System Status Briefing

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Overview

- The power system is vulnerable and volatile with 21 days loadshedding since September 2019 including Stage 6 on 09 December 2019 as unplanned breakdowns were above 12 500 MW
- Planned maintenance was affected over this period due to high breakdowns and was below the intended 5 500 MW, but we are now ramping up the philosophy maintenance.
- To return the power station fleet and system to a more predictable state may result in reduced capacity on the system
- The result is that the system will be vulnerable for a period of approximately 18 months with an increased likelihood of loadshedding over this period
- Additional focus will be on correcting new build defects, extending the life of operating units, reducing unplanned outages and managing coal quality and handling related issues
- We continue to ask South Africans to reduce demand as a concerted collective effort can help to reduce or avoid loadshedding
- We regret that we are inconveniencing customers while we address system constraints

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Overview of Transmission, Distribution and New Build performance

As at end Jan 2019

Division	Performance Status
Transmission	• Transmission performance challenges: – 4.03 System Minute (<1) losses YTD vs YE target of 3.53 (3 incidents involving severe plant failures contributed 1.36 System Minutes) – 1 Major Incident YTD (impacting Tshwane Metro) • Ongoing theft and vandalism incidents have impacted operations such as the collapse of line towers in the West Rand and Heidelberg area due to steel theft
Distribution	• Customer experience related to duration and frequency of interruptions is performing better than target (Q3 Performance): • SAIFI = 14.56 YTD actual vs. 19.6 YTD target • SAIDI = 37.48 YTD actual vs. 38 YTD target • 121 295 customer electrification (YTD) vs YE target of 157 900 • There is an increase in non-technical energy losses. This deterioration is due to illegal connections, tampering with meters and the culture of non-payment • The outstanding redistributor (municipal) debt continues to increase – the YTD increase is R 7bn reaching a total of R 26.8bn at the end of December 2019
New Build	• Kusile Project Manager appointed • Ingula units rerated from 245 MW to full design capability of 330 MW • Kusile Unit 2 on load supporting grid at an average of 400 MW and Kusile Unit 3 on load supporting grid at an average of 700 MW (non-commercial units)

Generation performance for YTD December FY2020

68.0%

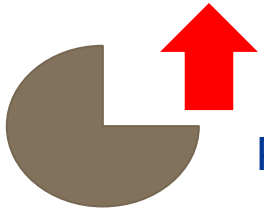
Availability vs. 71.5% target for Q3 FY20

