IN THE HIGH COURT OF SOUTH AFRICA

GAUTENG DIVISION, PRETORIA

CASE NUMBER: 2023/005779

In the matter between:

UNITED DEMOCRATIC MOVEMENT AND 18 OTHERS Applicants

and

ESKOM HOLDINGS SOC LIMITED AND 7 OTHERS Respondents

FIRST RESPONDENT'S ANSWERING AFFIDAVIT: PART A

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I the undersigned,

ANDRÉ MARINUS DE RUYTER

do hereby make oath and say as follows:

1 I am the Group Chief Executive Officer (GCEO) of the First Respondent, Eskom Holdings SOC Limited ("**Eskom**"). I assumed this office in January 2020. I am authorised to depose to this affidavit on behalf of Eskom.

2 The facts in this affidavit are within my personal knowledge or have been extracted from the records of Eskom, unless the context indicates otherwise, and are to the best of my knowledge both true and correct.

3 In my understanding and statement of the facts, I also rely on the evidence of the following persons at Eskom, whose affidavits and reports shall be filed herewith and which I believe to be true and correct:

3.1 Mr Thomas Conradie, Eskom's Acting Group Executive: Generation;

3.2 Mr Calib Cassim, Eskom's Chief Financial Officer;

3.3 Ms Isabel Fick, Eskom's General Manager of Transmission;

3.4 Ms Gabisile Vuyisile Mkhatshwa, Senior Manager of Climate Change and Sustainable Development in Eskom's Risk and Sustainability Division;

3.5 Mr Augusto Jose Correia, the Emergency Response Manager in Eskom's Risk and Sustainability Division;

3.6 Dr Ulrich Minnaar, Middle Manager: Eskom Distribution Solutions, Research, Testing and Development in the Office of the Chief Operations Officer; and

3.7 Ms Daphne Mokwena, Senior Manager of the Centre for Excellence in Eskom's Distribution Division.

4 Where I make legal submissions, I do so on the advice of Eskom's legal representatives.

5 I structure this answer in four parts:

5.1 Part 1 provides an overview of Eskom's response to Part A of this application.

5.2 Part 2 deals with the question at the heart of this application: Why do we currently have load shedding? It is a simple question, but it has a complex answer that dates back to at least 1998. I provide as full account as possible in the time and space available of the historical and immediate causes of the load shedding South Africa is burdened with today.

5.3 Part 3 addresses Eskom's plans to address load shedding and the measures it is already taking and plans to take in the immediate future. I explain Eskom's Generation Recovery Programme and the extensive maintenance work it is doing on its base-load power stations to improve their performance and reliability, as well as the measures it is taking to onboard new sources of energy supply, all as a matter of urgency. In Part 3, I also address the applicants' assertions that alternative solutions to load shedding are immediately available which Eskom has failed to consider and/or implement. I explain why the applicants', and NUMSA's expert, Mr Ted Blom's assertions are ill-informed and wide off the mark.

5.4 Part 4 pointedly addresses the interim relief being pursued in Part A. I explain why the orders sought in prayers 3, 4, and 5 require Eskom to do what is

practically and legally impossible and that they cannot, therefore, be granted. I also explain what Eskom is doing to alleviate the impact of load shedding on some of the public facilities and institutions the applicants have identified as requiring protection from load shedding. The applicants' suggestion that Eskom has been callous about the impact of load shedding and has simply thrown up its hands when confronted with the impact on vulnerable public facilities is patently wrong.

6 This answer and the supporting affidavits and reports, as complex and voluminous as they are, have been prepared under immense time pressure. To the extent that any matter traversed in this affidavit or its supporting affidavits and reports require further explication, it will be provided in the answer to Part B.

7 To avoid unduly burdening already voluminous papers in the context of urgent proceedings, Eskom has not attached documents that are readily available online or which are not pertinent to the relief sought in Part A. Should these documents be required to be produced, Eskom will do so.

8 Further, instead of answering the founding affidavit *ad seriatim*, I answer the application thematically, with pertinent aspects addressed in more detail in the supporting affidavits and reports by Eskom officials with the relevant expertise. I refer in this answer to those affidavits and reports where they are relevant.

9 Any allegation in the founding affidavit that is not answered in this affidavit and the supporting affidavits, and which is inconsistent with what is stated in these answering papers, must be taken to be denied.

PART 1: OVERVIEW OF ESKOM'S ANSWER TO PART A

The load shedding crisis and Eskom's plans to address it

10 Eskom recognises that load shedding is taking a heavy toll and negatively impacting on the lives of South Africans and the economy of the country. It recognises that there is a human cost to load shedding and that the prolonged, frequent and more severe cycles of load shedding have precipitated a national crisis.

11 Eskom readily supports the marshalling of all available resources to ameliorate and, wherever possible, to prevent the human and socio-economic costs of load shedding.

12 The load shedding that South Africa is continuing to experience is implemented as a measure of last resort, because there is insufficient generation capacity – and thus insufficient electricity supply – to meet the demand for electricity in the country. On Eskom's assessment, the current shortfall in available electricity supply is 4000 to 6000 megawatts (MW), depending on the season, time of day and customer usage patterns.

13 Load shedding is implemented to save the national electricity grid from complete collapse and a resulting national blackout. If supply and demand are not kept in balance on the national electricity grid, the grid will collapse and the entire country will experience a blackout or total loss in electricity supply.

14 How long such a blackout would last is impossible to predict with any certainty. However, for the reasons explained by Eskom's General Manager of Transmission System Operator Ms Isabel Fick, Eskom estimates that it could take up to several weeks to restore the electricity grid, that length of time being highly dependent on the state of the grid when the black-out occurs. Without wishing to sound alarmist, the consequences of such a blackout would be catastrophic. Some of the likely impacts

are identifiable from international experiences of extended blackouts (such as the week-long blackout in Venezuela in March 2019). They include: the loss or interruption of water supply and sewerage treatment; the shut down of telephone and internet services; rationing and shortages of liquid fuel (petrol and diesel) with knock-on impacts on transport, industry and institutions that depend on liquid fuel to run back-up generators (including hospitals, laboratories, morgues); digital platforms, including payment platforms and automatic teller machines not running with the consequence of a shortage of hard currency; chaos on the roads, as traffic lights go down; shops and residents will struggle to keep produce fresh, and food supplies will be impacted; and a high risk of looting, vandalism and public unrest. Self-evidently, a blackout is a risk that South Africa cannot afford to take.

15 While the immediate cause of load shedding is the current shortfall in electricity supply, the reasons for that shortfall are complex and can be traced back decades. Since at least 1998, Eskom has been calling on the Government to urgently invest in new generation capacity in the light of increasing electricity demand. Eskom was divested of its independent mandate and means to invest in new generation capacity after it was converted into a state-owned enterprise. With the building of new power stations delayed for over a decade, Eskom has had to run its ageing coal fleet at far higher usage levels than accepted international industry practice and defer planned maintenance (since maintenance requires taking the power stations offline, sometimes for as long as three months).

16 This combination of running coal-powered plants harder and deferring maintenance has, inevitably, had a knock-on effect on the performance of Eskom's coal fleet – evidenced by the declining Energy Availability Factor ("**EAF**") of the plants. An unfortunate (but also predictable) cycle has begun: unplanned plant breakdowns and

reduced available capacity compels further increases in the usage of the working plants and continued deferral of planned maintenance outages.

17 The applicants call for accountability in this application. They seek an explanation of why South Africa is still suffering the effects of load shedding and disclosure of what Eskom has done and plans to do to immediately address load shedding.

18 The South African public should undoubtedly have this information. While Eskom has endeavoured – through its regular reports to Parliament, the Minister of Public Enterprises, the Minister of Mineral Resources and Energy, the National Energy Regulator of South Africa ("**NERSA**"), National Treasury and various other stakeholders – to convey its understanding of the causes of load shedding and what its plans are to address it as quickly as possible, it welcomes the opportunity in this case to explain as fully as it can in this answer, its understanding of the causes of load shedding and, more crucially perhaps, what its plans are to address it. These aspects are dealt with in Parts 2 and 3 of this affidavit.

19 The applicants call on Eskom and its shareholder representative, the Minister of Public Enterprises, "to produce a plan" that explains the measures we will take to end load shedding and to maintain Eskom's power stations and improve their EAF.[1] Eskom already has such a plan: Eskom's Generation Recovery Plan. This plan provides for the generation of 6000MW of additional supply within 24 months. It sets out the measures Eskom shall take and is already taking – including immediate measures – to address load shedding. The measures detailed in Eskom's Generation Recovery Plan align with what is expected of Eskom under the Energy Action Plan produced by the National Energy Crisis Committee ("**NECOM**", the multi-sectoral committee

[1] Paragraph 8 of the Notice of Motion, Part A. This prayer has since been abandoned for Part A.

established by the President in July 2022 to address load shedding). Eskom is also already implementing detailed plans for the maintenance and performance recovery of its fleet of coal power stations.

20 Eskom's plans have all been developed with an appreciation of the urgency of the need to address load shedding as swiftly as possible. They are developed with the view to both ameliorating the impact of severe load shedding in the immediate term and to end load shedding altogether as soon as possible.

21 Eskom's plans take into account, as they must, the constraints under which Eskom operates. These constraints – financial, legal, regulatory – impact on what is possible for Eskom to achieve and cannot, unfortunately, be discounted or wished away. These plans also identify and set out the key enablers that are required – and which must be actioned by Government and NERSA – to ensure effective and efficient implementation. Whether these enablers are met are, in the main, out of Eskom's control.

22 The applicants contend that there are a range of measures available to Eskom to address the shortage of electricity supply immediately. They suggest that Eskom's failure to take these measures evidences its failure to treat the electricity crisis as an emergency and with the seriousness it deserves. They rely in particular on the evidence of Mr Ted Blom in advancing these submissions. As I explain in Part 3 of this affidavit, and as is further detailed in the supporting affidavit of Eskom's Acting Head of Generation, Mr Thomas Conradie, Mr Blom's account of these alleged 'alternative solutions' is patently unrealistic and a gross oversimplification of what is practically entailed in solving the energy crisis. He fails to have regard to fundamental practical realities (such as what resources are in fact available) and to Eskom's legal obligations (such as Eskom's obligations to reduce its reliance on polluting coal).

Eskom has considered all the measures Mr Blom describes and has, for the reasons outlined in Part 3 of this affidavit and particularised in Mr Conradie's affidavit, determined that they are either not viable alternatives at all or certainly not within the timeframes and at the scale proposed by Mr Blom.

Ameliorating the impacts of load shedding on public facilities and institutions

23 The harsh reality is that, until the national electricity supply is increased to meet demand, load shedding is unavoidable in the discharge of Eskom's obligation to avoid a national black out. On Eskom's best estimation, assuming Eskom is able to implement its Generation Recovery Plan, it could take up to 24 months to generate the additional supply required to bring an end to load shedding.

24 Given this timeframe, the applicants are understandably concerned to protect a range of public institutions and facilities from the impact of load shedding. I reiterate that Eskom supports the marshalling of all available resources to ameliorate the impact of load shedding.

25 However, for the reasons addressed in Part 4 of this affidavit, the relief the applicants seek in prayers 3, 4 and 5 is simply not possible for Eskom to implement. The impediments are predominantly technical and legal in nature, but also financial.

26 In summary:

26.1 In most cases, hospitals and clinics, schools, police stations, small businesses, electronic communications networks and telecoms infrastructure are embedded in distribution networks containing other residential and non-residential loads. Due to their embeddedness, these institutions cannot be excluded from load shedding without also excluding the other customers who

share those distribution lines. In other words, to continue to supply an embedded customer with electricity thus requires continuing to supply all the other upstream customers on the distribution line as well.

26.2 Given the very large number of institutions and facilities the applicants seek to protect from load shedding and the fact that most are embedded in distribution networks spread throughout the country, were they to be excluded from load shedding, there would be very little load left to shed to reduce demand on the grid. The relief in prayers 3 and 4 thus defeats the very purpose of load shedding: it requires maintaining much the same level of demand on the grid in circumstances where there is an insufficient supply to sustain that demand. This presents a manifest risk of grid collapse or blackout.

26.3 Wherever load is protected or excluded from load shedding (by the grant of load shedding exclusions or otherwise), other customers have to endure a greater reduction of supply. This is because:

26.3.1 Maintaining the grid, and preventing a blackout, requires keeping electricity supply and demand levels in balance.

26.3.2 Load shedding is only implemented as a measure of last resort to ensure that demand does not outstrip supply, once all other available means to reduce demand or increase supply have been exhausted. The NRS 048-09:2017 Code of Practice for Emergency Load Reduction ("**the NRS 048-09 Code**"), which governs the implementation of load shedding, obliges Eskom as the System Operator to exhaust all other available measures to balance supply

and demand before declaring a System Emergency to permit load shedding.[2]

26.3.3 Maintaining supply to excluded customers where load shedding is being implemented – and by implication, when all other measures have been exhausted – will require more severe load shedding elsewhere on the grid.

26.4 Under its transmission and distribution licences, Eskom is obliged to apply the South African Grid Code System Operation Code ("**Grid Code**") and the NRS048-9 Code. As the Electricity Regulation Act obliges Eskom to adhere to the conditions of its licences, it renders compliance with the Grid Code and the NRS 048-09 Code a statutory obligation. These codes impose significant constraints on Eskom's ability to implement the relief in prayers 3 and 4 of Part A of the Notice of Motion when it implements load shedding.

26.4.1 The Grid Code obliges Eskom to maintain the safe and efficient operation of the interconnected power system, and to implement load shedding where all other available measures have been exhausted to maintain the necessary balance between electricity supply and demand. As the System Operator, Eskom is obliged under the Grid Code to implement load shedding when and to the extent that it is necessary. Prayers 3 and 4 effectively require Eskom to desist from doing so.

[2] The NRS 048-09 Code has been developed by industry representatives and a range of other stakeholders, and is approved and enforced by NERSA. The background and particulars of the NRS Code are described in the affidavit of Mr Correia.

26.4.2 The NRS 048-09 Code sets protocols for determining whether critical loads (such as hospitals, schools and police stations) can be excluded from load shedding and it obliges licensees, like Eskom, to treat all customers without discrimination in applying those rules. The rules in the NRS 048-09 Code do not permit the blanket exclusions the applicants seek. To accommodate that relief, NERSA would have to approve the variation or exemption from the requirements of the NRS 048-09 Code.

26.5 Just as Eskom cannot implement the relief in prayer 3 without violating the NRS 048-09 Code, it also cannot issue instructions to municipalities to do so. Municipalities also hold distribution licences which oblige them to adhere to the NRS 048-09 Code.

26.6 Moreover, municipalities are vested with the constitutional responsibility for the reticulation of electricity. Save for the instructions it can issue as the System Operator (in terms of the Grid Code), Eskom does not, and I am advised cannot, instruct municipalities on how to exercise that power.

26.7 A revision of the current version of the NRS Code (the 2017 edition) is presently underway and the process is well-advanced. Eskom chairs the NRS Working Group (a multi-stakeholder body), which has held extensive consultations on the revision of the NRS 048-09 Code and is formulating proposals for approval by NERSA. Of particular relevance is the assessment whether the 'critical load protocols' in the NRS 048-09 Code can be revised to better protect public institutions and facilities. Eskom expects that NERSA will conduct its own public consultation process in considering the proposed revisions to the NRS

048-09 Code, and the applicants should have the opportunity to participate in that process.

27 Notwithstanding these constraints, Eskom is presently working with various government departments and National Treasury to find solutions as quickly and cost-effectively as possible to protect vulnerable facilities and institutions from load shedding. Given the different configurations and infrastructure used in distribution networks around the country, the variety of electricity supply-needs of different customers, and the disparities in the resources that may be available (including in terms of technology, materials, manpower, funding etc.), no single technological solution can be applied to all. Eskom is, therefore, working with different departments and customers seeking protection from load shedding – including public hospitals and agri-food producers – to assess their needs and to determine the optimal solutions on a case-by-case basis, all the while keeping in mind its overall duty to ensure that any exemptions granted are done rationally, equitably, and without compromising the integrity of the grid overall. These engagements are addressed in Part 4 of this affidavit and in the supporting affidavit of Ms Daphne Mokwena, Senior Manager of Eskom's Centre for Excellence within the Distribution Division.

28 The complex technological considerations, time and costs involved in rolling out alternative technological solutions to embedded customers on the grid are detailed in the report of Dr Minnaar and the affidavit of DMs aphne Mokwena. They demonstrate that implementing any of the alternative solutions will take time and be very costly.

29 Given Eskom's constrained financial position and the extensive maintenance and supply generation programmes it is already implementing, Eskom's resources for implementing these alternative solutions are limited. It is simply not feasible for Eskom to implement such technological solutions for all the categories of institutions and

facilities the applicants identify in prayer 3. Eskom does not have the resources available to do so.

30 Eskom has to use its limited resources to balance and optimise the short, medium and long-term electricity supply needs of the country. As is explained in the affidavit of Eskom's Chief Financial Officer, Mr Cassim, Eskom's resources are extremely constrained – predominantly due to many years of having non-cost reflective tariffs imposed by NERSA (with the result that Eskom does not recover the cost of supplying electricity) and ballooning municipal debt (now in the region of R57 billion). Eskom must maximise the benefit it derives from the use of its financial and human resources.

31 Short-term solutions are likely to be less sustainable. Rolling out the "short-term" solutions the applicants suggest may, in any event, take over two years, by which time Eskom's Generation Recovery Plan – if efficiently implemented and not diverted – would have resolved the supply shortage we are currently experiencing, in a responsible, rational and sustainable way.

32 Most short term solutions are by no means quick fixes. The implementation of the technological solutions Eskom is exploring is dependent on a host of factors, including, among other things, the lead time for supply of technology and materials; the rights and licenses required (such as servitudes and environmental approvals); the availability of manpower, skills and resources; and budgetary constraints.

33 Against this overview, I proceed to explain the causes of load shedding and Eskom's plans to address it.

PART 2: WHY DO WE HAVE LOAD SHEDDING?

34. Eskom, like the rest of South Africa, shares the applicants' desire that load shedding be brought to an immediate end. But regrettably this is impossible to achieve, and dangerous for any court to order.

35. To understand the challenge that ending load shedding presents, and when and how this can be achieved, requires an understanding of the causes of the problem.

36. In calling for an immediate end to load shedding, the applicants have failed to appreciate the nature of the problem, the complexity of its causes, and the delicate balance that Eskom has to maintain to avoid collapsing the national electricity grid. They have also failed to appreciate the practical realities, constraints, and regulatory and financial hurdles that Eskom has to confront in bringing an end to loadshedding.

37. I endeavour, therefore, to explain the causes of load shedding, and to do so with the necessary historical perspective. Before turning to the causes of load shedding (and the causes of the current levels of load shedding in particular), I provide a high-level explanation of what load shedding is, when it becomes necessary, what happens if it is not implemented, and the metrics that indicate when it becomes necessary.

WHAT IS LOAD SHEDDING AND WHY IS IT IMPLEMENTED?

38. Load shedding is the controlled reduction of electricity demand. It is implemented by disconnecting certain points on the transmission and distribution networks on the national electricity grid. Load shedding is employed as a last resort when electricity demand exceeds the supply of electricity, to avoid a collapse of the electricity grid and a complete loss of supply across the country (otherwise known as a blackout[3]).

[3] The technical definition of a blackout is "an uncontrolled interruption of electricity supply effecting many (if not all) customers simultaneously and for an unpredictable length of time".

Restoration of supply after a blackout could take days or possibly weeks, depending on the root cause and prevailing conditions including the status of the network when the blackout occurs.

39. The consequences of a blackout, and the particular difficulties South Africa will face if it sustains one, are explained fully in the supporting affidavit of Eskom's General Manager of Transmission System Operator, Ms Isabel Fick. In short, unlike many other countries, South Africa cannot rely on neighbouring countries to generate sufficient electricity to allow it swiftly to restore its electricity system to operation. During the period of a blackout, the country would suffer immense human and economic harm.

40. The immediate cause of load shedding is insufficient generation capacity. Where a system generates a surplus amount of electricity, it can temporarily take various of its power stations offline in order to perform required maintenance. It can also sustain required supply during unplanned outages (or breakdowns) of power stations by relying on its reserves.

41. Where there is little or no surplus of generation capacity, however, unplanned outages can result in electricity demand exceeding available supply, meaning that load shedding is required. Additionally, if power stations are intentionally taken offline to perform required maintenance, electricity demand can exceed generation supply. Insufficient generation capacity therefore often means either that maintenance cannot be performed or that load shedding must be implemented to enable required maintenance.

42. An additional consequence of insufficient generation capacity is that generation units must run at a higher-than-benchmarked Energy Utilisation Factor ("**EUF**").[4] This metric describes the ratio of actual energy produced by a unit during a specific time over the total energy availability capacity, taking into account all planned and unplanned outages. In essence, it reflects "how hard" a unit is run. Where a unit is run above the benchmarked EUF, it degrades faster than it otherwise would and, over time, will only be able to supply a decreasing amount of electricity.[5] This is reflected as a decrease in the power station's EAF, which reflects the percentage of its nominal capacity (taking into account all outages) that a power station is able to produce.[6]

THE ROOT CAUSES OF LOAD SHEDDING

43. The load shedding that South Africa is experiencing today has been at least 25 years in the making. Over this period, a confluence of factors – the bulk of which are entirely out of Eskom's control – have inhibited Eskom's ability to ensure adequate electricity supply. Many of these factors persist and continue to remain out of Eskom's control, making the relief sought against Eskom all the more unrealistic.

44. Most fundamentally:

    44.1. Since 1998, there has been insufficient investment in new generation capacity, a responsibility vested in the Minister of Minerals and Energy.[7] As a result, Eskom has had to operate with insufficient generation capacity. At present, therefore, and as Eskom has consistently and publicly explained, it

[4] The benchmarked amount is that of the members of Vereinigung der Großkesselbesitzer e.V ("**VGB**"), a European-based technical association for electricity and heat generation industries.

[6] This is explained, in detail, in the supporting affidavit of Mr Thomas Conradie.

[7] Section 1 read with section 34 of the Electricity Regulation Act, 2006.

requires 4000 to 6000 MW of additional generation capacity. It cannot obtain that additional capacity unless new capacity is unlocked. Eskom does not hold that key.

44.2. For approximately 15 years, NERSA has not permitted Eskom to recover cost-reflective tariffs, leading to a revenue shortfall of approximately R40 billion to R60 billion per annum in recent years. Eskom has repeatedly explained to NERSA the need for cost-reflective tariffs. This need was recognised in the Department of Mineral Resources and Energy's Electricity Pricing Policy, 2008 and in the proposed revisions to the Electricity Pricing Policy published for public comment in February 2022.[8] Despite this, the need for cost-reflective tariffs has not been met.

45. These two factors have had a mutually reinforcing adverse effect. Insufficient generation capacity has meant that Eskom has had to run its power stations at a higher-than-benchmarked EUF – simply put, it has had to run its stations too hard. It has also had to defer the maintenance of its power stations which require it to take them off-line. Given its insufficient generation capacity, as well as a Government instruction to "keep the lights on", Eskom deferred required maintenance over many years, resulting in degraded power stations with reduced generation capacity (or EAF).

46. The absence of cost-reflective tariffs has compounded this difficulty. Without cost-reflective tariffs, Eskom has had insufficient revenue to perform the fleet maintenance required to increase its generation capacity. In turn, this has meant that Eskom's

[8] GG 45899 dated 10 February 2022, GNR 1747.

existing power stations have been further degraded, which has further diminished Eskom's generation capacity.

47. These core underlying problems have been exacerbated by a series of other events and circumstances, which have compounded the pressure on Eskom's supply capacity. I shall detail them later in this affidavit but in summary they are the following:

47.1. In 2005, the decision was belatedly taken by Government to permit Eskom to introduce new generation capacity through the construction of the Kusile and Medupi coal power stations. These power stations were poorly designed and poorly built, partly due to the unreasonably short timeframes imposed for implementation as well as the inherent corruption in procurement activities associated with the build programme. The result is that the on-streaming and operation of these plants have been beset with problems and significant cost overruns, and they have consistently failed to generate the expected supply.

47.2. Eskom's fleet of coal power stations are, in general, approaching 50 years of service.[9] As they age, the coal plants are manifesting increased unreliability with more frequent unplanned breakdowns and lower supply capacity (measured as EAF), and increased maintenance costs.

47.3. Eskom's Koeberg nuclear plant is due to reach the end of its 40-year lifespan in 2024. To extend this lifespan for another 20 years, Eskom has had to take Koeberg's unit one offline in order to install new steam generator. This has temporarily reduced Eskom's generation capacity.

[9] Based on international standards and best practice, the 50 year landmark is significant for coal pwer stations. As I explain below, after this period, it is generally not economically viable to sustain power plants as maintenance costs increase substantially. As a result, beyond the 50 year period, it is generally prudent to use available funds to maintain younger power stations, or to introduce new generation capacity.

47.4. Until recently (prior to the change in management at Eskom in 2020), there has been inadequate maintenance of Eskom's power stations and years of deferred maintenance to keep the lights on in the absence of sufficient reserve capacity. There is now a maintenance backlog which cannot be deferred any longer. Eskom has had to take several of Eskom's power units temporarily offline, resulting in unavoidable planned outages, in order to address the maintenance backlog, safety concerns and statutory requirements.

47.5. From 2015 to 2017, under former Eskom Group Chief Executive Officers, Mr Brian Molefe and Mr Matshela Koko, Eskom refused to conclude agreements with Renewable Energy Independent Power Producers ("**REIPP**"). Mr Molefe and Mr Koko took these decisions in contravention of a determination by the Minister of Minerals and Energy that Eskom was to conclude REIPP agreements to mitigate the foreseeable supply constraints we are now experiencing. By taking these decisions, Mr Molefe and Mr Koko inhibited the necessary growth of South Africa's generation capacity.

47.6. Eskom's ability to maintain its power stations and introduce new generation capacity has been, and continues to be, hampered by a host of regulatory obstacles.

47.7. Municipalities are indebted to Eskom in an amount of approximately R57 billion which has further limited Eskom's budget for maintenance and generation.

47.8. State Capture, and corruption more generally, have hollowed out Eskom's financial resources and its experienced and skilled personnel.

47.9. Eskom's various power stations have experienced widespread sabotage, criminality and destructive and unlawful industrial action.

47.10. In 2021 and 2022, units at Medupi and Kusile suffered catastrophic failures, which have required sustained outages, for reasons that remain under investigation.

48. I shall endeavour to explain these factors in the limited time and space available as follows: I first address the series of decisions and events that have caused Eskom's generation shortfall. I then turn to the financial considerations which have compounded this shortfall. Thereafter, I address the effect on Eskom of corruption, sabotage and unlawful industrial action. Finally, I explain the recent events which have required escalations to stage 6 load shedding.

INSUFFICIENT GENERATION CAPACITY

Failure to Implement the 1998 White Paper

49. In 1990, only 35% of South African households had access to electricity. As a result, in the Reconstruction and Development Programme, the African National Congress set as a policy objective the electrification of 2.5 million additional households by 2000.

