

The growth of renewables needs to be capped

By: Matshela Koko, Eskom's Group Executive for Generation

I have written a series of articles in the last few weeks pointing to the weaknesses of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) in its current form. Bid Windows 1 to 3.5 are unaffordable and its related costs should be ring-fenced and paid for separately, from the fiscus, so that they do not burden the consumer. The responses from the likes of Anton Eberhard, Chris Yelland and others only throw mud at Eskom, instead of providing a cogent response to the arguments raised in my previous columns.

The REIPPPP resulted in an economic loss of R4.27 billion in the first six months of financial year 2016/17. This economic loss is expected to double by the end of this financial year. In deriving this R4.27 billion of economic loss, the calculation method developed by the Council of Scientific and Industrial Research (CSIR) was used. The same method was used to calculate the R4 billion economic benefit of the first six months of 2015. None of the commentators, including Anton Eberhard, have responded to the R4.27 billion economic losses, precisely because none of them can. I challenge the critics to focus their energies on explaining the economic loss rather than on trying to discredit Eskom.

I have also argued that in the first six months of 2016/17, R6.64 billion has been spent to purchase 3 048 gigawatt hours (GWh) at an average cost of 218 cents per kilowatt hour (c/kWh). The entire 218 c/kWh is passed through to the consumer via the tariff. In 2021/22 the consumer is forecasted to pay 207 c/kWh, if Eskom signs Bid Windows 4 to 4.5. Over the next 20 years, an estimated R1.2 trillion will be spent on the renewable energy programme which will be funded off the back of a 20-year power purchase agreements (PPAs) with Eskom, at a guaranteed tariff rate.

The fact is that the current average blended Eskom tariff is 83 c/kWh and commentators must explain why the consumer should continue to pay 218 c/kWh for renewable energy, which is only available when Eskom has sufficient reserve margin and is not available during the peak hours, when it is most needed. It is not good enough to simply say that the prices of renewables in the future are coming down and therefore it is correct for the consumer to continue bearing the brunt of Bid Windows 1 to 3.5. This is materially significant given that the electricity system is adequate until 2020/2021. The consumers need be told why Eskom need to sign for additional generating capacity at whatever the price when there is more than enough of operating reserve capacity.

It is true that the prices of renewables are coming down and that more renewables should be deployed into the future. The study by CSIR shows the levelised cost of electricity calculations for new base load coal at between 105 to 116 c/kWh and new base load nuclear at 117 to 130 c/kWh. New power from solar photovoltaic (PV) and wind is shown to be at least 40% cheaper than that from new base load coal today.

It is, however, not a coincidence that the latest study by CSIR does not repeat the narrative by some thought leaders that base load can be created without constraint by using renewable energy along with flexible generation at a levelised cost of 100 c/kWh, as long as the flexible generation can be produced at less than 200 c/kWh. All that the CSIR did in their exercise was to create a thought experiment to encourage the correct conversations. Sadly, this has been completely misunderstood by Eberhard and others.

The real challenge is that Eskom expects the peak demand in 2026-28 to be 40 gigawatts (GW). At that stage, South Africa must be on its way to de-carbonise the electricity sector and, having

achieved universal access of electricity, provide the cheapest electricity to grow the economy. This must take into consideration that all low carbon technologies are capital intensive and that integration into the system requires long-term financial arrangements.

Eberhard is of the view that wind, solar and gas will provide the energy mix that will meet the 40GW base load capacity in 2026. He is made bullish by the CSIR's thought experiment that suggests that 40GW of base load capacity can be met with 90GW of renewable and 35GW of flexible generation. What he completely does not understand is that the combination of solar, wind and flexible generation, as is currently proposed, will result in system instability due to reduced system inertia.

Unlike Eberhard, the CSIR understands very well that the future power system will have insufficient system inertia due to the introduction of renewable energy resources, and that this has to be compensated by the provision of synthetic inertia. For these reasons, CSIR has approached Eskom to collaborate on a study on the topic of system inertia. The study aims to assess the current limitations of the existing system and the cost of different options available for grid stability as more renewable energy resources are integrated into the grid. The numbers often quoted by Eberhard and others do not include the cost for synthetic inertia. On this basis, I do not take the numbers being peddled on renewables seriously and neither should the South African public. In fact, to protect the system from black outs the growth of renewable energy resources needs to be capped until energy storage systems have proven themselves.

If storage systems could shift all of the renewable generation from intermittent generator from off-period to the peak period, the value of the electricity supplied would increase significantly. However, if procurement programs do not properly take into account the value of the electricity produced at different times, renewable generators will have no incentive to add storage to their projects. Anton Eberhard, Chris Yelland and others just do not get this.

The planning for 2026 and beyond must be on the basis that the 40GW peak will be met by non-renewable technologies. It is for this reason that nuclear build programme must be rolled out at the pace and scale that South Africa can afford.