471

UAGS Trips vs. 420 target for Q3 FY20

21.0%

Unplanned load losses vs. 18.5% target for Q3 FY20



4 197 MW

Partial load Losses vs. 3 500 MW target for FY20

9.3%

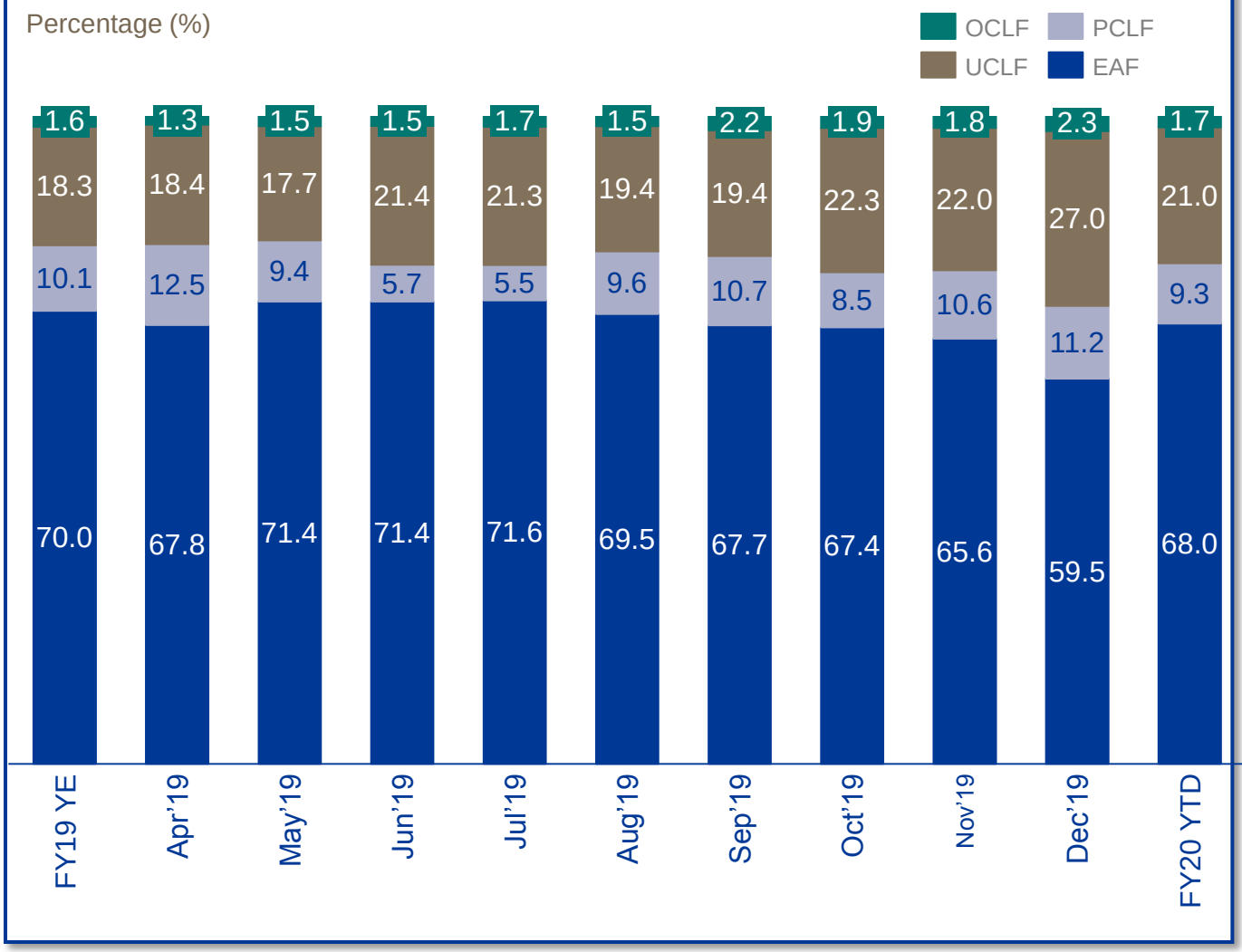
Planned maintenance vs. 8.5% target Q3 FY20

R 2.51bn

Open Cycle gas turbines cost vs budget of R 6.975bn

Unplanned losses have been higher than anticipated resulting in 21 days loadshedding over the period, and stage 6 on 9 December 2019