50. In 1993, 300 000 new households were electrified. By 1995, the total number of additional electrified houses reached 450 000 and by the end of 1999, the target of 2.5 million additional electrified households had been achieved. Over this period, South Africa achieved the highest annual electrification rate in the world.

51. Additionally, from the mid-1990s, South Africa experienced strong industrial and economic growth, further contributing to the increased demand for electricity.

52. By 1998, therefore, it was apparent that without the introduction of additional generation capacity, Eskom's existing generation capacity surplus would be fully utilised by 2007. This was explained by the Department of Minerals and Energy in the 1998 White Paper, which was approved by Cabinet. The Department explained there that "*Eskom's latest Integrated Electricity Plan forecasts for an assumed demand growth of 4,2%"*, meaning that, without the introduction of additional generation capacity, "*Eskom's present generation capacity surplus will be fully utilised by about 2007"*. It went on to caution that:

> *"[t]imely steps will have to be taken to ensure that demand does not exceed available supply capacity and that appropriate strategies, including those with long lead times, are implemented in time. The next decision on supply-side investments will probably have to be taken by the end of 1999 to ensure that the electricity needs of the next decade are met"*.

53. The 1998 White Paper also set out the intended structural reforms of Eskom, including the unbundling of Eskom's Generation, Transmission, and Distribution divisions. Through this restructuring, it was hoped that the private sector would ultimately contribute approximately 30% of South Africa's electricity generation.

54. To avoid overburdening these papers, I attach only the relevant portions of the 1998 White Paper as annexure "**AA1**".

55. Throughout 1998, Eskom made various requests to Government to heed the warning set out in the 1998 White Paper and to allow it to commission additional generation

capacity. Regrettably, these requests were refused on the basis that, through the restructuring of Eskom (which would involve the establishment of an independent system and market operator), the private sector would supply an additional 30% of generation capacity. In April 2001, Cabinet took the decision that "*Eskom is not allowed to invest in new generation capacity in the domestic market".* Eskom was thus divested of the mandate and responsibility for investing in new generation capacity, and this responsibility was assumed by the Department responsible for energy. For a variety of reasons, including that Eskom was not restructured, the anticipated private sector investment in generation also did not materialise. Neither of these decisions were within the control of Eskom.

56. Former President Thabo Mbeki would later acknowledge that the decision to refuse Eskom's requests for additional generation capacity was a mistake. At a 2007 fundraising gala, he admitted that:

> "*When Eskom said to government: "We think we must invest more in terms of electricity generation", we said no, but all you will be doing is just to build excess capacity. We said not now, later. We were wrong. Eskom was right. We were wrong".*

57. I attach as annexure "**AA2**" a news report detailing President Mbeki's comments.

58. As a result of Government's refusal to procure additional generation capacity, coupled with increased electricity demand, from 1998 onwards Eskom's reserve margin began to decrease. This metric reflects the amount of surplus generation capacity within an electricity system. Admittedly, it is an imperfect means of discerning the adequacy of an electricity system's generation capacity, but it does provide some indication of the ability of an electricity system to meet demand.

58.1. Typically, a well-run electricity system has a reserve margin of approximately 15% which allows for preventative maintenance and unplanned shut-downs without load shedding.

58.2. In 1992, Eskom had a reserve margin of 40%.

58.3. By 1998, this had decreased to approximately 30%.

58.4. By 2001, it had dropped to 13.6%; by 2003, to just above 10%; and by 2008 to 5%.

59. At the same time as Eskom's reserve margin dwindled and its EUF increased, Government adopted a "keep the lights on" policy. Eskom was effectively prohibited from performing required maintenance if doing so would result in load shedding.

Medupi and Kusile

60. Only in late 2004, when Eskom's reserve margin had fallen to approximately 8.2%, was it finally permitted by Government to introduce new generation capacity. Eskom could therefore initiate plans to tender for the construction of Medupi and Kusile, two approximately 4800 MW, coal-fired, direct dry-cooled power stations.

61. By this time, however, Eskom faced two obstacles. First, given its dangerously low generation capacity, the tender process and construction of Medupi and Kusile would have to follow impossibly short timeframes. As the 1998 White Paper had warned, a decision about the commissioning of new generation capacity should have been taken by 1999, at the latest, to avert a generation capacity shortage in 2007. The large power stations constructed in the 1980s took approximately 7 to 8 years, or 84 to 96 months, from placing of the relevant contracts to commissioning of the first units.

It was nonetheless hoped that the first units of Medupi and Kusile would be commissioned within an international best practice time period of about 54 months, by 2011 – against the typical period in the USA of 60-66 months, for typically two-unit power stations, not the six-unit type such as Medupi and Kusile. This has proved to have been wildly optimistic and miscalculated. The first units of Medupi were commissioned in August 2015 and its last units in August 2022. The first units of Kusile were only commissioned in August 2017 and the last of its units have still not been commissioned. Regrettably, these delays appear to have been caused in part by a series of corrupt tender awards.

62. Second, in 2005, Eskom had not built a new power station for approximately 16 years. In addition, against the backdrop of a government policy and cabinet decision that it would never again build new power stations in South Africa, Eskom had significantly reduced its skills and capacity to execute mega-construction projects. Eskom thus had to entirely re-establish its new build project management capacity.

63. The result of these two obstacles was that Eskom did not follow normal tendering processes when it commissioned Kusile and Medupi, and instead went to market using so-called “virtual designs”. That is, Eskom went to market using the designs for the Majuba power station, which had been formulated in the 1980s.

64. In October 2007, Hitachi Ltd, a Tokyo based conglomerate, was awarded the tender to construct both the Medupi and Kusile boilers. At the time Hitachi was awarded these contracts, it had no experience working with South African coal.

65. Medupi and Kusile have been plagued by a litany of design and construction failures which have delayed their completion and negatively affected their performance.

These are detailed in the supporting affidavit of Mr Thomas Conradie, Eskom's Acting Group Executive for Generation.

66. As at 1 November 2022, Kusile and Medupi had nominal capacities of only 2 880 and 3 600 MW, respectively, below the 3 720MW[10] that each station was intended to produce.

67. Based on the media release referred to below, it appears that the appointment of Hitachi for the Medupi and Kusile construction projects could be a result of possible corruption. In September 2015, the United States Securities and Exchange Commission ("**SEC**") charged Hitachi with various violations of the Securities Exchange Act of 1934 in relation to the award of the Medupi and Kusile contracts. It alleged, in particular, that:

    67.1. Hitachi sold a 25% stake in one of its South African subsidiaries to Chancellor House Holdings (Pty) Ltd ("**Chancellor House**"), knowing that this was a funding vehicle for the African National Congress;

    67.2. This arrangement gave Chancellor House the ability to share in the profits from any power station contract that Hitachi secured;

    67.3. Hitachi encouraged Chancellor House to use its political influence to ensure that it obtained contracts from Eskom; and

    67.4. Hitachi paid Chancellor House approximately US$5 million in "dividends" based on profits derived from the Medupi and Kusile contracts.

[10] As is explained in the supporting affidavit of Mr Conradie, the total capacity of a power plant differs from its nominal capacity. The latter metric reflects what the plant is actually intended to produce, since it takes into account the energy the plant will have to expend powering itself.

68. In September 2015, without admitting liability, Hitachi agreed to pay the SEC a settlement penalty of US$19 million and that it would be permanently enjoined from future violations of the Securities Exchange Act. I attach as annexure "**AA3**" the relevant SEC briefing.

Deferred Maintenance and Excessive Energy Utilisation Factor

69. Kusile and Medupi have failed to deliver their expected increase in generation capacity. However, even if they had done so and had therefore been commissioned in 2011, this would have come too late to avert the first onset of load shedding in 2007 and 2008. The first implementation of load shedding was partly caused by a shortage of coal. But more fundamentally, it was caused by Eskom's already insufficient generation capacity.

70. From 2008 onwards, Eskom deferred maintenance and ran its units at a higher than benchmarked EUF because of its insufficient generation capacity and the "keep the lights on" mandate from Government. In 2010, because South Africa was hosting the 2010 FIFA World Cup, Government reaffirmed the instruction to keep the lights on.

71. Government has, in fact, consistently explained the consequences of doing so. Thus, in its 2010 Integrated Resource Plan, the Department of Energy explained that "*maintenance has been significantly postponed and further delays create health and safety risks and increase the risk of serious breakdowns and outages*".

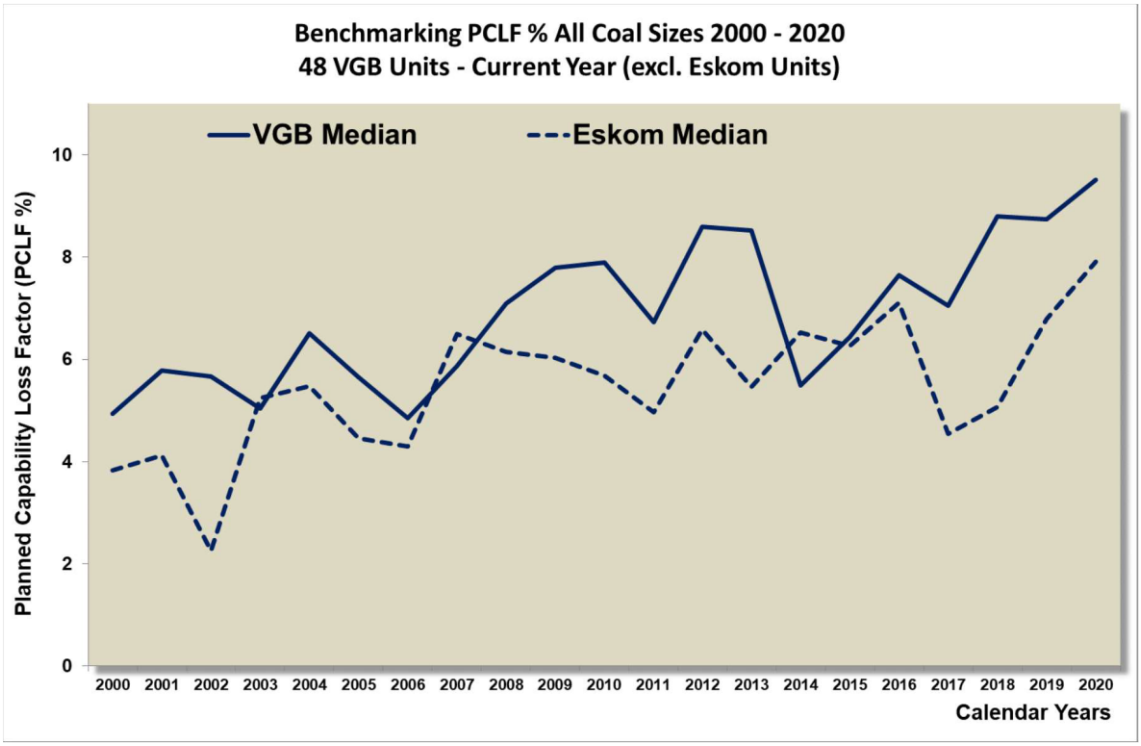
72. In the 2013 Integrated Resource Plan Update Report, the Department of Energy similarly explained that:

> *"Since the 2008 electricity supply crisis Eskom was able to meet electricity demand through delaying maintenance on the generation fleet. This has led*

to the deterioration in performance of the aging fleet, exacerbating the current crisis but also incurring a longer term impact on the effectiveness of the fleet to meet future demand."

73. To avoid overburdening these papers, I attach only the relevant portions of the 2010 Integrated Resource Plan and the 2013 Update Report as annexures "**AA4**" and "**AA5**".

74. More recently, on 4 November 2022, in response to a request for information from NERSA, Eskom delivered representations to NERSA which included the graph below. It indicates that from about 2008, Eskom's Planned Capability Loss Factor ("**PCLF**") fell below the globally benchmarked VGB amount. This metric reflects the number of planned outages implemented in order to perform maintenance or other required construction at a power plant.



75. Eskom's representations to NERSA also explained that:

75.1. “since 2008, necessary philosophy or reliability maintenance and midlife refurbishment were delayed to avoid load shedding caused by lack of capacity, as units would have had to be taken offline for maintenance”;

75.2. “after 10 years of running the stations above design parameters since 2002/03 and of deferring maintenance since 2008 (as a means of creating ‘virtual capacity’ to compensate for the lack of system capacity), the inevitable reduction in reliability finally started manifesting at the end of 2012”;

75.3. “by 2014, because of high utilisation, deferred maintenance, and age, about 80% of stations were already in a period where they required major equipment replacements to restore plants’ technical performance and economic life”; and

75.4. “deferring this work to “keep the lights on” in a context of inadequate system capacity was a major cause of continued escalation in plant breakdowns”.

76. I attach the Eskom’s representations to NERSA as annexure “**AA6**”.

Regulatory obstacles

77. Eskom’s ability to maintain its existing fleet has been further hampered by regulatory obstacles. As Eskom explained in its aforementioned representations to NERSA in November 2022:

77.1. “There is an added challenge of the cumbersome procurement process where Eskom needs to get the National Treasury to make decisions on our operations with a waiting time of up to 90 days for a decision”; and

77.2. "Efforts to save money by using least-cost methods resulted in using cheaper and often inferior parts".

78. Two particularly significant delays caused by regulatory obstacles in the procurement context[11] occurred in respect of the Camden and Majuba power stations:

78.1. In May 2020, National Treasury refused Eskom's request to appoint WBHO Construction (Pty) Ltd ("**WBHO**") to complete work urgently required at Camden at a cost of R212 million. It did so despite the fact that Eskom explained that, if this work was not timeously completed, it would incur expenses of R1.2 billion to make up the consequent generation shortfall elsewhere, and that WBHO was already established onsite, reducing lead times and costs.

78.2. Subsequent to National Treasury's refusal, Camden had to remain offline for four months, reducing Eskom's generation capacity by approximately 1600MW over this period. Had WBHO been timeously appointed, this time period would have been significantly truncated.

78.3. On 12 June 2020, Eskom applied to National Treasury for approval to appoint Tenovo Mining and Minerals (Pty) Ltd ("**Tenovo**") to complete work upgrading the coal offloading facilities at Majuba, at an approximate cost of R108 million. This work became necessary because, as I explain below, Majuba's coal conveyor had caught fire and been destroyed in circumstances which suggested deliberate sabotage.

[11] The requirement for National Treasury approval to procure goods or services without conducting a competitive bidding process derives from National Treasury SCM Instruction No. 3 of 2016/2017, which remained in effect until 31 March 2022.

78.4. Eskom explained that Tenovo was best placed to perform the work because, amongst other things, it had designed and manufactured the coal offloading facilities, was established onsite, and could therefore source and install the relevant parts at a lower cost and in a shorter time frame. Eskom also explained that the work was urgently required because, without its coal offloading facilities, Majuba was reliant on trucked coal supply, which had increased costs by approximately R60 million from the date of the fire. Additionally, without the ability to properly offload coal at Majuba, Eskom would incur costs of approximately R6.5 billion made up, amongst other things, of contractual penalties and damage sustained as a result of inferior coal.

78.5. On 5 August 2020, after it had not received a decision from National Treasury, Eskom wrote to National Treasury to emphasise again the urgency of the requested approval. 110 days after its initial request, on 30 September 2020, National Treasury's erstwhile Acting Chief Procurement Officer, Estelle Setan, notified Eskom that the request had been rejected.

78.6. On 7 October 2020, Eskom appealed the decision but, on 19 October 2020, Ms Setan responded to indicate that the appeal had been refused.

78.7. On 20 October 2020, Eskom therefore again wrote to National Treasury, and to the Minister of Public Enterprises, to explain the urgency and necessity of Eskom's initial request, and the substantial costs and damage Eskom would sustain if it was not approved.

78.8. On 3 November 2020, National Treasury reversed its decision and approved Eskom's initial request. However, the consequences of this delay were significant. Tenova withdrew its offer and Eskom was only able to appoint a

new contractor to perform the work in June 2021. Over this period, Majuba was therefore reliant on coal transported by truck and, as a result, it incurred additional costs of approximately R276 000.00 per day.

79. In his address of 25 July 2022, President Cyril Ramaphosa acknowledged that regulatory obstacles had inhibited Eskom's ability to ensure the adequate performance of its plants. He explained that Government was *"cutting red tape that has made it difficult for Eskom to buy maintenance spares and equipment within the required period to effect repairs*." I attach a copy of the President's address as annexure "**AA7**".

80. Eskom is also constrained by environmental legislation. These constraints are explained fully in the supporting affidavits of Mr Conradie and Ms Mkhatshwa.

81. For instance, a number of Eskom's power plants do not and cannot comply with new Minimum Emission Standards ("**MES**"), promulgated under the National Environmental Management: Air Quality Act of 2004. If it had immediately complied with the MES, Eskom would have lost approximately 16GW of generation capacity for extended periods and would have needed to spend over R300 billion. It therefore applied to the Department of Forestry, Fisheries and the Environment to postpone the implementation of the MES, but its applications were only partially successful. Eskom has since appealed the Department's decision and is awaiting a response.

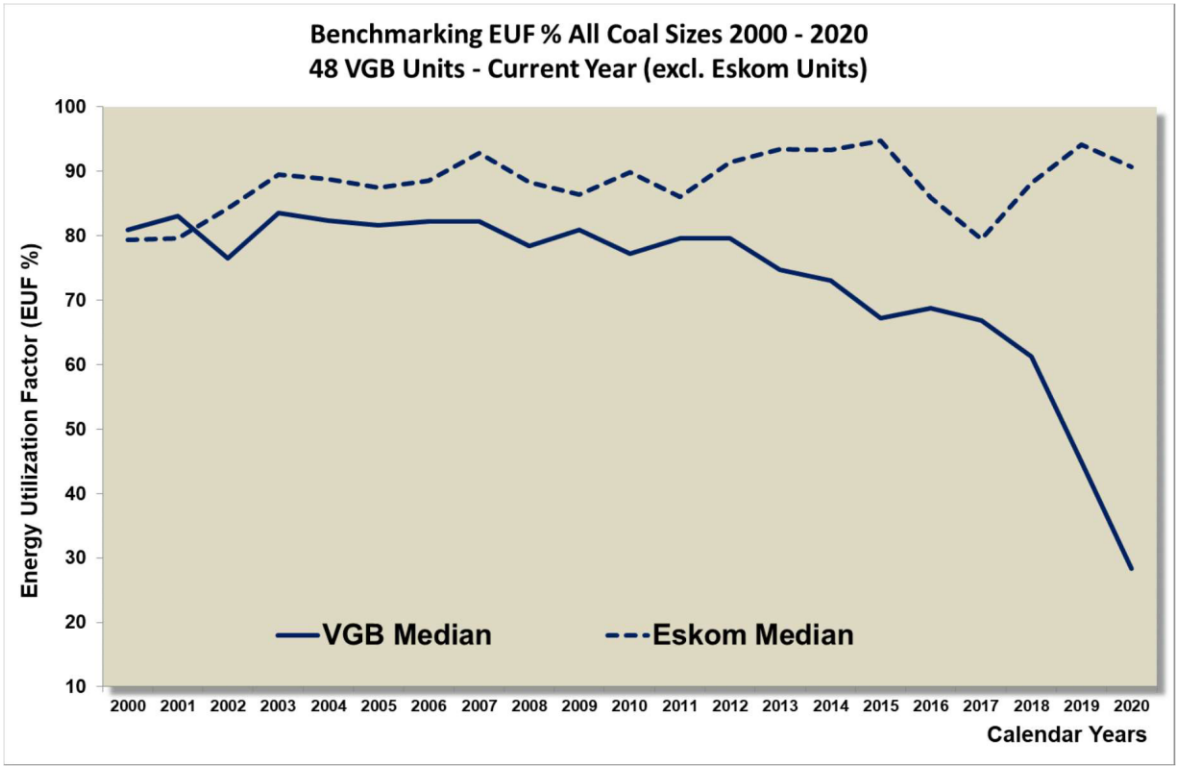
82. Importantly, even if it were feasible to indefinitely extend the lifespans of Eskom's coal power stations (which, as I explain below, it is not), a wilful breach of the MES would put all available "Green Funding" at risk, and would accordingly jeopardise the most cost-effective means of introducing new generation capacity. While Eskom is committed to a just and sensible energy transition, it has nonetheless extended the

lifespan of certain of its coal power stations. The supporting affidavit of Mr Conradie sets out the details of these extensions and of Eskom's shutdown plans.

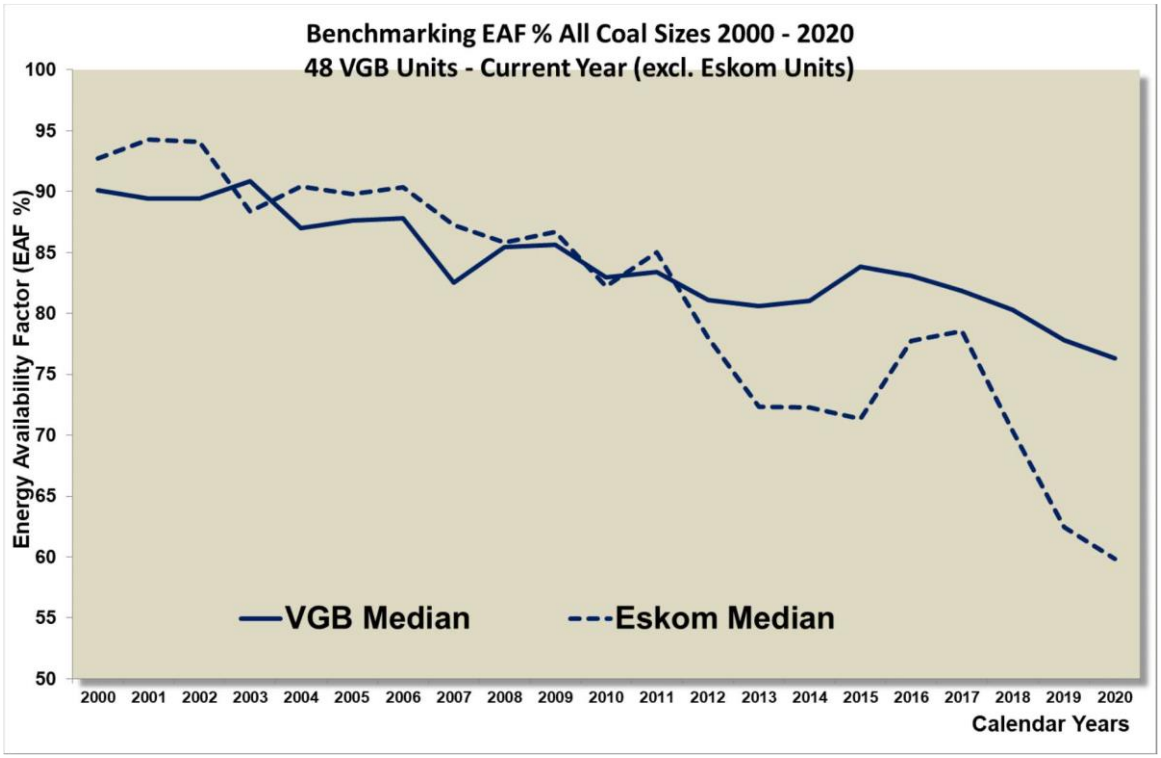
Eskom's Ageing Fleet

83. The applicants make the startling submission that Eskom's ageing fleet is unrelated to current levels of load shedding. They suggest that a power station can operate for an indefinite length of time, provided it is suitably maintained. Respectfully, this is hopeful sophistry. Like any piece of machinery, as a power station ages, maintenance becomes more expensive. Eventually, maintenance of a particular power station becomes so expensive that resources are better spent elsewhere. Specifically, resources are better utilised introducing new generation capacity or performing maintenance on power stations where maintenance is less expensive and generation capacity can be improved at less cost. For this reason, international experience is that coal power plants are retired on average at about 50 years.

84. With the exception of Kusile and Medupi, Eskom's fleet of coal powered stations are on average 43 years old. Eskom's declining reserve margin, coupled with the "keep the lights on" policy, has meant that these power stations have been run at a higher than benchmarked EUF without adequate maintenance, and have therefore degraded at a faster rate than might otherwise have been expected. This is detailed in the graph below which reflects Eskom's coal power stations median EUF measured against the VGB median, which reflects the global benchmark.



85. As a consequence of Eskom's high EUF, as the graph below indicates, from 2011 onwards the Energy Availability Factor of Eskom's power stations has decreased at a faster rate than the benchmarked decrease. However, even at the benchmarked rate, Eskom's fleet would have shown a deteriorating EAF.



86. Additionally, as is explained in Mr Conradie's supporting affidavit, the costs of repairs and maintenance for Eskom's coal fleet is the largest portion of the repairs and maintenance costs and is growing annually by an average of 4.7 %.

87. The applicants also ignore that the Koeberg nuclear power station is nearing the end of its operational life. To prolong the lifespan of Koeberg for a further 20 years beyond 2024/25, Eskom has to install new steam generators at both of its units. The first such installation began on 8 December 2022 at Koeberg Unit 1 and is expected to be completed by June 2023. This planned outage has meant that this unit has had to be taken offline reducing Eskom's generation capacity by approximately 920MW. Koeberg Unit 2 is scheduled to undergo a similar steam generator replacement, refuelling and maintenance outage towards the end of 2023.

The 2015 decision to cease the REIPP program

88. From 2011 to 2015, pursuant to the Integrated Resource Plan for Electricity 2010-30 ("IRP 2010"), and various ministerial determinations, Eskom procured approximately 6300MW of generation capacity from independent power producers and secured R200 billion private investment through the REIPP programme.

89. In 2015, however, Eskom's erstwhile GCEO, Mr Brian Molefe, took a decision that Eskom would no longer conclude agreements with independent power producers. This despite Eskom having been designated as the buyer in determinations made by the Minister of Mineral Resources and Energy under section 34 of the Electricity Regulation Act. From 2016 to 2017, when Mr Matshela Koko assumed the role of GCEO, Eskom continued to refuse to buy from independent power producers.

90. The State Capture Report has highlighted that during that same period starting in 2015, "*the conduct of Eskom officials [including Mr Molefe and Mr Koko] involved the abuse of their position and power and undue influence on subordinates in order unduly to benefit the Gupta family in the awarding of the Brakfontein Coal Supply Agreement to Tegeta"*.

91. On 24 January 2023, I appeared before the Standing Committee on Public Accounts ('**SCOPA**") and explained the consequences of this set of decisions. I that it was estimated that up to 96% of the load shedding today would have been avoided had Mr Molefe and Mr Koko not halted the REIPP program. This has since been corroborated by an independent firm, Meridian Economics. While the 96% estimate might be open to debate, there can be no doubt that Mr Molefe and Mr Koko acted contrary to the IRP 2010 and the relevant ministerial determinations and, in doing so, significantly worsened Eskom's current generation capacity.

92. I attach the relevant pages of Meridian Economics' report as annexure "**AA8**" and the minutes of the SCOPA meeting as annexure "**AA9**".

