

Applications for suspension, alternative limits and/or postponement of the MES compliance timeframes

Eskom Motivation

CESA Presentation
24 May 2021



WHY IS ESKOM MAKING THIS APPLICATION ?

- MES legislation was published in 2010 (revised 2013 & 2019) – it gave industry until 2015 to meet existing plant emission limits and until 2020 to meet stricter new plant emission limits.
- Eskom power stations, except Medupi and Kusile, were built before 2013 and need to have extra new equipment installed to meet the limits.
- Installing equipment to improve emissions is happening **but** installing all the equipment has challenges and is costly in various ways.
- If you weigh up the costs and benefits of installing all the new equipment Eskom thinks it does not make sense for South Africa to require Eskom to install all this equipment.

Implementation Timeline – State of Eskom’s Current Fleet and Implications

- In terms of emissions abatement control on Eskom’s fleet, the focus to date has primarily been on particulate control.
- With the advent of the minimum emissions standards, focus is now moving toward De-SO_x and De-NO_x abatement.
- Kusile (new build) will be Eskom’s first coal fired power station to employ a wet flue gas desulphurisation (FGD).
Medupi (new build) will be retrofitted with a wet-FGD during the first general overhaul (GO) cycle.
- Both Medupi and Kusile (new build) will comply with the NO_x limits for new plant from inception (low NO_x burners plus over-fire air).
- Feasibility studies have commenced for the upgrade of existing power stations in order for them to comply with the min. emissions standards and the conditions of the postponement application.
 - Particulate upgrade strategy has been completed in 2014.
 - NO_x and SO_x upgrade strategy has been completed in 2015 and 2016 respectively.

ESKOM'S EMISSION REDUCTION PLAN



	Technology already installed	Pollutant to be abated	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	50-year life
Kusile	FFP,LNB and FGD	N/A																
Medupi	FFP, LNB	SO ₂																2064-
Majuba	FFP	NO _x																2046-51
Kendal	ESP + FGC	PM																2038-43
Kendal	ESP + FGC	SO ₂																2038-43
Matimba	ESP + FGC	SO ₂																2037-41
Matimba	ESP + FGC	PM																2037-41
Lethabo	ESP + FGC	PM																2035-40
Tutuka	ESP	PM																2035-40
Tutuka	ESP	NO _x																2035-40
Duvha (4 & 6)	FFP(1-3); ESP(U4-6)	PM																2030-34
Matla	ESP + FGC	PM																2029-33
Matla	None for NO _x	NO _x															D	2029-33
Kriel	ESP + FGC	PM															D D D D	2026-29
Arnot	FFP	N/A							D								Dx2 D Dx2	2021-29
Hendrina	FFP	N/A																2018-26
Camden	FFP	NO _x																2020-23*
Grootvlei	FFP (U1,5,6); ESP+FGC (U2,3,4)	N/A																2018-28
Komati	ESP + FGC	N/A																2024-28

*Possible delay of decommissioning

Legend	
Completed projects	
Future projects	
Decommissioning	D
Investment approval dates	
Shut down for reserve storage	SD
Previous commitment	

Abbreviations:

CFB-FGD = Circulating Fluidised Bed – Flue Gas Desulphurisation to reduce SO₂
 ESP = Electrostatic Precipitator to reduce PM
 FFP = Fabric Filter Plant to reduce PM
 FGC = Flue Gas Conditioning to reduce SO₂

	Full compliance with MES	Eskom's emission reduction plan
SO₂	Wet FGD at: Medupi, Majuba, Kendal, Matimba & Tutuka. Semi-dry FGD at: Duvha, Matla & Lethabo	Wet FGD at: Medupi (pilot at Kendal & Matimba)
NO_x	LNBS at: Majuba, Matla, Tutuka, Lethabo & Duvha	LNBS at: Majuba, Matla & Tutuka
PM	FFP at: Tutuka ESP Refurb/Upgrade at: Duvha, Matla, Kendal, Lethabo, Matimba	FFP at: Tutuka ESP Refurb/Upgrade at: Duvha, Matla, Kendal, Lethabo, Matimba

	Year		
	2025	2030	2035
PM	38 %	49 %	58%
SO₂	18 %	52 %	66 %
NO_x	15 %	32 %	46 %
Coal Prod (GWh)	210 730	189 047	159 103

Reduction in relative emissions from 2020 with implementation of Eskom emission reduction plan and station decommissioning

- It will take 12 years from planning to complete operation of the SO₂ emission reduction at Medupi.
- Other technologies may not be as long but big projects take a long time.
- Some of Eskom's existing emission reduction projects already delayed by several years.
- Once installed the equipment must run for a number of years to be a financially viable project (20 ?).
- It is not practically possible to install or financially viable to put in equipment for stations which will close down before 2030/35.

- Eskom's emissions do contribute to the emission levels in the area.
- Particulate levels are high but are most impacted by low level sources (household fuels, dust from roads). The offset programme Eskom is implementing will help address this.
- Nitrogen oxide levels as measured at local measuring stations are not in exceedance of limits.
- SO₂ levels in areas are high in areas but Eskom is not the only source of SO₂ and the Eskom emissions reduction plan and station decommissioning will reduce it.

- There are financial costs and benefits to installing emission reduction equipment.
- The cost benefit study shows from a high level financial basis it is not prudent to require Eskom to implement full compliance to the MES standards.

THE COST OF FULL COMPLIANCE

Implications	Full compliance with MES	Eskom's emission reduction plan
Water consumption increase	20% - (59 million m ³ /annum)*	2% - (9.6 million m ³ /annum)
CAPEX cost (2019 overnight costs, excluding interest and interest during construction)	Approx R187 billion	R46 billion
Annual OPEX costs (2019 costs)	Approx R5.9 billion	R900 million
Tariff increase	7 to 10 %	2 to 3 %
Auxiliary power consumption increase	2 500 123 MWh/year	400 192 MWh/year
CO₂ emission increase (direct emissions from the FGD process only)	2.8-3.0 million tons/annum	435 000 tons/annum
Increase in coal consumption due to low NOx burner retrofits	735 105 tons/annum	555 369 tons/annum
Waste (FGD by-product) production	9.7 million tons/annum	2.7 million tons/annum
Sorbent Consumption	5.2 million tons/annum	1.5 million tons/annum

- Eskom aims to manage and operate its power stations so that risks to the environment and human health are minimised and socio-economic benefits are maximised.
- Eskom believes that given the reasons described that the proposed Eskom emissions reductions plan presents a fair balance between cost and benefit whereas full compliance with the MES does not.