Generation monthly and YTD performance



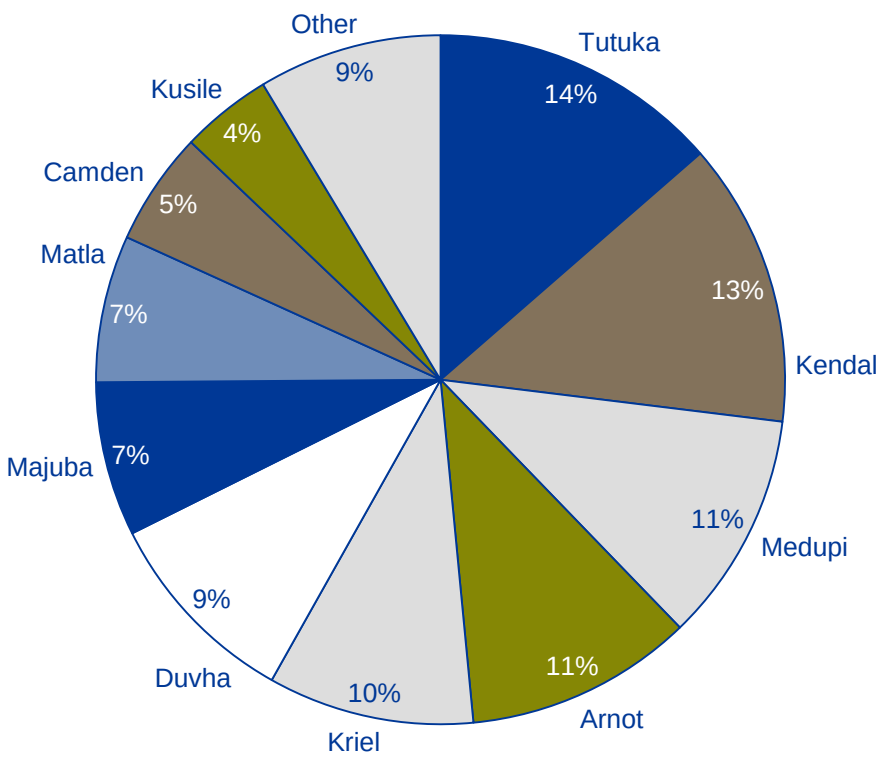
Contributing factors

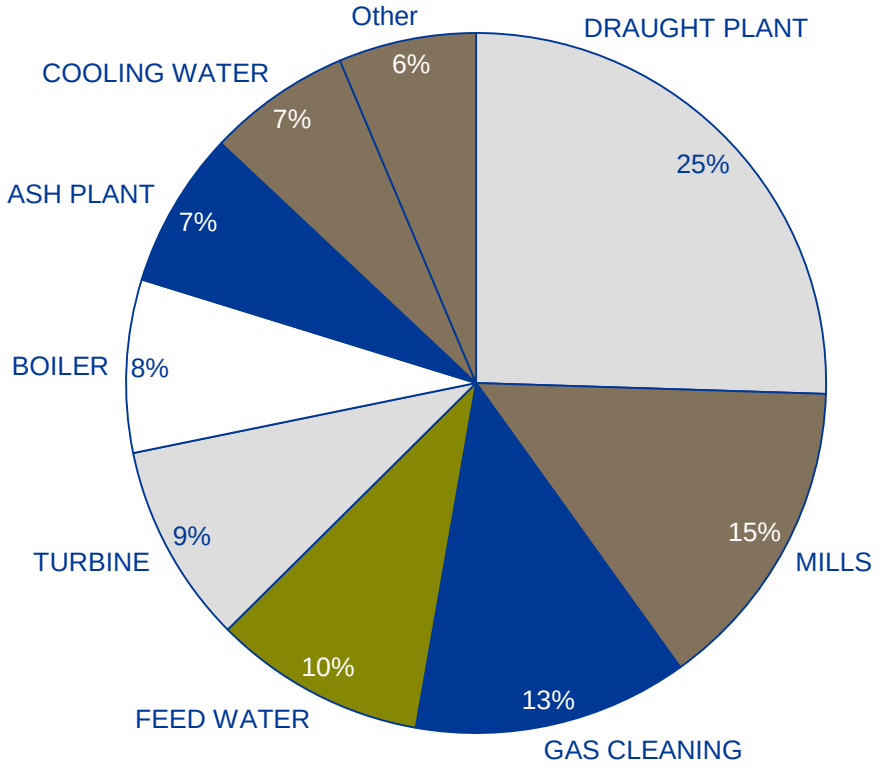
- Increase load losses with plant outage slips at 2.5%
- Vacuum losses at Matimba PS have increased due to adverse weather.
- Major projects such as Cooling Towers refurbs and HP Heater replacements to be implemented to sustainably reduce these losses at most stations.
- Flooding due to excess rain was a major concern in December 2019 due to the impact on coal supply to the units.
- Stage 6 implemented on 9 December 2019

FY2020 YTD figures as at end Dec 19

Partial Load Loss Breakdown YTD December FY2020

Generation Partial load loss UCLF performance FY2020 December 2019 YTD





Key Insights

- **Tutuka, Kendal, Medupi and Arnot** contribute approximately 48% of the total Partial Load Losses YTD.
- **Draught Plant, Milling Plant, Gas Cleaning and Feed water** were the main contributors (63% contribution) for December YTD.