ESKOM'S DETERIORATING FINANCIAL POSITION

93. Eskom's financial position has substantially weakened over time, making it impossible for Eskom to ensure that its fleet is reliably maintained and its performance enhanced and to invest in adding more generation capacity.

94. Eskom's deteriorating financial position has three main contributing factors:

    94.1. the non-cost reflective pricing of electricity;

    94.2. the non-payment by and bulk debt owed by municipalities; and

94.3. Eskom's high debt servicing costs and inability to access debt funding due to sub-cost reflective tariffs.

95. Each of these factors has directly hindered Eskom's efforts to avert load shedding.

Sub-cost reflective tariffs

96. As mentioned above, NERSA's sustained refusal since at least 2006 to enable Eskom to recover cost-reflective tariffs is amongst the dominant causes of Eskom's current predicament. The effect of sub-cost reflective tariffs and a consequent revenue shortfall for an energy utility are well-known: insufficient funds for increasing generation capacity and for maintenance. In a 2007 report, Professors Newbary and Eberhard explained that the—

> *"reluctance to raise prices hinders the ability either to fund investment and maintenance out of profits, or the creditworthiness to borrow against future profits. In extreme cases the ESI cannot even maintain existing equipment; reliability and availability drop, and power outages become the norm."*

97. In a 2016 report, the World Bank similarly explained the consequences of a revenue shortfall for an energy utility:

> *"One of the casualties of insufficient revenue is maintenance expenditure. Utility managers often have to choose between paying salaries, buying fuel, or purchasing spares (forcing them to cannibalize parts from functional equipment)".*

98. I attach the relevant extracts from these reports as annexure **"AA10**" and "**AA11**".

99. There also can be no dispute that Eskom's tariffs have consistently been sub-cost reflective. In its 2016 report, the World Bank reported that Eskom's average tariff was US$ 6c/kWc whereas Eskom's total costs were approximately US$ 10c/kWh. It also explained that 80% of the difference between the tariff and costs was due to under-pricing of electricity in South Africa. This figure was, in fact, significantly higher, as the World Bank overvalued the contribution to the differential caused by labour costs. More recent tariffs continue to fall significantly below Eskom's costs:

    99.1. In 2021, Eskom's costs were 143c/kWh and the average tariff was 111c/kWh;

    99.2. In 2022, Eskom's costs were 152.6c/kWh and the average tariff was 127.9c/kWh; and

    99.3. Eskom's current costs are approximately 170c/kWh and the average tariff is 138/kWh.

100. While NERSA's most recent determination is a much needed step towards cost-reflective tariffs, if implemented, the average tariff will still be around 5 to 10% short of covering Eskom's costs after 2024.

101. The effect of this lengthy history of non-cost reflective tariffs has been a sustained and significant revenue shortfall and increasing pressure on Eskom's liquidity. The difference between what cost-reflective electricity tariffs would have been and the tariffs NERSA has authorised is a cumulative after-tax revenue shortfall of approximately R370 billion since 2006.

102. The history of non-cost reflective tariffs has had a demonstrable impact on the funds available to Eskom to perform required maintenance. Specifically:

102.1. In its 2014 MYPD3 determination, NERSA disallowed R68.3 billion of generation capital expenditure, of which R39.3 billion was related to capital expenditure for Eskom's existing fleet.

102.2. In Eskom's 2022 representations to NERSA (previously attached as annexure "AA6"), Eskom explained that this amounted to an average reduction per year of R7.9 billion of expenditure required to improve plant performance.

102.3. As a result of the MYPD5 determination, Eskom will in the 2024 financial year see a capital shortfall of approximately R10.6 billion.

103. Eskom's sustained revenue shortfall, owing to sub-cost tariffs, has, of course, also significantly impacted its financial viability. In turn, this has reduced Eskom's ability to borrow funds necessary to increase generation capacity and perform maintenance.

103.1. The 2014 5-year MYPD3 revenue determination implied R225 billion less revenue over the five-year period than Eskom had applied for – which application reflected a five-year phased implementation of cost-reflective tariffs.

103.2. The following year, in March 2015, Eskom was downgraded from investment grade to sub-investment grade status.

103.3. On 25 November 2016, Standard & Poor ("**S&P**") reported that Eskom's weak metrics are "due to continued delays in implementing tariffs that reflect costs".

103.4. On 5 December 2016, Moody's reported that "Eskom's credit metrics… are already very weak owing to: (1) tariffs that are not cost-reflective… its

standalone credit quality or Baseline Credit Assessment (BCA) of b3 … reflects Moody's expectation of a… default assessment of 50% or the debt that is not supported by the government guarantee."

103.5. On 8 December 2016, Fitch published a report which explained that Eskom's "failure to achieve more cost-reflective tariffs" resulted in an unsustainable credit profile and a reduction in Eskom's debt service capability.

103.6. I attach the relevant extracts from the S&P, Fitch, and Moodey's S&P press releases as annexure "**AA12**", "**AA13**", and "**AA14**".

104. For further details on the impact of non-cost reflective tariffs on Eskom's financial position, I refer to Eskom's answering affidavit filed in response to two other pending applications challenging NERSA's decision,[12] deposed to by Eskom's Chief Financial Officer, Mr Caleb Cassim. It is attached hereto marked "**AA15"**. I ask that its contents be incorporated herein to the extent relevant.

105. I pause here to make three important points, which the applicants have seemingly overlooked in challenging NERSA's latest Eskom revenue decision. I am advised that Part A of this application has been limited to prayers 3,4 and 5 of the notice of motion, and the applicants therefore no longer seek a suspension of NERSA's determination pending Part B. Nonetheless, these three points of clarity place in proper context the enduring prejudice that Eskom has suffered as a result of sub-cost reflective tariffs.

106. First, in terms of section 15(1) of the Electricity Regulation Act, NERSA is obliged to set tariffs which enable Eskom, as a licensee, to "recover the full cost of its licensed

[12] *Democratic Alliance v NERSA and Others,* GP case no. 003615/2023 and *Tebeila Institute v NERSA and Others* GP case no, 1338/2023.

activities, including a reasonable margin or return". Given the adverse consequences of a revenue shortfall, the reasons for this injunction are apparent. As I have explained, despite this requirement, NERSA's latest revenue decision will not enable Eskom to recover the prudently and efficiently incurred costs of its activities.

107. The relief the applicants seek (previously in Part A and still in Part B) in respect of NERSA's revenue decision would, therefore, require NERSA not only to act in breach of its statutory duties but would also exacerbate Eskom's continued revenue shortfall and inhibit Eskom's ability to perform essential maintenance of its power stations. Since the applicants correctly acknowledge that Eskom must perform increased maintenance, the relief they seek is palpably self-defeating.

108. Second, the applicants misconceive the nature and effect of NERSA's revenue decision. They allege that it will render electricity unaffordable to poor citizens and inhibit such citizens' access to electricity. But this is not necessarily so. It remains possible, and within NERSA's mandate, to grant subsidies to particular categories of end-users, for instance indigent consumers. Whether and how such subsidies will be granted, will be determined by NERSA in or about late February 2023, when it makes its retail tariff structural adjustment determination. In addition, beyond this determination, it is also within the purview of National Treasury to subsidise electricity tariffs for particular end-users. The relief sought by the applicants in relation to NERSA's tariff determination is therefore misguided and premature.

109. Third, it bears noting that, even if tariffs were set at a cost-reflective price of 170c/kWh (and thus above NERSA's latest determination), they would still be:

109.1. the lowest unsubsidised average tariff in the world;

109.2. far lower than the minimum price that new electricity generation technology from nuclear or fossil fuel would require;

109.3. far lower than the cost at which any consumer could self-generate (other than low-volume agricultural consumers at the end of a long and dedicated transmission line); and

109.4. far lower than the economic cost of load shedding.

110. For these reasons, Eskom has consistently challenged NERSA's inadequate tariff determinations and those challenges have consistently vindicated Eskom's view.

111. From 2011 to 2021, Eskom challenged NERSA's revenue allocations by way of Regulatory Clearing Account ("**RCA**") applications. The details of the MYPD formula and the RCA are explained in the affidavit of Eskom's Chief Financial Officer, Mr Cassim. In essence, the MYPD formula calculates a licensee's allowable revenue, which is supposed to allow a licensee to recover its efficient and prudent costs. Where the initial calculation is subsequently shown to fall short of this amount, the relevant shortfall is "held" in the RCA, and a licensee can apply to NERSA to recover these amounts.

112. In each year from 2011 to 2021, Eskom has had to apply for an RCA determination on the basis that its allowable revenue had been under calculated. While these applications have partly been necessitated by changes in environmental factors, they are largely the result of inadequate original revenue decisions. Those applications have all been successful. NERSA itself has therefore been constrained to accept, through its RCA determinations, that it has consistently and significantly under-calculated the amount of revenue which Eskom should be entitled to recover. It has therefore permitted Eskom to recover an additional R70 billion over its initial

determinations. The history of these RCA applications and decisions is reflected in the following table:

FY	RCA application amount	RCA decision amount	Reviewed	Amount reviewed	Additional amount after review
2011-2013	R18.4bn	R7.8bn	N	Accepted	N/A
2014	R22.8bn	R11.2bn	N	Accepted	N/A
2015	R19.1bn	R12.6bn	Y	R4.9bn	R0.5bn
2016	R23.6bn	R12.1bn	Y	R8.4bn	R1.1bn
2017	R23.9bn	R8.1bn	Y	R13.6bn	R3.1bn
2018	R20.6bn	R3.9bn	Y	R14.3bn	Judgment outstanding
2019	R27.3bn	R13.3bn	Y	R10bn	Judgment outstanding
2020	R8.4bn	R3.5bn	To be Reviewed	R3.3bn	
2021	R10.7bn	TBD	TBD	TBD	

113. Despite this, as is apparent from the table, Eskom maintains that even in its RCA determinations, NERSA has under-calculated Eskom's allowable revenue. For this reason, since 2015, Eskom has also taken the RCA determinations on review. Eskom has succeeded in every one of those applications in which there has been a court decision so far.

114. The above table also does not take into account an additional revenue shortfall in excess of R70 billion, which in 2018 and 2019, led Eskom to launch two further successful reviews of NERSA's revenue determinations.[13]

115. Although Government has committed to provide Eskom funding in the total amount of R136.8 billion over the period 2020 to 2023, this will only enable Eskom to service its debt commitments and improve its liquidity in the short-term. Without cost-reflective tariffs, Eskom's financial position will continue to deteriorate and it will continue to be forced to rely on Government support at the expense of the tax-payer.

Municipal arrear debt

116. Eskom's financial viability, and consequent ability to increase generation and maintenance spend, has also been impacted by alarming amounts of debt owed to Eskom by municipalities. The problem of non-payment by municipalities for the electricity that Eskom supplies has ballooned in recent years.

    116.1. In 2015, the total municipal arear debt owed to Eskom stood at approximately R5 billion.

    116.2. By 2017, the amount owing had nearly doubled to R9.4 billion.

    116.3. By September 2020, total municipal arrear debt stood at R33 billion.

    116.4. To date, municipalities owe Eskom approximately R57 billion.

[13] *Eskom Holdings SOC Limited v National Energy Regulator of South Africa and Others* (74870/2019) [2020] ZAGPJHC 168; and *Eskom Holdings Soc Limited v National Energy Regulator of South Africa* (Case No.: 37296/2018)

117. The top 20 defaulting municipalities – including Maluti-a-Phofung, Emalahleni, Matjhabeng and Emfuleni – constitute 80% of total invoiced municipal arrear debt, with 38% of that owed by Free State municipalities. A total of 48 municipalities have arrear debt of more than R100 million each.

118. Eskom has taken numerous steps to arrest the escalation of debt owed by municipalities and to reduce the overdue debt. I detail these steps in Part 3 of this affidavit. Suffice it to say that despite Eskom's best – and continuing efforts – the problem of escalating municipal debt remains. It poses an increasing risk to Eskom's financial viability.

Eskom's high debt servicing costs

119. A number of factors have contributed to Eskom's burgeoning debt. Key among the these is the non-cost reflective tariffs and the non-payment by municipalities. The continuous pressure on liquidity caused by insufficient revenue recovery has forced Eskom to borrow funds.

120. Despite recovering insufficient revenue, Eskom had to engage in an ambitious capacity expansion programme due to the system capacity constraints. The build programme embarked on by Eskom involved the construction of three large-scale power stations (Ingula, Medupi and Kusile) and the strengthening of its transmission network. The capital expansion programme was mostly funded from debt financing as revenue was not sufficient to fund it. Raising funding on Eskom's own balance sheet became difficult and was expensive. Due to the weakening of Eskom's balance sheet, the Department of Public Enterprises, in its capacity as the shareholder of Eskom, provided guarantees to the value of R350 billion to Eskom.

121. As at 31 March 2022, Eskom's net debt amounted to R389 billion; by the end of December 2022, this had increased to R422 billion. Its debt servicing costs for the 2022 financial year amounted to R70.7 billion. Eskom has had to repay just under R81 billion in capital and interest repayments in the 2023 financial year. It has now entered a three-year cycle in which its debt repayments are expected to be R89 billion, R69 billion and R41 billion per annum. Eskom cannot afford its high debt servicing costs and relies on equity support and debt relief from the Government.

122. Eskom's constrained ability to access debt funding, combined with high debt servicing costs means that it has less money available to fund the maintenance needed to improve the performance of its existing fleet and capital expansion programmes to add much needed new capacity to the grid.

CORRUPTION, SABOTAGE AND UNLAWFUL INDUSTRIAL ACTION

Corruption

123. Corruption has had a profound effect on Eskom. The report issued by the Judicial Commission of Inquiry into State Capture, Fraud, and Corruption ("**State Capture Report**") found that "*in total, R14.7 billion of Eskom's contracts are calculated to have been afflicted by State Capture"*. The cumulative financial impact on Eskom of State Capture and corruption more generally is difficult to quantify, but it is likely to be significantly higher than the amount of R14.7 billion.

124. By way of example of the damning contents of the State Capture Report, the Commission found that:

124.1. The evidence "*revealed quite clearly that part of the reason why some of the state owned companies have performed as badly as they have and why some*

rely on Government bail outs year in year out is the calibre of some of the people who are appointed as members of the Boards of these companies or who are their Chief Executive Officers and Chief Financial Officers".

124.2. A vivid example of the impact of corruption on both Eskom's finances and generation capacity is the unlawful award, in March 2015, of a contract to supply coal to Eskom's Majuba power station to the Gupta-owned company, Tegeta Exploration and Resources (Pty) Ltd ("**Tegeta**"). I already touched on that contract above. Pursuant to this contract, Eskom paid Tegeta approximately R1.26 billion.

124.3. Tegeta's coal failed numerous quality control tests before Mr Koko intervened to ensure that it was scored positively.

124.4. To this end, the Commission explained that *"[c]ontrary to his assertions of self-righteousness, evidence before the Commission shows that, acting on Tegeta's request, Mr Koko lifted the suspension of the Tegeta Brakfontein contract, which had been suspended for supplying Eskom with substandard coal. Mr Koko also breached the terms of the contract by sending coal from the Tegeta owned Brakfontein Mine to Kendall Power Station during late 2015, which was not a SANAS accredited laboratory, nor were they an independent laboratory, which was a requirement of the Coal Quality Management Procedure, a standard procedure attached to all Eskom coal contracts, including the Brakfontein Coal Supply Agreement."*

124.5. The State Capture Commission also found that Eskom officials negotiated a price with Tegeta for both S4L (a particular grade of coal) and a blended product for supply to the Majuba Power station, even though the blended product was unsuitable for that station. Additionally, Tegeta's resource

estimates were insufficient to sustain the quantity required for the Majuba Power Station over the life of the contract.

124.6. Tegeta therefore provided the Majuba power station with out-of-specification coal and, from October 2016 to September 2017, it undersupplied Eskom by around 265 000 tones of coal. As a result, at one time Majuba's coal stockpile fell below 10 days, whereas it required 40 days' worth to maintain security of supply. This put power supply from the station at risk.

124.7. Additionally, Mr Koko and Mr Molefe, together with various other Eskom officials, colluded to ensure that, on 10 December 2015, Tegeta procured Optimum Coal Holdings Ltd ("**OCH**") from Glencore.

124.8. Amongst other things, on 9 December 2015, the day before Tegeta concluded the relevant sale of shares agreement with Glencore, the Eskom Board approved a prepayment of R1.6 billion to Optimum Coal Mine ("**OCM**"), a subsidiary of OCH, purportedly for the supply of coal to Eskom's Hendrina power station. A day later, this payment was reclassified as a guarantee. On 11 April 2016, the Eskom board approved payment of a further amount of R659 million to Tegeta, purportedly for the supply of coal to Eskom's Arnot power station.

124.9. These transactions were, however, a sham as both the R1.68 billion guarantee and further R659 million payment were used by Tegeta to pay the purchase price for OCH. The commission therefore concluded that these payments "*were made with the single purpose of ensuring that the Guptas' deal in terms of which they acquired the Glencore coal interests did not fall through for want of finance on the part of the Guptas".*

125. The Commission recommended, amongst other things, that the National Prosecuting Authority consider criminal prosecution of Mr Koko and Mr Molefe, and various other Eskom officials for their involvement in numerous state capture matters.

126. To avoid overburdening these papers, I attach only the relevant parts of the State Capture Report as annexure "**AA16**", "**AA17**", "**AA18**", "**AA19**".

127. Former GCEOs Mr Koko and Mr Molefe have since been charged in respect of findings made in the State Capture Report. These individuals are also being pursued for the recovery of losses suffered by Eskom due to their involvement in state capture and corrupt activities.

128. Corruption has compromised Eskom's financial position, board, and management structures; reduced its coal supply security; degraded its power stations through the use of out-of-specification coal; and thereby negatively impacted its generation capacity.

Sabotage, criminality, and unlawful industrial action

129. In recent years, Eskom has also experienced unprecedented levels of sabotage, criminality and unlawful industrial action, which has significantly impaired its operations.

130. Tutuka provides a particularly vivid example. Despite being one of Eskom's newest power stations, it currently operates at an EAF of between 15% and 17% (a sharp drop from 30% in the 2022 financial year). As I explained to SCOPA on 24 January 2023 (the minutes of which are attached as annexure "AA9"), at present, the Tutuka station manager has to wear a bulletproof vest when walking the stations and has to be accompanied by two bodyguards. His wife and children also have to be

accompanied by bodyguards all as a result of threats being made on his life. Tutuka's underperformance, of course, has various causes. But intolerable levels of criminality plaguing Tutuka are undoubtedly a significant contributor to its unacceptably low EAF.

131. Tutuka is not an isolated example. Eskom is spending approximately R3.2 billion per annum on private security due to the sustained sabotage and criminality it and its personnel have experienced.

132. In a number of cases, it is clear that damage to Eskom property and operations has been deliberate. This is not always the case, but the sheer number of inexplicable incidents of damage to Eskom's property, coupled with the substantial number in which intention is clear, overwhelmingly confirms that Eskom has experienced a sustained campaign of sabotage. For example:

132.1. On 18 December 2019, Majuba's overland coal conveyor caught fire. Subsequent investigation revealed that two valves controlling water flow to a fire suppression system on the conveyor were shut off before the fire broke out. There was no record of any approval for the valves to be shut off. As a result of this fire, Eskom had to transport coal to Majuba by truck, at an approximate cost of about R100 million per year.

132.2. On 17 November 2021, a pylon carrying power lines to Lethabo's overland coal conveyor was cut, causing the pylon to collapse, and the conveyor to stop functioning. It took 9 hours the coal supplies to be re-routed to Lethabo. Eskom narrowly avoided an entire outage of Lethabo's 3558 MW of generating capacity which would have moved the country from stage 4 to stage 6 load shedding.

132.3. In May 2022, Eskom's Chief Operating Officer, Jan Oberholzer, received a bomb threat.

132.4. On 22 June 2022, an extension cord was dropped into Matimba's unit 2 transformer. All three of Matimba's cooling units consequently shut down. Three units tripping in this way at Matimba, one of Eskom's best performing power stations, was unprecedented.

132.5. On the same day, a unit at Kendal and two units at Matla broke down. Cumulatively, these incidents reduced generation capacity by 2 400 MW.

132.6. On 28 June 2022, unlawful industrial action at various of Eskom's power plants interrupted its operations, and caused 10 generation units to trip. As a result, the country was moved from stage 4 to stage 6 load shedding.

132.7. On 10 November 2022, a contractor at Camden removed the bearing oil plug from the stations bearing, causing oil burners to trip repeatedly, resulting in an outage of Camden Unit 4. The contractor later confessed that this was an intentional act of sabotage.

132.8. On 12 December 2022, I was poisoned with cyanide.

132.9. Eskom has recorded more than 25 arrests for matters of sabotage relating to plant tampering and theft of diesel and fuel oil.

132.10. On 16 December 2022, since Eskom was under near constant siege, the President deployed South African National Defence soldiers to four of Eskom's power stations.

133. I attach as annexures "**AA20**", "**AA21**", "**AA22**", "**AA23**", "**AA24**", "**AA25**", "**AA26**", "**AA27**", and "**AA28**" news article reporting on these incidents.

134. The applicants, nonetheless, describe sabotage and criminality at Eskom as “an exaggerated risk”. Respectfully, this is an uninformed submission that is entirely wrong.

STAGE 6 LOAD SHEDDING

135. Stage 6 load shedding – which essentially requires the reduction of 6,000 MW of load – was implemented for the first time in December 2019. That stage 6 load shedding was precipitated by unusually high rains and flooding in Mpumalanga, which impacted coal supply and flooded two power stations taking out about 4000 MW of expected supply.

136. Stage 6 was implemented again on 28 June 2022, following the loss of generating capacity due to unlawful strike action coupled with a loss of 2,766 MW from planned maintenance and another 17,395 MW from power station breakdowns.

137. Since then, the country has been subject to stage 6 loadshedding on several further occasions, including: on 18 September 2022 (after the tripping of a generation unit each at Kusile and Kriel power stations); on 7 December 2022 (when over 20,000MW of generation was taken off line due to a high number of power station breakdowns); on 16 December 2022 (with the breakdown of eight generating units overnight); on 20 December 2022 (following the breakdown of six generating units on the same day); from 11 to 16 January 2023 (with the breakdown of 11 generating units); on 31 January 2023 (with the breakdown of 6 generating units in 24 hours); and on 19 February 2023 (following the breakdown of eight generating units).

138. As indicated in Eskom’s 22 November 2022 System Status and Outlook Briefing (attached to the founding affidavit as annexure FA14), three recent events have

placed particular strain on Eskom's supply, which have compounded the problems described above. They are major contributors to the implementation of stage 6 load shedding in late 2022 and earlier this year.

138.1. First, on 8 August 2021, Medupi Unit 4 experienced a large explosion, after air was introduced into its generator while combustible levels of hydrogen were still present. Extensive damage was caused to the Unit 4 generator. Investigations revealed that there was a deviation from procedure when carrying out the activities which led to the explosion, and the incident remains under investigation. As a result of this explosion, Unit 4 was taken offline and remains offline. Based on the property damage assessment and taking into account the long-lead items required for repairs, the commercial operation of Medupi Unit 4 is expected in about August / September 2024. The temporary loss of Medupi Unit 4 has reduced Eskom's generation capacity by 720 MW.

138.2. Second, on 23 October 2022, Kusile's unit 1 flue gas duct experienced a structural failure and collapsed onto a windshield supported by the units 2 and 3 ducts, which were thereby compromised and at risk of collapsing. The decision was therefore taken to keep unit 2 offline, which had been scheduled to return to service after a planned outage for maintenance. Unit 3 was initially kept running but, on 3 November 2022, tripped due to an issue with its recycle pump. Unit 3 has therefore also had to remain offline. These units have remained offline. The loss of Units 2 and 3 at Kusile removed more than 2000 MW of capacity.

138.3. Third, in order to extend the operational lifespan of the Koeberg nuclear power station by a further 20 years beyond 2024/25, Koeberg Unit 1 was taken offline on 8 December 2022 until the end of June 2023 to install three

replacement steam generators. This reduced Eskom's generation capacity by approximately 920MW.

139. Cumulatively, these three incidents have reduced Eskom's generation capacity by more than 3,600 MW, which translates to nearly four levels of load shedding.

140. These incidents, coupled with the high number of unplanned breakdowns being experienced at Eskom's ageing coal fleet, continues to severely constrain the country's electricity supply.

PART 3: ESKOM'S PLANS TO ADDRESS LOAD SHEDDING

141. Load shedding is a problem that has been decades in the making, and it cannot be remedied overnight. However immediate steps can – and are – being taken by Eskom, in conjunction with the government and other stakeholders, to bring an end to load shedding as swiftly as possible.

142. In this part, I describe these plans and their key components. This account is a summary. Further detail can be found in the plans themselves, which are attached.

143 Eskom has developed plans that are aimed at meeting the problem of loadshedding. However, those plans are not an island; they are subject to and must be understood within the framework of plans of government and other stakeholders.

144 These plans are developed collectively as a policy response to the energy crisis, and they involve multiple actors across the executive, with inputs from a variety of experts, sectoral representatives and business actors, across the energy landscape. Eskom's input into the plans has been critical, and many of its proposals have recently been incorporated into the overarching Energy Action Plan, discussed below.

145 To avoid ad hoc or conflicting implementation of the plans, the President has attempted to ensure the implementation of the overarching plan in a coordinated manner. While Eskom has attempted to put in place various measures to respond to the energy crisis, many of those measures depend, for their implementation and efficacy, on regulators and factors that are oftentimes outside of Eskom's control.

146 Much of what follows in this section of my affidavit is only indirectly relevant to Part A of this application, as it goes beyond Eskom's plans to address the current energy crisis. However, it is with respect necessary for the Court to get a sense of the medium and long term plans Eskom – together with many other actors – has painstakingly developed to address the energy supply crisis. That is because, should this Court decide to grant the relief the applicants seek in Part A, it should be aware of the cascading effect the relief would have on longer term planning. The crisis in energy is in large part the product of Eskom historically prioritising immediate energy supply imperatives over the – often competing – imperatives to invest in maintaining its infrastructure and developing new sources of electricity supply. The current Eskom leadership is determined to find an appropriate balance between addressing the immediate crisis and laying solid foundations for the future. By granting the relief applicants seek, this Court will inadvertently upend those carefully considered plans.

THE ENERGY ACTION PLAN

147 The Energy Action Plan is the government's overarching plan to address load shedding and achieve energy security. It was announced by President Ramaphosa on 25 July 2022, after consultation with Eskom and other stakeholders (labour federations, business representatives, experts in the energy sector, amongst others). At the same time, the President announced the establishment of the NECOM, charged with

ensuring that the measures announced in the Energy Action Plan are implemented in a coordinated manner.

