

*“Everyone has the right –*

*(a) to an environment that is not harmful to their health or well-being; and*

*(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –*

*(i) prevent pollution and ecological degradation;*

*(ii) promote conservation; and*

*(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”*

44 As I will explain below, the South African government accepts that climate change poses a substantial threat to this section 24 right and related constitutional rights. As a result, the government has signed and ratified international agreements committing the country to the global effort to address climate change, including the Paris Agreement. The government also recognises that coal-fired power stations are the single largest source of this country’s GHG emissions, which cause global heating and thus lead to climate change.<sup>18</sup>

<sup>18</sup> Described in Section IV C below. See, for example, Department of Environmental Affairs’ 7<sup>th</sup> National Greenhouse Gas Inventory for South Africa 2000 – 2017, attached as **FA56**.

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45 Section 28(2) of the Constitution enjoins the state to ensure that in all matters concerning children, their best interests are of paramount importance. The “best interests” principle is both a substantive right and a guiding principle that must inform all state actions. It has particular significance in this case, as children are most vulnerable to the impacts of climate change and the further health risks caused by coal-fired power stations.

46 Further constitutional rights are also implicated by the state’s plans, including:

46.1 The right to equality, which is protected under section 9;

46.2 The right to dignity provided for in section 10;

46.3 The section 11 right to life; and

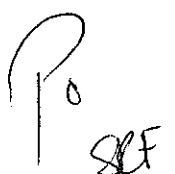
46.4 The section 27 rights to healthcare, food and water, which include a negative duty on the state not to take actions which deprive people of the enjoyment of these rights.

## **B SOUTH AFRICA’S INTERNATIONAL CLIMATE CHANGE OBLIGATIONS**

47 South Africa is party to several international legal instruments aimed at addressing climate change. It has signed and ratified the United Nations Framework Convention on Climate Change (“**Framework Convention**”), acceded to the Kyoto Protocol and signed and ratified the Paris Agreement of 2015.

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- 48 The Paris Agreement commits state parties to limiting the global average increase in temperature to *"well below 2°C above pre-industrial levels"* and to *"pursue efforts to limit the temperature rise to 1.5°C above pre-industrial levels"* (Article 2(1)(a)).
- 49 To achieve this goal, state parties are required to set emissions reduction targets, called nationally determined contributions ("**NDCs**") (Article 3, Paris Agreement), and have pledged to reduce emissions at the *"highest possible ambition"* (Article 4).
- 50 South Africa's first NDC, submitted in 2015, though now revised in September 2021, committed that national GHG emissions would peak from 2020-2025 in the range between 398 and 614 Mt CO<sub>2</sub>-eq, and thereafter plateau and then decline from 2035. A copy is attached as annexure "**FA15**".
- 51 The 2015 NDC acknowledges the necessity of keeping temperature increases well below 2°C or even below 1.5°C, *"in light of emerging science, noting that global average temperature increase of 2°C translates to up to 4°C for South Africa by the end of the century"* (page 1, South Africa's NDC, 2015). The 2015 NDC also recognises that near zero GHG emissions are required by 2050. Despite this, the 2015 NDC was rated as "highly insufficient" by Climate Action Tracker in its analysis, attached as "**FA15A**".
- 52 State parties must submit a new NDC every 5 years. The next contribution must be a *"progression beyond"* the current one (Article 4.3, Paris Agreement). Being a signatory entails progression, not regression, in relation to climate mitigation and adaptation and must reflect South Africa's highest possible ambition. Thus, South Africa's commitments under the Paris Agreement can only become stricter over time.

A handwritten signature in black ink, consisting of a large, stylized 'P' followed by a smaller 'o' and a series of loops and strokes that form the letters 'S', 'C', 'F'.

53 An update to the 2015 NDC ("**NDC update**") was submitted in September 2021 ahead of the 26<sup>th</sup> Conference of the Parties to be held in November 2021. The NDC update commits to, *inter alia*, an emissions target range for 2030 of between 350 and 420 megatonnes of carbon dioxide equivalent ("**MtCO<sub>2</sub>eq**")<sup>19</sup> in 2030.<sup>20</sup> The NDC update is attached as "**FA16**".

54 This updated NDC was approved by Cabinet, on the strength of the recommendations of the Presidential Climate Change Commission, a multi-stakeholder body established by President Ramaphosa. The Commission had urged more ambitious targets than what were initially proposed by the Department of Forestry, Fisheries and Environment. In its first report, published in June 2021, the Commission recommended the revised emission targets by 2030, with "net zero" emissions by 2050. This means that by mid-century, emissions must be balanced with their removal. I attach a copy of the Presidential Commission's report as "**FA17**".

## C THE ELECTRICITY REGULATION ACT ("ERA") AND NERSA ACT

55 The ERA establishes a national regulatory framework for the electricity supply industry.

The objects of the ERA, as set out in section 2, are to, *inter alia*:

*"(a) achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa;*

*(b) ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic;*

<sup>19</sup> Carbon dioxide equivalent is a measure used to compare the emissions from various greenhouse gases, such as methane and nitrous oxide, on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming.

<sup>20</sup> This amount includes emissions from land use, land use change and forestry (LULUCF).

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... and

*(g) facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public" (emphasis added)."*

56 The ERA defines the IRP as "a resource plan established by the national sphere of government to give effect to national policy".

56.1 Section 4(a)(iv) of the ERA recognises the existence of the IRP and requires NERSA to issue rules designed to implement it.

56.2 Regulation 4(1) of the Electricity Regulations on New Generation Capacity under ERA stipulate that "the integrated resource plan shall- (a) be developed by the Minister after consultation with the Regulator; and (b) be published in the Government Gazette by the Minister".

57 The IRP therefore deals with a range of issues concerning the provision of electricity, including – for example – the sources of such electricity (for instance coal, renewable energy (solar and wind) or gas) and the amount planned to be generated from each source and in which years.

58 All new generation capacity must be licensed by NERSA unless specified exemptions, as set out in Schedule 2 to the ERA, are met. Section 10(2)(g) of the ERA requires that an application for a NERSA licence must provide evidence of compliance with any IRP applicable at that point in time or provide reasons for any deviation from the IRP, for the approval of the Minister. In other words, all new generation capacity must (unless expressly exempt) be aligned with the IRP, including new capacity called for under a Ministerial determination.

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- 59 The IRP is thus a crucial planning document for new electricity generation capacity in South Africa. The nature of South Africa's electricity mix, including which sources are used in what proportion, for how long, and subject to what conditions, has a material and direct impact on the rights of the people of South Africa, including on the right to an environment not harmful to health or wellbeing (section 24 of the Constitution).
- 60 Ministerial determinations for new generation capacity are provided for in section 34 of the ERA. Section 34 states that the Minister of Energy may, in consultation with NERSA, determine that new generation capacity is needed and the types of energy sources from which electricity must be generated. NERSA is a concurrent decision-maker in respect of section 34 determinations.
- 61 NERSA is the designated authority, established under the NERSA Act to regulate the electricity, piped-gas and petroleum pipeline industries; and to provide for matters connected therewith. It is required to undertake the functions of the National Electricity Regulator as set out in section 4 of the ERA (section 4(1)(c), National Energy Regulator Act, 2004).
- 62 NERSA's decisions, including its concurrences in the Minister's determinations, must meet the requirements of section 10 of the National Energy Regulator Act, 2004 ("**NERSA Act**"), which states:

*(1) Every decision of the Energy Regulator must be in writing and*

*(a) consistent with the Constitution and all applicable laws;*

*(b) in the public interest;*

*(c) within the powers of the Energy Regulator, as set out in this Act, the Electricity Act, the Gas Act and the Petroleum Pipelines Act;*

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*(d) taken within a procedurally fair process in which affected persons have the opportunity to submit their views and present relevant facts and evidence to the Energy Regulator;*

*(e) based on reasons, facts and evidence that must be summarised and recorded; and*

*explained clearly as to its factual and legal basis and the reasons therefor.*

*(2) Any decision of the Energy Regulator and the reasons therefor must be available to the public except information that is protected in terms of the Promotion of Access to Information Act, (Act No. 2 of 2000)" (emphasis added).*

63 The Minister's section 34 determination and NERSA's concurrence are initial steps in a multi-stage process before the construction of new coal-fired power stations may commence. This process typically has five primary stages:

63.1 First, the publication of the IRP;

63.2 Second, the Minister's section 34 determination for new generation capacity, published with NERSA's concurrence;

63.3 Third, the initiation of a procurement process for independent power producers ("IPPs"), which will be administered by the Department of Mineral Resources and Energy ("DMRE") if the Minister, with NERSA's concurrence, has determined that the new generation capacity shall be procured from IPPs;

63.4 Fourth, the environmental authorisation and licensing process, in which prospective power stations will have to secure all required environmental authorisations and licences – in addition to other approvals - to allow them to reach "financial and commercial close"; and

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63.5 Finally, the conclusion of power purchase agreements between the selected IPPs and Eskom, as the designated buyer, and thereafter – commercial and financial close.

64 Each step in this process and each decision-maker involved in these processes must ensure that the decisions are compatible with constitutional rights and legal obligations. Each decision-maker has self-standing constitutional obligations.

65 For this reason, the Minister and NERSA cannot defer consideration of constitutional rights and environmental harms to other “downstream” decision-making processes. The protection and promotion of constitutional rights must inform decision-making at every level and each decision must be compatible with the state’s constitutional obligations.

66 As I explain below, decision-makers have justified the granting of environmental authorisations and other licences to proposed coal-fired power stations by relying on the previous version of the IRP. NERSA is also bound by the Minister’s section 34 determination in its licensing decisions, as provided for in section 34(3) of ERA. Accordingly, the IRP and the Minister’s determination have direct, external legal effect which impact on the rights of all South Africans.

#### **D THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)**

67 NEMA is the overarching environmental legislation which provides a framework and guiding principles for actions that impact on the environment. The National Environmental Management Principles listed in section 2 of NEMA must be adhered to

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by any organ of state in all actions and decision-making that may significantly affect the environment. This includes decisions in terms of the Electricity Regulation Act. These binding principles include the following:

- 67.1 The environment is held in public trust for the people, the beneficial use of the environmental resources must serve the public interest and the environment must be protected as the people's common heritage ("**public trust doctrine**");
- 67.2 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 ("**precautionary principle**");
- 67.3 Negative impacts on the environment and on people's environmental rights must be anticipated and prevented, and where they cannot altogether be prevented, must be minimised and remedied ("**preventive principle**");
- 67.4 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; and
- 67.5 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.

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#### IV FACTUAL BACKGROUND

##### A THE HISTORY OF THE IMPUGNED DECISIONS

###### *The 2010 IRP*

68 The IRP 2010 – 2030 was promulgated on 6 May 2011 (R400, Gazette no 34263) (“**2010 IRP**”). It was described as *“a living plan that is expected to be continuously revised and updated as necessitated by changing circumstances. At the very least, it is expected that the IRP should be revised by the Department of Energy (DoE) every two years, resulting in a revision in 2012”*. Relevant extracts from the 2010 IRP are attached as “**FA18**”.

69 The 2010 IRP made provision for 6300 MW of new coal generation capacity. Flowing from that, a determination for 2500 MW of coal generation capacity was issued in December 2012. To date, none of that 2500 MW of new coal generation capacity has been built. The two proposed coal-fired power stations that were planned to be developed under the December 2012 determination – the Thabametsi and Khanyisa coal fired power stations – were the subject of successful legal challenges in this Court on the basis that they failed to conduct adequate climate change impact assessments. I am informed that both projects have been abandoned during the course of 2020 - 2021.

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### *The draft IRP process*

70 Despite the clear intention for the 2010 IRP to be revised and regularly updated, no updates were made for more than eight years. Draft IRP revisions were published for public comment in 2013, 2016, and again in 2018.

71 Over the years, groundWork and the other members of the Life After Coal/Impilo Ngaphandle Kwamalahle Campaign (made up of the Centre for Environmental Rights ("CER"), groundWork, and Earthlife Africa) had a series of engagements with the Minister's predecessors, including former Minister David Mahlobo and Minister Jeff Radebe, concerning these various draft versions of the updated IRP. It is not necessary to traverse all of these engagements here. It suffices to say that in all these engagements the parties objected to the inclusion of any new coal capacity in the IRP.

72 On 27 August 2018, the draft Integrated Resource Plan for Electricity ("**draft IRP 2018**"), was published for public comment. Relevant extracts are attached as "**FA19**".

72.1 The draft IRP acknowledged that on a "least cost" model of electricity generation, no new coal-fired power would be procured. That concession was made at page 37, where it explained that:

*"Without a policy intervention, all technologies included in the promulgated IRP 2010–2030 where prices have not come down like in the case of PV and wind [i.e. coal], cease to be deployed because the least-cost option only contains PV, wind and gas" (emphasis added).*

It further explained at page 34 that:

*"Adopting no annual build limits on renewables or imposing a more stringent GHG emission reduction strategy implies that no new coal*

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power plants will be built in the future unless affordable cleaner forms of coal to power are available (emphasis added).

- 72.2 Nevertheless, the draft IRP sought to force in 1000 MW of new coal between 2023 - 2024 as a “*policy adjustment*” (page 39).
- 72.3 This new coal capacity was specifically intended to be sourced from projects “*already procured and announced*” (page 39), which was a reference to the proposed Thabametsi and Khanyisa coal-fired power stations which have since been scrapped.
- 72.4 No provision was made for further procurement of coal capacity from other sources after 2024, as is reflected in the table at page 41 of the draft.
- 73 On 18 September 2018, the Chairperson of the Portfolio Committee on Energy (“**Portfolio Committee**”) issued a call for public submissions on the draft IRP 2018.
- 74 CER submitted comments to the Portfolio Committee in its capacity as a member of the Life After Coal Campaign, on 5 October 2018, and confirmed its interest in making verbal submissions to the Portfolio Committee. In sum, the submissions raised a number of concerns with the draft IRP 2018, including objections to the inclusion of new coal capacity. The submissions are attached as annexure “**FA20**”.
- 75 In October 2018, groundWork and CER submitted comments on the draft IRP 2018 to the then Department of Energy (now DMRE) along similar lines as those provided to the Portfolio Committee. The submissions are attached as annexures “**FA21**” and “**FA22**” respectively.

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76 On 12 June 2019, the Life After Coal/Impilo Ngaphandle Kwamalahle Campaign wrote a letter to the newly appointed Minister Mantashe highlighting key energy-related issues which should be prioritised as the Minister commenced his tenure. These included the threats posed by coal-fired electricity generation to climate change, human-health, the environment and the economy. In addition, the letter drew attention to a report titled, "The Myth of Clean Coal" which presents an overview of the coal cycle to demonstrate that "clean coal" is, in fact, impossible. The Life After Coal/Impilo Ngaphandle Kwamalahle Campaign also reiterated its willingness to engage on these issues. The letter is attached as "FA23". No response was received.

#### ***The 2019 IRP***

77 On 18 October 2019, a final revised IRP was published under Government Gazette number 42784, setting out government's electricity plans for the decade horizon of 2019 to 2030. The relevant excerpts of the 2019 IRP are attached as "FA24".

78 The 2019 IRP, in its own definition, meant to be an "*electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimize negative emissions and water usage)*" (page 8, emphasis added).

79 The 2019 IRP provides expressly for fossil fuel electricity capacity in the form of 1500 MW of new coal-fired power capacity and 3000 MW of gas. It further provides for, *inter alia*, 6000 MW of solar photovoltaic (PV) capacity to be constrained with an annual limit of 1000 MW and 14400 MW of wind capacity to be constrained with an annual build limit of 1600 MW.

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80 The 2019 IRP states the following in relation to coal capacity:

*"Coal: Beyond Medupi and Kusile coal will continue to play a significant role in electricity generation in South Africa in the foreseeable future as it is the largest base of the installed generation capacity and it makes up the largest share of energy generated. Due to the design life of the existing coal fleet and the abundance of coal resources, new investments will need to be made in more efficient coal technologies (HELE [high efficiency low emission] technology, including supercritical and ultra-supercritical power plants with CCUS) to comply with climate and environmental requirements. The stance adopted by the Organization for Economic Cooperation and Development and financial institutions in regard to financing coal power plants, is a consideration upon which the support of HELE technology is predicated. This ensures that South African coal still plays an integral part of the energy mix. Given the significant investments required for CCS and CCUS technology, South Africa could benefit from establishing strategic partnerships with international organisations and countries that have made advancements in the development of CCS, CCUS and other HELE technologies" (page 12);*

*"Taking into account supply and demand balance and the impact of load shedding on the economy, shutting down of MES non-compliant power plants and Koeberg power station in 2024 (at the end of its design life) are not recommended...";*

*"Decision 3: Support Eskom to comply with MES over time, taking into account the energy security imperative and the risk of adverse economic impact"; and*

*"HELE coal technologies including underground coal gasification, integrated gasification combined cycle, carbon capture utilization and storage, ultra-supercritical, super-critical and similar technologies are preferred for the exploitation of our coal resources. Due consideration must be given to the financing constraints imposed by lenders and the Organization of Economic Cooperation and Development (OECD) countries, insofar as coal power plant development. Due consideration must also be given to the pace and scale of the coal-to-power programme taking into account the lessons from Medupi and Kusile mega projects. Procurement under the IPP programme has shown that there is a business case for modular and smaller power plants (300MW and 600MW)".*

81 The IRP makes the following express decision in relation to new coal capacity, *"Decision 6: South Africa should not sterilise the development of its coal resources for purposes of power generation, instead all new coal power projects must be based on high efficiency, low emission technologies and other cleaner coal technologies".*

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82 On this basis, the 2019 IRP provides for the procurement of 1500 MW of new coal capacity, split into 750 MW in 2023 and a further 750 MW in 2027. This appears from Table 5 at page 42, reproduced below:

Table 5: IRP 2019

	Coal	Coal (Decommissioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37 149		1 860	2 100	2 912	1 474	1 980	300	3 830	499
2019	2 155						244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1 433					114	300			
2021	1 433					300	818			
2022	711				513	400	1 000	1 600		
2023	750					1 000	1 600			500
2024			1 860				1 600		1 000	500
2025						1 000	1 600			500
2026							1 600			500
2027	750						1 600		2 000	500
2028						1 000	1 600			500
2029					1 575	1 000	1 600			500
2030				2 500		1 000	1 600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33 364		1 860	4 600	5 000	8 288	17 742	600	6 380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	


 Installed Capacity  
 Committed / Already Contracted Capacity  
 Capacity Decommissioned  
 New Additional Capacity  
 Extension of Koeberg Plant Design Life  
 Includes Distributed Generation Capacity for own use

- 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030
- Koeberg power station rated / installed capacity will revert to 1926 MW (original design capacity) following design life extension work.
- Other / Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility
- Short term capacity gap is estimated at 2000 MW

83 This 1500 MW of new coal-fired power was not previously contemplated in the 2018 draft IRP. As explained above, the 1000 MW of new coal reflected in the 2018 draft related to the two shelved Thabametsi and Khanyisa coal-fired power stations. The 2019 IRP makes provision for a further 1500 MW of new capacity, over and above the initially planned 1000 MW.

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- 84 The inclusion of 1500 MW of new coal was once again confirmed to be a “policy adjustment” which was not consistent with a least cost model of electricity supply. The 2019 IRP, at page 23, specifically acknowledged that “[t]he inclusion of coal ... through policy adjustment was criticised on the basis of being a deviation from the least cost path.”
- 85 This policy adjustment was made by imposing a cap on renewable energy procurement. The 2019 IRP provides for a limit of 1000 MW of new solar PV capacity annually and for 1600 MW of new wind capacity annually. In other words, the IRP makes a decision to constrain the amount of renewable capacity that would have been built by the model in accordance with a least-cost plan. As a result, the modelling was intentionally manipulated to achieve the desired result of forcing in 1500 MW of new coal.
- 86 The IRP further admitted that new coal could only be forced into the model if these caps on renewables are imposed. It stated that “[t]he system only builds renewables (wind and PV) and gas if unlimited renewable and gas resources are assumed”. The IRP states further that “[w]hen annual build limits on renewables are imposed and realistic gas availability assumptions are applied, the system builds battery storage and coal to close the gap” (page 41).
- 87 This means that a least-cost plan would not include any new coal capacity, without these adjustments.

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### **Requests for reasons for the 2019 IRP**

88 On 5 November 2019, CER, on behalf of groundWork and Earthlife Africa NPC, wrote to the Minister to request reasons for the Minister's decision to promulgate the updated IRP of 18 October 2019. This request directed specific requests for reasons in respect of the proposed procurement of new coal, including:

*"6.1. What are the reasons for deciding that the IRP should provide for 1 500 MW new coal capacity, despite the IRP's confirmation that it is intended to be a least-cost plan and that "the system only builds renewables (wind and PV) and gas if unlimited renewable and gas resources are assumed"?"*

*6.2. What are the reasons for increasing the coal allocation from 1 000 MW – in the draft 2018 IRP, on which public participation was conducted – to 1 500 MW?*

*6.3. What are the reasons for "Decision 6" of the IRP, namely that "South Africa should not sterilise the development of its coal resources for purposes of power generation, instead all new coal power projects must be based on high efficiency, low emission technologies and other cleaner coal technologies"? In particular what are the criteria and benchmarks for determining what technologies are "clean coal" technologies?*

*6.4. Why does the IRP refer to 900 MW of new coal capacity as "already procured"? Can the Department confirm that this 900 MW pertains to the two preferred bidder coal independent power producers (IPP) – Thabametsi and Khanyisa?*

*6.5. For what reasons does the IRP exempt the "already procured" 900 MW of new coal, from the requirement "that all new coal to power capacity ... will be in the form of clean coal technology"?*

...

*6.7. For what reasons was it decided (in reference to Decision 5 of the IRP) that the IRP should impose annual build limits on renewables (wind and PV) and how was the provided justification for these limits – i.e. to address "large erratic annual capacity allocations in the plan" – arrived at?*

*6.8. What are the reasons for concluding that new coal capacity, specifically, should be built into the system to "close the gap" when "annual build limits on renewables are imposed" and "realistic gas availability assumptions are applied"?*

*6.9. For what reasons does the Department consider the provision for new fossil fuel-based electricity sources (coal and gas) – which will lock South*

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*Africa into high greenhouse gas (GHG) emissions for at least the next 30 years – acceptable and permissible in terms of government's international and Constitutional obligations to reduce GHG emissions?*

- 89 A response was requested by 5 December 2019. The letter is attached as annexure **"FA25"**.
- 90 Also on 5 November 2019, CER on behalf groundWork and Earthlife Africa NPC wrote to NERSA to request reasons for NERSA's decision to concur in the promulgation of the updated IRP of 18 October 2019. A response was requested by 5 December 2019. The letter is attached as annexure **"FA26"**.
- 91 Neither the Minister nor NERSA responded to these requests for reasons. This resulted in follow up letters to both dated 13 December 2019 extending the deadline for a response to 3 February 2020. These letters are attached as annexure **"FA27"** and **"FA28"**.
- 92 On 1 May 2020, we received NERSA's response, in which NERSA disputed any obligation to provide reasons. That response is attached as annexure **"FA29"**.
- 93 In the absence of any reasons from the Minister, and in light of NERSA's unjustified and unlawful refusal to provide reasons, groundWork filed an application to compel reasons, in this Court in July 2020, under case number 32200/20.
- 94 On 14 August 2020, the Minister replied to the letter of 5 November 2019. In his response, the Minister indicated that he disagreed that the promulgation of the IRP constitutes administrative action in terms of the Promotion of Administrative Justice Act 3 of 2000, or that reasons for the IRP can be provided in the form prescribed.

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Nevertheless, the Minister provided responses to specific questions. The Minister's response is attached as annexure "FA30".