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Eskom Board approved and supported the Generation Recovery Plan on 29 January 2020

- Going forward, philosophy maintenance and mid-life refurbishment will not be compromised.
- To return the power station fleet and system to a more predictable state may result in reduced capacity on the system

✓ Procurement agility via engaging the Government (e.g. NT and PFMA approval timeframes)

✓ Contracting with Original Equipment Manufacturers (OEM) and reputable specialised companies (long term partnership with shared risk)

✓ Operation of the remaining operating units at Hendrina, Camden and Grootvlei beyond their previously approved shutdown dates

✓ Address the vacuum losses at Matimba

✓ Special dispensation to recruit externally where critical skills and experience cannot be sourced internally – more than 80% of critical vacancies filled, including plant operators

✓ Revisit existing coal supply agreements to evaluate price, quality and possible solutions to address coal supply security via engagement with the relevant government departments

✓ Fast-track 9-point recovery plan

Achieving stability on the plant

- Generation will:
  - ✓ Improve new build defects at Medupi and Kusile
  - ✓ Prioritise refurbishment to improve the availability and reliability of the generation fleet: Duvha, Kendal, Kriel, Matimba, Matla, Lethabo, Majuba, Arnot and Tutuka
  - ✓ Improve the environmental performance of the coal fired power stations
  - ✓ The rest of the stations will be maintained under normal maintenance, without further investment due to their age, considering that they are to be retired in the next five years
  - ✓ Implement the five year Tech Plan and Life of Plant Plan to improve reliability
    - ➢ Started with philosophy maintenance on the following units (3 200 MW):
      - ❖ Hendrina 7; Kendal 5; Lethabo 6; Medupi 3; Kriel 5; Majuba 1
  - ✓ Manage coal quality and handling related issues to improve plant performance

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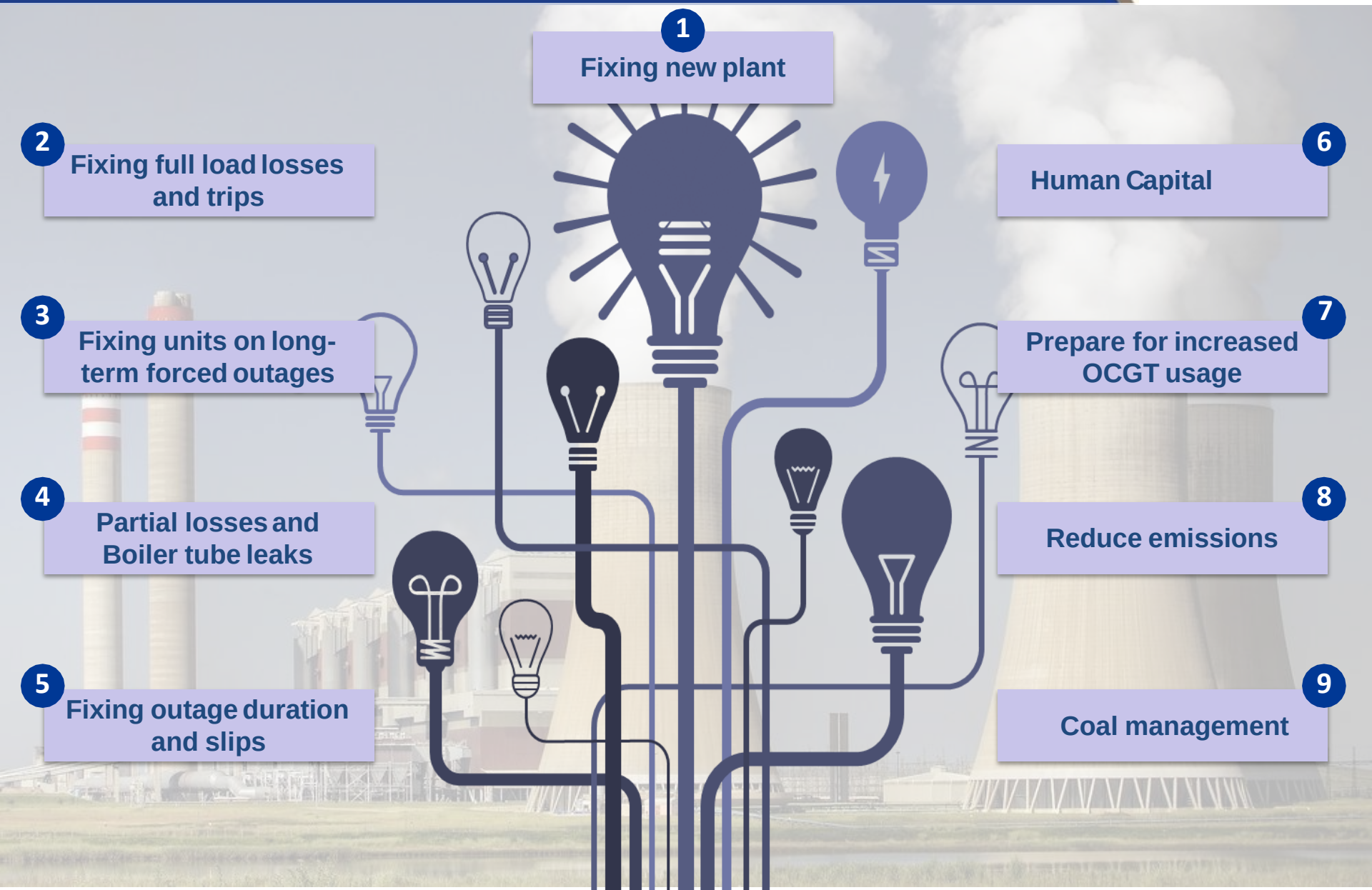
The plan covers load losses, coal stock, people issues and preparation for adverse circumstances