148 The NECOM comprises all relevant government departments and Eskom, and is led by the Director-General in the Presidency. NECOM reports directly to an Inter-Ministerial Committee, which is chaired by the Presidency and comprises the Minister in the Presidency, the Minister of Mineral Resources and Energy, the Minister of Public Enterprises, the Minister of Finance, the Minister of Forestry, Fisheries and the Environment and the Minister of Trade, Industry and Competition.

149 I attach a copy of the Energy Action Plan released by the Presidency entitled 'Confronting the Energy Crisis: Actions to End Loadshedding and Achieve Energy Security' marked "**AA29**".

150 The short-term objective of the Energy Action Plan is to reduce the severity and frequency of load shedding through immediate measures to improve the performance of Eskom's existing power stations and stabilise the energy system. The long-term objective is to end load shedding altogether and achieve energy security by adding as much new generation capacity to the grid as possible, as quickly as possible.

151 In his State of the Nation Address, on 9 February 2023, President Ramaphosa announced the establishment of a new post in his Cabinet – the Minister of Electricity – who will oversee all aspects of the electricity crisis response including the work of NECOM.

152 The Energy Action Plan is intended to build upon and fast-track the programmes to which the government had already committed itself to address the shortfall in electricity, including (but not limited to):

152.1 reviving the renewable energy procurement programme in 2018 to facilitate the procurement of new generation capacity;

152.2 diversifying generation by allowing parties other than Eskom to generate electricity. Raising the licensing threshold for new generation projects to 100MW in June 2021 – enabling private investors to build generation facilities up to this size without needing to obtain a licence; and

152.3 making changes to the Regulations under the Electricity Regulation Act to allow municipalities to procure power independently.

153 The Energy Action Plan identifies five key areas of intervention needed to address the immediate load shedding crisis and move South Africa decisively towards energy security. It identifies the actions to be taken by government, Eskom and other stakeholders under each of the five key interventions, and stipulates timeframes where possible. I summarise these steps below (for a fuller description of the steps and timeframes, the Court is referred to the Plan itself).

154 **Intervention 1:** Fix Eskom and improve availability of existing supply. This entails:

154.1 bringing the remaining units at Medupi and Kusile online as quickly as possible;

154.2 enabling Eskom to implement so-called “reliability maintenance” across the fleet to prevent further decline in its energy availability;

154.3 National Treasury to provide a sustainable solution to deal with Eskom’s debt, in recognition that the huge debt burden on Eskom hinders its ability to address the challenges it faces;

154.4 a coordinated effort by law enforcement agencies to address sabotage, fraud and theft at Eskom.

155 **Intervention 2:** Enable and accelerate private investment in generation capacity. This entails:

155.1 removing the licensing threshold for new generation projects entirely to allow private investment in larger, utility-scale plants;

155.2 accelerating new generation projects by:

155.2.1 declaring embedded generation projects Strategic Infrastructure Projects – which shortens the timeframes for environmental authorisations, water use licences and other requirements.

155.2.2 declaring certain areas Renewable Energy Development Zones, where strategic environmental assessments have already been undertaken.

155.2.3 creating dedicated capacity at Eskom to process grid connection applications quickly.

155.2.4 simplifying the NERSA registration process including by removing the requirement for a Power Purchase Agreement ("**PPA**");

155.3 passing special legislation on an expedited basis to ease the legal and regulatory obstacles and facilitate investment in new generation capacity for a limited period;

155.4 in the meantime, taking steps to reduce the regulatory requirements for renewable energy projects and simplify the process and reduce the timelines for all energy project applications; and

155.5 the release by Eskom of land adjacent to its existing power stations for private investment in renewable energy projects.

156 **Intervention 3:** Accelerate procurement of new capacity from renewables, gas and battery storage. This intervention recognises that a massive implementation of renewable energy offers the best chance of ending load shedding as quickly as possible. The specific actions aimed at to accelerate new generation capacity include:

156.1 Eskom to take steps to add new generation capacity to the grid on an urgent basis by:

156.1.1 purchasing surplus capacity from existing independent power producers;

156.1.2 purchasing additional energy from existing private generators that have surplus power (such as mines and shopping centres);

156.1.3 importing power from neighbouring countries, which have surplus energy, through the Southern Africa Power Pool arrangement;

156.2 Eskom to use climate funding provided through the Just Energy Transition Partnership to invest in the grid and repurpose shut down coal fired power stations;

156.3 Eskom to procure battery storage through its Battery Energy Storage Systems programme;

156.4 Government to procure additional capacity through the renewable energy procurement programme. This includes releasing further bid windows for renewable energy, gas and battery storage and increasing the amount of new capacity to be procured; and

156.5 Government to review and update the Integrated Resource Plan 2019 to reflect current energy needs and climate commitments.

157 **Intervention 4:** Facilitating businesses and households investing in rooftop solar. This intervention recognises that there is significant potential for households and business to install rooftop solar PV and connect this power to the grid. Specific actions include:

157.1 Eskom will develop rules and a pricing structure to enable consumers who have installed solar PV to sell surplus power to Eskom; and

157.2 National Treasury to consider the expansion of tax incentives for residential and commercial installations.

158 **Intervention 5:** Transforming the electricity sector to achieve long-term energy security. This requires:

158.1 restructuring Eskom to separate its generation, transmission and distribution businesses into separate entities;

158.2 diversifying South Africa's energy sources to improve the security of supply. This will enable large-scale private investment in generation capacity as the only long-term solution to address the electricity shortfall. The following actions are specified:

158.2.1 Establishing a competitive electricity market allowing multiple generators (both private and state-owned) to compete on an equal footing, while the grid remains public and managed by an independent transmission company; and

158.2.2 Expediting broader reforms to establish a competitive electricity market through finalisation of the Electricity Regulations Amendment Bill, to enable private investment in the electricity sector.

159 Eskom welcomed the President's announcement of the Energy Action Plan and is in full support of the measures it proposes. Many of the interventions set out in the Energy Action Plan were recommended to the President by Eskom as critical interventions needed to end load shedding. The three critical pillars of Eskom's own plans are now reflected in the Energy Action Plan – I detail those pillars further below.

160 Eskom is doing all it can to ensure the rapid and effective implementation of the Energy Action Plan. It is working with government, the regulator, labour and the private sector to bring an end to load shedding as swiftly as possible.

ESKOM'S PLANS TO END LOAD SHEDDING

161 Within the boundaries of its mandate, Eskom has developed its own plans to end load shedding – that is, to address the immediate shortage of generation capacity to meet the country's needs as well as to ensure the long-term adequacy and sustainability of South Africa's energy supply.

162 Eskom's plans have three main pillars:

162.1 First, recovering the performance and supply capacity at Eskom's power stations. This process is guided by Eskom's Generation Recovery Plan.

162.2 Second, adding additional generation capacity to the grid, including by prioritising Just Energy Transition projects, procuring emergency supply, and facilitating private investment in renewable energy; and

162.3 Third, pivoting to a sustainable future by restructuring Eskom and opening access to the electricity grid.

163 I address these pillars in turn.

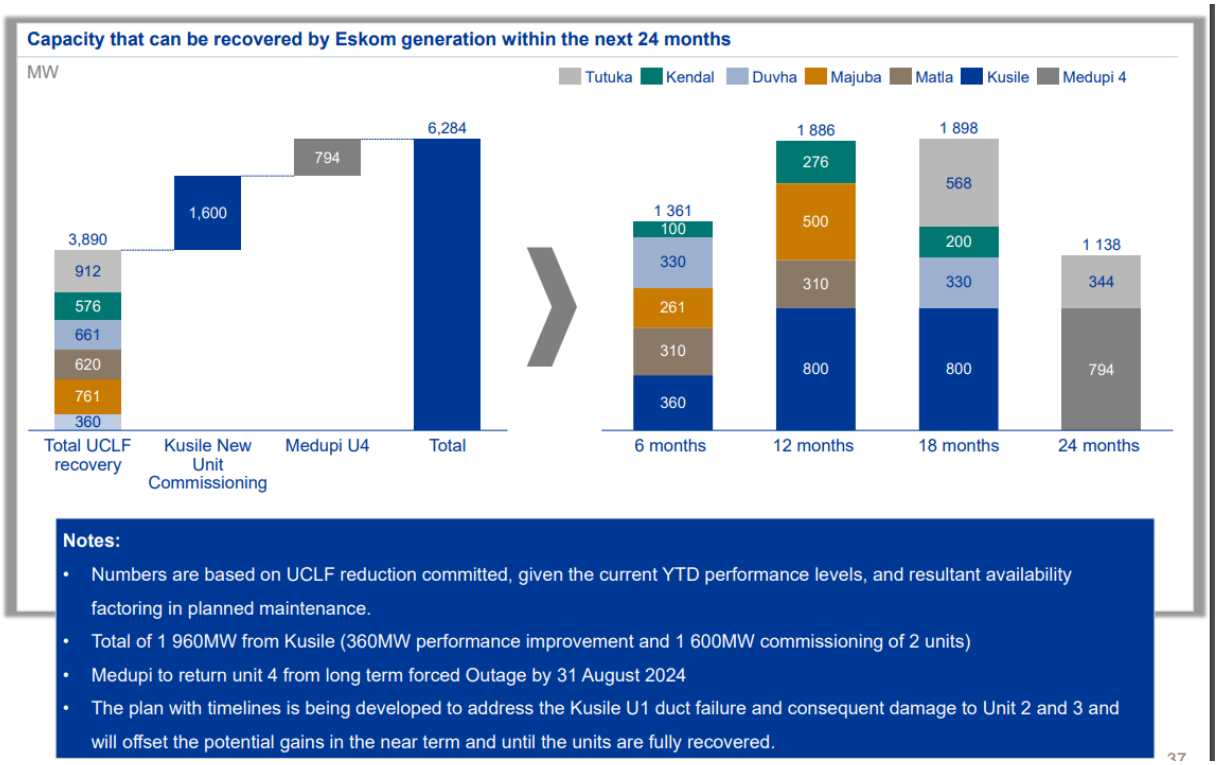
ESKOM'S GENERATION RECOVERY PLAN

164 Eskom's immediate priority is to improve the reliability and predictability of its generation fleet and to get more operational megawatts on the grid to reduce the need for load shedding. Improving the available generation capacity at its plants – measured as the EAF – entails (i) improving performance at its plants; and (ii) bringing the units of its new builds online as quickly as possible. The measures required, and which Eskom is already implementing, are described in Eskom's Generation Recovery Plan.

165 Eskom's Generation Recovery Plan was introduced in October 2022, following the appointment of Eskom's new Board of Directors. However, it builds upon and continues the implementation of earlier plans, including Eskom's Turnaround Plan, the 2035 Strategy, the 9-Point Plan and the Reliability Maintenance Recovery Programme.

166 The Plan is geared towards improving the EAF from the current 58% to 65% by the end of the 2024 financial year and at least 70% by the end of the 2025 financial year. The target set by Eskom is to recover approximately 1 862 MW in the 2023 financial

year – this amounts to about two stages of load shedding. By improving generation performance and bringing the new builds online, approximately 6 000MW can be delivered by Generation in the next 24 months. How this may be achieved is illustrated in the diagram below.



167 Eskom's Generation Recovery Plan is directed at:

167.1 improving performance at six priority stations while sustaining the performance of the rest of Eskom's generation fleet; and

167.2 addressing 10 focus areas to improve generation performance (at the level of people, plant and process).

168 Eskom's Generation Recovery Plan is being periodically reviewed and updated; the latest version is dated January 2023. A copy of the latest version is attached marked "**AA30**".

Recovery of the Top 6 stations

169 The Generation Recovery Plan applies to Eskom's entire generation fleet. Eskom has detailed maintenance plans for each of its power stations, with specific targets and interventions to drive towards these targets. However, Eskom's Generation Recovery Plan prioritises the maintenance and recovery of performance at six stations – Duvha, Kendal, Kusile, Majuba, Matla and Tutuka. These stations – dubbed "the top 6" – were selected because they are amongst the highest contributors to unplanned load losses and show the greatest potential for adding available megawatts to the grid by improving their performance. Eskom is therefore prioritising the maintenance and recovery work required at these six stations – i.e., in terms of timetabling and implementing planned maintenance and budget allocation.

170 The maintenance plans for each station, starting with the top 6 stations, are centrally monitored and tracked by Eskom. They are also being stress-tested by independent consultants reporting directly to Eskom's Board. Engagements have already started with the external service provider to provide these reviews. The Generation division is executing the maintenance plans by following a detailed work plan with deadlines in order to ensure project success.

171 The Generation Recovery Plan also identifies 10 focus areas for intervention and monitoring, to achieve improved generation performance. These are itemised in the graphic below:

Ten focus areas being addressed to ensure a holistic approach to improving Generation performance

10 Focus areas	What we are doing
Plant Condition	Increased maintenance within limitations. Establish War room, accelerated spares sourcing. Establish long term contracts.
Inadequate Capacity	Defer maintenance. Engaged to expedite IPPs, Risk Mitigation, etc. Planned repowering of stations shutting.
Skills & Experience	Appointing Plant Managers. Engaging experienced external experts. Ramping up training and development. Skills/competency audit.
Fraud & Corruption	Eskom has increased governance controls and performs trending analyses on volumes and prices. Investment in technology, QSs, training.
Policies & Procedures	Engaged government (DPE, NT) for relaxation of some requirements.
Funding	Aggressive cost cutting. Making funds available for outage and midlife refurb
Environmental Compliance	Proposed an emission reduction plan that is achievable. Appealed DFFE decision.
Coal	Engaging mines re quality & quantity. Renegotiating agreements. Investing in cost-plus mines. Increasing verification and monitoring.
New Build Defects	Solutions for some areas developed and tested on Medupi 3. Rolled out to other units. Additional solutions to be rolled out to achieve desired performance.
Eskom Rotek Industries	OEM engineering support and oversight on turbine centreline. Improved Quality Assurance process. De-scoping ERI contracts and approach OEMs on specific plant areas, e,g, Kusile FGD,

172 Eskom has made and continues to make significant progress in a number of these key areas, which I discuss in more detail below.

The Reliability Maintenance Recovery Programme

173 Eskom continues to implement its Reliability Maintenance Recovery Programme, introduced in 2020, as the best means to improve plant performance and reduce unplanned outages.

174 All stations have their own specific maintenance requirements, but generic rules exist, including:

174.1 A mid-life refurbishment takes place after about 25 years of service to improve or extend the life span of the plant. This involves the refurbishment of the control systems, the electrical systems, the boiler and the terminal.

174.2 A general overhaul needs to be carried out every 10 to 12 years and requires the plant to be shutdown to do inspection and repair of the turbine and generator.

174.3 A mini general overhaul needs to be carried out every 5 to 6 years and requires the plant to be shut down for inspection of low pressure turbines and a pressure test.

174.4 Interim repair is needed every 18 to 24 months and requires the plant to be shutdown to inspect and repair the boiler components.

174.5 A boiler inspection is carried out between interim repairs to review the condition of the boiler and plan the scope of the next outage.

174.6 Minor inspections and maintenance activities to ensure plant safety and operability are carried out on a continuous basis with the plant remaining online. This work is essential to facilitating planning and budgeting for more intrusive maintenance work that may be required.

175 Projects aimed at improving plant reliability and performance (reliability maintenance) are carried out during general overhauls and mini general overhauls. Eskom is focused on executing reliability maintenance because it is an essential minimum requirement to improve on reliability and predictability of the fleet. Reliability maintenance requires specialised skill as well as spares and equipment from Original Equipment Manufacturers, which require long lead times to secure. For this reason, planned

outages for general and mini overhauls need to be planned 24 months in advance. In addition, budgeting for and the timely release of funding for planned outages has a significant impact on Eskom's ability to properly prepare for and execute the planned outage. Eskom has increased funding for planned outages for the current financial year from R8.2 billion to R9.5 billion. However, there is still a shortfall of outage funding and additional funding is required.

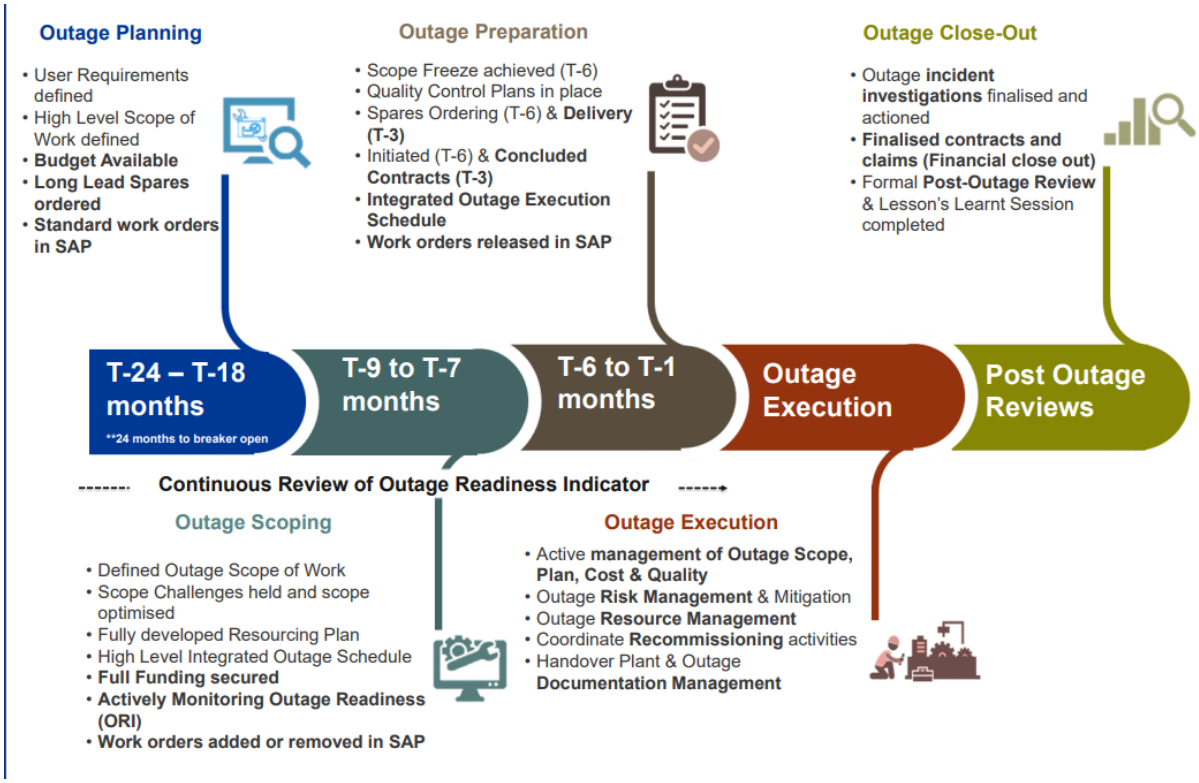
176 Eskom has a detailed strategy for planning, preparing for and executing planned outages for maintenance and repairs. The process starts 24 to 18 months before the outage with outage planning, which requires a high level definition of the scope of work required, ensuring that budget is available for the work planned and that any spares that have a long lead time to procure have been ordered. The next stage, outage scoping, takes place 7 to 9 months before the planned outage. In this stage, the scope of work is fully defined, potential issues identified and responsibility allocated and timelines put in place for resolving them. From this stage onwards, outage readiness is closely monitored using a scoring process to aid in determining the potential for success.

177 The final stage before the planned outage, outage preparation, starts 6 months before the outage. The work order, which provides all the information about the planned maintenance tasks and outlines the process for completing the tasks, including the scope, who it's assigned to, and what is expected, is released and the spares required are delivered.

178 During the execution of the planned outage, the scope of work is actively managed to ensure successful execution. Once maintenance and repairs are complete, recommissioning activities are carefully coordinated to bring the plant back online.

Finally, after the outage, any incidents are investigated and formal reviews are conducted.

179 The steps required at each stage of a planned outage and the timelines for completion are set out in the diagram below.

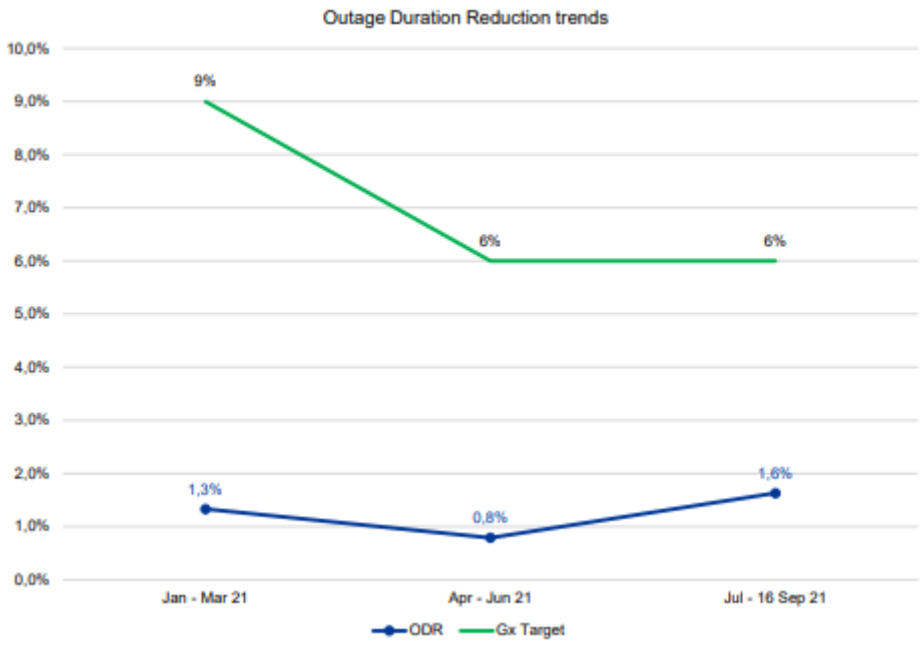


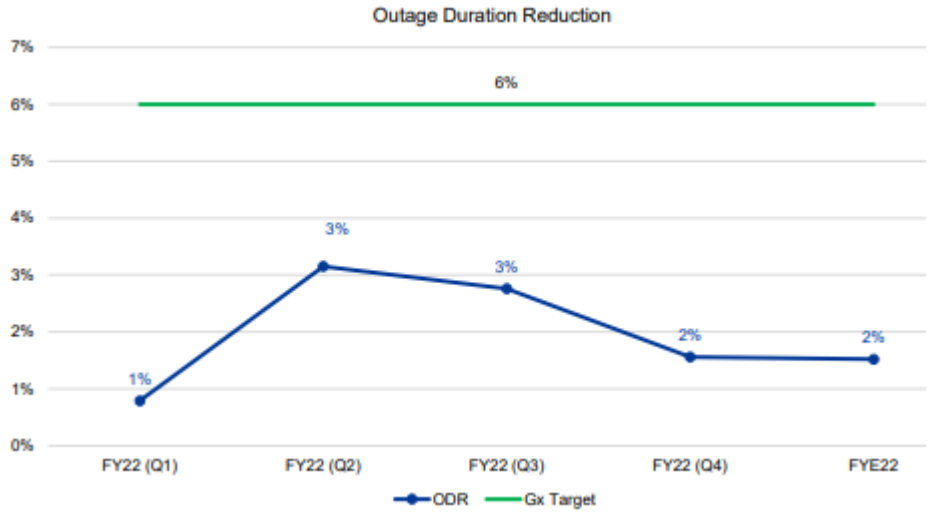
180 Eskom continues to direct its efforts towards improving outage readiness. A central Reliability Maintenance Recovery team is in place, which provides direction and support on outage planning and overall outage readiness at stations. Long-term contracts required to support the objectives of the Reliability Maintenance Recovery programme – such as contracts for the supply of equipment and parts with the Original Equipment Manufacturers – are being put in place.

181 Eskom is also accelerating the sourcing of spares and equipment needed for maintenance through more agile procurement. National Treasury has relaxed some requirements that will speed up procurement. For instance, it has granted exemptions

from local content designations for equipment such as transformers and insulators, to enable expedited procurement.

182 Eskom measures outage performance using four key indicators: outage readiness; reduction in outage duration; execution of the outage by the due date; unplanned lost capacity following the outage. As a result of the measures that Eskom has adopted, Eskom is seeing a steady improvement across all four indicators. Critically, while still below target of a 6% reduction in outage duration, Eskom has seen a marked reduction in the duration of planned outages – decreasing the time that plants have to be taken offline. A comparison of the 2021 and 2022 financial years illustrates the improvement.





183 These short-term measures are thus showing immediate benefits. The road ahead is not an easy one, however. As explained elsewhere, the difficulty of doing maintenance is compounded by the many years that Eskom was not able to do maintenance properly, including because of decisions by government to "keep the lights on" despite Eskom's warnings that this would present very severe future problems. Those problems of the past continue to manifest in the present, and planned outages are still being deferred and cancelled, even at the top six stations, due to the volatility of the system and capacity constraints. The moving of planned outages is essential to avoiding even higher stages of loadshedding, but it delays the performance of maintenance which is required for performance to improve and can make the maintenance more complicated.

184 Despite planned outages to conduct reliability maintenance being deferred and cancelled, space has to be found for additional outages to address the most urgent emergent issues that could result in load losses or plant damage (such as breakdowns). Eskom uses these outages as an opportunity to perform additional maintenance while the plant is offline. However, these outages often can only address the symptoms and not the root cause of problem. That is why this affidavit, and Eskom's Generation Recovery Plan, speak to a multitude of other required

improvements and innovations to ensure solutions to loadshedding, and which are aimed at addressing root causes rather than only symptoms.

Eskom's new build programme – bringing Medupi and Kusile units online

185 Eskom's capacity expansion programme, which commenced in 2005, aimed to build three new power stations (Ingula, Medupi and Kusile), reinstate mothballed stations (Grootvlei, Camden, and Komati[14]), build Open Cycle Gas Turbines (Gourika and Ankerlig) to increase installed generation capacity, and to strengthen the transmission network. Since the inception of the programme, about 10 587MW of nominal capacity has been added to the grid.

186 The programme is close to completion with only the two coal-fired plants, Medupi and Kusile, each with a generation capacity of approximately 4,800 MW, still needing to be brought fully online. Significant progress has been made with bringing Medupi and Kusile online.

187 The final unit of Medupi Power Station achieved commercial operation on 31 July 2021. However, as I have already explained, Medupi Unit 4 suffered an explosion, which resulted in extensive damage to the generator. Unit 4 is currently out of service – resulting in a loss of 720 MW. Based on results from the property damage assessment and taking into account long lead items for replacement parts, the commercial operation of Medupi Unit 4 is expected to be returned online in August/September 2024.

[14] Komati, which has reached the end of its operational life, is being repurposed as part of Eskom's Just Energy Transition initiatives.

188 Unit 4 at Kusile Power Station was synchronised to the grid on 23 December 2021, adding 800MW to the grid. The Unit achieved commercial operation on 31 May 2022, earlier than the scheduled date of January 2023.

189 Kusile Unit 5 was making good progress towards first synchronisation scheduled for June 2023. However, the gas air heater at Kusile Unit 5 caught fire on 17 September 2022, resulting in a discontinuation of all commissioning activities. While this has delayed the schedule, the Unit will be synchronised to the grid in December 2023 – adding 720MWs to the grid – and will achieve commercial operation by June 2024. The last unit – Unit 6 – will be synchronised in November 2023, with commercial operation planned for May 2024.

