Wind, warmer weather and solar energise ailing Eskom

Eskom's 2023 winter performance

Average available energy capacity: **24,540MW**
Winter tends to vary by more than **3,000MW**

SOLAR

Estimated solar energy from installed rooftop PV: **4,000MW**

WINTER TARGET

Eskom winter target average for unplanned losses: **15,000MW** or lower

WIND GENERATION

Maximum in a 24-hour winter period: **2,150MW** (varied between 150MW and 2,500MW)

- Wind energy from 24 utility-scale wind farms developed under Renewable IPP programme with **3,343MW** capacity
- Eskom owns and operates wind farms with **100MW** capacity
- **830MW** capacity wind farms added in the past 24 months

DIESEL COSTS

Diesel costs for Open Cast Gas Turbines: **R985m** between June 1 and June 19

- Eskom spent **R637m** on diesel
- **R348m** spent on diesel by Independent Power Producers on Open Cycle Gas Turbines

OTHER FACTORS

Demand for energy standing at **2,000MW** lower than Eskom's projections at other times of the day

UNPLANNED BREAKDOWNS

Between **14,000MW and 16,000MW**

Graphic: Ruby-Gay Martin

But the lower stages of load-shedding we've been enjoying lately may not last too long

By **ISAAC MAHLANGU**

● Despite solar and wind energy filling Eskom's sails – backed by a mild winter – the lower stages of load-shedding South Africans have been enjoying recently may not last the season.

Wind power has in some instances contributed more than 2,100MW to the grid, which is equivalent to three Kusile generation units, thus playing a key role in helping Eskom fend off higher load-shedding.

During the evening peaks this week, wind energy contributed 3,051MW to the grid, with 1,992MW and 959MW on Tuesday and Wednesday respectively, according to Eskom's system performance figures.

South Africa has also seen a rapid increase in the installation of rooftop solar photovoltaic (PV) systems, which more than doubled between December 2022 and May 2023, adding an estimated additional capacity of 2,590MW, according to Eskom.

Brian Day

But Eskom spokesperson Daphne Mokwena warned this week that despite a better-than-expected winter energy performance, stage 8 load-shedding is still a possibility in the winter months ahead.

"Stage 8 may still be a possibility, but is less likely given all the plans we are implementing and the performance of the Eskom generation fleet, which is at 60% energy availability factor," Mokwena said.

Solar energy has also come to the party, with Eskom estimating that total installed rooftop PV systems are generating more than 4,000MW – equivalent to four stages of load-shedding.

"The estimated rooftop PV in July 2022 was 2,260MW. We have seen a rapid increase since December 2022 when it was estimated to be 2,590MW. The estimate in May 2023 was 4,040MW. Note that these estimates are not directly measured but rather statistically determined based on the national demand for electricity," Mokwena said.

She said that while Eskom was still implementing planned maintenance, though reduced, some outages were "due to a re-optimisation of the outage plan to minimise the risk of load-shedding in both summer and winter".

Mokwena said the new leadership in Eskom's generation entity and the appointment of skilled people had helped.

Eskom has also credited a slightly warmer winter for keeping energy demand in check. The South African Weather Service says an above-average winter temperature is likely. "We are not expecting anything extreme, we expect an above-normal average," said forecaster Tokelo Chiloane on Friday.

Chiloane said South Africa also was entering an El Niño cycle, which is characterised by warmer temperatures, low rainfall and drought.

Despite the difference being made by renewables, diesel was another reliable generation fuel that helped to keep the lights on, with almost R1bn spent between June 1 and June 19 by Eskom and independent power producers.

"Wind generation in winter is driven by cold fronts that traverse the country. As these pass the Western and Eastern Cape, high winds are generated," Mokwena said.

Eskom said windfall from wind energy is generated as cold fronts pass coastal areas. However, the low pressure tailing the cold front causes wind generation to immediately drop significantly and rapidly. "Therefore wind speeds are variable and considering an average output is misleading."

Mokwena said this coincides with the arrival of cold conditions in densely populated Gauteng, driving up demand for electricity. "This double whammy results in less generation but higher demand," Mokwena said.

Eskom said the maximum change in wind generation recorded within a 24-hour period in the country was a staggering 2,150MW. "In recent weeks, the wind generation has varied between 150MW and 2,500MW," Eskom said.

The private sector is in the forefront as Eskom-owned and operated wind farms generated about 100MW. "There are 34 utility-scale wind farms developed under the renewable IPP programme with a total capacity of 3,343MW. In the past 24 months, 830MW of wind capacity has been added under the programme," Eskom said.

The chair of the South African Independent Power Producers' Association, Brian Day, said the good wind in the past few days and installed solar PV systems, including those by small companies and homes, have boosted the role of renewables in reducing load-shedding.

"We should be grateful to the government for removing some of the regulatory hurdles, especially the cap on private generation projects, which can now be any size," Day said.

He said the private sector would have long come to the party had the government removed the regulatory hurdles years back.

"Up to the end of March, 4.3GW of private generation projects had been registered with the National Energy Regulator. In a year or two, a lot of these projects will come on stream ... those projects are potentially six to 12 months away from development."

Energy economist Lungile Mashele said: "The wind certainly deserves a pat on the back, as does the changing weather system. Also, the new Eskom board and executives seem to have taken a firm stance to return to engineering and project management principles. We're seeing less outage slippage, increased performance and a higher energy availability factor."

Mashele said the problem with wind and solar energy was that they were weather-dependent and intermittent. "Over the past week we have, however, observed an almost 24-hour availability of wind, with an output nearing 3,000MW – this is fantastic and certainly makes the case for renewables even in the evening peak."