1. Fixing new plant
2. Fixing full load losses and trips
3. Fixing units on long-term forced outages
4. Partial losses and Boiler tube leaks
5. Fixing outage duration and slips
6. Human Capital
7. Prepare for increased OCGT usage
8. Reduce emissions
9. Coal management

Since inception, we have made implementation progress (1/6)

Stream	Status in November 2018	Progress to date
1 Fix new plant	• Steercom between Eskom and MHPSA has been established • Design defects at Kusile and Medupi have been identified 	• Ingula units upgraded from 245 MW to 330 MW • Agreement between Eskom and MHPSA has been reached for the resolution of the boiler defects at Medupi and Kusile • Medupi Unit 3 is planned to be shutdown for 75 days from January 2020 until mid April 2020 in order to attend to the design defects
2 Fix unit trips	• The trip performance remains a challenge.	• YTD trip performance is at 471 as compared to a target of 360, • Trip reduction teams have been established at all the sites • Enhanced operational focus at 4 stations • Good progress in reducing trips at some of the power stations.

Since inception, we have made progress (2/6)

Eskom

Stream 3 — **Fix units on long-term forced outages**

Assessment phase | Progress in line with plan | Progress at risk | Returned

	Description	Status/Progress
Lethabo Unit 5 (600MW)	• High Pressure steam pipe failure on 10 October 2018 • The High Pressure pipework completed , busying with extensive commissioning	**Targeted Return** February 2020
Duvha Unit 4 (600MW)	• On 23 August '17, turbine tripped on generator stator earth fault – returned on 6 Nov 2018 but was shut down again to address a Generator H_2 leak	**Returned**
Grootvlei Unit 2 (200 MW)	• Auxiliary steam range pipe burst on 26 January'18 • Also experienced generator issues • Initial delay due to funding constraints	**Returned**
Kriel Unit 2 (600MW)	• Stator earth fault on 03 May '18	**Returned**
Matla Unit 5 (575MW)	• Cold reheat non return valve leak experienced on 05 February 2019	**Returned**
Duvha Unit 1 (600MW)	• Generator Stator fault on 17 Jul 2019 • Stator rewind completed, busy with commissioning activities	**Target ed Return** February 2020
Duvha Unit 3 (600MW)	• Progress pending legal action	To be confirmed

Since inception, we have made progress (3/6)

Stream	Status in November 2018	Progress to date
4 **Fix partial losses (PLLs) and Boiler tube leaks**	• **71 outages scheduled** to address load losses until Dec 2019 • Boiler tube failure strategy in place	• Year-to-date PLLs of **4 215 MW** against a target of 3 500 MW • The **Boiler Tube Leak Reduction** Program station reviews are currently underway at the stations • To date **51 Outages** completed, 10 in execution and 10 planned up to March 2020
5 **Fix outage duration and slips**	• Engineers **identified to be** redeployed to power stations • Developed plan to focus on **Rotek performance** – enabling contracts, skills, spares and quality management	• **Relinking of the Outage execution resources** to power stations has been completed • Rotek has entered into partnership agreements with **multinational OEMs and international companies** to support with outage execution and technical support on the turbine centreline

1. There will be continued focus to drive the outage plan, however funding is a constraint 2 Failures including preventables.