190 In addition, for the reasons, explained above, Kusile Unit 1 suffered a collapsed flue duct. Units 1, 2 and 3 are presently out of service, resulting in a loss of 2 100MW. Eskom will be making a formal application to the Department of Mineral Resources and Energy to grant it a temporary exemption to allow it to bypass the flue gas desulphurisation units at Kusile. This would enable Eskom to return Units 1, 2 and 3 to service much earlier. The generation capacity lost with the units out of service equates to about 2 stages of load shedding. If this exemption is approved, it is anticipated that Units 2 and 3 will return to service in around six months, while Unit 1 will return to service in around 12 months.

191 The new plants at Medupi and Kusile Power Stations did not initially achieve required levels of performance and reliability because of a combination of plant design defects (in particular, in the design of the generator boilers) and operational and maintenance inefficiencies. Solutions for major boiler plant defects were developed in collaboration with the boiler contractor, Hitachi, in 2019. Good progress is being made on the correction of new build defects. At Medupi, the boiler plant modifications by the boiler

contractor have been implemented on all six units. At Kusile, the major boiler plant modifications have been completed on four units (Units 1 to 4), while modifications on Units 5 and 6 are being rolled out during construction and will be completed before commercial operation.

192 Performance at Medupi has improved considerably as a result of the interventions. All units (with the exception of unit 4 following the fire) are now capable of reaching full load, and Medupi is currently averaging supply capacity (EAF) in excess of 90%.

193 The latest total estimated cost for the defects correction of all Medupi and Kusile units, based on the best available information, ranges from R5.6 billion to R7.2 billion. Eskom prioritised remedying the defects in collaboration with the relevant contractors before engaging in a dispute about liability. Eskom has now entered into a contractual consultation process with Hitachi to determine liability for the necessary modifications to correct the defects. At the conclusion of this process, should it be adjudicated that Eskom is not contractually liable, Eskom's costs will recover the disputed costs.

Improving coal quality

194 Coal quality remains a problem, with poor coal quality contributing to partial load losses and ultimately, the need to implement load shedding. Eskom has implemented a variety of measures to both secure coal supply and improve coal quality. These measures are fully set out in the supporting affidavit of Mr Conradie. I briefly summarise the measures implemented by Eskom here.

195 Eskom utilises three types of contracts for the supply of coal:

195.1 Cost plus mine contracts in terms of which Eskom invests in a mine situated close to a power station and secures a dedicated supply of coal with the coal

price set at the mining costs plus an agreed profit consisting of management fees and a return on the capital originally invested by the supplier;

195.2 Fixed price contracts in terms of which coal is sold to Eskom at a pre-determined base price, which escalates annually in accordance with an escalation formula; and

195.3 Short and medium term contracts, which are similar to fixed price contracts except that they are of much shorter duration. These contracts, while allowing for flexibility, have a much higher R/t cost and generally require coal to be transported to power plants by rail or road.

196 Eskom is implementing a long-term coal supply strategy. The strategy gives preference to dedicated long-term coal contracts – giving preference to fixed term and cost plus mine contracts over short and medium term contracts. This strategy will ensure a predictable coal price path and security of coal supply. Eskom is also focussing on coal delivered on conveyors instead of road – reducing the risk of coal theft and tampering (for instance, contractors mixing lower quality coal with higher quality coal to meet volume targets).

197 After years of underinvesting in cost-plus mines, Eskom has resumed investing in cost plus mines to expand the mines and access the remaining contracted reserves. Cost plus contracts have certain advantages: they are historically the lowest R/t cost; the coal is dedicated to Eskom – ensuring security of supply; and the coal is transported to the power plant by conveyor instead of road.

198 Eskom's strategy is already paying off. The volume of coal from short and medium-term contracts had decreased from 56% in the 2020 financial year to 41% total coal volumes by the 2022 financial year.

199 The shift towards cost plus and fixed price contracts also has a significant impact on plant performance. Power stations that are supplied from a single mine receive a more consistent quality of coal – allowing them to better optimise combustion and unit processes for that quality of coal. This is associated with a significantly higher energy availability factor. Power stations with imports from multiple coal sources from short and medium-term contracts receive a more variable quality of coal and resultantly do not perform as well.

200 In addition to this, Eskom has taken several measures to increase verification and monitoring in order to prevent the delivery of poor quality coal, including

200.1 ensuring that coal supplies are also pre-certified by laboratories to ensure they adhere to contractual quality before being delivered;

200.2 ensuring that the magnets or metal detectors from all coal suppliers are in place and working effectively;

200.3 deploying monitors at the power stations and mines to identify any coal-quality issues, including foreign material, excessive contamination and wet coal; and

200.4 increasing the intensity of the coal verification at various sites. This is an audit process where Eskom confirms the quality of coal delivered at a particular power station.

201 A large part of the problem relating to coal quality is rampant criminality. The risk of criminality is increased where coal is transported by road. To prevent coal theft and tampering, stockpiles of coal destined for Eskom from the contracted mines are pre-tested and certified by both parties. It is required that the delivery coal trucks are inspected at source and the trailers are sealed on site for security purposes. The seals are to remain in-tact until the truck reaches the Eskom power station where it is again inspected for tampering before the coal is off-loaded. Eskom is also seeking to pilot a project whereby the coal will be tested to determine whether it meets certain specifications upon delivery at the power plant. Eskom is aware that criminals are actively engaged in circumventing these controls, sometimes in connivance with corrupt Eskom contractors and employees.

202 In addition, Eskom has contracted private security to investigate coal theft and tampering, and overt and covert surveillance and intelligence gathering have been put in place. These measures are already bearing fruit with instances of coal tampering at Camden and Matla recently being uncovered.

203 Where Eskom encounters instances of coal tampering it investigates and acts accordingly. This includes reporting the incidences to law enforcement and suspending the contracts of suppliers and transporters. Four illegal coal blending facilities have been stopped and are with law enforcement for action. There are also approximately 30 other such blending facilities which are under investigation and against whom law enforcement will take appropriate action

Recruiting and retaining skills and experience

204 One of Eskom's biggest challenges in recent years has been the loss of skills and experience and the failure to transfer and replenish those skills. Eskom is working hard at addressing this problem:

204.1 In 2021, Eskom implemented a focused recruitment drive, which has already shown a significant increase in the replacement of skills, particularly since February 2022. Eskom has brought back 18 skilled specialists with skills covering engineering management, operating management, plant commissioning, outage management, project management, procurement management, materials management, and power station management. The recruitment drive will continue into 2023.

204.2 Eskom has developed a crowdsourcing digital platform to attract skilled and experienced candidates. Eskom has shortlisted 153 candidates for recruitment from a database of 238. Twenty-five individuals were selected with the first intake and commenced work in November and December 2022. To ensure sustainability, these individuals will be required to transfer skills to the permanent Eskom team they are paired with.

204.3 Eskom is conducting a skills audit for technical managers, technical non-managerial employees, and non-technical staff. The skills audit is critical for enabling Eskom to understand the gaps in skills and appropriately redress them. The skills audit is now nearing completion.

204.4 Eskom has restarted staff competency, skills development and mentoring programmes, including the Generation Technical Leadership Programme; Eskom's Management Development Programme; and the Top Talent and Millennial Programme.

205 Eskom has also launched the Culture Transformation Programme in recognition of the demise in performance culture at Eskom and the urgent need to restore the integrity of the institution. This programme aims to re-establish a high performance culture at Eskom over the next three to five years. The programme is built around six principles: accountability, operational excellence, people prioritisation, financial prudency, a values driven culture and customer centricity.

Combatting theft, fraud and corruption

206 Theft, fraud and corruption have been hampering Eskom's operations and generation business, in particular in the areas of procurement, coal and other fuel supplies (oil and diesel). Eskom is taking urgent measures in an effort to combat this and continues to appeal to the SAPS and NPA for assistance.

207 Eskom is engaged in a campaign of governance clean-up, which is focussed on the following key areas:

207.1 Conducting proactive lifestyle audits and reviews of conflicts of interest for executives and senior management.

207.2 Enhancing ethics and anti-fraud frameworks, as well as consequence management. Eskom is implementing its Fraud Risk Prevention Plan, which is monitored by Eskom's Anti-Fraud and Corruption Integration Committee. As part of the plan, Eskom's Assurance and Forensic Department is tasked with visiting each power station to identify possible fraud risks and opportunities for improved fraud detection and response activities.

207.3 Instituting disciplinary proceedings against employees and suppliers, as well as pursuing criminal and civil legal action where appropriate. Eskom has

adopted a zero-tolerance approach to fraud and corruption, in which every matter where evidence of criminality exists is referred to law enforcement agencies for criminal investigation. In addition, where appropriate, civil proceedings are instituted to recover losses suffered by Eskom.

207.4 Establishing a dedicated task team to address the recommendations of the Zondo Commission. Eskom's task team has developed an implementation plan, which was submitted to the Presidency in October 2022. Key focus areas include civil recoveries; consequence management for implicated suppliers, former employees and former directors; and the review of policies and procedures, specifically related to procurement and human resources, to support the eradication of fraud and corruption.

207.5 Strengthening Public Finance Management Act and commercial governance processes. Eskom's Procurement and Supply Chain Management department has implemented several initiatives to reduce the occurrence of irregular expenditure and improve commercial governance processes through its procurement roadmap. The procurement roadmap aims to: reduce the number of cancellations of published tenders; improve compliance with procurement plans; reduce the number of contract modifications, expansions and deviations; enhance contract management and performance monitoring; and ensure that continuous reviews and monitoring are under way.

208 Eskom is also in the process of establishing a crime-risk management compliance programme focused on combating bribery and corruption, financial crime, physical assets crime, cybercrime and anti-money laundering.

209 Eskom has employed private security at a cost of R3.2 billion per annum nd has acquired additional technology, including drones and smart cameras, to tackle sabotage and theft. It has put overt and covert detection and monitoring systems in place to monitor and secure its power plants.

210 Eskom is now receiving increased support from law enforcement to address crime at its plants, and the increased efforts of law enforcement are beginning to show results. A total of 67 cases are on the court roll and three have been finalised with a conviction. In addition to this, the South African National Defence Force has been deployed since December 2022 at four Eskom power stations: Majuba, Camden, Grootvlei and Tutuka.

Key assumptions and enablers for Eskom's plan to succeed

211 For the EAF percentage to improve to the levels targeted by Eskom, the main requirement is for Eskom to perform the required maintenance, repairs and component replacements. And for the required maintenance to happen, there are essentially two main requirements, namely:

211.1 adequate system space for long planned outages so that Eskom can carry out the reliability maintenance required; and

211.2 sufficient funding secured and released timeously to ensure that contracts can be placed and spares ordered in advance.

212 Planned outages for reliability maintenance continue to be deferred or cancelled primarily due to system and budget constraints. These constraints correctly result in priority being given to outages required to address safety requirements over outages for performance improvement or reliability maintenance.

213 The steps that are being taken by Eskom, government and private investors to add additional capacity to the grid are discussed in the next section. These steps are essential to the success of the Generation Recovery Plan.

214 However, in addition to creating system space, Eskom requires sufficient funds to properly plan maintenance and procure long-lead spares well in advance, as it needs to do to execute maintenance effectively. Until Eskom has sufficient funds, plant performance cannot be expected to improve. Therefore, re-establishing an adequate and reliable power supply is dependent on a financially sustainable Eskom.

215 Lastly, a solution needs to be found to Eskom's aging coal fleets' non-compliance with the MES limits to prevent critical capacity being lost from the grid. The challenges in this regard and the plans in response are discussed further below.

Financial enablers

216 There is a shortfall in the budget needed to implement Eskom's Generation Recovery Plan. To execute the Plan, Eskom needs adequate funds to carry out reliability maintenance and to procure diesel fuel for its Open Cycle Gas Turbines. Additional funding, which must be immediately secured, includes:

216.1 An additional R13.1 billion over and above the R131 billion that has been allocated to the Generation business based on the previous corporate plan.

216.2 An additional R12.7 billion to enable Eskom to continue using Open Cycle Gas Turbines at higher levels. Eskom runs Open Cycle Gas Turbines at high cost in order to minimise or avoid loadshedding and to increase space for maintenance to be executed.

217 These figures are subject to change, as they are dependent on the rate of exchange and other macro-economic factors.

218 In addition to requiring increased funding, a solution must be provided for Eskom's financial sustainability. This entails:

218.1 Cost-reflective tariffs approved by NERSA and implemented;

218.2 National Treasury to provide support to reduce Eskom's debt; and

218.3 Municipal debt reduced significantly through government intervention.

219 The deterioration in Eskom's financial position as a result of non-cost reflective tariffs, its huge debt burden and high debt serving costs and the non-payment by municipalities (coupled with its inability to access debt funding), has made it impossible for Eskom to fund the required maintenance and diesel fuel to prevent loadshedding.

220 While these debilitating factors are largely beyond Eskom's control, Eskom has not simply thrown its hands in the air. It has taken steps to regain sound financial footing. It has limited its capital expenditure and engaged in aggressive cost cutting measures to save on operational expenditure. However, for Eskom to regain financial sustainability, cost-reflective tariffs, debt relief as well as municipal debt collection and revenue recovery are essential.

221 Further details around financing and the related challenges are provided elsewhere.

Eskom's debt

222 As explained above, Eskom's debt has burgeoned resulting in unaffordable debt servicing costs. Addressing Eskom's high debt burden is essential to ensuring its

financial sustainability, and to enabling Eskom to implement the Generation Recovery Plan. The Minister of Finance announced a prospective debt relief solution in the Medium-Term Budget Policy Statement ("**MTBPS**") on 26 October 2022 to the effect that government will take over between 1/3 and 2/3 of the Eskom debt. National Treasury is working on a sustainable solution to deal with Eskom's debt, as per the MTBPS, in a manner that is equitable and fair to all stakeholders. Further detail, including the conditions to be attached to the debt relief, will be communicated by the Minister of Finance in the National Budget Speech in February 2023.

Cost reflective tariffs

223 As explained above, electricity prices in South Africa have been maintained at artificially low and unsustainable levels by pricing electricity without adequately accounting for the cost of generating, transmitting and distributing electricity.

224 NERSA's revenue determination decision of 12 January 2023 goes some way to putting Eskom back on the path towards cost-reflective tariffs. However, as explained above, the revenue determination is still below the amount needed for Eskom to cover the prudent and efficient costs of providing electricity services. A suspension of NERSA's 'tariff hike' will, accordingly, have a negative impact on Eskom's already constrained financial position.

225 For Eskom to be financially sustainable and to continue to operate and maintain its fleet in a reliable state, the tariff needs to migrate to cost-reflective levels. Any delay in this migration would worsen Eskom's financial position and prolong the need for loadshedding.

Municipal debt

226 The trend of non-payment by municipalities is continuing and the total arrear municipal debt has escalated to unsustainably high levels. As explained above, the municipal arrear debt owed to Eskom currently stands in excess of R57 billion.

227 Eskom cannot afford for this trend to continue. The overdue debt has contributed negatively to the liquidity, financial performance and sustainability of Eskom. The budget deficit caused by non-payment by municipalities means that Eskom has to borrow more money to fund its operations and capital expansion programme.

228 Eskom has adopted a Municipal Debt Strategy to address the challenges of municipal debt and revenue collection. A copy of a PowerPoint presentation outlining Eskom's Municipal Debt Strategy is attached marked "**AA31**".

229 The objectives of Eskom's strategy include:

229.1 Current account management – stopping the defaulting and enforcing payment of current amounts;

229.2 Arrear debt management – reducing and/ or eliminating overdue debt; and

229.3 Future debt management – preventing future defaulting through pre-emptive action.

230 To address the systemic issues that perpetuate municipal debt, including a shortage of key skills, electricity theft, meter tampering and non-payment by consumers, Eskom has offered Active Partnering to Municipalities. Active partnering is intended to support Municipalities to build capacity and improve their ability to manage their customers and service their Eskom debt. However, there has not been a significant level of uptake by

Municipalities. A factsheet explaining Eskom's Active partnering Programme is found at slide 9 of annexure "AA31".

231 Eskom adopts a balanced approach to the problem – offering support to Municipalities to enter into debt repayment arrangements with Eskom as well as enforcing Eskom's right to payment through legal processes and limiting service provision as a measure of last resort. Eskom's ability to limit service provision to Municipalities as a means to encourage payment has now been drastically diminished by the recent order and judgment of the Constitutional Court in *Eskom Holdings SOC Ltd v Vaal River Development Association (Pty) Ltd*.

232 Eskom's Municipal Debt Strategy has not as yet yielded a significant improvement in the situation. Eskom requires government intervention to support the reduction or elimination of municipal debt and to assist Eskom to collect its outstanding debt.

233 Eskom is engaging with National Treasury on reinforcing financial oversight of affected municipalities and ensuring municipalities prioritise the settlement of the arrear amounts due to Eskom. Eskom is also participating fully in the work of the Eskom Political Task Team, which was established by President Ramaphosa in 2020 to provide political leadership support to Eskom, and its Multi-Disciplinary Revenue Committee. Unfortunately, progress has been slow.

Minimum Emissions

234 The execution and success of Eskom's Generation Recovery Plan is dependent on finding a solution to Eskom's aging coal power plants' non-compliance with the Minimum Emissions Standards.

235 As detailed above, the decision of the Department of Forestry, Fisheries and the Environment refusing Eskom's application for a postponement of or exemption from the implementation of the Minimum Emissions Standards for certain power stations threatens the continued operation of these stations. Eskom has appealed this decision, and the appeal process is currently ongoing.

236 Full compliance with the Minimum Emissions Standards would necessitate expenditure of more than R300 billion. This is simply unaffordable to both Eskom and the South African economy. Eskom proposes that emissions reduction could better be achieved by closing down old coal-fired power stations and spending the capital, which would otherwise be required to retrofit old coal-fired power stations to meet the Minimum Emissions Standards, on adding urgently needed new capacity through renewables.

237 If the Minimum Emissions Standards decision is upheld, the result will be an immediate loss of 16 000 MW of capacity, resulting in stage 8 of continuous loadshedding immediately. This is because seven power plants (Lethabo, Matla, Tutuka, Kendal, Kriel, Duvha, and Medupi) will be unable to meet the primary particulate matter (PM) and nitrogen oxide (NOx) limits and will be forced to immediately cease operations fully or operate at reduced outputs until retrofits can be completed. There would also be an immediate knock-on impact on the coal mining industry (specifically those mines with cost-plus and fixed-term supply agreements with Eskom) and broader socio-economic impacts.

238 Moreover, the Department's decision requires eight stations (Duvha, Lethabo, Matla, Tutuka, Kendal, Majuba, Matimba and Medupi) to meet a certain sulphur dioxide (SO_2) limit by 2025. The only means to comply would be to install flue gas desulphurisation plants at these eight stations. This is not only practically unachievable by 2025 but would require all eight stations to be taken offline simultaneously for these installations to take place, resulting in a capacity loss of 30 000 MW post 2025. This would require stage 15 loadshedding – essentially leaving South Africa without electricity. I note that the applicants have not joined the Department responsible for this decision.

239 The diagrams below demonstrate the current compliance status and the risk of non-compliance across Eskom's coal fleet.

Station	Compliance status immediately on decision			MW loss
	PM (limit)	NOx (limit)	SO_2 (limit)	
Duvha	50	1100	2300	200
Grootvlei	50	1100	3500	0
Kusile	50	500	750	0
Lethabo	50	1100	2500	3558
Matla	50	750	2600	3450
Arnot	50	1000	2500	0
Hendrina	50	1100	3200	0
Matimba	50	750	3500	0
Medupi	50	750	3500	600
Tutuka	100	1100	3400	3510
Camden	50	1100	3200	0
Kendal	50	1100	2600	3840
Kriel	100	1100	2800	800
Komati	100	1100	2600	0
Majuba	50	1300	3200	0
Acacia	50	600	500	0
Port Rex	75	600	500	0
Total				15958
Comply with limit	Not comply		Risk of noncompliance	

Station	Compliance status April 2025			MW loss
	PM (limit)	NOx (limit)	SO_2 (limit)	
Duvha	50	750	1000	2875
Grootvlei	50	1100	3500	0
Kusile	50	500	750	0
Lethabo	50	750	1000	3558
Matla	50	750	1000	3450
Arnot	50	1000	2500	0
Hendrina	50	1100	3200	0
Matimba	50	750	1000	3690
Medupi	50	750	1000	4320
Tutuka	50	750	1000	3510
Camden	50	1100	3200	0
Kendal	50	750	1000	3840
Kriel	100	1100	2800	800
Komati	100	1100	2600	0
Majuba	50	750	1000	3843
Acacia	50	1300	3200	0
Port Rex	50	1300	3200	0
Total				29886
Comply with limit	Not comply		Risk of noncompliance	

240 This goes some way to explaining why it is no answer to the load shedding problem to merely say that Eskom should continue to rely on coal-fired power stations, rather than to transition to clean energy sources. Relying on coal-fired power stations comes with its own significant costs, including costs that Eskom will be forced to incur because of regulatory imposition beyond its control.

ADDING ADDITIONAL CAPACITY TO THE GRID

241 Eskom has long maintained that improving the performance of its ageing coal fleet is not enough to meet South Africa's immediate energy needs. New, clean generation capacity must be added to address the shortage in supply.

242 This view is not Eskom's alone. South Africa has bound itself to international agreements targeted at reducing carbon emissions, which inarguably are exacerbated by fossil fuel energy production. The move towards renewable energy as a source of power is reflected in the National Development Plan and the Integrated Resource Plan, 2019.

243 Eskom has developed its own renewable energy strategy — Eskom Strategy for 2035 — which must read with Eskom's Just Energy Transition Strategy, both of which are attached to Ms Mkhatshwa's supporting affidavit as annexures "GM6" and "GM7", respectively. The Just Energy Transition Strategy contemplates three routes that may be taken by Eskom. Eskom favours the route that would leverage the transition to just energy in order to resolve South Africa's most significant challenges: environmental, future capacity, financial and socio-economic. The benefit of renewable energy is that it is:

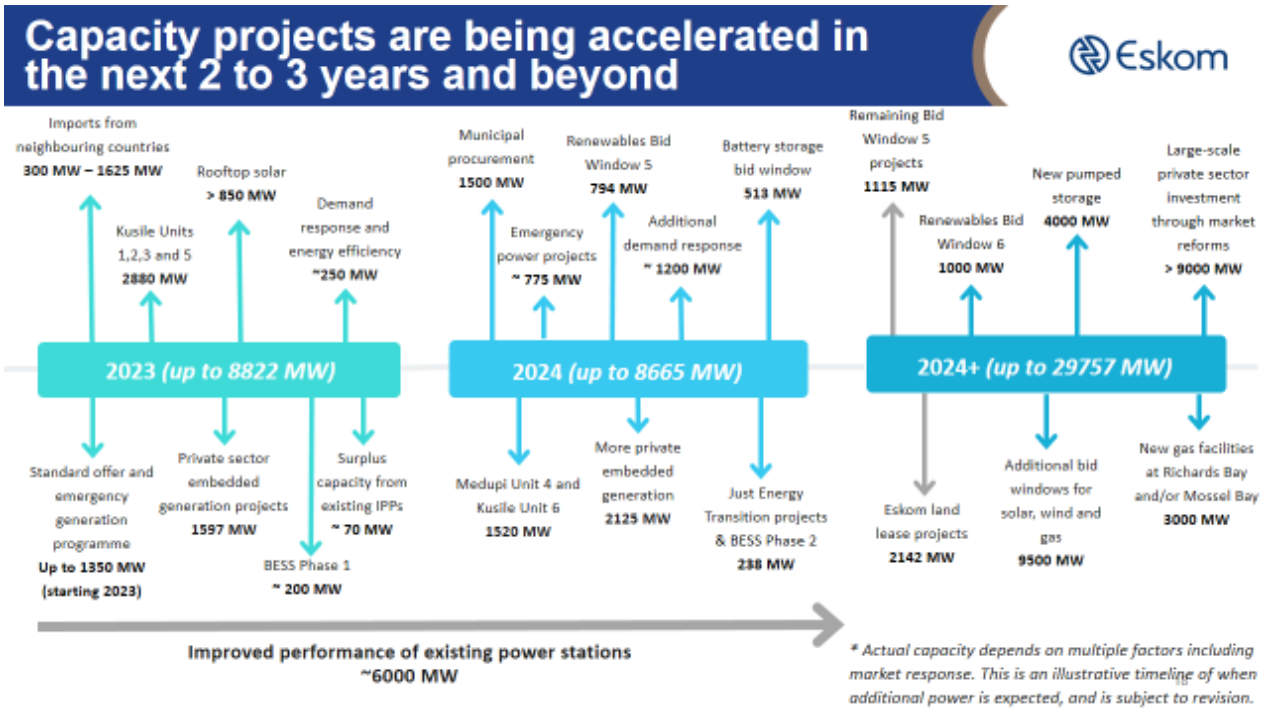
243.1 At less than 2 years, these plants are quick to construct (compared to new coal which would take between 10 and 12 years);

243.2 More economical with access to abundant concessional green finance (compared to new coal which costs two to four times more and has no financing options); and

243.3 Ensures South Africa can continue to export its products across various sectors of the economy, in spite of growing carbon tariffs (compared to new coal which compromises 46% of South Africa's exports due to decarbonisation).

244 By constructing renewable energy power sources, Eskom could add over 850MW to the grid in 2023, 238MW to the grid in 2024 and 5 000MW, beyond 2024.

245 A number of projects are being accelerated to add additional capacity to the grid over the next two to three years, and beyond – with a particular emphasis on clean and renewable energy. These projects are highlighted in the diagram below together with an indication of the amount of megawatts that the project is expected to add to the system.



246 I discuss some of these projects and the roles of different stakeholders.

Eskom's Just Energy Transition projects

247 As I have said, as part of Eskom's Strategy for 2035, Eskom is transitioning towards renewable sources of energy. Renewable energy sources offer the quickest path to adding capacity to the grid at the lowest cost, and are thus essential to ending load shedding as quickly as possible. Generation is thus focusng on priority JET-related projects to urgently add additional capacity to the grid.

248 Solar, wind, gas and storage projects are under development at nine stations. Solar and battery storage projects at Komati, Majuba and Lethabo and several other power stations are expected to connect to the grid in 2023, and will result in over 500MW being added to the system.

249 Eskom's battery energy storage system project is making good progress. Battery energy storage systems are devices that store and discharge electrical energy as and when required. The system stores and releases energy instantly at the flick of a switch.

249.1 Phase 1 of the project, which is expected to deliver approximately 199MW additional capacity, is underway. Contracts have already been concluded and construction begun for 162MW, which will be added to the grid in 2023. Eskom is currently in the process of concluding contracts for the remaining 35MW and it is anticipated that the projects will be completed by the end of 2024.