- 95 groundWork responded to the Minister seeking clarity on a number of issues raised by the Minister in his response, and requesting adequate reasons – to which it is entitled. The Minister did not respond to the request, but proceeded to file his opposition to the application and answering affidavit – which largely reflected the content of his 14 August 2020 response letter.
- 96 NERSA also opposed the application and filed unsigned answering papers, in which it set out its objections to the IRP constituting administrative action and persisted with the submission that NERSA is not a concurrent decision-maker in respect of the IRP and therefore not obliged to provide reasons.
- 97 The application was subsequently withdrawn by agreement between the parties on 16 February 2021 in the interests of avoiding the expenditure of further time and costs on the matter, having received some reasons from the Minister, albeit inadequate.
- 98 I will address the Minister's reasons in detail below in showing why they provide no reasonable or justifiable basis for limiting constitutional rights.

#### ***Publication of the draft determination***

- 99 On 18 March 2020, NERSA published a consultation paper on its website in relation to NERSA's proposed concurrence with a proposed Ministerial Determination on the procurement of new generation capacity ("**the consultation paper**"). That draft

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determination was signed by the Minister on 18 February 2020 (**"the draft determination"**) but had not previously been made public. Copies of the consultation paper and draft determination are attached as **"FA31"** and **"FA32"**.

100 The Minister did not invite comments on the draft determination, nor did he conduct any public participation process in relation to the draft determination prior to its promulgation.

101 The consultation paper and accompanying draft determination proposed the following capacity as per the allocations in the 2019 IRP:

101.1 1500 MW should be generated from coal, which represents the capacity allocated under the heading "Coal", for the years 2023 to 2027, in Table 5 of the 2019 IRP;

101.2 6800 MW to be procured to be generated from renewable energy sources (Photovoltaic (PV) and Wind), which represents the capacity allocated under the headings "PV" and "Wind", for the years 2022 to 2024, in the 2019 IRP;

101.3 513 MW to be procured to be generated from storage, which represents the capacity allocated under the heading "Storage", for the year 2022, in Table 5 of the 2019 IRP; and

101.4 3000 MW to be procured to be generated from gas, which represents the capacity allocated under the heading "Gas and Diesel", for the years 2024 to 2027, in Table 5 of the 2019 IRP.

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102 NERSA invited written comments from stakeholders by 7 May 2020, confirming also, in the consultation paper, that NERSA would host public hearings in relation to the consultation paper and draft determination. Those public hearings did not transpire.

103 The Life After Coal Campaign submitted comments on the consultation paper and draft determination on 7 May 2020 – attached as “FA33” (“**the draft determination comments**”). These comments highlighted, *inter alia*, the campaign’s, including groundWork’s, objections to the provision for new fossil fuel (coal and gas) capacity in the draft determination and the need for the coal and gas allocations to be removed from the draft determination. Other organisations also submitted detailed objections.

#### ***NERSA’s concurrence with the determination***

104 During a meeting on 29 July 2020, NERSA concurred in the Minister’s determination, despite the objections.

105 This concurrence was only published in a media release by the Department of Mineral Resources and Energy on 10 September 2020, titled “Minister Mantashe welcomes NERSA Concurrence to Ministerial Determination for the Procurement of 11 813 MW of Power” attached as “FA34”.

106 NERSA published the purported reasons for its concurrence with the Ministerial determination on 22 September 2020. These are attached as “FA35”.

107 On 25 September 2020, the signed determination was published in Government Gazette number 43734, NO 1015. A copy is attached as “FA36”.

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***Requests for reasons in respect of the determination***

108 On 13 October 2020, the applicants' attorneys, on behalf of groundWork wrote to Minister Mantashe seeking reasons for the decision to promulgate the determination, in terms of section 5 of the Promotion of Administrative Justice Act, 2000 ("PAJA"). A copy of the request is attached as "FA37".

109 groundWork requested reasons for the Minister's decision to promulgate the determination in its totality, and specifically requested that the reasons deal with, but are not limited to, the following issues:

109.1 What are the reasons for the allocation of 1500 MW of new coal capacity in the determination, despite the harms of such an allocation as set out in the draft determination comments?

109.2 For what reasons did the Minister decide to allocate the entire 2019 IRP coal allocation from 2023 to 2027 in this determination?

110 A response was requested within 30 days, by 12 November 2020. The 90 day deadline for the provision of reasons in terms of PAJA expired on 11 January 2021.

111 A response was received from the Minister on 25 January 2021, a copy of the response is attached as "FA38". The Minister stated the following:

*"What drives the allocation of 1500 MW of new capacity in the determination is the need for the generation capacity of electricity to ensure the continued and reliable supply of electricity"*

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*Carbon capture and storage, underground coal gasification, and other clean coal technologies are critical considerations that will enable us to continue using our coal resources in an environmentally responsible way into the future. Air quality regulations under the National Environmental Management Act: Air Quality (Act No. 39 of 2004) provide that coal power plants under Eskom's fleet, amongst others, have to meet the minimum emission standard (MES) by a certain time, or they would be non-compliant and cannot be legally operated. In addressing the potential non-compliance with the law, a balance will have to be found between energy security, the adverse health impacts of poor air quality and the economic cost associated with these plants shutting down.*

*It is further in line with the decision that South Africa should not sterilise the development of its coal resources for purposes of power generation, and that instead, all new coal power projects must be based on high efficiency, low emission technologies and other cleaner coal technologies".*

112 groundWork's attorneys also wrote to NERSA on 30 October 2020 to record that NERSA's purported reasons, as published on its website on 22 September 2020 (referred to above, attached as "FA35") fall short of NERSA's obligations to provide adequate reasons. In that letter, groundWork requested adequate reasons, clarification and evidence from NERSA, in line with NERSA's obligations under section 10(e) of the NERSA Act read with section 5 of PAJA. The letter is attached as "FA39".

113 NERSA responded on 21 January 2021, providing its reasons. The response is attached as "FA40".

114 I will return to address the reasons provided by NERSA and the Minister in greater detail below.

### ***Further efforts to engage the Minister and NERSA***

115 On 9 July 2021 the applicants' attorneys wrote to the Minister and NERSA, on behalf all three applicants, asking whether the DMRE will commence with the process of updating the IRP before the end of 2021; if not, why not; and whether the Minister and NERSA

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have any intention to revoke or amend the section 34 determination that provides for 1500 MW of new coal-fired power. The letter is attached as "FA41". There was no response.

116 On 17 September 2021, the applicants addressed a letter of demand to the Minister, and NERSA, requesting that the Minister abandon all plans for the procurement of new coal capacity and revise the 2019 IRP. This letter specifically drew attention to recent developments and reports demonstrating why the procurement of new coal capacity is misguided, which I address in detail below. The Minister was requested to respond to this letter by 8 October 2021. A copy of the letter is attached as "FA42".

117 The Minister failed to respond to the letter by the deadline, leading the applicants to finalise and launch this application.

118 The Minister has publicly signalled his continued intention to proceed with the procurement of the 1500 MW of new coal-fired capacity. Recent plans announced in Parliament suggest that the DMRE intends to issue a request for proposals by 31 March 2022, with the deadline for bid submissions set for 4 December 2022. The scheduled commercial operation date for the new coal-fired power stations is currently set for May 2028. I attach the relevant slide from the DMRE's presentation on 24 August 2021 as "FA43".

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## B THE CLIMATE CRISIS

### *The international scientific consensus*

119 It is incontrovertible that climate change is happening, its pace is faster than initially predicted, and it is caused by human activities that emit CO<sub>2</sub> and other greenhouse gases into the Earth's atmosphere.

120 This scientific consensus is captured in the reports of the United Nations Intergovernmental Panel on Climate Change ("IPCC") — the world's foremost authority on climate science. In its updated Nationally Determined Contribution, the government stated that "*South Africa considers the IPCC reports to be of the highest importance in guiding our actions*" (2021 NDC Update, page 2).

121 On 9 August 2021, the IPCC released the first of three Working Group reports which will, along with three special reports, collectively comprise the Sixth Assessment Report, providing the most up-to-date review of the science relating to climate change ("**IPCC's Sixth Assessment**"). The "Summary for Policymakers", attached as "**FA44**", is the product of line-by-line approval by delegates from all participating governments, including South Africa. The key findings captured in this summary are the following:

121.1 Human influence has warmed the atmosphere, ocean and land, causing widespread and rapid changes (Summary for Policymakers, Finding A1, page 5);

121.2 Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in

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extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since the IPCC's Fifth Assessment Report in 2013/14 (Finding A3, page 10);

- 121.3 Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21<sup>st</sup> century unless deep reductions in CO<sub>2</sub> and other greenhouse gas emissions occur in the coming decades (Finding B1, page 17);
- 121.4 Many changes in the climate system will become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover and permafrost (Finding B2, page 19);
- 121.5 With further global warming, every region is projected to increasingly experience concurrent and multiple changes in these climatic impact-drivers. Changes in several climatic impact-drivers would be more widespread at 2°C compared to 1.5°C global warming and even more widespread and/or pronounced for higher warming levels (Finding C2, page 32). Many changes due to past and future greenhouse gas emissions are irreversible for centuries to millennia, especially changes in the ocean, ice sheets and global sea level; and

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121.6 This requires urgent action to limit cumulative CO<sub>2</sub> emissions, reaching at least net zero emissions, along with strong reductions in other greenhouse gas emissions.

122 The average temperature on Earth is now 1.1°C hotter than at any time before the industrial revolution, and it is approaching a tipping point of foreseeable and irreversible catastrophic effects.

123 Much depends on how the world responds to this threat. The IPCC has charted five potential futures, called the “Shared Socio-Economic Pathways” (“**SSPs**”).<sup>21</sup> These five futures show the possible socio-political responses to climate change in the coming decades, with corresponding levels of predicted GHG emissions and climate change impacts. Ranked from best-case to worst-case scenario, they are:

123.1 SSP1-1.9: Very low GHG emissions, with net zero emissions around 2050;

123.2 SSP1-2.6: Low GHG emissions, with net zero emissions around 2075;

123.3 SSP2 – 4.5: Intermediate GHG emissions, with emissions around current levels until 2050, then falling but not reaching net zero by 2100;

123.4 SSP 3-7.0: High GHG emissions, with emissions doubling by 2100; and

123.5 SSP 5-8.5: Very high GHG emissions, with emissions tripled by 2075.

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<sup>21</sup> Box SPM 1 pp 15 – 16, Figure SPM 4. These were previously called the “Representative Concentration Pathways (“**RCPs**”).

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124 The estimated levels of global warming associated with each of these futures is shown in the following table extracted from the IPCC's Summary for Policymakers:<sup>22</sup>

Scenario	Near term, 2021–2040		Mid-term, 2041–2060		Long term, 2081–2100	
	Best estimate (°C)	<i>Very likely</i> range (°C)	Best estimate (°C)	<i>Very likely</i> range (°C)	Best estimate (°C)	<i>Very likely</i> range (°C)
SSP1-1.9	1.5	1.2 to 1.7	1.6	1.2 to 2.0	1.4	1.0 to 1.8
SSP1-2.6	1.5	1.2 to 1.8	1.7	1.3 to 2.2	1.8	1.3 to 2.4
SSP2-4.5	1.5	1.2 to 1.8	2.0	1.6 to 2.5	2.7	2.1 to 3.5
SSP3-7.0	1.5	1.2 to 1.8	2.1	1.7 to 2.6	3.6	2.8 to 4.6
SSP5-8.5	1.6	1.3 to 1.9	2.4	1.9 to 3.0	4.4	3.3 to 5.7

125 The best-case scenario of SSP 1-1.9 is the only feasible path for countries to achieve the Paris Agreement goal of limiting the global temperature rise to 1.5 °C above pre-industrial levels. This is the scenario in which no new coal-fired power stations are built and reductions in emission by 45% by 2030 and net zero by 2050 are necessary. Even on this scenario, with deep reductions in emissions, global warming is due to reach 1.6°C by mid-century, before stabilising at around 1.4°C from 2081, and we are expected to exceed the threshold as early as 2030.

126 On the worst-case trajectory (SSP 5 - 8.5), in which emissions continue to grow, the global average temperature will increase to over 2.4 °C by mid-century, and up to 3.3 - 5.7°C between 2081-2100.<sup>23</sup>

<sup>22</sup> Finding B1.1 p 18.

<sup>23</sup> Finding B1.1 *ibid.* Box SPM 1, Figure SPM 4 pp 15 – 16 *ibid.*

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- 127 In the intermediate scenarios (SSP 2 – 4.5), where emissions stay at more or less current levels, 2°C of warming will be reached by mid-century, and rise to 2.7°C by 2100.<sup>24</sup>
- 128 The consequences of global warming of 1.5 °C and above were assessed in greater depth in the IPCC's milestone 2018 Special Report on 1.5 °C ("**IPCC Special Report**"). Relevant excerpts are attached as "**FA45**".
- 129 The IPCC Special Report again confirmed that climate change has already resulted in widespread harm to the environment, human health and well-being from more frequent and intense storms, droughts, heatwaves, and other climactic events (IPCC Special Report, page 35) — including in South Africa, as described below.
- 130 The IPCC found that to limit warming to 1.5°C, countries must reduce CO<sub>2</sub> emissions by 45% within the next decade and achieve net zero emissions around 2050 (executive summary, page 12, IPCC Special Report). The IPCC has estimated that limiting warming to 1.5°C would require limiting atmospheric CO<sub>2</sub> concentration to no more than 430 parts per million ("**ppm**"), a level we are getting closer to daily.
- 131 Keeping temperature increases to 1.5°C is the absolute minimum goal states must achieve to avert a climate disaster.
- 132 Even at 1.5°C, the IPCC has warned that "*[s]everal regional changes in climate are assessed to occur . . . , including warming of extreme temperatures in many regions (high confidence), increases in frequency, intensity, and/or amount of heavy*

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<sup>24</sup> Box SPM 1, page 15 *ibid*

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*precipitation in several regions (high confidence), and an increase in intensity or frequency of droughts in some regions (medium confidence)" (page 7, IPCC Special Report).*

133 Surpassing 1.5°C would *"lead to irreversible loss of the most fragile ecosystems, and crisis after crisis for the most vulnerable people and societies"* (page vi, IPCC Special Report).

134 A global average temperature increase of 2°C translates to up to 4°C for South Africa by the end of the century (South Africa's 2015 Nationally Determined Contribution, page 1). Similarly, it is confirmed in the 2021 NDC update that *"South Africa is already experiencing significant impacts of climate change, particularly as a result of increased temperatures and rainfall variability, and is warming at more than twice the global rate of temperature increase"* (emphasis added) (page 6).

135 The United Nations Environmental Program also highlighted the central importance of the next decade in its 2020 Emissions Gap Report. The relevant excerpts of this report are attached as **"FA46"**.

*"In the absence of significant climate action by 2030, the daunting challenge that lies beyond 2030 suggests that limiting global warming to even slightly higher levels than 1.5°C would effectively be out of reach"* (page 34).

136 Unfortunately, according to the UN Emissions Gap Report of 2020, the world is currently heading for at least a global average 3°C of warming by 2100 (page 35). A temperature rise of that magnitude would *"very likely"* result in a *"substantial increase in potentially deadly heatwaves"* and lead to *"[d]rastic reductions in maize crop globally and in Africa (high confidence)"* (IPCC Special Report, page 264) – impacting on food security.

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***The South African government's acknowledgement of the threat***

137 The South African government has repeatedly acknowledged the reality of climate change and the severe threat that this poses to the country.

138 The government's National Climate Change Response White Paper ("**White Paper**"), published on 19 October 2011, sets out the government's *"vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower carbon economy and society."* I attach relevant excerpts from the White Paper, marked "**FA47**".

139 The White Paper acknowledged that South Africa is extremely vulnerable to the effects of climate change:

*"Climate change is already a measurable reality and along with other developing countries, South Africa is especially vulnerable to its impacts" (page 5).*

*...  
"South Africa is extremely vulnerable and exposed to the impacts of climate change due to our socio-economic and environmental context. Climate variability, including the increased frequency and intensity of extreme weather events, will disproportionately affect the poor. South Africa is already a water-stressed country and we face future drying trends and weather variability with cycles of droughts and sudden excessive rains. We have to urgently strengthen the resilience of our society and economy to such climate change impacts and to develop and implement policies, measures, mechanisms and infrastructure that protect the most vulnerable" (page 8).*

140 The White Paper further explained that on the most conservative estimates of global warming, the outlook for South Africa is dire:

*"[E]ven under emission scenarios that are more conservative than current international emission trends, it has been predicted that by mid-century the South African coast will warm by around 1 to 2°C and the interior by around 2 to 3°C. By 2100, warming is projected to reach around 3 to 4°C along the*

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coast, and 6 to 7°C in the interior. With such temperature increases, life as we know it will change completely; parts of the country will be much drier and increased evaporation will ensure an overall decrease in water availability. This will significantly affect human health, agriculture, other water-intensive economic sectors such as the mining and electricity-generation sectors as well as the environment in general. Increased occurrence and severity of veld and forest fires; extreme weather events; and floods and droughts will also have significant impacts" (page 9) (emphasis added).

- 141 The National Development Plan 2030 ("**NDP**"), adopted by Cabinet in 2012, also recognises the danger of climate change and the need for bold strategies:

*"Climate change is already having an impact on South Africa, with marked temperature and rainfall variations and rising sea levels. Over the short term, policy needs to respond quickly and effectively to protect the natural environment and mitigate the effects of climate change. Over the long term, with realistic, bold strategies and global partnerships, South Africa can manage the transition to a low-carbon economy at a pace consistent with government's public pledges, without harming jobs or competitiveness" (NDP, page 48).*

- 142 The relevant excerpts from the NDP are attached as annexure "**FA48**".

- 143 The harms of climate change have also been recognised in the 2019 National Climate Change Adaptation Strategy ("**Adaptation Strategy**"), which was approved by Cabinet. I attach relevant excerpts from the Adaptation Strategy, marked "**FA49**". The Adaptation Strategy provides a common vision of climate change adaptation and climate resilience for the country, and outlines priority areas for achieving this vision. It recognises that South Africa is already experiencing the negative effects of climate change and is expected to suffer significant consequences in the future. It states that:

*"South Africa is experiencing significant effects of climate change particularly as a result of increased temperatures and rainfall variability... There is evidence that extreme weather events in South Africa are increasing, with heat wave conditions found to be more likely, dry spell durations lengthening slightly and rainfall intensity increasing. Climate zones across the country are already shifting, ecosystems and landscapes are being degraded, fires are becoming more frequent, and overused natural terrestrial and marine*

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*systems are under stress (DEA 2017). According to the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5), climate change is likely to increase the frequency and magnitude of many extreme events and will certainly increase the risk of slow-onset events such as sea level rise and drought (IPCC 2013)" (page 9).*

*"However, systemic changes are required in order to minimise the impacts of climate change. Technological advancements that consider social and economic factors can assist in making these transformative changes." (page 9).*

- 144 Our country's specific vulnerability is also recognised in the government's Low Emission Development Strategy 2050, attached as "**FA50**". This strategy was published by the government in 2020, in terms of the Paris Agreement obligation to "*formulate and communicate long-term low greenhouse gas emission development strategies*" by 2020. This Strategy states that:

*"South Africa is particularly vulnerable to the impacts of climate change. These changes will impact on water resources and food production, and increase the vulnerability of impoverished communities, amongst others (DEA, 2013). For this reason, the South African government regards climate change as a considerable threat to the country and its socio-economic development, having the potential to undermine many of the advances made in recent years. At the same time, if climate change is to be limited through limiting the growth in global GHG emissions, with South Africa contributing its fair share to emission reductions, there will be other implications for the country. As one of the top 20 emitters globally, with a high dependency on fossil fuels, substantial emission cuts will be required".*

- 145 In a speech given by President Ramaphosa at a Virtual Leaders' Summit on Climate Change in April 2021, he referred to the South African government's position on addressing climate change, stating, inter alia, that "We remain committed to contributing our fair share to reduce global emissions, and to do so in the context of overcoming poverty, inequality and underdevelopment. Climate change is the most pressing issue of our time. It is a global phenomenon from which developing economies are particularly vulnerable. Without effective adaptation, climate change has the potential to reverse the

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developmental gains in our countries, and push millions of people further into poverty” (emphasis added). A copy of the speech is attached as “FA51”.

- 146 President Ramaphosa addressed the Committee of African Heads of State and Government on Climate Change, in his role as coordinator of that committee in June 2021. His speech, attached as “FA52”, states, inter alia, the following:

*“While the continent is dealing with the impact of the pandemic on human health, our societies and our economies, Africa continues to bear the brunt of climate change, with annual costs to African economies of between 3 to 5 per cent of their GDPs on average. Africa continues to be one of the most affected regions and frequently experiences phenomena associated with global warming. These include droughts, floods, cyclones and other extreme weather events, which have caused enormous damage to infrastructure and displaced thousands of people”* (emphasis added).

*“Progress in addressing the global challenge of climate change can only be made when we all honour our mutual commitments and respect our common, but differentiated responsibilities. It is absolutely imperative that everyone must contribute their fair share if we are to limit global warming to the agreed target of well-below 2 degrees, build the resilience of our economies and ensure the safety and well-being of our citizens. Therefore, at this critical juncture, Africa needs to speak with one clear voice to emphasise the primacy of multilateralism and to express our unwavering support for the full implementation of the UN Climate Change Convention and its Paris Agreement”* (emphasis added).

## C COAL AND CLIMATE CHANGE

- 147 Coal is the single most significant contributor to climate change. It is the most emissions intensive fuel, producing more GHG emissions per unit of energy than any other fuel source.
- 148 The International Energy Agency (“IEA”), an international organisation of which South Africa is an associate nation, estimates that coal-fired electricity generation contributes 30% of global emissions. Coal combustion alone is responsible for at least a third

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(0.3°C) of the increase in global average annual surface temperatures experienced to date. This makes coal the single largest source of global temperature increases. These figures are set out in the IEA's 2018 Global Energy & CO<sub>2</sub> status report, attached as "FA53".

149 Due to South Africa's reliance on coal, the country is a significant contributor to global GHG emissions, placed in the top 15 global emitters.

150 The Global Carbon Atlas, a global collaborative initiative to track GHG emissions, has ranked South Africa as the 12th highest emitter in the world and the highest emitter in Africa, with estimated emissions of 479 MtCO<sub>2</sub> in 2019. This results in annual emissions of 8.2 tonnes of CO<sub>2</sub> ("tCO<sub>2</sub>") for each South African, far in excess of the global average of 4.7 tCO<sub>2</sub> per person. The relevant sources are attached as "FA54" and "FA55".

151 The government's White Paper acknowledges this link between the country's relatively high GHG emissions and coal-fired power:

"[I]t is also recognised that South Africa is a relatively significant contributor to global climate change with significant GHG emission levels from its energy intensive, fossil-fuel powered economy."<sup>25</sup>

...

The energy intensity of the South African economy, largely due to the significance of mining and minerals processing in the economy and our coal-intensive energy system, has resulted in an emissions profile that differs substantially from that of other developing countries at a similar stage of development as measured by the Human Development Index. Since coal is the most emissions-intensive energy carrier, South Africa's economy is very emissions-intensive ... In 2000, average energy use emissions for developing countries constituted 49% of total emissions, whereas South Africa's energy use emissions constituted just under 80% of total emissions. Even in some fast-developing countries with a similar reliance on coal for energy, energy use emissions are lower than South Africa" (emphasis added).<sup>26</sup>

<sup>25</sup> White Paper, p 8.

<sup>26</sup> White Paper, p 26.

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152 South Africa's Low Emission Development Strategy 2050, published in February 2020, confirms that the "*[e]nergy sector accounted for 79.5% of the total gross emissions for South Africa in 2015, with the percentage contribution of this sector to overall emissions growing by 25% between 2000 and 2015. Energy industries (which includes electricity generation and liquid fuels production from both crude oil and coal) were the main contributor, accounting for 60.4% of emissions from the energy sector and almost half of gross emissions*" (page 12). I have previously attached relevant excerpts, attached as "FA50".