Since inception, we have made progress (4/6)

Stream	Status in November 2018	Progress to date
6 Human Capital	• Identified critical vacancies and skills gaps at power station management, operations and maintenance areas	• **1 872** critical positions were identified and recruitment is underway • **985** positions have been filled as of the end of December 2019 • **205** Eskom trained plant operators were appointed in October 2019
7 Prepare for increased OCGT usage	• Tank levels for diesel were low with constrained supply and excessive usage • Finance developed plan to secure supply of diesel	• There has been higher diesel usage in the third quarter due to plant challenges • Load factor is at 9% as of the 31 December 2019 • Five-year diesel purchasing agreements were approved by the board in October 2019

Since inception, we have made progress (5/6)

Stream	Status in November 2018	Progress to date
8 **Reduce Emissions**	• Eskom not implementing emission retrofit projects within committed timelines could lead to medium term risk of 9 000 MW • Non-compliance with Atmospheric Emission License limits could lead to a short term risk of 4 470 MW	• The emission reduction stream has been established • Focus on 10 of the 87 generation units where emissions are high - a potential risk of 6 633 MW • There has been good progress at Tutuka in achieving the monthly emission target • There is a high risk at Kendal where the majority of the units operating above the emission license • There are three units at Matla and one unit at Lethabo operating above the license limits • Projects have been initiated and the approval process is underway • Kendal 5 is currently on an extended outage with Kendal 1 planned early February 2020

Continuous engagement with Department of Environment, Forestry and Fisheries (DEFF)

Since inception, we have made progress (6/6)

Stream 9 **Coal management**

	Status in November 2018	Progress to date
Challenge	• **10 stations** below Grid Code Rrequirement • **5 of the 10** stations below **10 days**	• **All but only 1 station (Arnot – 19.7 days)** above Grid Code
Stations impacted	• Arnot, Tutuka, Majuba, Matla, Kriel, Camden, Duvha	• The plan is to recover the stock days at Arnot to above 20 days by end of February 2020
Stock pile levels	• Actual stock days 22 days	• **49.6 days** as at 09 Jan 2020 • The plan is to maintain not to go below the average of **37 days**
Coal Quality	• **Coal Quality** – Good progress with coal quality related **OCLF at 0.76%.** There have been coal quality deterioration at three of the power stations which is Tutuka, Matla and Kriel **affecting UCLF and** OCLF	
Risks	• **Rain**: Heavy rains were experienced during November 2019 and December 2019. More rain is expected in February 2020, which will affect coal handling.	

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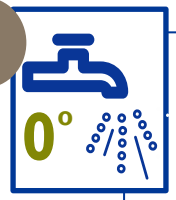
Conclusion

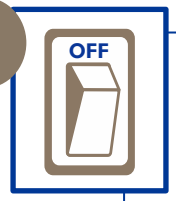
- Eskom is committed to recovering its operational performance and will not compromise on philosophy maintenance and mid-life refurbishment
- This is in order to ensure South Africa has a reliable and sustainable plant fleet going forward
- Eskom commits to keeping South Africa informed early in the event that loadshedding is necessary – a detailed schedule is being developed and will be synchronised with the national calendar
- We appeal to customers to continue to use electricity sparingly to avoid or limit the probability of loadshedding
- There will be heightened focus on sustained transmission and distribution network performance in order to manage other potential threats to the reliability of electricity supply

Use electricity smartly

It can be this easy for households to **save electricity** (and costs) during **summer**

1. 

Use the cold water tap rather than using the geyser every time

2. 

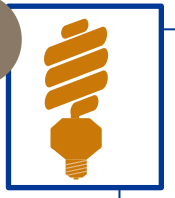
When you leave the room, **remember** to switch off the lights

3. 

Set your **swimming pool pump** cycle to run twice a day, three hours at a time for **optimal energy use**. And avoid running a cycle between 5pm and 9pm to support the power system

4. 

Set air-conditioners' average temperature in summer at **23ºC**

5. 

Be energy efficient and change your light bulbs to **energy efficient lights/LEDs**

6. 

At the end of the day, **turn off** computers, copiers, printers and fax machines at the switch. **Avoid stand-by** or sleep mode.

Thank you