249.2 Phase 2 of the project consists of 144MW at Distribution substations with an additional 58MW of solar PV planned. Eskom is awaiting Public Finance Management Act approval from National Treasury.

250 Eskom is also seeking to repurpose its end-of-life stations through the accelerated construction of renewable plant and cleaner-fuel technologies. Repurposing these

stations allows Eskom to take advantage of the existing transmission infrastructure, network and connections already in place and to contribute to the capacity solutions and the sustainability of local communities.

251 Eskom has already commenced with its repurposing and repowering programme at Komati power station. The repurposing of the Komati power station into a renewable energy plant is expected to produce or store a total of 370M comprised of solar (150MW), battery (150MW) and wind (70MW). Eskom is leveraging climate finance to undertake the Komati repurposing and repowering. The World Bank Group has made a financial commitment to the project of just under US$498 million (which equates to around R9 billion at the present exchange rate).

252 While Eskom would wish to add even more capacity to the grid through additional renewable energy projects, its financial constraints mean that it has to rely on grant or concessionary funding or find innovative solutions such as private-public partnerships.

Surplus Energy

253 Eskom has taken a number of steps to procure surplus energy on an urgent basis. These include the following:

253.1 Eskom has launched a Standard Offer Programme to procure power from companies which have existing generation capacity through PPAs of a maximum of three years duration. The Standard Offer Programme allows Eskom to purchase energy at an established price. Through the Standard Offer Programme, Eskom is in the process of securing approximately 1 000MW of excess energy from existing generators.

253.2 Eskom has launched an Emergency Generation Programme to procure more expensive power from existing generation facilities when the grid is significantly constrained. The Emergency Generation Programme, which will add 600MW to the grid, has received conditional Public Finance Management Act approval from National Treasury as well as an exemption from Electricity Regulations on New Generation Capacity[15] from the Department of Mineral Resources and Energy.

253.3 Eskom is securing imports of power to the country through the Southern African Power Pool, which aims to provide reliable and economical electricity supply to its 12 member countries by coordinating the planning and operation of the electric power system among member utilities. So far, 300 MW has been secured and a further 1 000 MW has been identified for 2023.

253.4 Eskom is applying to purchase energy under the Department of Mineral Resources and Energy's short-term independent power producer programme. In terms of this programme, independent power producers who are already signed and producing energy would provide extra energy in addition to their already contracted capacity. Eskom has established that a total of 64MW of additional capacity could be provided in this way. Eskom is working with the Independent Power Producers Office (within the Department of Mineral Resources and Energy) and generators to unlock this capacity.

The government's renewable energy programme

254 The IRP envisages that government will acquire additional generation capacity from renewable energy sources. Electricity produced by these projects is purchased by

[15] Published under the Electricity Regulation Act; GN R399 in GG 34262 of 4 May 2011.

Eskom, which is the designated single buyer, after government has entered into PPAs with the independent power producers.

255 The REIPP Programme is a competitive tender process that was designed to facilitate private sector investment into renewable energy generation in line with the Integrated Resource Plan.

256 At the end of the 2022 financial year, the programme had connected a total of 91 independent power producer projects with a capacity of 6 490MW to the grid since its inception.

257 Under existing and expected bid windows, 8 500MW of renewable energy is expected to be added to the system before 2025. Bid Window 5 projects are expected to add 2 600 MW to the grid by 2024, while Bid Window 6 projects are expected to add 5 200 MW beyond 2024.

258 As is recorded in the Presidency's sixth month update on the progress in implementing the Energy Action Plan (issued in January 2023), recent progress has been made on the REIPP Programme. The update is annexure FA16(b) to the founding affidavit.

259 The update explained that:

259.1 19 out of 25 projects from Bid Window 5 have signed project agreements to date for 1 800 MW of new capacity, and are proceeding to financial close and construction.

259.2 Five preferred bidders have already been selected for Bid Window 6 to provide 1 000 MW of solar power.

259.3 A request for proposals for battery storage has been finalised and will be released shortly.

259.4 A request for proposals for gas power will be released by March 2023.

259.5 The Minister of Mineral Resources and Energy published a ministerial determination for the remaining allocations in the IRP (over 18 000 MW). Further bid windows will be opened to procure this new generation capacity from wind, solar and battery storage.

260 The Risk Mitigation Independent Power Producer Procurement Programme was identified in the IRP 2019 as an urgent requirement to address the gap in supply and demand. Thus far, Eskom has signed three projects with a total of 150MW of dispatchable energy under this programme. An additional 1 500MW was targeted for January 2025 through the Karpowership deal, but this has been delayed.

261 An accelerated execution of both programmes is needed to add new generation capacity to the grid as quickly as possible. Eskom is engaging with the Department of Mineral Resources and Energy to expedite them.

262 In addition, the Integrated Resource Plan 2019 needs to be revised with great urgency to ensure that South Africa's energy needs are met in the future. The Presidency has committed that the review of the IRP 2019 will be completed by March 2023.

Facilitating private sector generation projects

263 As is recorded in the Presidency's sixth month update, significant progress has been made towards accelerating private investment in generation capacity.

264 Raising the licensing threshold has increased the pipeline of private sector projects to over 100 projects with more than 9000 MW of new capacity. This new capacity will reduce the need for load shedding when the megawatts become available. Schedule 2 of the Electricity Regulation Act has been amended to remove the licensing requirement entirely for generation projects of any size. This, together with the streamlining of the authorisation processes and the reduction of the timelines for energy projects, will facilitate and accelerate private investment in energy projects at a larger scale.

265 Eskom recognises that facilitating private investment in new generation capacity is the quickest way to provide relief to the constrained electricity system. Adding new generation capacity through private investment will alleviate pressure on the system, thus increasing Eskom's ability to conduct maintenance at its existing fleet, reducing loadshedding and the usage of open cycle gas turbines. While many of the steps urgently need to facilitate private investment in new generation capacity fall within the remit of government, Eskom is actively playing its part.

266 Eskom also recognises that innovative ways must be considered to add new generation capacity to the system, including leveraging Eskom assets to incentivise independent power producers to expedite the establishment of generation capacity. To this end, Eskom has made large tracts of land available adjacent to its existing power stations where there is existing grid capacity for private investments in renewable energy projects. Leasing land to independent power producers supports faster deployment of additional capacity to support the system and mitigate load shedding.

267 In October 2022, Eskom signed land leases for around 6 000ha for the purpose of generating electricity from renewable technologies either for Eskom's consumption or

for sale to third parties. This will enable an estimated 2 000MW of additional private sector investment. It is anticipated that the generators will be connected to the grid within 24 to 36 months from financial closure, subject to environmental, land zoning and other regulatory approvals.

268 Eskom plans to make more land available around its power stations and other sites where there is sufficient grid capacity to connect renewable energy producers. Eventually, up to 30 000ha can be made available for similar projects. It is estimated that this programme could add further generation capacity of up to 4 000MW to the national grid over the next few years.

269 Eskom is also working, together with government, towards enabling businesses and households to invest in rooftop solar.

270 Work is underway to develop a compensation mechanism so that customers can sell surplus energy they produce to distributors. The objective is to increase the uptake of rooftop solar PV to support the electricity system. Eskom has already applied to NERSA to approve a net metering billing mechanism. This would give consumers credits for the electricity that they add to the grid, which are offset against their electricity bill. This will make it more financially beneficial to the consumer to invest in rooftop solar. Another option is the use of a feed-in-tariff, which similarly offers a financial benefit to the consumer who gets paid for supplying surplus energy to Eskom.

271 There is significant potential for additional capacity from rooftop PV – approximately 10 000MW by 2030. This is comprised of 2 100MW from residential, 3 500MW from commercial and industrial, 1 750MW from agriculture and 2 700MW from mining. However, as explained in the supporting affidavit of Mr Conradie, this is a lengthy and complex process. Regrettably, it does not provide the quick and immediate fix which

Mr Blom suggests. It is also plainly not within Eskom's power to ensure the roll-out of rooftop solar alone. In particular, to achieve these results would require a funding mechanism to make solar more accessible to all customers, as not enough customers can self-fund rooftop solar.

RESTRUCTURING ESKOM AND OPENING ACCESS TO THE GRID

272 The third pillar of Eskom's plans to ensure adequate and sustainable supply – and so to bring an end to load shedding – involves structural reform. There are two key priorities: (i) restructuring Eskom; and (ii) enabling open access to the grid.

Eskom restructuring

273 In October 2019, the Department of Public Enterprises published the Roadmap for Eskom in a Reformed Electricity Supply Industry, which aims to restructure Eskom's outdated, vertically integrated structure. The Department of Public Enterprises recommended that Eskom be unbundled into three entities responsible for different functions – Generation, Transmission and Distribution – with the immediate priority being the establishment of a Transmission entity to manage the transmission grid. The Department's recommendations built on the recommendations of the Presidential Eskom Sustainability Task Team, appointed in 2018. I attach a copy of the relevant portion of the Roadmap dealing with the restructuring of Eskom marked "**AA32**".

274 The need to restructure Eskom is driven by an evolving South African energy market and policy landscape. The Department of Public Enterprises points out that restructuring Eskom into separate entities will facilitate private investment in energy by providing more investment comfort. A critical feature of Eskom's reform is the

establishment of an independent transmission system and market operator, with its core function to act as an unbiased electricity market broker.

275 The establishment of independent transmission system and market operator will put in place the basis for a competitive energy generation sector, where multiple generators sell to the national grid –setting the electricity industry on a new path, with more diversification, competition and private sector investment.

276 Eskom is implementing the Department of Public Enterprise's recommendations through its restructuring programme, which will culminate in the establishment of an independent transmission company and separate Generation and Distribution businesses.

277 The Roadmap originally set out timelines for the restructuring of Eskom as follows: divisionalisation by March 2020; functional separation by March 2021; legal separation of the Transmission entity by December 2021; legal separation of the Generation and Distribution entities by December 2022.

278 Eskom completed divisionalisation in the 2020 financial year and achieved functional separation in April 2021. As part of the first stages of separation, Eskom ring-fenced the financials of each of the divisions and started reporting separate financial statements.

279 To complete the structural reform and legal separation, Eskom requires support from government and regulators. Specifically, Eskom requires:

279.1 adapted legislative, regulatory and licensing frameworks to accommodate the three businesses; and

279.2 lender approval from some lenders to transfer assets to new entities.

280 Eskom has established the National Transmission Company South Africa SOC Ltd to house the transmission business. The National Transmission Company will play the roles of system operator (balancing supply and demand) and market operator. Eskom finalised an asset transfer agreement in December 2021, in which it agreed to transfer its transmission division to the National Transmission Company.

281 The National Transmission Company is not yet operational. Eskom's aim is to operationalise the National Transmission Company as quickly as possible.

282 Eskom is putting in place arrangements for the operationalisation of the National Transmission Company and the implementation of the asset transfer agreement. Eskom applied to NERSA for a transmission licence for the National Transmission Company in December 2021. The licensing has been delayed as a result of a number of both internal and external matters. However, on 17 February 2023, it was announced that NERSA has published the license for public comment. NERSA will take a decision on the license after the public participation process. Eskom is working with the Department of Public Enterprises to appoint an independent Board of Directors for the National Transmission Company. Given these delays, it is uncertain whether the National Transmission Company will commence trade around April 2023, in line with Eskom's revised timelines. It is subject to the external dependencies mentioned above.

283 Both the Distribution and Generation divisions have started their journey towards legal separation, but they similarly depend on government to action the necessary legislative and regulatory reforms. Eskom's revised plans target readiness for Distribution operationalisation by December 2023 and commencement of trade by April 2024.

Legal separation of Generation is targeted in 2025. These dates remain subject to external dependencies which may affect the timelines.

284 The Department of Mineral Resources and Energy has started the process of amending the Electricity Regulation Act, 2006 and the Electricity Pricing Policy. The Electricity Regulation Amendment Bill, which will establish a competitive electricity market, was finalised for submission to Cabinet in January 2023. In his State of the Nation Address, President Ramaphosa committed to tabling the Electricity Regulation Amendment Bill later this year.

A transmission grid for the future

285 Eskom's transmission division is focussing on enabling access to the grid for new generation capacity by expanding the transmission grid. Most new generation capacity from renewable energy will reside in the Northern, Eastern, and Western Cape, where the conditions are ideal for solar and wind energy. This requires a fundamental transition given that the transmission grid was developed to transport energy from the coalfields in Mpumalanga and Limpopo. The grid of the future will require the transportation of renewable energy from the Northern, Eastern, and Western Cape to major economic hubs across the country.

286 Eskom formulated the Transmission Development Plan 2020 in response to the Integrated Resource Plan 2019. The Integrated Resource Plan identified additional generation capacity to be connected to the system, much of which is intended to come from renewable energy sources. The expansion of the transmission grid is critical to enable access for the new energy sources in line with the Integrated Resource Plan.

287 Eskom's Transmission Development Plan is a living document, which is reviewed and revised. The most recent version, the Transmission Development Plan 2022 covers the planning period from 2022 to 2030. Over this period, 30 GW of new generation capacity is expected, mainly from renewable energy sources in areas with limited network infrastructure. To provide for an adequate and reliable transmission system, Eskom plans to increase the transmission infrastructure by approximately 8 400 km of extra-high-voltage lines and 119 transformers to bring on board 58 970 MVA of transformer capacity over the next 10 years. A copy of chapter 6 of the Transmission Development Plan 2022, which provides a high-level description of the planned transmission infrastructure, is attached marked "**AA33**".

288 The Transmission Development Plan 2022 had to revise the plan contained in earlier versions due to capital constraints, which required reprioritisation of projects to fit in with the available budget. Similarly, the plan had to be revised in light of protracted land and servitude acquisition processes, which necessitated the delay of certain projects. Transmission projects are frequently delayed because of the complexity of obtaining land and servitude rights over the long distances associated with transmission lines.

289 Adequate funding is a key enabler for the successful execution of the Transmission Development Plan 2022 include adequate funding. Significant investment in strengthening and upgrading the transmission grid is required to execute the Transmission Development Plan - R118 billion over the next 10 years. An additional essential enabler is expediting the acquisition of land and servitude rights.

THE APPLICANTS' ALTERNATIVE PROPOSALS

290 The applicants rely on an affidavit from Mr Ted Blom (attached to the affidavit of NUMSA's General Secretary, Mr Irvin Jim) to submit that alternative measures are readily available to Eskom to address load shedding. They suggest that Eskom's failure to take these measures is evidence of poor management and a lack of appreciation of the urgency of the impacts of load shedding on South Africa. Eskom denies these accusations which, as appears in particular from Mr Conradie's and Ms Mkhatshwa's affidavits, are ill-informed.

291 Together with the rest of the Eskom management team, I fully appreciate the heavy toll that load shedding is having on South Africa and the livelihoods of people living in the country. Eskom is committed to doing everything within its power and available resources to ending load shedding as quickly as possible. The plans that Eskom has developed to recover and bolster its generation capacity are the culmination of careful and considered planning, scenario-testing and budgeting (as well as re-budgeting processes). Eskom's plans entail a necessary balancing of the immediate, medium and long-term needs of Eskom – and indeed, of the country – to ensure not only a quick end to the immediate problem of load shedding, but also to ensure South Africa's long term energy security. They are informed by the financial and legal constraints in which Eskom has to operate, and a concern to maximise the benefit of Eskom's available resources. Eskom can no longer afford to make short-term decisions which compromise its longer term performance.

292 As will already be clear from what I have said above, the question of how to fix the energy crisis is not an easy one. It involves a proper appreciation of the history of the problems, the nature and extent of the current situation, the plans that have already painstakingly and with much time been prepared by Eskom, how those plans are being

coordinated with other parties, including government, and the budgetary implications for each of those plans to be actioned and implemented. Any outside interference with those plans, even well-meaning ones, could not only be catastrophic – in the form of a national black out – but may also upset finely tuned budgets that would otherwise achieve immediate and favourable results.

293 It is essential that Eskom's management be allowed to implement its carefully balanced plans so as to reduce loadshedding whilst also ensuring that adequate reliability maintenance is performed and that Eskom is on the path to financial sustainability. A court order which undermines managements' ability to carry out the remedial action planned, will undermine investor and supplier confidence, with potentially devastating effects for Eskom and the finances that it has attempted to raise.

294 As explained above, it is already difficult for Eskom to raise funding on its own balance sheet due to its deteriorating financial position and low credit ratings. Investors will rightly be concerned about whether they will receive any return on their investment if the ability of Eskom's management to carry out its plans is thrown into a state of uncertainty by external interference. Any further loss of confidence by investors will make it more difficult for Eskom to raise the funding that is needed for Eskom to add additional generation capacity, particularly through critical Just Energy Transition projects. Loss of investor confidence will limit Eskom's access to funding without government guarantees and will increase the cost of borrowing – worsening Eskom's already difficult financial position.

295 Similarly, suppliers will be concerned about whether Eskom will be able to pay them for goods and services and will rightly be hesitant to supply Eskom other than for cash or with guarantees. This will make it more difficult for Eskom to obtain the goods and services that are essential for it to operate. The impact of Eskom struggling to acquire

primary energy sources such as coal, fuel-oil and diesel as a result of loss of supplier confidence, would seriously diminish Eskom's ability to deal with the electricity crisis. Loss of supplier confidence will mean that Eskom will have to pay a premium for goods and services – increasing its operational costs, depleting its revenue and possibly requiring Eskom to acquire debt funding from lenders in order to operate. For these additional reasons, external interference should be avoided.

296 With that in mind, I turn to address the alternatives proposed by Mr Blom. I explain why, in some respects, the alternatives are viable and are already being implemented or are under investigation by Eskom. In other respects, I explain why they are not feasible options. I refer to the supporting affidavit of Mr Conradie from Eskom's Generation Division in response to Mr Blom for detailed responses to Mr Blom's proposed alternatives.

297 I start with the options that are more feasible, although not on the scale or within the timelines proposed.

298 Rooftop solar: Like Mr Blom, Eskom is a proponent of rooftop solar. In fact, the incentivisation of rooftop solar is among the elements put forward in Eskom's Generation Recovery Plan.

299 Eskom agrees that increased uptake of rooftop solar PV will support the electricity system. Eskom is doing what it can, within its mandate, to facilitate households and businesses investing in rooftop solar. As explained in detail above, to incentivise increased up-take, Eskom is working on developing a compensation mechanism so that customers can supply surplus energy they produce to distributors. However, the approval of the compensation mechanism is up to NERSA.

300 Eskom supports tax incentives to make rooftop solar more accessible and attractive to customers. However, the decisions in this regard lie not with Eskom, but with the South Africa Revenue Service and the Ministry of Finance.

301 That said, I point out, with reference to Mr Conradie's supporting affidavit, that Mr Blom's suggestion that rolling out rooftop solar to 8 million homes would add 8 000MW within a few months has no basis in reality.

302 Mr Blom's proposal would require a national funding mechanism for mass roll out of rooftop solar approved by National Treasury, as on Eskom's estimates only about 250 000 of its customers would be able to self-fund the acquisition of roof-top solar even with tax incentives. Even if a funding mechanism were in place, which is not the case, 1 000MW to 15000MW from rooftop solar is the most that can be added within one year.

303 Improving coal supply: Improving coal supply is a key strategic aim of Eskom's and a cornerstone of its Generation Recovery Programme. I have already set out above the numerous steps that Eskom is taking to ensure quality coal supply and Mr Conradie addresses this in more detail.

304 Mr Blom is, however, wide of the mark in suggesting that poor coal quality causes losses of between 1 000 MW and 6 000 MW daily or that it is responsible for 30% of boiler breakdowns. There is simply no basis for these claims.

305 At worst, poor coal quality causes losses of 600MW per day. However, even this loss is unacceptable to Eskom, and it is implementing its long term coal supply strategy and intensive verification and monitoring measures to improve the quality of coal supplied.

306 Power factor optimisation: Eskom already runs power factor correction equipment. Each of Eskom's large generators is equipped with an excitation control system that is always in service and that does correct the power factor of that specific generator in accordance with the system requirement of the grid.

307 However, Eskom does not install power factors correctors for customers. The responsibility for this lies with the customer in terms of NERSA's Network Code (a copy of which is attached to Mr Conradie's supporting affidavit). This is the most pragmatic approach. The customer is the person who is in control of what is plugged into the system and who has the incentive to install a power factor corrector because it will reduce their electricity bill.

308 While Eskom accepts that installing power factor correctors would reduce demand, requiring Eskom to do this for each customer – instead of customers doing so for themselves – is plainly unreasonable. There are quicker and cheaper ways for Eskom to get additional megawatts on the grid, and this would not be the best use of Eskom's resources or capacity. I again refer to Mr Conradie's affidavit in this regard.

309 Procuring cheaper diesel: To mitigate loadshedding, Eskom has expended an increasingly larger part of its budget on diesel. Diesel is an expensive fuel and particularly susceptible to price fluctuations. The Russian invasion of Ukraine in February 2022 has led to declining fuel availability and rising fuel prices.

310 However, Mr Blom is incorrect in asserting the Eskom pays too much for diesel. In general, Eskom pays below the wholesale price of diesel, which is published monthly by the Department of Mineral Resources and Energy, because it negotiates discounts with suppliers.

311 Nonetheless, to reduce the price that Eskom pays for diesel, Eskom has applied to obtain a wholesale diesel licence, which would enable it to procure and import diesel directly and pay the basic fuel price for diesel, which is about R8 per litre less than the wholesale price. However, the Department of Mineral Resources and Energy refused Eskom's application at the end of last year. I again refer to Mr Conradie's affidavit in this regard.

312 Ghost vendors: Eskom recognises that the unlawful sale of electricity by unauthorised vendors reduces Eskom's revenue. The problem is one of criminality, which is outside Eskom's mandate to resolve and for which responsibility lies with various law enforcement agencies. Nonetheless, Eskom has worked closely with law enforcement to crack down on the problem and to trace and recover ghost vending machines.

313 In addition to this, Eskom has taken and is taking a number of steps to eliminate ghost vending, including (but not limited to): facilitating reporting on ghost vending; consumer education and awareness and using technological solutions to eliminate ghost vending. Eskom is currently in the process of upgrading the vending system and rolling out smart meters in order to eliminate ghost vending. Ultimately the software installed on the offline machines currently used for ghost vending will expire at the end of November 2023. I again refer to Mr Conradie's affidavit in this regard.

314 I now turn to the options that are entirely unfeasible.

315 Running diesel full time: Given the debilitating cost of loadshedding to the country, Eskom utilises its Open Cycle Gas Turbines beyond the targeted levels and despite the prohibitive cost. If Open Cycle Gas Turbines were utilised only at targeted levels, Eskom could generate a net profit.

316 While running the Open Cycle Gas Turbines full time would somewhat mitigate loadshedding, it is not an option that is available to Eskom. Eskom is not in a financial position to carry the burden of running Open Cycle Gas Turbines full time to ensure security of supply to the country.

317 Eskom had already exhausted its R13.3 billion budget on diesel at the end of October 2022 and has had to find additional funds to procure more diesel at high cost. National Treasury has indicated that it is unable to provide additional cash injections or even to lend Eskom the funds to procure more diesel. Due to a shift in the cash forecast since September 2022, Eskom has been able to procure additional diesel from surplus operational cash – this has been achieved by Eskom's divisions reducing their operational cash requirements. This comes at an opportunity cost as this cash is used on expensive diesel instead of on Eskom's operations. This type of budgetary recalculation therefore requires careful consideration and, with respect, is not something this Court can undertake.

318 In addition, Eskom has not been able recoup its full diesel costs in its Multi-Year Price Determinations applications and Regulatory Clearing Account applications. NERSA has consistently allowed Eskom significantly less than the amount for which Eskom applied.

319 In any event, Eskom has been unable to source and deliver more than around R1.5 billion worth of diesel per month on open cycle gas turbines – meaning that it cannot possibly run them full time.

320 Emergency gas procurement strategy: While the emergency gas procurement strategy that Mr Blom proposes is theoretically possible, it is not the best use of Eskom's limited

resources and is absolutely impossible within the timeline that Mr Blom asserts, as Mr Conradie discusses in some detail.

321 Mr Blom's suggestion is simply unaffordable. To generate the number of megawatts suggested by Mr Blom, Eskom would have to pay approximately R159 billion per year to run the jet engines at 90% load factor. This excludes the initial cost of procuring the gas turbines and transporting them to South Africa. This is the case if Eskom could manage to source sufficient supply of gas, which is unlikely given the global shortages.

322 Mr Blom's timeline is unrealistic. His proposal fails to take into account the regulatory environment within which Eskom operates, which requires it to obtain exemptions and approvals from a number of different entities in order to implement an emergency procurement strategy. That does not even take account of the infrastructure that Eskom would have to build in order in order to transport the gas to power plants and connect the electricity to the grid.

323 BHP Contacts: Contrary to Mr Blom's suggestion, Eskom cannot simply terminate its contract with South32 SA Coal Holdings (Pty) Ltd ("South 32"), which is the owner of the Hillside Aluminium Smelter and a spin-off of BHP. The contract is entirely lawful and, as such, is valid and binding on Eskom. It has not been challenged by the applicants in these or any other proceedings.

324 The contract was approved by NERSA and complies with the Electricity Pricing Policy and the Department of Mineral Resources and Energy's Interim Framework for Long-Term Negotiated Pricing Agreements' (a copy of which is attached to Mr Conradie's affidavit).

325 In any event, the allegations that Mr Blom makes regarding Eskom's contracts with South32 are entirely false**.** Eskom has negotiated a price for electricity with South 32which is lower than the standard tariff levels. However, South32 pays significantly higher tariffs than those Mr Blom asserts. Although, for reasons of commercial confidentiality, I cannot disclose the amount, it is – as it is required to be – higher than the cost of generating electricity, which is currently around 57c/kWh.

326 In addition, South32 consumes about 1 200MW (not 8 000MW), which equates to roughly 5% of available supply. Eskom's contract with South32 gives Eskom the ability to interrupt supply to South32 when there are constraints on the grid. Eskom uses this interruptibility benefit to avoid loadshedding by instantly reducing demand.

PART 4: INTERIM RELIEF

327 Following case management, the applicants advised that, for the purposes of Part A, only the relief in prayers 3, 4 and 5 of the amended Notice of Motion is being pursued.

328 While Eskom's response to all the relief initially sought in Part A will be apparent from these answering papers, I focus in this part on responding to the relief in prayers 3, 4 and 5. I reserve the right to supplement these papers to the extent necessary for the Part B hearing. I begin by addressing prayers 3 and 4, and then deal with the alternative relief in prayer 5. I explain why these prayers, if granted, would impose impossible obligations on Eskom – that is, they require Eskom to do what is practically and legally impossible. I am advised that the court will not grant orders that are impossible to execute.

329 I also explain why the relief in prayers 3 and 4 defeats the very purpose of load shedding – to prevent a total blackout. It requires maintaining a level of demand on

the grid in circumstances where there is an insufficient supply to sustain that demand. This presents a manifest risk of grid collapse or blackout, which is a risk that Eskom – and indeed, the country – cannot afford to take.