153 The Department of Environmental Affairs' 7<sup>th</sup> National Greenhouse Gas Inventory for South Africa 2000 – 2017, released on 24 August 2021, reaches similar conclusions based on updated figures. It states that "*[e]lectricity generation is the largest key GHG emission source in South Africa, mainly because it ... uses sub-bituminous coal which is abundantly available in the country*" (page 150). Emissions from the energy sector contributed 80.1% of South Africa's GHG emissions in 2017 (page 6), of which 87% of emissions were generated by public sector electricity production (i.e. Eskom) which is heavily reliant on coal (page 147). Relevant extracts are attached as "FA56".

154 In light of the short window to prevent catastrophic levels of global warming, experts agree that countries must stop burning fossil fuels, including coal-fired power.

154.1 The IPCC has noted that mitigation pathways consistent with a 1.5°C target involve "*decarbonisation of electricity and other fuels*" (page 95, IPCC Special Report).

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154.2 The International Renewable Energy Agency (“IRENA”), an intergovernmental organisation with 162 member states, emphasises that today’s emissions level must fall by 70% in the next three decades to keep the temperature rise well below 2°C. To achieve this goal, countries must “[s]top building new coal power plants and accelerate the retirement of existent coal power facilities” (page 85), among other measures to reduce fossil fuel demand. The relevant pages of this report are attached as “FA57”.

154.3 In 2019, Climate Analytics, a multidisciplinary team of climate science experts—some of whom are lead authors of IPCC reports—similarly found that building new coal capacity is inconsistent with achieving the 1.5°C goal.

154.3.1 “To keep the door open for staying within the ... 1.5°C limit, countries will need to plan to retire a large number of existing coal power plants early, reduce the capacity factor of those that remain, and refrain from building new coal capacity” (emphasis added).

154.3.2 “[E]very single new coal power plant that enters the system will exacerbate the problem, locking in the energy infrastructure of many countries into a carbon-intensive pathway for decades and increasing the assets at risk of stranding. Therefore, there is an urgent need to cancel the expansion plans for the coal fleet.” (emphasis added).

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154.3.3 *"Global coal use in electricity generation must fall by 80% below 2010 levels by 2030".*

154.3.4 The relevant excerpts of the Climate Analytics Report are attached as **"FA58"**.

155 The UN Secretary General António Guterres has, since 2019, echoed these calls, urging states to cancel all global coal projects in the pipeline. He has called the phasing out of coal from the electricity sector *"the single most important step to get in line with the 1.5-degree goal of the Paris Agreement."* A copy of a speech given in March 2021 is attached as **"FA59"**.

156 Since 2015, 44 countries have formally committed to no new coal-fired power stations, including Angola, Ethiopia, and Senegal. A further 40 countries do not have any plans for new coal capacity or have cancelled those plans, including Ghana, Nigeria, Namibia and Zambia. In total, over 1175 gigawatts (**"GW"**) of planned coal-fired power projects have been cancelled, more than the total installed capacity of coal-fired power stations in China. These statistics are summarised by E3G, an independent climate change research organisation, in a report released on 13 September 2021. Relevant extracts are attached as **"FA60"**.

157 South Africa's plans to procure 1500 MW of new coal fired power stand directly at odds with these global calls for action. This is despite the country's vulnerability to climate change impacts.

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## D SOUTH AFRICA'S VULNERABILITY TO CLIMATE CHANGE IMPACTS

158 As the government has repeatedly acknowledged, South Africa is already experiencing the harmful impacts of climate change. The situation will only get worse if countries, including South Africa, fail to achieve the 1.5 °C goal.

159 The specific harms facing South Africa are summarised in an expert report by Professors Robert Scholes and Francois Engelbrecht from the Wits University Global Change Institute ("**Scholes and Engelbrecht report**"). Their report is attached marked "**FA1**". A supporting affidavit by Prof Engelbrecht, which includes his *curriculum vitae*, will accompany this affidavit. Prof Engelbrecht is one of the lead authors of the IPCC's 2018 Special Report and 2021 Sixth Assessment. Professor Scholes sadly passed away in April 2021.

160 This analysis is further supported by the expert report of Prof Nicholas King, a leading expert on environmental futures and a review editor of the IPCC's Fifth Assessment report. His report is attached as "**FA2**".

### ***Rising temperatures and extreme heat***

161 Temperatures in South Africa are already rising faster than the global mean surface temperature.

162 The IPCC's Special Report identifies southern Africa as a climate change 'hotspot', meaning it is a location where climate change impacts are abnormally high in a global context. This stems from the region's subtropical climate, already warm and dry, which under climate change is projected to become drastically warmer and likely also drier.

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- 163 The government confirms this in South Africa's Third National Communication under the United Nations Framework Convention on Climate Change of March 2018. It states that South Africa has experienced more warming than the rest of the world. From 1931 to 2015, western parts of South Africa, "*including much of the Western and Northern Cape, and also in the east over Gauteng, Limpopo and the east coast of KwaZulu-Natal,*" warmed by 2°C/century or even higher – in the order of twice the global rate of temperature increase (page 12). It predicts that this warming will escalate, stating that under certain scenarios, temperatures in the interior of South Africa would rise between 2.5°C and 4°C by the end of the century (pages 104 and 123). The relevant excerpts of this communication are attached as "FA61".
- 164 Rising temperatures will result in the increasing frequency of heat waves, causing heat stress. Professors Scholes and Engelbrecht explain that this will bring rising rates of mortality and decreased productivity for outdoor work.

### ***Freshwater scarcity***

- 165 South Africa is already a water-scarce country, due to the combination of an inherently low and variable rainfall, high levels of evaporation, and the rapidly rising demand for water for agriculture, industries and urban areas. Rising temperatures and decreasing, intermittent rainfall, are predicted to decrease available freshwater supplies.
- 166 The Scholes and Engelbrecht report explains that the impact of decreasing rainfall is amplified in semi-arid regions like South Africa. Decreasing rainfall results in an approximately threefold decrease in available freshwater, meaning that for every 1 litre decrease in annual rainfall, approximately 3 litres of available freshwater will be lost.

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Reduction of fresh water availability, which is already critically limited, deterioration of water quality, due to lack of fresh water flow, and illnesses and diseases due to lack of clean water, are anticipated due to climate change.

- 167 This threat of water scarcity is further acknowledged in a report published in May 2017. This report, titled "The State of Climate Change Science and Technology in South Africa", was undertaken by the Academy of Science of South Africa (**"the ASSAF Report"**) on behalf of the Department of Science and Technology and was endorsed by Cabinet. It highlights the key climate change challenges and impacts in South Africa over the next 30 years and notes that *"[t]he strongest impacts of climate change in South Africa in the first half of the 21st century will be on the security of freshwater supplies to industry, towns and agriculture; on crop and livestock agriculture, due to less favourable growing conditions; on human health, due to heat stress and disease spread, particularly in urban areas; and on biodiversity, due to shifting habitat suitability"* (ASSAF Report, page 15). Relevant excerpts of this report are attached marked Annexure **"FA62"**.

- 168 The King Report anticipates that *"For future generations, increasing conflict over scarce water will almost certainly arise, with those communities already unserved, remaining unserved. Conflicts will also very likely arise with neighbouring countries over shared river-basin resources and diminishing supplies. With rising number and severity of extreme weather events, floods will occur more often, damaging water infrastructure, affecting quality and precipitating disease outbreaks. Together with ongoing rising temperatures and drought conditions, it is virtually certain that these events will collapse crop production, kill livestock and greatly exacerbate food insecurity."* (page 4, King Report).

## Droughts

169 Climate change has already increased the frequency of multi-year droughts in southern Africa and the risk will increase further as global warming intensifies.

170 The Scholes and Engelbrecht report explains that in a warmer world, the frontal systems which are an important feature of the climatology of southern Africa, are systematically displaced poleward, to the extent that they will bring rainfall to the continent less frequently. This will result in the risk of multi-year droughts in the winter rainfall region (such as the 2015-2017 Cape Town drought). The report notes that this has already increased by a factor of three due to climate change, and will increase further as global warming intensifies.

171 The report notes further that:

*"The duration, severity and frequency of regional-scale droughts all interact to create a steeply-rising risk of agricultural and water supply system failure with increasing levels of global warming. This is because these systems are designed or adapted to cope with the level of drought which they have historically experienced. There is high certainty that the historically - expected levels of drought will be exceeded in the future. Several of the intrinsic drought-buffering mechanisms – such as the amount of water that can be stored in the soil profile, or the capacity of wild plants or animals to tolerate dry periods - are effectively impossible to change in the short and medium term."*

172 After three of its lowest rainfall years on record, in January 2018 Cape Town became the first major world city on the verge of shutting off its water supply. That day, known as "day zero", did not occur, though it imminently threatened to cut off water to 3.7 million people. The Scholes and Engelbrecht report confirms that climate change has already made the 1 in 100-year drought that contributed to the Cape Town water crisis three times more likely.

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173 Multiyear droughts in cities such as Cape Town and Gauteng are already happening. Frequency of multi-year droughts is estimated to increase, as well as increase in duration, severity and frequency of regional-scale droughts, leading to: agricultural and water supply system failures, economic costs, as well as high mortality rates in wildlife, if we are to reach higher than 1.5 °C. The most recent drought cost South Africa R2.5 billion in drought relief expenditure alone.

### ***Food insecurity***

174 Climate change has already had an impact on South Africa's agricultural production which will continue to increase in a warmer world. Rising temperatures, more frequent and intense droughts, and lower freshwater availability all impact on crops and livestock.

175 The Scholes and Engelbrecht report explains that in 2019, 6.5 million South Africans (11% of the population) were already classified as food insecure. The risk of food insecurity will increase substantially as global average temperatures continue to rise beyond the 1.5°C threshold. At 3°C global warming, the livestock industry (including wool, milk and meat production) and crops (such as staple maize crops) are anticipated to have lower yields, which will lead to food insecurity and hunger.

176 According to the IPCC, "[l]imiting warming to 1.5°C compared with 2°C is projected to result in smaller net reductions in yields of maize, rice, wheat, and potentially other cereal crops, particularly in sub-Saharan Africa . . . and in the CO<sub>2</sub>-dependent nutritional quality of rice and wheat (high confidence). Reductions in projected food availability are larger at 2°C than at 1.5°C of global warming in . . . southern Africa . . . (medium confidence)" (IPCC Special Report, pages 9 -10). Warming of 2°C–3°C will result in

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*"[v]ery high risks of undernutrition in communities in Southern Africa who are dependent on dryland agriculture and livestock" (IPCC Special Report, page 261).*

177 The United Nations Office for the Coordination of Humanitarian Affairs confirms that the drought in southern Africa in late 2018, which hit just after the maize planting season, caused a severe food crisis for 10.8 million people. The November 2018 article is attached as "FA63".

178 Going forward, *"[w]armer temperatures enable greater pest and disease productivity and outbreaks on crops, livestock and wildlife will almost certainly increase. Food insecurity will rise, and children will very likely suffer most from hunger and malnutrition, and have to spend longer hours assisting with food production and/or procurement, most especially girls. However, extreme heat will reduce the ability to work outdoors and extreme heat waves will lead to rising numbers of morbidities and mortalities, especially amongst the most vulnerable i.e. the young, the infirm and the elderly. Opportunities for children's schooling, especially girls, will increasingly be adversely affected, setting back gender equity gains"* (page 5, King Report).

### **Wildfires**

179 Longer fire weather seasons have already affected certain regions in South Africa—such as the diverse fynbos biome in the Western Cape—and will continue to rage as the climate warms.

180 The King report explains that: *"South Africa has already and will almost certainly experience rapidly increased probability of fire risk conditions in most areas"* and that

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the risk of wildfires will also increase in *"areas not normally associated with fires such as the forests of the east coast and interior mountain ranges."* Wildfires present particular risks to the poor and the vulnerable: *"Informal settlements will be particularly vulnerable to increasing fire risk, destroying dwellings and livelihoods and killing people. Children will be most vulnerable to these traumatic events."*

181 The *Lancet* Countdown's 2020 report on health and climate change identified South Africa as a country that had experienced one of the largest increases in wildfire risk over the past decade. The report found that the number of days of exposure to very high or extremely high risk of wildfire in 2016-2019 had increased by 50 days compared to 2001-2004. A copy of this report is attached as "FA64".

182 The IPCC found that increasing temperatures and drier winters will result in further loss of Fynbos biome from wildfires. The region is projected to *"lose about 20%, 45% and 80% of its current suitable climate area under 1°C, 2°C and 3°C of global warming, respectively, compared to 1961–1990 (high confidence)"* (page 221, IPCC Special Report).

### ***Storms and Flooding***

183 In the past decade, South Africa has already experienced several extreme and fatal storms and resultant flooding. Examples include, the November 2016 Johannesburg flood, reportedly killing 6 people; and the April 2019 Easter weekend flooding in Durban, reported to have killed at least 60 people. The CSIR reported 4 floods in the Western Cape between 2011 and 2014; and 3 floods in Mpumalanga between 2014 and 2017 all of which have affected countless homes and human lives. The risk of these extreme

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weather events is likely to increase in the coming decades as a result of global warming.

The relevant news reports are attached as "FA65".

184 The Scholes and Engelbrecht report notes that:

*"Worldwide, the number of intense tropical cyclones (category 4 and 5 hurricanes) is projected to increase as the world continues to warm. Moreover, tropical cyclones and storms, when they do occur, are expected to deliver more rainfall than in the past<sup>4</sup>. This follows directly from the thermodynamics of a warmer world, which yields that storms can carry more moisture than in the past. The cyclones which affect southern Africa originate in the southwest Indian Ocean, where category 5 events have only been detected over the last two decades."* (page 8-9).

185 This risk is noted in the IPCC's latest report, which confirms that the eastern side of southern Africa will experience an *"increase of average tropical cyclone wind speeds and associated heavy precipitation and of the proportion of category 4-5 tropical cyclones"* (AR6 – Regional Fact Sheet - Africa).

186 Scholes and Engelbrecht note that the high winds, elevated sea levels and extreme precipitation associated with cyclones result in loss of life, injury and major damage to coastal infrastructure. They also pose risks far inland, after they have weakened to tropical depressions, which nevertheless result in flooding. They refer to Cyclone Idai as an example, which occurred in March 2019, and affected 2.2 million people, caused more than 2000 deaths, damage to about 100 000 homes and crop and infrastructure losses in excess of USD 773 million.

187 Professor King goes further:

*"In addition to the extreme weather events projected for the Highveld, tropical cyclones will very likely extend increasingly further inland, bringing devastating flooding to the Mpumalanga Highveld and east coastal belt with significant destruction of infrastructure, socio-economic disruption and loss*

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of lives. Each of these events will individually and cumulatively create significant potential physical harms as well as mental trauma on all, but especially the most vulnerable such as children, who will also suffer related health issues and lost educational opportunities. As these storms intensify, the impacts are likely to outstrip those of Cyclone Idai in March 2019 . . . . The potential for a related disaster, such as the bursting of one or more of the major Highveld dams, such as the Witbank Dam at eMalahleni, or Loskop Dam, on the major river system, the Olifants, is as likely as not." (page 11, King Report).

### ***Rising sea levels and loss of ocean life***

188 Climate change will also have a significant impact on South Africa's coastal areas and oceans. Professor King explains that:

*"Temperature increases in the oceans together with acidification will negatively impact marine living resources. These will mostly shift ranges and/or die out, affecting the livelihoods of all who depend on them directly for food and income. In addition, collapse of coral reefs and other marine and coastal tourist attractions such as penguin, shark and whale watching will very likely close this sector. Most associated jobs will likely be lost. Rising sea levels exacerbated by increasing storm surges will almost certainly inundate coastal areas, estuaries and coastal infrastructure. As evidenced in other countries, government at all levels will very likely be unable to overcome the public resistance to implementing the required 'managed retreats' away from the coastline."*

189 Rising sea levels bring the increased risk of storm surges and coastal flooding. The King report highlights that between 2041 and 2060 in the Western Cape, "[c]oastal property prices are likely to have collapsed due to sea-level rise and storm-surge coastal erosion and damage to property and transport networks along the coastline".

### ***Species extinction and the loss of biodiversity***

190 South Africa is one of 17 "mega biodiverse" countries worldwide; with exceptionally high numbers of unique species. A substantial portion of our economy, including the tourism sector, is built on this biodiversity.

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191 The Scholes and Engelbrecht report notes that 14% of plants, 17% of mammals and 15% of birds are currently classified as threatened with extinction. This risk of extinction rises ever more steeply with climate change, exacerbated by air pollution and water shortages. This is because *"[w]ild species have adapted to past climate changes, though not without substantial waves of extinction."* By comparison *"[a]nthropogenic climate change is a bigger challenge, because it is very rapid, and the fragmentation of habitats by human activities means that organisms cannot easily migrate to areas of more favourable climate"*. They conclude that *"[f]or many species, suitable future habitats in the wild are projected to no longer exist under unmitigated climate change"* (page 9).

### ***Psychological harms linked to present and future impacts***

192 Climate change also has a devastating impact on mental health. Dr Garret Barnwell (**"Barnwell"**), a clinical psychologist, has provided a further expert report on these psychological and mental health impacts of climate change on current and future generations living in South Africa, who are particularly vulnerable to these impacts. His report is attached as **"FA3"**.

193 The Barnwell report describes how people will experience climate change through a range of traumatic and stressful events, or climate change exposures. These include natural disasters, water insecurity, food insecurity and air pollution. These exposures in turn lead to serious mental health impacts, including post-traumatic stress, anxiety, depression, suicide, interpersonal violence, decreased work productivity and increased hospitalisation, amongst others.

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- 194 The report notes that the vast majority of South Africans will have difficulty adapting to climate change, given the country's legacy of Apartheid, marginalisation, inequality and poverty which already provide additional burdens. Climate change thus, multiplies the threats that individuals already living on society's margins have to face and will have profound impacts on the whole of South African society as conditions worsen.
- 195 The report highlights that children and youth in present and future generations are particularly vulnerable and are more likely to suffer from increased risk of poor mental health outcomes because of their exposure to climate change impacts, directly or through witnessing harm to others or in anticipation of future events. It further notes that affected children are likely to have challenges at school as their concentration is impaired and they are emotionally overwhelmed by impacts of the climate crisis and fears for their futures. Children can turn these feelings inwards and experience profound sadness, loss, helplessness or hopelessness, or they can turn these feelings outwards in destructive ways such as engaging in violence or alcohol abuse. These children's sense of hope, happiness, self-worth and trust in the world can be challenged and dulled.
- 196 The report finds that Government's plan to procure 1500 MW of new coal-powered electricity generation risks exacerbating the immediate and long-term mental health effects of climate change in South Africa, through increasing greenhouse gas emissions and air pollution. It further finds that communities already exposed to adverse living and environmental conditions, such as air pollution have expressed a sense of constant psychological distress about the inability to prevent exposure as they live in highly polluted communities without having the means to move because of their socio-economic status.

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## Economic Costs

- 197 The costs of responding to the effects of climate change are substantial, and will divert scarce resources allocated to alleviating poverty and promoting sustainable development.
- 198 The NDC update states that South Africa requires billions in US dollars to implement measures to adapt to the impacts of climate change over the 2021-2030 period – this includes the costs of adaptation measures themselves as well as the costs of building the relevant human and institutional capacity. *“Adaptation needs and costs for the period 2021 – 2030 is USD 16 – USD 267 billion”* (page 12, NDC update). *“In addition, South Africa will face significantly higher costs as a result of climate impacts which cannot be avoided during this period”*, it states (page 29, NDC update).
- 199 The Western Cape government's Third Biennial Climate Change Monitoring and Evaluation Report 2019/20 Climate Change Response Report (**“WC Climate Report”**) highlights, *inter alia*, the costs incurred by the province in responding to climate change related issues.

*“The Stern Review completed in 2006 estimated that the percentage of global governments' Gross Domestic Product (GDP) being consumed by recovering from climate related disasters could increase to between 5% and 20% by 2100, although these figures may be even greater in the current context. As stated in the 2015/16 M&E report: “...against the backdrop of the socio-economic challenges facing the country and the province, such increased disaster recovery costs pose a significant risk to the achievement of the Western Cape's growth and development goals (including those related to job creation)...” – this statement is ever more true and current given the state of climate related disasters in the province and the economic costs of responding”* (page 4).

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200 The WC Climate report explains that the Western Cape, as the most disaster-prone province in South Africa, is particularly prone to the effects of climate change and that these pose a serious risk to the Province's economy, ecosystems and population.

*"At the time of writing of the first 2015/16 M&E report, direct damages from extreme climate events over a 10-year period were in the vicinity of R5 billion, and the drought at that point had resulted in estimated R4 billion in losses. Since 2015 the drought has persisted into 2020 and the Agriculture sector alone in the Western Cape is tallying up to R14 Billion in losses. Other sector loss estimates (such as Agriculture, Industry, Building, Film, etc.) have yet to be calculated. The tourism sector for example though has been estimated to have lost between R700 million and 1.7 billion in GDP in the 2018 period at the height of the "Day Zero" threat. The single Fire/Storm event of June 2017, particularly in relation to the fires in the Garden Route (Knysna/George area), resulted in up to R6 Billion in losses. These disaster-related damages place a significant financial burden on service delivery and the economy, without taking into account the indirect costs of social, environmental and other disruptive impacts that typically characterise such events. National disaster response funding is substantially inadequate to respond, and is not able to provide for the private sector and the public at large who have all contributed and re-budgeted in order to respond to the crisis. The impacts associated with the future climate projections for the region will result in an increasing economic burden, particularly if climate vulnerability is not reduced across the province" (page 18).*

201 The relevant excerpts from the WC Climate Report are attached as annexure "FA66".

202 The King Report states, in relation to economic impacts, that "[f]or less developed countries such as South Africa, with already constrained fiscal resources, disaster response, relief work and rebuilding will very likely overwhelm the state's ability to respond adequately, compromising every aspect of future service delivery and socio-economic wellbeing. For an example of just how costly addressing climate impacts is (and which will increasingly rise), the amounts in drought relief fund allocations (just one expense) across the country for each of the past 5 years are given. These were R212m, R162m, R265m, R300m, and R51m, or a massive R990m in total. The current allocations in progress across the country amount to an additional R138m. Addressing rising disaster relief costs and rebuilding will become increasingly unaffordable for a

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country with an already weak economy, massive unemployment and the world's greatest inequality and the ensuing growing social support demands" (King Report, page 7). These costs are derived from a Parliamentary Q&A in October 2020, which revealed drought relief fund allocations over the past 5 years amounted to R 990 million, with a further allocation of R138 million in 2021. A copy is attached as "FA66A".

***The disproportionate impact on the poor and the vulnerable***

203 Poor and vulnerable communities in South Africa are already disproportionately impacted by the harms of climate change. South Africa's National Development Plan explicitly acknowledges this fact:

*"The poor and vulnerable continue to be disproportionately affected by climate change. Human health-related risks due to climate change are exacerbated by widespread poverty that includes a unique disease burden, high population mobility, and informal settlement housing characterised by poor sanitation, risks of waterborne disease, fires, flooding and malnutrition" (NDP, page 211).*

204 The government's National Climate Change Adaptation Strategy further recognises that these compounding disadvantages will have a particular impact on women and other vulnerable groups:

*"There are still many South Africans that live below the poverty line. These and other vulnerable groups, including the elderly, sick, children, and disabled, will be affected the most by climate change. In terms of gender, women in South Africa are still more vulnerable to the impacts of poverty and face different challenges to men in the workplace, in society and at home".*

205 In its 2021 report, the United Nations Environment Programme ("2021 UNEP Report"), confirms these disproportionate impacts. Relevant excerpts of the 2021 UNEP Report are attached as "FA67".

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206 The UNEP Report states that "[p]oor and vulnerable communities are most at risk from environmental threats and future generations will be more affected than the current. Poverty is increasingly concentrated in rural dryland areas of South Asia and Sub-Saharan Africa" (page 87).

207 It further explained that "[c]limate change disproportionately affects disadvantaged and vulnerable populations through food insecurity, higher food prices, income losses, lost livelihood opportunities, adverse health impacts and population displacements" (page 95).

### ***The impact on children, young people and future generations***

208 Children, young people and future generations in South Africa are at particular risk.

209 In a recent report titled "The Climate Crisis is a Child Rights Crisis", the United Nations Children's Fund ("UNICEF") has described the climate crisis as "the defining human and child's rights challenge of this generation" which is "already having a devastating impact on the well-being of children globally" (page 9). Relevant extracts from this report are attached as "FA68".

210 The UNICEF report highlights that "the climate crisis affects or will affect all children, everywhere, in often significant, life-changing ways, throughout their lives", (page 111) and explains why children are uniquely vulnerable to the harms of climate change:

*"Children are more vulnerable to climate and environmental shocks than adults for a number of reasons:*

- *They are physically more vulnerable, and less able to withstand and survive shocks such as floods, droughts, severe weather and heatwaves.*

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- *They are physiologically more vulnerable. Toxic substances, such as lead and other forms of pollution, affect children more than adults, even at lower doses of exposure.*
- *They are more at risk of death compared with adults from diseases that are likely to be exacerbated by climate change, such as malaria and dengue.*
- *They have their whole life ahead of them – any deprivation as a result of climate and environmental degradation at a young age can result in a lifetime of lost opportunity." (Page 11)*

211 Children, young people and future generations will bear the brunt of the decisions made today. It is they who will suffer the consequences of rising global temperatures and extreme events, which will increase in intensity throughout the 21<sup>st</sup> century. The adult decision-makers driving new investments in fossil fuels and polluting policies will be long dead by the time that the consequences of their actions are experienced most intensely.

212 UNICEF estimates close to one billion children around the world, almost half of all children, to be at "extreme risk" from climate impacts. It rates the climate risks to children in South Africa as 'medium-high'. Importantly, UNICEF concludes that "[i]t is now clear that economic growth that comes at the expense of the environment is not a trade-off that can be considered in the 'best interests of the child'" (page 109). I repeat that the applicants dispute the purported benefits associated with 1500 MW of new coal. Regardless, these are trade-offs that come at the expense of the environment and a stable climate, not only causing an unjustifiable limitation of the section 24 rights, but also a contravention of the best interests of the child principle as enshrined in section 28(2) of the Constitution. I return to the interdependence between the section 24 rights and section 28(2) further below.

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213 Professor King's report analyses the impacts of climate change on the lives and livelihoods of young South Africans and future generations in 2021, 2030, 2040 and beyond. To illustrate these impacts, he focuses on the climate change impacts in three regions: the Western Cape, Limpopo and Mpumalanga.

214 His analysis is summarised in the following table. Each column represents the impacts of likely temperature rises over the coming decades, unless urgent action is taken to reduce GHG emissions:

Timeline/Temp Region	2021-2040 /2°C+	2041-2060 /3-4°C	2060-2100 /4°C+
Western Cape and coastal regions	<ul style="list-style-type: none"> <li>Marine living resources are rapidly shifting ranges and/or dying out, affecting local livelihoods directly and those of the associated tourism sector e.g. scuba-diving, great white shark and whale watching.</li> <li>Drought periods are more extensive, affecting the agricultural sector, as well as tourism.</li> <li>Fire frequency and damage increases.</li> <li>Unemployment from economic decline from above impacts rises, together with in-migration from further north.</li> <li>Significant changes in biotic communities are occurring.</li> </ul>	<ul style="list-style-type: none"> <li>Earlier impacts increase in frequency and severity.</li> <li>Coastal flooding and erosion require government imposed 'managed retreats' from a number of shorelines, as increasing frequency of damage to coastal transport infrastructure (roads, railways), and coastal property makes it unaffordable to replace or maintain.</li> <li>Water resources are severely constrained leading to socio-economic conflict.</li> <li>Commercial agriculture becomes increasingly unproductive.</li> <li>Health impacts rise from knock-on effects, rising temperatures, poor sanitation, over-crowding, storm damage, declining service delivery.</li> </ul>	<ul style="list-style-type: none"> <li>Earlier impacts increase in frequency and severity.</li> <li>South Africa's coastline is changing fairly dramatically, with coastal towns and cities having had to withdraw inland to higher ground; marine commerce is severely impacted as ports cease to function.</li> <li>The majority of the Cape Floral Kingdom (fynbos) will no longer exist due to changes in seasonal rainfall and repeated, severe fires.</li> <li>Property values have plummeted due to ongoing water shortages, coastal erosion and damage, food insecurity, tourism decline and rising social unrest and violence.</li> </ul>
Limpopo/Lephalale	<ul style="list-style-type: none"> <li>Rising heat stress in both urban and rural settings.</li> <li>Water resources increasingly are constrained, increasing difficulty to grow rain-fed crops and keeping livestock.</li> <li>Dramatic increases in extreme heat events such as heat waves and high fire-risk events occur.</li> <li>Reduced access to biological resources e.g. medicinal plants and bushmeat as these are similarly impacted by changing physical conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Earlier impacts increase in frequency and severity.</li> <li>Most staple crops, and livestock, are no longer farmable due to drought and heat stress.</li> <li>Bush encroachment is severely reducing rangeland grazing potential.</li> <li>Usual coping mechanisms to deal with e.g. multi-year droughts are overwhelmed and people depend on government support and/or voluntary moving as adaptation.</li> <li>Government services and support are over-stretched and inadequate, forcing mass migration from rural areas to cities.</li> <li>Social disruption and rising violence is significant.</li> </ul>	<ul style="list-style-type: none"> <li>Earlier impacts increase in frequency and severity.</li> <li>Largely uninhabitable area of the country due to heat and drought.</li> <li>Massive loss of infrastructure to extreme weather events.</li> <li>Forced out-migration of the population. Only potentially very wealthy individuals and/or industry e.g. mining, able to afford to adapt through extensive cooling and water infrastructure, will be able to be present.</li> <li>Significant ongoing conflict over allocations of water, including transboundary requirements of neighbouring countries.</li> </ul>

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Emalahleni/ Mpumalanga Highveld	<ul style="list-style-type: none"> <li>• Already lethally high air pollution; climate change impacts exacerbate the health and mortality impacts of air pollution.</li> <li>• Rising temperatures make manual labour harder and agriculture less productive.</li> <li>• Already over-subscribed and polluted water resources become sources of conflict.</li> <li>• Extreme storm events damage infrastructure and cause mining stoppages, affecting employment.</li> <li>• Malaria and other diseases become more prevalent and health services are over-stretched.</li> </ul>	<ul style="list-style-type: none"> <li>• Earlier impacts increase in frequency and severity.</li> <li>• Phasing out coal mining and power generation without significant transition planning and remediation is causing massive unemployment and social upheaval.</li> <li>• Rain-fed agriculture is no longer viable.</li> <li>• Increasing frequency and severity of tropical cyclones pushing in from the east coast.</li> <li>• Growing infrastructure damage from extreme storm events.</li> <li>• Rising frequency and intensity of fire events razing farms, housing and infrastructure.</li> <li>• Local economies are collapsing due to damage, uncertainties in fossil fuel futures, water problems and rising social conflict over lack of service delivery, unemployment and general social stress, exacerbated by in-migration from countries to the north.</li> </ul>	<ul style="list-style-type: none"> <li>• Earlier impacts increase in frequency and severity.</li> <li>• All coal mining and power stations have closed down, sparking massive social migration to other urban centres.</li> <li>• Water is no longer readily available, even for domestic use.</li> <li>• Commercial agriculture is no longer viable through lack of irrigation water and heat stress</li> <li>• Health problems are rife from food insecurity, poor water quality, spread of infectious diseases and social stress and violence.</li> </ul>
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215 Professor King concludes that *"today's youth, and all future generations, are faced with the virtually certain probability of severe harms from a range of increasingly severe impacts caused by climate change."* Unless drastic action is taken, the outlook is dire: *"[w]ithin a decade we will very likely be looking back on today's extreme events as mild. Daily lives will be vastly more difficult, quality of life and economic opportunities greatly diminished and many will suffer premature death from extreme weather events, heat-stress, exacerbated diseases outbreaks and/or violent social upheaval and conflicts, as well as stress-induced suicide. Inter-generational inequity will rapidly increase without a transformational change in energy policy now, based on no new fossil fuel investments, and rapid phase out of all existing fossil fuel use."*

216 Although all of the binding principles under section 2 of NEMA, as listed above, are of equal importance, the public trust doctrine holds special significance in this regard:

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*"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."*

217 Government decision-makers are custodians of the environment on behalf of the public in general, owing a particular duty to more vulnerable groups, such as children who typically do not have the capacity or opportunity to represent themselves in decision-making processes. In the face of the dire predictions in Professor King's assessment, children largely depend on - and are left to trust - those presently in power to conserve the environment, protect society's common heritage, and ensure a safe climate now and during the decades to come. I return to the issue of children's representation in the IRP and determination processes, below.

#### ***Individual experiences of climate change***

218 Three children, young people, and parents currently living in the Western Cape, Limpopo and Mpumalanga have deposed to affidavits in support of this application, describing their experiences of climate change and the impact on their lives. These affidavits are attached as "FA69" to "FA76".

219 Fourteen-year-old Anelisa Mgedezi, a resident of Khayelitsha in Cape Town, lived through the severe drought that brought the city to the brink of "Day Zero". She states that:

*"In 2018, there was a drought, it was very hot and accessing water was particularly challenging at this time. When we could get water from the tap it was brown. I think drinking this dirty tap water resulted in me contracting cholera. I had to immediately seek medical attention after having experienced diarrhea. I had to choose between going to school and going to the clinic, I was so ill that I had to go the clinic. We waited for a long time at the clinic because there were a lot of people. I was not the only person who contracted cholera, two of my cousins also contracted cholera."*

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220 Anelisa further explains that her community has experienced, and been affected by, heavy rains and floods. On multiple occasions, her family has had to rebuild their home after heavy rains and flooding. Such extreme weather events will become more common as global temperatures continue to rise.

221 Anelisa states that she has *"seen how climate change impacts me, my family and my community ... I feel the effects of climate change every day."* She states *"I am worried that climate change will result in there being more storms and other natural disasters, which will lead to homelessness and other severe consequences. I want my community to be safe from these impacts of climate change."*

222 Yola Mgogwana, a 14-year-old from Khayelitsha also lived through the Cape Town water crisis. She describes how her community went for days without water and how fights broke out when a water truck finally arrived. While some look forward to rain, Yola lives in fear of flooding, which has affected her life and schooling:

*"There was one flood in particular which resulted in my school uniform and books getting wet. Floods have also affected my ability to study. I distinctly recall having to miss my Mathematics final exam, because I was up late at night trying to assist alleviating the damage caused by the flood instead of studying. I have tried to explain my situation and how floods affect my schooling to my teachers but I do not think that they understand."*

*Apart from affecting my studies, the floods also affect my and my family's life more generally. When our home gets flooded we cannot leave because we have nowhere else to go. I have asthma, which means I have a weak immune system. There was a time when I had to be rushed to the hospital because I suffered an asthma attack. I think that the asthma attack came after I caught the flu as a result of being wet from the rain and being exposed to the cold weather."*

223 Yola is concerned about her future and the impact that climate change will have on her life. She says *"I have dreams for myself and my family, I want to take my family out of poverty but I find myself wondering if I will be able to fulfill these dreams if the climate*

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*crisis gets worse.” She feels that climate change has robbed her of her childhood: “I am a young child, I should be enjoying my life, focusing on my studies and looking forward to my future, instead I am focused on environmental justice and bringing about change.”*

224 Lulama Jolobe, is a thirteen-year-old from Mowbray in Cape Town. She explains that her family tries to do their bit to assist in the climate and ecological crisis but that these attempts seem in vain, given that big companies and industries are causing the most damage. She states that she tries not to think about the climate and ecological crisis too much as it is a lot to take on. She explains her fears about the climate and ecological crisis: *“I try not to think about what this means for the future, my future. If I do think about it, it worries me. . . . I fear that if we do not reverse climate change, we are all going to die or at least many of us, mostly poorer communities at risk, will face danger and death.”*

225 Anelisa, Yola and Lulama’s experiences are shared by Ms Michelle Mhaka, Gabriel Klaasen and Ms Lisakhanya Mathiso, young adults who also live in Cape Town. They describe their experiences living through the water crisis and the impact of climate change on their lives.

226 Gabriel Klaasen, aged 23, states that *“[m]y anxiety, fear and depression is brought on by observing current realities related to the unfolding climate crisis and its impacts. I see droughts, wildfires, sea levels rise and immense destruction both locally and globally. I see the disproportionate impacts on poor and economically marginalised people. These things are happening now in the present, and this is enough to distress and sometimes destabilise me significantly.”* They further state that, *“[w]hen I think of*

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*the future, when these impacts are predicted to intensify manifold, I become completely overwhelmed."*

227 Ms Mhaka, a 21-year-old, describes her struggles with eco-anxiety and the *"intense feeling of helplessness"* she feels when thinking about the future. She states that *"this feeling is intensified when government does not share the same sense of urgency and does not recognise that we are currently in a crisis"*.

228 Eighteen-year-old Ms Mathiso explains that she experienced climate change before she learnt about it. She describes how the drought severely affected people living in the township who already have to face a number of socio-economic challenges. She states that *"we already have so many crises to tackle on a daily basis, the water crisis added to our already existing crises."* She further explains the difficulties that came with sharing 50 litres of water in a household with six individuals.

229 Ms Mbali Mathebula, a 25-year-old mother of two, lives in Emalahleni, Mpumalanga. She states that she is *"worried that with climate change, it will get hotter and we already struggle with water cuts in Emalahleni, if there is a drought it will be harder for my children to live."*

230 Twenty-five-year-old mother of one, Ms Beatrice Sibabela, lives in Lephalale, Limpopo. Ms Sibabela explains that the expected impacts of climate change worry her, particularly as a parent. She continues to explain *"I think about my son and the risks to water and food in the future. Water is already scarce, and this looks like it will become a lot worse. We need water to grow food. We might not be able to grow maize and vegetables in future."*

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## E THE MYTH OF “CLEAN COAL”

231 When confronted with the harms of coal-fired power and the dangers of climate change, both the Minister and NERSA have repeatedly claimed that new generation capacity will employ “*clean coal*” technologies, also referred to as “*High Efficiency Low Emission*” (“HELE”) technologies.

232 The 2019 IRP expressed an unfounded preference for such technologies, stating that:

*“[N]ew investments will need to be made in more efficient coal technologies (HELE) technology, including supercritical and ultra-supercritical power plants with CCUS to comply with climate and environmental requirements. (2019 IRP, page 46).*

233 The type of HELE technologies that are contemplated include “*underground coal gasification, integrated gasification combined cycle, carbon capture utilization and storage, ultra-supercritical, super-critical and similar technologies are preferred for the exploitation of our coal resources.*” (2019 IRP, page 46). The 2019 IRP further states – in the comments and response section, in relation to the draft IRP of 2018, that “*[c]leaner coal in the form of HELE is included in the assumptions. For the costs to be revised, this must be based on at least one operational project experience (ideally 3) anywhere in the world, to substantiate claims by manufacturers etc.*” (page 63, 2019 IRP).

234 These appeals to “clean coal” technology are addressed in the expert report of Dr Sahu, referred to above and previously attached as “FA4”. Dr Sahu is confirming the findings of this report in a confirmatory affidavit, which in the process of being notarised and authenticated, in terms of Rule 63 of the Uniform Rules of Court. This, with Dr Sahu’s

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curriculum vitae, will be filed with the supplementary founding affidavit following receipt of the Rule 53 record.

235 Dr Sahu confirms that "clean coal" is a myth:

*"[T]here is simply no such thing as 'clean coal', regardless of whether HELE technologies are used to minimize air emissions from coal (or gas derived from coal). Even if HELE technologies are applied consistently and perfectly (a practical impossibility, since the technologies do not work under all modes of operation, such as during startup or malfunction), air emissions are considerable even just at the plant itself. Plus, there are non-air impacts such as waste water and cooling water and waste generation at the plant. Of course, in addition to impacts from the plant, a coal plant will need to rely on an extensive supply chain starting at the coal mine and through disposal of the coal ash, with transportation in between – all of which not only have significant air impacts but also water and waste impacts. Thus, 'clean coal' is a myth." (Emphasis added)*

236 Dr Sahu's report analyses the different technologies that are generally put forward as being "clean coal", showing that all still involve considerable emissions, that they are costly, and many are unfeasible for the capacity contemplated in the 2019 IRP (that it must be based on one operational project experience (ideally 3) in the world) and the Minister's determination. The technologies he analyses include:

236.1 **Supercritical, ultra-supercritical ("USC"), and advanced supercritical boiler technology.** These technologies seek to achieve higher levels of thermal efficiency, meaning the amount of energy in the coal that is converted to electricity. A more efficient plant does not necessarily reduce pollution per tonne of coal burnt and in particular, incremental efficiency increases do not necessarily lead to substantial reductions in greenhouse gas emissions.

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- 236.2 **Pulverized Coal ("PC") and Circulating Fluidised Bed ("CFB") combustion systems.** Pulverized coal (in which finely ground coal is combusted in a furnace and the resulting heat used to raise steam) remains the primary power generation technology used today by the vast majority of operating coal-fired power plants and those under construction. CFB systems use lower-quality coal, including discard coal. Only a few ultra-supercritical circulating fluidised bed units are now operating globally, and no such units are present in South Africa.
- 236.3 **Integrated gasification combined cycle technology ("IGCC").** In this technology, coal is not burned but is instead gasified to form a synthetic gas. This gas, after suitable cleaning, is then burned in combustion turbines. In effect, one must run a chemical plant and a power plant together. There are no commercial plants of this type in South Africa.
- 236.4 **Underground coal gasification ("UCG")** essentially involves burning coal underground to produce gas. Two sets of holes are drilled into a coal seam, blowing oxygen into one side, setting fire to the coal underground, and extracting gas at the other side. This is commercially unproven at scale and has severe environmental consequences, both through emissions and potential contamination of groundwater.
- 236.5 **Carbon capture and storage ("CCS")** technology seeks to dispose of CO<sub>2</sub> emissions. This remains the "holy grail" for fossil fuel use, but it remains unproven at scale, exorbitantly expensive, and inefficient in reducing emissions. Dr Sahu notes that there are 23 carbon capture projects in

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operation or under construction around the world, but not a single one is located at a coal-fired power station of a commercial scale. The two examples of CCS used at coal-fired power stations illustrate the lack of feasibility:

236.5.1 The installation of CCS technology at a Canadian 110 MW coal-fired power station cost more than \$1.1 billion and was so unsuccessful that plans for a second plant were scrapped.

236.5.2 The only example of CCS technology in the United States, the Petro Nova project in Texas, shut down after only four years as it was too expensive and inefficient. The carbon capture technology was so energy intensive that it required an entirely separate gas-fired plant to power it.

237 Dr Sahu draws the following key conclusions, after assessing these different technologies:

237.1 Ultra-supercritical efficiency is the highest possible thermal cycle efficiency that can be anticipated for procurement of 1500 MW of new coal under the 2019 IRP. This is because the deployment of advanced ultra-supercritical plants (currently the most efficient of the HELE technology options) as contemplated in the 2019 IRP is not possible – given the 2019 IRP requirement for the technology options to be based on technologies that are operational and proven. Many supercritical and several ultra-supercritical

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plants are operating around the world today, but there are currently no operational advanced ultra-supercritical plants.

- 237.2 Circulating fluidized bed technology would likely be a preferable option due to its ability to handle low quality and waste coals in South Africa. However, it is more likely that new coal plants in South Africa would use the less efficient pulverised coal technology. This is because the vast majority of operating coal-fired power plants today, or those under construction globally, are based on pulverized coal. CFB technology is a distant second (after pulverized coal) in terms of use in the global coal plant fleet. The coal plant technology costs considered by the Department, as an input for the IRP 2019, were costs for “coal pulverized with FGD” and “FBC (fluidized bed combustion) with FGD (single unit)”. Two of the coal power technology options considered in the ‘Power Technology Data for the Integrated Resource Plan’ report, April 2017 technical update, were CFB and pulverized coal.
- 237.3 Integrated gasification combined cycle (IGCC) and underground gasification combined cycle (UGCC) power plants are unproven and cost-prohibitive at scale, and extremely unlikely to be implemented for the 1500 MW of new coal proposed under the 2019 IRP for these reasons.
- 237.4 Operating 1500 MW of new coal capacity at only ultra-supercritical efficiency is likely to result in substantial greenhouse gas emissions and therefore have substantial climate impacts, regardless of using pulverised coal or circulating fluidized bed technology.

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- 237.5 Carbon capture technologies are unproven, hugely expensive, and extremely unlikely to be implemented for the 1500 MW of new coal proposed under the 2019 IRP for these reasons. Based on the track record of carbon capture to date globally, there is simply no pathway to economically utilise carbon capture in South Africa now or in the foreseeable future for reducing CO2 emissions from new coal generation. There are currently no coal to power projects operating with commercial success using carbon capture anywhere in the world and none are anticipated in the foreseeable future.
- 237.6 Emissions of a range of so-called major and hazardous air pollutants are simply inescapable when using coal as a fuel. For example, if either pulverized coal or circulating fluidized bed technologies are used, regardless of the efficiency of the thermal cycle (which can only attenuate such emissions but not eliminate them), significant quantities of SO2, NOx, particulate matter, and hazardous air pollutants will be formed because of coal properties and the combustion process.
- 237.7 While air pollution abatement technologies such as Selective Catalytic Reduction (“**SCR**”), wet flue gas desulphurisation, and fabric filters can be used to reduce these pollutant emissions, the emissions cannot be eliminated. The degree of reduction of air pollutants by using the technologies noted prior depends on their design and how they are operated. For example, in the case of SCR, while a state-of-the-art design might provide 90-95% reduction of NOx, actual efficiencies closer to 50-60% or even lower are not uncommon given substandard design, non-replacement of aging catalysts, poor use of ammonia, and many other factors.

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- 237.8 Given that no South African coal-fired power stations have been willing to pay for the full suite of the most effective pollution control technologies, it appears unlikely that the 1500 MW of new coal would be required to use these technologies at suitable levels of pollutant reduction, given the capital and operating costs of adding such technologies and operating them effectively. To the extent that the applicants are aware, there is presently no indication that the independent coal plants will actually be legally required to use these technologies.
- 237.9 Even if using some combination of HELE technology that is applied consistently and perfectly at the plant at all times (a practical impossibility even with the best of intentions, since HELE technologies do not work under all modes of plant operation, such as during start-up or malfunction), the remaining air emissions (greenhouse gases and hazardous air pollutants) from the proposed plants and upstream associated emissions from mining, ash transport and disposal are considerable. Even if these technologies were installed, it is also impossible to eliminate significant emissions of toxic organic compounds, trace metals, acid gases and particulate matter from a coal plant. Thus, the new coal plants will inevitably result in significant air pollution and harms to human and environmental health regardless of pollution controls.
- 238 Dr Sahu concludes that given the type, cost and feasibility of existing HELE and carbon capture technologies available in South Africa, it is unrealistic to assume that HELE and carbon capture technologies can adequately mitigate the potential environmental and climate impacts of the proposed new coal capacity.

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239 In any event, all of these technologies would result in a substantial increase in capital and operating costs – making coal even more expensive and uncompetitive when compared with alternatives.

240 This myth of “clean coal” is further evident in the analysis conducted by the Electric Power Research Institute (“EPRI”) in 2017, as part of the IRP process. The EPRI was commissioned to develop cost and technology estimates, based on 2015 data, which were used in the IRP modelling process. This included estimates of likely emissions. I attach relevant excerpts from this report as “FA77”.

241 I immediately emphasise that the EPRI’s analysis is incomplete and likely a significant under-estimation of the emissions from coal-fired power stations. Its estimates do not include other GHGs, beyond CO<sub>2</sub>, such as nitrous oxide (“N<sub>2</sub>O”), methane (“CH<sub>4</sub>”) and sulphur hexafluoride (“SF<sub>6</sub>”). These other GHGs all have greater global warming potential than CO<sub>2</sub>. It also does not estimate other harmful pollutants from coal-fired power, such as mercury. Furthermore, the EPRI’s estimations of emission reductions from carbon capture and storage and the costs appear to be entirely speculative, given that there are no examples of coal-fired power stations successfully implementing this technology at a commercial scale.

242 Nevertheless, the EPRI analysis shows that emissions of GHGs and other harmful pollutants would still be substantial:

242.1. For pulverised coal, CO<sub>2</sub> emissions ranged from 930.2 kg/MWh to 947.3 kg/MWh without any form of carbon capture and storage. The addition of carbon capture and storage was estimated to result in CO<sub>2</sub> emissions of 136.2 kg/MWh (Tables

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7-1 to 7-3). Notably, the cost of adding abatement technology to reduce SO<sub>2</sub>, increases the plant cost by 25%, and installing carbon capture technology increases the cost of the plant by **130%**, while increasing water consumption from 33.4 litres/MWh to **320.2 litres /MWh** (7-6 to 7-8).

242.2. Integrated Gasification Combined Cycle plants were estimated to produce CO<sub>2</sub> emissions of 930 kg/MWh, falling to 120 kg/MWh with carbon capture and storage (Tables 7.7 and 7.8). The addition of carbon capture increases the plant cost on a per kilowatt basis by about 33%, and the water consumption rate increases significantly to **over 1000 litres/MWh** due primarily to the water used in the water shift (7-12 to 7-15).

242.3. Circulating fluidized bed (CFB) plants were estimated to produce CO<sub>2</sub> emissions of 1003 kg/MWh, with 150 kg/MWh of CO<sub>2</sub> assuming carbon capture and storage (Tables 7-11 to 7-13). Adding carbon capture increases the plant cost by about **78%** on a per kilowatt basis, and carbon capture technology increases water consumption from 33.3 litres/MWh to about 50.0 litres/MWh (7-20 to 7-23).

242.4. The EPRI's analysis also showed significant emissions of harmful SO<sub>x</sub>, NO<sub>x</sub> and fine particulate matter for all of these technologies. The addition of carbon capture and storage was estimated to result in a small increase in these other harmful pollutants, while, the installation of abatement technology to reduce these harmful pollutants, increases CO<sub>2</sub> emissions.

243 Notwithstanding the limitations of the 2017 EPRI Report, this analysis corroborates Dr Sahu's key conclusions. It again demonstrates that so-called "clean coal" technologies

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are nothing of the sort. These technologies cannot adequately mitigate the potential environmental and climate impacts of the proposed new coal capacity, they would result in a substantial increase in plant cost (making coal prohibitively expensive and uncompetitive when compared with renewables), and carbon capture and storage would significantly increase the use of scarce water resources.

## **F NEW COAL WILL ALL BUT GUARANTEE THE CLIMATE CRISIS**

244 The plans to procure 1500 MW of new coal-fired power will set back global efforts to achieve the Paris Agreement goal of limiting temperature increases to 1.5°C - the minimum temperature target necessary to avert a global climate crisis. This is so for five reasons:

244.1 First, the emissions from new coal-fired power will directly contribute to climate change.

244.2 Second, new coal will drive up South Africa's cumulative emissions and the system-wide costs of achieving emission reductions.

244.3 Third, new coal will prevent South Africa from doing its "fair share" to achieve the 1.5°C target.

244.4 Fourth, new coal will also make it more costly and difficult for the country to achieve its updated Nationally Determination Contribution, and will stand in the way of more ambitious targets in future.

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244.5 Fifth, this will undermine the global call for rapid decarbonisation and the cancellation of new coal-fired power projects.

***New coal contributes to climate change***

245 The IPCC's latest report is unequivocal: "every tonne of CO<sub>2</sub> emitted adds to global warming" (IPCC 2019 SPM, Finding D1). This again confirms the scientific consensus that there is a near linear correlation between GHG emissions and global temperature rises.

246 Professor King explains the implications in his expert report:

*"Every additional GHG emission will exacerbate global heating and the resultant climate change impacts. Projected changes in extremes are larger in frequency and intensity with every additional increment of global heating. Without every effort possible to mitigate emissions, most specifically through cessation of use of fossil fuels, the lives of today's youth and future generations will be profoundly negatively impacted by climate change."*

247 As the previous section has demonstrated, the emission of GHGs and other harmful pollutants is simply inescapable when using coal as a fuel.

248 The Minister and NERSA have not publicly disclosed their estimate of the likely lifetime GHG emissions from new coal-fired power stations, if any such analysis was conducted, beyond the figures contained in the EPRI report discussed above.

249 What is known is that these coal-fired power stations are likely to operate for decades, until 2050 at the very least, locking in substantial GHG emissions.

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250 The government's own Low Emission Development Strategy acknowledges this. It states that "[t]hrough regular updates to the IRP, and making early commitments to deep transformation of the sector post 2030, ambition can be increased. However, including new coal-fired power stations in the build plan will result in further lock-in to carbon intensive electricity supply, or the potential for stranded assets in the sector" (page 25).

***New coal would substantially increase South Africa's cumulative greenhouse gas emissions and the costs of achieving emission-reductions***

251 In its expert modelling of the likely impact of the 1500 MW of new coal capacity, the UCT Energy Systems Research Group ("ESRG") concludes that the inclusion of this new coal capacity would result in increased cumulative greenhouse gas emissions and significantly increase electricity system costs. The report is attached as "FA5" with a confirmatory affidavit to be filed by co-author, Ms Jesse Burton.

252 ESRG analysed the impact of 1500 MW of new coal capacity by modelling three scenarios:

252.1 A "reference scenario" which takes into account South Africa's current reality (including flagging economic growth and falling electricity demand) and develops an optimal, least-cost build plan for electricity generation based on this reality.

252.2 The "350 Mt" or "climate policy" scenario in which South Africa makes the necessary efforts to achieve a Paris Agreement-compatible emission limit of

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350Mt CO<sub>2</sub>eq in 2030. This 350 Mt CO<sub>2</sub>eq target is the ambitious end of the range committed to in South Africa's updated NDC. In this scenario, *"existing coal plants are closed earlier than in the IRP 2019 and are also run at lower load factors, lowering emissions."*

252.3 The "420 Mt scenario" in which South Africa seeks to reduce its emissions to the upper limit of its updated NDC targets of 420 Mt CO<sub>2</sub>eq by 2030 (addressed in the addendum to the ESRG report).

253 In each of these scenarios, the ESRG has modelled the impact of forcing in 1500 MW of new coal capacity.

254 In the "reference scenario", the ESRG found that forcing new coal capacity into an otherwise least-cost electricity supply mix would increase the country's cumulative GHG emissions by 289 MtCO<sub>2</sub>eq until 2050. This is because new coal capacity would not only contribute greater GHG emissions, but it would also displace renewable energy sources from the energy mix. These emissions would be even higher if the lifespan of the new coal-fired power stations extends beyond 2050.

255 The ESRG further found that in this "reference scenario", the inclusion of new coal would increase annual emissions to 454.6 MtCO<sub>2</sub>eq in 2030, adding 12 MtCO<sub>2</sub>eq when compared with a scenario where no new coal is built. To place that into perspective, an additional 12 MtCO<sub>2</sub>eq is equivalent to the total emissions of Botswana, Namibia and Lesotho in 2019, combined.<sup>27</sup>

<sup>27</sup> 2019 emissions from neighbouring states were: Botswana (6 MtCO<sub>2</sub>); Namibia (4 MtCO<sub>2</sub>); Lesotho (2 MtCO<sub>2</sub>). Data sourced from the <http://www.globalcarbonatlas.org/en/CO2-emissions>.

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256 In the "climate policy" scenario, if South Africa were to take all steps to achieve the more ambitious target of 350Mt CO<sub>2</sub>eq by 2030, the addition of 1500 MW of new coal would significantly drive up the costs to the economy. The discounted electricity system costs would increase by R109 billion to achieve the lower 350 Mt target; as huge economic sacrifices would have to be made to bring down emissions to a level that would offset the increased emissions from 1500 MW of new coal.

257 In the "420 Mt" scenario, the addition of 1500 MW of new coal would increase the system cost by R74 billion, as the addition of new coal would again force other sectors to make bigger emissions reductions to achieve the 420 Mt target.

***New coal would prevent South Africa from doing its fair share to achieve the 1.5°C target***

258 New coal capacity will therefore make it more difficult and costly for South Africa to achieve ambitious emission-reductions, consistent with its "fair share" contribution to achieving the Paris Agreement goals. This is demonstrated in the expert report by the Climate Equity Reference Project ("**CERP**") attached as "**FA6**".

259 As explained in the CERP Report, a "fair share" approach determines whether a country is contributing to the global effort to achieve the 1.5°C threshold in proper proportion to its national capacity and responsibility (page 2). The core principle is that it would not be possible to stabilise the planetary climate system unless the relative contributions to the stabilisation process by countries and groups is perceived as fair (page 2).

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260 A fair share approach also acknowledges that lower-emitting countries must contribute to preventing the climate crisis, and should not use lesser emissions as an excuse for insufficient action. Even if the relative share of global emissions is low, preventing further climate change requires all countries to act. As CERP noted in its report: *"If the efforts of countries that collectively are responsible for one-quarter of global emissions is treated as irrelevant, then global emissions can never approach zero, and the Paris temperature objective is out of reach"* (page 3).

261 The South African government has repeatedly endorsed the use of a fair share approach to guide its emissions reduction commitments, including in government's Low Emission Development Strategy 2050, statements by President Ramaphosa, and South Africa's 2021 NDC update.

262 CERP assessed South Africa's fair share of GHG emissions using the Climate Equity Reference Framework, a fair share analysis framework supported by a wide range of civil society groups, including several in South Africa (page 1). The South African government also used this framework as a basis for gauging the fairness of the country's reduction targets in the 2021 NDC update - *"Regarding mitigation, South Africa has undertaken further detailed analysis of its relative fair share, updating the information provided in the first NDC. A fair share framework was developed, as a lens on how South Africa's mitigation contribution represents a fair share of global mitigation efforts"* (page 30, NDC update).

263 This framework presents an ethically coherent method for calculating national fair shares for all countries, whatever their development status.

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264 In their report, CERP utilised their Climate Equity Reference Framework, to calculate each country's fair share expressed as an equity range with a lower and upper bound, representing a 1.5°C pathway and a 1.8°C pathway, respectively, as well as two different specific perspectives of what could be considered fair. Additional results representing a 2°C pathways are provided as well. For purposes of assessing consistency of additional coal capacity with South Africa's fair share targets, CERP then reports these results for South Africa. Results for a 1.8°C pathway are used to provide details that are consistent with a possible interpretation of the "well below 2°C" requirement in the Paris Agreement.

265 According to CERP's calculations, South Africa's fair share range is between 0.46% and 0.70% of the global mitigation effort in 2030. This proportion of global mitigation efforts translates to a fair share target range of:

265.1 274-352 MtCO<sub>2</sub>eq by 2030, including emissions and removals from Land Use, Land Use Change, and Forestry ("LULUCF"), for an emissions pathway that is aligned with the 1.5°C goal; and

265.2 311-376 MtCO<sub>2</sub>eq by 2030, including emissions and removals from LULUCF, for a 1.8°C pathway (page 9).

266 This fair share analysis further concludes that South Africa must reduce emissions below CERP's baseline projections, in sectors other than LULUCF, by between 121 and 187 MtCO<sub>2</sub>eq in 2030 to do its fair share of limiting warming to 1.8°C, and between 146 and 223 MtCO<sub>2</sub>eq to do its fair share of limiting warming to 1.5°C.

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267 Based on the ESRG's modelling, the CERP Report finds that forcing 1500 MW of new coal capacity into an otherwise least-cost power sector future raises annual GHG emissions by 103 to 181 MtCO<sub>2</sub>eq above the country's fair share of a 1.5°C mitigation trajectory, and 78 to 144 MtCO<sub>2</sub>eq above its fair share of a 1.8°C global trajectory (page 11).

268 On this basis, the CERP Report further concludes that the addition of 1500 MW of new coal *"is inconsistent with South Africa's efforts to undertake its fair share of the global mitigation needed to adhere to the Paris Agreement temperature goal"* (page 12).

269 A 2021 Climate Analytics Report confirms this analysis, stating that a 1.5°C compatible pathway requires South Africa to reduce emissions to 39% below 2010 levels. It states further that continued coal dependency, as outlined in IRP 2019, is incompatible with achieving a 1.5°C compatible pathway. Relevant excerpts of this report are attached as **"FA78"**.

270 Climate Action Tracker, also confirms that the 2019 IRP, and in particular its addition of new coal, would propel South Africa outside of its fair share contribution to climate mitigation:

*"The IRP2019 aims to decommission over 35 GW (of 42 GW currently operating) of coal-fired power capacity by 2050. To be in line with the Paris Agreement goals, South Africa would need to adopt more ambitious climate action beyond the IRP2019, such as further increasing renewable energy capacity by 2030 and beyond, stopping the planned commissioning of 1.5 GW of new coal capacity, fully phasing out coal-fired power generation by latest 2040, and avoiding investing in natural gas."<sup>28</sup>*

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28 Climate Action Tracker, South Africa (updated 22 September 2020), <https://climateactiontracker.org/countries/south-africa/fair-share/>. Climate Action Tracker also found South Africa's 2016 NDC is "highly insufficient" and falls outside of its "fair share" range. Warming would reach between 3°C and 4°C if other countries were to adopt similar NDCs.

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271 A copy of the relevant page from Climate Action Tracker website is attached marked "FA79".

***New coal will make it more difficult and costly to achieve current and future NDC targets***

272 New coal capacity will make it more difficult and expensive for South Africa to meet the updated NDC targets to which it has now committed under the Paris Agreement.

273 As explained above, Cabinet has recently approved, and the government has submitted to the UN, an updated NDC, setting an emissions target of 350 – 420 MtCO<sub>2</sub>eq by 2030.

274 While this target represents an improvement on the weaker targets set in the initial NDC, it remains largely insufficient for South Africa to comply with its constitutional obligations and to undertake its fair share to prevent the global climate crisis. The state's constitutional obligations and its "fair share" commitments under international law require it do more, a matter that will be addressed further in argument.

275 These reservations with the updated NDCs aside, the addition of 1500 MW of new coal would make it more difficult and costly for the country to achieve these emission-reduction targets, insufficient as they may be.

276 As previously explained, the ESRG's modelling shows that if South Africa were to achieve the more ambitious target of 350Mt MtCO<sub>2</sub>eq by 2030, the addition of 1500 MW of new coal would increase the discounted electricity system costs by R109 billion.

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- 277 This would make it less likely that the country will be able to achieve this target. It would also leave fewer resources available to address other urgent climate mitigation and adaptation needs.
- 278 Even if the less ambitious upper range of the NDC update target of 420 MtCO<sub>2</sub>eq were to be achieved, whilst pursuing the plans for 1500 MW of new coal, this would increase discounted electricity system costs by R74.4 billion.
- 279 The ESRG modelled the updated NDC target range, reflecting these results in an addendum to the report ("FA5"). It found that in both cases, in order to meet either the 350 or 420 figure, *"building and running new coal capacity is accompanied by increases in greenhouse gas emissions that squeezes out other emissions/emitting infrastructure when a total cap on greenhouse gas emissions is implemented. This means that the new coal capacity pushes out the relatively cheaper existing coal in Eskom's fleet more quickly, raising the costs of transition."* *"The limited emission space also results in increased mitigation on the demand side (i.e. in demand sectors such as transport and industry), accelerating electrification to offset the emissions from the new coal capacity, pushing costs up further (e.g. faster switching to electric vehicles). In other words, the system with the forced coal capacity has more emissions from the power sector than the system without the forced coal. Since both systems have to meet the same CO<sub>2</sub> limits, less space is available for other sectors (other than the power sector) such as transport and industry, which have to now include more mitigation action. This involves an increase in electricity use by those sectors."* (pages 47-8)
- 280 South Africa has committed to update these NDCs every five years, to set more ambitious targets. Article 4.3 of the Paris Agreement requires states to communicate

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and maintain successive nationally determined contributions, "*which will represent a progression beyond the Party's then current nationally determined contribution*" and through its NDCs to "*reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities*" to reduce its emissions in line with the Paris Agreement targets.

281 It is evident that new coal-fired power stations, which will likely operate for decades, will therefore stand in the way of the country doing its part to achieve deeper emissions reductions in future.

***New coal undermines the global call for rapid decarbonisation***

282 Climate change is the ultimate collective action problem. No country can individually control the global climate, and it therefore requires collective efforts by all nations to address the problem. Each nation must take urgent emissions-reduction measures in a way that stimulates confidence and promotes reciprocal efforts in other countries.

283 By continuing to support new coal-fired power in the face of the climate crisis, South Africa further undermines the calls from the UN Secretary General and climate scientists to abandon coal going forward. It also threatens to weaken the global resolve to rapidly decarbonise economies.

284 This has a direct impact on the rights of all South Africans, who will be exposed to the increasing scale and intensity of climate change harms if these global efforts fail.

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## G THE FURTHER HARMS OF COAL

285 The harms of procuring new coal-fired power capacity are not confined to the climate change impacts. The history of burning coal (and producing the coal to supply the power stations) has left a trail of premature death, illness, and other harm in communities across South Africa. In this section, I describe these harms.

### *Atmospheric emissions and human health*

286 The pollutants emitted when burning coal – which include particulate matter (“PM”); sulphur dioxide (“SO<sub>2</sub>”); oxides of nitrogen (“NO<sub>x</sub>”); mercury (“Hg”); and CO<sub>2</sub> – are extremely harmful to human health and wellbeing.

287 Coal-related pollution has heavily contributed to massive non-compliance with national air quality standards meant to protect human health.

288 The precise locations of the planned new coal-fired power stations are not yet known, but it can be assumed that these projects will be based near South Africa's coal resources. These are areas which are already environmentally stressed due to a saturation of existing coal-fired power stations, coal mines and industrial activities. This is addressed in the report by Dr Sahu referred to above and attached as “FA4” (“the Sahu Report”).

289 At present, most of the country's coal-fired power stations are concentrated in the Mpumalanga and Gauteng Highveld, in what has been demarcated by government as the Highveld Priority Area under the National Environmental Management: Air Quality Act, 2004.

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290 Recent litigation in this Court uncovered the Department of Environmental Affairs' own estimates of the deadly effects of air pollution in the Highveld region. The Department's *Initial Impact Assessment of the Priority Area Air Management Plan Regulations*, 2019, is attached as "FA80" ("Initial Impact Assessment").

290.1 This report confirms that communities in the Highveld are at "*high risk of acute and chronic health effects due to exposure to PM, NO<sub>x</sub> and SO<sub>2</sub>*" (Initial Impact Assessment, page 11);

290.2 In respect of PM<sub>2.5</sub> and PM<sub>10</sub> levels alone, between 5000 and 10 000 deaths could be avoided if levels of these pollutants were brought within the limits prescribed in the National Standards. The assessment states that:

*"The Highveld Priority Areas health study finding reveals through Human Health Risk Impact Assessment for air pollution levels (i.e. specially for PM<sub>10</sub> and PM<sub>2.5</sub> levels) on the cases of mortality estimated a 4 881 decrease in PM<sub>2.5</sub> attributable mortality if annual PM<sub>2.5</sub> NAAQS were met, whereas the estimated lives that could have been saved by meeting the annual NAAQS for PM<sub>10</sub> is 5 125 people. Findings of the report concluded that there is a chance to save thousands of lives if annual PM NAAQS were met, and further more recommended that it is essential to improve air quality to meet NAAQS and to save lives" (Initial Impact Assessment, page 11, emphasis added).*

290.3 Notably, this study only considered exposure to harmful PM levels. This does not account for the further lives that could be saved by reducing levels of other harmful pollutants, including SO<sub>2</sub>, NO<sub>x</sub>, mercury and O<sub>3</sub>.

290.4 Section 1.5 of the assessment further noted that women, youth, children, people with disabilities and low-income groups are all most at risk because "[t]heir health and well-being [is] negatively affected" and that "women,

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*youth, children, and people with disabilities are not benefit[t]ing*" (Initial Impact Assessment, page 10).

291 The emissions from the operation of Eskom's coal-fired power stations alone give rise to an estimated 2 200 attributable deaths every year, according to a 2017 study by Dr Mike Holland, titled "the Health Impacts of Coal Fired Power Plants in South Africa" (**"the Holland Report"**). The Holland Report also found a number of extensive unacceptable health impacts for communities (in particular children) living in the vicinity of Eskom coal-fired power stations (Table 3-2).

291.1 For example, the Holland Report found that coal-fired power generation in South Africa contributes to approximately 12 314 cases of bronchitis and related respiratory diseases in adults and children each year (page 15).

291.2 The health cost of air pollution from these impacts was estimated at about USD2.37 billion (this is currently R32 889 269 900 at 14.16 South African Rands to 1 US Dollar) every year (page 15).

291.3 A copy of the Holland Report, together with Dr Holland's expert affidavit as filed in previous litigation, is attached as **"FA81"**.

292 It is also important to recognise the cumulative harms of the full lifecycle of coal, such as the extraction (mining), transportation, storage, and waste, and not simply the burning of coal in isolation.

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293 The evidence that coal mining is detrimental to the health of the mineworkers and the surrounding communities is well accepted even in the international community. According to the World Federation of Public Health Associations, 'Call to Ban Coal for Electricity Production' ("**WFPHA Call**"), *"each phase of coal's lifecycle (mining, disposal of contaminated water and tailings, transportation, washing, combustion, and disposing of post-combustion wastes) produces pollutants that harm human health"* (WFPHA Call, page 1). The WFPHA Call, declaring coal as a *"lethal product"*, is attached as "**FA82**". This confirms that coal contributes to thousands of deaths annually:

*"In China, India, the USA, South Africa, and the Philippines, there are 250,000-366,000, 115,000, 13,000, 2100, and 960 deaths per year due to coal pollution, respectively (43-48). Globally, there are over 2 million serious illnesses and 151 million minor illnesses annually as a result of coal pollution"* (WFPHA Call page 2.).

294 In 2018, Eskom disclosed that exposure to emissions from 13 of its 15 coal-fired power stations results in an additional 320 premature deaths per year if no further pollution control technology is installed at its stations. According to Eskom's calculation these premature deaths resulted in a R17.6 billion baseline health cost. These estimates are significantly lower than independent expert assessments, and, again, this is limited to the emissions from 13 of Eskom's coal-power plants. It does not account for the environmental, public health, and other adverse social costs along the coal supply chain that serves Eskom's existing fleet of 15 coal-fired power plants. The relevant news report is attached as annexure "**FA82A**".

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### ***Water consumption and contamination***

295 Coal-fired power stations – and associated coal mines – are notorious users and polluters of water. Coal-fired power stations require large volumes of water in order to operate.

296 Coal mining and power generation together consume 5% of South Africa's water. This is detailed in a 2018 report, which looks at the broad range of water impacts and externalities linked to the coal sector, titled "Water Impacts and Externalities of Coal Power" ("**Water Externalities Report**"). I attach relevant extracts as "**FA83**". The report found that:

296.1 At a more local level in the Upper Olifants Catchment, power generation accounts for 37% of water use;

296.2 Water for power generation in South Africa is under-valued. This is supported by a Greenpeace study which found that the opportunity cost (or scarcity value) of the water used for Kusile power station alone will be between R6 billion and R12 billion each year. The electricity sector pays far less for water (approximately R3.40/m<sup>3</sup>) than the average household (approximately R8/m<sup>3</sup>). This means there is no incentive for the very water-intensive coal sector to prioritise water-efficient supply options.

297 The Water Externalities Report highlights the need for a revised IRP to consider a range of water-related externalities and impacts in determining and costing South Africa's

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future electricity supply mix. As far as we are aware, necessary water externalities were not considered or included in the 2019 IRP.

298 In addition, a report by the Department of Water and Sanitation entitled 'Integrated Water Quality Management Policies and Strategies for South Africa: 1.3 Water Quality and Water Quality Management Challenges in South Africa' highlights the deterioration in water quality, mainly as a result of coal mining and power generating activities. The report is attached as "**FA83A**". It highlights the various root causes of the deterioration in water quality as follows (page 14 of the report):

298.1 The root cause of water resource acidification due to acid mine drainage is a historical and recent lack of precautionary planning, regulation and enforcement by the relevant authorities, and of ring-fenced rehabilitation financing for the necessary rehabilitation by the relevant mining companies.

298.2 The root causes of contamination of water resources by heavy metals and related acidification are any of the following: lack of compliance by mines and thermal power stations with their licence conditions; lack of or inappropriate licence conditions; lack of monitoring and reporting of their own pollution loads; inadequate enforcement capacity in the national and provincial Environment Affairs departments and DWS; and inadequate cooperative governance and regulatory interfaces between the Department of Mineral Resources (DMR), the National Energy Regulator, DEA and DWS and the promoters of economic activity such as the Department of Energy (DoE), Department of Public Enterprises (DPE) and Department of Trade and Industry (DTI).

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- 298.3 The cause of acidic atmospheric deposits includes inappropriate atmospheric emission licence conditions for Eskom's power stations and other industries with large emissions; a lack of understanding of the current pollution loads and their effects on SA's water resources, lack of monitoring and accurate reporting of pollution loads; lack of enforcement; and inadequate cooperative governance and regulatory interfaces between the water-energy-air role-players such as Eskom, the National Energy Regulator, Environmental Affairs, and the DMRE, among other responsible departments.
- 299 Furthermore, a number of studies attempt to quantify water treatment costs associated with coal-fired power and coal mining. It has been estimated that the cost of acid mine drainage could be as high as R0.38/kWh (2009 ZAR). The capital and operational costs to treat mine water are considerable - South Africa has close to 6 000 recorded derelict and ownerless mines. It is estimated that the closure of these mines, including long-term treatment of acid-mine drainage, would cost up to R60 billion.
- 300 As a water-scarce country, it is imperative that electricity planning gives proper and full consideration to the sector's impacts on South Africa's water resources. Coal power disproportionately negatively affects marginalised communities located around coal mines and power stations; exacerbating environmental injustice.
- 301 In addition to the impacts of requiring and using vast volumes of scarce water, the hazardous ash waste generated by coal plants poses a risk to human health, not only through air emissions, but also a pollution risk for water resources and soil in the areas in which they operate. These polluting activities have far-reaching ecological and public health impacts.

### *Hazardous coal ash*

- 302 Coal ash is the non-combustible powder-like waste generated from the burning of coal. The ash is essentially the non-carbon mineral matter that is naturally present in coal, and the ash residuum concentrates the coal's constituents that are not burned and lost as a gas. As a result, coal ash has many of the same elemental constituents as the parent coal, but at much higher concentrations.
- 303 Coal ash often contains high, and potentially toxic, concentrations of many substances, boron, iron, aluminium, zinc, arsenic, barium, cadmium, chromium, lead, manganese, mercury, molybdenum, selenium, and vanadium. Depending on exposure, these can present a severe health risk if inhaled and these substances can pollute any water that comes into contact with the ash. That polluted water is commonly called leachate, and it tends to be alkaline (high pH) and enriched in numerous substances, especially sulphate.
- 304 Leaching takes place from both old and new sites, and peak leaching of hazardous chemicals occurs **many decades after disposal** and can persist for hundreds of years. Thus, ash disposal sites are potential sources of groundwater and surface water contamination for many decades after ash deposition has ceased.
- 305 The accumulation of enormous volumes of ash from coal-fired electricity in South Africa presents a significant waste management problem, especially in coal-affected areas. In fact, South Africa's National Waste Management Strategy, 2020, confirms that waste from the generation of electricity using coal accounts for 75% of the total volume of

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hazardous waste in South Africa. 66% of this is fly ash. I attach relevant extracts as “FA84” (page 12).

306 According to its 2020 annual report, Eskom’s fleet of coal-fired power stations in the Highveld and Limpopo province generated 32 million tons of hazardous ash in a single year. That is the equivalent of almost 5 pyramids in Egypt, over the period of 12 months. It is important to highlight here that regardless of the technology used by a new coal-fired power station, it will still generate a substantial volume of hazardous ash waste during its lifespan.

307 Considering the ecological impacts and public health risks known to be associated with toxic coal ash, in addition to the fact that it is the single largest waste stream in South Africa, the applicants submit that government should not be pursuing further coal-fired power that - aside from the other environmental and climate harms described above - will only compound the hazardous waste problem that already exists.

***Individual experiences of the impacts of coal-fired power stations***

308 These harms are further detailed in the affidavits of individuals who live near coal mines and coal-fired power stations in Mpumalanga and Limpopo. They explain the devastating effects of coal on their health and well-being and on their communities. These affidavits are attached as “FA85” to “FA88”.

309 Mr Goodman April Mashiya lives with his wife and three children in Vosman, Emalahleni. He describes the area as having coal mines and surrounded by coal-fired power stations, including Duvha power station, Kendal power station, Kriel power station and

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Kusile power station. Mr Mashiya describes living in Emalahleni as a struggle. He explains that:

*"From where I live, I can see the black dusty air in the atmosphere above, which usually comes from the direction of the coal mines and the impacts are largely felt and seen on windy days. At times when I breathe in, I inhale the dust particles, they feel like soil in my mouth. The air pollution affects us all in this area and we are also aware that the air we breathe is not healthy. The elderly in our community are falling sick as a result.*

*Two of my children have asthma. My eleven (11) month old baby started having health complications six months ago when he was five (5) months. I took him to the doctor, who gave us some medication for him but it did not heal him. The doctor referred us to the clinic where he was diagnosed with asthma and put under oxygen. The clinic gave me drops which I need to administer through a syringe whenever he struggles to breathe, this often happens when he has a cough or the flu. The clinic also gave me Sinutab drops because they said that his nose was blocked, which contributed to him having difficulty breathing and Zithromax for his coughing as this was a result of a dry chest. I still administer the drops and use Zithromax whenever my son coughs and sneezes and I take him to the clinic, when necessary.*

*My fifteen (15) year old son also has the same issues. He started having challenges with his health four years ago. I took him to the clinic where he was diagnosed with asthma. When he has the flu, he experiences difficulty breathing, he does not sleep at night. He wakes up coughing. He also suffers from sinusitis. I also began to notice that he had problems with his eyes, his eyes would become sore when he was exposed to the sunlight."*

310 Ms Nonhlanhla Ngwenya, explains that the coal mines and coal-fired power stations have severely affected her health and resulted in her being diagnosed with asthma. In relation to the availability of drinking water, she explains that she cannot drink tap water, because it is heavy polluted. Further that when poured into a glass, the water is visibly dirty.

311 These concerns are also shared by Mr Mashiya. He states that:

*"Our tap water is very dirty, as a result of this, we cannot drink tap water and we have to buy drinking water. Our household finances are severely strained because we rely mainly of the social grant, when I do not have enough money to buy water, I get water for my family from a borehole. This is clean water because it comes from underground. The service we get from the*

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*municipality is not good and they do not seem to care about our water issues. It makes me sad to say that the last time we drank clean and safe (healthy) water was during the apartheid era. It seems that all that government cares about is our votes and not us."*

312 Ms Ngwenya and Mr Mashiya's testimonies are not unique. Individuals living in Emalahleni are not experiencing the prosperity and development that government often portrays in relation to coal, in fact, they have known nothing but hardship as a result of coal-fired power stations. Ms Musawenkosi Dlamini explains that *"we do not benefit from existing mines and coal-fired power stations. . . [t]he coal mines and coal-fired power stations are not helping us with anything."*

313 Ms Dlamini further states that:

*"The air pollution in Emalahleni produced by the coal mines and the coal-fired power stations, has affected my health. I was healthy most of my life until 2010, when I started to experience problems with my health. At this time I was 11 years old. My symptoms started [off] like the flu, it began with me coughing and developed into a wheezy chest and I had difficulty breathing. This resulted in me being hospitalised. The hospital ran various tests and I was ultimately diagnosed with asthma. I was informed by the doctor that because I was not born with asthma, I would grow out of it. However, that has not happened, instead I have developed other ailments. I am currently on dialysis for my kidneys, and depend on my asthma inhaler and prednisone tablets for treatment."*

314 Their individual experiences are reinforced by the Initial Impact Assessment, referred to above, which confirms that communities in the Highveld are at high risk of acute and chronic health effects due to exposure to pollutants in the area, read with the Holland Report which found that coal-fired power generation in South Africa contributes to approximately 12 314 cases of bronchitis and related respiratory diseases in adults and children each year.

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315 When it comes to the treatment of these debilitating conditions, local clinics are often inundated and generally under-resourced with the appropriate medicine and equipment to assist patients, causing further hardships. Ms Dlamini explains that:

*"There was a time that I had to go to the clinic at night because my chest was tight and I was struggling to breathe, when I arrived at the clinic, the nurses told me that they did not have inhalers or oxygen and that I had to wait or come back the next day.*

*My mother is unemployed and my family relies on a social grant and the money we receive from leasing out the backrooms on our property, to survive. This is not enough for us to make ends meet.*

*My asthma diagnosis has had an impact on my family's finances because we have had to cut down on some of our household expenses to ensure that if anything happens to me, in terms of my health, we have the means necessary to ensure that I can get the medical assistance that I need because the clinics do not help us at all."*

316 Ms Ngwenya, who was also healthy most of her life, until she was diagnosed with asthma in December 2019, describes her struggle as follows:

*"I am on treatment for my asthma. The doctor prescribed inhalers, which I need to take every day, and prednisone tablets. I often collect my treatment at the clinic, but sometimes the clinic runs out of medication, when that happens, I have to buy the medication from the pharmacy. My partner pays for all my medication because I am unemployed and cannot afford the medication on my own, and when he does not have money, we need to borrow money in order to buy my medication.*

317 Ms Mathebula, who has two children aged seven (7) and three (3) years old, who are living with asthma, had to resign from work in order to take care of her children. She explains that:

*"Both of my children have asthma and are often sick. I have taken them to the hospital and to doctors many times. Sometimes I have woken up in the night and found that my children couldn't breathe properly. I have had to organise transport and take them to the hospital in the night.*

*In 2018, I took my 7 year old daughter to the hospital. At the hospital they put my child on a nebuliser to help with her asthma. They told me that I needed to get a nebuliser but only gave me the pipes. I saw that a nebuliser*

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*costs R3500 at Clicks, but I needed to use my money to buy food and medicine and couldn't buy a nebuliser."*

318 Ms Helena Greyling lives in Onverwacht in the Lephalale area, Limpopo. Prior to moving to Onverwacht, she lived in Steenbokpan, outside Lephalale. She describes the air as being highly polluted by emissions from the Matimba power station and Medupi power station. Ms Greyling explains that:

*"It is visible as a grey-brown haze and smells bad. Soot and dust are also visible and coat buildings, infrastructure and vegetation in town and the surrounding areas. It appears to me that this coating affects the growth of trees and plants, and they look sickly and stunted."*

319 Ms Greyling's family members, like most people who live in coal affected communities, have developed respiratory illnesses. She explains that her daughters developed asthma four years ago and are now on medication (asthma pumps and antibiotics) and are on lung support. The health impacts of coal mines and coal-fired power stations extend beyond respiratory illnesses to include waking up with headaches almost every day and eye irritations and conditions.

320 Ms Greyling further explains the water supply challenges brought on by coal-fired power stations in the area:

*"Lephalale is a water scarce area and there have been severe and ongoing challenges to water delivery, particularly in the past 4 years. The coal mine and power stations use a lot of water, and this competes with the needs of the town and surrounding areas and villages. Eskom is using more water now that Medupi is also operational, and Eskom is a priority water user."*

*Water supply disruptions are common. Sometimes there is no supply from the municipality at all and may last for days at a time or longer in some cases. There is often very low water pressure, and the fluctuation in water pressure regularly causes pipes to crack and other infrastructural damage."*

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321 Ms Sibabela also lives close to the Matimba and Medupi power stations. She expresses concerns for her son's future. She explains that she is afraid that her son will not live in the same environment that she grew up in, because of the pollution.

322 Ms Sibabela, like Ms Greyling explains the water supply challenges that the Lephalale community has to live with due to the coal mines and coal-fired power stations in the area. She states that:

*"We have water problems in Lephalale, which I understand is because the mines and power stations use up a lot of water. We experience many water shortages and outages. When there is water, it is very often brown. I have regularly experienced a running stomach and a headache from drinking the water. . . . I buy bottled water for my child and I to drink, but this is expensive."*

## V THE LEGAL BASIS OF THIS APPLICATION

323 As explained in the introduction, this application is both a direct constitutional challenge and a review application.

324 The Minister's determination, NERSA's concurrence, and the underlying IRP are all exercises of public power that must be consistent with the Constitution. To the extent that they unjustifiably limit rights contained in the Bill of Rights, they must be declared constitutionally invalid and set aside.

325 The impugned decisions are also reviewable under PAJA:

325.1 While the IRP is a policy instrument, the applicants submit that it is administrative action under PAJA as it is intended to implement national legislation. This will be addressed further in argument.

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325.2 The Minister's section 34 determination and NERSA's concurrence are also administrative action under PAJA, which have the potential to directly impact individual rights.

326 In any event, all of these decisions, including the IRP, are exercises of public power that are reviewable under the section 1(c) constitutional principle of legality.

327 As a consequence, this Court is obliged by the Constitution, PAJA and the principle of legality to engage robustly with the impugned decisions. If they are an unjustifiable limitation of any constitutional right, or are otherwise unlawful, irrational, unreasonable, or disproportionate, this Court is required to declare them to be unlawful and invalid and to set them aside. This Court is further empowered by section 172(1)(b) of the Constitution to make any other order that is just and equitable.

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## VI THE CONSTITUTIONAL CHALLENGE

328 The applicants focus this constitutional challenge on four sets of fundamental rights, bearing in mind that all constitutional rights are interlinked and mutually reinforcing. These rights must also be interpreted and applied in a manner that is consistent with South Africa's international law obligations, in accordance with section 39(1)(b) of the Constitution.

### A THE LIMITATION OF RIGHTS

#### *The section 24 environmental rights*

329 The decisions to procure new coal-fired power is a limitation of section 24 of the Constitution.

330 This right has two distinct parts:

330.1 Section 24(a) is an "unqualified" right to "*an environment that is not harmful to their health or well-being*". It is a right to a safe environment here and now.

330.2 Section 24(b) is a "qualified" right to the protection of the environment, even where there is no immediate danger to human health and well-being. It entitles everyone to "*have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*"

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331 Read with section 7(2) of the Constitution, the State, at all levels, bears an obligation to give effect to section 24 of the Constitution. This includes negative obligations to desist from harming the environment and positive obligations to take measures to ensure a healthy, ecologically sustainable environment for present and future generations.

332 The negative obligations imposed on the state by section 24(a) are not subject to any assessment of reasonableness. Where the state creates or facilitates environmental conditions that directly threaten human health and well-being, that is a limitation of section 24(a) of the Constitution, regardless of the justifications offered by the state.

333 The decision to procure new coal-fired power directly limits the section 24(a) right due to the harmful impacts of coal-fired power demonstrated in great detail above, including its impacts on:

333.1 Climate change;

333.2 Air quality and human health; and

333.3 Water scarcity and pollution.

334 At bare minimum, the section 24(a) right, read with section 7(2) of the Constitution, requires the South African state to do its part in limiting global temperature increases to 1.5°C and below. The IPCC's assessment of the catastrophic harms that are already being caused by climate change, and the further harms if temperatures rise beyond 1.5°C, demonstrates this conclusively.

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335 For the government to uphold its duty to protect the people of South Africa from the worst impacts of climate change, it must take rapid and urgent steps now to decarbonise, meaning that it cannot lock South Africa into new carbon-intensive power generation such as coal plants.

336 This is a constitutional duty that would exist even without the Paris Agreement and related instruments. But this obligation gains even greater force from international law, as section 39(2) requires the Bill of Rights to be interpreted in a manner that is consistent with international law.

337 The various obligations and principles flowing from these international instruments are captured in the concept of a "fair share". As the analysis presented above has shown, the addition of new coal-fired power is inconsistent with South Africa's "fair share" obligations. It will also make it difficult and more costly for South Africa to achieve its updated NDC targets and to set more ambitious emission-reduction targets in future, as is required under the Paris Agreement.

338 The addition of new coal capacity is also a limitation of the section 24(b) right. A measure can only be considered a reasonable measure to protect the environment for the benefit of present and future generations where it:

338.1 Has the purpose of protecting the environment;

338.2 Does so for the benefit of both present and future generations;

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338.3 Has some reasonable connection to the goals of preventing pollution and ecological degradation, promoting conservation, and securing sustainable development;

338.4 Is consistent with South Africa's international law obligations; and

338.5 Is consistent with other constitutional rights.

339 The decision to build new coal-fired power is inconsistent with all of these requirements:

339.1 First, the procurement of 1500 MW of new coal-fired power could never be classified as a measure to protect the environment, given the proven and unavoidable harms.

339.2 Second, it could never be justified as a measure for the benefit of present and future generations, given that new coal will directly contribute to the climate crisis.

339.3 Third, new coal is inconsistent with principles of sustainable development, which require, at minimum, that economic development cannot occur at the expense of environmental protection. In any event, there is no economic justification for new coal-fired power, as is addressed in greater detail below.

339.4 Fourth, new coal is also inconsistent with South Africa's "fair share" obligations under the Paris Agreement and related international law.

339.5 Finally, the addition of new coal is also inconsistent with other fundamental rights, as the analysis that follows will show.

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### *The rights of children*

340 Section 28(2) establishes the principle and self-standing right that the best interests of the child are paramount in all matters concerning children.

341 For the reasons set out in detail above, children are particularly vulnerable to the climate change risks and further harms that will be caused by new coal-fired power. They will also have to live with the adverse consequences of these decisions throughout their lifetimes.

342 On this basis, the procurement of new coal-fired power could never be consistent with the best interests of present and future generations of children under section 28(2) of the Constitution.

343 The section 28(2) principle has a further procedural component, requiring the interests of children to be given proper consideration and that they have a voice in all matters concerning their interests. These obligations are codified in the Children's Act 38 of 2005. Section 10 of the Act confers a specific right on children to participate in all decisions affecting them, taking into account their age, maturity and development.

344 The IRP, the Minister's determination, NERSA's concurrence, and the subsequent reasons offered for these decisions are entirely silent on children's rights and interests. It is evident that the Minister and NERSA failed to give full and proper consideration to the interests of children who will be most affected by their decision to procure 1500 MW of new coal.

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345 There is also no evidence that the Minister and NERSA took any meaningful steps to give children a voice in the various public participation processes that preceded their decisions.

346 The affidavits from children and young people who are affected by climate change demonstrate the importance of such participation and what was lost by failing to meaningfully consider the interests of children and young people in the process.

### ***Life and human dignity***

347 Due to the harms set out above, the decision to procure new coal-fired power further limits the section 11 right to life and the section 10 right to human dignity.

348 The right to life is meant to protect against potentially lethal risk-taking. In its examination of the right to life under the International Covenant on Civil and Political Rights, the UN Human Rights Committee has explained that these obligations extend to "*reasonably foreseeable threats and life-threatening situations that can result in loss of life.*" States violate the right to life by exposing victims to a real risk of the deprivation of life, even if "*such threats and situations do not result in loss of life.*" A deprivation of this right "*goes beyond injury to bodily or mental integrity or threat thereto.*"

349 The Human Rights Committee has also noted that climate change is one "*of the most pressing and serious threats to the ability of present and future generations to enjoy the right to life.*" To satisfy its obligation to protect and ensure the right to life, a state party must take measures "*to preserve the environment and protect it against harm, pollution and climate change caused by public and private actors.*"

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350 In addition, water and air pollution from coal-fired power stations poses a direct threat to the right to life. The studies and reports cited above, combined with the individual testimonies of individuals living in close proximity to coal fired power stations and mines, is clear proof of these threats.

351 The right to life is more than just a right to be alive. It includes the right to a life of dignity. Climate change and the further harms of coal-fired power rob communities of a dignified life, particularly those who live in close proximity to coal-fired power stations and coal mines.

#### ***Water, healthcare and food***

352 The section 27(1) rights to sufficient food and water, and access to healthcare are also infringed by the plans for new coal-fired power.

353 These rights include an immediately realisable obligation on the state not to take any actions that would deprive individuals of enjoyment of these rights. Like section 24(a) of the Constitution, this negative obligation is not subject to any of the qualifications contained in section 27(2).

354 The reports by Professors Scholes and Engelbrecht and Professor King have set out in detail how climate change will have a significant impact on water and food security in South Africa over the coming decades. The addition of new coal will directly hasten this climate crisis.

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355 Equally the human health consequences of water and air pollution, described in detail above, show that coal-fired power places a further burden on the strained healthcare system.

***Equality and unfair discrimination***

356 The content of section 24 environmental rights must be informed by the section 9 right to equality. In particular, an action cannot be “reasonable” under 24(b) of the Constitution where it produces unfair discrimination.

357 The government has repeatedly acknowledged the disproportionate impacts of climate change and air pollution in its own reports and studies, set out in greater detail above. New coal directly contributes to these impacts.

358 New coal-fired power will have a disproportionate, unfairly discriminatory impact on intersecting grounds of race, gender, and social origin. This is because poor, black South Africans, and particularly women and children, are the primary victims of ecological degradation and air pollution caused by coal-fired power. They will also be the worst affected by the climate crisis. For example, government’s Initial Impact Assessment (annexure “FA80”, page 11) finds that women, youth, children, and people with disabilities, are most vulnerable to air pollution.

359 Women and children will also be the worst affected by the climate crisis, experiencing its impacts in different ways due to social structures and conditions. An example of this is highlighted in the King Report (page 4):

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*"Girls and women who traditionally are tasked with fetching water for their families, will spend more time sourcing and fetching water, with all the attendant negatives associated thereto e.g. missed schooling for girls, insecurity and risks of violence."*

360 The decision to procure new coal also unfairly discriminates on the basis of age, as it the young who will disproportionately shoulder the burden of climate change, as the harms intensify in coming years and the harms of air pollution and water scarcity. The elderly are also at particular risk, as they are particularly vulnerable to extreme weather events and air pollution.

## **B NO JUSTIFICATION UNDER SECTION 36**

361 The onus falls on the Minister and NERSA to demonstrate that these limitations of constitutional rights are reasonable and justifiable in an open and democratic society based on human dignity, equality and freedom. The reasons advanced by the Minister and NERSA offer no justifiable basis for these limitations.

### ***The nature and extent of the limitation***

362 For the reasons addressed above, the limitation of rights is severe, and largely irreversible, given the proven harms of coal-fired power and the dangers it poses to the country's efforts to address climate change.

363 The Minister and NERSA have attempted to downplay the rights-limiting consequences of their decisions. In their reasons, they offer three primary arguments: the appeal to "clean coal"; the plans to decommission existing coal-fired power stations; and the

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“downstream” environmental authorisation and licensing process. We address each of these arguments in turn,

364 First, the vague promises of “clean coal” made by the Minister and NERSA are unsustainable, for the reasons already discussed above and in further detail in Dr Sahu’s expert report. There is no such thing as “clean coal”, nor are the various unproven carbon capture technologies touted by the Minister and NERSA feasible or cost-effective.

365 Second, the government’s plans to add more renewable capacity and to decommission Eskom’s old coal-fired power stations do not in any way diminish the rights-limiting harms of adding 1500 MW of new coal-fired power.

365.1 In terms of climate change impacts, the analysis presented above shows that even with the planned transition to more renewable energy, the addition of 1500 MW of new coal fired power would significantly increase emissions and would make it more difficult and costly for South Africa to comply with its “fair share” obligations in future.

365.2 Moreover, it is no answer to communities that will be living in the shadow of new coal-fired power stations to say that the harmful air pollution and environmental degradation they will suffer will be offset by renewable energy and the decommissioning of coal-fired power stations elsewhere.

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366 Third, the breach of constitutional obligations and rights is not diminished by the “downstream” environmental authorisation and licensing processes that new coal fired power stations must undergo. This is so for six reasons.

366.1 First, as emphasised above, the Minister and NERSA cannot seek to shirk their constitutional obligations by deferring consideration of constitutional rights violations to other decision-makers involved in entirely distinct processes. All organs of state involved in these decision-making processes have a duty to protect constitutional rights.

366.2 Second, these downstream procedures involve project-specific assessments of the likely impacts of individual proposed power stations. These project-specific impact assessments would not necessarily address the cumulative rights-limiting impact of adding 1500 MW of new coal-fired power to the system. For example, a typical environmental assessment of a proposed 350 MW power station would fail to take into account the overall GHG emissions and consequent climate change impacts of developing the full 1500 MW of new coal capacity.

366.3 Third, it is necessary to address the decision to procure 1500 MW of new coal fired power at its root, as decision-makers are prone to rely on ministerial determinations and the IRP as being conclusive of the need for further coal-fired power.

366.3.1 NERSA is specifically obliged to take into account the IRP and section 34 determinations in its licensing decisions.

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- (a) Section 10(2)(g) of ERA requires that an application for a NERSA licence must provide evidence of compliance with any IRP applicable at that point in time or provide reasons for any
- (b) NERSA is also bound by the Minister's section 34 determination in its licensing decisions, as provided for in section 34(3) of ERA.
- (c) deviation from the IRP, for the approval of the Minister. Even where there are no such explicit statutory requirements, decision-makers considering environmental authorisations, atmospheric emission licences, water-use licences and the like have placed heavy reliance on the IRP and section 34 determinations in their decisions.

366.3.2 For example, this reasoning was reflected in a January 2018 appeal decision by the former Minister of Environmental Affairs in approving an environmental authorisation for the proposed Thabametsi coal-fired power station. A copy of her decision is attached as "FA89".

366.3.3 While the former Minister acknowledged that the Thabametsi project was assessed as having "Very High" climate change risks (the highest on the scale), she proceeded to conclude that the benefits outweighed the risks.

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366.3.4 This was because the Minister regarded the 2010 IRP as having already determined the need for new coal. She stated:

*"4.6 In addressing the justification of the benefits of the proposed project, I have taken note, as I had done when initially adjudicating on this appeal, the terms of the Integrated Resource Plan for Electricity 2010-2030 (the IRP)."*

366.3.5 The Minister believed that the 2010 IRP had already assessed the climate change risks and had concluded that these were outweighed by the benefits:

*"4.9 Concerns about the threat of climate change and the need for greater reliance on renewable energy were raised in the public participation process. These considerations were taken into account by decision-makers during the development of the IRP. A number of complex factors were weighed. Ultimately, the decision-makers concluded that the harms that would result from the establishment of new coal-fired facilities (to generate an addition 63 GW) were outweighed by the benefit to the country of having the additional energy generation capacity." (Emphasis added)*

366.3.6 The Minister concluded that:

*"4.10 Having carefully balanced all relevant factors (including the threat of climate change), the final IRP 2010 - 2030 does not prohibit the establishment of new coal-fired power stations. Rather, it permits that 6.3 GW of new generation capacity may be derived from coal.*

*4.11 I am satisfied, therefore, that the overall assessment of the risks and impacts associated with the GHG emissions and climate change vulnerabilities is systematic, realistic, conservative and not understated."*

366.3.7 Earthlife Africa NPC and groundWork subsequently launched an application to review and set aside the Minister's decision. That relief was later granted with the consent of all parties. However,

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the former Minister and her Department have never publicly conceded that the Minister's reasoning in this regard was wrong.

366.4 Fourth, the state and independent power producers have consistently argued that in the absence of a direct challenge to the IRP and section 34 determinations, litigants are powerless to contest the merits of new coal-fired power in opposing environmental authorisations and licenses.

366.4.1 For example, in *Earthlife Africa v Minister of Environmental Affairs and Others* (65662/16), a review before this Honourable Court of the initial environmental authorisation issued to the proposed Thabamesti coal-fired power station, the Minister and officials of the Department of Environment, stated the following in their answering affidavit attached as "FA90":

*"Notably, the decision taken in the IRP and section 34 determination have not been challenged by Earthlife. As a consequence, they still stand. Therefore, when considering an application for an environmental authorisation, the decision-maker must take these decisions into account."* (answering affidavit, paragraph 29).

366.4.2 In the second round of litigation over the Thabametsi project, *Earthlife Africa v Minister of Environmental Affairs and Others* (21559/18), the Thabametsi Power Company (Pty) Ltd advanced the same argument. It contended that "[i]t is impermissible to challenge the Minister's decision to grant Thabametsi an environmental authorisation by in fact challenging the pre-existing pillars on which that decision was based", namely the 2010 IRP

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and the section 34 determination. *"Thabametsi submits that the Minister's decision is rational and cannot be impugned because it does not correspond to the underlying policy imperatives that the applicants would prefer"* (paragraphs 12 and 13 of the fourth respondent's answering affidavit) attached as **"FA91"**.

366.4.3 The applicants deny that these arguments are sustainable, but similar arguments will no doubt feature prominently in all future litigation over "downstream" decisions.

366.5 Fifth, individual challenges to specific licences and authorisations are extremely costly, time-consuming, risky and are only available to the most well-resourced or those with access to scarce *pro bono* legal services. This makes it difficult, if not impossible, for vulnerable groups to adequately protect their rights.

366.5.1 In the experience of the applicants and their attorneys, section 34 ERA determinations for new generation capacity generally give rise to a large influx of electricity generation projects seeking to obtain environmental approvals.

366.5.2 Following the 2012 determination for new coal capacity, some 14 companies applied for environmental authorisations to operate and build coal plants.

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- 366.5.3 Each proposed project requires various licences, and each licence and authorisation has legislated processes to be followed for comment, objection, internal appeals and then judicial review.
- 366.5.4 Opposing just one project requires significant time, resources, and specialist legal expertise to follow the environmental impact assessments for environmental authorisations, and applications for waste management licences, water use licences, and atmospheric emission licences.
- 366.5.5 These applications are all accompanied by lengthy technical reports, which require expertise and substantial time and resources for scrutiny and consultation.
- 366.5.6 In reality, this means that those whose rights are most affected by new coal-fired power, including young people, the poor and other vulnerable groups, have little to no prospect of effectively participating in these individual decision-making processes, let alone challenging these decisions in court.
- 366.5.7 These challenges are illustrated by the experience of the third applicant, groundWork, and the applicants' attorneys in opposing the Khanyisa coal-fired power station. These efforts included:
- a) Bringing a review application to review and set aside the environmental authorisation and the Minister's refusal of an

internal appeal, which took approximately 4 (four) years, involved a team of senior and junior counsel and attorneys, as well as three experts

- b) Challenging the application for a water use licence, which took one year and 11 months, involved a separate team of counsel and attorneys, and involved approximate 6 international and national experts.
- c) Challenging the Minister's decision to uplift the suspension of the Water Use Licence pursuant to the institution of the appeal, together with an interdict, which is ongoing for over 2 years, and involved a separate team of senior and junior counsel and attorneys, together with approximately 5 experts;
- d) Challenging the atmospheric emissions licence before the Nkangala District Municipality, which again involved attorneys and counsel, spanned approximately 1 year and 10 months.
- e) Opposing the application to NERSA for a generation licence, which again involved attorneys and junior counsel, involved more than a year of work on technical submissions and a public hearing, the decision of which is yet to be delivered.
- f) A confirmatory affidavit from Misaki Koyama, an attorney at CER who was involved in these proceedings, will confirm these facts.

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366.6 Sixth, individual licensing processes and enforcement, involving fragmented decision-making by under-resourced organs of state, has been unable to curb the harmful impacts of coal-fired power stations that have accumulated to date. There is no reason to believe that these mechanisms would effectively address these harms in future through the addition of new coal fired power stations:

366.6.1 The Department of Environmental Affairs' own assessment of the deadly levels of air pollution in the Highveld Priority Area, home to most of South Africa's coal-fired power stations, is indicative of the limits of enforcement measures.

366.6.2 The Department has acknowledged that more than 12 years after this region was declared a priority area, levels of atmospheric pollution remain far in excess of the national ambient air quality standards.

366.6.3 In its assessment of the main reasons behind the ongoing levels of deadly air pollution in the Highveld Priority Area, the Department — the competent authority for the implementation and enforcement of environmental laws — identifies systematic problems, including: *"industries do not prioritise environmental compliance. They focus on profit"* (page 7 of **FA80**); *"The country is held to ransom by industry because of unemployment problems"* (page 7 of **FA80**); *"lack of compliance monitoring and enforcement of the existing*

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*[regulatory] tools" (page 9 of FA80); and "lack of clarity on the roles and responsibilities (DMRE and DEFF)" (page 9 of FA80).*

***No legitimate purpose for the limitation***

367 The Minister and NERSA have failed to identify any legitimate purpose for the limitation of rights, nor is there any relationship between the purposes they advance and the limitation.

Coal is not part of a "least cost" model of electricity generation

368 There is no economic case for new coal. The state's own modelling shows that new coal is not part of a "least cost" model of electricity generation.

369 South Africa is no longer faced with a choice between clean electricity and cheap electricity. The costs of renewables have plummeted over the last decade, making renewable energy significantly cheaper than coal. In its concurrence in the Minister's determination, NERSA referred to international studies which show that solar PV prices dropped by more than 82% in the last decade, while onshore wind technology fell by more than 38% (NERSA concurrence, paragraph 5.2.32).<sup>29</sup>

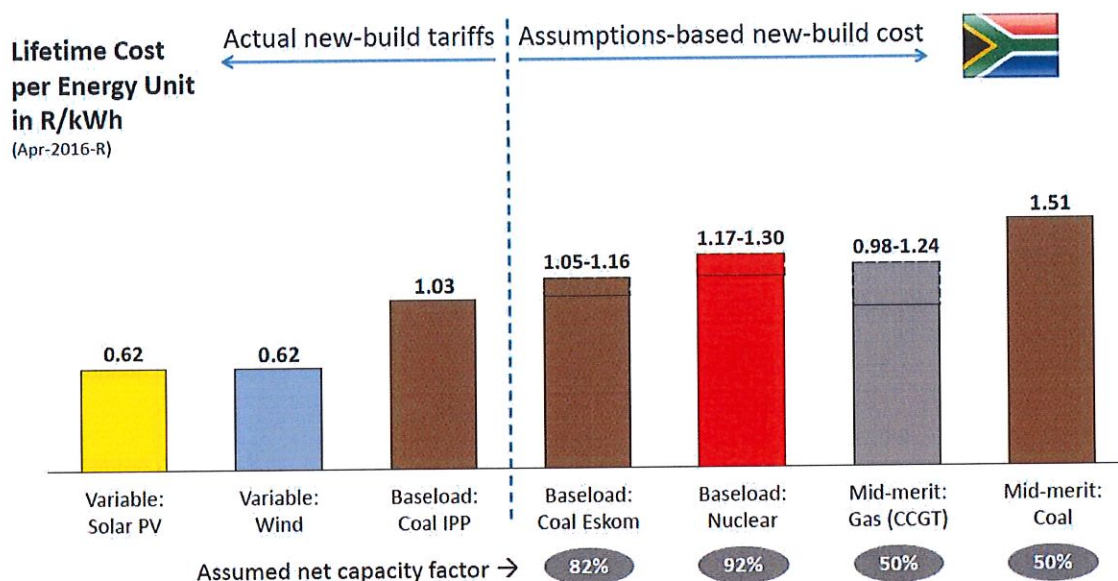
370 This international trend is reflected in South African pricing. In 2015, the previous bid window under the Renewable Energy Independent Power Producer Programme ("REIPPP"), renewables were already approximately 60% cheaper than new coal plants

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<sup>29</sup> Annexure FA35.

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on a levelized cost of electricity ("LCOE") basis.<sup>30</sup> At the time, the price for renewables was set at R0.62 per kilowatt hour ("kWh"), whereas the tariff for new coal was R1.03/kWh. These falling prices are reflected in CSIR analysis in the ESRG report (Figure 5):



371 In the last five years, the cost of renewables relative to coal has continued to fall dramatically. In the October 2021 announcement of preferred bidders under the Department of Mineral Resources and Energy's latest bid window for renewable energy, the average tariff for wind energy has fallen to 49.5 cents per kWh, 90% cheaper than in 2011 and 36% cheaper than in 2015. Solar photovoltaic (PV) power has an average tariff of 42.9 cents per kWh, which is 75% cheaper than 2011 and 45% cheaper than in 2015. These figures are reflected in the CSIR's analysis of the October 2021 announcement, attached as "FA91A".

<sup>30</sup> The ESRG report explains that "levelized cost of energy" (LCOE) refers to the total cost of energy generation over a plant's lifetime in relation to the total energy produced in that lifetime.

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372 By comparison, the cost of new coal continues to rise. In its concurrence in the Minister's determination, NERSA estimated that the cost of new coal incorporating so-called "clean coal" technologies, would be over R2.07 per kwh (NERSA concurrence, para 5.5.23, figure 8). This is likely a significant underestimation of true costs of these unproven technologies, for the reasons addressed in Dr Sahu's report. In any event, this estimated figure is more than double the cost of renewables procured in 2015, adjusted to current prices, and almost four times the cost of new renewables (NERSA concurrence, paragraph 5.2.34 figure 1).

373 The prospect of carbon taxes, tariffs and stricter emission legislation will further inflate the price of coal. NERSA states that it *"agrees that carbon tax and stricter emissions legislation will make coal more expensive than the current prices, and this must be factored into the decision."* (NERSA concurrence, paragraph 5.5.22).

374 It is for these reasons that the state's own modelling concluded that no new coal-fired power stations ought to be built on a "least-cost" approach, as the least-cost option only contains solar PV, wind and gas.

374.1 The 2018 draft IRP confirmed that:

*"Without a policy intervention, all technologies included in the promulgated IRP 2010–2030 where prices have not come down like in the case of PV and wind, will not be deployed because the least-cost option only contains PV, wind and gas." (2019 IRP, page 91)*

374.2 The 2019 IRP also recognised that no new coal-fired power stations would be built unless artificial caps were imposed on renewables in the modelling exercise. It stated that *"[t]he system only builds renewables (wind and PV) and gas if unlimited renewable and gas resources are assumed"*. The 2019 IRP

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states further that “[w]hen annual build limits on renewables are imposed and realistic gas availability assumptions are applied, the system builds battery storage and coal to close the gap.” (page 41).

375 Modelling exercises conducted by both state and private research institutions have repeatedly confirmed this conclusion.

376 Since 2016, the Council for Scientific and Industrial Research (“CSIR”), the state-run scientific research and development organisation, has demonstrated that a least-cost electricity plan for South Africa does not include new coal. Excerpts of a 2016 report by CSIR are attached as “FA92”.

377 The CSIR’s independent modelling and analysis formed part of the public consultation process over the draft 2018 IRP. In its formal comments (excerpts of which are attached as “FA93”) on the draft IRP 2018, the CSIR states the following:

377.1 *“It is clear from the outcomes of the least-cost unconstrained outcomes of the Draft IRP 2018 (IRP1) that no new coal capacity is built. It is also clear that no new coal capacity is built pre-2030 in any of the Draft IRP 2018 scenarios.”*

377.2 *“New-build coal capacity is only built post-2030 if CO2 emissions are not too restrictive (PPD Moderate) and new-build [Variable Renewable Energy] is limited annually.”*

378 Most recently, in a July 2020 Technical Report prepared by the CSIR and Meridian Economics, they assessed whether South Africa could meet its electricity demands

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while drastically reducing CO<sub>2</sub> emissions. The report modelled progressively ambitious CO<sub>2</sub> emissions abatement scenarios for the South African power sector for the period 2020-2050. These scenarios ranged from the highest-emissions scenario based on the 2019 IRP to a Paris-aligned 2Gt CO<sub>2</sub> budget scenario (page 36). The report is attached as annexure "FA93A". With regards to coal, CSIR and Meridian found that:

*"All lowest cost electricity sector trajectories for [South Africa] involve an immediate and substantial RE build programme. Despite being included as options, no new coal or nuclear plant is chosen in any optimal scenario investigated. These technologies are too expensive and not required for grid adequacy (reliability of supply)." (page 60)*

379 These findings are further supported by the ESRG's modelling, which shows that this proposed new coal-fired power capacity would not form part of a least-cost electricity plan for South Africa. The ESRG's two modelling scenarios, as explained above, further demonstrate that the addition of new coal would drive up the total system cost and unit price of electricity substantially.

379.1 In the "reference scenario", the ESRG found that new coal would increase the total electricity system cost by over R23 billion.

379.2 In the "climate policy scenario", new coal would raise these costs by over R109 billion.

380 On this basis, the primary goal of ensuring cheap and stable electricity supply is actively undermined by procuring new coal-fired power stations. The IRP's stated objective of being based on least-cost electricity supply and demand balance, taking into account security of supply and the environment, is thus not being met.

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381 In a sudden about-turn, the Minister has now claimed that the state's economic modelling somehow favoured the inclusion of new coal and that this was not a "policy adjustment". In the Minister's reasons for the IRP on 14 August 2020, he stated that:

*"New coal (1 500 MW) in the IRP2019 is not forced after modelling (not a policy adjustment outcome) but an outcome of a technical modelling exercise that takes into account lead time, cost and emissions limits. All this is explained in the IRP2019."*

382 These statements plainly contradict what is stated in the 2018 draft IRP and the 2019 IRP. It is clear that artificial "policy adjustments" were made to the economic models to achieve the desired inclusion of new coal.

383 The applicants' attorneys have called upon the DMRE to disclose the full document trail reflecting its economic modelling process. The DMRE has, thus far, failed to make full and proper disclosure.

383.1 On 13 December 2019, CER submitted a PAIA request to the DMRE for these documents. The PAIA request is attached as annexure "FA94".

383.2 The DMRE sent a response letter on 25 June 2020 and records on 30 June 2020. A copy of the letter is attached as "FA95".

383.3 The response and records received, however, did not respond to a number of CER's requests, either adequately or at all.

383.4 On 2 September 2020, CER sent a further letter to the DMRE, highlighting the significant gaps in the documents provided. These included the absence of any

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documents reflecting the assumptions used in the modelling process in the IRP 2019 or draft IRP 2018. A copy is attached as "FA96".

384 The applicants therefore invite the Minister and the DMRE to make full disclosure of the modelling process in the Rule 53 record, as they are obliged to do.

385 Finding economics and modelling to be against them, the Minister and NERSA have resorted to a number of further arguments for the inclusion of new coal in the energy mix. None of these arguments are sustainable, nor do they justify the severe limitation of rights.

New coal is not required for energy security

386 The modelling exercises described above have conclusively demonstrated that energy security can be achieved at least-cost without any new coal capacity.

387 NERSA further acknowledges that government's plans for new coal offer no solution to South Africa's immediate electricity needs and the threat of "load-shedding". In its concurrence with the Minister's determination, NERSA conceded that coal-fired power stations "*require long lead times*" of between 4 and 9 years, with the result that "*no new coal capacity would close the energy gap by 2024*" (NERSA concurrence, paragraph 5.5.5).

388 Nevertheless, the Minister and NERSA have made broad appeals to the need for energy security and so-called "base load" to justify their decisions. In the Minister's reasons for the determination, he has claimed that "*[w]hat drives the allocation of 1 500 MW of new coal capacity in the determination is the need for the generation capacity of electricity*

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to ensure the continued and reliable supply of electricity." NERSA's initial consultation note made similar claims that new coal is necessary to provide "base load".

389 The ESRG report explains in detail why these justifications are flawed. The appeal to "base load" reflects "an outdated approach to managing power systems" which entirely ignores "that technology has advanced and that the costs of alternatives such as renewables have vastly improved, to the point that variable renewable energy (such as wind and solar) can be technically and economically supplemented by flexible dispatchable generators" (page 25).

390 In summary, the ESRG report explains that:

390.1 Stable and reliable electricity systems require the system operator to ensure that supply meets demand at every moment, however much demand fluctuates.

390.2 The term "base load" stems from historical alignment between minimum ("base") electricity demand ("load") and the profile and economics of large power stations, such as coal and nuclear.

390.3 In the past, it was generally cheaper to build and run these large "base load" power stations at close to their maximum capacity, with limited variation in their output. Running these power stations consistently produced cheaper electricity per kilowatt hour than ramping them up and down. This led to large base supply generators (such as large coal plants) dominating electricity systems in the 20<sup>th</sup> century.

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- 390.4 However, with the decline in renewable energy costs, renewables are now the most cost-competitive suppliers of power.
- 390.5 This requires a “systems approach” as opposed to a “base load” approach to electricity generation. Under a systems approach, what matters is not how a single plant or type of plant runs, but how the system works together to keep supply and demand in balance.
- 390.6 A systems approach to electricity planning ensures that a reliable supply of electricity is generated from complementary resources across the system, with the aim of meeting demand at lowest cost. Variable renewable energy, like solar PV and wind power, will need to be supplemented by complementary resources that can be turned on and off quickly, or that supplement particular weather patterns. Such flexible dispatchable capacity can be pumped storage or hydro, batteries, geothermal, or demand side management, depending on the system in question and the type of market.
- 390.7 This is reflected in the growing number of large, industrialised countries, such as Germany and the United Kingdom, which maintain a stable electricity supply with renewables constituting a substantial and growing share of the electricity mix.
- 390.8 Several large developing countries in the G20 – South Africa’s peers – also manage renewables penetration higher than South Africa, notably India (8.9%), China (9.5%), Brazil (10.6%) and Turkey (12.0%); as do some major developed

countries such as the US (11.6%) and Japan (10.1%) - in comparison to South Africa, currently sitting at around 6%.

391 On this basis, the ESRG report concludes that *“power systems do not require “baseload” because “such plants are no longer economically viable nor technically necessary”* Instead, *“[e]lectricity systems in which renewables constitute a large share of the energy sources can meet demand reliably while remaining cost-competitive - or even, as described above, lowering costs.”*

#### Coal creates fewer jobs than alternatives

392 The Minister and NERSA have repeatedly claimed that new coal-fired power is needed for job creation, as part of a “just transition”. NERSA has gone as far as to assert that coal creates more jobs than alternatives. These claims are incorrect.

393 The ESRG report demonstrates that, overall, the shift to renewable energy creates more jobs than coal.

394 The ESRG report collates and compares job creation numbers from government sources and recent studies, including the Renewable Energy IPP Programme and a 2016 study conducted for the Department of Mineral Resources and Energy. These numbers show that considerably more jobs are created per unit of electricity produced by wind and solar PV than by coal, measured in terms of direct jobs in the operation and maintenance of plants. This is reflected in the following table:<sup>31</sup>

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<sup>31</sup> ESRG Report Table 3.

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	Jobs/TWh				Jobs/GW			
	PV	Wind	Coal	Nuclear	PV	Wind	Coal	Nuclear
REIPPP round 1,2	153	62			376	196		
REIPPP round 3	282	170			691	540		
McKinsey/IEP	107	127	28	60	262	405	184	420
EIA_2017	44	22			107	69		
Eskom			35.7	92.1			206	645
This Study	153	98	50.8	92.1	376	311	333	645

395 Two methods of comparison are used in this table:

395.1 The first measure, jobs per terawatt hour (Jobs/TWh), considers the total number of jobs to provide the same output of electricity.

395.2 The second measure, jobs per gigawatt (Jobs/GW), considers the number of jobs for a given amount of installed capacity (i.e. the number of jobs for a plant of a particular size).

396 The Jobs/TWh method allows for a better comparison between coal and renewables. This is because renewables generally have a lower "capacity factor", meaning the amount of time that a power station is operating. For example, a coal plant may operate 75% of the time, while a solar plant may operate 25% of the time. This means that more GW of installed solar capacity would be needed to produce the same output of power, and hence more jobs would be created per unit of output.

397 These findings are supported by previous studies:

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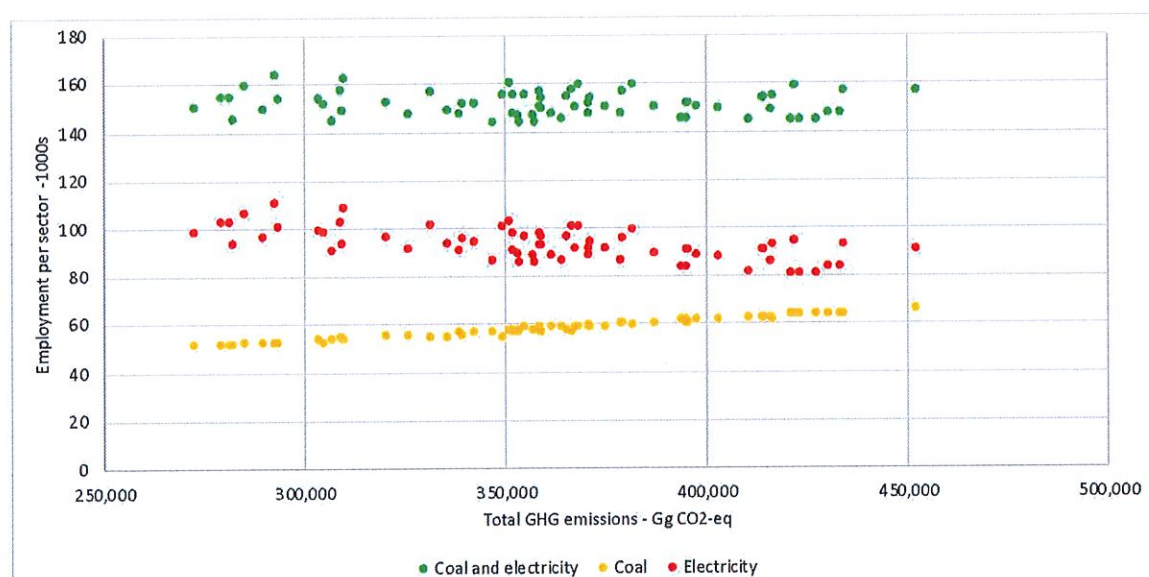
- 397.1 Modelling by the CSIR also indicates that a renewable energy system requires more jobs per unit of output than coal plants. These jobs are in construction and installation as well as in operation. Beyond the electricity system, a large pipeline for renewable energy projects would create the demand for manufacturing investments. The CSIR highlights that a decarbonised scenario (95% decarbonisation by 2050) would create the most jobs, with between 112 000 - 144 000 jobs by 2030, reaching up to 331 000 by 2050. This is contained in the CSIR's comments on the draft 2016 IRP, relevant extracts of which are attached as "FA92".
- 397.2 The Department of Mineral and Energy's own analysis of job creation potential, contained in a 2016 report, reaches similar conclusions. Relevant extracts are attached as "FA97". This report found that while new coal may initially create jobs in the construction phase, relatively few direct jobs are created during the operation phase over the lifetime of the plant. Instead, renewable energy technologies, including solar PV and wind, were found to have "*the highest job creation potential*" during the operation phase (page 29).
- 398 Beyond direct job creation, the ESGR explains that cheaper renewable energy has greater potential to unlock job creation across the economy. It finds that, "*[a]t an economy-wide level, higher renewable penetration can have increased benefits on employment ... primarily because cheaper electricity has broader positive economic effects, which allows firms to grow and households to spend.*" (ESGR Report, page 21) Conversely, investment in more expensive coal-fired power would result in higher electricity prices, reduced GDP growth, and greater investment costs. This has the potential to depress job creation across the economy (ESGR Report, page 21 – 23).

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399 The ESRG's modelling further demonstrates that new coal capacity will in fact result in job losses across the economy. The report notes that *"the additional coal also reduces economic growth by 0.11% in 2030 and 0.08% in 2040 compared to the reference scenario without forced coal, and results in job losses of around 25 000 in 2030 across the economy"* (emphasis added).

400 The President's Climate Change Commission has endorsed the ESRG's assessment in its comments on the draft Nationally Determined Contribution. It found that as the country reduces its greenhouse gas emissions, the potential job losses in the coal sector *"will be offset by jobs associated with renewable energy, battery storage, peaking power and energy efficiency measures"* (page 27). This is reflected in the following graph, showing the employment outcomes associated with different levels of GHG emissions. The shifting employment numbers in the coal mining sector (yellow dots) are offset by gains in the electricity sector as a whole (red dots) through increased investment in renewables and other alternatives. The green dots show the combined jobs in coal and power.



ESRG Report, Figure 6

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401 As a result, a “just transition” does not involve the construction of new coal-fired power stations. A just transition aims to protect workers and communities as the economy moves to rapidly decarbonise. This is to be achieved through interventions such as retraining coal workers, pensions, education, and social assistance for affected communities.

402 Given the costs of new coal-fired power, the ESRG report concludes that targeted interventions that directly benefit workers and communities would come at a much lower cost than subsidising uncompetitive new coal-fired power stations and their financiers (ESRG p 19). This is because *“new coal plants would cost consumers more than a targeted support programme for coal workers; would increase carbon emissions and air pollutants; and make electricity expensive for all users, undermining GDP growth and employment elsewhere in the economy.”* (ESRG Report, page 45)

403 A “just transition” is also about more than simply protecting jobs. It requires efforts to protect all vulnerable communities from climate change and the economic shifts required to reduce emissions. Due to the rights-limiting harms of coal-fired power, both for present and new generations, new coal has no place in a just future.

New coal is not justified by the planned decommissioning of existing coal-fired power stations

404 The planned decommissioning of 11000 MW in existing coal-fired power does not warrant the addition of new coal-fired power, nor does this justify the impact of new coal. The reasons for this are the following:

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404.1 This is evidenced by the modelling conducted by ESGG, which factors in the decommissioning of Eskom coal capacity, and envisages 9.4 GW of coal capacity coming offline between 2020 and 2030 (inclusive). Even under these circumstances, new coal capacity is not needed and does not form part of a least-cost plan.

404.2 As I have further emphasised above, the addition of 1500 MW of new coal fired power would significantly increase emissions and would make it more difficult and costly for South Africa to comply with its “fair share” obligations to address climate change. The direct harms to communities that would be living near these new coal-fired power stations would also not be mitigated by the fact that coal-fired power stations will be decommissioned elsewhere.

#### “Sterilisation of coal” arguments

405 Both the Minister and NERSA claim that because South Africa has coal reserves, it must use them. This is reflected in the 2019 IRP determination that South Africa should not “sterilise” its coal resource, a line that has been repeated by the Minister and NERSA in their subsequent reasons for the determination. This reasoning is fundamentally mistaken.

406 First, the mere existence of coal reserves could never justify the rights-limiting impacts of constructing new coal-fired power stations.

407 Second, such an argument is inconsistent with a commitment to sustainable development, which requires that economic development cannot come at the expense

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of human health and the environment. Furthermore, economic development objectives are better served through alternative electricity supply options, as outlined in the ESRG modelling.

408 Third, and in any event, there is no longer an economic case for the construction of new coal-fired power, as the analysis presented above conclusively demonstrates. Both economics and human rights weigh heavily against digging up and burning our remaining coal reserves.

409 In sum, the mere fact that South Africa has coal reserves is no argument for building new, heavily polluting coal-fired power stations that are unnecessary, too costly, have severe rights-limiting consequences, and that will become stranded assets in the near future.

#### ***Less restrictive means***

410 There are less restrictive means to achieve the stated aims of promoting electricity security, reducing electricity costs, and promoting sustainable development. As the government's own modelling indicates, the most economically and environmentally viable option is to construct no new coal-fired power stations and to focus instead on clean renewable energy and other forms of flexible generation.

411 South Africa has the opportunity to join other open and democratic societies in rejecting new coal-fired power stations. As the world turns away from coal, South Africa is at risk of being an environmental pariah in pursuing plans for new coal-fired power and locking

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itself into assets which will become stranded in the near future. Abandoning these plans is not only a moral and political imperative, but it is what the Constitution requires.

## VII THE REVIEW APPLICATION

412 The applicants further seek to review and set aside the Minister's determination, NERSA's concurrence, and the 2019 IRP to the extent that they make provision for 1500 MW of new coal.

413 I begin with the general grounds of review that apply to all of the impugned decisions, before addressing specific grounds of review relevant to the individual decisions.

414 The applicants have not yet had the benefit of a Rule 53 record. Accordingly, we reserve our rights to supplement the grounds of review on receipt of the Rule 53 record of these impugned decisions, which will cast further light on the decision-making processes that resulted in these decisions and reviewable irregularities in these processes.

### A GENERAL GROUNDS OF REVIEW

415 For the reasons set out in the previous section, the impugned decisions to procure 1500 MW of new coal-fired power are an unjustified limitation of rights. Accordingly, all of these decisions stand to be reviewed and set aside in terms of section 6(2)(i) of PAJA and the principle of legality, as they are unconstitutional and unlawful.

416 Furthermore, there is no evidence that these decisions were taken with a proper regard for the impact of 1500 MW of new coal-fired power on constitutional rights, including the rights of present and future generations of children who will bear the greatest burden of

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these decisions. Accordingly, the impugned decisions also fall to be set aside in terms of:

416.1 Section 6(2)(e)(iii) of PAJA and the principle of legality, as relevant considerations were not considered.

416.2 Section 6(2)(i) of PAJA and the principle of legality, as this failure is otherwise unconstitutional and unlawful.

## **B GROUNDS OF REVIEW IN RESPECT OF THE 2019 IRP**

417 For the reasons set out in detail above, the inclusion of 1500 MW of new coal in the 2019 IRP is not reasonably or rationally connected to its stated purpose of being an "*electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimize negative emissions and water usage)*" (page 8, emphasis added).

417.1 On the government's own modelling, new coal-fired power is not part of a least cost plan, nor is it required to balance electricity supply and demand. This conclusion is further supported by the expert report of the ESRG and further modelling by the CSIR and Meridian, described above.

417.2 New coal-fired power is not consistent with efforts to minimize emissions and other environmental harms. The environmental and human health risks of coal-fired power have also been set out extensively above.

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417.3 Accordingly, the inclusion of 1500 MW of new coal in the IRP stands to be set aside in terms of:

417.3.1 Section 6(2)(f)(ii) of PAJA and the principle of legality, as it is irrational.

417.3.2 Section 6(2)(h) of PAJA, as it is unreasonable.

418 Moreover, the Minister's claim, set out in his reasons for the IRP, that new coal "*is not forced after modelling (not a policy adjustment outcome) but an outcome of a technical modelling exercise*" is false and misleading for the reasons addressed above.

418.1 To the extent that the Minister believed that the inclusion of new coal is consistent with a "least cost" modelling exercise, his decision reflects a material error of fact, which stands to be reviewed and set aside in terms of section 6(2)(e)(iii) of PAJA and the principle of legality.

418.2 Alternatively, to the extent that the "least cost" modelling exercise was artificially manipulated to engineer a result that called for the inclusion of 1500 MW of new coal, this reflects an ulterior purpose which stands to be reviewed and set aside in terms of section 6(2)(e)(ii) of PAJA and the principle of legality.

## C GROUNDS OF REVIEW IN RESPECT OF THE MINISTER'S DETERMINATION

419 The Minister has explicitly justified his section 34 determination in respect of new coal as being "*in line with the Integrated Resource Plan*" (Minister's reasons, para 1.1).

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420 The Minister's reasons suggest that he regarded the 2019 IRP as being determinative of the need for new coal.

421 Furthermore, there is no evidence to suggest that the Minister gave any meaningful consideration to public comment on the draft determination, particularly comments opposing new coal.

422 I am advised that while it is permissible for decision-makers to take into account policy instruments when exercising a discretion, such instruments cannot be applied in a rigid and inflexible manner. Legal argument will be addressed on this issue at the hearing of the matter.

423 Thus, while the Minister was clearly entitled to consider the 2019 IRP as a relevant consideration, he was not entitled to regard it as determinative of his decision on the inclusion of 1500 MW of new coal or to disregard public comments on the draft determination that addressed the harms of coal.

424 Therefore, the Minister's decision stands to be reviewed and set aside on the following grounds:

424.1 section 6(2)(e)(iii) of PAJA and the principle of legality, as relevant considerations were not considered;

424.2 section 6(2)(f)(ii) of PAJA and the principle of legality, as the decision was not rationally connected to the purpose for which it was taken, the purpose of the empowering provision, or the information before the decision-maker; and

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424.3 section 6(2)(h) of PAJA, as the decision was unreasonable.

#### D GROUNDS OF REVIEW IN RESPECT OF NERSA'S CONCURRENCE

425 In terms of section 10(1) of the NERSA Act, NERSA's decisions must be "(a) *consistent with the Constitution and all applicable laws*" and "(b) *in the public interest*".

426 This places a particular obligation on NERSA to scrutinise the potential impact of draft determinations on fundamental human rights.

427 In the request for reasons submitted to NERSA, the applicants' attorneys asked NERSA the following question: "*Did NERSA conduct its own assessment of the climate change and health impacts of "environmental emissions" from coal-fired power stations? If not, why?*" (Request for reasons, para 9.2.1).

428 NERSA's response is telling. It stated:

*"It is not within NERSA's mandate or expertise to assess climate change and health impacts, the Department of Environmental Affairs (DEA) is entrusted to do such studies. The emission constrain scenarios were received from DEA and were in line with the emissions reduction country mandate."*  
(NERSA's reasons, p 9)

429 The applicants' attorneys further requested NERSA to explain the basis for its contention that the IRP 2019 gave proper consideration to "*environmental emissions*" (Request for reasons, para 9.2.2). NERSA responded:

*"The basis is that the constrain as supplied by the DEA was implemented in the model and as a result reduced the amount of emitting plants built, this is seen by the results of the model and the gazetted energy mix. It is thereby understood that the outcome of the model has taken into account these constrains. It is also important to note that the coal in the IRP 2019 was not forced but came in on its merit with total emissions continuing to stay below the PPD limits."*

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430 In sum, NERSA's position is that:

430.1 It believes it has no mandate or obligation to consider the climate change and health impacts of new coal-fired power.

430.2 It relied solely on the Department of Environmental Affairs' "*emission constrain scenarios*", presumably a reference to the "peak, plateau, decline" trajectories for GHG emissions under the previous (and now outdated) version of the NDC.

430.3 It did not conduct further, independent assessment of the climate change impacts of building 1500 MW of new coal.

430.4 It made no effort whatsoever to consider the further human health impacts of new coal, beyond GHG emissions.

431 In the circumstances, NERSA has impermissibly abdicated its responsibility to ensure that its decision is in the public interest and is consistent with human rights. Its decision stands to be reviewed and set aside on the following grounds:

431.1 section 6(2)(b) of PAJA and the principle of legality, as mandatory and material procedures or conditions contained in section 10 of the NERSA Act were not complied with;

431.2 section 6(2)(e)(iii) of PAJA and the principle of legality, as relevant considerations were not considered;

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431.3 section 6(2)(f)(ii) of PAJA and the principle of legality, as the decision was not rationally connected to the purpose for which it was taken, the purpose of the empowering provision, or the information before NERSA;

431.4 section 6(2)(h) of PAJA, as the decision was unreasonable; and

431.5 section 6(2)(i) of PAJA and the principle of legality, as the decision was otherwise unconstitutional or unlawful.

## VIII REMEDY

432 The applicants seek a declaration that the impugned decisions are unconstitutional, unlawful and invalid and a further order setting them aside, to the extent that they provide for 1500 MW of new coal.

433 It is just and equitable to set aside these portions of the determinations and the IRP to ensure that the Minister and NERSA can reconsider these decisions and arrive at a constitutionally compatible decision.

434 There can be no conceivable prejudice to the Minister or other parties in granting this relief, particularly as the procurement process for any new coal fired power stations has not been initiated. The request for proposals is only due to be issued in March 2022, at the very earliest.

435 The remaining contents of the IRP, the determination, and the concurrence are unaffected by the relief sought by the applicants and would remain operative. In

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particular, the applicants again stress that there is nothing in the relief sought that would impede the swift procurement of further renewable energy.

## IX PROCEDURAL MATTERS AND CONDONATION

436 The constitutional challenge to the Ministerial determination, NERSA's concurrence and the IRP are based squarely on the implicated constitutional rights. To that extent, no question of delay or condonation arises.

437 In respect of the further application to review these decisions, either under PAJA or under legality, the applicants seek condonation for the delays, to the extent necessary.

438 This application is due to be launched at the beginning of November 2021.

439 In respect of the IRP, this application will be launched approximately 24 months after the IRP was initially published and 14 months after the Minister delivered reasons, albeit inadequate. The timeline of events, as detailed above, is as follows:

439.1 On 18 October 2019, the 2019 IRP was published setting out government's electricity plans for the decade horizon of 2019 to 2030.

439.2 On 5 November 2019, groundWork and Earthlife through CER, wrote to the Minister to request reasons for the Minister's decision to promulgate the updated IRP of 18 October 2019. A letter was also sent to NERSA requesting the reasons for its comments on the IRP. A response was requested by 5 December 2019.

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439.3 When a response was not received from the Minister and NERSA, a follow up letter was sent on 13 December 2019 extending the deadline for a response to 3 February 2020.

439.4 Given the lack of response from the Minister and NERSA, groundWork filed an application to compel reasons, in this Court in July 2020.

439.5 The Minister replied to the letter dated 5 November 2019 on 14 August 2020. In the response, the Minister asserted that the promulgation of the IRP did not constitute admin action and that reasons could not be provided in the form prescribed. The Minister nevertheless provided specific responses to questions groundWork had posed.

439.6 groundWork responded with more clarity seeking questions on 3 November 2020. The Minister did not respond, instead, the state filed answering papers in the application to compel. NERSA also filed papers opposing the application. On 16 February 2021, the application was withdrawn by agreement between the parties.

440 In respect of the Minister's determination and NERSA's concurrence, this application will be launched 13 months after the determination and NERSA's concurrence were first published and nine months after the Minister and NERSA delivered their reasons. The relevant timeline, as detailed above, is as follows:

440.1 The determination was published on 25 September 2020.

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440.2 On 13 October 2020, groundWork wrote to Minister Mantashe seeking reasons for the decision to promulgate the determination. A response was requested within 30 days, by 12 November 2020. A response was received from the Minister on 25 January 2021.

440.3 groundWork's attorneys also wrote to NERSA on 30 October 2020 to record that NERSA's purported reasons, as published on its website on 22 September 2020. NERSA responded on 21 January 2021.

441 The applicants have repeatedly attempted to engage further with the Minister and NERSA in an attempt to resolve this matter:

441.1 On 9 July 2021 the applicants wrote to the Minister and NERSA, asking whether the DMRE will commence with the process of updating the IRP before the end of 2021; if not, why not; and whether the Minister and NERSA have any intention to revoke or amend the section 34 determination that provides for 1500 MW of new coal-fired power. No response was received.

441.2 On 17 September 2021, the applicants addressed a letter of demand to the Minister, copying NERSA, requesting that the Minister abandon all plans for the procurement of new coal capacity and revise the 2019 IRP. The Minister was requested to respond to this letter by 8 October 2021.

442 The Minister's failure to respond left the applicants in considerable uncertainty as to whether the government would indeed go ahead with its plans to procure 1500 MW of new coal.

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443 The 2019 IRP is, by its nature, meant to be a living plan that ought to be updated every two years address changing circumstances and technologies. The applicants reasonably believed that the Minister would announce efforts to revise and update the IRP, particularly in light of recent developments detailed in the correspondence with the Minister, including:

443.1 The announcement by President Ramaphosa on 10 June 2021, that schedule 2 under the ERA will be amended to allow projects up to 100 MW to generate electricity without a NERSA generation licence. This increase in the exemption threshold will impact the configuration of the proposed energy mix under the IRP 2019, warranting an update;

443.2 The IPCC Sixth Assessment report outlined above, which confirms the need for radical emission reductions in the next 9 years, in order to avoid exceeding the Paris Agreement's 'safe limit' of 1.5°C and to ensure against the worst effects of the climate crisis; and

443.3 The ESRG Report and Sahu Report, which further demonstrate the unreasonableness of the decision to procure new coal-power generation capacity and that even if HELE technologies are used at the new coal-fired power plants, large quantities of GHG emissions and other air pollutants are unavoidable.

444 The applicants firmly hoped that the updates to the IRP would trigger further reconsideration of the determination.

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445 There has also been substantial uncertainty around whether the Minister's determination in respect of new coal will actually be put into effect through a request for proposals.

446 There were initial suggestions from departmental officials that a request for proposals ("RFP") would be issued by the end of 2021, but the applicants have repeatedly sought clarity from the Minister on this score. Clarity only emerged in the DMRE's presentation to Parliament on 24 August 2021, which has now indicated a date of March 2022.

447 The preparation of this application has also required considerable time, which has included extensive consultations with experts and affected communities. These preparations have also been prolonged due to key developments, such as the release of the latest IPCC report. The timeline of the applicants' efforts is as follows:

447.1 Following instructions from the third applicant to investigate the prospect of opposing the inclusion of 1500 MW of new coal in the determination and the IRP 2019, an initial consultation was held with counsel on 23 September 2020, just prior to the publication of the determination;

447.2 Requests for written reasons for the Minister's determination, and NERSA's concurrence, were submitted in October 2020, for response by 12 November 2020 and 1 December 2020, respectively;

447.3 Pending receipt of the reasons for the impugned decisions, extensive consultations with the applicants' legal team were conducted between October and November 2020;

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- 447.4 Having identified technical issues requiring expert input, CER, on behalf of the applicants, briefed five different subject matter experts during the period of December 2020 to January 2021;
- 447.5 Upon the eventual receipt of the reasons letters from both NERSA and the Minister on 21 and 25 January 2021, respectively, and after due consideration, CER briefed a sixth subject-matter expert and revised the scope of work for some of the appointed experts to directly address specific aspects in the Minister and NERSA's reasons, between February to March 2021;
- 447.6 During the period of March to July 2021, the applicants' legal representatives continued to work on the matter and consulted with the appointed experts, cited above, on the preparation of their reports in support of this application;
- 447.7 It also became apparent that an additional subject matter expert was necessary to attest to the climate change implications for South Africa's youth from 2021 onwards – the Professor King report was commissioned in July 2021;
- 447.8 During the period of July 2021 to mid-October 2021, CER, on behalf of the applicants, conducted multiple consultations (telephonic and in-person) with a group of 13 interested and affected individual clients from the Mpumalanga Highveld, Limpopo, and the Western Cape. These engagements resulted in the preparation of the supporting affidavits that accompany this application;
- 447.9 The release of the IPCC's Sixth Assessment report on 9 August 2021 prompted further consultations and necessitated further work on the expert reports and draft papers to account for the latest science;

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447.10 It was also necessary for the CERP Report and ESG Report to account for the updated NDC approved by Cabinet in September 2021, as the updated NDC has a material impact on the inputs and/or conclusions in both these reports. Accordingly, these outstanding expert reports were revised during October 2021; and

447.11 These papers were finalised during the course of October 2021, after all the necessary supporting affidavits and expert affidavits were finalised.

448 In these circumstances, the applicants have provided a full explanation for the period of the delay. The applicants have gone out of their way to afford the Minister ample opportunity to engage on the decision to retain the 1500 MW new coal allocation. Due to the Minister's unresponsiveness, they have been left with no alternative but to institute these proceedings in the public interest and in order to vindicate constitutional rights.


449 There can no prejudice to the Minister, NERSA or other parties as a result of these efforts and delays. They have had ample forewarning of this application and ample opportunity to engage meaningfully to resolve the matter.

450 I further submit that this application has clear merits for all the reasons addressed above. The applicants accordingly submit that it is in the interests of justice to grant condonation.

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**X     CONCLUSION**

451 For these reasons, the applicants pray for an order in terms of the notice of motion.



**SARAH ROBYN FARRELL**

Signed and sworn before me at OBSERVATORY on this the 03 day of NOVEMBER 2021,  
the deponent having acknowledged that she knows and understands the contents of the  
affidavit, that she has no objection to taking the prescribed oath and that she considers such  
oath to be binding on her conscience.



**COMMISSIONER OF OATHS**

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