330 While the applicants now say that they are limiting their part A relief to prayers 3, 4 and 5, any one of these prayers granted even on an interim basis would have far broader implications for Eskom and the country than the applicants realise.

331 Accordingly, the applicants' efforts to limit their relief to just three prayers does not assist them. That is because those prayers cannot be granted without proper consideration of the potentially devastating knock-on effects they may have on the country in general and on Eskom in particular.

332 To give just one example, the applicants' Part A relief is a precursor to the relief they seek in Part B, but a quick consideration of what they seek in Part B underlines just how dangerous their Part A relief is. Their arguments culminate in prayers 6 and 7 (Part B) of the amended notice of motion – namely, to review and set aside the decisions to shut down the Komati, Camden, Hendrina, and Arnot power stations and to direct Eskom to reopen those power stations. But their entire case – in Part A and B – ignores what Eskom and this Court are not entitled to ignore. That is that Eskom's Just Energy Transition requirements, which underlie the decision to shut down these coal-powered stations, are not optional. They are, in large part, required by domestic legislation - and more particularly by Eskom's environmental authorisations - and by South Africa's international obligations. Accordingly, if this Court were to order that Eskom undo its decisions to shut down certain power stations, it would not be able to comply without breaking the law.

333 Moreover, continued reliance on the aging infrastructure of shutdown coal power stations is not commercially viable. It would result in Eskom spending more money on producing less electricity and, because of the international trend away from fossil fuels, would be difficult if not impossible to fund.

334 The Part A relief thus demonstrates the fanciful and downright dangerous approach adopted by the applicants which ignores the complexities of the electricity crisis, the myriad legal obligations upon Eskom (including to transition to clean energy) and the intricately poised funding that Eskom has desperately sought to secure to implement the quickest, cleanest, and most cost-effective strategy to improve the country's energy supply.

335 The applicants are in no position to make that assessment. What is more, they have not put the Court in a position to come close to that assessment, not least of all because they have inexplicably failed to join the Minister of Finance as the head of Treasury or the municipalities that supply almost 50% of the country's electricity directly to their customers.

336 Eskom has sought to demonstrate to the Court the extensive nature of the implications of the relief in Part A – the budgetary, planning and operational consequences, and the potential calamitous consequences if the delicate task of balancing the grid and protecting it from a blackout were to be disrupted by ill-considered interference.

337 In what follows, I provide a summary of why, given all of those multiple factors, the paired down relief sought by the applicants cannot be granted. As I shall show, the relief is not just and equitable, is vaguely and arbitrarily drawn and impossible to implement for practical and legal reasons, and entails this Court making orders that may not only destabilise the national electricity grid, but seriously retard Eskom's

recent and extensive efforts to meet the challenges of the energy crisis as quickly as possible in the most cost-effective manner.

Prayers 3 and 4

338 In prayer 3, the applicants seek an order in the following terms:

> *"3. In respect of users of electricity that are supplied electricity directly by Eskom Holdings SOC Limited (Eskom), the Minister of Public Enterprises and/or Eskom shall ensure that there shall be no interruption of supply as a result of loadshedding to the following institutions and/or facilities:*
>
> *3.1 all "public health establishments" as defined in the National Health Act 61 of 2003, including publicly owned hospitals, clinics, and other establishments or facilities;*
>
> *3.2 all "public schools" as defined in the South African Schools Act 84 of 1996;*
>
> *3.3 "electronic communications networks" as defined in the Electronic Communications Act 36 of 2005, and the infrastructure necessary for the operation of such networks, and any other infrastructure necessary for the operation of mobile phone and internet networks;*
>
> *3.4 the "South African Police Service" and "police stations" as envisaged in the South African Police Service Act 68 of 1995, including facilities and infrastructure providing municipal police services;*
>
> *3.5 any entity responsible for the provision of water in terms of the National Water Act 36 of 1998; and*
>
> *3.6 "micro", "very small" and "small" businesses as provided for in schedule 1 of the National Small Enterprises Act 102 of 1996, trading in perishable goods such as meat and milk and which depend on electricity for storage of such goods".*

339 In prayer 4, the applicants seek the equivalent relief for users who are supplied electricity by municipalities. Some 177 local municipalities are licensed to distribute electricity. They supply approximately 50% of distribution customers in the country, predominantly in the urban areas, in terms of bulk-supply agreements with Eskom. In respect of these users, the applicants seek an order that –

> *"Eskom and/or the Minister of Public Enterprises shall ensure that any instruction to that municipality to reduce electricity and/or commence or continue load shedding includes an instruction to ensure the exemption on the terms mentioned in paragraph 3 above."*

340 I have reproduced these prayers because their breadth and scope must be appreciated to understand why it is practically impossible to implement them.

341 To give a better sense of their scope, I set out below some analysis (albeit rudimentary in the time available) of all the institutions and facilities the applicants would have Eskom and municipalities immediately exclude from load shedding.

341.1 "Public health establishments" are defined in the National Health Act 61 of 2003 as follows:

341.1.1 A "health establishment" is defined to mean "*the whole or part of a public or private institution, facility, building or place, whether for profit or not, that is operated or designed to provide inpatient or outpatient treatment, diagnostic or therapeutic interventions, nursing, rehabilitative, palliative, convalescent, preventative or other health services*".

341.1.2 A “public health establishment” is defined to mean “*a health establishment that is owned or controlled by an organ of state*”.

341.1.3 Therefore, a public health establishment is the whole or part of any institution, facility, building or place owned or controlled by an organ of state, whether for profit or not, that is operated or designed to provide inpatient or outpatient treatment, diagnostic or therapeutic interventions, nursing, rehabilitative, palliative, convalescent, preventative or other health services.

341.2 According to the Department of Health’s Annual Report for 2021/2022, there are 3,873 public health establishments in South Africa, including 3,346 clinics, 381 hospitals and 146 other types of health establishment.[16] I attach the relevant extracts marked “**AA34**”.

341.3 According to the Department of Basic Education’s Annual Report 2021/2022, there are 23 213 public schools in South Africa.[17] I attach the relevant extract of this report marked “**AA35**”.

341.4 An “electronic communications network” is defined in the Electronic Communications Act 36 of 2005 to mean “*any system of electronic communications facilities (excluding subscriber equipment), including without limitation (a) satellite systems; (b) fixed systems (circuit- and packet-switched); (c) mobile systems; (d) fibre optic cables (undersea and land based); (e)*

[16] Department of Health Annual Report 2022, at pages 34 and 69 (https://www.gov.za/sites/default/files/gcis_document/202210/healthannualreport202122.pdf (3))

[17] Department of Basic Education Annual Report 2021/2022 at page 119 (https://www.gov.za/sites/default/files/gcis_document/202210/dbe-annual-report-2022.pdf). I note, however, that elsewhere in the Annual Report, the total number reflected in a different tabulation of public schools per province is 22 589 (at page 69 of the Report).

electricity cable systems (to the extent used for electronic communications); and (f) other transmission systems, used for conveyance of electronic communications". To give some sense of the number of these installations, I note the following:

341.4.1 The 2022 ICT Sector Report[18] indicates that there were 749 269 analogue fixed telephone line subscriptions, and 1 461 046 fixed line subscriptions,[19] and there were 1 379 207 fibre to home or building internet subscriptions.[20] Further, in 2021, there were 53 digital satellite stations, 86 terrestrial satellite stations, and 147 content distributors.[21] There were also 1,686 transmission sites for radio.[22] I attach the relevant extracts of this report marked **"AA36"**.

341.4.2 Prayer 3.3 relates also to "the infrastructure necessary for the operation of such networks, and any other infrastructure necessary for the operation of mobile phone and internet networks". Precisely what infrastructure this entails is unclear.

341.4.3 While the scope of the relief the applicants seek in prayer 3.3 is uncertain, I point out that Eskom has 11,568 supply points for what it characterises as 'telecommunications infrastructure', connected to distribution lines throughout the country. It can reasonably be assumed that municipalities would have at least as many

[18] The State of the ICT Sector Report of South Africa March 2022, available at State-of-ICT-Sector-Report-March-2022.pdf (icasa.org.za)

[19] ICT report page 40, table.

[20] ICT report page 41.

[21] ICT report page 59.

[22] ICT report page 60.

telecommunication supply points across their distribution networks (and probably more in the urban environment).[23]

341.5 According to the SAPS Annual Report for 2021/22, there are 1 158 police stations countrywide.[24] In addition, at least the following municipalities have established their own municipal police services: Cape Town, Johannesburg, City of Tshwane, Ekurhuleni, eThekwini and Nelson Mandela Bay. Precisely which facilities and infrastructure is contemplated in prayer 3.4 in respect of such municipal policing services is unclear. I attach the relevant extract of the SAPS Annual Report marked "**AA37"**.

341.6 The scope of prayer 3.5 is also not clear: it refers to "entities responsible for the provision of water in terms of the National Water Act 36 of 1998". It appears that this may encompass all of the following infrastructure:

341.6.1 In terms of the National Water Act, a *"Government waterwork*" means a waterwork owned or controlled by the Minister of Water and Sanitation, and includes the land on which it is situated; and "*waterwork*" includes any borehole, structure, earthwork or equipment installed or used for or in connection with water use.

341.6.2 The Department of Water and Sanitation controls 257 water schemes, of which 25% (65) are schemes where raw water is collected and transferred from one catchment to another, with more

[23] Dr Minnaar's report para 70.

[24] South African Police Service Annual Report, 2022 at page 443; site: https://www.saps.gov.za/about/stratframework/annual_report/2021_2022/Annual-Report-2021-22-latest.pdf

than 5 000 registered dams (wall height over 5 m and storage capacity over 12 000 m3).[25]

341.6.3 Water management and transfer require energy for pumping, and 15 525 million households (or 88.7% of all South Africans) are dependent on municipalities and water boards for daily safe and reliable water supply.[26]

341.6.4 Water supply infrastructure takes the form of: treatment works; pump stations; reservoirs; and reticulation, and consists of a network covering a large area and consisting of a variety of stations.

341.6.5 With regard to sanitation services, in 2022 there were: "995 wastewater networks and treatment works, comprising 850 municipal wastewater treatment systems; 115 systems owned by the national and provincial Departments of Public Works; and 30 privately-owned systems".[27]

341.6.6 I attach marked "**AA38**", the relevant extracts of the SAICE Infrastructure Report, 2022 that contains these figures.

341.7 It is difficult – if not impossible – to identify and quantify "micro, very small and small businesses trading in perishable goods such as meat and milk, and which depend on electricity for the storage of such goods".

[25] SAICE 2022 Infrastructure Report page , available at SAICE-2022-Infrastructure-Report-Card.pdf

[26] SAICE report page 24.

[27] SAICE report page 27.

341.7.1 A “small enterprise” is defined in terms of the National Small Enterprises Act 102 of 1996 as a separate and distinct business entity, together with its branches or subsidiaries, if any, including cooperative enterprises, managed by one owner or more predominantly carried on in any sector or subsector of the economy mentioned in column 1 of the Schedule, and classified as a micro, a small or a medium enterprise by satisfying the criteria mentioned in columns 3 and 4 of the Schedule.”

341.7.2 The term "micro", and "small" business as provided for in Schedule 1 of the Act, for all of the sectors listed therein (including retail, wholesale, catering and accommodation, transport and storage), means: (i) between zero and 10 total full-time equivalent of paid employees for micro-enterprises; and (ii) between 11 and 50 full time paid employees for small enterprises. In addition to the number of employees, there are turnover thresholds for micro- and small enterprises in terms of Schedule 1 to the Act.

341.7.3 There is no readily-available register of all the micro, very small and small businesses in South Africa, let alone one that identifies the particular category with which the applicants are concerned. Overall, the number of SMMEs in South Africa, as estimated by the Small Enterprise Development Agency (in its third quarterly report for 2021) was 2.4 million.[28]

[28] SMME Quarterly Update 3rd Quarter 2021 page 8, available at SMME Quarterly 2021Q3 (002).pdf (seda.org.za).

341.7.4 Eskom is not aware of any data available on the number of SMMEs specifically trading in perishable goods in South Africa. However this would presumably include all restaurants, cafés and spaza shops in the country.

Practical impossibility

342 The uncertainty as to precisely which institutions, facilities and infrastructure are encompassed by prayers 3 and 4, on its own, renders their implementation impossible. I am advised that the orders sought in prayers 3 and 4 thus flout the basic principle that for an order to be executable or enforceable its wording must be clear and unambiguous. An order that lacks clarity in its wording or is vague is incapable of enforcement.

343 But there is a far more fundamental problem. Were prayers 3 and 4 to be granted, the sheer number of the institutions, facilities and infrastructure that would have to be excluded from load shedding and assured an uninterrupted supply of electricity, would, without a doubt, pose a serious and unacceptable risk of a national blackout.

344 The applicants' relief apparently assumes that Eskom can isolate certain institutions and facilities from load shedding. Eskom's Dr Ulrich Minnaar (from Eskom Distribution Solutions: Research, Testing and Development) has prepared a report to explain the problem of the embeddedness of customers on Eskom's transmission and distribution networks, and how this renders it impossible, at a technical level, to isolate and exclude particular customers from load shedding. That report is attached to this affidavit as annexure "**AA39**".

345 As Dr Minnaar explains, the institutions and facilities the applicants seek to exclude from load shedding, by and large, share a set of common characteristics:

345.1 they are widely distributed across the country and located as close to communities as possible in order to serve the needs of the public; and

345.2 apart from larger hospitals, these facilities typically use small electrical loads connected to the low voltage distribution network present in every neighbourhood spread across South Africa;

345.3 the overwhelming majority of customers are not supplied by means of direct feeders (distribution lines) connected to the supply station or substation with switches (circuit-breakers) to enable their supply to be independently controlled. Customers are, instead, “embedded” in the distribution network in the sense that they share feeders with hundreds or thousands of other customers without independent switching capability; and

345.4 the overwhelming majority of municipalities (all but about twenty) have little or no remote-controlled switching capability in their distribution networks. This means that it is impossible to instruct them to implement load shedding in any targeted and rotational fashion, let alone the highly specific manner in which the applicants propose. As Dr Minnaar explains in his report, Eskom’s regional control centres have agreed, at the request of local municipalities, to implement load shedding in their jurisdictions through Eskom’s Supervisory Control and Data Acquisition (SCADA) system. This system enables Eskom’s national and six regional distribution control centres to remotely open and close circuit breakers at Eskom’s sub-stations or circuit breakers, but not along the municipalities’ own distribution networks. Eskom has no control over the

municipalities' lines. For the majority of municipalities, this means that Eskom switches the entire municipality off during load shedding.[29]

346 The result is that, in the main, the electricity supply to individual users or facilities cannot be isolated and separately controlled. To exclude one customer from load shedding requires excluding all other customers upstream on the same feeder line from load shedding and, for many municipalities, it would mean keeping their entire network online.[30]

347 This problem of embeddedness can be no surprise to the applicants. Despite claiming the relief they do in prayers 3 and 4 – which would wish away the difficulty – their own papers admit that the various entities are too embedded to be excluded.

348 Mr Irvin Jim tells this Court that he "*instructed an expert team of engineers skilled in electrical engineering and energy studies to prepare a report for the purposes of presenting NUMSA's concerns on the technical management of Eskom to this Honourable Court*".[31] He also tells this Court that he "*aligns [himself] fully with the findings contained therein*",[32] and that "*the experts in question have the qualification and experience necessary*"[33] to draft their report. The centrality of that report to the applicants' case is made apparent in the main founding affidavit of Mr Holomisa, who says at para 138 that: "*In the context of this matter, Mr Jim instructed that these experts with qualifications in electrical engineering and energy studies, amongst others, prepare an expert report on the* ***immediate challenges facing Eskom and the measures that can be implemented forthwith to alleviate the energy crisis***" (my

[29] Minnaar report paras 29 to 36.

[30] Minnaar report, para 4.

[31] Para 4 of Irvin Jim's confirmatory affidavit.

[32] Para 5 of Irvin Jim's confirmatory affidavit.

[33] Para 6 of Irvin Jim's confirmatory affidavit.

emphasis). It is thus plain that these experts were providing the applicants their advice on measures that can be implemented forthwith, that is immediately.

349 While Eskom does not accept the other aspects of the experts report, for the reasons given elsewhere in Eskom's supporting affidavits, there is one part of the report by Mr Jim's experts that is aligned with Eskom's views and evidence. Indeed, that part of the experts' report explains emphatically why prayers 3 and 4 cannot possibly be measures that "can be implemented forthwith". The experts' report concludes as follows at paragraphs 11 and 12 (my emphasis):

"11. Is (sic) the current high stages justifiable in relation to the operational functionality of each power station.

- **Yes the system operator has to act to protect the system from collapsing and has to do so without interference and he has to act independently without being interfered with. The system operator is our last line of defence"**

350 Accordingly, the applicants' own experts' report confirms that the system operator is presently justifiably loadshedding to protect the system from collapsing. The system operator – not the applicants or this Court – is "our last line of defence". Moreover, according to Mr Jim's experts, the system operator must be accorded all due deference and space to do so. The experts underlined that point **three** times in one sentence: explaining that to do the job of protecting the system from collapsing, the System Operator has to do so "without interference", has "to act independently", and must do so "without being interfered with". Yet the relief sought by the applicants in prayers 3 and 4 is precisely such interference.

351 The applicants' expert report in paragraph 12 goes on to explain why this is simply not possible (I quote with emphasis):

> "12. **Is it possible to ensure that critical factors are not subjected to loadshedding and to do so indefinitely**. If yes, how must the grid be managed to accomplish this?
>
> - **Eskom and Municipalities switches (sic) off large blocks of consumers during loadshedding. The critical sectors imbedded (sic) in the blocks cannot be shielded from loadshedding**. However, Eskom, Municipalities and Government can install standby generation at these critical sectors to shield them from the effects of loadshedding".

352 The applicants' relief is thus at war with its own experts. It is incomprehensible that the applicants would persist with their relief in the face of their own experts' warnings.

353 I can confirm that the embeddedness problem applies throughout the country. The number and distribution of the institutions and facilities the applicants seek to exclude from load shedding is vividly depicted in the maps of the police stations and health facilities in South Africa in Dr Minnaar's report (at page 5).

354 If regard is had to the sheer number and geographical distribution of facilities and institutions the applicants seek to exclude from load shedding, it is clear that implementing the relief in prayers 3 and 4 (or either one) would effectively mean that there can be no load shedding in the country.

355 This presents a dire risk for South Africa, as load shedding is implemented by Eskom as a measure of last resort to prevent a power system blackout.

356 Under the Grid Code[34] and as a condition of its Transmission licence,[35] Eskom is obliged as the System Operator to maintain the safe and efficient operation of the interconnected power system, which includes the national electricity grid. To do so, Eskom must control, in real time, the amount of generation (electricity supply) that is available versus the load (electricity demand). Supply and demand must be kept in balance, to ensure that the frequency of electrical supply is within the limits that the grid can sustain.

357 As is explained by Eskom's Ms Isabel Fick, when there is a deficit in supply to match demand – which manifests as a decline in the electricity system's frequency – the Grid Code specifies a number of measures that the System Operator must implement and exhaust before declaring a system emergency and implementing load shedding. The System Operator will declare a System Emergency and instruct that load shedding be implemented only if, after implementing all other possible measures to reduce demand or increase supply, the frequency of supply continues to fall.[36]

358 Load shedding is, therefore, a measure of last resort that Eskom, as the System Operator, employs to prevent the cascading collapse of the grid and resulting black out.

359 Ms Fick also describes the devastating impact that a blackout – which entails a complete loss of electrical power that may last for more than two weeks – would foreseeably have.[37] I have already referred to that evidence. It is no exaggeration to say that it would, in all likelihood, be a monumental and unprecedented national

[34] South African Grid Code: System Operation Code (version 10.1, January 2022), approved by NERSA. The Grid Code is attached to the affidavit of Mr Correia as annexure "**AC2**". See, in particular, clauses 2, 2.1.1 to 2.1.4 on the System Operator's obligations. See also the affidavit of Ms Isabel Fick at paras 4-5.

[35] Clause 4.2 of Eskom's Transmission Licence designates Eskom's Transmission Division as the System Operator.

[36] Fick supporting affidavit paras 11-18.

[37] Fick supporting affidavit paras 7-9; 27 -30.

catastrophe that would threaten many lives. The orders the applicants seek in prayers 3 and 4, if directed, would pose a very real risk of such a catastrophe unfolding. With respect, such orders could simply never be implemented; they would be the epitome of orders that are not just or equitable.

360 Giving effect to what is sought in prayers 3 and 4 would, in fact, require the wholesale reconfiguration of the distribution network in the country.

361 The distribution network would have to be reconfigured to address the embeddedness problem and enable the controlled (switchable) supply of electricity to individual end-users. Even if this were done, it would also not deliver results sufficiently quickly to address the load shedding problem. The reconfiguration of Eskom's and all 177 municipalities' distribution networks would not yield the desired results in a shorter period than Eskom's existing strategy, that is, to solve the problem by addressing the underlying causes of load shedding – i.e., by addressing the supply shortage and performance and reliability problems at Eskom's base-load fleet and implementing the alternative and far more cost-effective approach of transitioning to cleaner sources of energy supply.

362 Dr Minnaar's report explains what reconfiguring the distribution network would entail.[38] In sum, it requires:

362.1 for larger institutions connected to Eskom's medium voltage network, such as hospitals, the installation of direct feeder lines – i.e., lines that feed only the hospitals – connected to the nearest substations (with available capacity) and with their own circuit breakers; and

[38] Minnaar's report paras 71 to 79 and 92 to 96.

362.2 the roll-out of an entire network of remote-controllable switches or circuit breakers and a smart meter infrastructure on Eskom's and municipalities' low voltage networks – to enable the switching off of supply to all customers upstream on the protected user's feeder, whilst supply is maintained to the protected users.

363 Both options for network reconfiguration are hugely costly, technically and legally complex processes that would require as long, if not substantially longer, to implement than the 24 months Eskom requires to implement its Generation Recovery Plan to end load shedding.[39]

364 As regards the installation of direct feeders (distribution lines), Eskom estimates that <u>at a minimum</u>:

364.1 the project process required for installing a single dedicated MV feeder is anywhere between <u>12 months and 36 months</u> (taking into account project initiation and planning, budget approvals, environmental assessments, municipal clearances, servitude rights, procurement of long lead items such as circuit breakers etc.);[40] and

364.2 the average cost of installing a dedicated MV feeder (taking into account hardware requirements, such as the installation of dedicated feeder bays, circuit breakers and other essential equipment such as protection devices at Eskom substations and the customer end, and whether overhead or underground solutions are sought and the length thereof), is more than R2,35

[39] Id at paras 80 to 91; 97 to 98.

[40] Minnaar's report paras 89-90.

million per kilometer for underground installations and over R1 million per kilometer for overground installations (which is feasible in rural areas).[41]

365 Even if it were possible, for Eskom to implement such vast and complex changes to its network, this would require an extensive budget and human resources that it does not have. I have already referred to the affidavit of Eskom's CFO, Mr Cassim, which details the Eskom's severe funding constraints. Eskom would have to divert and redirect its limited human resources to implementing a vast and complex project when those resources are required to address the underlying causes of load shedding.

366 A more feasible network solution – at least for Eskom's network – is the roll-out of smart meters. Smart meters allow Eskom to control (cut off) supply and to implement load limiting at the customer level. Eskom has in fact already embarked on the replacement of basic meters (pre-paid or conventional) with smart meters. After a successful pilot in 2015, Eskom began installing smart meters in 2021 and has, to date, installed approximately 150,000 smart meters on its network.

367 The current cost estimate for the complete replacement of basic meters with smart meters on Eskom's network (i.e., for an estimated 7 million meters) is R15 billion, with an implementation period of 4 years. This R15bn estimate includes the costs of the smart meters; data concentrators (or collectors); SIM cards; and customer-end installation costs, including movement of old meters and installation of new pole-top boxes; installation of separate earth leakage protection units where required etc. The R15bn does not include any work on the back-end infrastructure. However, Eskom is already advanced in the process of procuring a data management and repository system for its network that would accommodate the large amount of data collected

[41] Minnaar's report paras 80-88.

from the smart meters. Importantly, the business case for the complete roll-out of smart meters across Eskom's network is still being finalised, and is yet to considered and approved at Board level.

368 The roll-out of smart meters country-wide would require municipalities to embark on a similar process, as approximately 50% of electricity customers are supplied via municipal networkss. As Dr Minnaar notes in his report, given the state of service delivery and the maintenance backlog in municipalities across South Africa, Eskom has serious doubts about the national capability to roll out smart meter infrastructure technology across South Africa's municipal networks in a short time period.[42]

369 Whether implemented by Eskom or municipalities, it is clear that the roll-out of smart meters will take several years to complete. This network solution cannot be implemented within a timeframe that would protect customers from loadshedding over the next two years.

370 If Eskom is to end load shedding in the next 24 months, it must be allowed to implement its Generation Recovery Plan and focus its resources on conducting the planned maintenance of its fleet and onboarding new sources of supply. It cannot afford to divert its limited resources to implement such immense and complex network reconfigurations, which would, in any event –

370.1 not resolve the underlying problem of load shedding; and

370.2 not provide relief in the time required (i.e., over the next 24 months when load shedding is expected to persist).

[42] Minnaar's report para 98.

371 Moreover, as noted, about 50% of distribution customers are supplied by some 177 local municipalities.[43] Given the severe resource, capacity and delivery problems in municipalities across South Africa, Eskom has serious doubts about the national capability to implement any of these network-based measures across South Africa within any timeframe that would protect customers from load shedding.

372 To the extent that the applicants relief in prayers 3 and 4 is predicated on the assumption that there is a ready and immediate solution to the load-shedding problem – in the form of an alternative source of supply – this is simply not true. The applicants appear to place considerable reliance on Mr Blom's assertion that there are a host of measures readily available to Eskom to meet the gap in supply. As explained in Part 3 (and further detailed in Mr Conradie's supporting affidavit), Mr Blom's assertions in this regard are uninformed and unrealistic.

373 Finally, the applicants ignore the disruption their relief, if granted, would cause to Eskom's JET strategy, which is based on a careful and years-long calculation that a renewables-dominant energy mix, enabled by storage and peaking capacity, is the optimal way to expand South Africa's generation capacity in the context of Eskom's mandatory environmental obligations and budgetary constraints. That disruption, and the threat to Eskom's funding to implement the JET strategy, is explained in Ms Mkhatshwa's supporting affidavit.

374 The applicants' relief is aimed at short-term results, but those may well compromise severely the plans that Eskom has already developed – and the funding it has raised – to move towards a more sustainable solution as quickly as possible and which serves the needs of everyone in the country.

[43] Minnaar's report para 36.

Legal impossibility

375 Load shedding is a carefully regulated process. It is governed by two NERSA-approved Codes – the South African Grid Code System Operation Code (Grid Code) and the NRS048-9 Code of Practice for Load Reduction (NRS 048-09 Code). Eskom is obliged, under its licenses, to implement and adhere to these Codes.

376 Each of these Codes imposes legal constraints on Eskom in respect of its implementation of load shedding, which the applicants have failed to consider at all. The relief the applicants seek would require Eskom to breach these Codes and, thereby, to breach its licenses with NERSA. It would also require Eskom to act in violation of section 21(1) of the Electricity Regulation Act which obliges a licensee *"to exercise the powers and perform the duties set out in such licence"*.

377 The application of the Grid Code and the NRS 048-09 Code is explained in detail in the supporting affidavits of Eskom's Ms Isabel Fick and Mr Augusto Jose Correia, from Eskom's Transmission and Distribution divisions, respectively. I summarise the import of their evidence below.

<u>The Grid Code</u>

378 First, the Grid Code obliges Eskom to maintain the safe and efficient operation of the interconnected power system, which includes the national electricity grid.[44] To do so, Eskom must control, in real time, the amount of generation (electricity supply) that is available versus the load (electricity demand). Supply and demand must be kept in balance, to ensure that the frequency of electrical supply is within the limits that the grid can sustain. Where all other available measures have been exhausted to maintain

[44] Clause 2(1) of the Grid Code provides: "The System Operator shall be responsible for the safe and efficient operation of the IPS". See also clauses 2.1.1 and 2.1.2 of the Grid Code, on 'system reliability and safety' and 'system security'.

the requisite balance, Eskom as the System Operator is obliged under the Grid Code to implement load shedding.[45]

379 The relief the applicants seek would require Eskom to desist from load shedding in circumstances where all other available measures to balance supply and demand on the grid have already been carefully calibrated and exhausted, and thus to act in a manner that places the safety and security of the grid and South Africa's interconnected power system in jeopardy.

The NRS 048-09 Code

380 Second, when it implements load shedding, Eskom is obliged to do so in accordance with the provisions of the NRS 048-09 Code. The NRS 048-9 Code was first developed as a sector-designed code of practice in response to load shedding in 2008, to define the guiding principles and processes for emergency load reduction (which includes load shedding). The second (2017) edition of the Code is currently in force, and its implementation is required by NERSA as a condition of Eskom's licenses.[46] It is attached to Mr Correia's affidavit as annexure "AC1".

381 The NRS 048-09 Code strives to balance two fundamental objectives: an equitable distribution of the burdens caused by an electricity shortage and the imperative of avoiding the catastrophic consequences of a blackout. It provides, among other things, that load shedding should be equitably implemented by means of rotational, time-based schedules;[47] subject to a carefully constructed protocol for the protection of

[45] This is addressed in both Ms Fick and Mr Correia's affidavits.

[46] That compliance with the NRS 048-9 Code is a condition of Eskom's licences was specifically confirmed in a directive NERSA issued to Eskom on 18 November 2010, attached to Mr Correia's affidavit as annexure "AC6".

[47] Clause 4.4.2 of the NRS 048-9 Code.

critical loads;[48] and that customers should be notified in advance of load shedding schedules and changes in stages of load shedding.[49]

382 As is detailed in Mr Correia's affidavit, the NRS 048-9 Code addresses the impact of load shedding on "essential loads" and "critical loads".[50] These are defined as follows:

382.1 An "essential load requirement" is "*the minimum customer load requirement (e.g. MW, notification time, and duration) to avoid a direct and significant impact on the safety of people, the environment, and physical plant or equipment (or both) for nationally critical products, and which has been (a) specifically notified as such by the customer to the licensee, and (b) agreed to in writing by the licensee*";[51] and

382.2 "Critical loads" are "*loads that are critical for maintaining the operational integrity of the power system or for avoiding a cascading impact on public infrastructure in the event of a system emergency*".[52]

382.3 The following entities and facilities are identified as "critical loads": airports; commuter rail and long distance rail; traffic lights; water servicing power stations; water servicing industrial facilities; water servicing agricultural facilities; potable water; stadiums; sewerage facilities; refineries; fuel pipe lines; coal mines; educational facilities; police stations; telecommunications facilities; hospitals; data centres; port authorities; government buildings; and electricity control centres.

[48] Id at clauses 7 and 8.

[49] Id at clauses 4.10.2 and 4.10.3.

[50] Correia's affidavit at paras 52ff.

[51] Clause 3.1.

[52] Clause 8.1.

382.4 The NRS 048-9 Code stipulates that –

> *"Critical loads should as far as possible be protected from the impact of load shedding or loss of supply. Protection measures could include the exclusion from load shedding schedules, installing of backup facilities, or implementing of specific protocols for interaction between the customer and the licensee."*[53]

383 Load Reduction Principle 3 in the Code also recognises the need for the protection of critical and essential loads, where possible. It provides:

> *"Critical loads and essential load requirements shall be taken into consideration in order to limit the potentially negative impacts of mandatory load reduction on safety, the environment, and infrastructure that is critical to communities and the economy."*[54]

384 Given the realities of South Africa's distribution network – and the problem of embeddedness in particular – the NRS 048-09 Code recognises that it is impossible to exclude all of these critical loads from load shedding without compromising the load reduction that is required to maintain the safety of the grid.

385 The Code thus delineates exclusion protocols for critical loads per facility-type. A few facilities with critical loads are automatically excluded from load shedding under the Code including, for instance, bulk potable water supplies and water servicing power stations. For others, the Code indicates where the facilities are expected to have their

[53] Clause 8.1.

54 Clause 4.4.3.

own back-up supply (eg. in the form of generators) and are thus not excluded in the ordinary course.

386 For example, all hospitals are expected to have a back-up energy supply, since it is understood that in the ordinary course (and even if there were no load shedding) hospitals must have back up supply to ensure that they can keep life-saving equipment like oxygenators running 24 hours a day. The NRS 048-09 Code thus does not provide for the exclusion of all hospitals. It does, however, establish a protocol for a hospital in need of temporary and emergency supply (eg. if its back-up facility has failed) to contact its distributor (Eskom or the municipality) for immediate restoration of electricity supply.

387 The pertinent point is this: there is a carefully regulated scheme in the NRS 048-09 Code, which was compiled with the input of multiple stakeholders, that governs load shedding and the protection of essential and critical loads. Eskom – and all distributors, including municipalities – are bound by their licenses to apply that Code.

388 The relief the applicants seek in prayers 3 and 4 would have Eskom (and all other distributors) disregard the Code entirely, and effectively set it aside. The result would not only be for this Court to abolish the industry standard – produced after years of consultation and input – that regulates the crucial aspects of load shedding, in order to make way for what the applicants claim is the better approach. It would also mean that this Court is asked to act as a super-regulator, interposing itself into the management of the electricity crisis, overriding the experts and experienced personnel that, on a daily basis, in real-time, seek to discharge the heavy burden of balancing the demands on the grid, while attempting to find an overall and sustainable solution to the energy crisis.

389 I respectfully submit that the detail, volume and wide-ranging nature of the supporting affidavits and reports filed in this matter by Eskom, confirms the expertise of the officials involved, and the extensive work already done and that continues to be done tirelessly by them. It will not have been lost on this Court that instead of continuing with their work towards those solutions, their energies have unfortunately been diverted for the past weeks in having to explain not only how misguided the applicants' case is, but also the precipitous danger that the relief portends.

390 What is more, the applicants ask the Court to endorse their own rather arbitrary selection of institutions or facilities they consider require protection above all others. Yet those facilities cannot be excluded without imposing a greater burden of load shedding on others. When a System Emergency is declared and load shedding is required, a certain amount of load must be removed from the grid to balance with the available supply. If the entities the applicants demand be protected are all excluded from load shedding (even assuming this were technically possible), other customers – including all the other critical loads identified in the NRS Code – would have to bear a greater burden of load shedding to accommodate this. It is precisely this sort of inequity that the NRS Code seeks to avoid.

391 It bears emphasis too, that the NRS 048-09 Code was developed and revised after extensive consultations and deliberations by those fully cognisant of the technical and practical constraints of the distribution network.[55]

392 As Mr Correia explains, the 2017 edition of the NRS 048-09 Code is now presently under review by the NRS Working Group and has already been subject to wide consultation. The NRS Working Group will soon table a revised edition of the Code to

[55] Correia affidavit paras 15 -18.

NERSA for its consideration and approval.[56] It is expected that NERSA will convene a further round of public consultations to inform its decision in this regard. It will presumably be open to the applicants to engage in that process, and to put forward their proposals for how the protocols governing critical loads can be improved. What they cannot do, I respectfully submit, is to ask this Court simply to ignore and override the legal framework that governs load shedding, in order to enforce their own determined priorities, which arbitrarily exclude multiple other customers who also bear critical loads under the NRS 048-09 Code.

Eskom's authority vis-à-vis municipalities

393 Third, the relief the applicants seek in prayer 4 presupposes that Eskom has the authority to issue instructions to municipalities that distribute electricity in their jurisdictions. Eskom does not have such authority and, were it to issue such instructions, it would be requiring municipalities to breach the law.

394 While this is matter for legal argument, I draw attention to the following:

394.1 Municipalities with distribution licenses are equally obliged under their licenses to respect the Grid Code and to comply with instructions given by the System Operator in accordance with that Code and other regulatory instruments (including the NRS Code) to ensure the safety and security of the interconnected power system.

394.2 As with Eskom, were municipalities to grant the blanket exclusions from load shedding that the applicants seek when load shedding is required, they would

[56] Correia affidavit paras 19-20.

contravene both the Grid Code and the NRS 048-09 Code, and thus too their licenses. Eskom certainly cannot instruct them to do so.

394.3 Moreover, municipalities are specifically obliged under section 27 of the Electricity Regulation Act to exercise their executive authority and duties by, inter alia, *"(a) complying with all the technical and operational requirements for electricity networks determined by the Regulator"* and "*(f) ensuring sustainable reticulation services through effective and efficient management and adherence to the national norms and standards contemplated in section 35"*. The norms and standards in section 35 include guidelines and codes of conduct made by NERSA, such as the Grid Code and NRS 048-09 Code.

394.4 Municipalities are vested with constitutional authority for electricity reticulation in their areas of jurisdiction. The effect of the relief the applicants seek is for Eskom and/or the Minister of Public Enterprises impermissibly to override that authority by issuing instructions to municipalities on how to distribute electricity in their networks when load shedding is implemented beyond the terms authorised by the Electricity Regulation Act (i.e., those instructions the System Operator is permitted to issue under the Grid Code).

394.5 Even if Eskom and/or the Minister of Public Enterprises were entitled to issue such instructions, they would have no authority to enforce them, let alone the means to monitor if they were being implemented. Eskom has no means of knowing how load shedding is implemented in municipalities' distribution networks, as it has no oversight or internal control of those networks. It is only able to assess whether the overall load reduction required has been

achieved.[57] Neither does this court. It is being asked to venture into this unknown territory by the applicants through the door of prayer 4, without any way of knowing what the effect would be on the grid overall of granting a prayer aimed at some 177 municipalities throughout the country.

394.6 The court is in the dark about any of these impacts or on-the-ground information about how prayer 4 would work, since the the applicants have failed to join the municipalities licensed to distribute electricity, or the Minister for Cooperative Governance and Traditional Affairs. Given the impact the relief in prayer 4 has on these municipalities' obligations under the Electricity Regulation Act and distribution licences, and their authority and responsibility for electricity reticulation in their jurisdiction – not to mention the practical impossibility of what the relief would practically require of them – the applicants were obliged to join the municipalities. In the absence of such joinder, the relief in prayer 4 cannot be granted.

Prayer 5

395 In the alternative to prayers 3 and 4, the applicants seek the following relief:

> *"that Eskom and the Minister of Public Enterprises must take immediate steps to procure alternative sources of electricity and/or energy for all the establishments and facilities contemplated in paragraph 3… including, but not limited to solar panels and generators".*

396 The applicants do not say anywhere in their founding affidavit the legal basis on which they contend that Eskom and the Minister of Public Enterprises are responsible for

[57] Correia affidavit paras 93-94. See also Dr Minnaar's report at para 33.

procuring alternative sources of energy to compensate for load shedding. I submit that they have failed to make out a case for this relief.

397 This, too, is matter for legal argument. However, and without purporting to be exhaustive on this issue (particularly since the applicants have not explained the basis for this relief – a fatal error on its own), I submit that Eskom does not bear this obligation for the following reasons:

397.1 No such obligation is imposed on Eskom under the Constitution or the Electricity Regulation Act. In particular, the IPP Office, which reports to the Department of Mineral Resources & Energy, is the designated procurer of electricity. Any procurement of electricity by Eskom is subject to an approval by the Minister under Section 34 of the Electricity Regulation Act.

397.2 No such obligation is imposed on Eskom under the Grid Code or the NRS 048-09 Code.

397.3 No such obligation is imposed on Eskom under its Transmission licence. The Transmission licence obliges Eskom to, inter alia, manage the national electricity grid and interconnected power supply and to transmit electricity via its transmission network. It must do so, inter alia, in accordance with the Grid Code.

397.3.1 Clause 4.1.6 requires Eskom Transmission (as the Licensee) to enter into operating agreements "with all entities connected to the Licensee's transmission network, defining their reciprocal obligations, <u>in accordance with the Grid Code</u>" (my emphasis).

397.3.2 Clause 10 further recognises that, while the uninterrupted supply of electricity is required of the licensee, there may be reasons beyond Eskom's control which may require such reduction or discontinuance.[58]

397.3.3 Clause 15 obliges Eskom as the licensee to "comply with all applicable laws and especially those governing the electricity supply industry including regulations, codes, directives, guidelines as effected from time to time". That includes the Grid Code and the NRS 048-09 Code, which authorise and require load reduction, including by means of load shedding, when necessary to protect the grid from collapse.

397.4 No such obligation is imposed on Eskom under its Distribution licence. Eskom's obligation under this licence is to distribute and supply electricity to consumers through its distribution network for a NERSA-approved price and tariff.

397.5 No such obligation is imposed on Eskom under Eskom's bulk-supply agreements with municipalities.

398 Where public institutions and facilities are in need of state support to ensure their effective functioning, it falls to the Departments responsible for those institutions to provide the requisite financial and technical support. Where the facilities provide basic

[58] Clause 10 reads as follows in relevant part:

> *"The Licensee shall also not, except for reasons beyond its control, reduce or discontinue the transmission of electricity to a customer unless —*
>
> *a) the customer is insolvent; or*
>
> *b) the customer has failed to pay the agreed charges or to comply with the conditions of service delivery and has failed to remedy the default within 14 days, or within such longer period as may be specified by the NER"* (emphasis added).

municipal services, it falls to the responsible municipality to provide the requisite financial and technical support. There is no basis in law (or in reality) to impose on Eskom a duty to "procure" such alternative sources.

399 That is not to say that Eskom is oblivious to the importance of being a good constitutional citizen within the current crisis. As I explain below, Eskom does endeavour to assist and support the responsible Departments in addressing the impact of load shedding on public institutions, wherever possible, and within the strictures placed upon it by its licence, the Grid Code, and the NRS Code. In particular, where the solution proposed to be implemented requires work on Eskom's transmission or distribution network and infrastructure, Eskom will perform the necessary work, at a cost payable by the customer or the responsible Department. Eskom will also assist where it can to procure or make available material resources required to implement alternative solutions for energy supply, if they are readily available to Eskom.

400 But in doing so, Eskom does not assume responsibility for funding or procuring such work and resources, and nor has it been expected to by any Government Department or municipality. It is appreciated, in government at least, that this falls outside the remit of Eskom's mandate and responsibility.

401 Without the approval and assistance of the responsible departments and National Treasury, Eskom cannot simply procure alternative sources of energy for public institutions. The relief sought is wholly misguided, not least and most obviously because this Court has no idea what the budgetary implications or possibilities would be without the responsible Departments or Treasury having been joined, and whether the affected municipalities are willing and able to exclude the hospitals for which they are responsible (which would mean this relief is not required).

402 In addition, imposing such an obligation on Eskom would, again, require it to perform the impossible. Eskom does not have the budget, material and human resources to implement such extensive relief.

403 I reiterate that Eskom is already operating well below-cost (as a result of NERSA's non-cost reflective tariffs) and under severe financial and liquidity constraints. At the end of December 2022, Eskom's debt securities and borrowings stood at R422 billion; and it already depends on substantial Government guarantees (R350 billion, with R323 billion already committed). I refer in this regard to paragraphs 57 to 61 of Mr Cassim's affidavit, which describes Eskom's debt and liquidity problem.

404 In the limited time Eskom has had to respond to this application, Eskom has not had the opportunity meaningfully to cost the roll-out of alternative sources – generators, PV and BESS (battery energy storage systems), microgrids – to all of the relevant entities. However, even on a rough and conservative estimate, rolling out these alternative sources of supply to all the entities the applicants identify would impose a significant financial burden on Eskom – in the order of billions of Rands – which it is simply not in a position to shoulder.

405 Dr Minnaar's report provides indicative costs of installing generators and PV (solar) and BESS (battery energy storage system) technology, of various generation capacities, on a per site basis. Any meaningful assessment of the costs of rolling out this technology requires a detailed and site-specific assessment to determine the size of the system required to meet the customer's demand and energy usage. As Dr Minnaar notes, the most common notified maximum demands for health facilities, police stations and schools are generators sized 16 kVA, 25 kVA, 50kVA and 100kVA; whereas common generator sizes for larger health facilities like hospitals are 200 kVA,

500 kVA and 1000 kVA. Roughly equivalent sized PV panels (in kWp) would supply the same amount of electricity, but subject to battery storage capacity.

406 To give just some indication of costs, supplying a 500kVa generator to all 381 public hospitals – without factoring in the cost of fuel – would cost approximately R400 million (at R1,050,000 per generator); whereas supplying a 1000kVa generator to all public hospitals would cost in the region of R762 million (at R2 million per generator). On the assumption that the average hospital bed consumes between 35kWh and 92kWh per day per bed, and diesel costs approximately R6 to R9 per kWh, at best it would cost, on average, R210 per day to provide sufficient diesel for a single hospital bed.

407 To provide every public hospital with a system of PV panels of 500kWp and battery storage of 1000 kWh, with storage capacity to cover two hours of loadshedding, would cost nearly R5 billion (at a cost of R12 822 875 per system). These costs would increase by 50 to 60% for increased storage capacity to cover four hours of load shedding.

408 Another, but expensive, source of alternative electricity supply is a microgrid: a repurposed container which holds a storage battery and has PV panels fitted on its roof.

408.1 The micro-grids which Eskom is currently testing contain a 22kW PV panel and an 80kW storage battery at an approximate cost of R1.8 million each.

408.2 These micro-grids might generate sufficient capacity for a police station. However, according to the SAPS Annual Report, there are 1158 police stations in South Africa meaning that a roll-out of micro-grids to each of these stations would cost over R2 billion, without including installation costs.

408.3 An average public school reportedly uses approximately 450kWh per day, although there are substantial differences in energy usage across schools.[59] I attach a media report by the academic authors of the study, together with a copy of the study marked **AA40**. I am advised that a micro-grid with larger generation capacity than those Eskom has currently tested would be required to meet an energy usage of 450kWh per day, and that a 100kW PV panel, together with the requisite storage, would be required. This would cost approximately R5 million per micro-grid. There are approximately 23 000 public schools in South Africa. Without taking into account the substantial variation in energy usage and demand across schools (which would require detailed assessment), providing micro-grids of the size required to meet average need to each public school would therefore likely cost in the region of R115 billion (excluding costs of installation).

408.4 Adequately-sized micro-grids for public hospitals would similarly be prohibitively expensive and alternative solutions (such as generators or the installation of direct feeders) would likely be more economical.

409 The above figures provide some sense of the costs – scale and variability – involved in rolling out these alternative technologies. However, finding the optimal and most cost-effective solution for each site requires a site-specific analysis – taking into account, inter alia, the local electricity network, the entity's existing back-up systems, and its energy use and demand profile. Often a combination of technologies provides the optimal solution.

[59] Samuels et al, 'Light Years Apart: Energy Usage by Schools across the South African Affluence Divide' (2020) 70 *Energy Research and Social Science* 101692, reported in https://www.news24.com/fin24/opinion/opinion-sas-schools-use-r5bn-in-electricity-per-year-heres-how-they-can-save-20210202.

410 As is detailed in a presentation Eskom delivered on 30 January 2023, attached to Ms Mokwena's affidavit as annexure "DM3" (also addressed below), Eskom has provided a more detailed assessment and estimation of the costs of implementing combined solutions to insulate all public hospitals from load shedding. It costed this at approximately R356 million, with installations estimated to take between 12 and 36 months. For Eskom to bear this cost would require additional funding from National Treasury.

411 There are additional, fundamental concerns for Eskom as regards this relief, which go to its very sustainability as a public company.

412 Should the Court direct Eskom to provide this relief, it would, in effect require Eskom management to abandon its Generation Recovery Plan to address load shedding for the entire country, in favour of a court-directed remedy to protect the applicants' selection of facilities. Given Eskom's current budget and resource constraints on the one hand, and the costs and resources that would be required to implement the relief the applicants seek on the other hand, Eskom could not conceivably dedicate the resources it needs to implement its Generation Recovery Plan, while at the same time implementing the relief in prayer 5.

413 Furthermore, given Eskom's resource constraints, its decisions about how best to raise capital in order to ensure the most cost-effective solutions as quickly as possible to the energy crisis, are currently delicately poised. The relief the applicants seek would require this Court to venture into that territory at a critical time for Eskom, as it seeks to transition from coal to clean energy in order to most effectively end load-shedding. The entire apple cart is at risk of being upended by relief that, with respect, pays no regard whatsoever to the complexity of the situation, or the policy decisions that have been taken by Eskom in conjunction with the executive to deal with the energy crisis.

414 The result is that an order directed at alleviating the short-term plight of some public institutions and facilities (even assuming this were technically feasible, which it is not) would compromise Eskom's ability to bring an end to load shedding as soon as possible, for the benefit of all South Africans and all public institutions and facilities. This, I submit, could never be just and equitable. It is not even in the interest of the public facilities that the applicants seek to protect. The relief is short-sighted and has no regard to the dire opportunity costs it carries for Eskom's capacity to address load shedding.

415 It also bears emphasis that after years of under-funding by NERSA and an escalating municipal debt burden, Eskom has had to rely increasingly heavily on private financing to sustain its operations. Were the Court to grant the relief the applicants seek, it would signal to Eskom's lenders and investors that Eskom's management does not control the allocation of its resources and that no reliance can be placed on its own plans, as they can be fundamentally altered by this Court. I have no doubt that such an order and signalling would threaten this financial life-line, which Eskom depends on to implement its Generation Recovery Plan and transition into a sustainable and reliable energy company. Should Eskom lose this lifeline, the state would have to bear all the costs of financing Eskom and maintaining it as a going concern.

Eskom's efforts to find solutions for public hospitals and other facilities

416 The applicants unfairly suggest that Eskom has been callous about the impact of load shedding, and the plight of public hospitals, amongst others. This is quite wrong.

417 Since September 2022, Eskom has been working with the Department of Health to find alternative solutions for public hospitals to ensure uninterrupted energy supply. The Department of Health turned to Eskom for assistance having identified particular

hospitals for possible exclusion from load shedding on the basis of, among other things, non-availability of diesel and depleted budgets for operating generators.

418 Eskom has expended substantial time and resources to ensure that all possible solutions are explored, and it continues to do. These efforts are detailed in the supporting affidavit of Ms Daphne Mokwena, the Senior Manager of the Centre for Excellence in Eskom's Distribution Division. In short, Ms Mokwena explains that:

418.1 Eskom received a list from the Department of Health of 213 hospitals in need of relief from load shedding. Eskom assessed the position of all of these hospitals – taking into consideration their level of embeddedness, the potential risk of excluding them (and their embedded customers) from load shedding on the grid's stability, and whether the hospital had particular network characteristics to enable ready isolation from load shedding.

418.2 With the aim of trying to proactively and prudently find a response to the obviously prejudicial impact of load shedding on hospitals, within a month, Eskom had conducted its assessment and reported to the Department of Health. Eskom found that it could exclude 25 hospitals supplied by its network, as they were not deeply embedded in the grid. Eskom also recommended the exclusion of 51 hospitals within the municipal areas of supply. It did so applying the criteria outlined above, which established a rational and consistent basis on which to make these decisions.

418.3 Even where hospitals were found to be deeply embedded in the grid, Eskom has endeavoured to find solutions. Eskom's proposals are detailed in a presentation it delivered on 30 January 2023, and is attached to Ms Mokwena's affidavit as annexure "DM3". It details the possible solutions, the costs and

timeframes associated with these solutions. It is estimated that installing necessary infrastructure to insulate all public hospitals from the load shedding schedule would cost approximately R356 million and that such installations would take between 12 and 36 months.

418.4 Eskom has also received requests from 453 private hospitals and clinics for exclusion from the load shedding schedule, and the possibility of these exclusions remains under investigation.

419 Since about October 2022, Eskom has also been engaging with the Department of Basic Education to consider possible solutions to load shedding at public schools in the country. Regrettably, Eskom determined that it cannot exclude public schools as there is simply not enough available electricity to supply 23 000 deeply-embedded public schools during school hours. (In addition, and as with the hospitals, many of the schools fall into the municipalities' areas of competence, and Eskom can do no more than make recommendations in that regard.)

420 Eskom advised the Department of Basic Education that it should take steps to procure back-up generators for public schools. I am unaware whether such steps were taken. The applicants have not joined the DBE and therefore this information is not before this Court.

421 Eskom has also been engaging with the Department of Agriculture and various stakeholders and representatives in the agriculture and food production sectors, to address the impact of load shedding, which potentially undermines South Africa's food security. Eskom has already facilitated relief for some entities, such as Premier Foods' milling plants. These engagements and efforts to find solutions are ongoing.

422 I wish to emphasise that Eskom has not simply thrown up its hands because of the embeddedness of certain institutions. It continues to work with the Departments concerned to find solutions as quickly and cost-effectively as possible. However, the time and planning involved in assessing the network conditions and possible solutions, and the time required to implement these solutions simply does not allow for the urgent relief the applicants seek. The appropriate course, I submit, is for Eskom to be allowed to pursue its work with the Department of Health to find solutions, fully cognisant as it is of the urgency.

423 Eskom has not been approached by the Departments of Police, Small Business Development, Water and Sanitation, or Communications and Digital Technologies in respect of the effects of load shedding.

424 If and when these Departments make such an approach, Eskom will endeavour, as it has repeatedly, to find appropriate solutions wherever possible, alive to the considerations and difficult balances described in this affidavit and that of Ms Mokwena.

CONCLUSION

425 In light of what is set out in this affidavit and in the supporting affidavits and reports that accompany it, Eskom prays that the application must be dismissed.

_____

DEPONENT

The Deponent has acknowledged that the deponent knows and understands the contents of this affidavit, which was signed and sworn to before me at _____ on this the _____ day of _____, the regulations contained in Government Notice No.R1258 of 21

July 1972, as amended, and Government Notice No R1648 of 19 August 1977, as amended, having been complied with.

_____

COMMISSIONER OF OATHS

Name:

Title:

Address: